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Middle Fork Weiser River Landscape Restoration Project

DRAFT ENVIRONMENTAL IMPACT STATEMENT

Volume 1–Chapters 1 to 4
Payette National Forest

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Chapter 1 — Purpose and Need

1.1. Introduction

This Draft Environmental Impact Statement (DEIS) discloses the temporary, short- and long-term, direct, indirect, irretrievable, irreversible, and cumulative environmental impacts of a Proposed Action and alternative actions for the Middle Fork Weiser River Landscape Restoration Project (Project) on the Council Ranger District of the Payette National Forest (Forest) in Adams County, Idaho. Proposed restoration activities include timber harvest, biomass harvest, road reconstruction, road realignment, temporary road construction, road decommissioning, culvert removal, thinning of sub-merchantable trees, prescribed fire, and other actions as described in detail in Chapter 2. Proposed recreation improvements include designated and dispersed recreation site improvements, motorized and non-motorized trail development and realignment, trailhead improvements, and replacement of a vault toilet. This document has been prepared pursuant to the requirements of the National Environmental Policy Act (NEPA, 40 CFR 1500–1508); National Forest Management Act (NFMA) implementing regulations of 2005, including transition language (36 CFR 219.14); and 2003 Payette National Forest Land and Resource Management Plan, as amended (Forest Plan) (United States Department of Agriculture [USDA] Forest Service 2003a).

The Forest's 800,000 acre Weiser-Little Salmon Headwaters Project (WLSH) was accepted in the Collaborative Forest Landscape Restoration (CFLR) Program[1] in 2012, and the Project is within the WLSH area. The purpose of the CFLRP is to encourage the collaborative, science-based ecosystem restoration of priority forest landscapes. Planning for this Project was initiated in summer 2013 in collaboration with the Payette Forest Coalition (PFC). The PFC, formed in June 2009, is a collaborative group comprised of stakeholders from a broad range of outside interests, including the environmental community, timber industry, recreational groups, and State and County government. The goal of the PFC is to work to sustain the ecologic function of landscapes and the economic health of rural communities.

In 2009, the Forest deferred the Middle Fork Weiser River area from analysis, due to ongoing analysis of the Mill Creek-Council Mountain Landscape Restoration Project (also a collaborative project), a large-scale project located north of and adjacent to this Project area currently in the implementation phase. A second project collaborated on with the PFC, and currently in the implementation phase, is the Lost Creek-Boulder Creek (LCBC) Landscape Restoration Project.

As part of the planning process, a Project Travel Analysis Process (TAP) was completed in June 2013 and updated in November 2013, and the Interdisciplinary Team (IDT) identified a Minimum Road System (MRS) recommendation (USDA Forest Service 2013a). The MRS identified National Forest System (NFS) roads needed for the protection, administration, and utilization of the NFS lands and the use and development of its resources. The Middle Fork Weiser River Landscape Assessment (Assessment) (USDA Forest Service 2014) was also completed for this Project to assess the existing conditions compared to historical conditions

[1] Established with the Omnibus Public Land Management Act of 2009, PL 111-11

within the Project area. This EIS uses information from the TAP and Assessment as a basis for assessing existing versus desired conditions and the formulation of the Proposed Action.

1.1.1. Project Area

The Project area is located approximately 6 miles southeast of Council, Idaho, in Adams County. Land ownership within and adjacent to the Project area includes NFS lands, Idaho State lands, and private ownership. Access to the area is via the Middle Fork Weiser River Road (National Forest System [NFS] road 50186), accessed by US Highway 95, south of Council, Idaho, or via State Highway 55 and West Mountain Road (NFS road 50195) west of Donnelly, Idaho.

The Project area encompasses approximately 49,276 acres within the Weiser River drainage, and comprises approximately 38,519 acres of NFS lands and 10,757 acres of private land within the following 5 subwatersheds: Little Fall Creek—Weiser River, Mica Creek—Weiser River, Jungle Creek—Weiser River, Granite Creek—Weiser River, and a portion of the upper East Fork Weiser River. (Figure 1-1). The Project area is located in T14N, R1E, Section 1; T14N, R2E Section 6; T15N, R1E, Sections 1-5, 9-16, 21-27, 35 and 36; T15N, R2E, Sections 1-12, 14-22, and 28-32; T16N, R1E, Sections 1, 12, 13, 24-27, and 32-36; T16N, R2E, Sections 2-11 and 14-35; T17N, R2E, Sections 27-34, Boise Meridian (Figure 1-1).

1.2. Proposed Action

A brief overview of the Proposed Action follows, with a more complete description in Chapter 2. Proposed landscape restoration treatments on approximately 24,000 acres would do the following:

- Apply thinning treatments to forest stands followed by prescribed burning.
- Apply regeneration treatments where vigorous, fire-resistant trees are absent by creating openings up to 10 acres in size. Forest structure for wildlife habitat would be retained in these openings. Sites would be prepared for planting or natural regeneration using prescribed burning and/or hand scalping.
- Move forest stands toward desired conditions as described in the Forest Plan by returning fire to the ecosystem; promoting the development of large tree forest structures mixed with a mosaic of size classes; and improving growth, species composition, and resiliency to insects, disease, and fire.
- Improve habitat for Family 1 wildlife species, represented by the white-headed woodpecker (*Leuconotopicus albolarvatus*), by restoring forest conditions that contribute to source habitat for these species and providing appropriate Family 2 habitat, represented by pileated woodpeckers (*Dryocopus pileatus*). Provide appropriate habitat for wildlife in Families 3, 5, 7, 11, 12, and 13.
- Improve water quality, enhance aquatic habitat, and restore riparian and floodplain function by reducing road-related impacts.
- Create a shaded fuelbreak (SFB) to protect values at risk.
- Thin plantations and reduce fuel loading in the older stands using either skidding, lop and scattering, and/or mechanical piling followed by burning.

- Remove, pile, burn and/or biomass in harvest treatments.

The Project also proposes managing recreation use in the Project with an emphasis on identifying and hardening primary dispersed recreation areas, improving and realigning existing trails, and developing new trail opportunities.

1.1.1 Document Organization

This DEIS is tiered to the *Southwest Idaho Ecogroup Land and Resource Management Plans Final Environmental Impact Statement* (Forest Plan FEIS) (USDA Forest Service 2003d). Documented analyses in the Forest Plan FEIS have been referenced and/or summarized rather than repeated. Detailed information supporting the analyses presented in this document, unless specifically noted otherwise, is contained in the project record located at the Council Ranger District Office. This DEIS is organized as follows:

- Chapter 1 introduces the Purpose and Need for which the Forest Service is proposing action, the public issues surrounding it, and other considerations.
- Chapter 2 presents and compares the alternatives, including the No Action alternative, with information about environmental effects and project design features and mitigation measures.
- Chapter 3 describes the environment affected for each alternative and the direct, indirect, and cumulative effects likely to occur with implementation of each alternative considered.
- Chapter 4 lists IDT members or individuals who have contributed background information and analyses, lists references cited, and includes the glossary and list of acronyms
- Sections refer to subdivisions within chapters.
- The following appendices provide additional documentation about the environmental analysis:
  - Appendix 1—Maps
  - Appendix 2—Road Treatment Table
  - Appendix 3—Cumulative Effects
  - Appendix 4—Monitoring and Evaluation
  - Appendix 5—Riparian Conservation Area Thinning Guides
  - Appendix 6—Appendix A of the Payette National Forest Land and Resource Management Plan
  - Appendix 7—Legacy Tree Guidelines
  - Appendix 8—Proposed Forest Plan Amendment

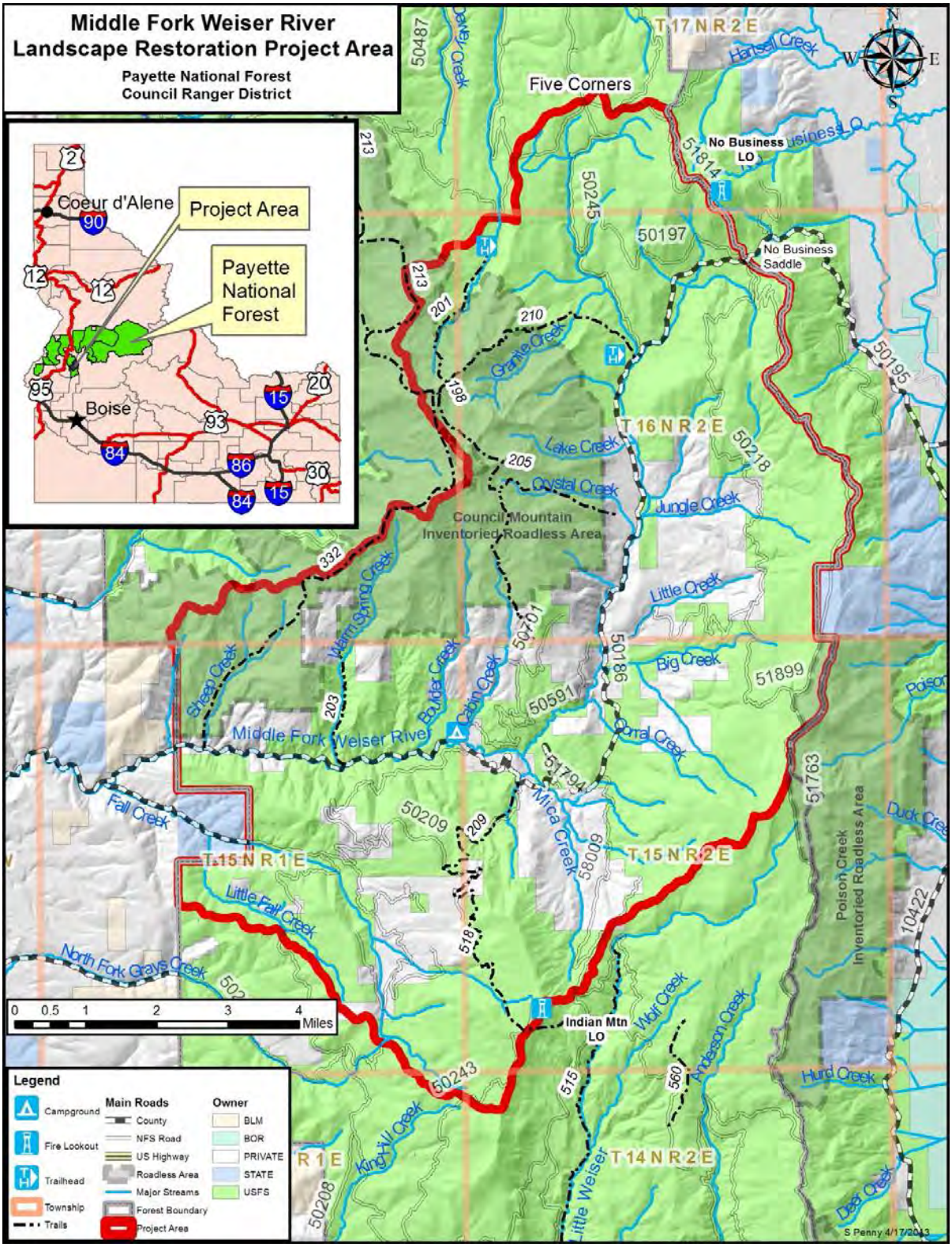

Figure 1-1. Project Area map

1.3. Historical and Existing Conditions

1.3.1. Land Ownership and Land Use Patterns

Large inholdings of private land, predominantly owned by Potlatch Corporation, are located within the Project area (Figure 1-1). Potlatch Corporation manages their lands to maximize profit and, as a result, much of the forested Potlatch Corp. land is in young-tree age classes, as mature forests are harvested.

1.3.2. Precipitation

The Natural Resources Conservation Service's (NRCS) National Water and Climate Center administers a Snotel site (a weather station that can record snowfall data) on Squaw Flat at the northern end of the Project area at 6,240 feet elevation. Year-round data have been recorded since 1980, with complete data since 1982. Mean yearly precipitation from 1982 to 2012 was 43.7 inches, and varied from a low of 24.4 inches in 1994 to a high of 65.7 inches in 1997. Median yearly precipitation was 43.5 inches. See Figure 1-2 for a graph of yearly precipitation from 1980 through 2012.

The National Weather Service operates a cooperative weather station in Council, Idaho at 3,200 feet elevation, approximately 9 miles northwest of similar elevation in the Project area. Mean yearly precipitation recorded from 1948 to 2006 was 24.0 inches, with a low recorded in 1976 of 4.1 inches and a high in 1964 of 39.8 inches. Figure 1-3 displays these data.

Precipitation in the Project area generally increases with elevation. Elevations range from 3,840 feet, where the Middle Fork Weiser River exits the Project area, to the peak of Council Mountain at 8,126 feet. Precipitation also varies by time of year, with the majority occurring during winter months in the form of snow. Spring and fall rains occur, primarily due to low-pressure systems that form in the Pacific Ocean and track from the west, resulting in widespread storm events. During summer, the jet stream moves north, causing a decrease in precipitation and dry, high-pressure air masses that affect local weather conditions. Summer precipitation is usually localized, occurring mostly in association with thunderstorm development.

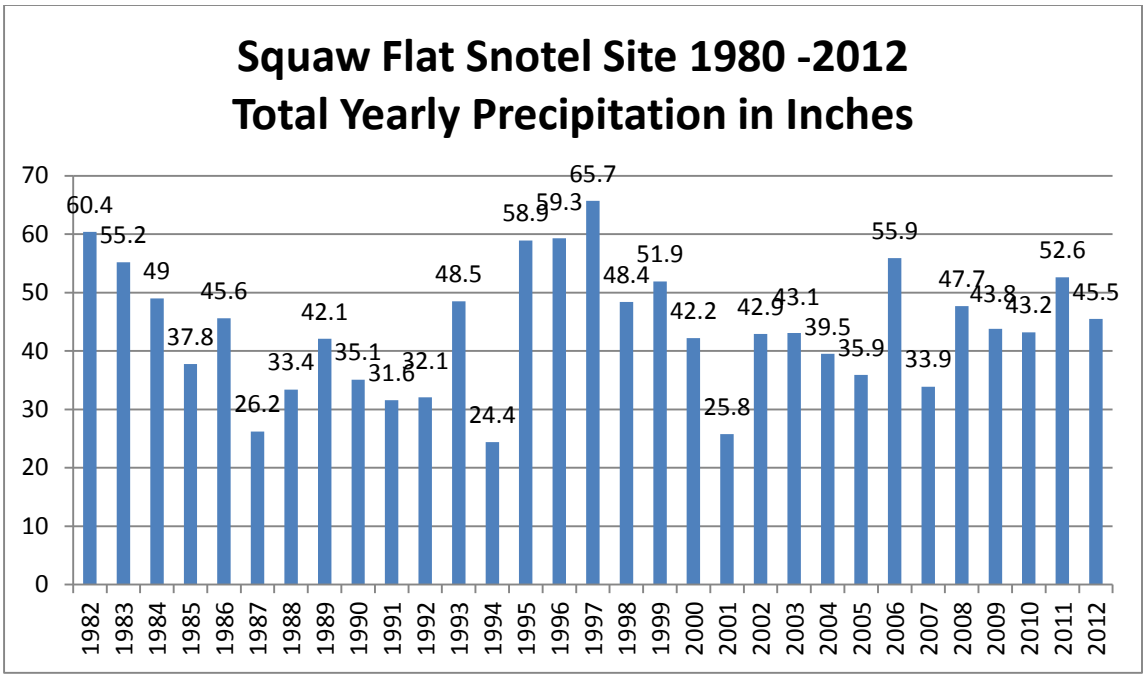

Figure 1-2. Graph of precipitation for the Squaw Flat Snotel site

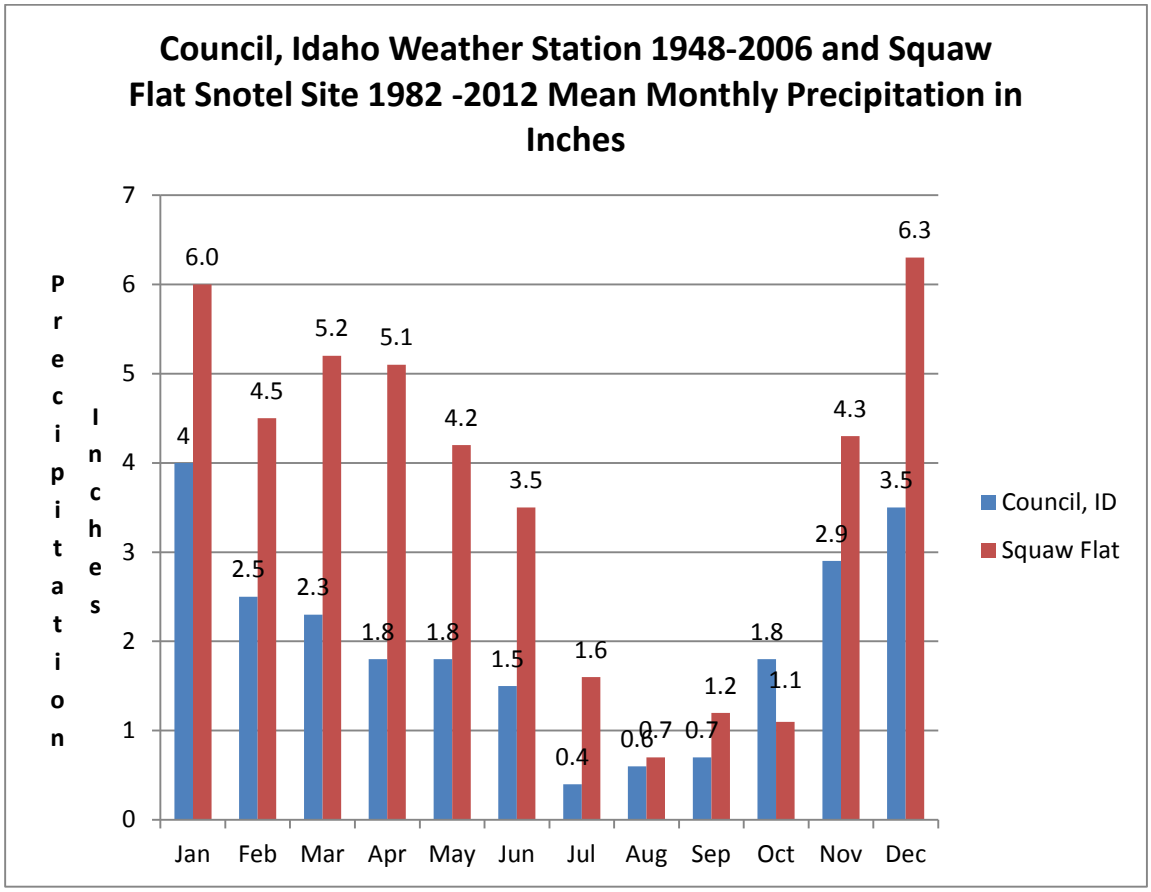

Figure 1-3. Mean monthly precipitation, Squaw Flat Snotel Site, 1982–2012 and Council, Idaho Cooperative Weather Station, 1948–2006

1.3.3. Geology

The Forest Plan describes the geology of the Project area as, "The main geomorphic landforms found in the area are periglacial uplands and mountain slopes, plateaus and escarpments, and fluvial mountains. Slope gradients range from 15% to 40% on the periglacial uplands and mountain slopes, 30% to 50% on the fluvial mountains, and 15% to 80% on the plateaus and escarpments. Columbia River Basalts dominate the surface geology, with scattered inclusions of metasedimentary and granitic rock. Soils generally have low to moderate surface erosion potential, and moderate to high productivity." Table 1-1 displays the type and description of geology within the Project area. Figure 1-4 displays a map of the surface geology of the Project area. Imnaha Basalt (one of two members of the Columbia River Basalt group) dominates the area. These volcanic flows occurred sometime around 15 to 18 million years ago and were followed by the Grande Ronde Basalt flows. The next most extensive formation of rocks is the Idaho Batholith, which formed between 75 and 95 million years ago. This material has a generally higher erosion risk than the basalt rock and associated soils.

Table 1-1. Type and description of the geology in the Project area

Type	Description	Acres
Extrusive	Columbia River Basalt Group, undivided	7
Extrusive	Grande Ronde Basalt, Columbia River Basalt Group	1,834
Extrusive	Imnaha Basalt, Columbia River Basalt Group	27,634
Intrusive	Foliated biotite granodiorite, Older plutonic series, Idaho Batholith	4,184
Intrusive	Foliated hornblende-biotite tonalite, Older plutonic series, Idaho Batholith	9,768
Intrusive	Mylonitized porphyritic biotite granodiorite of Salmon River suture zone, Idaho Batholith	697
Metamorphic	Biotite gneiss and biotite schist	1,870
Sedimentary, unconsolidated	Alluvial, landslide, and glacial deposits	3,281
Grand Total		**49,276**

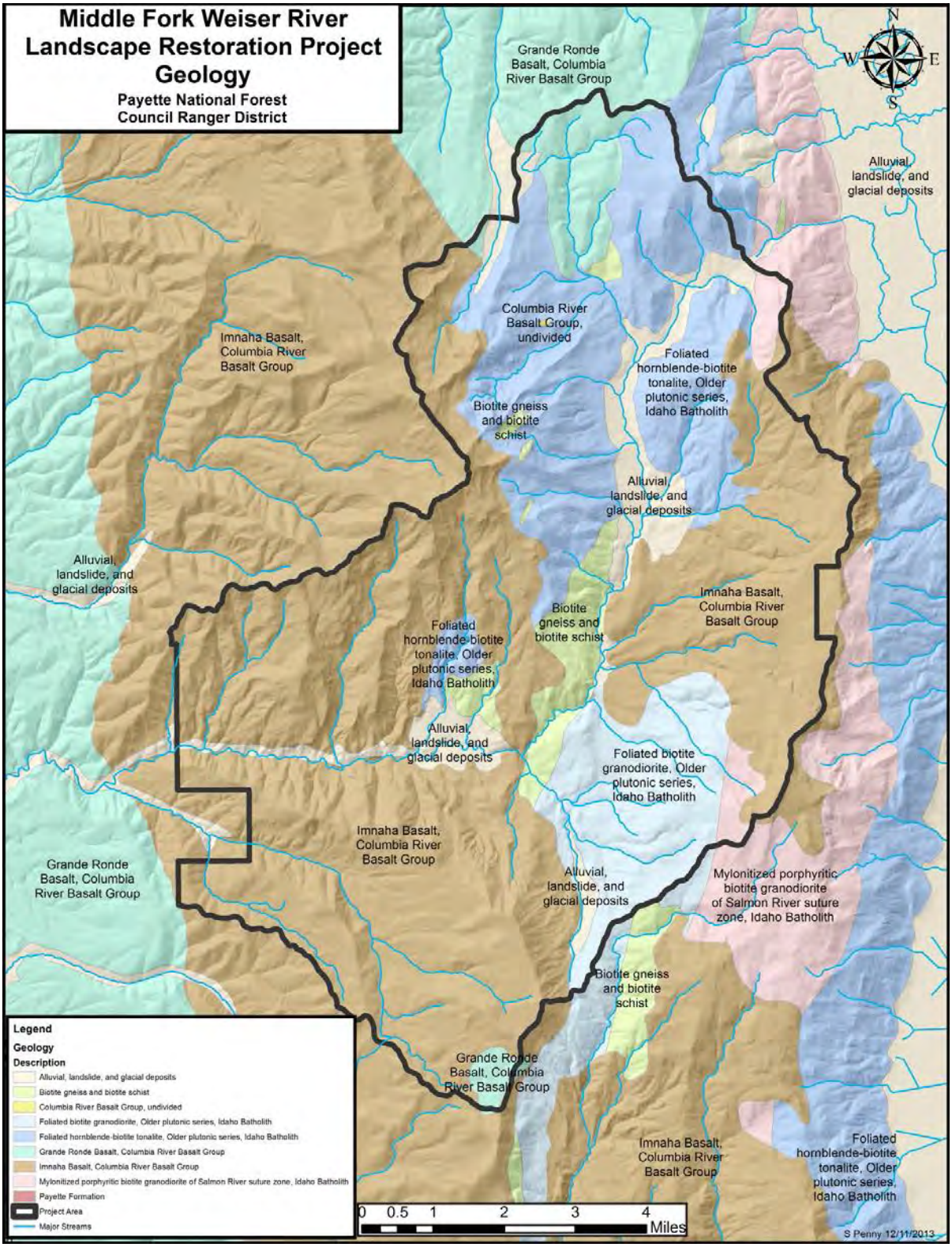

Figure 1-4. Map displaying the geology within the Project area

1.3.4. Forested and Nonforested Vegetation

The vegetation in the Project area includes forested and nonforested vegetation types. The Forest Plan uses Potential Vegetation Groups (PVGs) to classify vegetation (USDA 2003, Appendix A). PVGs are groups of habitat types that share similar environmental characteristics, site productivity, and disturbance regimes. PVGs classify the landscape to provide a framework for studying succession of vegetation over time. The overall condition of forest stands in the Project area is departed from desired conditions for this project.

Desired conditions for vegetation are based on Appendix A of the Forest Plan with some site-specific modifications to foster restoration of wildlife habitat. The desired conditions for forested vegetation are based on Tables A-2, A-3, A-5, A-7, A-8, and A-9 (USDA Forest Service 2003a, Appendix A). The Forest Plan allows for modification of desired conditions at the project level to address site-specific biophysical conditions (USDA Forest Service 2003a).

Historically, wildfire disturbance helped shape these forested and nonforested landscapes. However, decades of fire exclusion, forest management, and grazing have substantially altered nonforested areas and forest structure, composition and spatial patterns (Hessburg et al. 2005, Taylor and Skinner 2003, Morgan and Parsons 2001, Hessburg et al. 2000) in the Project area, especially those areas that were historically within the nonlethal-to-mixed1 fire regimes (see Table 2-2 for fire regime classifications). Additionally, forested and nonforested areas in the mixed2 to lethal fire regimes have been affected by fire exclusion (Perry et al. 2011).

The Grays Creek Fire, a large fire event in 2007, burned a total of 24,050 acres including 12,685 acres of NFS and private land within the Project area. The fire burned with varying severity across the forested landscape with crown fire occurring in some stands, resulting in large patches of mortality, to light underburning in other areas. It affected mainly lower elevations in the western portion of the Project area. Timber salvage and subsequent planting occurred on private and NFS lands following the fire.

In the Project area, low- to mid-elevation forests generally have fewer early seral legacy trees than desired (e.g., ponderosa pine (*Pinus ponderosa*), western larch (*Larix occidentalis*), and Douglas-fir (*Pseudotsuga menziesii*). Forest areas not burned by the Grays Creek Fire often have multiple canopy layers, dense forest structure, continuous high fuel levels, and are at increased risk for stand-replacing wildfires, insect outbreaks, or intensified disease outbreaks. Plantations harvested up through the 1970s are predominately even-aged ponderosa pine and lack coarse woody debris (CWD), snags, and forest structure diversity.

Compared to desired conditions, vegetation in the Project area displays the following trends:

- Less large tree size class in the warm dry Douglas-fir and dry grand fir PVGs (PVGs 2 and 5). See Appendix 6 for a description of PVGs.
- An overabundance of the large tree size class in the cool moist grand fir, warm dry subalpine fir, hydric subalpine fir, persistent lodgepole pine, and high elevation subalpine fir PVGs (PVGs 6, 7, 9, 10, and 11).
- Higher tree densities and more ladder fuels within stands.

- Less early seral tree species (e.g., ponderosa pine, Douglas-fir, western larch, whitebark pine, and/or aspen) than desired in PVGs 2, 5, 6, 7, 9, 10, and 11. Late seral tree species (e.g., grand fir and subalpine fir) are more widespread, compared to desired conditions within PVGs 2, 5, and 6.
- Increased tree densities in wet and dry meadows throughout the landscape.

Insect and disease considerations

Fire was likely the primary disturbance that maintained and influenced stand development prior to 20th century logging and fire suppression. In the absence of other disturbances, forest insects and diseases will act as the primary disturbance agents that will influence stand development (Jorgenson 2013).

In PVGs 6, 7, 9, 10, and 11, western spruce budworm, douglas-fir beetle, and fir engraver beetle are expected to increase to uncharacteristic levels and change the forest composition, fuel dynamics, and tree species in these stands. Additionally, the presence of non-native balsam woolly adelgid within the Project area is increasing in subalpine and grand fir.

1.3.5. Soil, Water, Riparian, and Aquatic Resources

In roughly the first half of the 19th century, the Project area was largely undeveloped. The absence of roads, especially in riparian areas, allowed stream channels to function without the impediment of restricted floodplains, increased drainage network, and reduced stream shade that is often characteristic of heavily roaded watersheds. Little-to-no soil was committed to log landings, skid trails, or other infrastructure associated with timber harvest. At that point in time, recreation, agriculture, ranching, mining, and the development of power line corridors were not significant sources of ground disturbance or water diversion in and adjacent to the Project area. Early disturbance came mostly from periodic wildfire or burning by Native American tribes. Immediately after the late 1860s, much of the ground disturbance was from livestock grazing (Jones 1989).

By the turn of the 20th century, private property owners and the federal government began reconnaissance to establish access for timber removal. By the mid-1930s, Forest roads were built into the main drainages and most of the main road systems were completed between the 1950s and 1970s. Many roads were built near streams or on steep grades, contributing sediment to streams and altering floodplains and riparian areas. Today, some of these old roads are vegetated with grass, shrubs, and trees, while others continue to erode, as evidenced by the presence of gullies and slope failures. Many of these roads still impact (constrict) stream floodplains, influence riparian vegetation, and alter the movement of water through the drainage system. Unmaintained roads are vulnerable to future events, such as floods or wildfire, which could remove or reduce the stabilizing effect of existing vegetation and make the road prisms susceptible again to erosion or mass failure. Table 1-2 displays current road and motorized trail miles in the Project area within the Middle Fork Weiser River watershed.

Table 1-2. Current road and motorized trail miles in the Project area

Road Type	Number of Miles
National Forest System open year-round	55.2
County open year-round	18.1
National Forest System open seasonally	27.7
National Forest System closed	74.8
Unauthorized routes	64.9
Private (off Forest) roads	144.0
TOTAL ROADS	384.7
National Forest System two-wheel motorized trail	21.8
National Forest System all-terrain vehicle (ATV) trail	2.4
National Forest System non-motorized trail	3.8
TOTAL TRAILS	28.0

The presence or absence of vegetation within drainages can alter, through evapotranspiration and changes in hillslope shading, the amount of water reaching streams as surface and subsurface flow. This, in turn, can affect processes, such as regulation of stream peak and base flows, development and maintenance of fish habitat, and growth and development of riparian vegetation. Climate changes, such as increased frequency of rain-on-snow events or higher-intensity rain events, can exacerbate some of these effects, such as greater peak stream flows, fluctuations in water temperature and affect subsequent water quality. Altered vegetation within Riparian Conservation Areas (RCAs) can affect levels of large woody debris (LWD) available to the channel as well as stream shade and bank stability. Historical logging practices often harvested timber close to stream channels, and many RCAs within the Project area are still affected by the lack of large tree structure. Regeneration harvest and subsequent slash disposal during the 1950s through the 1970s created tree plantations that lack snags and CWD.

Spring flooding of the Project area occurred as recently as June 2010 when heavy rains from two precipitation events occurring within three days of one another, coupled with rapid melting of a significant winter snowpack, flooded many of the main streams. Roads adjacent to and crossing the Middle Fork Weiser River were damaged by fill slope erosion, culvert failure, and ditchline erosion. The subwatersheds most affected within the Project area were Mica Creek-Weiser River and Jungle Creek-Weiser River. Specifically, many culverts where main tributaries crossed the Middle Fork Weiser River Road (NFS road 50186) plugged or failed entirely. This damage resulted in increased sediment delivery to the Middle Fork Weiser River, decreased bank stability, loss of riparian vegetation (and consequently fish and wildlife habitat) where streambanks, or fillslopes functioning as streambanks, failed.

1.4. Forest Plan Desired Condition

Desired future conditions (DFCs) help guide natural resource management consistent with the Forest Plan, key issues, and ecological conditions of the Project area (see Chapter III, pages 6–7 in USDA Forest Service 2003a). Forest Plan DFCs described for each resource (see Chapter III, pages 6–77 in USDA Forest Service 2003a), in conjunction with the Forest Plan direction outlined below, provide the parameters for identifying and defining project-specific DFCs. The Forest Plan describes DFCs in the following language:

Ecosystems on the Forest:

- Have ecological and watershed integrity, meaning they have a viable combination of all the diverse elements and processes needed to sustain the systems and to perform desired functions;
- Are dynamic in nature and resilient and resistant to natural and human-caused disturbances;
- Have a range of vegetative composition and structure that provide habitat for desired plant, wildlife, and aquatic species;
- Are managed in an environment of public and interagency trust, and cultural and socio-economic sustainability; and
- Are managed to promote meaningful relationships with Native American tribes to understand and incorporate tribal cultural resources, needs, interests, and expectations.

Ecosystems have the following physical, biological, social, and economic components and conditions:

- Soils retain all or most of their natural productivity and are in a condition that promotes vegetative growth, hydrologic function, long-term nutrient cycling, and erosional stability. Streams and lakes provide clean water, appropriate temperatures, and a variety of connected habitats to support native and desired non-native aquatic species. Smoke from wildland fire occasionally affects air quality.
- Forest, grassland, shrubland, and riparian plant communities are within a desired range of variability for composition, structure, patterns, and processes. Vegetation forms a diverse network of habitats and connective corridors for wildlife and provides desired levels of snags, CWD, and soil organic matter. Terrestrial and aquatic habitats support species diversity, with emphasis on maintaining or restoring threatened, endangered, and sensitive (TES) species; rare and unique plant communities; and species of cultural, commercial, and recreational significance. Riparian areas connect upland and aquatic habitats and promote stable and diverse stream channel conditions. Existing noxious weed populations are not expanding and new invader species are not becoming established.
- Disturbance processes—such as fire, insects, disease, floods, and landslides—contribute to functioning ecosystems. Where appropriate and desirable, fire plays its natural role but is suppressed where necessary to protect life and resources. Fire is used to manage vegetation and, where appropriate, to enhance ecosystem resiliency and lower hazardous fuel levels.
- Recreational settings range from primitive to developed, offering a wide spectrum of opportunities and uses. Facilities—such as roads, trails, campgrounds, and administrative sites—are constructed, reconstructed, or eliminated as needed to provide a balance of safe, effective, and environmentally responsible management activities. Visitors enjoy a variety of special attractions including National Recreation Areas, Wilderness Areas, Wild and Scenic Rivers, Scenic Byways, historic landmarks, and winter recreation areas. People have the opportunity to explore and learn about their cultural heritage. Significant cultural sites are preserved and accessible through working tribal and public partnerships.

1.5. Forest Plan and Management Area Direction

The Forest Plan embodies the provisions of the NFMA, its implementing regulations, and other guiding documents. The Forest Plan sets forth in detail the direction for managing the land and resources of the Forest. The Forest Plan divides the Forest into Management Areas (MAs) that describe current resource conditions, management emphasis, goals, objectives, standards, and guidelines for the major resource programs within the area. The MA description and direction section of the Forest Plan describes each of these areas in detail, highlights resource areas of importance or concern within each area, and prescribes more specific management direction to address specific concerns not covered in the more general Forest-wide direction.

Management prescriptions are defined as, "Management practices and intensity selected and scheduled for application on a specific area to attain multiple use and other goals and objectives" (36 CFR 219.3). Management Prescription Categories (MPCs) are broad categories that indicate the general management emphasis prescribed for a given area. MPCs are based on Forest Service definitions developed at the national level and represent management emphasis themes, ranging from Wilderness (1.0) to Concentrated Development (8.0). The national MPCs were customized during Forest Plan revision (completed in 2003) to better fit the needs and issues of the Forest.

The Project area is in the Weiser River MA 3. The MPCs listed in Table 1-3 apply to the Project area.

Table 1-3. Management Prescription Categories within the Project area

Management Prescription Category	Number of Acres	Percent of Area
2.2—Research natural areas	67	<1%
4.1c—Maintain unroaded character with allowance for restoration activities	9,621	19%
5.1—Restoration and maintenance emphasis within forested landscapes	8,311	17%
5.2—Commodity production emphasis within forested landscapes	20,478	42%
Private land	10,798	22%
TOTAL	49,276	100%

The Council Mountain Inventoried Roadless Area (IRA) and Poison Creek IRA are in MPC 4.1c. Management actions in this MPC must be designed and implemented in a manner consistent with the unroaded landscape.

The Council Mountain Research Natural Area (RNA) is located at the peak of Council Mountain within the IRA and is in MPC 2.2. Totaling 111 acres, it has a representation of sagebrush and subalpine meadow communities and small stringers of subalpine fir plant communities on basalt substrates. Sixty-seven acres of this RNA are within the Project area.

1.5.1. Forest Plan Goals and Objectives

1.5.1.1.1. Wildlife Resources

The management direction of Forest Plan goal WIGO01 is to, "Provide habitat capable of supporting viable populations of native and desired non-native wildlife species" (USDA Forest Service 2003, page III-25). The management direction of Forest Plan goals WIGO04 through WIGO06 is as follows (USDA Forest Service 2003, page III-25):

- WIGO04—Provide habitat that will help keep Region 4 sensitive wildlife species from becoming listed (see Table 3-30 for the current list of species).
- WIGO05—Provide habitat capable of supporting the viability of wildlife management indicator species (MIS). The Payette National Forest MIS species are the white-headed woodpecker and pileated woodpecker.
- WIGO06—Provide well-distributed habitat and connective corridors important to sustaining MIS and other wildlife species.

1.5.1.1.2. Threatened, Endangered, Proposed, and Candidate (TEPC) Species Resources

The management direction of Forest Plan goal TEGO01 is to, "Provide habitat capable of contributing to the survival and recovery of species listed under the ESA" (USDA Forest Service 2003, page III-8). The management direction of Forest Plan goals TEGO03 through TEGO06 is as follows:

- TEGO03—Balance the need for restorative actions to address the long-term threats to listed and proposed species with the short-term need to protect listed and proposed species and their habitats.
- TEGO04—Design and implement management actions to provide for ecological conditions, population viability, reproductive needs, and habitat components required by threatened, endangered, proposed, and candidate (TEPC) species.
- TEGO05—Provide for well-distributed habitat capable of maintaining self-sustaining, complex, interacting groups of TEPC species.
- TEGO06—Provide habitat capable of maintaining stable or increasing trends in abundance of TEPC species in all recovery units.

TEPC Objective TEOB03 is to, "Identify and reduce road-related effects on TEPC species and their habitats using the WARS and other appropriate methodologies" (USDA Forest Service 2003, page III-8).

1.5.1.1.3. Vegetation Resources

Vegetation Goals VEGO01 through VEGO07 provide direction to maintain or restore vegetative components, including size classes, canopy cover, structure, and snags (USDA Forest Service 2003, page III-30). Additionally, Vegetation Objective VEOB01 identifies and prioritizes areas for regeneration of the following:

- Aspen in both climax stands and as a seral component of coniferous stands

- Native herbaceous understory in shrub communities
- Woody riparian species
- Western larch
- Whitebark pine

These desired conditions are expected to provide for ecological processes, reduce uncharacteristic disturbances, maintain or enhance habitat for various species, facilitate regeneration of desirable plants, and maintain or restore spatial patterns important to other goals of the Forest Plan.

VEST01 in the activity area shall be used to assess snag and CWD conditions for vegetative management actions.

1.5.1.1.4. Timberland Resources

Timberland Resources Goal TRGO01 states that the Forest will, "Manage forested vegetation to achieve: a) conditions that are resilient and resistant to uncharacteristic fire, insect, and disease damage and b) conditions that contribute to desired vegetative conditions, including distribution of tree sizes, species composition, and canopy cover" (USDA Forest Service 2003, page III-41).

Timberland Resources Goal TRGO02 states that the Forest will, "Manage suited timberlands to achieve: a) Growth rates and yields that are compatible with other resources, b) Annual harvest of expected timber volume, c) Maintenance or improvement, where possible, of genetic diversity within tree species, d) Successful reforestation through the application of appropriate and available silvicultural techniques, and e) Vegetative conditions (structure, density, etc.) in plantations and surrounding stands that result in reduced hazard for loss from uncharacteristic disturbance events" (USDA Forest Service 2003, page III-41).

1.5.1.1.5. Recreation Resources

Recreation Goal REGO01 provides direction to, "Manage, operate, and maintain a year-round recreation program that offers a broad range of developed and dispersed recreation opportunities and experiences in a range of settings as reflected by the Recreation Opportunity Spectrum (ROS) in the Forest Plan". Forest Plan Goal REGO02 provides direction to, "Plan and manage the recreation program and recreation resources to meet established standards (e.g., Meaningful Measures) to provide for health and cleanliness, safety and security, facility conditions, responsiveness to customers, environmental setting, and permit administration" (see Appendix F of the Forest Plan for descriptions of ROS classes, USDA Forest Service 2003).

Recreation Access goal REGO05 states, "Manage motorized and non-motorized travel and travel-related facilities to: a) Provide for public safety, b) Meet resource objectives and access needs, c) Mitigate road and trail damage, and d) Minimize maintenance costs and user conflicts." Objective REOB10 states, "Use education and interpretation opportunities to foster dispersed camping that is at least 100 feet from trails, lakes, streams, or other occupied campsites, as terrain permits." Objective REOB11 states, "Monitor recreation resource conditions, visitor use levels, types of uses, and visitor expectation to guide recreation management actions." (see Appendix F of the Forest Plan [USDA Forest Service 2003a] for descriptions of ROS classes and section 1.12.3 for a Project related evaluation).

1.5.1.1.6. Soil, Water, Riparian and Aquatic Resources

The management direction for Soil Processes and Productivity, Hydrology and Watershed processes, Water Quality and Aquatic and Riparian Habitat and Species is as follows (USDA Forest Service 2003, p. III-19):

- SWGO01—Maintain soil productivity and ecological processes where functioning properly, and restore where currently degraded. Maintain the physical, chemical, and biological properties of soils to support desired vegetation conditions and soil-hydrologic functions and processes within watersheds.
- SWGO02—Provide for stream channel integrity, channel processes, and the sediment regime under which the riparian and aquatic ecosystems evolved.
- SWGO05—Design and implement watershed management programs and plans that will restore water quality and watershed function to support beneficial uses.
- SWGO10—Provide riparian and aquatic habitat capable of supporting viable populations of native and desired non-native aquatic species.

Soil, Water, Riparian, and Aquatic Resources (SWRA) Objective SWOB16 is to, "Identify opportunities to restore degraded upland and aquatic habitat conditions …Opportunities should focus on restoring passage for fish and other aquatic species, and restoring desired ranges of water temperature, LWD, streambank stability, sediment levels, water chemistry, and pool size and numbers…" (USDA Forest Service 2003, p. III-8).

SWRA Objective SWOB18 is to, "Reduce road-related effects on soil productivity, water quality, and aquatic/riparian species and their habitats…" (USDA Forest Service 2003, p. III-8).

1.5.1.1.7. Weiser River Management Area Objectives Pertinent to the Project

The white-headed woodpecker is a Region 4 sensitive species (USDA Forest Service 2011a) and a Forest MIS. The Weiser River MA (MA 3) includes Wildlife Resources Objectives 0337 and 0338 to increase white-headed woodpecker and flammulated owl (*Otus flammeolus*) habitat by managing PVGs toward the desired ranges of tree size classes, tree canopy cover, tree species composition, snags, and CWD, as described in the Forest Plan (USDA Forest Service 2003, Appendix A). Wildlife Resources Guideline 0341 states that an increase in the white-headed woodpecker or flammulated owl habitat may be achieved by reducing tree densities and ladder fuels under and around existing large ponderosa pine trees and snags, to reduce the risk of stand-replacing fire and to restore more open canopy conditions (USDA Forest Service 2003).

Fire Management Objective 0376 directs the managers to, "Use prescribed fire and mechanical treatments within and adjacent to wildland-urban interface (WUI) areas…to manage fuels to reduce wildfire hazards" (USDA Forest Service 2003).

SWRA Objective 0318 includes direction to, "Improve water quality ...by reducing road-related accelerated sediment through a combination of road decommissioning, realignment, reconstruction, and maintenance in the … Middle Fork Weiser River drainages" (USDA Forest Service 2003, p. III-131).

SWRA Objective 0319 includes direction to, "Restore riparian vegetation and floodplain function throughout the MA by reducing road-related impacts through relocation, realignment, or obliteration" (USDA Forest Service 2003, p. III-131).

SWRA Objective 0320 includes direction to, "Restore riparian areas by relocating or hardening dispersed recreation sites in…Cabin Creek...and the horse camping area in the Jungle Creek drainage' (USDA Forest Service 2003, p. III-131).

SWRA Objective 0322 includes direction to, "Reduce riparian road density and stream crossings in all drainages…"(USDA Forest Service 2003, p. III-131).

Vegetation Objective 0325 includes direction to, "Maintain and promote native grasses and aspen where they occur, and maintain or restore desired conditions for age and canopy class structure in sagebrush and bitterbrush cover types" (USDA Forest Service 2003, p. III-131).

Vegetation Objective 0326 includes direction to, "Restore structure and composition of shrub and deciduous tree components in those portions of riparian areas where the components are missing or on a downward trend" (USDA Forest Service 2003, page III-131).

1.6. Watershed Condition Framework (WCF), Aquatic Conservation Strategy (ACS), and Watershed Aquatic Recovery Strategy (WARS)

In 2010, the Forest Service introduced the Watershed Condition Framework (WCF). The WCF is a comprehensive approach for classifying watershed condition, proactively implementing integrated restoration, and tracking and monitoring program accomplishments. As part of a national effort, the Payette completed a Watershed Condition Classification Assessment to evaluate and classify 6-level watersheds in terms of their health and resiliency (Potyondy and Geir 2011; USDA Forest Service 2011b).

Three watershed condition classes were recognized as directly related to the degree or level of watershed functionality or integrity:

- Class 1 watersheds are "Functioning Properly" and exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural condition. Class 1 watersheds are resilient and able to recover to desired conditions when disturbed by large natural events or management activities.
- Class 2 watersheds are "Functioning at Risk" and exhibit moderate geomorphic, hydrologic, and biotic integrity relative to their natural condition.
- Class 3 watersheds have "Impaired Function" and exhibit low geomorphic, hydrologic, and biotic integrity relative to their natural condition.

Class 3 watersheds have reached an undesirable level for some physical or biological threshold. Substantial changes to factors that caused the degraded state are needed to set them on a trajectory of improving conditions that sustain watershed integrity. One step of the WCF is to identify priority watersheds, in which Watershed Restoration Action Plans would identify all essential restoration activities needed to "improve the watershed condition class." While the Forest Plan direction is to identify and implement restoration opportunities in all watersheds, none of the Project area watersheds have been selected as a WCF priority watershed. One of the Project objectives is to move all watersheds towards an improving trend.

The Aquatic Conservation Strategy (ACS) provides direction, within the Forest Plan, to maintain and restore characteristics of healthy, functioning watersheds, riparian areas, and associated fish habitats (USDA Forest Service 2003, pages B-48 through B-57). The ACS is a long-term strategy to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within lands administered by the Forest. *The East Fork Weiser River is the only subwatershed in the Project area that is listed as an ACS priority watershed.*

The Forest Plan developed a Watershed and Aquatic Recovery Strategy (WARS) within the ACS to prioritize Forest-wide watershed and aquatic restoration planning (USDA Forest Service 2003). Within the Project area, *none of the subwatersheds are listed as WARS high priority for restoration, though all are listed as "Active" restoration focus, versus "Passive."* See Table 1-4 below for a summary of each subwatershed in the Project area and its associated ratings. The WCF Watershed Condition Classification, WARS Restoration Activity, WARS Priority, and ACS Priority are listed below for each subwatershed.

Table 1-4. Watershed Condition Framework (WCF), Aquatic Conservation Strategy (ASC), and Watershed and Aquatic Recovery Strategy (WARS) designations for the subwatersheds in the Project

Subwatershed	6th Level HUC	6th Level HUC acreage (mi^2)	Project Acres	WCF Class	WCF Priority	WARS Rest	WARS Priority	ACS Priority
East Fork Weiser River	170501240203	20,906 (32.7)	1,438	3	No	Active	Mod.	Yes
Granite Creek – Middle Fork Weiser River	170501240401	11,672 (18.2)	11,672	3	No	Active	Low	No
Jungle Creek – Middle Fork Weiser River	170501240402	12,384 (19.4)	12,187	2	No	Active	Low	No
Little Fall Creek – Middle Fork Weiser River	170501240404	16,200 (25.3)	7,122	2	No	Active	Low	No
Mica Creek-Middle Fork Weiser	170501240403	17,564 (27.4)	16,857	3	No	Active	Low	No

Note: Since the Forest Plan was written, subwatershed delineation by the Natural Resources Conservation Service (NRCS) has changed. The Middle Fork Weiser River HUC 5 was comprised of three subwatersheds that have since been split into four.

1.7. Purpose and Need

1.7.1. Purpose

The purpose of the Proposed Action is as follows:

1) Move vegetation toward the desired conditions (e.g., canopy cover in large tree size class, species composition, and size class distribution), with an emphasis on:
    a) Improving habitat for Family 1 species, such as the white-headed woodpecker, while maintaining habitat for federally-listed and sensitive species;
    b) Maintaining and promoting early seral species composition (e.g., aspen, whitebark pine, western larch, ponderosa pine, and Douglas-fir);
    c) Reducing the risk of uncharacteristic wildland fire, with an emphasis on restoring and maintaining desirable plant community attributes including fuel levels, fire regimes, and other ecological processes;
    d) Maintaining and promoting large tree size class in PVGs 2 and 5;
    e) Restoring spatial patterns by establishing varying patch sizes consistent with the historical range of variability that promote forest resilience to fire, insect, disease and climate change;
    f) Reducing tree densities in PVGs 2, 5, 6, 7, 10, and 11;
    g) Maintaining and promoting native grasses within nonforested habitats and restoring age and canopy class structure of sagebrush and bitterbrush;
    h) Restoring aspen and nonforested habitats by reducing conifer encroachment.
2) Move all subwatersheds within the Project area towards the desired condition for the soil, water, aquatic, and riparian resource with emphasis on:
    a) Improving water quality by reducing road-related accelerated sediment through a combination of road obliteration, realignment, and maintenance.
    b) Restoring hydrologic function, stabilizing unstable streambanks, and reducing channel condition risk through road obliteration and realignment, and removal of culverts on long-term road closures.
    c) Improving aquatic habitat and fish connectivity by obliteration and realignment of roads within RCA and by removing or upgrading culverts.
    d) Restoring riparian vegetation and reducing sediment impacts by reducing in size (using physical barriers) and hardening dispersed recreation sites in RCAs.
3) Manage recreation use in the Project with an emphasis on hardening primary dispersed recreation areas, updating Cabin Creek Campground, improving existing trails and providing new trail opportunities including an off-highway vehicle (OHV) loop and a non-motorized trail.
4) Contribute to the economic vitality of the communities adjacent to the Payette National Forest.
5) Improve firefighter and public safety by establishing strategically placed defensible fuel breaks within the Project area.

1.7.2. Need—Why Here? Why Now?

The need for the Proposed Action is driven by the difference between the current and desired conditions. The current conditions are departed from the desired conditions. The objective is to move toward the desired conditions found in Appendices A, B, and E of the Forest Plan (USDA Forest Service 2003b). This type of restoration is recommended in the IDFG report, *Preserving and Restoring the Old-Growth Ponderosa Pine Ecosystems in Idaho* (Mehl and Haughler 2004) and the *Idaho Statewide Forest Resource Strategy* (Kimball and Stephenson 2010), which includes restoration goals recommended by a broad range of federal, State, and private partners. Within the Project area, the current conditions include are as follows:

1) A loss of habitat for Family 1 wildlife species, such as the white-headed woodpecker, compared to desired conditions;
2) Less large tree size class than desired in the warm, dry forest types (PVGs 2 and 5), and higher canopy cover than desired;
3) Less of an early seral tree species component (e.g., whitebark pine, aspen, ponderosa pine, Douglas-fir, and western larch) than desired;
4) Increased stand and landscape homogeneity of size classes, species diversity, tree distributions (i.e., currently in some vegetation types the tree spacing is uniform in nature);
5) More high canopy cover class than desired in the large tree size class in some vegetation types (PVGs 2, 5, 6, 7, 10, and 11);
6) Increased conifer encroachment into aspen and nonforested habitats (e.g., shrublands, sagebrush, and grasslands);
7) Higher surface fuel loading in those areas that have missed one or more fire return intervals;
8) Impaired watershed function and integrity derived from past and current disturbances, road-related erosion and sediment, floodplain and riparian area encroachment, and aquatic habitat fragmentation;
9) Trail and recreation facilities that do not meet current design, accessibility, and maintenance standards.

The desired conditions for this project are based on the Forest Plan, the WCF, and the most recent science concerning management of wildlife habitats including the Draft Payette National Forest Wildlife Conservation Strategy Technical Report (Egnew et al. 2015).

1.8. Objectives and Measurements

The Purpose and Need drives the Proposed Action and is based on Forest Plan goals and objectives (see section 1.5.1, “Forest Plan Goals and Objectives”). The purpose of the Proposed Action is represented by specific objectives. **Objectives**, as the term is used for this project, are concise, time-specific statements of actions or results designed to help achieve resource-specific goals related to the Purpose and Need. In this document, they are tracked by measurements analyzed in Chapter 3. **Measurements** are resource-specific and are used to compare how each alternative meets the objectives of the project.

1.8.1. Objectives and Measurements Identified

1.8.1.1. Vegetation (Forested and nonforested)

Objective 1: Move vegetation toward the desired conditions, with an emphasis on promoting large tree forest structure, early seral species composition, and forest resiliency.

Measurements:

- Tree Size Class.
  - Acres treated to promote or maintain the large tree size class.
  - Distribution of tree size classes.
- Tree Canopy Cover.
  - Percentage of area (acres) in each canopy cover class within the large tree size class.
- Tree Species Composition.
  - Acres treated to maintain and/or promote desired species composition.
- Spatial Patterns.
  - Percent departure from reference conditions per PVG.

Objective 2: Maintain or restore a representation of native plant communities throughout the Forest.

Measurement:

- Acres of aspen treatment.
- Acres of meadow treatment.

1.8.1.2. Fire and Fuels

Objective 3: Restore and maintain desirable fuel levels, fire regimes, and ecological processes.

Measurement:

- Amount of departure from historical fire regimes.

Objective 4: Establish and maintain strategically-placed SFBs to improve firefighter and public safety. Improve the defensible space adjacent to private lands and provide protection to infrastructure to the east of the Project area.

Measurement:

- Acres of SFB.

1.8.1.3. Wildlife

Objective 5: Improve habitat for Family 1 wildlife species, as represented by the white-headed woodpecker, a Region 4 Sensitive Species (USDA Forest Service 2011a) and Forest MIS, by restoring forest conditions that contribute to source habitat for these species.

Forested stands providing these source habitats should be restored to desired conditions within, or near, the Historical Range of Variability (HRV) (Morgan and Parsons 2001).

Measurement:

- Quantity and quality of Family 1 white-headed woodpecker habitat restored to conditions within HRV. Quantity is measured by acres of PVGs 2, 5, and portions of PVG 6 in the Large Tree Size Class and Low Canopy Cover Class. Quality is measured by the presence of old forest characteristics (e.g., legacy trees, snags, CWD, canopy gaps, and understory patchiness) as described in the Forest Plan.

1.8.2. Soil, Water, Riparian, and Aquatic (SWRA) Resources

Objective 6: Improve watershed and aquatic function and integrity by moving all watersheds within the Project area towards the desired condition for the soil, water, aquatic, and riparian resources with emphasis on:

1) Improving water quality by reducing road-related accelerated sediment through a combination of road obliteration, realignment, and maintenance.
2) Restoring hydrologic function, stabilizing unstable streambanks, and reducing channel condition risk through road obliteration and realignment.
3) Improving aquatic habitat, restoring riparian vegetation and reconnecting streams by obliterating and realigning roads within RCAs, reducing in size and hardening dispersed recreation sites, and removing or upgrading culverts.

Measurements:

- Water Quality (Sediment)
  - Amount of road-generated sediment reduced through road decommissioning and long-term closure over the long term as modeled by Geomorphic Road Analysis and Inventory Package (GRAIP) and GRAIP Lite
- Hydrologic Function (Channel Condition)
  - Total road density
  - Total road density within RCAs
- Aquatic Habitat Improved (stream miles)
  - Number of fish barriers removed or improved (specifically to improve fish passage)
  - Stream miles improved (includes miles of fish habitat reconnected and miles of stream enhanced through road decommissioning and road graveling within RCAs)
  - Miles of roads in RCAs

1.8.3. Recreation

Objective 7: Manage recreation use in the Project with an emphasis on identifying and hardening primary dispersed recreation areas, updating Cabin Creek Campground, improving existing trails, and developing new trail opportunities.

Measurements:

- Miles of open motorized trail by vehicle class (per Forest Motor Vehicle Use Map [MVUM]) for motorized trails, and miles of open and managed non-motorized trails.
- Miles of open road.
- Change to existing dispersed recreation sites measured by changes to recreation facilities and/or resource improvements at the existing sites' economics.

Objective 8: Contribute to the economic vitality of local communities.

Measurements:

- Employment contribution (number of jobs on annual average).
- Income contribution.

1.9. Decisions to Be Made

The Responsible Official for this project is the Payette National Forest Supervisor. Based on the analysis presented in this document, the Forest Supervisor will make the following decisions and document them in a Record of Decision (ROD) following the Final Environmental Impact Statement (FEIS).

Should the Forest Service implement this project, including commercial and noncommercial vegetation treatments, fuels reduction, road management, watershed and fish habitat restoration, and recreation improvements at this time?

If so:

- What and how many acres should be treated and by what means?
- What action should be taken on recreation facilities, trails, and dispersed recreation sites?
- What watershed restoration and fish habitat improvements should be implemented?
- What road management actions should be implemented?
- What Project design features or mitigation measures are necessary to assure compliance with the Forest Plan?
- What monitoring requirements are appropriate to evaluate project implementation and effectiveness?
- Should a site-specific non-significant amendment of the Forest Plan be prepared to allow for creating more than 30% unsuitable Canada lynx habitat (Forest Plan Standard TEST15, USDA Forest Service 2003a) within the Middle Fork Weiser River Lynx Analysis Unit (LAU) only?

1.10. Collaboration and Public Involvement

1.10.1. Collaboration

The Proposed Action was developed in response to Agency direction and policy, input from interested members of the public, and from recommendations received in comments provided by the PFC to the Forest Supervisor on August 20, 2014.

The PFC's objectives are to collaborate on the design of a project at a landscape scale that would restore and improve wildlife habitat, forest resiliency to wildfire, and watershed health; enhance forest access and recreation; and recommend actions that are financially responsible and contribute to the economic vitality of communities adjacent to the Forest.

1.10.2. Scoping and Public Involvement

The Council on Environmental Quality (CEQ) defines scoping as, "…an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a Proposed Action" (40 CFR 1501.7).

Among other things, the scoping process is used to invite public participation, help identify public issues, and obtain public comment during the EIS process. Scoping should begin early and continue until a decision is made. The public was invited to participate in the Project in various ways, as described below.

1.10.3. Public Mailing and Documents Availability

The IDT developed the Proposed Action and on December 19, 2014, a scoping letter and map describing the Project was mailed out (Project Record) to approximately 171 individuals, livestock permittees, and other agencies and groups. In addition, a Notice of Intent to prepare an EIS was published in the December 24, 2014, edition of the Federal Register (Volume 79, Number 247), and a Request for Comments was published in *The Idaho Statesman*, the newspaper of record, on December 23, 2014, and in the *Adams County Record* on December 24, 2014. Fourteen public comments were received during the scoping period.

The Project also appeared in the USDA Forest Service's *Schedule of Proposed Actions* (SOPA) from April 2013 through January 2016. A public meeting was held in Council, Idaho on January 12, 2015. In attendance were members of the PFC, general public and an Adams County Commissioner. The Project concept was introduced and the Forest Service received feedback from those in attendance.

Additionally, the Council Ranger District and the PFC conducted public field tours of the Project on June 25, 2013, July 24, 2013, September 19, 2014, and November 6, 2015 to view potential vegetation treatments, watershed improvements, and recreation improvements.

1.11. Issues and Indicators

Issues (along with Project objectives) were used to develop alternatives and/or appropriate mitigation measures or project design features to address the effects of proposed activities. Each issue is tracked using **indicators,** which compare the effects of the proposed activities by alternative.

Issues were grouped by resource and described using an issue statement, and a list of indicators measuring the effects of the proposed activities. Chapter 2 includes a summary comparing the effects of the alternatives on issues and their indicators. Chapter 3 describes the environmental consequences of the alternatives in terms of the issues.

1.11.1. Wildlife

Issue Statement:

*High open **road densities** affect wildlife (e.g., elk) security and can lead to the removal of important habitat components (e.g., snags).*

Indicator:

- Change in elk security areas (Hillis et al. 1991).
- Miles of NFS roads and unauthorized roads decommissioned by (1) physical closure and (2) obliteration.
- Estimated effectiveness of closures and/or decommissioning.
- Effects of opening closed roads to allow for additional firewood harvest.

Issue Statement:

*Treatments may adversely affect **source habitat** for wildlife species dependent on mixed conifer forests with multi-layer structural characteristics. Such forests are associated with mixed to lethal fire regimes and associated processes (larger scales of insect and disease outbreaks and fire effects). Species of concern include listed and sensitive species and MIS.*

Background: A primary need Forest-wide and in the Project area is to maintain and promote dry, lower elevation, large tree and old forest characteristics for the associated wildlife species and reduce fragmentation that negatively affects species of concern. The processes, function, patch-size and diversity of forested habitats must all be considered in order to properly address wildlife habitat needs.

Indicators:

- Quantity (acres) and distribution of habitat for species of concern.
- Quality (specifically old forest, snags, patch, and pattern) and distribution of habitat for species of concern.

Issue Statement:

Project activities (logging, log haul, prescribed burning, and temporary road construction) may cause disturbance to wildlife species of concern

Indicators:

- Disturbance effects to species of concern.

1.11.2. Soil, Water, Riparian, and Aquatic (SWRA) Resources

Issue Statement:

Proposed activities for roads, vegetation treatments, and prescribed fire may degrade water quality by increasing soil erosion and sediment delivery.

Background: management activities that have the potential to disturb soils and decrease ground cover can result in increased soil erosion and, with a flow path, can result in increased sediment delivery to streams via overland flow or channelized flow, especially if delivered via road infrastructure at stream crossings or ditch relief culverts.

Indicators:

- Miles of temporary road constructed, including use of unauthorized roads.
- Miles of road realignment and reconstruction.
- Miles of new long-term road closures (road storage).
- Miles of road decommissioned.
- Acres of ground-based mechanical vegetation treatment.
- Acres of prescribed burn.

Issue Statement:

Propose vegetation treatments and prescribed burning in RCAs may negatively affect stream temperatures and LWD.

Indicators:

- Acres of vegetation treatment and prescribed burning within RCAs.
- Acres treated within one site-potential tree height.

Issue Statement:

Proposed activities may change timing and duration of peak runoff, which may affect bank stability in sensitive channels.

Indicators:

- Total road density
- Number of drainages that are over 25% Equivalent Clearcut Acres (ECA) (High Category)

Issue Statement:

Proposed activities may decrease long-term soil productivity and impair soil-hydrologic function

Indicators:

- Percent detrimental soil disturbance (DD) within activity areas (Forest Plan Standard SWST02)
- Percent total soil resource commitment (TSRC) across the Project area (Forest Plan Standard SWST03).
- Levels of CWD retained within activity areas for long-term soil productivity.

1.11.3. Transportation Resources

Issue Statement:

Proposed activities to the road system (e.g., road closures and decommissioning) may reduce the amount of access to the areas identified in the Forest Plan for active management.

Indicators:

- Suited timber lands within 0.25 miles of a Forest System road (includes closed roads)

1.12. Other Concerns Evaluated

The IDT evaluated other concerns that helped frame the scope of the analysis during the scoping process. These concerns were not considered issues because they were resolved through project design and, therefore, were not used to develop alternatives analyzed in detail. These concerns are not addressed within the effects analysis by resource in Chapter 3 of this document because there were no effects to resources.

1.12.1. Cultural and Archaeological Resources

Several Federal laws and memorandums protect Cultural and Historic Properties. Cultural resources are defined by tribes as resources that are essential for the continuation of the culture. Archeological resources are the material remains of the past left on the landscape. Forest Service handbook (FSH) and manual definitions are located in this document's glossary (Chapter 4.4).

A brief summary of each of the major laws, executive orders (EOs), memorandums or acts pertaining to the management of cultural and archaeological resources is provided in section 1.13.

Since 1972, there have been over 50 federal actions providing Payette National Forest Heritage Program staff with the opportunity to conduct cultural resource site inventories on a variety of projects throughout the Project area (see Appendix 3, Cumulative Effects, for a list of past projects). During the course of this work, heritage staff have identified and evaluated 36 archaeological sites using criteria established by the National Register of Historic Places (NHRP, 36 CFR 800.4(c)) that are located within the Project boundary. During the 2015 field season, approximately 1,259 acres of intensive survey in high probability areas, based on the Forest's predictive model (Bennett 1986, Dixon 2000), were conducted. Prior to 2015, a total of 3,826 acres were surveyed in the project boundary, making the grand total of acres surveyed 5,085.

A total of 36 previously recorded sites occur in the Project area; 15 of these sites were not eligible for the NRHP. Heritage staff monitored the 21 eligible sites located within the project boundary from 2009 to 2015. After monitoring, 13 sites remained eligible to the NRHP. The remaining 8 sites had changes in eligibility due to no diagnostic artifact or subsurface components being found during the time of monitoring and/or no stratigraphic context being found to yield additional information. In addition, many of the only diagnostic artifacts found at these sites were previously collected with no provenience recorded. Of the 13 total historic properties eligible for inclusion in the NRHP, 8 are Native American sites and 5 are historic sites. No new sites were found or recorded for the Project.

During the summer of 2015, approximately 1,259 acres of intensive survey in high probability areas based on the Forest's predictive model were conducted (Bennett 1986, Dixon 2003). Heritage staff monitored and updated 21 sites, 13 remain eligible historic properties potentially affected by the project. These sites include PY-109, PY-358, PY-821, PY-825, PY-892, PY-1117, PY-1313, PY-1334, PY-1341, PY-1471, PY-1483, PY-1491, and PY-1530. These sites will be avoided or the project will be redesigned to exclude these sites during implementation.

Due to the landscape scale of the proposed project, Forest Heritage staff recognized the need to implement a phased identification effort as defined in 36 CFR 800.4 (b) (2). The Forest executed a Memorandum of Agreement (MOA PY 2013-2694) with the Idaho State Historic Preservation Office (SHPO) in December 2015.

The MOA specifically stipulates that the Forest Service shall do the following:

1. Sign a formal NEPA decision authorizing the Middle Fork Weiser River Landscape Restoration Project prior to completing stipulations 2-5.
2. Mark all National Register eligible sites for avoidance prior to implementation.
3. As projects within the analysis area are developed, conduct systematic archaeological surveys (30-meter transects or less) of the Area of Potential Effects (APE) associated with the Middle Fork Weiser River Restoration Project in areas either lacking previous inventory or where previous inventory is deemed inadequate. Surveys will conform to the Forests' Sites Identification Strategy and Predictive Model and will be reported to the Idaho SHPO using standard reporting formats.
4. Evaluate all new cultural resources found within the specific project APEs for their National Register eligibility and report those determinations to the Idaho SHPO using standard reporting formats.
5. Conduct secondary consultation with Idaho SHPO on each project phase requiring new inventory or if previous inventory is determined to be inadequate. This consultation will follow standard reporting formats.
6. Resolve adverse effects to historic properties following regulations found in 36 CFR 800.6.
7. Articulate provisions for managing unanticipated discoveries which may occur during project implementation.

If the stipulations of the MOA are met, the project will be considered "No Adverse Effect." In addition, the Forest will consult with the tribes regarding the findings of additional inventory and identified areas for protection as defined in applicable laws. Secondary consultations with the Idaho SHPO and interested tribes will occur as needed. As the project is implemented, the 15 eligible historic properties will be flagged for avoidance and monitored. Project staff will be informed as to the locations of the Historic Properties so as to avoid potential impacts to them. If these requirements are followed, there will be no direct, indirect or cumulative effects to archaeological resources.

1.12.2. Air Quality

Prescribed burning for fuels reduction and ecosystem restoration includes careful planning (prescription development) to minimize impacts on air quality by restricting prescribed

burning to conditions when smoke dispersal would be optimal. To ensure that air quality meets federal and State standards during prescribed burning, the Forest is part of a partnership known as the Montana/Idaho State Airshed Group. Before prescribed fires are ignited, fire managers are required to submit their plans to the Montana/Idaho State Airshed Group monitoring unit which reviews existing air quality levels and weather conditions to determine which prescribed fires can be ignited and which, if any, must be delayed to ensure that air quality meets federal and State standards.

The Hells Canyon National Recreation Area (Class I Airshed) is approximately 20 miles northwest of the proposed burn sites and is the only Class I Airshed near the Project. No non-attainment or sensitive areas (i.e., areas with large populations) are located near the Project area.

Prescribed fire burn plans, completed for all prescribed burns, address the following management actions with respect to air quality:

a) Consider other sources of emissions.
b) Identify sensitive areas.
c) Include descriptions of planned measures to reduce smoke impacts as appropriate.
d) Identify the potential risk for smoke intrusions into sensitive areas.
e) Describe ambient air monitoring plans, when appropriate.

The action alternatives would comply with air quality regulations and no regulatory distinction exists between alternatives. The action alternatives would allow for greater control over air quality impacts compared to the No Action alternative due to control over burning operations versus uncontrolled wildfires. The action alternatives include proposals to remove biomass from the Project area for use in plants that burn the material at high temperatures in controlled conditions, reducing particulate emission compared to material burned in prescribed fires or wildfires.

1.12.3. Recreation Opportunity Spectrum (ROS)

The Payette Land and Resource Management Plan (Forest Plan) Appendix F, describes the ROS as a classification system in which components of recreation setting and facilities—such as access, developed sites, activities, and experiences—are organized and arranged along a continuum or spectrum. The continuum ranges from very primitive settings and experiences to highly concentrated, urbanized ones. Each class is defined in terms of its specific combination of activities, setting, facilities, and experience opportunities.

The ROS provides a framework for defining the types of outdoor recreation opportunities and experiences that the public might desire. It also provides a context and tool for estimating and describing recreation resources as well as effects to those resources from alternative management strategies and actions. On the Payette National Forest, ROS is divided into both summer and winter opportunities and there are separate maps and classifications for each of the two seasons.

All recreation facility related improvements are along main open road corridors that are within a Roaded Natural (RN) summer ROS. The winter ROS does not have RN but instead is primarily RM and Semi-primitive Motorized (SPM). Project related proposals would not alter existing summer or winter ROS. All recreation facility improvements proposed under the Proposed Action alternative would maintain the existing ROS classifications.

Implementation of the proposed recreational trail projects would not change the existing Winter or Summer ROS. The proposed change in designation of a 2-mile section of Trail #198 from non-motorized to motorized use would be within a SPM ROS, so would continue to meet the objectives within the ROS. No trail projects are planned within the Semi-primitive Non-motorized (SPNM) winter ROS.

Mechanical treatments occurring during the winter months could temporarily impact the winter ROS that is SPM in much of the Project area with noise, road use and other activities associated with logging and running log trucks in the winter months. No other resource activities would affect the ROS in summer or winter months.

Continued future manipulation of the environment by any of the resources (recreation, range improvements, mechanical treatments, watershed improvements, fisheries habitat improvements, and wildlife habitat improvements) could eventually change the ROS to full modification across the Project area.

1.12.4. Visuals

Each of the alternatives has the potential to maintain, alter, or enhance the scenic character of the Forest landscape to varying degrees. While a natural-appearing landscape character is preferred, under the existing Visual Quality Objectives (VQOs) in the Project area, Partial Retention (PR) and Roaded Modified (RM) manipulation of the scenic environment is acceptable. All recreation facility related improvements are along main open road corridors that have a PR VQO. All recreation related improvements proposed under the Proposed Action alternative meet PR guidelines.

Trail proposals for maintenance, new trail designations, changes to season of use (from open year round to open seasonally), and trail reroutes are located within PR and RM VQOs. All trail proposals, when implemented, would maintain the existing VQO.

For the scenic environment, in areas of interspersed ownership (prominent within the Project area), there is a potential for combined effects to visual resources from National Forest activities and those evident on other ownership lands. Management activities on other lands that do not blend into the landscape can negatively affect the experiences of Forest users who are viewing scenery. Development and timber harvest on private lands adjacent to National Forest are often accomplished with different objectives than on public lands.

1.12.5. Climate Change

Recent rapid climate change has raised concern over the ability of some species to adapt to landscape changes associated with this phenomenon. Diaz and Eischeid (2007) found an average increase of approximately 1.0 degree Fahrenheit (°F) over the last 20 years in the western United States with the greatest increases at high elevations. Diaz and Eischeid (2007) contend that changes in annual shrub phenology (earlier flowering), increases in significant forest pest infestations, earlier spring runoff, intensified wildfires, and the disappearance of alpine and tundra ecosystems illustrate rapid changes in the hydrological, phenological, and biological indicators of western ecosystems that are a result of climate warming. Research findings (Gedaloff et al. 2005, Westerling et al. 2006) document increases in large western wildfires beginning in the mid-1980s and correlated climate variables, including increased spring and summer temperatures and early spring snow melt.

Climate data for the last 55 years (1951–2006) reveal that on average, temperatures in Idaho have increased 0.031% per year (Figure 1-5), and precipitation has increased 0.085% per year (Figure 1-6) (The Nature Conservancy 2011). Consistent with findings by Diaz and Eischeid (2007), the temperature increases have been more severe at higher elevations.

Restoration ecologists acknowledge that future climatic regimes may be different than the climatic regimes that developed historical representations of landscapes. However, Fule et al. (2009) argue that historical reference conditions remain useful in light of climate change evidence because historical forests were likely more resilient and resistant to drought, insect pathogens, and severe wildfire. Noss (2001) supports this approach and advocates that resilience and resistance are created by (1) maintaining a diversity of functional groups; (2) maintaining species richness and redundancy within functional groups; (3) identifying keystone species; and (4) maintaining keystone species at optimal, not just minimally viable, populations. This approach provides the best opportunity for species to adapt to changes. Noss (2001) also states that climate change is not the greatest threat to today's forests but is an additional stressor and suggests that restoring vegetative conditions will result in more adaptable forests.

The Project is designed to enhance resiliency to climate-related stressors such as drought, wildfire, insects, and disease. Moving vegetation toward desired conditions, as described in Appendix A of the Forest Plan, would decrease vulnerability of the vegetation and wildlife to climate change impacts and increase the adaptive capacity of the ecosystem elements.

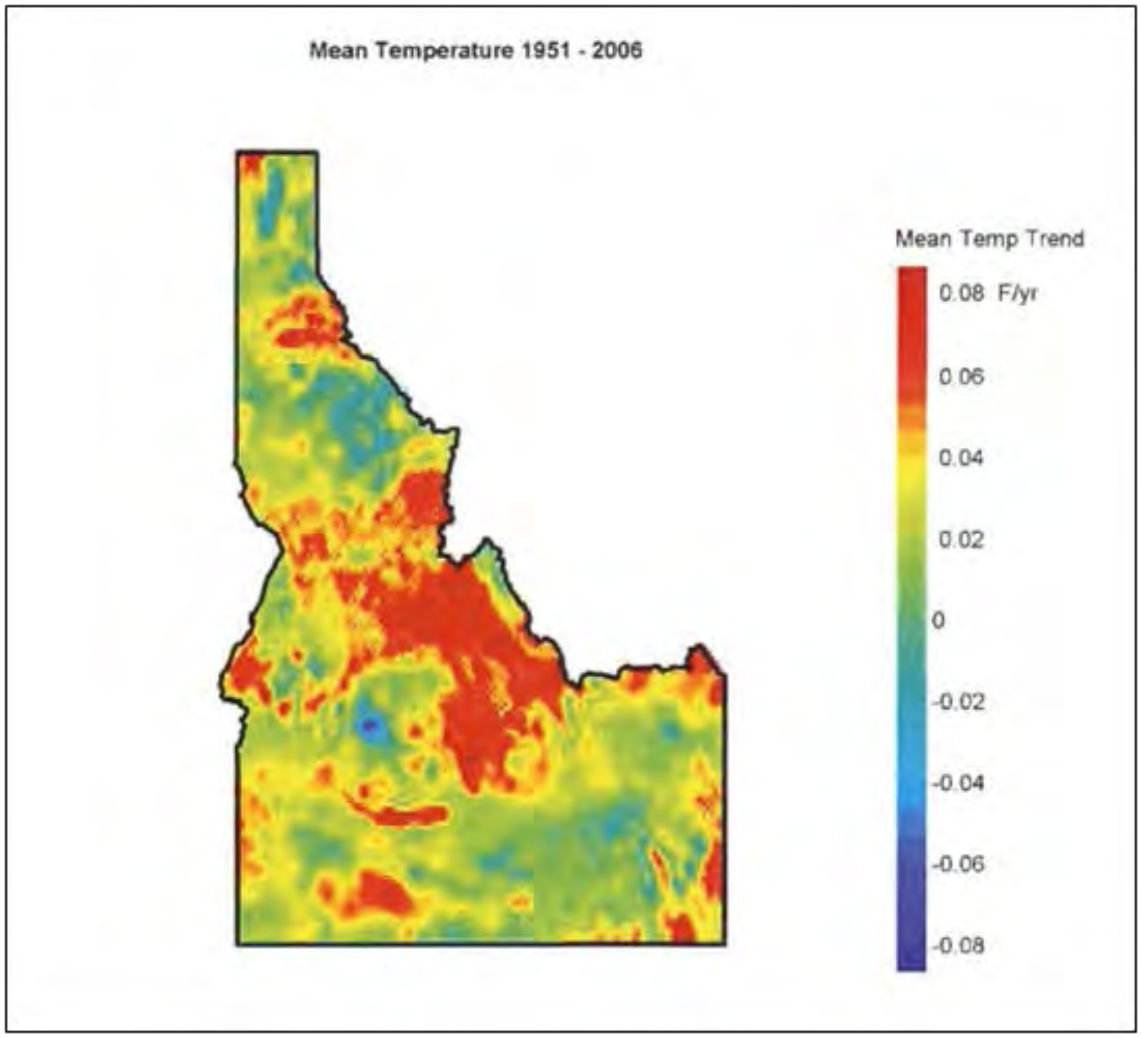

Figure 1-5. Average Temperature Changes for Idaho from 1951-2006

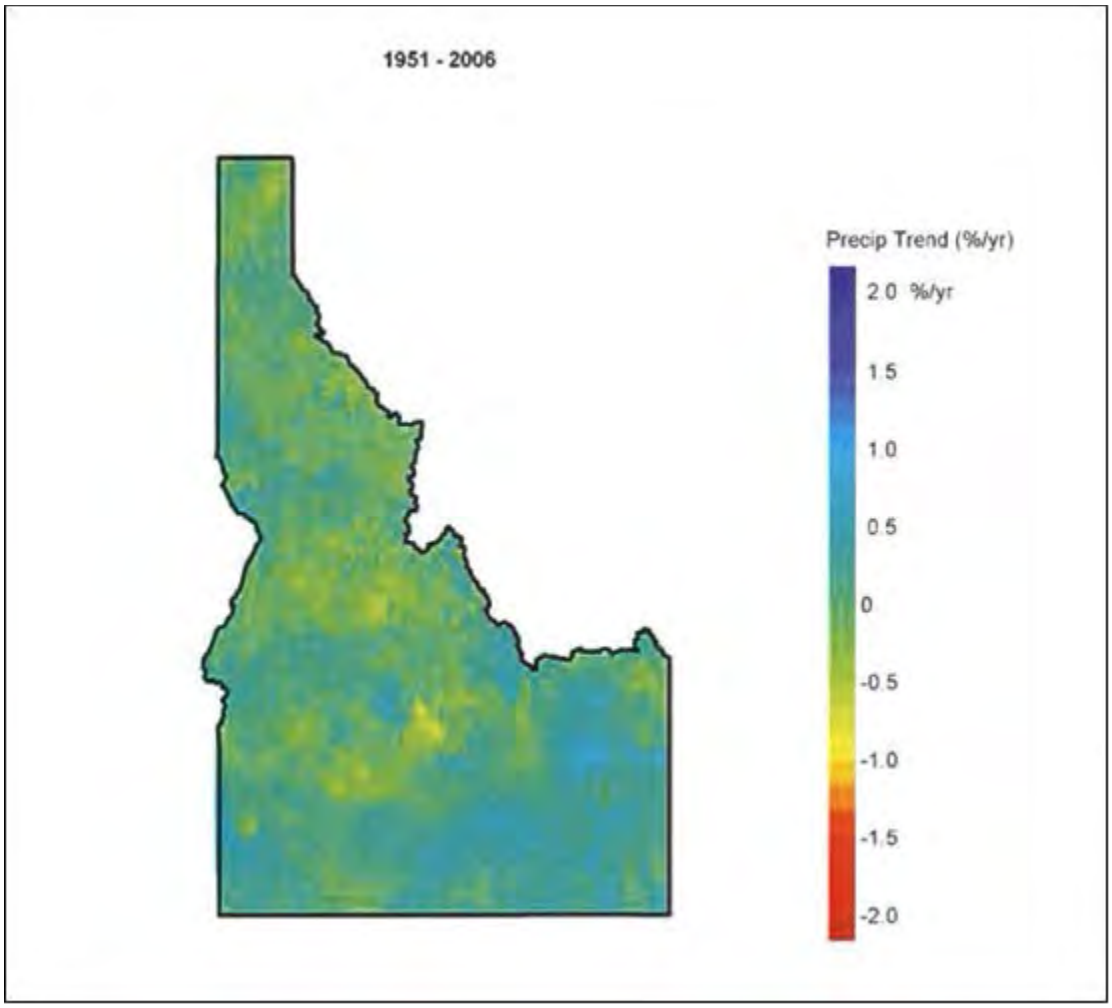

Figure 1-6. Average Precipitation Changes for Idaho from 1951 to 2006

1.13. Applicable Laws and Executive Orders

A partial list of federal laws and EOs pertaining to project-specific planning and environmental analysis on federal lands follows.

1.13.1. Archaeological Resources Protection Act of 1979

The purpose of the Archaeological Resources Protection Act (ARPA) is to protect irreplaceable archaeological resources on federal and Indian lands.

This statute (16 U.S.C. 470aa-470mm; Public Law 96-95 and amendments to it) was enacted "...to secure, for the present and future benefit of the American people, the protection of archaeological resources and sites which are on public lands and Indian lands, and to foster increased cooperation and exchange of information between governmental authorities, the professional archaeological community, and private individuals (Sec. 2(4)(b))".

The reasons behind enactment include recognition that archaeological resources are an irreplaceable part of America's heritage and that they were endangered increasingly because of the escalating commercial value of a small portion of the contents of archeological sites.

The primary impetus behind ARPA was the need to provide more effective law enforcement to protect public archeological sites. Two improvements over the Antiquities Act, which was the statute designed to provide this protection prior to ARPA's enactment, were more detailed descriptions of the prohibited activities and larger financial and incarceration penalties for convicted violators. Section 6 of the statute describes the range of prohibited actions including damage or defacement in addition to unpermitted excavation or removal. Also prohibited are selling, purchasing, and other trafficking activities whether within the United States or internationally. Section 6(c) prohibits interstate or international sale, purchase, or transport of any archeological resource excavated or removed in violation of a state or local law, ordinance, or regulation.

This management requirement is listed in section 2.4, Management Requirements. Additional information can be found in section 1.12.1.

1.13.2. American Indian Religious Freedom Act

The American Indian Religious Freedom Act, Public Law No. 95-341, 92 Stat. 469 (August 11, 1978) (commonly abbreviated as AIRFA), is a United States federal law and a joint resolution of Congress that was passed in 1978. AIRFA was enacted to protect and preserve the traditional religious rights and cultural practices of American Indians, Eskimos, Aleuts, and native Hawaiians.

1.13.3. Clean Air Act, as amended in 1990

The purposes of the Clean Air Act are, "…to protect and enhance the quality of the nation's air resources so as to promote the public health and welfare and the productive capacity of its population; to initiate and accelerate a national research and development program to achieve the prevention and control of air pollution; to provide technical and financial assistance to State and local governments in connection with the development and execution of their air pollution prevention and control programs; and to encourage and assist the development and operation of regional air pollution prevention and control programs."

1.13.4. Clean Water Act, as amended in 1977 and 1982

The primary objective of the Clean Water Act (CWA) is to restore and maintain the integrity of the nation's waters. This objective translates into two fundamental national goals: (1) eliminate the discharge of pollutants into the nation's waters and (2) achieve water quality levels that are fishable and swimmable. This Act establishes a non-degradation policy for all proposed federal projects.

The CWA is addressed through project design features and mitigation measures and monitoring (section 2.5 and Appendix 4). For more information, see section 3.5, "Watershed Resources."

1.13.5. Civil Rights, Consumers, Minorities, and Women

All Forest Service actions can impact, positively or negatively, the civil rights of individuals or groups, including minorities and women. The need to analyze these potential impacts is required by the Forest Service Manual and FSH. This project would not affect civil rights, consumers, or minorities or women.

1.13.6. Endangered Species Act of 1973, as amended

The purpose of the Endangered Species Act (ESA) is to, "…provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species, and to take such steps as may be appropriate to achieve the purposes of the treaties and conventions set forth in subsection (a) of this section." The ESA also states, "It is further declared to be the policy of Congress that all federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of this Act." The ESA is addressed in sections 3.4, "Wildlife Resources," 3.6, "Fisheries Resources" and 3.8, "Botany and Rare Plants".

1.13.7. Executive Order 11990—Protection of Wetlands

EO 11990 provides direction to federal agencies to protect the nation's wetlands when undertaking all activities. The order is addressed through project design features.

1.13.8. Executive Order 11988—Floodplain Management

EO 11988 requires that proposed activities must not increase flood hazards and must preserve the resource benefit of floodplains (the ability to dissipate flood flows and moderate flood peaks). This requirement is addressed through project design features.

1.13.9. Executive Orders Pertaining to Tribal Consultation

EO 13175 established a requirement for regular and meaningful consultation between federal and tribal government officials on federal policies that have tribal implications.

EO 12785 was enacted in order to reduce unfunded mandates upon state, local, and tribal governments; to streamline the application process forand increase the availability of waivers to state, local, and tribal governments; and to establish regular and meaningful consultation and collaboration with state, local, and tribal governments on federal matters that significantly or uniquely affect their communities.

EO 13007 was enacted in order to (1) accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and (2) avoid adversely affecting the physical integrity of such sacred sites. Where appropriate, agencies shall maintain the confidentiality of sacred sites.

1.13.10. Executive Order 12898—Environmental Justice

EO 12898 directs each federal agency to make achieving environmental justice (EJ) part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations. The President also signed a memorandum emphasizing the need to consider these types of effects during NEPA analysis. On March 24, 1995, the Department of Agriculture completed an implementation strategy for EO 12898. Where Forest Service proposals have the potential to adversely affect minority or low-income populations disproportionately, effects must be considered and disclosed (and mitigated to the degree possible) through NEPA analysis and documentation.

1.13.11. Executive Order 13112—Invasive Species

EO 13112 requires federal agencies, whose actions may affect the status of invasive species, to identify such actions, prevent the introduction of invasive species, detect and respond rapidly to and control populations of such species, provide for restoration of native species and habitat conditions, and promote public education on invasive species. Additionally, federal agencies are directed to not carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species.

Activities proposed under the Project are not anticipated to substantially cause or promote the introduction or spread of invasive species. Information on noxious weeds can be found under section 3.13.

1.13.12. Executive Order 13186—Responsibilities of Federal Agencies to Protect Migratory Birds

EO 13186 requires federal agencies to evaluate the effects of federal actions and agency plans on migratory birds with an emphasis on species of concern. No interagency determinations are to be made for migratory birds as with federally listed species. This information is reviewed with the United States Department of the Interior (USDI) Fish and Wildlife Service (FWS); no mechanism is in place for the FWS to consult on project effects. This issue is addressed in section *Wildlife Specialist Report* (Almack 2016).

1.13.13. Federal Noxious Weed Act of 1974

The Federal Noxious Weed Act provides for the control and management of non-indigenous weeds that injure or have the potential to injure the interests of agriculture and commerce, wildlife resources, or the public health. Noxious weed treatment would be conducted according to federal and State law if implemented in conjunction with this Project.

1.13.14. Idaho Forest Practices Act

The purpose of the Idaho Forest Practices Act (IFPA) is to ensure the continuous growth and harvest of forest trees and to maintain forest soil, air, water, vegetation, wildlife, and aquatic habitat. The IFPA requires consistency with forest practice rules for federal, State, and private lands in order to protect, maintain, and enhance the state's natural resources. Best Management Practices (BMP) and contract provisions would be used to meet specific IFPA regulations. Site-specific project design features and mitigation measures are listed in section 2.5.

1.13.15. Native American Graves Protection and Repatriation Act

The Native American Graves Protection and Repatriation Act provides a process for museums and Federal agencies to return certain Native American cultural items, such as human remains, funerary objects, sacred objects, or objects of cultural patrimony, to lineal descendants, and culturally affiliated Indian tribes and Native Hawaiian organizations.

1.13.16. Migratory Bird Treaty Act of 1918

The proposed agency activities should not degrade habitat for migratory landbirds that are known to exist in the Project area. Habitat for migratory species will be surveyed prior to implementation to ensure that appropriate measures have been taken to protect nest sites and other source habitat. For example, flammulated owls are neo-tropical migrants, wintering in Central America, but nesting in ponderosa pine forests of the northern Rocky Mountains. Flammulated owls have been documented in the Project area as recently as 2014. The stands where these birds were located would be surveyed again, prior to implementation of any harvest activities, to determine stand occupancy by flammulated owls. The survey transects would be sampled annually for, at least, the duration of the Project. A complete list of birds protected under the Migratory Bird Treaty Act is located in the wildlife specialist report in the Project record.

1.13.17. Facilitation of Hunting Heritage and Wildlife Conservation—E.O. 13443

On August 16, 2007, President George Bush signed an EO directing appropriate Federal agencies to facilitate the expansion and enhancement of hunting opportunities and the management of game species and their habitat (FR Vol. 72, No. 160, August 20, 2007).

The project area provides habitat for several game species including deer, elk, black bear, mountain lion, wolf, and forest grouse. The effects to wolves and elk were considered in previous sections and in the Wildlife Specialist Report (Almack 2016). Mitigation has been included to minimize and avoid impacts to elk (primarily through effective road closures and obliteration of unauthorized roads) so that habitat is provided to support Idaho Department Fish and Games population objectives. These measures should also benefit deer. In addition, project-wide prescribed fires should improve forage for deer and elk across the landscape. Mountain lion presence is largely tied to the presence of deer, so activities that maintain or improve deer habitat should maintain mountain lion populations.

Black bears are habitat generalists. While they prefer mixed deciduous-coniferous forests with thick understories, they will utilize a variety of habitats. Special habitat features include fallen logs and debris, and standing hollow trees that provide denning sites for bears. Snag and coarse wood desired conditions apply to all management activity areas and will provide for these components on the landscape in amounts, distribution and sizes that were historically expected to exist within each of the PVGs.

Dusky grouse, spruce grouse, and ruffed grouse are all present in the project area. Habitat use and needs vary between the species. Dusky grouse are found in open coniferous forests, often with a fir component. Douglas-fir provides day roosts and the buds and needles are an important winter food. Subalpine fir, with its dense foliage, is often selected as a night roost. Ruffed grouse utilize dense forests with some deciduous trees or shrubs. Aspen is an important component of habitat. Young forests provide optimum habitat for the species. Spruce grouse occupy coniferous forests that include short needled trees (lodgepole pine, spruce-fir). *Vaccinium spp* are a common component of habitats. Key features include forest structure that provides cover (i.e., lodgepole pine prior to self-pruning). All three grouse species are associated with forested habitats. The proposed action will reduce tree densities and canopy cover within dense stands, thus improving conditions for the dusky grouse. Prescribed fire treatments should help regenerate aspen forests, an important component of

ruffed grouse habitat. There will likely be no impacts or improvement to spruce grouse habitat from this project.

1.13.18. National Environmental Policy Act of 1969, as amended

The purposes of the NEPA are, "To declare a national policy which will encourage productive and enjoyable harmony between man and his environment, to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality" (42 U.S.C. Sec. 4321). The law further states "...it is the continuing policy of the federal government, in cooperation with State and local governments, and other concerned public and private organizations, to use all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans" (42 U.S.C. Sec. 4331(a)). NEPA establishes the format and content requirements of environmental analysis and documentation.

1.13.19. National Forest Management Act of 1976

The National Forest Management Act (NFMA) guides development and revision of National Forest Land Management Plans and has several sections ranging from required reporting the Agriculture Secretary must submit annually to Congress to preparation requirements for timber sale contracts. There are several important sections within the NFMA, including Section 1 (purpose and principles), Section 19 (fish and wildlife resource), Section 23 (water and soil resource), and Section 27 (management requirements).

1.13.20. National Historic Preservation Act of 1966, as Amended

The National Historic Preservation Act of 1966 (NHPA) changed the way in which the Federal Government regarded its role of historic preservation. The NHPA authorized the Secretary of Interior to expand and maintain a National Register of Historic Places composed of districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, engineering, and culture. This act requires federal agencies to consult with the SHPO and American Indian tribes when non-renewable cultural resources, such as archaeological sites and historic structures, may be affected by a federal action. Section 106 of NHPA requires federal agencies to review the effects proposed projects may have on cultural resources in the Project area.

The Idaho SHPO has been consulted concerning proposed activities in the Project area. Section 1.12.1, "Cultural and Archaeological Resources" discusses Idaho SHPO consultation and section 1.14 discusses American Indian tribal consultation.

1.13.21. Omnibus Public Land Management Act of 2009

Congress, under Title IV of the Omnibus Public Land Management Act of 2009, established the Collaborative Forest Landscape Restoration (CFLR) Program. The purpose of the CFLR Program is to encourage the collaborative, science-based ecosystem restoration of priority

forest landscapes. The CFLR Program provides a means to achieve an all lands approach to forest restoration" and to also:

- Encourage ecological, economic, and social sustainability;
- Leverage local resources with national and private resources;
- Facilitate the reduction of wildfire management costs, including through re-establishing natural fire regimes and reducing the risk of uncharacteristic wildfire;
- Demonstrate the degree to which various ecological restoration techniques achieve ecological and watershed health objectives; and,
- Encourage use of forest restoration by-products to offset treatment costs, to benefit local rural economies, to and improve forest health.

Title IV also establishes the CFLR Fund, providing authority for funding of CFLR Projects selected by the Secretary of the US Department of Agriculture (USDA). In 2010 and 2011, the Forest submitted a CFLR Project, and on February 2, 2012, the Secretary of the USDA announced the selection of the Forest's Weiser-Little Salmon Headwaters CFLR Project, currently encompassing 900,000 acres of NFS lands in the Council, New Meadows, and McCall Ranger Districts in Adams County. The Project is part of the landscape within the Weiser-Little Salmon Headwaters CFLR Project.

Uses and Limitations of the CFLR Fund include:

- The CFLR Fund may only be used on NFS lands.
- The CFLR Fund may not be used to cover planning costs.
- The CFLR Fund may be used to pay for up to 50% of the cost of carrying out and monitoring ecological restoration treatments on NFS lands.
- No more than $4,000,000 may be spent from the CFLR Fund in any one fiscal year on any one project.
- The CFLR Fund for any one proposal may be expended for no more than 10 fiscal years.

1.14. Tribal Rights and Interests

This section describes the cultural history, legal context, and existing federal agency relations with the Project area's affected Native American tribes. The United States government has a unique responsibility to Native American tribes. As federal agencies undertake activities that may affect tribes' rights, property interests or trust resources, care must be taken to implement agency policies, programs and projects in a knowledgeable and sensitive manner respectful of tribes' sovereignty and needs. Implications from this responsibility for Forest Service decision-makers are described as they relate to the Project.

1.14.1. Federal Trust Responsibility

The modern concept of trust responsibility grows out of the 1814 Treaty of Ghent, in Chief Justice Marshall's decision in Cherokee Nation v. Georgia 1831 (Supreme Court 1831). Justice Marshall characterized Native American tribes as domestic dependent sovereign nations, involving (1) the government or nation-state status of tribes, and (2) a special tribal

relationship with the United States (Strickland and Wilkinson 1982). Marshall described the trust relationship as one that "resembles that of a ward to his guardian," as a special relationship that exists nowhere else in the world. This relationship has been consistently recognized by federal courts ever since and has been described as "special," "unique," "moral," and "solemn" (Strickland and Wilkinson 1982).

In addition, the rights reserved by Native American tribes in treaties and agreements, or which were not expressly terminated by the Congress, continue to this day. These governmental rights and authorities extend to any cultural and natural resources which are reserved by or protected in treaties, EOs, and federal statutes. The courts have developed the Canons of Construction, guiding that treaties and other federal actions "should when possible be read as protecting Indian rights Tribes hold in title in a manner favorable to Indians (Strickland and Wilkinson 1982)."

The primary focus of the federal trust responsibility is the protection of Native American tribes' natural resources on reservations, and the rights and interests of tribes on all tribal homelands. In fulfilling the trust obligation, Congress also adopted laws and policies that protect Native American tribes' rights to self-determination, and promote the social well-being of tribes and their members. Under various laws and policies, agencies are responsible for implementing federal resource laws in a manner consistent with the tribes' ability to protect their members, to manage their own resources, and to maintain themselves as distinct cultural and sovereign tribal governments. Forest Service trust responsibilities apply to those actions under their authority. For example, they can undertake activities affecting all resources, including plant and animal habitats, on lands they administer.

The federal government's trust responsibility compels agencies to conduct their activities consistent with responsibilities that are established through case law to a tribe or tribes by virtue of inherent rights and sovereign authority, unextinguished aboriginal title, treaty, statute, judicial decisions, EO or agreement, of which give rise to legally enforceable remedies. In carrying out their trust responsibilities, the Forest Service must assess proposed actions to determine potential impacts on treaty rights, treaty resources or other unextinguished tribal rights and interests. Where potential impacts exist, the agencies must consult with affected tribes and explicitly address those impacts in planning documents and final decisions. Consultation with the tribes is essential in carrying out that trust responsibility. A key issue is the federal government's trust obligation to ensure that tribal rights and interests will be protected.

1.14.2. Consultation

Tribal governments have a special and unique legal and political relationship with the United States government as reflected in the United States Constitution, treaties, statutes, court decisions, EOs, and memoranda. This relationship imparts a duty on all federal agencies to consult, coordinate, and communicate with American Indian tribes on a government-to-government basis.

The intergovernmental consultation process serves as the primary means for the federal agencies to carry out their trust obligations. Consultation is not a single event, but instead is a process leading to a decision; for example, the ROD for this EIS. Consultation means different things to different tribes. It can be either a formal process of negotiation, cooperation, and policy-level decision-making between tribal governments and the federal government, or a more informal process. Tribal rights and interests are discussed and considered or incorporated into the decision. Consultation can be viewed as an ongoing

relationship between agencies and tribes, characterized by consensus-seeking approaches to reach mutual understanding and resolve issues. It may concern issues and actions that could affect the government's trust responsibilities, or other tribal interests.

Consultation minimally serves five purposes:

- To identify and clarify issues;
- To provide for an exchange of existing information and identify where information is needed;
- To identify and serve as a process for conflict resolution;
- To provide an opportunity to discuss and explain the decision;
- To fulfill the core of the federal trust obligation.

Legal requirements for federal agencies to consult with sovereign Indian tribes have their basis in federal law, court interpretations, and EOs. Applicable laws were described in section 1.14.

1.14.3. Documentation of Consultation Efforts

Because American Indian tribes can be affected by the policies and actions of the Forest Service in managing the lands and resources under its jurisdiction, the Forest Service has a duty to consult with them on matters affecting their interests. Because of this government-to-government relationship, efforts were made to involve local tribal governments and to solicit their input regarding the proposed action.

The Forest Service introduced this project to the Shoshone-Paiute leaders during the Wings and Roots Program meeting (government-to-government consultation) on March 12, 2015. Updates were provided to the Shoshone-Paiute leaders during the Wings and Roots Program meeting on December 10, 2015.

In accordance with EO 12875, letters describing the Proposed Action and requesting comments and concerns were sent to the Tribal Chairmen of the Nez Perce and Shoshone-Bannock Tribes on December 19, 2014. During informal consultation, the Forest Service presented the Proposed Action to the Nez Perce Resource Staff on December 3, 2014 and June 3, 2015.

The Nez-Perce and Shoshone-Bannock Tribes have not requested formal consultation on the project. Additional coordination with the Tribes will be conducted before a decision on this project is made to ensure that Tribes interests are considered.

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Chapter 2 — Alternatives

2.1. Introduction

Chapter 2 describes the management alternatives considered for implementation of the Proposed Action. This chapter also discusses alternative development and summarizes a comparison of the alternatives, contrasting both their accomplishment of the Purpose and Need and their response to the identified issues, which provides the information necessary for the Responsible Official to make an informed choice between alternatives.

Maps for each alternative considered in detail can be found in Appendix 1.

2.1.1. Range of Alternatives

Section 102(2)(3) of the NEPA states that all federal agencies shall, "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflict concerning alternative uses of available resources." An environmental impact statement (EIS) must also, "rigorously explore and objectively evaluate all reasonable alternatives." The courts have established that this direction does not mean that every conceivable alternative must be considered, but all selections and alternative discussions must permit a reasoned choice and foster informed decision making and informed public participation.

The range of alternatives may extend beyond the limits set by Forest Plan goals and objectives under NEPA; however, NFMA requires the selected alternative fully comply with the forest plan unless the plan is amended in accordance with 36 CFR 219.10(f).

The range of alternatives presented in this chapter was determined by evaluating external and internal comments and the Purpose and Need for this project. This project is intended to maintain or create resource conditions that are moving toward our project-specific desired conditions based on and consistent with Appendix A of the Forest Plan conditions, which might be expected to occur under natural disturbance and succession regimes (USDA Forest Service 2003b). By moving toward this condition, we can be more assured that the forest and ecosystem remain in a healthy and sustainable condition over time. Reducing the vulnerability of the forest to possible severe and undesirable effects of fire, insects, disease, or other unforeseen events would create a forest more resilient in the face of inevitable change and future uncertainties and provide for flexibility and a variety of possible future resource and management needs.

Forest Plan goals and objectives, existing and desired conditions, and standards and guidelines; federal laws, regulations, and policies; and economic viability also influenced alternative development. Within these parameters, the alternatives developed by the IDT display a reasonable range of outputs, treatments, costs, management requirements, design criteria, and effects to resources. In addition to the alternatives considered in detail, the IDT examined other alternatives during the analysis process. Although these alternatives contributed to a reasonable range of alternatives, they were eliminated from further consideration.

Using the information gathered from public and internal scoping and field-related resource information, the IDT formulated different alternative themes centered on various vegetation treatments, wildlife habitat effects, watershed improvement treatments, and transportation

management. Based on these themes, the IDT assigned potential prescriptions to create the various alternatives. Each action alternative represents a site-specific proposal developed by IDT evaluation of current and desired conditions. Unit identification and design was based on field reconnaissance, topographic maps, aerial photos, and resource data, which are available in geographic information system (GIS) format.

2.2. Alternatives Considered But Eliminated From Detailed Study

The IDT considered an alternative that would limit harvest of trees greater than a specified diameter (for example 30 inches diameter at breast height [DBH]). This alternative was eliminated because the project proposes to promote large trees and old forest conditions, and a diameter limit may restrict attainment of other silvicutural goals such as creating tree crown separation to reduce the risk of crown fire. In addition, all legacy trees would be retained (Legacy Tree Guidelines, Appendix 7).

The IDT considered an alternative that would maximize commodity production (timber harvest). The IDT eliminated this alternative because purely maximizing timber volume production would not be consistent with the purpose and need of the project, nor with Forest Plan standards and guidelines. In addition, Alternative 4 proposes to increase the amount of commodity resulting from restoration efforts while remaining consistent with both the purpose and need of the project, the Forest Plan, and the best available science.

2.3. Alternatives Considered In Detail

The No Action Alternative (Alternative 1), Proposed Action (Alternative 2), and two other action alternatives were considered in detail. No activities other than what is already occurring would occur under Alternative 1. The action alternatives present different ways of satisfying the Purpose and Need by responding with different emphases to the objectives and issues discussed in Chapter 1.

Areas, distances, mapped unit boundaries, and other measures used to define the alternatives are based on the best available information. Not all of the information was precisely measured in the field. Some differences may exist between estimates and field measurements when the project is laid out on the ground. Because of the variability of existing conditions in proposed activity units, treatments are not expected to occur on every acre within every unit. For example, if the canopy cover and species composition of trees in part of a unit meets the desired condition, the only treatment in that part of the unit would be prescribed burning. The estimated net proposed harvest acreage within each alternative is provided in the tables that accompany each of the alternatives. Changes that occur between planning and implementation would be within the resource parameters analyzed in this document. If changes are outside of the analysis parameters, the IDT will re-analyze that portion of the Project or it will be removed from the Project.

2.3.1. Alternative 1—No Action

The No Action Alternative provides a baseline against which impacts of the various action alternatives can be measured and compared and represents the existing condition in the Project area. Under Alternative 1, none of the specific management activities proposed in this DEIS would be implemented to accomplish Project goals and objectives. Ongoing activities

such as recreation, public fuelwood gathering, fire suppression, road maintenance, and existing road closures would continue at current levels.

2.3.2. Alternative 2—Proposed Action

2.3.2.1.1. Background for Vegetation Treatments

Forested vegetation refers to land that contains at least 10% canopy cover by forest trees of any size, or land that formerly had tree cover and is currently at an earlier seral stage.

Forested vegetation is described by habitat types (Steele et al. 1981), which uses potential climax vegetation as an indicator of environmental conditions. At the Forest Plan level, forested habitat types have been further grouped into PVGs that share similar environmental characteristics, site productivity, and disturbance regimes (Table 2-1). These groupings simplify the description of vegetative conditions for use at the broad scale. PVGs 1, 2, 4, 5, 6, 7, 8, 9, 10, and 11 are found in the project area. PVG 6 is most common, comprising 31% of the project area (see Appendix 6 for a description of PVGs).

Table 2-1. Potential Vegetation Groups (PVGs) within the Project area (acres and percent)

Potential Vegetation Group	Acres within Project Area (National Forest System Lands only)	Percent of Project Area (%)
PVG 1—Dry Ponderosa Pine/Xeric Douglas-fir[a]	246	<1
PVG 2—Warm Dry Douglas-fir/Moist Ponderosa Pine	3,306	9
PVG 3—Cool Moist Douglas-fir[b]	0	0
PVG 4—Cool Dry Douglas-fir[a]	122	<1
PVG 5—Dry Grand Fir	4,262	12
PVG 6—Cool Moist Grand Fir	11,614	31
PVG 7—Warm Dry Subalpine Fir	5,365	14
PVG 8—Warm Moist Subalpine Fir[a]	44	<1
PVG 9—Hydric Subalpine Fir	693	2
PVG 10—Persistent Lodgepole Pine	952	3
PVG 11—High Elevation Subalpine Fir	419	1
Total Forested Vegetation	27,023	73
Grassland/Shrubland	10,047	27
Total Analysis Area (National Forest System lands)	37,070[c]	

[a]PVGs 1, 4 and 8 were not analyzed since they represent less than 1% of the Project area
[b]PVG 3 was not analyzed since it generally does not encompass an entire stand (consequently no acres are designated in the Project area) and represents a small portion of the Project area (e.g., less than 1%).
[c]This total does not include private lands and NFS lands in the East Fork Weiser River subwatershed.

Vegetation across any landscape that historically developed under similar wildfire frequencies and intensities can be categorized into "fire regimes" (Table 2-2). Fire regimes are often characterized by the effects of fire on the overstory vegetation and the frequency or return interval of those fires. If most of the dominant overstory canopy is expected to survive a fire event, it is considered a nonlethal fire. By contrast, a fire that consumes or kills 90% or more of the existing vegetation is considered to be a lethal fire regime. If the intensity is in between, it is classified as a mixed fire regime, either mixed1 or mixed2 (USDA Forest Service 2003a).

Historically, stands in the nonlethal fire regime experienced fire every 5 to 25 years. Fire in these stands commonly occurred as low-intensity ground fires, with flame lengths from 1 to 4 feet, and resulted in overstory tree mortality of 10% or less (Agee 1998). The mixed1 fire

regime differs from the nonlethal fire regime in that it generally had a decreased frequency of fire return and an increased lethality in the overstory from a fire occurrence. Estimates of the historical fire return interval for the mixed1 fire regime are 5 to 70 years (Agee 1998). Relatively frequent surface fires maintained early seral species such as ponderosa pine and Douglas-fir, but the decreased fire frequency compared with the nonlethal fire regime allowed greater fuel accumulations and larger regeneration patches to develop. The resultant fires would burn with greater intensity and lethality. Flame lengths generally ranged from 2 to 6 feet, and overstory mortality would be approximately 10% to 50% (Table 2-2). Additionally, the patches of moderate-to-high severity in the mixed1 fire regimes were generally larger in extent and more frequently distributed than the patches seen in the nonlethal fire regime.

Mixed2 fire regimes continue the pattern of decreased frequency and increased lethality. The fire return interval was historically between 70 and 300 years (Agee 1998). Flame lengths in the mixed2 fire regime are greater than 10 feet, with overstory mortality between 50% and 90% (Table 2-2). The patches of mortality are generally larger in size than those for the mixed1 fire regime, with fewer and smaller areas of low-to-moderate intensity among the patches of high intensity. Within any given fire regime patch, some areas might, for site-specific reasons, have a different historical fire return interval, resulting in different effects on the vegetation compared with other sites within the patch. These areas are the minority within the patch, tend to be small, and contribute to the overall patch diversity.

Table 2-2. Fire regime classifications

Fire Regime	Fire Interval	Fire Intensity	Vegetation Patterns (Agee 1998)
Nonlethal	5–25 years	Low—10% mortality or less	Relatively homogenous with small patches generally <1.0 acre of different seral stages, densities, and compositions created from mortality
Mixed1	5–70 years	Low to moderate—10%–50% mortality	Relatively homogenous with patches created from mortality ranging in size from <1.0 to 600 acres of different seral stages, densities, and compositions
Mixed2	70–300 years	Moderate to high—50%–90% mortality	Relatively diverse with patches created by mixes of mortality and unburned or underburned areas ranging in size from <1 to 25,000 acres of different seral stages, densities, and compositions
Lethal	100–400 years	High—over 90% mortality	Relatively homogenous with patches sometimes >25,000 acres of similar seral stages, densities, and compositions. Small inclusions of different seral stages, densities, and compositions often result from unburned or underburned areas.

Design of Treatment Areas

Vegetation treatments include Noncommercial, Commercial, Meadow Restoration, Prescribed Burn, and Associated Actions. Vegetation treatments are needed to promote early seral species, create a mosaic pattern at the fine and large scales (e.g., structural diversity, density, and canopy cover), maintain and promote large tree structure (including legacy trees), and reduce fuel loading. Currently, in some areas of the Project, the vegetation conditions are outside of desired conditions with regard to tree size class distributions, species composition, and canopy cover distributions (USDA Forest Service 2014).

Riparian Conservation Area (RCA) Delineation

The Forest Plan (USDA Forest Service 2003a, Appendix B) outlines criteria to aid the IDT in delineating RCAs for perennial and intermittent streams, ponds, lakes, reservoirs, and wetlands. The RCAs within the project area have been identified by the IDT using "Option 2, Delineation Method for Forested Streams" (USDA Forest Service 2003a, Appendix B). Option 2 provides a more site-based delineation of an RCA boundary using site-potential tree heights. While PVGs occur within the Project area that, under option 2, would have RCA widths, based on site-potential tree heights, which are narrower than 120 and 240 feet, these PVGs are intermixed with PVGs where the 120 and 240-foot RCA distances are appropriate. For consistency and to reduce error during project layout, one RCA distance was used for all PVGs—the most conservative RCA distance. Table 2-3 lists the RCA delineation distance by water source.

Table 2-3. Riparian Conservation Area (RCA) delineation distance by water source

Water Body	RCA Width
Perennial Streams	240-foot slope distance (two site-potential tree heights)
Intermittent Stream Providing Seasonal Rearing and Spawning Habitat	240-foot slope distance (two site-potential tree heights)
Intermittent Stream	120-foot slope distance (one site-potential tree height)
Ponds, Lakes, Reservoirs and Wetlands	120-foot slope distance from edge of saturated (hydric) soils) (one site-potential tree height)
Seeps and Springs	30 feet and 120 feet, respectively

Note: RCA distance is measured slope distance from the ordinary high water mark (either side of the stream)

In RCAs with a specific vegetation treatment objective (i.e., aspen restoration, targeted fuels reduction, or upland vegetation restoration), portions of the RCA could be treated following a site-specific assessment, as long as soil and water requirements can be met. The treatment objectives within RCAs are based on DFCs as defined in Appendix A of the Forest Plan (USDA Forest Service 2003a) by PVG, and on MA specific objectives in the Forest Plan. Input on treatment design would be given by the District Hydrologist and/or Fisheries Biologist to ensure all riparian functions are maintained or improved, as required by Forest Plan standard SWST01 (USDA Forest Service 2003a). Further description of treatments proposed within RCAs is below, within subsections of the "Vegetation Treatments" section.

Other Considerations

A reduction in treatments acres is expected based on locations of northern goshawk (Post Fledgling Areas (PFAs) and nest stands, elk wallows, archeological sites, and additional streams and other water sources that would be identified during implementation. The specific guidelines below would be followed:

- There are 9 identified goshawk PFAs and within the PFAs, goshawk nest replacement and nest stands would not receive mechanical treatment. Stands within goshawk PFAs would be identified prior to marking operations and would be designed to meet management recommendations for northern goshawk in the southwestern United States (Reynolds et al. 1992).
- See section 2.5 "Project Design Features/Mitigation Measures" for more information on resource protection measures.

2.3.2.2. Vegetation Treatments

Under Alternative 2, a variety of vegetation treatments are proposed on 20,713 acres and prescribed burn is proposed on 24,250 acres (Table 2-4). Of the acres proposed for vegetation treatments, 3,000 acres are within RCAs (Table 2-5). And of the acres proposed for prescribed fire treatment, 6,319 acres are within the RCAs (Table 2-5).

2.3.2.2.1. Noncommercial Treatments

Noncommercial Thinning (NCT)—1,279 acres (153 acres in Riparian Conservation Areas)

Noncommercial thinning (NCT) would be completed in mature stands and plantations with density-related stress and in mature stands targeted for prescribed burning.

In areas targeted for prescribed fire treatments, NCT would be completed where necessary. Slash produced from NCT would be lopped and scattered or piled (machine or hand). Additionally, NCT would be permitted within the outer half of RCAs as approved by the District Hydrologist and/or Fisheries Biologist to help achieve desired conditions. All NCT in RCAs would be completed by hand and would not cut trees larger than 8 inches DBH. Slash would only be piled by hand within RCAs.

Within plantations, NCT would be completed to improve wildlife habitat, increase growth rates and tree vigor, improve stand resiliency to natural disturbance, and reduce density-related competition. Plantations targeted for NCT are generally <30 years old and have an average DBH of 8–10 inches. NCT would cut trees <8 inches DBH and prune residual trees, when practical, up to 6 feet tall. Post treatment, these stands would retain approximately 70–100 trees per acre. Thinning would favor early seral species but would retain a mixture of species and variable densities, depending on site-specific objectives. Where reserve trees within plantations receiving this treatment are causing forest health problems (primarily due to mistletoe), trees may be killed by girdling. Girdled trees would be marked with wildlife tags as necessary to meet desired snag numbers and sizes.

<u>Treatment intent in plantations:</u>

- Reduce noncommercial tree densities, increase growth rates, improve wildlife habitat, and improve tree vigor
- Improve stand resiliency to natural disturbance by reducing density-related competition
- Maintain and promote early seral species with variable densities depending upon site-specific objectives
- Promote spatial heterogeneity in species diversity (i.e., retention of naturally regenerating aspen or other desired species when present), canopy cover, and density
- Expand the opportunity for application of prescribed burn by changing the fuel profile
- Reduce fire severity potential and fuel loading prior to prescribed burning
- Reduce the potential for undesired fire effects (i.e., mortality of legacy trees)
- Aid in the retention of desired leave trees

Restoration of Burned Areas/Plantations (BA/PL)—3,240 acres (391 acres in RCAs)

Restoration of Burned Areas/Plantations (BA/PL) treatment would be completed in plantations burned during the Greys Creek fire. Plantations within this area burned at mixed severities; salvage harvested areas were replanted following the fire. Many of these plantations have experienced mixed survival; specifically, intermixed patches of dense, moderate, low and no survival of regeneration occur. Plantations have had 1-, 3-, and 5-year survival plots and have had adequate stocking rates; however, due to a combination of drought, herbivory (pocket gophers), and dense brush, some these plantations have experienced increased mortality.

BA/PL treatments would include NCT, piling (mechanical or hand), and pruning in areas with dense regeneration, brush removal, and replanting in areas with low stocking. NCT would generally cut trees <8 inches DBH and prune residual trees, when practical, up to 6 feet tall.

Treatment intent in dense regeneration areas:

- Reduce noncommercial tree densities, increase growth rates, improve wildlife habitat, and improve tree vigor
- Improve stand resiliency to natural disturbance by reducing density-related competition
- Maintain and promote early seral species with variable densities depending upon site-specific objectives
- Promote spatial heterogeneity in species diversity (i.e., retention of naturally regenerating aspen or other desired species when present), canopy cover, and density

Treatment intent in brush areas with low stocking:

- Reduce competition to seedlings from brush and grass

Treatment intent in low stocking areas:

- Meet desired stocking levels

2.3.2.2.2. Commercial Treatments—10,385 acres

Stands would be thinned through commercial logging. Potential harvest systems include ground based, skyline, and/or helicopter. Harvested trees would generally be removed with the limbs and tops attached. The limbs and tops would be utilized as biomass or other products, where practical. Where appropriate and needed, noncommercial-sized (e.g., <8 inches DBH) trees would be cut to reduce ladder fuels and promote desired advanced regeneration. Following harvest, these stands could be underburned as described in the prescribed burn section below. Commercial vegetative treatments have been divided into the categories described below.

Commercial Thin-Free Thin (CT-FT)—2,875 acres (347 acres within the outer half of RCAs)

Commercial thin-free thin (CT-FT) would allow the flexibility to use different thinning methods for varying stand conditions and objectives. CF-FT would be accomplished by low thinning (removing trees from the lower crown classes) with some crown thinning (removing trees from the dominant and co-dominant crown classes) and occasional sanitation cutting (removing trees to improve stand health by reducing the anticipated spread of insects or

disease, especially mistletoe infections). Merchantable material would be removed from the site and utilized as markets allow. Noncommercial material (slash) would be lopped and scattered, mechanically harvested for fuelwood decks, removed, hand piled, machine piled, and/or broadcast burned to reduce fuel loading.

These treatments would generally be completed in forested areas dominated by mature, vigorous ponderosa pine, Douglas-fir and/or western larch with canopy cover >35%. Approximately, 1.0% of the CT-FT treatment areas would be located in PVG 11 stands and potentially include promoting and maintaining whitebark pine (e.g., removal of subalpine fir and artificially regenerating rust resistant trees).

Following treatment, these stands would be a mosaic of thinned areas, clumps of trees, and small openings. Lower canopy cover (20%–30% post treatment canopy cover) would generally be targeted in PVG 2. Higher canopy cover (25%–40%) would generally be the desired post-treatment condition in PVGs 5 and 6. Portions of stands with natural openings and heavily thinned areas would have less canopy cover, perhaps as low as 10%. These openings would eventually develop more canopy cover where seedlings establish and grow. Following prescribed burning, up to an additional 10%, with an average of 5%, of the overstory trees would be expected to be killed. The average canopy cover in these stands after harvest and underburn operations would be between 20% and 40%.

This treatment includes the following specifications:

- Legacy western larch, ponderosa pine, and Douglas-fir should be retained. See Appendix 7 for legacy tree identification guidelines.
- Seral species (western larch, ponderosa pine, aspen, whitebark pine, and/or Douglas-fir) should generally be favored for retention over non-seral species (e.g., grand fir and subalpine fir) and preference given to retention of larger diameter trees
- Non-legacy trees greater than 20 inches DBH should generally be given retention preference. When these trees must be selected for retention or removal, the following guidelines should be utilized:
    - Give preference to larger diameter, vigorous, early seral trees for retention
    - Consider the appropriateness of retaining clumps and/or skips as described below
        - Dwarf mistletoe that cannot be isolated and would cause mid- to long-term forest health issues
            - Trees with lower mistletoe ratings would generally be favored over heavily infected trees. When possible, trees with mistletoe ratings of 0–3 would be favored over trees with a rating of 4–6. When trees with mistletoe ratings of 4–6 can be isolated (i.e., greater than 40 feet from uninfected host trees) while addressing mid-to-long term stand objectives these infected trees should be retained to meet wildlife objectives.
        - Give preference to retaining tree(s) exhibiting characteristics of high wildlife value (e.g., cavities, stem rot, broken tops with structure for nesting) even if this results in slightly higher than desired stocking.

    - Consider safety concerns when designating trees for retention/removal, including hazard trees in and/or adjacent to campgrounds, dispersed campsites, and roads/trails open to the public
    - Consider operational concerns when designating trees for retention/removal, including hazard trees, skid trails, skyline corridors, and landings
    - In large tree size class stands (generally stands that have 11 or more trees per acre that are ≥20 inches DBH), retain at least eleven, 20-inch DBH or larger trees per acre. This consideration may require retaining large diameter trees that do not meet the description for preference, above.
- Retention/removal of non-legacy late seral species should follow these guidelines:
  - Give preference for retaining late seral species when necessary to meet residual structural objectives (i.e., large tree size class and/or old forest characteristics)
    - Generally give preference to vigorous, healthy larger-diameter, late seral trees. Although, preference to retaining late seral tree(s) exhibiting characteristics of high wildlife value (e.g., cavities, stem rot, broken tops with structure for nesting) should also be given, especially when not common in a stand, even if this results in slightly higher than desired stocking. These would also be good areas to consider skips, see below.
  - Retain late seral trees >20 inches DBH not meeting merchantability specifications due to damage, poor form, or indicators of rot to meet wildlife objectives
  - Give preference for removing late-seral (e.g., grand fir, subalpine fir and/or Douglas-fir [PVG 2]) trees that are causing direct crown/root competition to large diameter and/or vigorous western larch and ponderosa pine
- Creating clumps, skips, and openings should follow these guidelines:
  - Retain clumps of trees, commercial and noncommercial sized, throughout the harvest area to meet wildlife and visual objectives. These clumps would consist of 2 to 20 or more trees and should be designed to enhance spatial variability within each given stand.
  - Design skips consistent with the principles identified in Franklin et al. (2013, pp. 81–87). Skips are defined as portions of units not treated mechanically These skips should not generally exceed 15% of a stand.
  - Create small openings <2.0 acres in areas dominated by grand fir, low vigor trees, or diseased trees or in areas with a high potential of aspen regeneration. Where aspen are present, conifers could be removed within the aspen stand to improve stand integrity. These openings should not generally exceed 10% of a stand and should consider the following recommendations.
    - Small openings of up to 2.0 acres may be used to stimulate aspen regeneration. In aspen patches, non-legacy coniferous trees would be removed within 50 feet of the aspen patch. To be considered an aspen patch, an area must have an average spacing of less than 20 feet between stems and be larger than 1/10 acre in size.

    - In openings outside of aspen patches, a minimum of 5–10 trees per acre would be retained, with leave tree preference given to legacy trees; vigorous serals (e.g., ponderosa pine, western larch, and aspen) in the dominant and co-dominant crown classes; and high wildlife value non-legacy/non-serals. Secondary preference would be given to dominant non-seral trees. These openings should rarely be wider than 50–100 feet and be well distributed across the area. Consideration of whether existing openings and the general thinning and burning prescription would create sufficient openings should be taken prior to intentionally creating additional openings. Artificial regeneration may be prescribed in patches between 1.0 and 2.0 acres if no suitable seed trees are present.
  - Release legacy ponderosa pine and western larch by removing younger trees for approximately twice the canopy drip line of the legacy tree(s). As discussed earlier, overlap of other legacy tree crowns is okay, and these other legacies should be retained. Release of replacement/future legacy trees/clumps should also be considered. In addition, retention of replacement trees should be considered if a desirable legacy tree replacement is within this area.

Treatment intent of CT-FT

- Reduce stand density and increase mean diameter
- Maintain and promote large tree forest structure and old forest characteristics while restoring the desired species composition, and stand densities
- Release legacy ponderosa pine, western larch, and Douglas-fir by removing younger trees for approximately twice the canopy drip line of the legacy tree(s). Overlap of other legacy tree crowns is acceptable and these other legacies would be retained. Release of replacement/future legacy trees/clumps would also be considered. In addition, retention of replacement trees would be considered if a desirable legacy tree replacement is within this area
- Promote resiliency, reduce competition and improve growth rates for remaining trees
- Improve habitat for wildlife species that require large tree and old forest characteristics with low-to-moderate canopy cover
- Maintain whitebark pine by reducing density of subalpine fir and artificially regenerating rust resistant trees
- Reduce potential for crown fire spread should a wildland fire occur
- Restore a heterogeneous fine scale mosaic pattern

Free Thin–Patch Cut-Modified Shelterwood (FT-PC-MSw)—5,343 acres (1,058 acres would occur within the outer half of RCAs. Only free thinning would occur within the outer half of the RCAs unless aspen are present.)

This treatment would be implemented primarily in PVGs 6, 7, 9, 10, and 11 that have evidence (e.g., relic trees, stumps, snags) of previously having had an early seral tree species (e.g., aspen, whitebark pine, ponderosa pine, western larch and/or Douglas-fir) component. Approximately 0.1% of the FT-PC-MSw treatment areas are PVG 11 and potentially have

whitebark pine present. Merchantable material would be removed from the site and utilized as markets allow. Noncommercial material (slash) would be lopped and scattered, mechanically harvested for fuelwood decks, removed, hand piled, machine piled, and/or broadcast burned to reduce fuel loading.

Following treatment, these stands would be a mosaic of thinned areas, clumps of trees, and small openings. Canopy cover in thinned areas would average 30%; Canopy cover could be over 40% in untreated areas. Canopy cover in created openings would be around 10%. Following prescribed burning, up to an additional 30%, with an average of 10%, of the overstory trees would be expected to be killed. The average canopy cover in these stands after harvest and underburn operations would be between 15% and 40%.

Implementing patch cuts would allow for regeneration (i.e., patch cut with reserves ranging from 3.0 to 10.0 acres, generally on less than 50% of a stand). In patch cuts, approximately 4–9 trees per acre would be retained as reserve trees. The patch would be either naturally or artificially regenerated after treatment. Unless the stand is predominately lodgepole pine and the intent is lodgepole regeneration, these stands would only be naturally regenerated. In modified shelterwood treatment areas (i.e., <40 acres) approximately 10–25 trees per acre would be retained as reserve trees and artificial or natural regeneration would be used to meet objectives.

Reserve tree preference would be legacy trees, replacement legacy trees, high value wildlife trees (i.e. cavities, broken tops with structure for nesting), dominant non-serals and vigorous serals in any crown class.

In portions of stands with an early seral component still remaining, free thinning or modified shelterwood would be implemented. Free thin treatment would occur as described above. Portions of each stand not meeting the criteria for patch cuts, modified shelterwood, or free thinning would not receive commercial treatment during this entry (e.g., skips).

Treatment intent of FT-PC-MSw:

- Restore a heterogeneous fine and landscape-level scale mosaic pattern by establishing varying patch sizes consistent with spatial patterns that improve forest resilience to disturbance.
- Retain and remove portions of stands that historically would not have been dominated by early seral species as clumps, skips, and gaps. *Clumps* are small groups retained with spacing closer than desired spacing specifications. *Skips* are areas with higher densities than specified in the rest of the unit that will not have any trees cut. *Gaps* are areas where the unit will have a wider average spacing than specified for the rest of the unit.
- Maintain early seral species in microsites
- Reduce stand density and increase mean diameter
- Maintain and promote large tree forest structure and old forest characteristics while restoring the desired species composition, and stand densities

- Release legacy ponderosa pine, western larch, and Douglas-fir by removing younger trees for approximately twice the canopy drip line of the legacy tree(s). As discussed earlier, overlap of other legacy tree crowns is acceptable and these other legacies would be retained. Release of replacement/future legacy trees/clumps would also be considered. In addition, retaining replacement trees would be considered if a desirable legacy tree replacement is within this area.
- Promote resiliency, reduce competition and improve growth rates for remaining trees
- Maintain whitebark pine by reducing density of subalpine fir and artificially regenerating rust resistant trees
- Improve habitat for wildlife species that require large tree and old forest characteristics with low to moderate canopy cover
- Promote and maintain willow in PVGs 7, 9, 10, and 11
- Reduce potential for crown fire spread should a wildland fire occur

Commercial Thin / Mature Plantations (CT-MP)—1,080 acres (177 acres in the outer half of RCAs)

This treatment would be applied to stands which were previously artificially regenerated (plantations). These stands are typically >30 years old and were planted predominately with ponderosa pine, Douglas-fir, and/or western larch. These mature plantations contain commercial trees with an average DBH >8 inches and would average approximately 70–80 trees per acre (which would generally result in crown spacing of 10–15 feet) after thinning. Thinning would generally favor retaining larger, early seral trees and be completed to create stands with variable densities while promoting a mix of desired species. Merchantable material would be removed from the site and utilized as markets allow. Noncommercial material (slash) would be lopped and scattered, mechanically harvested, hand piled, machine piled, and/or broadcast burned to reduce fuel loading. The cost of slash treatment, CWD, and fuel loading would be considerations in determining the method of noncommercial material treatment.

Following treatment, these stands would appear more open. Canopy cover in these stands are currently moderate to high and would be reduced to low Canopy cover (between 25% and 35%) after treatment.

Treatment intent of CT-MP:

- Promote large tree forest structure while restoring the desired species composition, and stand densities
- Promote spatial heterogeneity in species diversity (i.e., retention of naturally regenerating aspen or other desired species when present), canopy cover, and density
- Reduce stand density and increase mean diameter
- Promote resiliency, reduce competition, improve growth for remaining trees
- Reduce potential for crown fire spread in the event of a wildland fire

Conifer Removal in Aspen Stands (CT-ASP)—1,087 (181 acres within the outer half of RCAs or adjacent to seeps and springs)

This treatment would be implemented in forest types with evidence (e.g., relic early seral trees, stumps, snags) of previously having a dominant aspen overstory. The treatment would occur in stands which still have a dominant component of aspen present. To be considered an aspen patch, an area must have an average spacing of less than 20 feet between stems and be larger than 1/10 acre in size (not dependent on age class). Merchantable conifers would be removed from the clone and utilized as markets allow. Noncommercial material (slash) would be lopped and scattered, mechanically harvested for fuelwood decks, removed, hand piled, machine piled, and/or broadcast burned to reduce fuel loading.

Following treatment, these stands would be a mosaic of thinned areas, clumps of trees, and openings around aspen clones. The average canopy cover in these stands after harvest and underburn operations would be between 15% and 40%. Conifer canopy cover within and adjacent to aspen clones will generally be reduced to less than 25%.

Treatment intent of CT-ASP:

- Re-establish aspen stands where they have departed from desired conditions as described in Campbell and Bartos (2000). CT-ASP would remove all conifers except legacy ponderosa pine, western larch, and Douglas-fir. Conifers within 100 feet of the south and west edges of aspen stands and within 50 feet on the north and east edges of aspen stands would be removed. Whole tree yarding would be used to limit slash concentrations within the aspen stands. Excessive slash would be hand piled in the outer half of RCAs and burned. To initiate suckering of the root system, units would be burned; additionally, aspen may, in limited cases, be girdled or felled when other treatment options have failed. Active ignition for the prescribed burn would occur within the RCA where SWRA resource conditions would be maintained or improved.
- Establish varying patch sizes and densities (using FT-PC-MSw treatments as described above) consistent with spatial patterns created by historical fire regimes in areas adjacent to aspen clones. Retain portions of stands that historically would not have been dominated by early seral species as skips.
- To ensure that aspen are restored in riparian areas, both commercial harvesting and hand treatments (including girdling, NCT, and felling conifer trees) may occur within the outer half of RCAs and adjacent to seeps and springs. No equipment would be permitted within perennial or intermittent RCAs or within 30 feet of seeps and 120 feet of springs (See Appendix 5 for definition of seep vs. spring). Location and treatment type within RCAs, seeps, and springs would be determined on a site-by-site basis. In some locations near seeps and springs, fencing may be needed to protect aspen and soils during recovery and would be determined on a site specific basis.

2.3.2.2.3. Additional Vegetation Treatments—5,809 acres

These treatments would include a combination of commercial logging, NCT, and prescribed burn. Treatment areas would be those with unique characteristics (e.g., geography, hydrology, geomorphology, and species composition) which make treatment highly variable from stand to stand. Potential commercial harvest systems include ground based, skyline, and/or helicopter. Harvested trees would generally be removed with the limbs and tops attached.

The limbs and tops would be utilized as biomass, or other products, where practical. Where appropriate and needed, noncommercial-sized (i.e., <8 inch DBH) trees would be cut to reduce ladder fuels and promote desired species composition. Following treatment, these stands could be underburned as described in the prescribed burn section below. These additional vegetative treatments have been divided into the categories described below.

Vegetation Treatments in Stands with Low Site Quality (LSQ)—850 acres (166 acres within the outer half of RCAs)

These stands typically have stocking rates not conducive to commercial harvest; however, in many cases restoration needs exist in overstocked forested pockets. In many of these stands, an early seral species component is being affected by increased ladder fuels and insect/disease issues. Approximately, 5% of the low site quality (LSQ) treatment areas occur in PVG 11 and potentially in stands containing whitebark pine. Thinning (commercial and noncommercial), piling (machine or hand), and prescribed fire treatments are proposed in timber stands with lower densities. These stands generally will not contribute to the Allowable Sale Quantity (ASQ).

Treatment intent of LSQ:

- Maintain legacy trees while reducing stand densities and ladder fuels
- Restore natural fire disturbance regime to improve understory plant diversity and vigor, and provide habitat for native species
- Move the project area toward a pre-fire suppression vegetative condition related to stand density, tree size class, and species composition to enable the reintroduction of fire into a fire adapted ecosystem
- Maintain whitebark pine by reducing density of subalpine fir and artificially regenerating rust resistant trees
- Promote resiliency and reduce competition for remaining trees

Commercial and Non Commercial Thinning within Nonforested (dry and wet)

Nonforested stratum includes nonforested areas and wet meadow areas typically incapable of supporting more than 10% stocking rates of conifers. Thinning (commercial and noncommercial) and prescribed fire treatments are proposed in these areas to address Forest Plan Objective 0325 for the Weiser River MA, which states, “Maintain and promote native grasses and aspen where they occur…” (USDA Forest Service 2003b). Approximately, 4,519 acres will be treated with noncommercial treatments and 55 acres with commercial/noncommercial treatments. These stands generally will not contribute to the ASQ.

<u>Nonforested Treatment (NFT)—4,519 acres (405 acres within the outer half of RCAs)</u>

NFT areas include grasslands, sagebrush, scablands and dry meadows. Fire exclusion has led to an expansion of young conifers along the edges and a decadency of upland shrubs, grasses, and forbs. Treatment of encroaching conifers include a combination of felling, skidding, and lop and scatter or hand piling, followed by burning. The remaining dry meadow complexes may be treated with prescribed fire.

Since the conifer encroachment is generally concentrated along the nonforested edge it is expected that only 40% of each nonforested treatment areas would need hand thinning and piling. Conifer canopy cover within nonforested treatment areas will generally be reduced to less than 10%. Prescribed fire treatment may occur throughout the entire treatment type.

Treatment intent of NFT:

- Restore natural fire disturbance regime in dry meadows to enhance upland meadow species, increase meadow acreage, improve plant diversity and vigor, and provide habitat for native species
- Move the Project area toward a pre-fire suppression vegetative condition related to stand density, tree size class, and species composition to enable the reintroduction of fire into a fire-adapted ecosystem

Wet Meadow Treatment (WMT)—55 acres (all within the outer half of RCAs)

WMT areas include wet meadows, many of which have higher tree densities and reduced riparian vegetation within the project area. The preferred approach is to treat wet meadows in one entry using a combination of mechanical treatment or hand treatment followed by prescribed burn.

Equipment would not be allowed within 30 feet for seeps and 120 feet for springs, or anywhere on saturated soils. Treatment would be limited to the outer half of these RCAs. In some locations near seeps and springs, fencing may be needed and would be determined on a site-by-site basis. Conifer canopy cover within and adjacent to wet meadows will generally be reduced to less than 10%.

Treatment intent of WMT:

- Restore physical and biological (terrestrial and aquatic diversity and abundance) and ecological meadow processes (evapotranspiration) and functions (flow dispersal, ground water recharge, and sediment retention) appropriate for the current climate regime and comparable to reference conditions and offer resiliency to future climate regimes by restoring functional processes
- Restore fire in wet meadows to enhance riparian habitat for native riparian-dependent species, increase meadow acreage, improve plant diversity and vigor, provide habitat for native species, increase water availability for wetland species, and provide wetter conditions for a longer duration each year
- Provide diverse wildlife habitat for native riparian-dependent species

Proposed Vegetation Treatments within RCAs—2,933 acres

Thinning, restoration, and prescribed fire treatments are proposed in RCAs to maintain upland vegetation within the desired conditions. These acres are not additional acres of proposed treatment and are accounted for in the treatments listed above. Only areas in the outer half of RCAs have been proposed for this treatment.

RCA treatments would apply to upland vegetation that occurs within the outer portion of an RCA. These treatments would move more vegetation toward desired conditions as described in the Forest Plan (USDA Forest Service 2003a, pp. III-30, A-15 and III-131; Objectives 0325 and 0326).

Shaded Fuelbreak (SFB)—370 acres (52 acres in outer half of RCAs)

SFBs would be created using existing roads (NFS road 50186, NFS road 50206, and NFS road 51763) and terrain features on approximately 370 acres to provide areas to control large or emerging fires in a safe manner for firefighters and also provide protection to the values to the east of the Project (Tamarack Ski Area and structures in this area) and other private lands. This treatment would involve reducing crown closure, piling and burning ladder fuels (excavator or hand piles) or using a masticator to reduce fuel loading. The width of the fuelbreak would range from no fuelbreak needed to up to 500 feet wide, depending on fuel type, site slope, and the risk level associated with protecting improvements and increasing fire fighter safety.

As with the prescribed fire treatments described above, prescribed burning would, with the approval of the District Hydrologist or Fisheries Biologist, be directly applied to portions of the RCAs within the SFB and allowed to back in other portions. Active ignition would occur within the RCA only where soil and water resource conditions would be maintained or improved.

Thinning (commercial and noncommercial), piling (machine or hand), and prescribed fire treatments are proposed in SFBs.

Treatment intent of SFB:

- Increase fire fighter safety
- Provide protection for values at risk (WUI, private land, past investments)
- Maintain legacy trees while reducing stand densities and ladder fuels
- Promote resiliency and reduce competition for remaining trees.

Fuel Reduction within an Riparian Conservation Area (FR-RCA)—15 acres

FR-RCA would occur within approximately 0.5 miles of a stream corridor, or on about 15 acres within an RCA near the junction of two open NFS roads. Location of the FR-RCA treatment area was based on location of the shaded fuel break, proximity to the county road, and presence of high conifer density and fuel loading in the RCA understory. Within this defined location, RCA treatments would occur within the inner RCAs but would not occur within 15 feet of the stream channel; treatments would include understory/overstory thinning and prescribed burning. Treatments would be done by hand, remove less than 40%–50% of the canopy cover, and be developed in consultation with the District Fish Biologist and/or Hydrologist to ensure streambank stability, LWD recruitment, stream shade, and ground cover are addressed and riparian functions are maintained or improved as required by Forest Plan SWST10 (USDA Forest Service 2003a).

Treatment intent of FR-RCA:

- Reduce fuel loading within the RCA boundaries where they intersect with fuelbreaks
- Improve fire fighter safety (ingress and egress via the adjacent NFS roads) by reducing fine and ladder fuel loading

- Create a gradual transition between the treated upland and the stream channel, which would move treated stands toward desired conditions in Appendix A of the Forest Plan (USDA Forest Service 2003a) and increase the likelihood of achieving desired effects from prescribed burn operations

2.3.2.2.4. Prescribed Fire Treatments (PFT)—24,250 acres (6,319 acres within RCAs)

Proposed prescribed burning would occur on approximately 24,250 acres (Table 2-4) over the next 15–20 years. Commercial activities would generally be completed prior to applying fire. Reintroducing 500–10,000 acres of fire annually for the next 15–20 years would move forested and nonforested vegetation towards conditions that more closely represent desired conditions.

Primary target areas (9,400 acres) for treatment consist of stands with historically high fire frequencies and lower severities (grasslands and stands dominated by seral species such as ponderosa pine, Douglas-fir, and western larch). Secondary target areas (14,850 acres) include stands with historically moderate fire frequency and mixed severities stands comprised of both seral and non-seral species (i.e., grand fir).

A mosaic-like application of fire would reintroduce fire to approximately 75% of treated primary targeted acres and 50% of treated secondary targeted acres. All acres targeted for fire application would be available for NCT in order to minimize mortality from prescribed burning and aid in moving towards restored conditions.

Fire would only be applied to non-target areas to minimize fire intensities and severities in the non-target areas. These stands comprise young plantations, stands of historically low frequency and high severities, and stands set aside for other resource concerns or objectives (e.g., wildlife cover). Approximately 20% of non-target acres located within the proposed burning areas would be expected to receive fire through backing (low intensity fire spread without additional lighting). This minimal fire spread would not alter overall stand conditions within the non-target areas.

Prescribed burning would be used to reduce fuel loads and rejuvenate vegetation. Aspen stands in the Project area are in particular need of rejuvenation and regeneration. Coniferous trees have encroached on aspen stands due to the lack of natural fire (Swanson 2010a and 2010b). In the past, fire killed encroaching conifers and induced aspen root sprouting. After treatment, these areas would appear more open.

Existing barriers to fire spread (barren ridgelines, roads, and trails) would be used where possible to contain prescribed burns within specified boundaries. In areas where existing barriers are insufficient to control fire spread, handline would be constructed. Hand-constructed fireline would be limited to use only where necessary. The integrity of existing trails and roads would be considered in the application of fire and damage caused by these actions would be repaired. Constructed fireline would be rehabilitated after use.

Ignitions would be by hand or aerially. Prescribed burning operations may occur from early spring to late fall. Fire may be applied to tree wells in winter or early spring to reduce fuel accumulation and to reduce the potential for tree mortality during regular broadcast burning. Maintenance burning (burning after initial application of fire) would occur every 5 to 10 years to maintain desired conditions in high-frequency fire regimes. Prescription parameters (wind speed, fuel moisture, smoke dispersion, and other resource area objectives) would influence burn opportunities. Active ignition for the prescribed burn would occur

within the RCA where SWRA resource conditions would be maintained or improved and approved of in advance by the District Hydrologist and/or Fisheries Biologist. Active ignition within riparian vegetation would not occur.

All burning would follow Forest Plan Standards and Guidelines (USDA Forest Service 2003a) and adhere to national and State air quality regulations. Specific conditions under which burning would occur would be developed through a prescribed burn plan, prior to ignition.

Table 2-5 below displays only those acres within RCAs proposed for treatment.

Table 2-4. Vegetation treatment summary, including acres of prescribed burn treatments—Alternative 2

Type of Vegetation Treatment	Acronym	Total Acres
Noncommercial Thin	NCT	1,279
Burned Areas/Plantations	BA/PL	3,240
Commercial Thin-Free Thin	CT-FT	2,875
Free Thin–Patch Cut-Modified Shelterwood[a]	FT-PC-MSw	5,343
Commercial Thin / Mature Plantations	CT-MP	1,080
Conifer Removal in Aspen Stands	CT-ASP	1,087
Vegetation treatments in stands with Low Site Quality	LSQ	850
Nonforested Treatment	NFT	4,519
Wet Meadow Treatment	WMT	55
Shaded Fuelbreak	SFB	370
Fuel Reduction within a Riparian Conservation Area (RCA)	FR-RCA	15
Total Acres of Vegetation Treatments		20,713
Prescribed Fire Treatments[b]	PFT	24,250

Note: Acres includes area within RCAs. None of these treatments are proposed within the inner portion of RCAs except for the FR-RCA treatment.
[a]Only CT-FT would be used in this type of treatment unless aspent are present where Conifer Removal in Aspen Stand treatment would be used in that portion of the outer RCA.
[b]Prescribed burn would be allowed to back into RCA

Table 2-5. Vegetation Treatment Acres within Riparian Conservation Areas (RCAs), Alternative 2

Type of Vegetation Treatment within RCAs	Acronym	Total Acres
Noncommercial Thin	NCT	153
Burned Areas/Plantations	BA/PL	391
Commercial Thin-Free Thin	CT-FT	347
Free Thin–Patch Cut-Modified Shelterwood[a]	FT-PC-MSw	1,058
Commercial Thin / Mature Plantations	CT-MP	177
Conifer Removal in Aspen Stands	CT-ASP	181
Vegetation treatments in stands with Low Site Quality	LSQ	166
Nonforested Treatment	NFT	405
Wet Meadow Treatment	WMT	55
Shaded Fuelbreak	SFB	52
Fuel Reduction within an Riparian Conservation Area (RCA)	FR-RCA	15
Total Acres of Vegetation Treatments in RCAs		3,000
Prescribed Fire Treatments[b,c]	PFT	6,319

[a]Only CT-FT would be used in this type of treatment unless there is aspen present where Conifer Removal in Aspen Stand treatment would be utilized in that portion of the outer RCA.
[b]PFT is not counted in the grand total of treatment acres due to the overlap of treatment acres with many of the vegetation treatments.
[c]Prescribed burning would be allowed to back into RCA

2.3.2.2.5. Associated Actions

A number of activities associated with implementing these vegetation treatments are necessary.

Road Maintenance—Road maintenance may include the following activities: surface blading, culvert and ditch cleaning, removal of encroaching brush, installation of drivable dips, culvert installation and replacement, and surface replacement. This maintenance would occur on NFS roads used by the Project that are open for public and/or administrative use, including seasonally open roads. Approximately 137.5 miles of roads are proposed for maintenance.

Temporary roads—Temporary roads are defined as roads authorized by contract, permit, lease, other written authorization, or emergency operation that are not intended to be part of the forest transportation system; that are not necessary for long-term resource management; that are not forest roads or forest trails; and that are not included in a forest transportation atlas. Both planned and incidental temporary roads would be utilized and obliterated after project implementation. Planned temporary roads are defined as routes identified during the planning process and depicted on project maps. Some of the planned temporary roads would be newly constructed; however, most of the planned temporary roads have existing roadbeds (unauthorized routes) in place. Up to 9.7 miles of planned new and 34.8 miles of existing unauthorized routes would be used as temporary roads and obliterated after use. Incidental temporary roads are roads needed to complete vegetation treatments but cannot yet be identified due to the level of site-specificity necessary. These incidental temporary roads would be preferentially located on existing roadbeds (unauthorized routes) where possible and be obliterated when logging is completed. Incidental temporary roads would require approval by resource specialists prior to construction and would be limited to 7 miles or less of temporary road (not on an existing roadbed) throughout the Project area.

Brush Disposal—After thinning, slash reduction would include machine piling and burning, hand piling and burning, lop and scatter, broadcast/underburning, or removal. Slash reduction would apply within and outside of areas designated for prescribed fire treatments. Opportunities would be sought for removing and utilizing the biomass for energy production or other uses, where practicable.

Site Preparation—After harvest activities are completed, but prior to planting in proposed areas, site preparation may be completed either by prescribed burning or hand scalping. Site preparation would be completed to reduce competition to seedlings from brush and grass. All site preparation activities would be consistent with SWRA resource requirements, specifically detrimental disturbance and CWD.

Planting—Planting of ponderosa pine, rust resistant whitebark pine, western larch, Douglas-fir and/or Engelmann spruce seedlings on all proposed regeneration treatments would be completed as necessary to meet desired stocking levels. The species mix would depend on elevation and site conditions.

Firewood Availability—Areas and roads currently closed and used for timber harvest would be evaluated for firewood retrieval, including firewood decks. These areas may be made available for public use for a limited time period. NFS roads currently closed may be opened for a limited time to the public in the summer for firewood retrieval if resource objectives are met and the road has a minimum of 10 cords of firewood available. Snags identified for retention to meet wildlife habitat needs would be tagged as not to be cut. Roads in long-term

closure would not be opened. Areas not meeting the minimum number of snags as defined in the Forest Plan (USDA Forest Service 2003a) would not be opened.

2.3.2.2.6. Watershed Improvement and Restoration Treatments

Proposed watershed improvements would improve watershed function and resiliency by minimizing the impact of the road and trail network throughout the Middle Fork Weiser River subwatersheds and restoring vegetation and soil productivity in riparian areas. Treatments include road and trail decommissioning, improvements, and reroutes; dispersed recreation site improvements within the Middle Fork Weiser River RCA; and vegetation treatments designed to restore or enhance native riparian vegetation through mechanical or hand treatment, prescribed burning, and planting and seeding.

Restoration prioritization of subwatersheds in the Project area is based on the amount of NFS land within each one. Since impediments to watershed function, such as road density and disturbance in RCAs, are present in relatively equal proportions within each subwatershed, the higher the percentage of NFS land, the greater the immediate opportunity to restore the subwatershed to desired conditions, as stated in the Purpose and Need section. Table 2-6 displays land ownership and Watershed Condition Class by subwatershed.

Table 2-6. Land ownership, Forest Plan restoration objective, and Watershed Condition Class by subwatershed

Watershed	National Forest System lands (%)	Forest Plan Restoration Objective	Watershed Condition Class
Granite Creek	93	Move Toward Appropriate Function	Impaired
Mica Creek	73	Move Toward Appropriate Function	Impaired
Jungle Creek	65	Move Toward Appropriate Function	At Risk
Little Fall Creek	34	Move Toward Appropriate Function	At Risk

Road treatments proposed for this project were developed using the TAP conducted in 2013 (USDA Forest Service 2013a). Changes to the NFS road network are proposed to reduce road-related impacts to water quality and fish habitat, as well as reduce overall road density and comply with the Travel Rule (36 CFR Parts 212, 251, 261, and 295 2005) requirement of establishing a MRS.

Roads that are recommended to remain on the landscape as part of the MRS would be maintained and improved to reduce sediment production (guided by recommendations from site-specific sediment modeling). Aquatic Organism Passage (AOP) would be improved at two crossings as described below. NFS roads not needed for future management or access and unauthorized routes are identified for decommissioning.

NFS road treatments proposed throughout the project area include maintenance and/or improvement (see “Transportation Management” section below).

Long-term Closure of Roads—17.8 miles

NFS roads that were either known to resource specialists as high-priority candidates for long-term closure due to their location (e.g., located within an RCA or known to be contributing to sediment delivery in streams) or were field surveyed due to their proximity to streams or stream crossings and found to be inhibiting proper stream or watershed function would be put

into long-term closure for a total of 17.8 miles (Table 2-7). To improve the condition of these roads, work may include decompacting, establishing vegetation, installing cross-ditches, removing or bypassing culverts at stream crossings and blocking the entrance. These treatments would eliminate sediment delivery drain points identified in GRAIP surveys along these roads.

Road Decommissioning—80.7 miles

Decommissioning treatments proposed range from full recontour to spot treating isolated areas, such as stream crossings on roads that have little-to-no defined prism and have recovered based on the professional judgment of the Hydrologist or Soil Scientist, to a point where features blend with the surrounding terrain and hydrologic and soil functions are largely restored. Natural recovery is not a common occurrence, and usually these "recovered roads" are legacy, non-engineered skid trails, or temporary roads that were never recontoured following past management activities. Roads that were engineered (prism and drainage structures) largely require treatment to restore natural physical and biological processes (Lloyd et al. 2014).

Roads identified for decommissioning that were also recognized during planning as needed for administration of grazing permits (i.e., as stock driveways or access to range improvements like bull trout exclosure fences) would be treated so as to allow passage of cattle and provide for other necessary grazing permit activities but would not be designed for motorized access. The maximum restoration of soil-hydrologic function would be achieved while providing access to grazing permittees as well as a barrier to unauthorized use, which would result in decompaction of most of the road surface and a remnant path wide enough for livestock passage and grazing permit activities. These roads are exceptions to the description of road treatments above; they would be closed to public use and be incorporated into the grazing annual operating instructions (AOIs) as authorized infrastructure for use by the permittee only. These roads are identified in the project data and final actions would be determined during implementation.

Approximately 80.7 miles of road would be decommissioned, including 16.1 miles of NFS roads and 64.6 miles of unauthorized routes (Table 2-7). A total of 24.6 miles of routes proposed for decommissioning are located within RCAs (Table 2-7).

Aquatic Organism Passage/Habitat Connectivity

No known bull trout or designated bull trout habitat occurs within the Middle Fork Weiser River watershed. Streams within the Middle Fork Weiser River drainage were sampled for the presence of bull trout deoxyribonucleic acid (DNA) in 2014 and none was detected.

Two culverts that restrict proper hydrologic function and passage of fish and other aquatic organisms would be replaced (Table 2-7):

4) NFS road 50186 at the Middle Fork Weiser River near the junction with NFS road 50245
5) NFS road 50186 at Big Creek

Temporary culverts or bridges would be installed where planned temporary roads cross intermittent or perennial streams or on closed system roads where culverts have been removed. AOP would be provided where needed.

Table 2-7. Soil Water Riparian, and Aquatic Resource Improvement Treatment Summary, Alternative 2

Type of Treatment	Miles or Number
Long-term Closure	17.8 miles
Total Road Decommissioning	80.7 miles
National Forest System Road Decommissioning	16.1 miles
Unauthorized Route Decommissioning	64.6 miles
Total Road Decommissioning in Riparian Conservation Areas	24.6 miles
Aquatic Organism Passage/Habitat Connectivity	2 culverts

2.3.2.2.7. Transportation Management

All road miles are approximate and based on field and GIS data.

Five sources of material are identified and would be used for road improvement (Table 2-8). Road surface material sources will be the same in each of the action alternatives.

Table 2-8. Material to be used for road improvement, including the source, location, access road, and type

Source of Material	Location	National Forest System Access Road	Material Type
Five Corners	SW ¼ NE ¼ Section 29, T. 17 N., R. 2 E	51817	Pit-run and crushed aggregate
Wolf Creek Crossing	SW ¼ NE ¼ Section 33, T. 15 N., R. 2 E	50326	Pit-run and crushed aggregate
Jungle Pit	T. 16 N., R.2 E., SEC 23	51796	Pit-run and crushed aggregate
Fall Creek Pit	NE ¼ NE ¼ Section 23, T. 15 N., R. 2 E.	50436	Pit-run and crushed aggregate
Warm Bar Pit	NW ¼ SE ¼ Section 11, T. 15 N., R. 1 E.	50186	Rip-rap and crushed aggregate

Road Reconstruction—11.0 miles

Road reconstruction in the Project area includes any activity that improves or realigns an existing NFS road as defined below:

- Road improvement—Activity that results in an increase of an existing road's traffic service level expansion of its capacity, or a change in its original design function.
- Road realignment—Activity that results in a new location of an existing road or portions of an existing road and treatment of the old roadway.

Road Improvement

Approximately 8.8 miles of road resurfacing would be completed on NFS road 50214 (King Hill–Fall Creek Road), NFS road 50245 (Granite Creek Road), and NFS road 50692 (Little Creek Road) using crushed rock sources to improve the road surface and reduce watershed and fisheries impacts from sedimentation. Road reconstruction within RCAs totals 5.5 miles.

In addition to the areas identified above, spot graveling of roads would occur at crossings, dips, and soft spots.

Road Realignment

To reduce sediment and other road effects on water quality and riparian habitat, 3.0 miles of existing NFS road would be realigned away from RCAs; 2.2 miles of road would be constructed in the realignment for a net decrease of 0.8 miles of road. Roads to be realigned include segments of the following NFS roads: 50489, 50566, 50707, 51547 and 51791.

Other Road Actions

Implement Best Management Practices (BMPs)

Approximately 5.5 miles of NFS road that are currently Operational Maintenance Level (OML) 1 would have BMPs implemented. BMPs are designed to ensure the road can be stored, with minimal maintenance, for a period up to 30 years. Treatment would include removing culverts, installing water bars to ensure surface drainage, outsloping, or other treatments that would reduce sediment transport from the road and preserve the integrity of the road prism for future use.

OML 1 to OML 2 Roads

Approximately 14.2 miles of NFS road that are currently OML 1 would be converted to OML 2. These are roads that currently have easements for access by Potlatch Corporation. Converting the roads to OML 2 would allow for maintenance while providing private access.

Ensure Effective Closure on year-round and seasonally closed National Forest System Roads

If needed, closed NFS roads would be improved to ensure effective closure through the use of gates (OML 2 roads only), barriers, or obliterating the first portion of the road (generally the line of sight distance from the start of the road to where it turns out of view; This applies to OML 1 roads only). Ensuring effective closures may also be implemented in on-going road maintenance activities.

2.3.2.2.8. Recreation

Recreational use within the Project area is low in the spring and winter, moderate during the summer, and higher in the fall, during hunting season. One developed campground, Cabin Creek, is located in the area with the rest of the camping occurring in dispersed sites adjacent to open roads. Both motorized and non-motorized trails occur within the area. Trail use is low to moderate. Trail maintenance, minor trail realignments, trail re-establishments, and trail construction to realign trails around private land are proposed. Work would focus on trails on the east side of Council Mountain that are located in the headwaters of main tributaries to the Middle Fork Weiser River. Trailhead development off private land is also proposed to better accommodate recreational use of these trails.

Developed and Dispersed Recreation Improvements

Cabin Creek Campground would be improved as follows:

- Install one single vault toilet to replace the old existing one, and relocate it to meet all required health and safety codes

- Add new site markers to individual campsites, replace an existing fee tube and information kiosk, install accessible tables, and build an accessible pathway to the water system
- Gravel the main campground loop road, and widen the road and turn at the campground access to accommodate full size recreational vehicles

The Horse Cabin Flat dispersed site would be improved by installing up to 4 hitch rails, designating up to 5 camping sites with metal fire rings using boulders, installing gravel and site signs to mark the allowed camping locations, and adding a single vault toilet.

The crossing of the Middle Fork Weiser River at the dispersed camping area near the confluence with Jungle Creek would be hardened for stock use and to minimize resource damage and focus motorized access to the existing bridge approximately 300 feet from this crossing. Other general improvements would be made to the site, such as hardening, providing physical barriers to direct use, to minimize impacts to the adjacent Middle Fork Weiser River.

Roads identified for decommissioning located at the intersection with NFS open or seasonally open roads would be evaluated for site-specific dispersed recreation opportunities within 300 feet of the NFS road junction if no resource concerns are identified. If necessary for resource protection, sites would be improved by surfacing, or other hardening and evaluate for barriers, where stream impacts are found.

Trail Improvements

The south portion of NFS trail 198 (4.4 miles) and the east portion of NFS trail 205 (2.0 miles) would be rerouted to avoid sections currently on private land with no easement held by the Forest Service to provide legal access to these trails. New trailheads would be established on NFS land near Cabin Creek Campground for NFS trail 198 and 0.5 miles north of Lake Creek on NFS road 186 for NFS trail 205.

Motorized use is currently present and allowed within the Council Mountain IRA. To accommodate continued two-wheel motorized access on the entirety of NFS trail 198, the designation of a short section (2.0 miles) of the trail would be changed from non-motorized to two-wheel motorized use.

Trail maintenance (including proper signing) would be performed to bring all 28 miles of existing open designed trail to trail class and standard, as defined in the Trail Management Objective (TMO) (TMOs for each trail are found in the Forest Service - Payette National Forest Trails database called INFRA Trails) for that trail, within the Project area. Maintenance levels would vary from routine to heavy, depending on the trail condition and trail class. NFS trail 518 would need to be re-established/reconstructed in several sections.

A new motorized OHV loop trail (open to vehicles 70 inches and less in width) would be constructed and formally designated for seasonal use. This trail would be constructed using closed NFS road 50166 and closed NFS road 50485 for a motorized trail approximately 3 miles long. This trail would require constructing 0.5 miles of new trail to complete and close the loop.

Approximately 0.8 miles of former NFS trail 202 would be signed and formally designated as open for non-motorized use. This trail would be designated as NFS trail 212 and is referred as NFS trail 212 in this DEIS. For this trail, switchback construction would be

needed to mediate the steep sections. This is the only proposed action proposed in the East Fork Weiser River subwatershed.

The trailhead for NFS trail 209 (an all-terrain vehicle [ATV] trail) would be relocated onto NFS lands. The map would need to be corrected to coincide with the actual trail location. The designation of NFS trail 209 would be changed from “open year round” to “seasonal” to coincide with other seasonal trail and road designations in the immediate area.

Portions of NFS trail 198 (not to exceed 1.0 mile) would be re-routed near the base of Council Mountain to reduce resource impacts and improve sustainability. Work would also need to be done to reduce congestion of multiple trail junctions in this sensitive upper elevation trail network.

Approximately 3.4 miles of the West Mountain Jeep Road NFS road 51763 would be converted from Level 2 open road to a trail open to all vehicles to better reflect the type of motor vehicle use this route can accommodate. This change would add 3.4 miles of trail to the NFS trail system.

Council Mountain and Poison Creek Inventoried Roadless Areas

The following activities are proposed for the Council Mountain and Poison Creek IRAs (These miles are included in those described in previous sections and not additional proposals):

- Sign and formally designate 0.8 miles of NFS trail 212 as open for non-motorized use. Complete needed switchback trail construction to mediate the steep sections.
- Reroute the south portion of NFS trail 198 (2.3 miles located in the IRA) and the east portion of NFS trail 205 (1.5 miles located in the IRA) to avoid sections currently on private land with no easement held by the Forest Service to provide legal access to these trails.
- Re-route portions of NFS trail 198 near the base of Council Mountain to reduce resource impacts and improve sustainability. Work to reduce congestion of multiple trail junctions in this sensitive upper elevation trail network.
- Motorized use is currently present and allowed within the Council Mountain IRA. To accommodate continued two-wheel motorized access on the entirety of NFS trail 198, change the designation of a short section (two miles) of the trail from non-motorized to two-wheel motorized use.
- Full obliteration would occur on 10 segments (1.0 mile) of unauthorized route
- Trail maintenance would occur on 15 miles

Council Mountain Research Natural Area (RNA)

No activities are proposed in the Council Mountain RNA.

2.3.3. Alternative 3

Alternative 3 addresses internal and external comments requesting a more effective watershed restoration effort and proposals to address wildlife security. This alternative would treat PVGs 2, 5, and 6 but not PVGs 7–11 and would emphasize watershed restoration treatments in the Granite Creek subwatershed.

2.3.3.1. Vegetation Treatments

Under Alternative 3, vegetation treatments are identical to those under Alternative 2 except for the following, which are not included in this alternative:

- Treatments in PVGs 7–11
- Proposed SFBs
- Proposed fuels reduction within an RCA treatment

The description and intent of treatments are identical to those described in section 2.3.2. Table 2-9 summarizes the vegetation treatments proposed in Alternative 3, and Table 2-10 summarizes the vegetation treatments proposed in RCAs. Vegetation and fuels treatments in PVGs 7–11 would not move more than 30% of suitable lynx source habitat to unsuitable, following the 2000 Canada Lynx Conservation Assessment and Strategy (LCAS, Ruediger et al. 2000) requirements. Additionally, none of the whitebark pine populations in PVG 11 would be maintained or artificially regenerated with rust resist trees.

2.3.3.1.1. Prescribed Fire Treatments—16,600 acres

The types of treatments are identical to Alternative 2. The primary target area is 2,800 acres and the secondary target is 13,800 acres.

Table 2-9. Vegetation treatment summary, Alternative 3

Type of Vegetation Treatment	Acronym	Total Acres
Noncommercial Thin	NCT	921
Restoration Burned Areas/Plantations	BA/PL	3,178
Commercial Thin-Free Thin	CT-FT	2,697
Free Thin–Patch Cut-Modified Shelterwood*	FT-PC-MSw	4,946
Commercial Thin / Mature Plantations	CT-MP	1,039
Conifer Removal in Aspen Stands	CT-ASP	900
Vegetation treatments in stands with Low Site Quality	LSQ	715
Dry Nonforested Vegetation Treatment	NFT	3,592
Wet Meadow Treatment	WMT	43
Shaded Fuelbreak	SFB	0
Fuel Reduction within a Riparian Conservation Area (RCA)	FR-RCA	0
Total Acres of Vegetation Treatments		18,031
Prescribed Fire Treatments[b]	PFT	16,600

Note: Acres include area within RCAs. None of these treatments are proposed within the inner portion of RCAs except for the FR-RCA treatment.
[a]Only CT-FT would be used in this type of treatment unless there is aspen present where Conifer Removal in Aspen Stand treatment would be utilized in that portion of the outer RCA.
[b]Prescribed burn would be allowed to back into RCA.

Table 2-10. Vegetation treatment acres within the outer portion of Riparian Conservation Areas (RCAs), Alternative 3

Type of Vegetation Treatment within RCAs	Acronym	Total Acres
Noncommercial Thin	NCT	109
Burned Areas/Plantations	BA/PL	380
Commercial Thin-Free Thin	CT-FT	331
Free Thin–Patch Cut-Modified Shelterwood[a]	FT-PC-MSw	977
Commercial Thin / Mature Plantations	CT-MP	172
Conifer Removal in Aspen Stands	CT-ASP	148
Vegetation treatments in stands with Low Site Quality	LSQ	161
Nonforested Treatment	NFT	347
Wet Meadow Treatment	WMT	43
Total Acres of Vegetation Treatments in RCAs		2,668
Prescribed Fire Treatments[b,c]	PFT	4,511

[a]Only CT-FT would be used in this type of treatment unless there is aspen present where Conifer Removal in Aspen Stand treatment would be utilized in that portion of the outer RCA.
[b]PFT is not counted in the grand total of treatment acres due to the overlap of treatment acres with many of the vegetation treatments.
[c]Prescribed burn would be allowed to back into RCA.

2.3.3.1.2. Associated Actions

The types of associated actions proposed under Alternative 3 are identical to those proposed under Alternative 2. Approximately 8.1 miles of new planned temporary road would be constructed and 27.5 miles of existing unauthorized routes would be utilized as temporary road and fully recontoured following use. The types of Road Maintenance actions proposed under Alternative 3 would be identical to those proposed under Alternative 2. Roads proposed for maintenance would be 129.7 miles.

2.3.3.1.3. Watershed Improvement and Restoration Treatments

Proposed watershed improvement restoration treatments would be the same as under Alternative 2 with additions and changes as noted below.

Long-term Closure of Roads—15.0 miles

The description of long-term closure treatment under Alternative 3 is identical to Alternative 2. However, fewer miles would be put into long-term closure; these miles would be decommissioned instead (see below).

Road Decommissioning—87.9 miles

The description of road decommission treatment under Alternative 3 is identical to Alternative 2. Decommissioning would include 23.3 miles of NFS road and 64.6 miles of unauthorized routes. In addition to those routes proposed for decommissioning under Alternative 2, Alternative 3 proposes to decommission the following roads:

- All of NFS roads 50166, 50240, 50485, and 51547 would be decommissioned (full recontour, only portions of these roads are proposed for decommissioning under Alternative 2)
- NFS road 50489 would be decommissioned not be realigned

This alternative would reduce future access for vegetation treatments currently provided by the roads listed above but would result in greater benefit to the soil and water resources.

The description of Road Decommissioning with Permittee Coordination is identical to Alternative 2.

A total of 26.2 miles of routes proposed for decommissioning would be located within RCAs.

Aquatic Organism Passage/Habitat Connectivity

In addition to the two AOPs proposed under Alternative 2, Alternative 3 would replace one additional culvert for AOP and to improve hydrologic function on Jungle Creek (NFS road 50192).

Table 2-11. Soil, water, riparian, and aquatic resource improvement treatment summary, Alternative 3

Type of Treatment	Miles and Number
Long-term Closure	15.0 miles
National Forest System Road Decommissioning	23.3 miles
Unauthorized Route Decommissioning	64.6 miles
Total Road Decommissioning	87.9 miles
Total Road Decommissioning in Riparian Conservation Areas	26.2 miles
Aquatic Organism Passage/Habitat Connectivity	3 culverts

Road Surface Material Sources

The road surface material sources would be the same as under Alternative 2 (5 gravel pits).

Road Reconstruction—8.8 miles

Road Improvement

Road reconstruction activities would be completed on NFS road 50214 (King Hill–Fall Creek Road), NFS road 50245 (Granite Creek Road) and NFS road 50692 (Little Creek Road).

Road Realignment

Alternative 3 does not propose any road realignment.

Road reconstruction within RCAs would total 5.1 miles.

Other Road Actions

The types of treatment and miles are identical to those described in Alternative 2.

Implement Best Management Practices (BMPs)

Approximately 5.5 miles of NFS road that are currently OML 1 would have BMPs implemented.

OML 1 to OML 2 Roads

Approximately 14.2 miles of NFS road that are currently OML 1 would be converted to OML 2.

Ensure Effective Closure on year-round and seasonally closed National Forest System Roads

As described in Alternative 2, if needed, closed National Forest System Roads would be improved to ensure effective closure.

2.3.3.1.4. Recreation

Developed and Dispersed Recreation Improvements

All recreation improvements proposed under Alternative 3 are identical to those proposed under Alternative 2 with one exception: the 3 mile OHV Loop Trail using NFS road 50166 and closed NFS road 50485 is not proposed under Alternative 3.

Council Mountain and Poison Creek Inventoried Roadless Areas

Recreation improvements and road decommissioning as proposed in Alternative 3 are identical to those described in Alternative 2.

Council Mountain Research Natural Areas

No activities are proposed in the Council Mountain RNA under Alternative 3.

2.3.4. Alternative 4

Alternative 4 was developed to address internal and external comment concerning additional restoration in higher elevation stands that contain a viable seral tree component. This alternative would treat stands in PVGs 7–11 that have a viable seral species component in addition to those stands proposed for treatment under Alternative 2. This treatment plan is consistent with direction in the 2013 LCAS (Interagency Lynx Biology Team 2013), which provides flexibility of forest management in “Secondary Areas” that do not support core populations of lynx. The 2013 LCAS does not identify LAUs in “Secondary Areas” and allows for the creation of a mosaic of habitat in the Project.

Alternative 4 would require a site-specific non-significant amendment (FSH 1926.51) of the Forest Plan. Specifically, the Forest-wide standard TEST15 (USDA Forest Service 2003a, p. III-12), “Unless a broad-scale assessment has been completed that substantiates different historical levels of unsuitable habitat, limit disturbance within each LAU as follows: If more than 30% of lynx habitat within a LAU is currently in unsuitable condition, no additional habitat may be changed to unsuitable habitat as a result of vegetative management projects.” Should Alternative 4 be selected, a site-specific non-significant Forest Plan amendment would be prepared and attached to the decision document for this Project. The amendment would allow for more than 30% of lynx habitat to be made unsuitable with Project activities within the Middle Fork Weiser River LAU (See Appendix 8, Proposed Forest Plan Amendment for background and rationale).

2.3.4.1. Vegetation Treatments

The description and intent of treatments are identical to those described in section 2.3.2 and include additional areas proposed for treatment. Table 2-12 summarizes the vegetation treatments proposed under Alternative 4, and Table 2-13 summarizes the vegetation treatments proposed for RCAs under Alternative 4. Alternative 4 increases treatment acres in PVGs 7–11, specifically correlating to FT-PC-MSw, NCT, and LSQ treatments. Treatment in

stands potentially containing whitebark pine would also increase under Alternative 4 to 357 acres.

Wet Meadow treatments differ from Alternative 2 by treating the inner half of RCAs (191 acres) as well as the outer half of RCAs (80 acres). Additional acres treated in the outer half of RCAs (i.e., 55 acres under Alternative 2 versus 80 acres in Alternative 4) is due to the increased number of acres proposed for treatment in PVGs 7–11 under Alternative 4. Inner RCA treatment in Wet Meadows would be done by hand only.

2.3.4.1.1. Prescribed Fire Treatments—27,400 acres

The types of treatments proposed under Alternative 4 are identical to those proposed under Alternative 2. The primary target area is 9,400 acres and the secondary target is 18,000 acres.

Table 2-13 below displays only those acres within RCAs proposed for treatment.

Table 2-12. Vegetation treatment summary, Alternative 4

Type of Vegetation Treatment	Acronym	Total Acres
Noncommercial Thin	NCT	2,039
Restoration Burned Areas/Plantations	BA/PL	3,244
Commercial Thin-Free Thin	CT-FT	2,999
Free Thin–Patch Cut-Modified Shelterwood[a]	FT-PC-MSw	6,076
Commercial Thin / Mature Plantations	CT-MP	1,090
Conifer Removal in Aspen Stands	CT-ASP	1,087
Vegetation treatments in stands with Low Site Quality	LSQ	1,203
Dry Nonforested Vegetation Treatment	NFT	4,999
Wet Meadow Treatment	WMT	271
Shaded Fuelbreak	SFB	370
Fuel Reduction within a Riparian Conservation Area (RCA)	FR-RCA	15
Total Acres of Vegetation Treatments		23,393
Prescribed Fire Treatment[b]	PFT	27,400

Note: Acres include area within RCAs. None of these treatments are proposed within the inner portion of RCAs except for the FR-RCA treatment.

[a]Only CT-FT would be used in this type of treatment unless there is aspen present where Conifer Removal in Aspen Stand treatment would be utilized in that portion of the outer RCA.

bPrescribed fire would be allowed to back into RCA.

Table 2-13. Vegetation treatment acres within Riparian Conservation Areas (RCAs), Alternative 4

Type of Vegetation Treatment within RCAs	Acronym	Total Acres
Noncommercial Thin	NCT	282
Burned Areas/Plantations	BA/PL	394
Commercial Thin-Free Thin	CT-FT	384
Free Thin–Patch Cut-Modified Shelterwood[a]	FT-PC-MSw	1,199
Commercial Thin / Mature Plantations	CT-MP	181
Conifer Removal in Aspen Stands	CT-ASP	181
Vegetation treatments in stands with Low Site Quality	LSQ	209
Nonforested Treatment	NFT	459
Wet Meadow Treatment	WMT	271
Shaded Fuelbreak	SFB	52
Fuel Reduction within a Riparian Conservation Area (RCA)[b]	FR-RCA	15
Total Acres of Vegetation Treatments within RCAs		3,627
Prescribed Fire Treatment[b,c]	PFT	7,422

[a]Only CT-FT would be used in this type of treatment unless there is aspen present where Conifer Removal in Aspen Stand treatment would be utilized in that portion of the outer RCA.
[c]PFT is not counted in the grand total of treatment acres due to the overlap of treatment acres with many of the vegetation treatments.
[d]Prescribed fire would be allowed to back into RCA.

2.3.4.1.2. Associated Actions

The types of associated actions proposed under Alternative 4 are identical to those proposed under Alternative 2. Approximately 8.3 miles of new planned temporary road would be constructed, and 39.8 miles of existing unauthorized routes would be utilized as temporary road and fully recontoured following use. The types of road maintenance actions proposed under Alternative 4 are identical to those proposed under Alternative 2. Roads proposed for maintenance total 137.5 miles.

2.3.4.1.3. Watershed Improvement and Restoration Treatments

Long-term Closure of Roads—17.8 miles

The description and location of long-term closure treatments proposed under Alternative 4 is identical to those proposed under Alternative 2.

Road Decommissioning—76.7 miles

The description of road decommission treatments proposed under Alternative 4 is identical to those proposed under Alternative 2. Decommissioning would include 16.1 miles of NFS roads and 60.6 miles of unauthorized routes, totaling 76.7 miles.

A total of 23.6 miles of routes proposed for decommissioning would be located within RCAs.

Aquatic Organism Passage/Habitat Connectivity

AOP proposed under Alternative 4 is identical to that proposed under Alternative 2.

Table 2-14. Soil, water, riparian, and aquatic resource improvement treatment summary, Alternative 4

Type of Treatment	Miles and Number
Long-term Closure	17.8 miles
National Forest System Road Decommissioning	16.1 miles
Unauthorized Route Decommissioning	60.6 miles
Total Road Decommissioning	76.7 miles
Total Road Decommissioning in Riparian Conservation Areas	23.6 miles
Aquatic Organism Passage/Habitat Connectivity	2 culverts

2.3.4.1.4. Transportation Management

Addition of Unauthorized Roads to the National Forest System for Administrative Use

The TAP prepared for the Project area recommended adding 4.0 miles of unauthorized roads to the NFS (Add to System Roads) because they are necessary to facilitate vegetation management access for current and future projects. These roads generally have a road prism or portion of road prism in place and are overgrown from years of natural establishment and would require reconstruction to bring them to Forest Service specifications. Reconstruction could include re-establishing the road prism, blading the surface, installing or reinstalling culverts for drainage, improving ditches, and incorporating other road maintenance activities. These routes would be incorporated in the Payette National Forest Road Atlas. Once utilized for treatment, the roads would be put into a Maintenance Level 2 closure (see definition in Glossary). Alternative 4 is the only alternative that proposes Add to System roads.

Road Surface Material Sources

Road surface material sources proposed under Alternative 4 are identical to those proposed under Alternative 2 (5 gravel pits).

Road Reconstruction—17.3 miles

Road Improvement

Road reconstruction activities would be completed on NFS road 50214 (King Hill–Fall Creek Road), NFS road 50245 (Granite Creek Road) and NFS road 50692 (Little Creek Road).

Road Realignment

Alternative 4 proposes road realignments described under Alternative 2 and proposes additional miles of road realignment. These additional miles of realignment are in conjunction with the Add to System roads described above.

Approximately 8.7 miles of existing NFS road and unauthorized routes would be realigned and 4.5 miles of road would be constructed during realignment for a net decrease of 4.2 miles of roads and unauthorized routes. Roads to be realigned include segments of the following NFS roads: 50489, 50192, 50566, 50707, 51306, 51547 and 51791.

Road reconstruction within RCAs would total 6.9 miles.

Other Road Actions

The types of treatment and miles are identical to those described in Alternative 2.

Implement Best Management Practices (BMPs)

Approximately 5.5 miles of NFS road that are currently OML 1 would have BMPs implemented.

OML 1 to OML 2 Roads

Approximately 14.2 miles of NFS road that are currently OML 1 would be converted to OML 2.

Ensure Effective Closure on year-round and seasonally closed National Forest System Roads

As described in Alternative 2, if needed, closure methods on National Forest System Roads would be improved to ensure effective closure.

2.3.4.1.5. Recreation

Recreation Improvements

All recreation proposals under Alternative 4 are identical to those proposed under Alternative 2.

Council Mountain and Poison Creek Inventoried Roadless Areas

Recreation improvements and road decommissioning as proposed in Alternative 4 are identical to those described in Alternative 2.

Council Mountain Research Natural Areas

No activities are proposed in the Council Mountain RNA.

2.3.5. Comparison of Alternatives

Table 2-15 displays or compares the alternatives by activity. Acres and miles used in this analysis are approximations based on computer calculations. Actual figures may vary from these planning numbers.

Table 2-15. Comparison of alternatives by activity

Proposed Treatments	Alternatives			
	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Commercial and Noncommercial Vegetation Treatment (Acres)				
Noncommercial thin	0	1,279	921	2,039
Restoration burned areas/plantations	0	3,240	3,178	3,244
Commercial thin-free thin	0	2,875	2,697	2,999
Free thin–patch cut-modified shelterwood	0	5,343	4,946	6,076
Commercial thin / mature plantations	0	1,080	1,039	1,090
Conifer removal in aspen stands	0	1,087	900	1,087
Vegetation treatments in stands with low site quality	0	850	715	1,203
Dry nonforested vegetation treatment	0	4,519	3,592	4,999
Wet meadow treatment	0	55	43	271
Shaded fuelbreak	0	370	0	370
RCA fuels treatment	0	15	0	15
Total Vegetation Treatments		20,713	18,031	23,393
Acres of vegetation treatments in RCAs[b]	0	3,000	2,668	3,627
Prescribed Burn (acres)				
Prescribed Burn	0	24,250	16,600	27,400
Prescribed Burn within RCAs	0	6,319	4,511	7,422
Temporary Roads (miles)				
Existing Prism (existing unauthorized routes that would be used in harvest then obliterated)	0	34.8	27.5	39.8
New Temporary Road Construction	0	9.7	8.1	8.3
Soil, Water, Riparian, and Aquatic Resource Improvement Treatment (miles)				
Long-term Closure	0	17.8	15.0	17.8
NFS road Decommissioning	0	16.1	23.3	16.1
Unauthorized Route Decommissioning	0	64.6	64.6	60.6
Road Decommissioning (includes the unauthorized routes used as temporary roads listed above)	0	80.7	87.9	76.7

Proposed Treatments	Alternatives			
	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Road Decommissioning within RCAs (Miles)				
Total miles (included in the miles of road decommissioning listed above)	0	24.6	26.2	23.6
Aquatic Organism Passage (AOP)/Habitat Connectivity				
Number of AOP improved	0	2	3	2
Transportation Management (Miles)				
Road realignment	0	2.2	0	4.5
Add to System roads	0	0	0	4.0
Total road reconstruction (includes road realignment and Add to System roads)	0	11.0	8.8	17.3
Implement Best Management Practices (BMPs)	0	5.5	5.5	5.5
Operational Maintenance Level (OML) 1 to OML 2 Roads	0	14.2	14.2	14.2
Ensure Effective Closure on year-round and seasonally closed National Forest System Roads[d]	0	All	All	All
Recreation Improvements[c]—Trails (Miles)				
Trail Re-Route To Provide Legal Access From Trailhead	0	6.4	6.4	6.4
NFs trail 198 convert from non-motorized to two-wheel motorized	0	2.0	2.0	2.0
Trail Maintenance	0	28	28	28
New OHV Trail Open To Vehicles Up To 70 inches Wide	0	3.0	0	3.0
New Non-Motorized Trail (NFS trail 212)	0	0.8	0.8	0.8
Convert 3.4 miles of West Mountain Jeep Road (NFS road 51763) (Operational Maintenance Level 2 road) to a “trail open to all vehicles”.	0	3.4	3.4	3.4

[a]Wet meadow treatment is proposed in the outer half of RCAs in Alternatives 2 and 3. It includes both the inner and outer portions of RCAs in Alternative 4.
[b]Included in total above
[c]See section 2.3.2 Recreation Improvements for additional proposals in all action alternatives including developed and dispersed recreation improvements and addition trail maintenance and trailhead improvements.
d Ensuring effective closures may also be implemented in on-going road maintenance activities.

Table 2-16. Comparison of alternatives by objective

Vegetation Resource Objective 1: Move vegetation toward the desired conditions defined in the Forest Plan, with an emphasis on promoting large tree forest structure, early seral species composition and forest resiliency				
Measurement	**Alt 1**	**Alt 2**	**Alt 3**	**Alt 4**
Tree Size Class Acres treated to promote the large tree size class Acres treated to maintain the large tree size class	 0 0	 2,114 7,474	 2,084 6,761	 2,291 8,358
Tree Canopy Cover Percentage of area (acres) in each canopy cover class within the large tree size class	Varies by PVG, see Table 3-16, Table 3-17, and Table 3-18 for comparison of Alternatives for canopy cover			
Tree Species Composition Acres treated to maintain and/or promote desired species composition	0	15,754	14,393	17,140
Vegetation Resource Objective 2: Maintain or restore a representation of native plant communities throughout the Forest				
Measurement	**Alt 1**	**Alt 2**	**Alt 3**	**Alt 4**
Acres of Aspen Treatments	0	1,087	900	1,087
Acres of Meadow Treatment (Wet and Dry)	0	4,574	3,635	5270
Fire and Fuels Resource Objective 3 : Restore and maintain desirable fuel levels, fire regimes, and ecological processes				
Measurement	**Alt 1**	**Alt 2**	**Alt 3**	**Alt 4**
Acres moved towards historical fire regimes	0	24,236	16,618	27,435
Fire and Fuels Resource Objective 4: Establish and maintain strategically-placed shaded fuelbreaks to improve firefighter and public safety improve the defensible space adjacent to private lands and provide protection to infrastructure to the east of the Project area				
Measurement	**Alt 1**	**Alt 2**	**Alt 3**	**Alt 4**
Acres of shaded fuelbreak	0	370	0	370
Wildlife Objective 5: Improve habitat for Family 1 wildlife species, as represented by the white-headed woodpecker, a Region 4 Sensitive Species (USDA Forest Service 2011) and Forest Management Indicator Species (MIS), by restoring forest conditions that contribute to source habitat for these species. Forested stands providing these source habitats should be restored to conditions within, or near, the Historical Range of Variability (HRV)				
Measurement	**Alt 1**	**Alt 2**	**Alt 3**	**Alt 4**
Quantity and quality of Family 1—white-headed woodpecker habitat restored to conditions within HRV. Quantity is measured by acres of PVGs 2, 5, and portions of PVG 6 in the Large Tree Size Class and Low Canopy Cover Class. Quality is measured by the presence of old forest characteristics (e.g. legacy trees, snags, CWD, canopy gaps, understory patchiness), as described in the Forest Plan.	0 (742 current total)	3,985	4,054	4,039

Soil, Water, Riparian, and Aquatic (SWRA) Resources Objective 6: Improve watershed and aquatic function and integrity by moving all watersheds within the project area towards the desired condition for the soil, water, aquatic, and riparian resources				
Road Density by Subwatershed (miles/square mile)				
Measurement (Subwatershed) All ownership/Forest Service Land only	**Alt 1**	**Alt 2**	**Alt 3**	**Alt 4**
Granite Creek	4.6/4.5	3.0/2.5	2.6/2.1	3.1/2.6
Jungle Creek	5.9/4.2	5.3/2.1	5.3/2.1	5.4/2.2
Little Fall Creek	3.4/3.1	2.7/1.8	2.7/1.8	2.8/1.9
Mica Creek	4.8/2.6	4.0/1.6	4.0/1.6	4.1/1.6
RCA Road Density by Subwatershed				
Measurement (Subwatershed) All ownership/Forest Service Land only	**Alt 1**	**Alt 2**	**Alt 3**	**Alt 4**
Granite Creek	5.5/4.8	3.7/2.8	3.3/2.4	3.8/2.9
Jungle Creek	7.1/3.2	6.1/1.8	6.1/1.8	6.2/1.9
Little Fall Creek	5.2/5.1	4.1/1.8	4.1/1.8	4.1/2.0
Mica Creek	5.3/2.8	4.6/1.8	4.6/1.8	4.6/1.9
Number of Fish Barriers Removed or Replaced				
Measurement (Subwatershed)	**Alt 1**	**Alt 2**	**Alt 3**	**Alt 4**
Granite Creek	0	2	3	2
Stream miles improved—includes miles of fish habitat reconnected and miles of stream enhanced through road decommissioning and graveling within RCAs				
Measurement (Subwatershed)	**Alt 1**	**Alt 2**	**Alt 3**	**Alt 4**
Granite Creek	0	24.2	26.4	23.2
Jungle Creek	0	10.5	11.2	10.6
Little Fall Creek	0	5.7	5.9	5.7
Mica Creek	0	7.9	8.7	7.9
Graveling within RCAs	0	5.5	5.5	5.5
Total	0	53.8	57.7	52.9
Miles of Roads within RCAs by Subwatershed				
Measurement (Subwatershed)	**Alt 1**	**Alt 2**	**Alt 3**	**Alt 4**
Granite Creek	29.2	19.9	18.2	20.4
Jungle Creek	41.7	36.4	36.3	36.8
Little Fall Creek	20.7	16.5	16.5	16.7
Mica Creek	34.8	30.6	30.4	30.6
Total	126.4	103.4	100.4	104.5
Percent of total road-generated sediment reduced over the long term as modeled by GRAIP and GRAIP Lite				
Subwatershed	**Alt 1**	**Alt 2**	**Alt 3**	**Alt 4**
Granite Creek	0%	36.1%	48.3%	35.5%
Jungle Creek	0%	15.5%	15.5%	14.4%
Little Fall Creek	0%	41.1%	41.1%	41%
Mica Creek	0%	18.1%	18.2%	17.9%
Number of harvest units meeting Appendix A desired conditions for CWD, both in general and in the large (greater than 15 inches diameter) size class.	No harvest planned	Trend toward Forest Plan desired conditions as described in Appendix A more quickly than Alternative 1 in proposed harvest units		

Recreation Objective 7 : Manage recreation use in the Project with an emphasis on identifying and hardening primary dispersed recreation areas, updating Cabin Creek Campground, improving existing trails, closing and rehabilitating unwanted user created motorized routes and developing new trail opportunities.				
Measurement	**Alt 1**	**Alt 2**	**Alt 3**	**Alt 4**
Miles of open non-motorized trail	3.8	2.6[a]	2.6 [a]	2.6 [a]
Miles of open 2-wheel motorized trail	21.8	31.2[b]	31.2[b]	31.2[b]
Miles of open ATV, OHV, trail open to all vehicles	2.4	8.8[c]	5.8[c]	8.8[c]
Miles of open year-round and seasonally open National Forest System and County roads	100.0	98.6	96.1	98.8
Change to existing dispersed recreation sites measured by changes to recreation facilities and/or resource improvements at the existing sites	Existing number	+up to 20 dispersed sites improved	+up to 20l dispersed sites improved	+up to 20 dispersed sites improved
Economics Objective 8: Contribute to the economic vitality of local communities				
Measurement	**Alt 1**	**Alt 2**	**Alt 3**	**Alt 4**
Employment contribution (number of jobs on annual average).	0	49	41	50
Income contribution ($ thousands)	$0	$1,667	$1,443	$1,734

[a]Alt 2, 3 and 4 change in Non-motorized trail = 3.8 (existing) + 0.8 (addition of #212) – 2.0 (portion of #198 to two-wheel) = 2.6 mi.

[b]Alt , 3 and 4 change in two-wheel trail = 21.8(existing) + 2.0 (addition of #198 section) + 6.4 (reroutes around private land) + 1 (reroutes in general) = 31.2 mi.

[c]Alt 2 and 4 change in ATV/OHV = 2.4 (existing ATV) + 3.0 (new OHV) + 3.4 (road to trail conversion) = 8.8 mi.

Table 2-17. Comparison of alternatives by issue

Wildlife Issue: High open road densities affect wildlife (e.g., elk) security and can lead to the removal of important habitat components (e.g., snags).				
Indicators	**Alt 1**	**Alt 2**	**Alt 3**	**Alt 4**
Change in elk security areas (Hillis et al. 1991). (Using all roads, routes and motorized trails buffered ½ mile and polygons greater than 250 acres. See elk section in Wildlife Resources for additional analysis.	Current Condition 2 areas 1,278 acres	2 areas 858 acres (no change in number of areas, decrease of 420 acres)	3 areas 1,140 acres (no change in number of areas, decrease of 138 acres)	2 areas 858 acres (no change in number of areas, decrease of 420 acres)
Miles of NFS roads and unauthorized roads decommissioned by a) physical closure, b) obliteration.*	a) 0 b) 0	a) 12.2 b) 68.5	a) 12.2 b) 75.7	a) 12.2 b) 64.5
Estimated effectiveness of closures and/or decommissioning by a) physical closure, 2) obliteration.*	a) Moderate b) High	a) Moderate b) High	a) Moderate b) High	a) Moderate b) High
Effects of opening closed roads to allow for additional firewood harvest.	No opening of closed roads	No impact to elk, assuming road opening would occur outside of rifle hunting season. Cavity dependent wildlife species would be detrimentally impacted from snag removal; this would require site-specific snag analysis. Amount and duration of snag removal would not likely lead to federal listing of any protected species.		
Wildlife Issue: Treatments may adversely affect source habitat for wildlife species dependent on mixed conifer forests with multi-layer structural characteristics. Such forests are associated with mixed to lethal fire regimes and associated processes (larger scales of insect and disease outbreaks and fire effects). Species of concern include listed and sensitive species and management indicator species.				
Indicators	**Alt 1**	**Alt 2**	**Alt 3**	**Alt 4**
Quantity (acres) and distribution of habitat for species of concern	See discussion in Wildlife Resources Section of Chapter 3.	See discussion in Wildlife Resources Section of Chapter 3.	See discussion in Wildlife Resources Section of Chapter 3.	See discussion in Wildlife Resources Section of Chapter 3.
Quality (specifically old forest, snags, patch and pattern) and distribution of habitat for species of concern	See discussion in Wildlife Resources Section of Chapter 3.	See discussion in Wildlife Resources Section of Chapter 3.	See discussion in Wildlife Resources Section of Chapter 3.	See discussion in Wildlife Resources Section of Chapter 3.

*Total road decommissioning is 80.7, 87.9 and 76.7 miles for Alternatives 2, 3 and 4 respectively. The physical closure miles is less than full obliteration.

Wildlife Issue : Project activities (logging, log haul, prescribed burning, and temporary road construction) may cause disturbance to wildlife species of concern				
Indicator	**Alt 1**	**Alt 2**	**Alt 3**	**Alt 4**
Disturbance effects to species of concern	See discussion in Wildlife Resources Section of Chapter 3.	See discussion in Wildlife Resources Section of Chapter 3.	See discussion in Wildlife Resources Section of Chapter 3.	See discussion in Wildlife Resources Section of Chapter 3.

Soil, Water, Riparian, and Aquatic (SWRA) Issue : Proposed activities for roads, vegetation treatments, and prescribed fire may degrade water quality by increasing soil erosion and sediment delivery.					
Indicators		**Alt 1**	**Alt 2**	**Alt 3**	**Alt 4**
Miles of temporary road constructed		0	34.8	27.5	39.8
New temporary road		0	9.7	8.1	8.3
Miles of road realignment and reconstruction		0	11.0	8.8	17.3
Miles of new long-term closures (road storage)		0	17.8	15.0	17.8
Miles of road decommissioned	System	0	16.1	23.3	16.1
	Unauthorized		64.6	64.6	60.6
Acres of mechanical treatment*		0	18,820	16,591	21,308
Acres of prescribed fire		0	24,236	16,618	27,435

Soil, Water, Riparian, and Aquatic: Treatments that propose vegetation treatment and prescribed burning in Riparian Conservation Areas (RCAs) may negatively affect stream temperatures and large woody debris (LWD)				
Indicators	**Alt 1**	**Alt 2**	**Alt 3**	**Alt 4**
Acres of vegetation treatment and prescribed burning within RCAs	0	2,998	2,668	3,624
Acres treated within one site potential tree height	0	12	0	203

*For this indicator, mechanical treatment acres assume only 40% of dry, nonforested will actually receive mechanical treatment (mostly machine piling), as not every acre is in need of conifer removal. Assume 300 acres of machine piling for the shaded fuel break in Alternatives 2 and 4. These acreages are likely still high, as treatment in wet and dry meadows and some RCAs will be done by hand.

Soil, Water, Riparian, and Aquatic: Proposed activities may change timing and duration of peak runoff which may affect bank stability in sensitive channels					
Indicators		**Alt 1**	**Alt 2**	**Alt 3**	**Alt 4**
Total Road Density by subwatershed (All ownership)	Granite Creek	4.6	3.0	2.6	3.1
	Jungle Creek	5.9	5.3	5.3	5.4
	Little Fall Creek	3.4	2.7	2.7	2.8
	Mica Creek	4.8	4.0	4.0	4.1
Number of subwatersheds that are over 25% ECA (High Category)		1	2	2	2

Soil, Water, Riparian, and Aquatic (SWRA): Proposed activities may decrease long-term soil productivity and impair soil-hydrologic function				
Indicators	**Alt 1**	**Alt 2**	**Alt 3**	**Alt 4**
Percent detrimental soil disturbance (DD) within activity areas (Forest Plan Standard SWST02)	The Forest Plan would be attained over time	Compliant with the Forest Plan Standard (with project design features, mitigation measures and BMPs)		
Percent total soil resource commitment (TSRC) across the Project area (Forest Plan Standard SWST03)	3.1	2.3	2.1	2.3
Levels of Coarse Woody Debris (CWD) retained within activity areas for long term soil productivity	Initially unchanged and trend toward desired condition	Trend toward Forest Plan desired conditions as described in Appendix A more quickly than Alternative 1		

Transportation Resources: Proposed activities to the road system (e.g., road closures and decommissioning) may reduce the amount of access to the areas identified in the Forest Plan for active management				
Indicator	**Alt 1**	**Alt 2**	**Alt 3**	**Alt 4**
Suited timber lands within 0.25 miles of a Forest System road (includes closed roads) (Percent Change in Area)	No Change	-7.1	-12.2	-1.9

2.4. Management Requirements

Management requirements are standards project activities must adhere to that are established to protect Forest resources; they may be implemented before, during or after a project to meet Forest Plan and other direction. The proposed action includes the most pertinent management requirements and project design features listed in

Table 2-18 through Table 2-26. Additional applicable management direction (standards and guidelines) for wildlife is listed in the wildlife analysis in Chapter 3 (section 3.4). More management direction, including a complete list of standards and guidelines that apply to all action alternatives, can be found in the Forest Plan (USDA Forest Service 2003a).

Table 2-18. Management Requirements: Forested Vegetation

Management Requirements	Objective	Implementation Mechanism
The activity area shall be used to assess snag and coarse wood conditions for vegetation management actions (USDA Forest Service 2003a, p. III-30, VEST1).	Retain coarse woody debris to maintain soil productivity, ecological function and other benefits	Silvicultural prescription
Vegetation management actions associated with developed recreation shall be designed to meet recreation objectives, not vegetative desired conditions described in Appendix A (USDA Forest Service 2003a, p. III-30, VEST2).	Protect investments in developed recreation areas	Silvicultural prescription
Minimum stocking requirements for plantation certification shall meet those specified by Potential Vegetation Group (PVG) in the Forest Plan (USDA Forest Service 2003a, p. III-42, TRST1).	Ensure adequate stocking and consistency with the National Forest Management Act (NFMA)	Silvicultural prescription
Even-aged regeneration treatments shall not exceed 40 acres and shall be separated by stands not defined as an opening (USDA Forest Service 2003a, p. III-42, TRST2).	Ensure consistency with NFMA	Silvicultural prescription
Openings created by timber harvest will no longer be considered an opening when a new forest stand is established as documented through certification exams (USDA Forest Service 2003a, p. III-43, TRST3).	Ensure consistency with NFMA	Silvicultural prescription
Wood products harvested within Riparian Conservation Areas (RCAs), from high risk landslide prone areas and/or PVG 1, shall not contribute to the Allowable Sale Quantity (USDA Forest Service 2003a, p. III-43, TRST4 and 5).	Ensure treatments on lands determined to be not suited for timber production are designed to meet other resource needs/concerns	Silvicultural prescription

Table 2-19. Management Requirements: Soil, Water, Riparian, and Aquatic Resources

Management Requirements	Objective	Implementation Mechanism
Trees that are felled within Riparian Conservation Areas (RCAs) must be left unless determined not to be necessary for achieving soil, water, riparian and aquatic desired conditions. Felled trees or snags left in RCAs shall be left intact unless resource protection or public safety requires bucking them into smaller pieces (USDA Forest Service 2003a, p. III-22, SWST10).	Retain large woody debris in riparian areas to be available for sediment filtering, recruitment in streams, and for soil needs	Contract specifications
Do not store fuel or other toxicants or perform refueling within RCAs. Exceptions must have authorization of Fish Biologist or Hydrologist and have approved spill containment plan commensurate with the amount of fuel stored (USDA Forest Service 2003a, p. III-22, SWST11).	Reduce potential for fuel spills that could affect fish or fish habitat	Contract specifications
Management actions shall be designed in a manner that maintains or restores water quality to fully support beneficial uses and native and desired non-native fish species and their habitat (USDA Forest Service 2003a, p. III-21, SWST01).	Design and implement management programs and plans that will restore water quality and watershed function to support beneficial uses	Project design
Apply Best Management Practices (BMPs) as described in the National Core BMP Technical Guide (USDA Forest Service 2012; Forest Service Manual [FSM] 2550).	Reduce or minimize effects of management activities on soil and water resources	Contract specifications, mitigation measures
Maintain detrimental disturbance levels at 15% or less within activity areas following completion of proposed activities (USDA Forest Service 2003a, p. III-21, SWST02, FSH 2509.18).	Maintain the physical, chemical, and biological properties of soils to support desired vegetation conditions and soil-hydrologic functions and processes within watersheds	Contract specifications, mitigation measures
Apply mitigation and restoration measures within the activity area so that total soil resource commitment (TSRC) levels are moved back toward 5% or less following completion of the activities (USDA Forest Service 2003a, p. III- 21, SWST03).	Limit the extent of soil committed to non-productive land uses, such as roads and landings, to the minimum necessary for Forest management; maintain soil productivity and ecological processes where functioning properly, and restore where currently degraded	Contract specifications, mitigation measures
Neither degrade nor retard attainment of properly functioning soil, water, riparian, and aquatic desired conditions except where outweighed by demonstrable short or long-term benefits to watershed resource conditions or where the Forest Service has limited authority (such as access roads) (USDA Forest Service 2003a, p. III-22, SWST04, FSH 2520).	Maintain surface and ground water in streams, lakes, wetlands, and meadows to support healthy riparian and aquatic habitats; stability and effective function of stream channels; and downstream uses. Restore and maintain flow regimes sufficient to create and sustain soil-hydrologic and water quality conditions; and riparian, aquatic and wetland habitat; and to achieve patterns of sediment, nutrient, and large woody debris routing within their inherent range of capability.	Project design, contract specifications, mitigation measures

Management Requirements	Objective	Implementation Mechanism
Within legal authorities, ensure that new proposed management activities within watersheds containing 303(d) listed waters improve or maintain overall progress toward beneficial use attainment for pollutants that led to the listing (USDA Forest Service 2003a, p. III-22, SWST07).	Manage water quality to meet requirements under the Clean Water Act, with special emphasis on de-listing water quality limited waters under section 303(d) and supporting stated development and implementation of Total Maximum Daily Loads (TMDLs)	Project design, contract specifications, mitigation measures
Conduct field verification to delineate perennial and intermittent streams, seeps, springs, and bogs for riparian and wetland buffers (FSM 2520).	Ensure protection of riparian areas and wetlands	Level II Riparian Inventory mapping to determine flow regime. Timber sale layout will further verify flow regime and delineations and determine project design.
Conduct site-specific analysis or field verification of landslide-prone models to identify landslide prone areas in proposed management areas that may alter soil- hydrologic processes. Design management actions to avoid the potential for triggering landslides (USDA Forest Service 2003a, p. III-23, SWST12).	Avoid altering vegetation or hydrologic conditions on landslide prone areas, which could increase probability of slope failure	Project design, mitigation measures

Table 2-20. Management Requirements: Wildlife

Management Requirements	Objective	Implementation Mechanism
The Forest shall consult with the National Marine Fisheries Service and Fish and Wildlife Service as needed and appropriate to comply with consultation requirements under the Endangered Species Act and Magnuson-Stevens Act (USDA Forest Service 2003a, p. III-11, TEST01).	Fulfill requirements for consultation regulations	Project design
Design and implement projects to meet the terms of Forest Service-approved portions of recovery plans. If a recovery plan does not yet exist, use the best information available (for example, Biological Assessments, Biological Opinions, letters of concurrence, Forest Service-approved portions or Conservation Strategies) until a recovery plan is written and approved (USDA Forest Service 2003a, p. III-11, TEST03).	Ensure the project components meet the intent of the Forest Plan	Project design
Mitigate, through avoidance or minimization, management actions within known nesting, wintering, or roosting sites of threatened, endangered, proposed, and candidate (TEPC) species if those actions would adversely affect the survival of wintering or roosting populations. During project planning, determine sites, periods, and appropriate mitigation measure to avoid or minimize effects (USDA Forest Service 2003a, p. III-11, TEST13).	Comply with mitigation measures designed to avoid disturbance of nesting, wintering, or roosting sites	Project design
Unless a broad-scale assessment has been completed that substantiates different historical levels of unsuitable habitat, limit disturbance within each Lynx Analysis Unit (LAU) as follows: If more than 30% of lynx habitat within a LAU is currently in unsuitable condition, no additional habitat may be changed to unsuitable habitat as a result of vegetative management projects. Fire use or fire hazard reduction and associated vegetation management activities within the wildland urban interface watersheds that develop or maintain fuel profiles needed to reduce the risk of wildfire threats to the wildland urban interface areas are NOT bound by this standard (USDA Forest Service 2003a, p.III-27, TEST13).	Conservation of Canada lynx (listed under the Endangered Species Act [ESA]) and lynx habitat; compliance with the Canada Lynx Conservation Assessment and Strategy (Interagency Lynx Biology Team 2013)	Project design
Mitigate management actions within known nesting or denning sites of Management Indicator Species (MIS) or Sensitive Species if those actions would disrupt the reproductive success of those sites during the nesting or denning period (USDA Forest Service 2003a, p. III-27, WIST03).	Conservation of sensitive species	Project design, monitoring, contract specifications
In northern goshawk territories with known active nest stands, identify alternate and replacement nest stands during project-level planning when it is determined that the proposed activity is likely to degrade nest stand habitat (USDA Forest Service 2003a, p. III-11, WIST05).	Conservation of sensitive species	Project design, monitoring, contract specifications

Management Requirements	Objective	Implementation Mechanism
The northern Idaho ground squirrel will receive priority consideration for all management activities that occur within their known occupied habitat. The intent of this standard is not to exclude all other activities within this habitat, but rather to reduce or minimize potential impacts to this species while emphasizing habitat improvement within and adjacent to known sites (USDA Forest Service 2003a, pp. III- 132,161; Standards 0339, 0529).	Conservation of ESA-listed species	Project design, monitoring, contract specifications
An increase in habitat for the white-headed woodpecker or flammulated owl may be achieved by the following methods: a) reducing tree densities and ladder fuels under and around existing large ponderosa pine trees and snags to reduce the risk of tree-replacing fire and b) restoring more open canopy conditions (USDA Forest Service 2003a, pp. III- 133, 149; Guidelines 0341, 4442).	Restoration of habitat for sensitive species	Project design

Table 2-21. Management Requirements: Range Resources

Management Requirements	Objective	Implementation Mechanism
After completing vegetation treatments, livestock grazing practices (for example, salting locations, rest, temporary closure of stock water, herding, season of use, duration, and temporary electric fencing) may be altered as needed to hasten or enhance site recovery or treatment (USDA Forest Service 2003a, p. III-46, RAGU03).	Minimize impacts from livestock grazing	Annual operating instructions

Table 2-22. Management Requirements: Noxious Weeds

Management Requirements	Objective	Implementation Mechanism
All seed used on National Forest System (NFS) lands will be certified to be free of seeds from noxious weeds listed on the current All States Noxious Weeds List (USDA Forest Service 2003a, p. III-36, NPST02).	Prevent invasion/expansion of noxious weeds	Project design, contract specifications, mitigation measures
Revegetate areas, as designated by the Forest Service, where the soil has been exposed by ground-disturbing activity. Implement other measures, as designated by the Forest Service, to supplement the influence of re- vegetation in preventing the invasion or expansion of noxious weeds. Earth-disturbing equipment used on NFS lands shall be cleaned to remove all visible plant parts, dirt, and material that may carry noxious weed seeds. Cleaning shall occur prior to entry onto the project area and again upon leaving the project area, if the project area has noxious weed infestations (USDA Forest Service 2003a, p. III-36, NPST03).	Prevent invasion/expansion of noxious weeds	Project design, contract specifications, mitigation measures
Materials such as hay, straw, or mulch that are used for rehabilitation and reclamation activities shall be free of noxious weed seed, and shall comply with the 1995 weed-free forage special order against use of non- certified hay, straw, or mulch. Materials that are not covered under a weed seed free certification, and that have the potential to contain noxious weed seed, shall be inspected and determined to be free of weed seed before purchase and use (USDA Forest Service 2003a, p. III-36, NPST06).	Prevent invasion/expansion of noxious weeds	Project design, contract specifications, mitigation measures
Gravel or borrow material source sites with noxious weed species present shall not be used, unless effective treatment or other mitigation measures are implemented (USDA Forest Service 2003a, p. III-37, NPST08).	Prevent invasion/expansion of noxious weeds	Project design, contract specifications, mitigation measures
The Forest shall comply with the intent and direction established in the above provisions or clauses in a manner similar to that required of contractors or permittees (USDA Forest Service 2003a, p. III-37, NPST09).	Prevent invasion/expansion of noxious weeds.	Project design, contract specifications, mitigation measures
Projects that may contribute to the spread or establishment of noxious weeds shall include measures to reduce the potential for spread and establishment of noxious weed infestations (USDA Forest Service 2003a, p. III-37, NPST10).	Prevent invasion/expansion of noxious weeds.	Project design, contract specifications, mitigation measures

Table 2-23. Management Requirements: Threatened, Endangered, and Sensitive (TES) Plants

Management Requirements	Objective	Implementation Mechanism
Management actions that occur within occupied, sensitive plant species habitat must incorporate measures to ensure habitat is maintained where it is within desired conditions, or restored where degraded (USDA Forest Service 2003a, p. III- 33, BTST01).	Minimize negative impact to sensitive plant habitat; restore degraded habitat	Project design

Table 2-24. Management Requirements: Cultural Resources

Management Requirements	Objective	Implementation Mechanism
Avoid all known cultural sites during project implementation. If a new cultural site is discovered during the project, stop activities in the area until a Forest Service archaeologist evaluates the site and its importance. Apply any protective measures recommended (National Historic Preservation Act; Forest Service Manual; USDA Forest Service 2003a, pp. III-69 to III-70).	Protect cultural resources until they can be evaluated for eligibility for the National Register of Historic Places	Project design

Table 2-25. Management Requirements: Recreation

Management Requirements	Objective	Implementation Mechanism
All projects shall be designed to meet the adopted Visual Quality Objectives (VQOs) as displayed on the Forest VQO map (USDA Forest Service 2003a, p. III – 67, SCST01).	Protect or enhance Forest scenic value.	Project design

2.5. Project Design Features / Mitigation Measures

Project design features are designed to avoid, reduce, or eliminate undesirable effects. Mitigation measures are designed to rectify or compensate for undesirable effects from proposed activities. Unless noted otherwise in the decision document, the project design features / mitigation measures are mandatory if the Responsible Official selects an action alternative for implementation.

The project design features / mitigation measures listed in Table 2-26 through **Error! Reference source not found.** are practices the IDT developed during this project analysis to address site-specific environmental concerns and to meet Forest Plan Standards and Guidelines. Each feature or measure includes a description, the objective, applicable Forest Plan Standard/Guideline (USDA Forest Service 2003a), the enforcement mechanism and person(s) responsible for enforcement, and an effectiveness rating with the basis for that rating.

NEPA regulations (40 CFR 1508.20 Mitigation) state the following:

"Mitigation" includes

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environments.

Project design features were created to use design criteria to prevent the need of a mitigation measure.

Project design feature / mitigation effectiveness is rated as follows for this project:

- High—Highly effective (estimated at greater than 90%) at meeting the objective, and one or more of the following types of documentation or rationale is available:
  - Research or literature
  - Administrative studies
  - Experience: professional judgment of an expert
  - Fact: evident by logic or reason
- Moderate—Moderately effective (estimated at 60% to 90%), and its effectiveness is supported either by evidence or logic. Implementation of this project design feature or mitigation needs to be monitored, and it may be modified if needed to achieve its objective.
- Low—Somewhat effective (estimated at less than 60%), but its effectiveness is not supported by substantial evidence; or, professional judgment indicates limited success in implementation or meeting objectives. Implementation of this project design feature or mitigation needs to be monitored, and it may be modified if necessary to achieve its objective.

Table 2-26. Project Design Features and Mitigation Measures for Wildlife

#	Project Design Feature	Objective	Effectiveness and Basis	Applicable Forest Plan Standard/Guide	Enforcement
	Wildlife				
1	Prior to any ground-disturbing activity, including, but not limited to the construction of log landings, vehicle turnouts or parking areas, skid trails, or road construction and maintenance, road decommissioning and obliteration, and prescribed burning, the Wildlife Biologist or designated Wildlife Staff, should conduct onsite surveys at least 3 times during a 7-day period in potential NIDGS habitat to determine the presence of Northern Idaho Ground Squirrel (NIDGS). Surveys would be conducted to identify the presence of NIDGS in, or within harvest units and prescribed fire areas. The Wildlife Biologist would determine potential habitat areas to be surveyed based on GIS maps, aerial photos, and professional expertise. If occupied NIDGS sites are discovered, additional measures described below would be implemented to minimize potential effects: • Mechanical thinning operations, skidding, decking, slash piling, and prescribed burning is prohibited in occupied NIDGS sites without approval by the Wildlife Biologist. If necessary, project activities may be shifted to a time period outside the NIDGS above-ground activity period (April 1 to August 15). If project activities are shifted to the fall season, Wildlife staff would identify NIDGS dens with pin flags and coordinate all activities in these known sites. Fall activities would be allowed only if soil moisture levels are dry enough to prevent soil damage from machinery, as determined by the Sale Administrator, Wildlife Biologist and Timber Management Assistant (TMA). If wet soil conditions prevent project activities in fall, the activities may be shifted to winter. This would require at least 18 inches of firm snow and/or 4 inches of frozen soil prior to activity approval by the Sale Administrator, Wildlife Biologist and TMA. If project activities at any NIDGS site cannot be appropriately mitigated, that project unit and the associated project activities may be dropped from the timber sale. • In harvest units where NIDGS are found, ground-disturbing activities should occur in the time period from September 1 through March 15.	Provide protection to federally listed NIDGS, feeding sites, seasonal burrows, late summer estivation dens, and winter hibernacula	HIGH: research, literature, Forest Plan, agency direction, logic	TEST01 TEST02 TEST03 TEST06 TEST12 TEST13 TEGU01 TEGU02 TEGU06 WIGU01	Timber Sale Contract, Wildlife Biologist, Timber Management Assistant, Sale Administrator, Burn Plan, Fire Management Officer

#	Project Design Feature	Objective	Effectiveness and Basis	Applicable Forest Plan Standard/Guide	Enforcement
Wildlife					
2	If occupied NIDGS sites are found adjacent to haul routes on NFS lands, a speed limit of 15 mph would be recommended where determined necessary by the Wildlife Biologist. Monitoring would also be required. If speed limits, or other protections, are needed on County or State roads, the Forest Service would work with the appropriate agencies to resolve the issue.	Provide protection to federally listed NIDGS from vehicle-caused mortality	MODERATE: research, literature, Forest Plan, agency direction, logic	TEST01 TEST02 TEST03 TEST06 TEST12 TEGU01 TEGU02 TEGU06 WIGU01 WIGU04	Timber Sale Contract, Wildlife Biologist, Timber Management Assistant, Sale Administrator, Burn Plan, Fire Management Officer
3	In harvest units with known NIDGS sites, slash piles created from harvest activities must be removed from landings not later than March 15 of the year immediately following the harvest year in each of these units.	Provide protection to federally listed NIDGS from direct mortality from slash piles, machinery, vehicles, or slash burns	MODERATE: research, literature, Forest Plan, agency direction, logic	TEST01 TEST02 TEST03 TEST06 TEST12 TEGU01 TEGU02 TEGU06 WIGU01 WIGU04	Timber Sale Contract, Wildlife Biologist, Timber Management Assistant, Sale Administrator, Burn Plan, Fire Management Officer

#	Project Design Feature	Objective	Effectiveness and Basis	Applicable Forest Plan Standard/Guide	Enforcement
	Wildlife				
4	Known northern goshawk nests would be protected within a 30-acre forested nest stand as determined by the Wildlife Biologist in coordination with the Sale Administrator and the TMA. All activities within these nest stands would be restricted to those approved by the Wildlife Biologist and coordinated with the Sale Administrator and the TMA. During operations, if a new northern goshawk nest is located, onsite activities would be halted until a survey by Wildlife Staff can determine if the nest is active. A 30-acre forested nest stand would be identified, as above. If the nest is active, harvest activities in that 30 acres would be halted until the end of the nesting season (March 1 to Sept. 30). Harvest activities may resume earlier than Sept. 30 if the Wildlife Biologist determines that the birds are no longer present. All identified northern goshawk nest stands would have a post-fledgling area (PFA) of at least 600 acres and a foraging area of at least 6,000 acres identified by the Wildlife Biologist in consultation with the TMA. Within each PFA, 5 other nest stands would be identified by the Wildlife Biologist. These nest stands would have the same restrictions on human activities as noted above. The PFAs and foraging areas may have other activity restrictions applied from March 1 to Sept. 30, depending on site-specific information, and as determined by the Wildlife Biologist in coordination with the Sale Administrator and TMA . Refer to the Project Record for nest site locations and associated units	Provide protection to northern goshawk, nests, PFAs, and foraging areas	HIGH: research, literature, Forest Plan, agency direction, logic	WIST02 WIST03 WIST04 WIST05 WIGU01 WIGU05 WIGU06 WIGU07 Forest Service General Technical Reports RM-217 and PNW-GTR-733 as required by the Forest Plan	Timber Sale Contract, Wildlife Biologist, Timber Management Assistant, Sale Administrator, Burn Plan, Fire Management Officer

#	Project Design Feature	Objective	Effectiveness and Basis	Applicable Forest Plan Standard/Guide	Enforcement
Wildlife					
5	Any temporary roads or closed National Forest System (NFS) roads physically opened for access to project activities that would remain open during elk rifle season would be blocked with a temporary gate or other physical closure during use and until once again permanently closed or obliterated following management activities.	Minimize negative effects on wildlife; ensure contractors and employees do not have unfair advantage during hunting seasons; minimize damage to native surface roads that could result in increased erosion and sediment delivery	HIGH: research, literature, Forest Plan, agency direction, logic	TEST01 WIST02 WIST03 WIGU01 WIGU02 WIGU05 WIGU06 WIGU08 WIGU13 SWST04	Timber Sale Contract, Wildlife Biologist, Sale Administrator, Engineering Contract Administrator
6	In areas closed to public motorized access, prohibit contractors and their employees from access with motorized vehicles for purposes other than implementing contract or other authorized FS activities.	Minimize negative effects on wildlife; ensure contractors and employees do not have unfair advantage during hunting seasons	HIGH: research, literature, Forest Plan, agency direction, logic	TEST01 WIST02 WIST03 WIGU01 WIGU02 WIGU05 WIGU06 WIGU08 WIGU13	Timber Sale Contract, Wildlife Biologist, Sale Administrator, Burn Plan, Fire Management Officer

#	Project Design Feature	Objective	Effectiveness and Basis	Applicable Forest Plan Standard/Guide	Enforcement
	Wildlife				
7	Prior to any ground-disturbing activity, including, but not limited to, the construction of log landings, vehicle turnouts or parking areas, skid trails, road construction or maintenance, and prescribed fire, the Wildlife Biologist, or designated Wildlife Staff, must conduct onsite surveys to identify threatened, endangered, proposed, or candidate species; Management Indicator Species (MIS); or Sensitive species presence. In particular, spring surveys would be used to identify wildlife reproduction sites, such as elk calving, deer fawning, mammal denning, and bird nesting. Project activities may be altered to protect the wildlife species, as practicable, using measures approved by the Wildlife Biologist, following coordination with the TMA, Fire Management Officer, and Sale Administrator. Mitigate management actions within known nesting or denning sites of MIS or Sensitive Species if those actions would disrupt the reproductive success of those sites during the nesting or denning period.	Minimize negative effects on wildlife, especially during reproductive periods	MODERATE: Forest Plan, agency direction, logic	TEST06 TEST12 TEST13 WIST03	Timber Sale Contract, Wildlife Biologist, Sale Administrator, Burn Plan, Fire Management Officer
8	Provide a radius of 2 elk sight distances (total of 400 ft) of vegetation (where available and practicable) to protect mineral licks and elk wallows. No harvest or prescribed burning would be allowed in these sites, without approval by the Wildlife Biologist. Exact boundaries of each protected site would be identified by the Wildlife Biologist, following coordination with the TMA, Fire Management Officer, and Sale Administrator.	Minimize negative effects on wildlife, address big game vulnerability to hunting mortality, and to provide adequate habitat security	HIGH: research, literature, Forest Plan, agency direction, logic	WIGU13	Timber Sale Contract, Wildlife Biologist, Sale Administrator, Burn Plan, Fire Management Officer
9	During timber harvest, retain existing snags with the following stipulations: Timber contract provision would specify to leave standing dead trees. Snags would not be cut without permission of the Sale Administrator unless there is a safety or emergency situation.	Ensure habitat for snag-dependent species.	MODERATE: research, literature, administrative studies, logic	WIGU01	Timber Sale Layout, Contract, Administrator, Wildlife Biologist

#	Project Design Feature	Objective	Effectiveness and Basis	Applicable Forest Plan Standard/Guide	Enforcement
Wildlife					
10	Retain PVG 6 clumps within 300 ft of meadow habitat, where known great gray owl nesting and rearing sites exist prior to vegetation or prescribed fire treatments. Great gray owl nesting and rearing sites identified during treatment activities may require protected activity centers (PACs) to retain nesting and rearing habitat that is sufficient to rear fledgling great gray owls. PACs will retain PVG 6 clumps within 300 ft of meadow habitat. In either case, nest and roosting trees or snags will be retained.	Minimize negative effects on wildlife, especially during reproductive periods	HIGH: research, literature, Forest Plan, agency direction, logic	TEST12 WIGO01 WIGO02 WIGO03 WIGO04 WIOB01 WIOB03 WIOB07 WIOB09 WIST01 WIST02 WIST03 WIST04 WIGU01 WIGU05	Timber Sale Contract, Wildlife Biologist, Sale Administrator, Burn Plan, Fire Management Officer

Table 2-27. Project Design Features and Mitigation Measures for Botanical Resources

#	Project Design Feature	Objective	Effectiveness and Basis	Applicable Forest Plan Standard/Guide	Enforcement
Botanical Resources					
11	Prior to any ground-disturbing activity, including, but not limited to, the construction of log landings, biomass storage, vehicle turnouts or parking areas, skid trails, road construction or maintenance, and prescribed fire, the Forest Botanist, or designated staff, must conduct onsite surveys where rare plant habitat occurs, to identify Sensitive plant populations. Project activities may be altered to protect the rare species, using measures approved by the Forest Botanist and coordinated with the Timber Management Assistant, Fire Management Officer, and Sale Administrator.	Maintain or restore occupied rare plant habitat	MODERATE: Forest Plan, agency direction, logic	TEST06 TEST12 TEST13 WIST03, BTST01 BTGU01	Timber Sale Contract, Wildlife Biologist, Sale Administrator, Burn Plan, Fire Management Officer, Forest Botanist
12	All existing rare plant populations within the activity area would be designated for protection by a Botanical Specialist prior to project implementation.	Avoid risk to rare plant sites	HIGH: logic	BTGU01	Forest Botanist

Table 2-28. Project Design Features and Mitigation Measures for Soil, Water, Riparian and Aquatic Resources

#	Project Design Feature	Objective	Effectiveness and Basis	Applicable Forest Plan Standard/Guide	Enforcement
13	The Project has selected Option 2, as directed in the Forest Plan, Appendix B (USDA Forest Service 2003a), in the step down process for Riparian Conservation Areas (RCAs). Option 2 uses two site-potential tree heights (240 feet) for perennial streams and intermittent streams providing fish habitat. One site-potential tree height (120 feet) would be applied to intermittent streams not providing seasonal fish habitat, springs, ponds, lakes and wetlands. A 30-foot RCA distance would be applied to seeps. Any previously unmapped RCA discovered during implementation would be delineated. Limited equipment use and harvest would be allowed in the outer half of RCAs in stands identified and approved for RCA thinning as described in The RCA Thinning Guidelines (Appendix 5, DEIS). Project design features listed above would still apply to minimize ground disturbance. No harvest or related equipment operations allowed within the RCA distances described above unless on existing road prism or skid trail or over frozen and snow covered soils. Any of these scenarios would require approval by a Fisheries Biologist or Hydrologist. No mechanized equipment, new skid trails, temporary roads or landings allowed within RCAs unless evaluated and approved by a Fisheries Biologist or Hydrologist. Hydrologist, Soils Scientist and/or Fisheries Biologist would provide required mitigations to maintain watershed condition indicators including but not limited to chipping the landing material, rehabilitating skid trails and landings within the same year of use, and leaving trees cut during landing construction. RCA treatment prescriptions would be developed with the Fisheries Biologist and Hydrologist to ensure riparian functions are maintained. RCAs discovered during layout may be considered for treatment if they meet the intent of RCA treatments and all project design features and restrictions can be adhered to.	Maintain riparian function	HIGH: experience, logic, Belt et al. 1992, McDade et al. 1990, Gregory et al. 1991	SWST01 SWST04 SWST10	Sale Administrator, Timber Sale Contract Provision, Fisheries Biologist or Hydrologist

#	Project Design Feature	Objective	Effectiveness and Basis	Applicable Forest Plan Standard/Guide	Enforcement
14	Prohibit yarding of logs across streams unless fully suspended above the stream channel. Minimize skyline corridors and require full suspension within RCAs (including landslides and landslide prone areas). Sale Administrator would coordinate with Fisheries Biologist and/or Hydrologist prior to identifying skyline corridors where felling of trees would be necessary within RCAs. These trees would be left in place outside of harvest units.	Maintain channel integrity	HIGH: logic, experience	SWST10	Design and Layout, Contract, Administrator
15	No storage of fuel or refueling within RCAs unless approved by a Fisheries Biologist and/or Hydrologist. Unattended equipment should not be parked in RCAs. Timber sale contract provisions (as well as other contracts) shall require a spill response plan be included in the contract to meet state Best Management Practices (BMPs).	Minimize potential for fuel spill in stream	HIGH: logic	SWST01 SWST04 SWST11	Sale Administrator, Harvest Inspector, Timber Sale Contract Provision, Fisheries Biologist or Hydrologist

#	Project Design Feature	Objective	Effectiveness and Basis	Applicable Forest Plan Standard/Guide	Enforcement
16	No active ignition of prescribed fire in RCAs unless approved by Fisheries Biologist and/or Hydrologist. Instances where active ignition may occur could include areas that would minimize severity and intensity and where active ignition could take the place of fire line construction. Ladder fuel treatments (limbing and noncommercial understory thinning by hand) conducted as part of prescribed burning activities may be implemented to protect the overstory from effects of prescribed fire and to meet prescribed fire objectives. This would mostly involve thinning from below and tree limbing. Trees >6 inches diameter at breast height (DBH) would be limbed to approximately 8 feet above the ground. Minimal alteration of the overstory is expected. Ladder fuel treatments in RCAs would only occur in areas where prescribed fire is expected to be implemented and would not occur within riparian vegetation. No ladder fuel treatment would occur within the inner RCA unless approved by a Fisheries Biologist and/or Hydrologist. Slash produced by ladder fuel treatments would be lopped and scattered or hand piled as directed by a Fisheries Biologist, Soils Scientist and/or Hydrologist. No construction of mechanical fireline shall occur in RCAs and handline should be minimized. Promptly reclaim all fireline following burn activities. Reclamation activities shall include, but are not limited to, placing waterbars, pulling material removed (including mineral soil) back onto fireline and pulling slash as available onto the surface. All burn plans and anticipated ladder fuel treatments shall be annually reviewed by District Resource Specialists. Additional site-specific concerns regarding prescribed fire treatments would be addressed at that time.	Minimize loss of shade to perennial stream channels	HIGH: experience	SWST01 SWST04 SWST07 FMGU06	Fuels Specialist, Burn Boss, Fisheries Biologist, or Hydrologist
17	When constructing or reconstructing roads within RCAs or installing culverts on intermittent or ephemeral channels, use wood straw, jute matting or other erosion control measures as deemed necessary by a fisheries biologist or hydrologist. For culvert installations also see Project Design Features 22 through 27. Add gravel or surface 100 feet on new or reconstruction on either side of intermittent and perennial streams where necessary.	Minimize sediment delivery to channel	HIGH: experience, logic, Burroughs and King 1989, Foltz 2007	SWST01 SWST04	Timber Sale Contract, Sale Administrator, Harvest Inspector Fisheries Biologist, Hydrologist

#	Project Design Feature	Objective	Effectiveness and Basis	Applicable Forest Plan Standard/Guide	Enforcement
18	Roads identified for obliteration, including unauthorized roads used as temporary roads as well as those being obliterated for soil and water restoration, would be decompacted a depth of 16 inches or the extent possible, recontoured, blended with the surrounding terrain, seeded with native seed (where need is identified), and provided with a minimum of 50% to maximum of 80% ground cover (vegetation transplants at a rate of 15 per 100 linear feet, natural mulch, coarse woody debris (CWD), and ag or wood straw, in that order of preference) to an extent deemed necessary by a Fisheries Biologist and/or Hydrologist. In addition to the above treatment, stream crossings would receive planted vegetation plugs and additional ground cover to an extent deemed necessary by a Fisheries Biologist and/or Hydrologist, to reduce erosion, facilitate recovery of soil biological function and stabilize streambanks. Retained travelway would be effectively closed at entrance to prevent unauthorized use. Newly constructed temporary roads would not require vegetation transplants.	Minimize sediment delivery to channel and rehabilitate riparian area; reduce levels of total soil resource commitment	HIGH: experience, logic, Burroughs and King 1989, Foltz 2007; experience, local monitoring	SWST01 SWST04 SWST03(b) SWST08	For Temporary Roads–Sale Administrator and/or Harvest Inspector For All Roads–Timber Sale Contract Provisions, Hydrologist, Fisheries Biologist, Wildlife Biologist
19	If snow conditions allow, use a snow bridge as an alternative to road construction and culvert placement. Where a temporary culvert is needed in a temporary road, it would be removed within the same field season unless approved by the Fisheries Biologist and/or Hydrologist.	Minimize sediment delivery to channel and rehabilitate riparian area; reduce levels of total soil resource commitment	HIGH: experience, logic, Burroughs and King 1989, Foltz 2007; experience, local monitoring	SWST01 SWST04 SWST03(b) SWST08	Sale Administrator, Harvest Inspector Timber Sale Contract Provisions
20	System roads scheduled for long-term closure would be physically closed to prohibit motorized use, most often by recontouring the first 100 feet or line of sight from the entrance. Additional treatments would include scarifying the driving surface, seeding or hydro-mulching where necessary, installing water bars as needed and pulling culverts where necessary. Roads not identified for long-term closure that may be needed for administrative use in the more immediate future would be closed by installing water bars as needed, where needed, and physically closing to prohibit motorized use.	Reduce long term sediment production	HIGH: logic, experience, local monitoring, Foltz and Maillard 2003	SWST01 SWST04 SWST08	Fisheries Biologist, Soil Scientist, Hydrologist

#	Project Design Feature	Objective	Effectiveness and Basis	Applicable Forest Plan Standard/Guide	Enforcement
21	Add gravel or surface 100 feet on either side of intermittent and perennial channels on all new construction except where it is determined that existing shallow, rocky soils would provide sufficient protection from erosion. Spot rocking and armored dips would also be incorporated into road designs by project engineers.	Reduce long term sediment production	HIGH: experience, logic, Belt et al. 1992	SWST01 SWST04 SWST08	Engineer, Hydrologist, Fisheries Biologist
22	Install culvert or other crossing structures on natural channels after spring peak flows; the Fisheries Biologist or Hydrologist would determine when dewatering the channel is necessary. For permanent culverts, incorporate elements of the natural channel, such as substrate size and gradient, when reconstructing channel where fish habitat or potential fish habitat exists. The following permits shall be acquired prior to project implementation: Variance letter to exceed turbidity levels from Idaho Department of Environmental Quality, Stream Channel Alternation Permit from Idaho Dept. of Water Resources. In addition, a 404 Dredge and Fill Permit would be obtained from the USACE.	Minimize effects to fish and fish habitat	HIGH: logic, experience	NA	Fisheries Biologist or Qualified Designee. Hydrologist, Wildlife Biologist
23	Stream channels shall be dewatered prior to in-stream work with heavy machinery. The stream would likely be diverted using a temporary corrugated plastic or metal pipe and a temporary cofferdam. If water drafting is necessary, screen opening size would be the standard 3/32-inch or smaller (as required by the Forest Plan; USDA Forest Service 2003a). The culvert design team would specify stockpiling and staging areas; access to the site would be via an established roadway. Some trees may have to be felled within the RCA to complete construction; however, the number of trees cut shall be minimized to the extent possible.	Minimize effects to fish and fish habitat	HIGH: logic, experience	NA	Fisheries Biologist or Qualified Designee, Contract Administrator
24	Block nets shall be installed, and fish observed within the project area would be cleared from the area using dipping, seining and/or electrofishing methods. Fish would be transported to an unaffected portion of the creek above the in-stream work and released. Block nets would be removed after fish removal.	Minimize effects to fish and fish habitat	HIGH: logic, experience	NA	Fisheries Biologist or Qualified Designee, Contract Administrator

#	Project Design Feature	Objective	Effectiveness and Basis	Applicable Forest Plan Standard/Guide	Enforcement
25	During culvert installation activities on natural channels, a spill containment kit would be available on site and able to accommodate potential spills from the equipment used during implementation. No fuels would be stored in RCAs, unless there is no other alternative. Refueling or servicing of vehicles or equipment would not take place in RCAs. All equipment would be in good repair and free of leakage of lubricant, fuels, coolants and hydraulic fluid. In-stream work with heavy machinery would be minimized to the extent possible. Detectable sheens shall be reported to the EPA, any spills over 25 gallons shall be reported to IDEQ.	Minimize effects to water quality	HIGH: logic, experience	SWST01 SWST04 SWST11	Contract Administrator
26	During culvert installation, Sedimats or similar containment system would be placed within the natural channel to collect released fine sediments and minimize effects to downstream segments. These would be removed from the channel at the conclusion of activities. Sediment control measures may also include erosion control matting, mulch, straw wattles, straw bales and/or slash. The culvert/bridge installation and associated activities would be conducted in a manner that would minimize the potential for input of additional fine sediment or effecting riparian habitat; the Forest Service shall design a site-specific erosion control plan that suits the contracted activity. For Aquatic Organism Passage (AOP) culverts, stream simulation material would be washed (i.e., sprayed with water using pump and hose setup), to set fine material prior to reintroduction of flow. Flow would slowly be reintroduced into the streambed to minimize loss of downstream surface water and to minimize turbidity.	Minimize effects to water quality	HIGH: logic, experience	FRST05	Contract Administrator
27	Culvert replacement/removal site rehabilitation may include seeding and mulching disturbed areas and planting with native vegetation. Straw wattles may also be used to stabilize the road fill. All project-related materials and waste shall be removed from the site when construction is complete.	Reduce erosion	HIGH: logic, experience	NA	Contract Administrator
28	During installation of the vault toilets, if located in RCAs, follow programmatic consultation.	Reduce erosion	HIGH: logic, experience	NA	Contract Administrator
29	Locate and approve water drafting sites prior to use. The project Fisheries Biologist and/or Hydrologist must approve the sites. No vehicles allowed in stream courses at any time for the purpose of withdrawing water. Drafting hoses would be required to be fitted with screens with a 3/32-inch mesh.	Minimize impacts to stream channels, RCAs, and fisheries	HIGH: logic, experience	SWST01	Fisheries Biologist, Hydrologist

#	Project Design Feature	Objective	Effectiveness and Basis	Applicable Forest Plan Standard/Guide	Enforcement
30	New trail crossings (including fords and bridges) associated with the trail reroutes would be designed to allow passage of all aquatic organisms and shall comply with SWST08. Armor potential erosion sites (e.g. trail approaches) with appropriate rock or other erosion control measure. Select the site for the crossing to minimize effects to aquatic resources. Follow bridge/culvert project design features outlined above if the crossing would involve a bridge.	Allow passage of and minimize effects to aquatic organisms	HIGH: logic, experience	SWST08	Fisheries Biologist, Hydrologist
31	Utilize all applicable BMPs and Soil Water Conservation Practices (SWCPs) for harvest and road activities.	Reduce/limit levels of soil disturbance, erosion and potential sedimentation; meet requirements of State of Idaho Non-point Source Pollution Management Plan; maintain water quality and associated beneficial uses	HIGH: National Core BMP Technical Guide, Vol. I (FS-990a); local monitoring	SWST01 SWST02 SWST03 SWST04 SWGU08	Timber Sale Design and Layout, Sale Administrator

#	Project Design Feature	Objective	Effectiveness and Basis	Applicable Forest Plan Standard/Guide	Enforcement
32	Ground-Based Harvesting — Off-Road Jammer Required: • Logs on slopes 35% and greater, or where feller bunchers are restricted would be winched to designated skid trails. Tractors may also be used for skidding in portions of units that are <35% slope when approved by Forest Service (see skidding tractor requirements below). Ground-Based Harvesting — Skidding Tractor Required. • Tractor skidding and use of feller-bunchers and excavators is allowed on slopes up to 35%. Limited use of tractors, feller-bunchers, and excavators on slopes between 35% and 45% may be allowed with approval of a Forest Service Soil Scientist. • The Forest Service would determine when the soils are too wet to operate. Approval of ground-based equipment operations (including feller-bunchers and excavators) would only be considered when unacceptable soil rutting, displacement, or compaction would not occur and: 1) soil moisture is below 20% (determined when soil is dry to the touch and does not form a ball when pressure is applied by hand) OR 2) when soil is frozen/over snow. Heavy equipment including off-road jammers, skidding tractors, loaders, and processors must be kept on designated skid trails at all times except in the following situations: o When the ground is snow covered or frozen sufficiently so that soils would not be adversely impacted by heavy equipment use. The Forest Service shall determine when these conditions exist. o In areas with 35% or less slope where trees are being felled with a feller-buncher and hand felling is required for oversize trees; skidding tractors would be allowed off of designated trails to skid these oversize trees (when soil moisture levels are below 20%). Where soil impacts from this skidding warrants, trail rehabilitation would be required.	Minimize potential for detrimental soil disturbance from heavy machinery.	HIGH: logic, experience, local monitoring, Froehlich et al. 1983, Garland 1983	SWST02	Timber Sale Administrator, Timber Sale Contract, Soil Scientist

#	Project Design Feature	Objective	Effectiveness and Basis	Applicable Forest Plan Standard/Guide	Enforcement
33	Skid Trails: All skid trails must be designated and pre-approved by the Forest Service before timber felling operations begin. Non-constructed skid trails must be spaced so that the average distance between skid trails is at least 100 feet. Consideration should be given to terrain and landing locations when planning skid trail locations. Skidding on designated trails on slopes up to 35% is allowed when trail construction is not required. Constructed skid trails would be allowed on slopes up to 45% and would not exceed a 30% road grade except for short pitches. Constructed skid trails should be kept to a minimum, and spaced an average distance of 200 feet apart or greater, with consideration to terrain and landing location. Constructed skid trails are trails built across the slope where soil is moved to create a surface to operate equipment on. These trails would be recontoured or partially recontoured as determined by the Forest Service.	Minimize potential for detrimental soil disturbance from heavy machinery	HIGH: logic, experience, local monitoring, Froehlich et al. 1983, Garland 1983	SWST02	Timber Sale Design and Layout, Sale Administrator
34	Reclaim disturbed skyline/cable corridors by pulling soil berms back to original configuration and scattering slash (as available) on all areas of soil disturbance to provide for minimum of 50% to a maximum of 80% effective cover where available. Ensure that surface runoff is not directly channeled into skyline corridors from landing areas.	Reduce potential for erosion, rutting, and detrimental soil disturbance in corridors; facilitate revegetation	HIGH: logic, experience, local monitoring	SWST01 SWST04 SWGU05	Timber Sale Administrator, Timber Sale Contract
35	Improve road drainage (installing water bars/dips, cleaning relief culverts etc.) as needed on all roads used for harvest activities pre-haul, during and post-haul. Minimize disturbance to existing vegetated ditch lines if already properly draining to avoid undue soil disturbance that could increase ditch erosion and sedimentation into streams.	Reduce road-related sediment inputs; improve road surface conditions	HIGH: logic, experience, Burroughs and King 1989	SWST01 SWST04 SWGU08	Project Engineer, Timber Sale Road Package, Contract Provision
36	All new permanent road construction and reconstruction where cuts and fills are disturbed would require placing slash windrows and/or erosion control measures (e.g., hydroseeding and mulching) where erosion is identified as a concern, such as within contributing areas at all perennial and intermittent crossings and exposed steep cutslopes.	Reduce road-related sediment inputs; stabilize slopes	HIGH: logic, experience, Burroughs and King 1989	SWST01 SWST04	Engineering, Contract Administrator

#	Project Design Feature	Objective	Effectiveness and Basis	Applicable Forest Plan Standard/Guide	Enforcement
37	Winterize temporary roads that would be retained until reforestation and biomass activities are completed. Install drainage features to control runoff and reduce erosion.	Reduce road-related soil erosion and sediment inputs during the winter	HIGH: logic, experience, Burroughs and King 1989	SWST01 SWST04 SWGU08	Project Engineer, Timber Sale Road Package, Contract Provision

#	Project Design Feature	Objective	Effectiveness and Basis	Applicable Forest Plan Standard/Guide	Enforcement
38	Retain total amounts of CWD as evenly distributed as possible in the tonnages and diameters described below and in 6-foot or greater lengths (if tonnages and/or sizes are unavailable, then assure that trends toward desired conditions are achieved). Total tonnage is measured following the completion of all activities and must retain the percentages of the large sized CWD (greater than 15-inch diameter) identified in the Forest Plan (Forest Plan, Appendix A, page A-9, Table A-9; USDA Forest Service 2003a). • For Potential Vegetation Groups (PVGs) 2 and 5: retain CWD in amounts of 4 to 14 tons per acre with at least 75% of the tonnage provided from CWD that is greater than 15 inches in diameter. • For PVGs 3, 4 and 6: retain CWD in amounts of 4 to 14 tons per acre with at least 65% of the tonnage provided from CWD that is greater than 15 inches in diameter. • For PVG 7: retain CWD in amounts of 5 to 19 tons per acre with at least 50% of the tonnage provided from CWD that is greater than 15 inches in diameter. • For PVGs 8, 9 and 10: retain CWD in amounts of 5 to 19 tons per acre with at least 25% of the tonnage provided from CWD that is greater than 15 inches in diameter. • For PVG 11: retain CWD in amounts of 4 to 14 tons per acre with at least 25% of the tonnage provided from CWD that is greater than 15 inches in diameter. If needed for meeting CWD tonnages, all available cull material over 8 inches large end diameter and longer than 6 feet in length or other noncommercial material (e.g. decked firewood) shall be utilized to meet the CWD requirement. Preference should be given to larger diameter material to meet these requirements A contract provision requiring CWD to be returned from the log landing to the harvest unit would be utilized in tractor units where CWD deficiencies are identified prior to contract preparation.	Maintain CWD for long-term site productivity and for wildlife species	HIGH: Graham et al. 1991, 1994	SWST04	Timber Sale Contract, Administrator

#	Project Design Feature	Objective	Effectiveness and Basis	Applicable Forest Plan Standard/Guide	Enforcement
39	Ensure, as much as is practicable, through burn prescriptions, that CWD (in desired amounts and sizes) is retained at the desired condition or is maintained at existing levels if presently below the desired condition (see descriptions by PVG above). Twenty percent soil moisture is required for prescribed fire operations unless approved by the Soil Scientist or Hydrologist.	Maintain CWD for long-term site productivity and for wildlife species	HIGH: Graham et al. 1991, 1994	SWST04	Prescriptions for Prescribed Burn, Fuels Specialist, Soil Scientist
40	Maintain long-term rooting strength on (all high and moderate modeled, field verified if possible) landslide prone areas in commercial thinning areas by favoring deep rooted species such as ponderosa pine and Douglas-fir. Avoid tree mortality from prescribed fire on landslide prone areas with conifers trees. Avoid high and moderate intensity/severity prescribed fire on high landslide prone areas.	Reduce potential for landslides by retaining rooting strength	MODERATE: Shaub 2001, Burroughs and Thomas 1977	SWST12 SWGU04	Timber Sale Layout and Marking, Prescriptions for Prescribed Burn, Fuels Specialist
41	Avoid road and skid trail construction on landslide prone areas, and avoid concentrating water onto landslide prone areas from road drainage.	Reduce potential for landslides from roads	HIGH: Megahan 1977	SWST12	Road Layout and Road Design Package

#	Project Design Feature	Objective	Effectiveness and Basis	Applicable Forest Plan Standard/Guide	Enforcement
42	Reclaim skid trails and landing areas immediately following harvest activities. Take advantage of all opportunities within activity areas to reclaim soil disturbances (compaction, displacement, etc.) from past management activities, such as reusing well-located existing skid trails and landings Unless otherwise agreed in writing, obliterate all landings, skid trails, and temporary roads used in project implementation following these specifications: • Where physically possible, recontour to the natural slope profile for constructed skid trails and temp roads. • Where there is no cut/fill or it is not possible to fully recontour, compaction, rutting and displacement must be rehabilitated by sub-soiling, to a maximum depth of 16 inches, emphasizing slight lifting and fracturing, not plowing or mixing. Factors to consider in determining the depth and extent of subsoiling include: the number of passes by machinery (primary vs. secondary skid trail); depth of rutting; surface soil disturbance; and amount of intact vegetation. Lifting and fracturing shall span the entire width of the compacted skid trail, except when: o The road/trail has defined compacted track or tire ruts and the centerline of the skid road is not compacted and still vegetated, then only subsoil within defined track or tire ruts. o The roots of an existing tree greater than 8 inches DBH located along the edge of a skid road or landing would be damaged. This is typically defined by the trees drip line or a set radius around such trees would be determined by the Forest Service. • Pull slash, where available, to achieve 50% to 80% ground cover. Spread slash evenly over the entire disturbed area. Waterbar if needed. o On skid trails coarse wood shall be arranged leaving a 3 to 6-foot opening every 100 feet (+/- 20 feet) at existing trails if available. o On landings used to process wood chips, depth of residual chip material should not exceed 4 inches prior to obliteration. Where feller-buncher operations are off of designated skid trails and result in soil displacement and expose mineral soil on greater than 9 square feet or result in clearly identifiable ruts with berms, removed material must be pulled back. On slopes greater than 35% this pull back must be completed by hand. Only incidental occurrences are acceptable.	Restore newly created or existing areas of TSRC and detrimental disturbance (DD).	High: logic, experience, local monitoring	SWST01 SWST03 SWGU05	Timber Sale Administrator, Timber Sale contract

#	Project Design Feature	Objective	Effectiveness and Basis	Applicable Forest Plan Standard/Guide	Enforcement
43	Piling and burning of slash shall be avoided in the RCA. If necessary to pile, burn piles would be constructed 120 feet from stream channels. Forest Plan CWD and snag standards (USDA Forest Service 2003a) would be met and no commercial harvest would occur outside of RCAs designated for harvest (See RCA treatment section).	Minimize detrimental disturbance and potential for surface erosion in RCAs	HIGH: Experience	SWST02 SWST04	Fuels Specialist, Soil Scientist, Hydrologist.

Table 2-29. Project Design Features and Mitigation Measures for Rangeland

#	Project Design Feature	Objective	Effectiveness and Basis	Applicable Forest Plan Standard/Guide	Enforcement
Rangeland					
44	Protect range improvements such as fence, and water troughs from prescribed fire.	Protect improvements	HIGH: logic	N/A	Fuels Specialist, Burn plan.
45	Per “The Payette National Forest Noxious Weed and Poisonous Plant Control Program EA and DN”, treat populations of noxious weeds found in the planning area. Control measures may include spraying, biological controls, or other methods as needed.	Control noxious weeds.	HIGH: fact, experience	NPST10 NPGU01 NPGU05	Range Specialist
46	In order to prevent the potential spread of noxious weeds into the project or treatment areas, Forest Service contractors associated with project activities would clean all off-road equipment prior to entry onto the treatment area. When working in treatment areas identified as containing weed infestations, contractors would be required to clean equipment before leaving and moving to a new treatment area. This cleaning would remove plants, dirt, and material that may carry noxious weed seeds.	Limit the risk of new infestations of noxious weeds into the area	HIGH: fact, experience	NPST03 NPST04 NPGU03	Timber sale contract, Administrator

#	Project Design Feature	Objective	Effectiveness and Basis	Applicable Forest Plan Standard/Guide	Enforcement
Rangeland					
47	Any materials such as mulches, straw, etc., used for rehabilitation, reclamation, etc., would be free of noxious weed seeds and comply with the 1995 weed-free forage special order against the use of non-certified hay, straw, or mulch. Materials not covered in the special order, which have the potential to contain noxious weed seed, would be inspected and determined to be weed seed-free before purchase and use. Certification that these materials are free of noxious weed seed would be done by qualified individuals, such as the Idaho Seed Lab, County Weed Supervisor, or Forest Service noxious weed management specialist.	Limit the risk of new infestations of noxious weeds into the area.	HIGH: fact, experience	NPST01 NPST02 NPST03 NPST06	Soil Scientist, Range Specialist.
48	Source sites for gravel and borrow materials would be inspected before materials are used or transported. If noxious weeds are present, they would be treated to prevent seed production before use or transport. The source would not be used if noxious weed species were present that are not currently found at the site unless effective treatment or other mitigation measures identified by the District Ranger are implemented. Written documentation of the inspection by county weed agents, Forest Service noxious weed management specialists, or other individuals who the Forest Service stipulates are qualified would be required before materials are used.	Limit the spread of noxious weeds in the Project area.	HIGH: fact, experience	NPST07 NPST08 NPGU02	Range Specialist, Botanist, Engineer, Administrator.

Table 2-30. Project Design Features and Mitigation Measures for Threatened, Endagered, Proposed, Candidate and Sensitive Species

#	Project Design Feature	Objective	Effectiveness and Basis	Applicable Forest Plan Standard/Guide	Enforcement
Threatened, Endangered, Proposed, Candidate Species and Region 4 Sensitive Species					
49	Ground-disturbing activities would be stopped in any areas where previously unknown listed or sensitive fish, wildlife, or botanical species are discovered until a Fisheries Biologist, Wildlife Biologist, or Botanist, respectively, reviews the affected area and prescribes appropriate mitigation to ensure protection of the species.	Provide protection to threatened, endangered, and sensitive species	MODERATE: logic	TEST01 TEST02 TEST03 TEST06 TEST12 TEST13 TEGU01 TEGU02 TEGU06 WIST02 WIST03 WIST06 WIGU01 WIGU05 WIGU06 WIGU07	Fish Biologist, Wildlife Biologist, Botanist, Sale Administrator, Burn Plan, Fire Management Officer.

Table 2-31. Project Design Features and Mitigation Measures for Forested Vegetation

#	Project Design Feature	Objective	Effectiveness and Basis	Applicable Forest Plan Standard/Guide	Enforcement
Forest Vegetation and Timber					
50	Following harvest and prescribed burning operations the larger aspen stands would be evaluated for the need to protect aspen regeneration from damage by cattle, deer, and elk. Possible protection measures would include temporary electric fencing or rough windrow fencing using felled aspen trees.	Protect aspen regeneration from large animal damage.	HIGH: experience, logic	VEGO04 VEGO05 VEGO06	Silviculturist and Wildlife Biologist would evaluate and implement with available resources or contracts.
51	Use the Ips beetle contract provision for stands where substantial amounts of ponderosa pine would be harvested, if the proposed unit is near a plantation with a component of ponderosa pine.	Minimize Ips beetle population buildup.	HIGH: experience, logic	TRGO01	Timber Sale Contract, Sale Administrator
52	Include a timber sale contract provision that requires firewood to be made accessible to the public by requiring firewood to be decked separate from slash piles and in locations where removal would be practical.	Provide firewood gathering opportunities for the public	HIGH: logic	TRGO04	Timber Sale Contract, Sale Administrator

#	Project Design Feature	Objective	Effectiveness and Basis	Applicable Forest Plan Standard/Guide	Enforcement
Forest Vegetation and Timber					
53	In each treatment unit, CWD (tons per acre) shall be evaluated to ensure desired ranges based on PVG. If necessary, material would be left behind of the appropriate size classes to meet standards. When CWD in the larger size classes is not available for retention in an activity area, smaller size classes may be utilized to meet desired conditions described in Forest Plan Appendix A (USDA Forest Service 2003a). These smaller size classes should only be utilized when the resulting fire hazard risk would remain within defined fuels management objectives.	Forest Plan consistency	MODERATE to HIGH: experience	VEGU03	Silviculturist Contract Administrator Fire Management Specialist Silvicultural Prescription Contract Burn Plan
54	Management activities shall emphasize: Leave all dead standing trees (snags), unless falling is necessary for safety. Retention of snags away from roads to reduce the potential for removal.	Maintain snags for long-term site productivity and wildlife species	HIGH: experience	VEST01	Silviculturist Contract Administrator Fire Management Specialist Silvicultural Prescription Contract Burn Plan
55	Sufficient live trees of appropriate size should be retained for future CWD and snag recruitment where CWD or snag levels are below desired ranges (to meet Appendix A of the Forest Plan; USDA Forest Service 2003a).	Move toward desired CWD and snag levels	MODERATE to HIGH: experience	VEGU03	Silviculturist Fire Management Specialist Silvicultural Prescription Burn Plan
56	Retain forest stands that meet the definition of large tree size class. Management actions are permitted in such stands as long as they would continue to meet the definition of a large tree size class stand.	Ensure movement toward desired tree size objectives defined in the Forest Plan.	HIGH: experience		Silviculturist, Contract Administrator, Fire Management Specialist, Silvicultural Prescription, Contract, Burn Plan

#	Project Design Feature	Objective	Effectiveness and Basis	Applicable Forest Plan Standard/Guide	Enforcement
Forest Vegetation and Timber					
57	Prior to decommissioning routes or completing long-term closure activities, approval by the District TMA or Silviculturist shall be obtained to ensure that utilization of these routes for access, haul and/or skid trail is not necessary to complete any planned or proposed vegetation treatments.	Utilize existing routes to complete vegetation treatments.	MODERATE to HIGH: experience	N/A	Hydrologist / Soil Scientist/ District Timber Management Assistant
58	All acres treated with mechanical or prescribed fire treatments require a silvicultural prescription.	Ensure movement toward desired conditions to meet stand objectives.	MODERATE: experience	N/A – Forest Service Manual/Handbook Direction	Silviculturist, Fire Management Specialist, Silvicultural Prescription, Burn Plan

Table 2-32. Project Design Features and Mitigation Measures for Legacy Trees/Old Forest

#	Project Design Feature	Objective	Effectiveness and Basis	Applicable Forest Plan Standard/Guide	Enforcement
Legacy Tree/Old Forest					
59	Ponderosa pine, western larch and Douglas-fir that fit the definition of legacy trees should be retained during harvest. See Appendix 7 of this document for legacy tree guidelines for the Project.	Retain early seral legacy trees for ecological function, diversity and wildlife habitat.	HIGH: logic, experience	N/A—Appendix 7	Timber Sale Contract, Wildlife Biologist, TMA, Contract Administrator, Burn Plan, Fuels Specialist
60	Retain forest stands that meet the definition of old forest as defined in the Forest Plan, Appendix A (USDA Forest Service 2003a). Management actions are permitted in such stands as long as they would continue to meet the desired conditions	Retain old forest characteristic, such as legacy trees, snags, and CWD, appropriate for the forest type.	HIGH: logic, experience	N/A – Appendix A of the Forest Plan	Silvicultural Prescription, Silviculturist, Wildlife Biologist

Table 2-33. Project Design Features and Mitigation Measures for Air Quality

#	Project Design Feature	Objective	Effectiveness and Basis	Applicable Forest Plan Standard/Guide	Enforcement
Air Quality					
61	Identify sensitive areas for smoke impacts and coordinate all burning with Montana/Idaho State Airshed Group.	Avoid smoke immersion into non-attainment or sensitive areas	HIGH: logic, experience	ASGU02	Burn Plan, Fuels Specialist

Table 2-34. Project Design Features and Mitigation Measures for Cultural Resources

#	Project Design Feature	Objective	Effectiveness and Basis	Applicable Forest Plan Standard/Guide	Enforcement
Cultural Resources					
62	Project activities shall follow stipulations agreed to in Memoranda Of Agreement with the State Historic Preservation Office (SHPO) per 36CFR800.4 (b)(2). The stipulations shall include but are not limited the following requirements prior to implementation of individual projects: • Avoid all cultural resource sites during project implementation unless alternative treatments are developed and agreed to by all consulting parties. • All known sites would be monitored and flagged prior to implementation to ensure avoidance. • -If existing surveys are determined to be inadequate, inventories would be conducted according to the Secretary of the Interiors standards and a secondary consultation with Idaho SHPO and appropriate SHPO would be required for: o Log and biomass landing construction o Proposed Timber Harvest Units o Prescribed fire line construction o Newly constructed temporary roads o Road decommissioning o Proposed recreation actions o Fish passage barrier improvements and associated road rehabilitation.	Prevent damage to cultural resource site	HIGH: experience	N/A	Timber Sale Contract, Burn Plans, Forest Archaeologist Burn Boss, Contract Administrators

Table 2-35. Project Design Features and Mitigation Measures for Recreation and Visual Quality

#	Project Design Feature	Objective	Effectiveness and Basis	Applicable Forest Plan Standard/Guide	Enforcement
Recreation and Visual Quality					
63	Ridgeline silhouettes should not have unnatural-appearing breaks along them.	Meet visual quality objective	MODERATE: logic	SCGU06	Layout Forester
64	Install adequate drainage structures in new trail construction and ensure sediment transport is minimized where trails are located within RCAs, as per Forest Service Trail Construction Specifications. Stream crossings shall comply with Forest Plan Standard SWST 08 (USDA Forest Service 2003a).	Provide water quality protection in trail construction	HIGH: logic, experience	REST02	Recreation Staff, Engineer
65	Where necessary, restrict log hauling during periods of high recreation use, such as the opening day of big game hunting season.	Provide for public safety	MODERATE: logic	N/A	Administrator, Contract
66	The Forest shall close and sign groomed snowmobile routes in the project area being used as timber hauling routes to snowmobilers during the week. The routes would be open to snowmobiles on Saturdays and Sundays. All log hauling activity would be stopped after 10 pm on Friday and reopened Monday morning. If logging contractor vehicles are used to fuel or maintain equipment over the weekend, warning signs would be placed prominently so that snowmobilers would be aware that they may encounter vehicles on the road even on weekends. The Forest shall post reduced speed limits in the shared use areas. The Forest shall post signs and maps in parking and chain-up areas alerting snowmobiles coming into the logging area to the activities and potential hazards in the area. Contractors operating on groomed snowmobile routes should contact Adams County for required permits.	Ensure safety of snowmobilers during log hauling	HIGH: Logic	REOB08 REOB20 REOB23 REGU23 REGU26	Administrator, Contract
69	The Forest shall add protection measures for existing NFS trails in all timber sale contracts, annual operating plans for grazing, mining, and special use authorizations and prescribed fire implementation documents, and re-establish any lost trail head with these proposed activities.	Provide for trail protection	HIGH	REGU26	Inspection by Recreation Specialist

2.6. Identification of the Preferred Alternative

The preferred alternative is Alternative 2.

The Responsible Official's selected alternative for implementation could be this alternative or another alternative considered in detail. The final decision will be documented in the ROD.

Chapter 3 — Affected Environment

3.1. Introduction

Chapter 3 describes the existing physical, biological, and human aspects of the environment in the Project area.

3.1.1. Purpose and Content

Chapter 3 describes the physical and biological resources and socio-economic environment that may be affected by the alternatives presented in Chapter 2, and the effects the alternatives may have on the resources. The sections covering "Affected Environment" and "Environmental Consequences," are combined in this chapter to provide a concise depiction of the potentially affected resources and predicted effects under the different alternatives.

The environmental effects analysis forms the scientific and analytic basis for the comparison of alternatives.

Chapter 3 is organized by resource. It describes the affected environment and environmental consequences for resources that could be affected by any of the four alternatives analyzed in detail. The following resource areas are included:

3.2 Vegetation Resources
3.3 Fire and Fuels
3.4 Wildlife Resources
3.5 Watershed Resources
3.6 Fisheries Resources
3.7 Soils Resources
3.8 Botany and Rare Plants
3.9 Recreation
3.10 Roadless
3.11 Transportation
3.12 Economics/Socio-Economics
3.13 Range Management and Noxious Weeds

3.1.2. Analysis Calculations

In the modeling and analyses included throughout Chapter 3, road miles, treatment acres, and other quantitative measurements are all best estimates based on the latest available information. The modeling and analyses conducted for this DEIS are intended and designed to indicate relative differences between the alternatives rather than to predict absolute amounts of activities, outputs, or effects.

3.1.3. Incomplete or Unavailable Information

The CEQ regulations for implementing procedural provisions of the NEPA (40 CFR 1502.22) require federal agencies to identify relevant information that may be incomplete or unavailable for evaluating reasonably foreseeable significant adverse effects in an EIS. If the information is essential to a reasoned choice between alternatives and the cost of gathering it is not excessive, it must be included or addressed in the EIS.

The ecology, inventory, and management of ecosystems are complex and developing disciplines. However, central ecological relationships are well established, and a substantial amount of credible information about biological and physical resources of ecosystems and social/economic interests within the Project area are known. The alternatives were evaluated using the best available information.

The data collection and evaluation effort for this analysis can generally be categorized into six basic groups:

- Field data was collected, compiled and analyzed to support effects disclosures (e.g., vegetative stand surveys, cultural surveys)
- Resource databases were used to compile and summarize information
- GIS spatial analyses were used to link database information to geographic locations
- Information and analysis documented in Forest Plan and project resource specialist reports were prepared by Forest Service resource experts in the fields pertaining to each resource assessed in detail identified under section 3.1.1.
- Current scientific literature reviews were conducted

Following review of the above information with the IDT, the Responsible Official determined that relevant information was sufficiently complete and available for evaluating reasonably foreseeable significant adverse effects in this EIS important to making a reasoned choice between alternatives. Additional detail about the data used by IDT members to support their analyses and the limitations of these data are summarized in each resource section and discussed in greater detail in project record resource specialist reports.

3.1.4. Resources Not Evaluated in this Chapter

Two resource areas were determined by the IDT to not be measurably affected by the action alternatives developed to address project Purpose and Need (section 1.7) and/or issues (section 1.11) because they do not exist within any of the analysis areas described in the resource sections in Chapter 3 or the activities proposed would not affect the resources. Therefore, the analysis of effects of proposed alternatives on the following resources are not discussed:

- Wilderness and recommended Wilderness
- Wild and Scenic Rivers

3.2. Vegetation Resources

3.2.1. Scope of the Analysis

3.2.1.1. Direct and Indirect Effects Analysis Area

The scope of the direct and indirect effects analysis for vegetation resources (forested and nonforested) is the project area, outside the East Fork Weiser River subwatershed, on NFS lands. The direct and indirect effects analysis area comprises approximately 37,081 acres. This analysis area was chosen because it is large enough to represent

differences in vegetative characteristics affected both by environmental factors (e.g., historical fire regimes) and past management activities.

3.2.1.2. Cumulative Effects Area

The scope of cumulative effects analysis for vegetation resources is the Project area (including private lands, IRAs, and the East Fork Weiser River subwatershed). This analysis area comprises approximately 50,000 acres.

3.2.1.3. Temporal Scale

Time frames as defined in the Forest Plan are used for the direct and indirect effects analysis: temporary (1–3 years), short term (3–15 years), and long term (15 or more years) (USDA Forest Service 2003a). Time frames for the cumulative effects analysis are specified in that section and use the same definitions: temporary, short term, and long term. These are considered appropriate time scales for analysis because maintenance and future management will need to determine the appropriate objectives for management within the next 15 to 30 years for this project area.

- For the tree size class measurements, a quantitative analysis has been performed for the temporary time scale (immediately after vegetation treatments, including prescribed burning, are implemented) and a qualitative description has been completed for the short-term and long-term measurements of "distribution of tree size classes."
- Regarding the tree canopy cover measurement, a quantitative analysis has been performed for the temporary time scale and a qualitative description has been completed for the short-term and long-term measurements of "percentage of area (acres) in each canopy cover class within the large tree size class."
- Regarding the tree species composition measurement, a quantitative analysis has been performed for the temporary time scale of "acres treated to maintain and/or promote desired species composition." A qualitative description of how species compositions have been affected in the short and long term is also included in this section.
- For the spatial pattern measurement, a quantitative analysis has been completed for the temporary and long-term time frames concerning "percent departure from reference conditions."
- Regarding the aspen, nonforested (grasslands and shrublands), and wet meadow measurements, a quantitative analysis for the "acres treated to maintain/promote desired canopy closure" has been completed only for the temporary time frame, and a qualitative description of how aspen, nonforested vegetation, and wet meadows would be affected has been completed for the short and long term.

3.2.2. Data Sources and Methodology

3.2.2.1. Walk-through Surveys

Current stand conditions were characterized by updating the PVGs (USDA Forest Service 2003a) and strata/working group (USDA Forest Service 2004) data based on walk-though surveys. Field crews performed walk-through surveys on most forested stands on

NFS lands (excluding the IRAs) within the project area during the 2013 and 2014 field seasons. Additionally, in 2014, some stands designated as nonforested (predominately high-elevation meadows) were also visited.

The walk-through surveys categorized stands by habitat type, tree size, canopy cover, and species composition; these categories were utilized to update assignments of PVGs, strata, and existing species composition based on more site-specific information. A snapshot of existing vegetative conditions, the strata and species composition classification accounts for past management activities (such as timber harvest), as well as for natural disturbance events (such as wildfire). These data were used for characterizing the existing conditions, analyses, and designs of the alternatives.

3.2.3. Analysis Process and Objectives

3.2.3.1. Analysis Process

To complete the quantitative analysis, stands were classified—based on tree size class, canopy cover class, past management, and vigor—into strata.

To complete an effects analysis of the different alternatives at different time scales, the existing strata were modified, based on the treatments (or lack thereof) at the temporary, short-term, and long-term time scales.

The assignment of post-treatment strata for the temporary and long-term time frames utilized modeling in representative stands, professional judgment, and reviews of pertinent literature and research.

3.2.3.2. Objectives and Measurements

The objectives and associated measurements below will be used to compare alternatives, ascertain achievement of treatment objectives, and determine compliance with design features and the Forest Plan standards and guidelines (USDA Forest Service 2003a).

Objective 1: Move vegetation toward the desired conditions, with an emphasis on promoting large tree forest structure, early-seral species composition, and forest resiliency.

Measurements:

- Tree Size Class
  - Acres treated to promote or maintain the large tree size class.
  - Distribution of tree size classes.
- Tree Canopy Cover
  - Percentage of area (acres) in each canopy cover class within the large tree size class.
- Tree Species Composition
  - Acres treated to maintain and/or promote desired species composition.
- Spatial Patterns
  - Percent departure from reference conditions per PVG.

Objective 2: Maintain or restore a representation of native plant communities throughout the Forest.

Measurements:

- Aspen
  - Acres treated to maintain and/or promote aspen
- Nonforested and Wet Meadow
  - Acres treated to maintain and/or promote Nonforested Vegetation
  - Acres treated to maintain and/or promote Wet Meadow

3.2.4. Affected Environment

3.2.4.1. Current and Desired Conditions

The direct and indirect effects analysis area is dominated by forested vegetation; approximately 27,020 acres are forested. Much of the grassland/shrubland also contains scattered trees, but it does not possess the minimum canopy coverage to be considered forest. The project area is dominated by forest types and fire regimes that were historically open ponderosa pine forest (e.g., PVGs 2, 5, and portions of 6), with a mosaic of mixed conifer forest types (e.g., PVGs 7, 9, 11, and portions of 6). The distribution of forest types and historical vegetation in the project area is driven primarily by subtle changes in soils, elevation, aspect, and topography.

3.2.4.1.1. Background

Forested Vegetation

The Forest Plan utilizes PVGs developed by Mehl et al. (1998) to classify forested vegetation (USDA Forest Service 2003, Appendix A). PVGs are groups of habitat types that share similar environmental characteristics, site productivity, and disturbance regimes and that are used to classify the landscape, providing a framework for studying succession of vegetation over time. This classification allows for a more efficient and operational way to understand the ecological complexity of the landscape by grouping approximately 60 to 70 habitat types into 11 PVG types.

Additionally, nonforested vegetation and wet meadow/seeps types were also analyzed. For analysis purposes, shrublands and grasslands are combined into nonforested vegetation.

Table 3-1 identifies the acreage of different groups of vegetation in the direct and indirect effects analysis area. Descriptions (USDA Forest Service 2003a, Appendix A; Mehl et al. 1998) of the vegetation types carried forward in this analysis within the Project area are included below the table.

Table 3-1. Vegetation within the project area (acres and percent)

Potential Vegetation Group (PVG) and Vegetation Type	Acres within Project Area—National Forest System (NFS) Lands Only	Percent of Project Area
PVG 1—Dry Ponderosa Pine/Xeric Douglas-fir	254	<1%
PVG 2—Warm, Dry Douglas-fir/Moist Ponderosa Pine	3,300	9%
PVG 3—Cool, Moist Douglas-fir	0	0%
PVG 4—Cool, Dry Douglas-fir	138	<1%
PVG 5—Dry Grand Fir	4,246	11%
PVG 6—Cool, Moist Grand Fir	12,426	33%
PVG 7—Warm, Dry Subalpine Fir	4,702	13%
PVG 8—Warm, Moist Subalpine Fir	56	<1%
PVG 9—Hydric Subalpine Fir	576	2%
PVG 10—Persistent Lodgepole Pine	903	2%
PVG 11—High-elevation Subalpine Fir	419	1%
Total Forested Vegetation	27,020	73%
Grassland/Shrubland	10,061	27%
Analysis Area Total (NFS Lands)	37,081	

Notes:
The total does not include private lands and NFS lands in the East Fork Weiser River subwatershed.
PVG data were collected and updated during walk-though surveys.
Only PVGs 2, 5, 6, 7, 9, 10, and 11 are carried forward in this analysis.
PVGs 1, 3, 4, and 8 are not carried forward in this analysis because they represent less than 1% of the area.

Potential Vegetation Group 2—Warm, Dry Douglas-fir/Moist Ponderosa Pine

This PVG represents warm, mild environments at low to middle elevations, but may extend upward to 6,500 feet on dry, southerly slopes. The dominant cover types in this group are ponderosa pine, particularly at lower elevations, or large ponderosa pine mixed with smaller-sized classes of Douglas-fir. Historically, frequent nonlethal fire maintained stands of large, park-like ponderosa pine; Douglas-fir occurred on moister aspects, particularly at higher elevations. Understories consist mostly of graminoids such as pinegrass and elk sedge, with a cover of shrubs such as common snowberry, white spirea, and mallow ninebark.

Potential Vegetation Group 5—Dry Grand Fir

This PVG ranges from 4,300 to 6,400 feet in elevation, often on drier upper slopes and ridges. Ponderosa pine and Douglas-fir are common cover types appearing to have been maintained by fire regimes that were historically nonlethal to mixed1. In many areas, this group may have resembled PVG 1 and PVG 2, with open, park-like stands of large ponderosa pine. Mixed species were restricted to small micro-sites that burned less frequently. Understories are similar to PVG 2 in that pinegrass, elk sedge, and white spirea are common.

Potential Vegetation Group 6—Cool, Moist Grand Fir

This PVG ranges in elevation from 3,400 feet to 6,500 feet and represents more moist environments in the grand fir zone. It often occurs next to PVG 5 and the two may intermix

with each other, depending on topography. Ponderosa pine is common at the drier extremes of the group, and lodgepole pine occurs in colder areas. Western larch also may be present as an early-seral species. Cover types of Douglas-fir and Engelmann spruce also occur in this group. Understories in this group are often shrubby, with a conspicuous herb layer also common. Historical fire regimes have varied, ranging from mixed1 to mixed2, in part due to the wide environment this group occupies. Where ponderosa pine was maintained as a common seral species, it appears that fires were more often mixed1 because ponderosa pine produces a heavy seed that generally disperses only short distances. In other areas where western larch or Douglas-fir were maintained as common seral species, mixed2 fire regimes may have been more common.

Potential Vegetation Group 7—Warm, Dry Subalpine Fir

This group represents warmer, drier environments in the subalpine fir zone. Elevations range from 4,800 feet to 7,500 feet. At lower elevations, this group is found on steep, north-to-east aspects, but shifts to south-to-west aspects as elevation increases. Adjacent sites at lower elevations are Douglas-fir or grand fir, and these commonly intermix where topography controls cold air flow. Douglas-fir is the most common cover type throughout this PVG. Ponderosa pine may be found at the warmest extremes, particularly where this group grades into the Douglas-fir or grand fir zone. Lodgepole pine or Engelmann spruce may occur at cool, moist extremes, but these cover types rarely dominate. Understories are commonly shrubby and include mountain maple (*Acer glabrum*), mountain ash (*Sorbus scopulina* or *S. sitchensis*), serviceberry (*Amelanchier alnifolia*), and scouler willow (*Salix scouleriana*). Historical fire regimes were generally mixed2, although mixed1 fires may have occurred where ponderosa pine was maintained. A mixture of burning patterns has created a mosaic of early seral stages. With a recent history of fire suppression, these sites are losing their mosaic pattern and becoming more uniform. Unless thinned to maintain diversity, the risk of extensive, stand-replacement fire and bark beetle epidemics at these sites will increase.

Potential Vegetation Group 9—Hydric Subalpine Fir

Seasonally high water tables control this group; its extent may be small in some areas, depending on the presence of those conditions. Elevations range from 9,000 feet to as low as 4,500 feet in frost pockets and along cold air drainages. This group most commonly occurs on wet toe slopes, stream terraces, seep areas, and old bogs. Cover types are lodgepole pine, followed by Engelmann spruce and subalpine fir. Early seral conditions usually support lodgepole pine, because this species can tolerate intermittent high water tables and cold air that often accumulates. In severe frost-prone areas, lodgepole pine can persist for long periods. In other areas with better cold air drainage, Engelmann spruce and subalpine fir rapidly establish under the lodgepole pine. Understories in this group are primarily dominated by herbs and grasses that require the seasonal influence of a high water table. Shrubs are sparse, although Labrador tea (*Ledum glandulosum*) can dominate some sites. Historically, fire was lethal in this group, although underburns may have occasionally taken place. Ignitions more likely occurred on adjacent drier slopes, and burning in this group likely depended on weather conditions before and at the time of the ignition. Estimates of fire frequency range from 140 to 400 years. Generally, ignitions occurred on adjacent drier sites and the fire was wind-driven into these sites. Fire patterns could range from a high-intensity crown fire to a patchy underburn with occasional torching of tree clusters, depending on the burning conditions.

Potential Vegetation Group 10—Persistent Lodgepole Pine

This group is common throughout the subalpine fir zone. It represents cold, dry subalpine fir sites that range in elevation from over 9,200 feet down to 5,200 feet in frost pockets. Lodgepole pine is the dominant cover type, although small amounts of other species may occasionally occur. Understories may be sparse. Generally, grasses and scattered forbs are the most common understory components. Shrubs are sparse and consist mainly of low-growing huckleberries, including dwarf huckleberry (*Vaccinium caespitosum*) and grouse whortleberry (*V. scoparium*). Historically, this group experienced lethal fire, although nonlethal fires may have occurred during stand development. Lodgepole pine is more often nonserotinous in western portions of the Forest and appears to become more serotinous when moving easterly. Within the Forest, lodgepole pine may reproduce in areas that experience nonlethal fires. The result is more vertical stand diversity in some areas than is often found where lodgepole pine is mostly serotinous. Over time, the combinations of these low-intensity events, subsequent reproduction, and mountain pine beetle (*Dendroctonus ponderosae*) mortality would have created fuel conditions that allowed lethal fires to occur under the right weather conditions. Infrequent stand-replacing fires—usually interspersed with a few underburns and mountain pine beetle attacks—typified the historical process. Stand-replacement fires have occurred approximately every 100 to 300 years, with mixed severity burns occurring every 25 to 70 years.

Potential Vegetation Group 11—High-elevation Subalpine Fir (with Whitebark Pine)

This group occurs at the highest elevations of the subalpine fir zone and generally represents the upper timberline conditions. It often grades into krummholz or alpine communities. Whitebark pine (*Pinus albicaulis*) is a major seral species in this group. Engelmann spruce and subalpine fir are the climax co-dominates. In some areas, whitebark pine serves as a cover for Engelmann spruce–subalpine fir establishment. Understories are primarily forbs and grasses tolerant of freezing temperatures, which can occur any time during the growing season. Shrubs are sparse due to the cold, harsh conditions. Historically, the fire regime in this group is characterized as mixed2, although the effects of fires have been highly variable. Ignitions are common due to the high elevation; however, fuel conditions are historically sparse due to the cold growing conditions and shallow soils. Therefore, fire effects have been patchy. Fire regimes are mixed2, with whitebark pine being a major seral component.

Quaking Aspen

Quaking aspen (*Populous tremuloides*) is the most broadly distributed tree species in the Idaho Southern Batholith, occurring within 10 of the 11 PVGs; however, aspen is strictly a successional component of these systems. Under historical conditions, quaking aspen has been a more common community type within those habitat type classes experiencing a frequent (<50 years) fire return interval with mixed severity. Fire is considered a natural and necessary feature of the aspen seral community type. Fire suppression efforts and grazing have significantly reduced the natural fire processes within the quaking aspen communities. The result has been a major shift from a preponderance of young aspen communities to a preponderance of mature aspen communities throughout the planning landscape.

Nonforested Vegetation

Grassland

Perennial Grass Slopes—This cover type connects with the dry forested cover types, mountain big sagebrush, and bitterbrush groups and is more prevalent in the north and

northwestern foothills and the canyonlands of the Ecogroup (USDA Forest Service 2003a, Appendix A, A-23). It usually occurs between the 10 to 18-inch precipitation zone on the southern and western aspects. Historical fire intervals are frequent (20 years) with, typically, a mixed1 to a mixed2 fire regime.

Perennial Grass Montane—This cover type connects with numerous forested cover types, mountain big sagebrush, bitterbrush, and bluebunch groups (USDA Forest Service 2003a, Appendix A, A-23). In terms of ecotone diversity, it is very highly rated. It usually occurs between the 18 to 30-inch precipitation zone on the southern and western aspects. Historical fire intervals are frequent (20 years) with, typically, a mixed1 to a mixed2 fire regime.

Shrubland

Mountain Big Sagebrush—This cover type connects with the greatest number of other forested, nonforested, and riparian cover types (USDA Forest Service 2003a, Appendix A, p. A-23). This type consists of large blocks, with a wide range of distribution. It usually occurs between the 14 to >18-inch precipitation zone, on well-drained soils with a high content of rock and gravel. Historical fire intervals may be frequent (20–60 years) with, typically, mixed1 or mixed2 fire regimes.

Montane Shrub—This cover type is generally interspersed as stringers and patches within the mountain big sagebrush, aspen, and conifer cover types (USDA Forest Service 2003a, Appendix A, A-23). The patchiness is strongly related to mesic soils with high water-holding capacity and/or more northerly exposures. It usually occurs between the 14 to >18-inch precipitation zone, on well-drained soils with a high content of rock and gravel. Historical fire intervals may be frequent (20–40 years) with, typically, mixed1 or mixed2 fire regimes.

Bitterbrush—This cover type is generally associated with southern to western exposures (USDA Forest Service 2003a, Appendix A, A-24). Soils tend to be shallow, with stony or rocky loams tending toward sandy textures. Typically, bitterbrush occurs in small patches interspersed with lower ecological thresholds of ponderosa pine and with all sagebrush types except Wyoming big sagebrush. Historical fire intervals are seldom, usually greater than 40 years, with a mixed1 fire regime.

Other Vegetation

Wet Meadows and Seeps

Wet meadows and seeps are openings containing grasses, sedges, rushes, and herbaceous forbs that thrive under saturated moist conditions. These habitats can occur on a variety of substrates and may be surrounded by grasslands, forests, woodlands, or shrublands (Skinner and Pavlick 1994).

3.2.4.1.2. Disturbance Regimes

Prior to European settlement, the principal disturbance process that shaped vegetation distribution, development, and succession on the landscape was fire, with insects and other disturbance processes playing minor roles (Mehl et al. 1998; Morgan and Parsons 2001).

Fire

Table 3-2 is a summary of PVGs/vegetation and their associated fire regimes, fire return intervals, fire intensities, and vegetation patterns. The vegetation pattern indicates the average acreage burned and whether or not the fire burns homogeneously (even) or heterogeneously (mosaic).

Table 3-2. Fire regime descriptions

Fire Regime	Fire Interval	Potential Vegetation Group (PVG) and Vegetation Type	Fire Intensity	Vegetation Patterns (Agee 1998)
Nonlethal	5–25 years	**PVG:** 1, 2, 3, and 5	Low: 10% mortality or less	Relatively homogenous with small patches generally <1.0 acre of different seral stages, densities, and compositions created from mortality
Mixed1	5–70 years	**PVG:** 3, 4, 5, 6, 7, and 10 **Vegetation Types:** Aspen, Perennial Grass Slopes, Perennial Grass Montane, Mountain Big Sagebrush, Montane Shrub, and Bitterbrush	Low to moderate:10–50% mortality	Relatively homogenous with patches created from mortality ranging in size from <1.0 to 600 acres of different seral stages, densities, and compositions
Mixed2	70–300 years	**PVG:** 6, 7, 8, 9, 10, and 11 **Vegetation Types:** Perennial Grass Slopes, Perennial Grass Montane, Mountain Big Sagebrush, Montane Shrub, and Bitterbrush	Moderate to high: 50–90% mortality	Relatively diverse with patches created by mixes of mortality and unburned or underburned areas ranging in size from <1.0 to 25,000 acres of different seral stages, densities, and compositions
Lethal	100–400 years	**PVG:** 8, 9, and 10[a]	High: over 90% mortality	Relatively homogenous with patches sometimes >25,000 acres of similar seral stages, densities, and compositions; small inclusions of different seral stages, densities, and compositions often result from unburned or underburned areas

[a]PVGs 8, 9 and 10 predominately lethal but there are also possibility of low and moderate severity in in these PVGs (Mehl et al 1998, Crane and Fischer 1986).

Insects and Disease

Numerous site visits to the Project area conducted by USFS Forest Health and Protection specialists (USDA Forest Service 2012, 2013b, 2014) noted activity and/or susceptibility of numerous insects and disease within the project area, some of which are summarized below. These reports were considered in the development of the alternatives and are available in the project record.

western spruce budworm (*Choristoneura occidentalis*) has increased across the western United States in the past few years (DeRose et al. 2013). Since the mid-2000s, western spruce budworm defoliation has been evident on West Mountain west of Cascade, Idaho, and in the Payette National Forest. Stand conditions that favor western spruce budworm outbreaks are densely stocked stands of host trees, where the tree vigor is compromised due to tree competition; these conditions are common throughout the Project area. The primary

hosts for western spruce budworm are Douglas-fir (*Pseudotsuga menziesii*), grand fir (*Abies grandis*), and subalpine fir (*A. lasiocarpa*), but defoliation can also occur on Engelmann spruce (*Picea engelmanni*) and lodgepole pine (*Pinus contorta*) when western spruce budworm populations are high.

In addition, outbreaks of the spruce beetle—*Dendroctonus rufipennis* (Kirby)—have occurred; *D. rufipennis* is the most significant natural mortality agent of mature spruce. Spruce beetle outbreaks cause extensive tree mortality and modify stand structure by reducing the average tree diameter, height, and stand density. Residual trees are often slow-growing, small and intermediate-sized trees, which eventually become dominant.

In 2012 the western spruce budworm, douglas-fir beetle (*D. pseudotsugae*), and subalpine fir decline were quite prevalent in the project area. The fir engraver beetle (Scolytus ventralis) is expected to become more active as the current western spruce budworm and other bark beetle activity increases in the next few years, especially if the weather becomes droughty. In addition, the nonnative balsam woolly adelgid (*Adelges piceae*) is affecting many of the subalpine fir and some grand fir (Jorgenson 2013).

3.2.4.2. Desired Conditions

Desired conditions do not represent a static state; the conditions are dynamic because the ecosystem is dynamic. Achievement of desired conditions, well distributed across the planning unit, is a long-term goal of Forest management (USDA Forest Service 2003a). Tradeoffs in the achievement of one or more of the desired vegetative conditions specified in the Forest Plan may be considered. In these instances, decisions should be based not only on which vegetative component(s) are important to emphasize at any point in time, but also how to effectively move all components toward the desired conditions over the long term.

Desired conditions for vegetation on this project are based on the Forest Plan's Appendix A, with some site-specific modifications to foster restoration of wildlife habitat. The desired conditions for forested vegetation are based on tables A-2, A-3, A-5, A-7, A-8, and A-9 of the Forest Plan (USDA Forest Service 2003a). The Forest Plan allows for modification of desired conditions at the project level to address site-specific biophysical conditions. Therefore, the desired conditions were modified at the project level based on site-specific biophysical conditions.

The following sections provide the metrics that will be utilized to determine how well each alternative meets the project objectives for each of the measurements identified in 3.2.3.2.

Tree Size Class

Tree size class is determined by the size of the overstory trees. The average diameter of the trees in the overstory, or uppermost tree layer, determines the stand's tree size class. A canopy layer has a distinct break in height and must have non-overlapping canopy closure of at least 10%. A few individual trees (such as relic trees) representing distinctly different tree size are not recognized as defining a distinct canopy layer. Table 3-3 displays the desired amounts for each size class at the Forest-wide and 5th-field hydrologic unit code (HUC) scales.

Table 3-3. Tree size class definitions

Diameter at Breast Height (DBH) (inches)	Total Non-overlapping Canopy Cover of Trees (%)	Tree Size Class
≥20 .0	≥10	Large
12.0–19.9	≥10	Medium
5.0–11.9	≥10	Small
0.1–4.9	≥10	Sapling
0	NA	GFSS[a]

[a]GFSS = grass/forb/shrub/seedling size class.

Tree Size Class Measurement

Acres treated to promote or maintain the large tree size class—The desired condition for this measurement is to maintain and/or promote enough acres to move toward the desired large tree size class distributions shown in Table 3-4 of this document. This range of desired large tree size class is based on the desired percent ranges for the large tree size class in Table A-3 of the Forest Plan (USDA Forest Service 2003). The actual desired ranges, as well as the existing amounts of large tree size class, are displayed in Table 3-4. For example, in PVG 2, the desired condition is to treat 1,951 to 2,645 acres to promote and/or maintain the large tree size class.

Table 3-4. Desired and existing large tree size classes, by Potential Vegetation Group (PVG)

PVG	Desired Acres Treated That Promote or Maintain Large Tree Size Class		Existing Large Tree Size Class Stands
	Minimum	Maximum	
2	1,951	2,645	653
5	2,813	3,580	2,052
6	3,252	6,504	8,118
7	537	1,127	3,533
9	215	257	412
10[a]	105	190	860
11	92	159	348
Total	8,965	14,462	15,976

[a]References to PVG 10 are to be applied to the medium tree size class (overstory tree average diameter ranges from 12.0–19.9 inches DBH [diameter at breast height]). The overstory trees in PVG 10 stands (persistent lodgepole) generally do not attain an average diameter within the large tree size class (DBH) even though individual trees may equal or exceed 20 inches DBH.

Distribution of tree size classes—The desired condition for the distribution of tree size classes is based on Table A-2 and Table A-3 of the Forest Plan (USDA Forest Service 2003a). These values are displayed in comparison to the current conditions in Table 3-5 and Table 3-6; also see Figure 3-1.

Table 3-5. Size class, desired and existing conditions, in percentage of area by Potential Vegetation Group (PVG)

PVG	Grass/Forb/Shrub/Seedling (GFSS)	Sapling	Small	Medium	Large
2, Desired Condition	4–5%	3–7%	5–21%	7–35%	59–80%
2, Existing Condition	**5%**	14% - O	**13%**	48% - O	20% - D
5, Desired Condition	3–4%	3–7%	4–22%	7–30%	66–84%
5, Existing Condition	5% - O	1% - D	**12%**	34% - O	48% - D
6, Desired Condition	7–8%	7–9%	11–27%	18–36%	28–56%
6, Existing Condition	1% - D	4% - D	**11%**	**19%**	65% - O
7, Desired Condition	7–16%	11–15%	21–22%	32–36%	20–21%
7, Existing Condition	0% - D	0% - D	2% - D	22% - D	75% - O
9, Desired Condition	13%	8–15%	17–22%	25–29%	31–37%
9, Existing Condition	0% - D	0% - D	0% - D	20% - D	71% - O
10, Desired Condition[a]	16–23%	11–16%	46–48%	20%	
10, Existing Condition[a]	0% - D	0% - D	5% - D	95% - O	
11, Desired Condition	9–15%	14–15%	19–22%	22–38%	20–27%
11, Existing Condition	0% - D	0% - D	0% - D	17% - D	83% - O

Note: Desired conditions are expressed as a range. “D” indicates that existing conditions are deficit compared to desired conditions; “O” indicates overabundance. **Bold** indicate conditions within desired range.

[a]References to PVG 10 are to be applied to the medium tree size class (overstory tree average diameter ranges from 12.0–19.9 inches DBH [diameter at breast height]). The overstory trees in PVG 10 stands (persistent lodgepole) generally do not attain an average diameter within the large tree size class (DBH) even though individual trees may equal or exceed 20 inches DBH.

Table 3-6. Tree size class, desired and existing conditions, by acres in Potential Vegetation Group (PVG)

PVG	Grass/Forb/ Shrub/Seedling (GFSS)	Sapling	Small	Medium	Large
2, Desired Condition	132–165	99–231	165–694	231–1,157	1,951–2,645
2, Existing Condition	**160**	461 - O	**431**	1,596 - O	653 - D
5, Desired Condition	128–170	128–298	170–938	298–1,279	2,813–3,580
5, Existing Condition	188 - O	58 - D	**506**	1,442 - O	2,052 - D
6, Desired Condition	813–929	813–1,045	1,277–3,136	2,090–4,181	3,252–6,504
6, Existing Condition	130 - D	455 - D	**1,318**	**2,396**	8,118 - O
7, Desired Condition	376–858	590–805	1,127–1,180	1,717–1,931	537–1,127
7, Existing Condition	20 - D	0 - D	94 - D	1,105 - D	3,533 - O
9, Desired Condition	90–104	55–104	118–153	173–201	215–257
9, Existing Condition	0 - D	1 - D	0 - D	163 - D	412 - O
10, Desired Condition[a]	152–219	105–152	438–457	105–190	
10, Existing Condition[a]	0 - D	0 - D	43 - D	860 - O	
11, Desired Condition	38–63	59–63	80–92	92–159	59–113
11, Existing Condition	0 - D	0 - D	0 - D	72 - D	348 – O

Note: Desired conditions are expressed as a range. “D” indicates that existing conditions are deficit compared to desired conditions; “O” indicates overabundance. **Bold** numbers indicate conditions within desired range.

[a]References to PVG 10 in the above table are to be applied to the medium tree size class (overstory tree average diameter ranges from 12.0–19.9 inches DBH [diameter at breast height]). The overstory trees in PVG 10 stands (persistent lodgepole) generally do not attain an average diameter within the large tree size class (DBH) even though individual trees may equal or exceed 20 inches DBH.

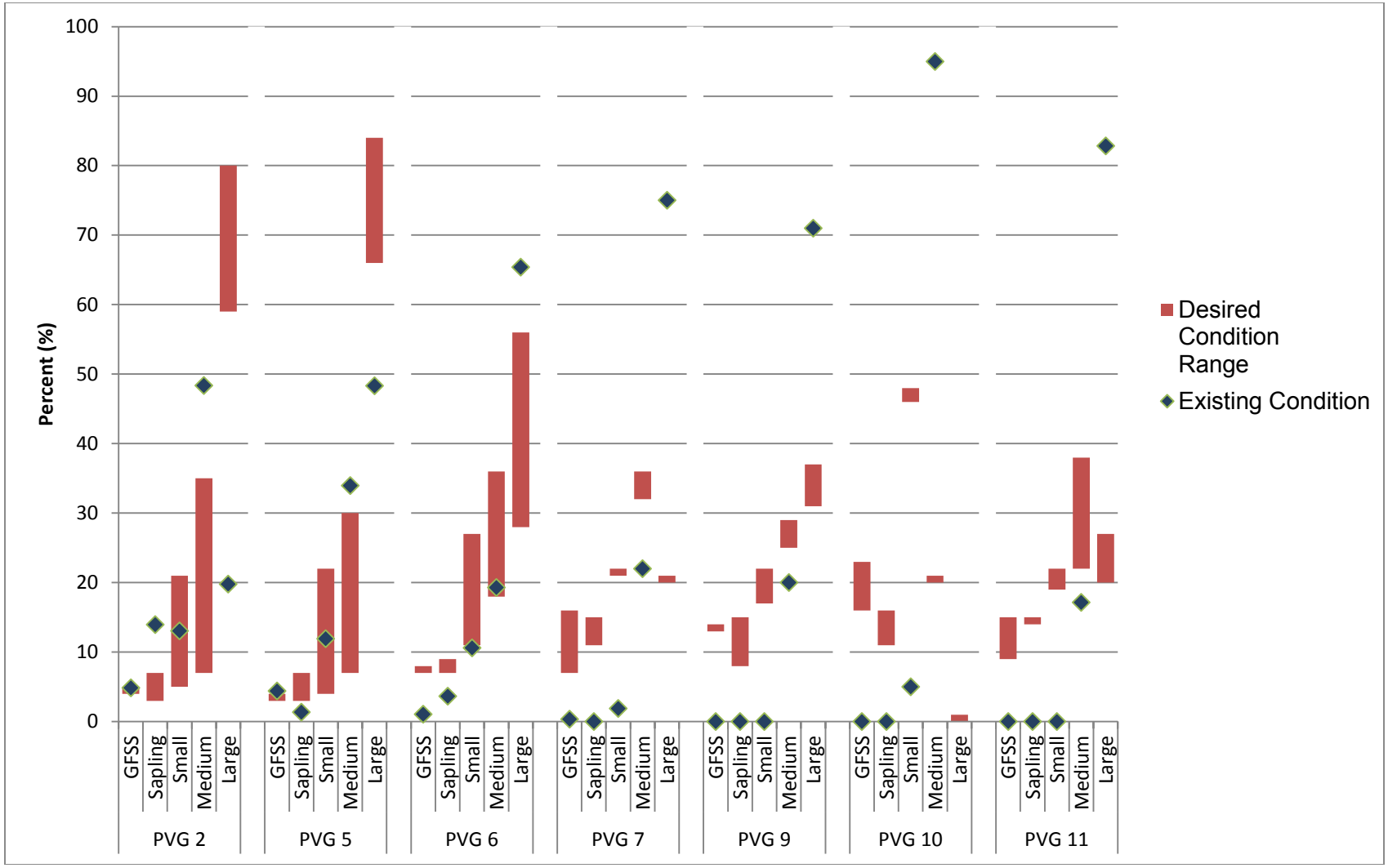


Figure 3-1. Tree size class, by Potential Vegetation Group (PVG): desired condition vs. existing condition.

Canopy Cover Class

The Forest Plan identifies desired conditions for canopy cover class only for stands in the large tree size class. Canopy cover is used in two different calculations. The first calculation is used to determine tree size class, as described in the tree size class section above. Once the tree size class is determined, canopy cover class is determined as the *total non-overlapping canopy cover of all trees in a stand, except seedlings*. (Trees in the seedling tree size class are used to estimate canopy cover class only when they represent the only structural layer present.) This total non-overlapping canopy cover determines the canopy cover class assigned to each stand. Areas with less than 10% canopy cover are considered either nonforested or in an earlier stage of plant succession.

Table 3-7 identifies the canopy cover class criteria utilized in this analysis.

Table 3-7. Canopy cover class criteria

Canopy Cover Class	Total Non-overlapping Canopy Cover
Nonforested	0–9%
Low	10–39%
Moderate	40–69%
High	70% or more

Tree Canopy Cover Measurement

- Percentage of area (acres) in each canopy cover class within the large tree size class

The desired condition for the tree canopy cover class measurement is based on Table A-5 of the Forest Plan (USDA Forest Service 2003). These desired values are displayed in Table 3-8 and in Figure 3-2 in comparison to the existing condition. These desired conditions apply only to stands within the large tree size class.

Table 3-8. Large tree size class canopy cover, desired and existing conditions, in percentage of area and acres by Potential Vegetation Group (PVG)

	PERCENTAGE			ACRES		
PVG	Low	Moderate	High	Low	Moderate	High
2, Desired Condition	74–94%	6–26%	0	483–614	39–170	0
2, Existing Condition	16% - D	52% - O	32% - O	104 - D	337 - O	212 - O
5, Desired Condition	25–45%	55–75%	0	512–923	1,128–1,538	0
5, Existing Condition	11% - D	**68%**	21% - O	228 - D	**1,402**	421 - O
6, Desired Condition	0–20%	80–100%	0	0–1,617	6,467–8,087	0
6, Existing Condition	**4%**	42% - D	54% - O	**331**	3,348 - D	4,373 - O
7, Desired Condition	0–14%	86–100%	0	0–486	2,987–3,473	0
7, Existing Condition	**13%**	55% - D	32% - O	**468**	1,907 - D	1,098 - O
9, Desired Condition	0	51–71%	39–49%	0	210–292	161–202
9, Existing Condition	17% - O	**55%**	28% - D	70 - O	**228**	114 - D
10, Desired Condition[a]	0%	81–100%	0–19%	0	697–860	0–163
10, Existing Condition[a]	23% - O	43% - D	34% - O	199 - O	369 - D	291- O
11, Desired Condition	0–16%	84–100%	0	0–57	292–348	0
11, Existing Condition	23% - O	64% - D	14% - O	79 - O	221 - D	47 - O

Note: Desired conditions are expressed as a range. “D” indicates that existing conditions are deficit compared to desired conditions; “O” indicates overabundance. **Bold** indicates conditions within desired range.

[a]References to PVG 10 are to be applied to the medium tree size class (overstory tree average diameter ranges from 12.0–19.9 inches DBH [diameter at breast height]). The overstory trees in PVG 10 stands (persistent lodgepole) generally do not attain an average diameter within the large tree size class (DBH) even though individual trees may equal or exceed 20 inches DBH.

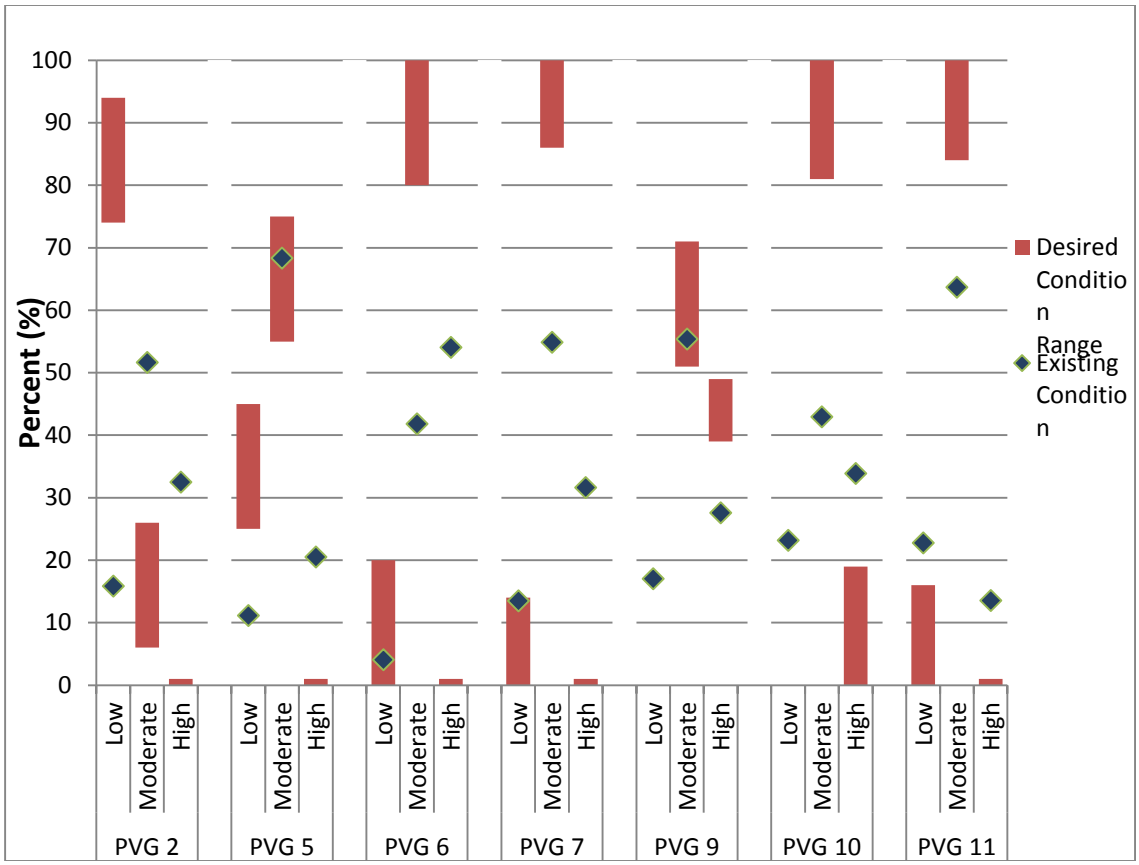


Figure 3-2. Percent of Large tree class canopy cover by Potential Vegetation Group (PVG): desired condition vs. existing condition. The desired condition range in the low canopy cover class for PVGs 9 and 10 are 0%.

Species Composition

The desired species compositions for this project are based on Table A-7 of the Forest Plan (USDA Forest Service 2003a, p. A-3).

Species composition data for this analysis were derived from strata/working group averages and field validations.

Tree Species Composition Measurement

- Acres treated to maintain and/or promote desired species composition

The desired condition for tree species composition is to maintain and/or promote seral species to move toward and/or maintain the desired species compositions (see Table 3-9 for the desired species compositions. The emphasis of acres treated to maintain and/or promote the desired species compositions is on early seral species (see Table 3-10 for the status of overstory species) and especially aims to promote species in decline, specifically western larch, whitebark pine, and quaking aspen.

The desired species compositions (in comparison to the existing species compositions) are displayed in Table 3-9.

Table 3-9. Species composition by Potential Vegetation Group (PVG)

Species	PVG 2		PVG 5		PVG 6		PVG 7		PVG 9		PVG 10		PVG 11	
	Desired	Existing All Size Classes	Desired	Existing All Size Classes	Desired	Existing All Size Classes	Desired	Existing All Size Classes	Desired	Existing All Size Classes	Desired	Existing All Size Classes	Desired	Existing All Size Classes
Aspen	T	—	T	—	T	—	6–11%	—	—	—	T	—	T	—
Lodgepole Pine	T	—	T	*1%*	1–5%	*4%*	28–42%	**15%**	29–37%	**15%**	82–94%	**28%**	18–25%	*18%*
Ponderosa Pine	81–87%	**55%**	80–88%	**31%**	23–41%	24%	T	[5%]	—	[2%]	—	[3%]	—	[2%]
Whitebark Pine	—	—	—	—	—	—	—	—	—	—	—	—	32–47%	—
Western Larch	—	—	0–1%	—	15–29%	—	T	—	—	—	T	—	—	—
Douglas Fir	10–16%	[28%]	7–17%	[30%]	15–25%	[29%]	24–34%	**20%**	T	[10%]	T	[16%]	—	[16%]
Engelmann Spruce	—	—	T	*1%*	0–2%	[3%]	3–5%	[13%]	28–33%	*28%*	T	[13%]	8–13%	[16%]
Grand Fir	—	[13%]	0–1%	[25%]	9–23%	[25%]	—	[10%]	—	[4%]	—	[5%]	—	[3%]
Subalpine Fir	—	—	—	[25%]	0–3%	[5%]	12–21%	[32%]	29–33%	[35%]	T	[32%]	18–29%	[41%]
OTHER	—	[4%]	—	[9%]	—	[10%]	—	[5%]	—	[6%]	—	[4%]	—	[3%]

Notes:

Bold indicates a deficit, *Italics* is within the desired range, and brackets [O] indicate an overabundance. T = Trace.

Existing species compositions displayed in this table are based on working group data. Working groups were not updated during the walk-through surveys. Species composition may have error because the data are from a mid-level analysis. Additionally, working group data do not account for western larch, aspen, or whitebark pine as individual species; instead, they are lumped into the “Other” category.

References to PVG 10 in the above table are to be applied to the medium tree size class (overstory tree average diameter ranges from 12.0–19.9 inches DBH [diameter at breast height]). The overstory trees in PVG 10 stands (persistent lodgepole) generally do not attain an average diameter within the large tree size class (DBH) even though individual trees may equal or exceed 20 inches DBH.

Table 3-10. Status of overstory species in forested Potential Vegetation Groups (PVGs) (Morgan and Parsons 2001)

PVG	Tree Species								
	POTR	PICO	PIPO	LAOC	PIAL	PSME	PIEN	ABGR	ABLA
2	Seral	Trace	Seral, Climax			Climax			
5	Seral	Seral	Seral	Trace		Seral	Trace	Climax	
6	Seral	Seral	Seral	Seral		Seral	Seral	Climax	Trace
7	Seral	Seral	Trace	Trace	Trace or Minor Seral	Seral	Seral	Trace	Climax
9	Seral	Seral				Trace	Seral, Climax		Climax
10	Seral	Seral[a]			Seral	Trace	Seral		Climax
11		Seral			Seral, Climax				Climax

Notes:

POTR = *Populous tremuloides* (quaking aspen); **PICO** = *Pinus contorta* (lodgepole pine); **PIPO** = *P. ponderosa* (ponderosa pine); **LAOC** = *Larix occidentalis* (western larch); **PIAL** = *P. albicalus* (whitebark pine); **PSME** = *Pseudotsuga mensezii* (Douglas-fir); **PIEN** = *Picea engelmenni* (Engelmann spruce); **ABGR** = *Abies grandis* (grand fir); **ABLA** = *A. lasiocarpa* (subalpine fir).

Trace is defined as species not explicitly modeled during the development of the Historical Range of Variability (USDA Forest Service 2003). These species were not included in the model for those PVGs because they occur in habitat types that represent only a minor part of the PVGs across the Ecogroup or because little information is known about their historical occurrence within a PVG (the latter was especially the case with quaking aspen).

[a]Denotes persistent seral species. Climax in one habitat type.

For species composition, finer scales (such as stand-level prescriptions) are not expected to mirror desired forest-wide values, due to the specific mix of habitat types present in individual areas. For example, aspen (*Populus tremuloides*) is a minor component of many PVGs, but because it is a trace species, forest-wide data do not capture its distribution and abundance well. For this reason, these early-seral, trace species—especially species in decline, such as aspen, whitebark pine, and western larch—should be retained where they are found on the landscape. (These 3 species are found in the analysis area in varying abundance, depending upon site characteristics.)

The proper species mix for each stand should be determined by habitat types and other concerns, such as wildlife or WUI. This landscape contains fewer habitat types represented by each PVG; thus, the forest-wide desired species composition should be viewed as a general goal. Although the desired stand-level species compositions may deviate from these forest-wide desired conditions, both would, in general, result in landscapes dominated by early-seral species for the PVGs and fire regimes already present in the project area. These early-seral species are better adapted to site conditions and usually more resilient to disturbances, such as fire.

In addition, Vegetation Goals VEGO01 through VEGO07 provide direction to maintain or restore vegetative components, including size classes, canopy cover, structure, and snags (USDA Forest Service 2003, p. III-30), together with Vegetation Objective VEOB01, which identifies and prioritizes areas for regenerating the following:

- Aspen, both in climax stands and as a seral component of coniferous stands
- Native herbaceous understory in shrub communities
- Woody riparian species
- Western larch

- Whitebark pine

The decline of whitebark pine and other distressed 5-needle white pines was brought to the attention of the chief of the U.S. Forest Service through the reports *Managing for Healthy White Pine Ecosystems in the United States to Reduce the Impacts of White Pine Blister Rust* (Samman et al. 2003) and *Whitebark Pine in Peril: A Case for Restoration* (Schwandt 2006).

These desired conditions are expected to provide for ecological processes, reduce uncharacteristic disturbances, maintain or enhance habitat for various species, facilitate regeneration of desirable plants, and maintain or restore spatial patterns important to other goals of the Forest Plan (USDA Forest Service 2003a).

Spatial Patterns

Recent advances in theory and empirical studies of vegetation and landscape ecology indicate that to achieve long-term biological diversity across landscapes, management needs to consider the major disturbance processes, including variability and scale, that determine ecosystem components and their spatial patterns (Crane and Fischer 1986; Baker 1992; Baker and Cai 1992; Hessburg et al. 2007). Because fire was historically a major disturbance process in the West and in the analysis area (Barrett 1994a and 1994b; Barrett et al 1997; Mehl et al. 1998; Morgan and Parsons 2001), historical fire regimes have been recommended to help set the context for the individual components of the desired conditions (Wallin et al. 1996).

The mix of historical fire regimes on the landscape helps to determine the appropriate patch size and arrangement (see Table 3-2 for a description of the fire regimes in the project area). For example, portions of a landscape dominated by nonlethal fire regimes (e.g., PVG 2 and PVG 5) may be primarily large tree size class with fine-grain patches of smaller tree size class, whereas portions of a landscape dominated by mixed fire regimes (e.g., PVGs 6, 7, and 11) may have numerous small to large patches of different tree size classes. For this analysis, the amount of vegetation departure from reference conditions was calculated utilizing the process defined in the *Fire Regime Condition Class (FRCC) Guidebook* (Hann et al. 2004). This departure is calculated by 1) determining the abundance (in percent) of each successional class (either existing or projected); 2) identifying the amount of similarity (in percent) that the existing conditions have to the reference conditions; and 3) adding the cumulative similarities and subtracting that resulting value from 100%. The resulting value is the amount of vegetation departure the landscape has or is projected to have. Strata data were utilized to compare existing conditions to the desired reference conditions. The desired reference conditions were adapted from the Forest Plan (USDA Forest Service 2003a, Appendix A) and the Morgan and Parsons (2001) documentation of the historical range of variability.

Spatial Patterns Measurement

Percent departure from reference conditions, per PVG—The desired condition for spatial patterns is to trend toward the reference conditions in the long term. The desired condition is not to achieve the reference conditions at all points in time, because vegetation is dynamic. However, the desired conditions can be viewed as a reference from which the abundance of different successional stages can be compared. It is expected, and desired, that the successional stages will shift in mosaics throughout the landscape, both spatially and temporally.

Aspen

Aspen (*Populus tremuloides*) stands are important for biodiversity in conifer-dominated forest landscapes. Aspen distribution within the analysis area has been altered by resource management and human settlement influences, wildfire management, and livestock grazing. (Gallant et al 2003). Campbell and Bartos (2000), based off of Forest Inventory Analysis data, concluded that aspen has declined approximately 61% in Idaho and 50–96% across the whole western United States. Aspen stands in properly functioning condition will often have the following characteristics: multi-aged stems in the stand, adequate regeneration to perpetuate the stand, age classes mostly less than 100 years old, and good undergrowth beneath the canopy (Campbell and Bartos 2000).

Aspen stands at risk of further decline are described as having greater than 25% canopy cover of conifer species (overstory or understory); aspen canopy cover less than 40%; dominant aspen trees greater than 100 years old; and/or less than 500 stems per acre of aspen regeneration (5–15 feet tall) (Bartos 2000, Campbell and Bartos 2000; Strong et al. 2010, Strong 2011a, Strong 2011b; Swanson et al. 2010a and 2010b; Seager et al. 2013, Shinnerman et al 2013).

Aspen Measurement

Acres treated to maintain and/or promote aspen—The desired condition in stands or portions of stands that are treated to maintain and/or promote aspen is to have 25% or less canopy cover of coniferous trees intermixed in the aspen stand after treatment.

Nonforested Vegetation and Wet Meadows

At the landscape level, nonforested ecosystems are a mosaic of patches. Nonforested vegetation groups have increased susceptibility to conifer encroachment during the past century (USDA Forest Service 2007). In some instances, this may reflect a process of contraction following a disturbance such as wildfire. Conifer encroachment into nonforested vegetation and meadows has been reported across the Pacific Northwest, in the Sierra Nevadas and in the inner mountain region (Vale 1981; Rochefort et al. 1994; Taylor 1995; Griffiths et al. 2005; Gallant et al 2003). Elsewhere, it may reflect a change in land use, such as cessation of sheep grazing, or a shift in climate (USDA Forest Service 2007). Within the project area, nonforested vegetation has been altered primarily by wildfire management (fire exclusion) and livestock grazing (Gallant et al 2003)The USDA Forest Service (2007) found that the most effective strategy for conservation and maintenance of meadow habitats is one that targets tree removal during the early stages of encroachment, followed by prescribed burning for maintenance.

Nonforested and Wet Meadow Measurements

- Acres treated to maintain and/or promote nonforested vegetation

The desired condition in grasslands and shrublands is to maintain less than 10% canopy cover of trees at all time scales.

- Acres treated to maintain and/or promote wet meadow

The desired condition for this measurement is to maintain less than 10% canopy cover of trees at all time scales.

3.2.4.3. Current Conditions

This section compares the existing conditions to the desired conditions for the measurements identified in section 3.2.3.2. The current conditions were used as the basis for the design of the proposed action and other action alternatives.

Tree Size Class

Measurement: Acres treated to promote and/or maintain the large tree size class

The following table identifies the minimum and maximum acres, by PVG, desired within the large tree size class, as well as the existing acres within the large tree size class. As can be seen in Table 3-4, PVGs 2 and 5 together are deficit by 2,059 to 3,520 acres, while PVGs 6, 7, 9, 10, and 11 have an overabundance of 5,034 to 9,070 acres. This measurement depicts how many acres would be treated to maintain and/or promote the large tree size class within desired canopy covers and species compositions in the long term.

Measurement: Distribution of tree size classes

PVGs 2 and 5 exhibit a deficit of the large tree size class and an overabundance of the medium size class. In PVG 2, grass/forb/shrub/seedling (GFSS) and small size class are at desired conditions. PVG 5 has a slight overabundance of GFSS, and the small size class is within desired conditions. PVGs 7, 9, and 11 exhibit an overabundance of the large tree size class and a deficit in all other size classes. PVG 6 has an overabundance of the large tree size class, a deficit of sapling and GFSS, and is at the low range of desired conditions for both the small and medium size classes. PVG 10 has an overabundance of the medium size class and a deficit in all other size classes.

Canopy Cover Class

Figure 3-2 and Table 3-6 display the current conditions for canopy cover class in the large tree size class stands, as compared to the desired conditions. This comparison indicates that PVGs 2 and 5 are deficit while PVGs 9, 10, and 11 are overabundant in the low canopy cover class. Low canopy cover in PVGs 6 and 7 is within historical range. PVGs 6, 7, 10, and 11 are deficit and PVG 2 is overabundant in the moderate canopy cover class. Moderate canopy cover in PVGs 5 and 9 is within historical range. PVGs 2, 5, 6, 7, 10, and 11 are overabundant in the high canopy cover class and PVG 9 is deficit. The overabundance in high canopy closure in the large tree size class decreases early-seral communities, increases landscape homogeneity, increases in dominance of single patch type, and decreases in patch diversity. These conditions are a result of past management in the project area, primarily fire suppression, combined with years of tree growth, natural seedling establishment, seedling growth, and a minimal amount of recent natural disturbance.

PVGs 2, 5, 6, 7, 10, and 11 have an overabundance in high canopy cover in the large tree size class. PVGs 2 and 5 have a deficit in low canopy cover; PVGs 6, 7, 10, and 11 have a deficit in moderate canopy cover. PVG 9 has an overabundance in low canopy cover and a deficit in high canopy cover.

Species Composition

Table 3-9 displays the desired species composition ranges and the existing species compositions for all tree size class stands and the existing species compositions for all stands.

Currently, undisturbed stands are declining in early-seral species and increasing in climax species as stands move through succession, as discussed by Steele et al (1981), Steele (1994) and Crane and Fischer (1986). A comparison of Payette National Forest inventory data, over time, indicates a decline in early-seral species (e.g., ponderosa pine) in unmanaged stands in the forest (Covington et al 1997). Plantations in the analysis area have an abundance of early-seral species because seral species were usually planted after regeneration harvests.

These forest-wide trends are consistent with field observations in the analysis area, indicating an overabundance of late-seral species (most notably grand fir and subalpine fir) and a decline in the vigor of desired early-seral species in mature stands (see Table 3-11). This decline in the vigor of western larch, aspen, whitebark pine, Douglas-fir, and ponderosa pine is noted throughout the analysis area, in many of the mature stands with mortality of the larger-diameter pine, larch, and Douglas-fir due to western pine beetle, *Ips* species, douglas-fir beetles (*Dendroctonus pseudotsugae*), and competition as the primary causal factors (Jorgenson 2013). Observations also indicate that many of the plantations are near-monocultures of ponderosa pine, with limited amounts of western larch and Douglas-fir.

These trends in species compositions can be attributed primarily to fire suppression and past timber management, which have reduced the number and frequency of surface fires, removed many of the large, early-seral tree species, and resulted in increased growth of shade-tolerant species, such as grand fir. Historical data and forest inventories across the western United States have shown declines in early-seral tree species and increases in climax (shade-tolerant) tree species (Sloan 1998a and 1998b; Covington and Moore 1994, Stein 1987).

Field review of the analysis area indicates that western larch, aspen, ponderosa pine, whitebark pine, and Douglas-fir are all in decline in mature and overmature stands and most notably in undisturbed stands. Although forest-wide data indicate that Douglas-fir is slightly overabundant in PVG 6, field review indicates that competition with grand fir, as well as douglas-fir beetle activity in the analysis area, are causing moderate levels of mortality in large-diameter Douglas-fir.

With regard to whitebark pine, approximately 84% of whitebark pine occurs on federal land and 48% occurs in designated and recommended wilderness areas and IRAs (Keane 2000). This latter designation poses challenges, both legal and philosophical, for whitebark pine restoration efforts (Keane 2011, Keane et al 2012, Keane 2013). The Project area has approximately 403 acres of PVG 11 that are not in wilderness areas or IRAs, allowing for some treatment possibilities to maintain and promote whitebark pine populations.

Spatial Patterns

Vegetative spatial patterns within the project area have been altered by a host of resource management and human settlement influences, including timber management, wildfire management, livestock grazing, road and trail construction, changes in ownership and use patterns, etc. These findings are consistent with research across the interior West regarding spatial patterns in ponderosa pine and mixed-conifer forests (Franklin et al. 2007; Churchill et al. 2013; Stine et al. 2014). Table 3-11 provides a reference condition to analyze spatial patterns throughout the project area.

Table 3-11. Reference conditions and existing distribution of successional classes

Potential Vegetation Group (PVG)		Early Seral[a]	Mid Seral Closed[a]	Mid Seral Open[a]	Late Seral Closed[a]	Late Seral Open[a]	Uncharacteristic[b]	Overall Vegetation Departure
PVG 2	Desired	6%	3%	14%	12%	65%	0%	64
	Existing	19	11	37	10	3	19	
PVG 5	Desired	5%	12%	6%	50%	27%	0%	39
	Existing	6	16	18	33	5	22	
PVG 6	Desired	8%	24%	3%	58%	7%	0%	51
	Existing	5	11	8	27	3	46	
PVG 7	Desired	11%	32%	3%	50%	4%	0%	45
	Existing	0	6	17	42	10	25	
PVG 9	Desired	14%	12%	19%	21%	34%	0%	39
	Existing	0	0	7	20	40	34	
PVG 10	Desired	20%	6%	54%	2%	18%	0%	64
	Existing	0	5	11	33	32	22	
PVG 11	Desired	12%	32%	3%	49%	4%	0%	44
	Existing	0	0	18	51	20	12	
Grassland / Shrubland	Desired	100%					0%	40
	Existing	60%					40%	
Vegetation Departure Rating		N/A						47

[a]Based on Appendix A of the Forest Plan (USDA Forest Service 2003a) and Morgan and Parsons (2001).
[b]"Uncharacteristic" is defined as high canopy cover stands in PVGs 2, 5, 6, 7, and 11 (canopy cover >69%) and low canopy cover stands in PVGs 9 and 10 (canopy cover <39%), as defined by Morgan and Parsons (2001).
Additional notes:
These reference conditions are based upon desired conditions documented in the Forest Plan (USDA Forest Service 2003a, Appendix A) and Morgan and Parsons (2001); midpoint values were used.
This chart summarizes the desired conditions outlined in the Forest Plan for PVGs in all Management Prescription Categories except for 5.2. Desired future conditions are based upon the historical range of variability from Morgan and Parsons (2001).

The potential consequences to biological diversity and sustainability increase whenever forest conditions are outside of, and remain outside of, the desired conditions (Morgan and Parsons 2001; Stine et al. 2014). The vegetation departure rating is currently outside of desired conditions within the analysis area, and many stands throughout are considered to be uncharacteristic. Consequences include increased susceptibility to stand-replacing fires where few ever occurred historically, which can put soils, streams, and fish at risk (Morgan and Parsons 2001).

To reduce the overall vegetation departure rating and move it toward desired conditions, 1) promote early-seral species (e.g., GFSS, sapling, and small size classes) in PVGs 6, 7, 9, 10, and 11; 2) reduce canopy closure from high to low in PVGs 2 and 5; 3) reduce canopy closure from high to moderate in PVGs 6, 7, and 11, and 4) maintain and promote late–seral species in PVGs 2 and 5.

Aspen

Measurement: Acres treated to maintain and/or promote aspen with less than 25% canopy closure

Approximately 1,100 acres of aspen stands were identified in the analysis area as exhibiting some level of aspen decline and/or conifer encroachment. It is anticipated that removal of conifer encroachment will aid in rejuvenating the aspen component. Aspen has been identified in the Forest Plan as a species that should receive priority for regeneration

(VEOB01). Based on a field review of aspen stands in the project area, the desired condition is to maintain at least these 1,100 acres of aspen in a sustainable condition for the long term. To achieve this, the canopy cover of coniferous trees should be reduced and maintained at less than 25% in portions of these stands.

Nonforested Vegetation and Wet Meadow

Measurement: Acres treated to maintain and/or promote nonforested vegetation with less than 10% canopy closure

Nonforested vegetation (specifically, herbaceous understory in shrub communities) has been identified in the Forest Plan as a community that should receive priority for restoration (VEOB01). Based on field reviews, approximately 10,000 acres of grasslands and shrublands are in need of reducing conifer encroachment. The desired condition, therefore, is to treat at least the amount of grasslands and shrublands that will maintain them in the short term with <10% canopy cover.

Measurement: Acres treated to maintain and/or promote wet meadow

Wet meadows within the analysis area have been altered by resource management and human settlement influences, wildfire management, and livestock grazing (Borgmann et al. 2008, USDA 2008, Thompson et al 2007).

Wet meadows (specifically, riparian vegetation) have been identified in the Forest Plan as a community that should receive priority for restoration (VEOB01). Based on field reviews, approximately 271 acres of wet meadows are in need of conifer encroachment removal. The desired condition, therefore, is to treat at least the amount of wet meadows that will maintain them in the short term with <10% canopy cover.

3.2.5. Direct and Indirect Effects

The effects of the alternatives on forested vegetation are measured by how each alternative would change the current condition in comparison to the desired conditions for the objectives and applicable measures.

To evaluate the direct and indirect effects of the alternatives on the forested vegetation, strata and working group data were utilized to develop quantitative estimates for the current and short-term (immediately after treatment) effect. For longer-term estimates, qualitative descriptors and applicable research were utilized to describe the effects of treatments.

3.2.5.1. Tree Size Class

Figure 3-2, Table 3-5, and Table 3-6 above compare the existing distribution of tree size classes, by PVG, to the desired conditions. Table 3-12 below, identifies the number of acres that would be treated to maintain or promote the large tree size class by alternative. The effects of each alternative on the percentage of area in each tree size class are discussed below.

3.2.5.1.1. Large Tree Size Class Measurements

Measurement: Acres treated to maintain and promote the large tree size class

Table 3-12 displays the amount of acres treated to maintain (existing large tree size class stands) and promote (existing medium tree size class stands) large tree size class stands. This

measurement was selected because there is currently a deficit of large tree size class stands in PVGs 2 and 5 (see Table 3-4), in the lower half of the desired range for the large tree size class. By maintaining existing large tree stands in that size class and enhancing the resiliency and resistance of the stands to disturbances that could move the stands out of the large tree size class, and by promoting the development of medium tree size class stands into the large tree size class with desired characteristics (e.g., canopy cover and species compositions), management actions would move toward the desired conditions specified in the Forest Plan.

Alternative 1 (No Action)

Current tree size class distributions are displayed in Table 3-6 above. Tree size class percentages would change slowly over time as growth occurs; some tree size classes would develop into the next size larger class, while others would fall into the lower size class due to natural disturbance events (e.g., insects and wildfire).

In addition, at current stand densities, many of the dense stands would have high susceptibility to insect attacks, which could affect the tree size class in some of these stands.

Of the 5,381 acres of plantations, approximately 45% (2,421 acres) are estimated to have moderate to high densities; the remaining plantations (2,960 acres) are associated with the Grays creek fire of 2007. Plantations within this area burned at mixed severities; areas that had salvage harvests were replanted following the fire. Many of these plantations have mixed survival; specifically, there are intermixed patches of dense, moderate, low, and no survival of regeneration. Plantations have had 1, 3, and 5-year survival plots and adequate stocking rates; however, due to a combination of drought, herbivory (pocket gophers), and dense brush, some these plantations have experienced increased mortality. Under this alternative, many of these dense plantations would be susceptible to western pine beetle infestations. Western pine beetle activity was documented in a number of these plantations during field reconnaissance. Many of these plantations are currently in, or entering into, the size class and density ranges where susceptibility to western pine beetle is anticipated to increase (Jorgenson et al. 2013). These dense plantations would also be susceptible to density-induced growth rate reductions; once the reductions occur, the trees are not anticipated to return to the higher diameter growth rates (Basford et al. 2010), which would further slow the development of these stands into larger tree size classes.

Mature stands in the grand fir forest (PVGs 5 and 6), subalpine fir (PVGs 7, 9, and 11), and lodgepole pine (PVG 10) types, especially in the north and eastern portions of the analysis area, have seen recent and intensifying activity of douglas-fir beetle, fir engraver beetle, balsam woolly adelgid, western balsam bark beetle, spruce beetle, mountain pine beetle, and western spruce budworm, whereas the central and southwestern portions of the analysis area have recently seen increases in western pine beetle and *Ips* beetle activity (USDA FHP 2008, 2009, 2010, 2011, 2012). Under Alternative 1, the dense conditions in many of these mature stands will lead to higher susceptibility to douglas-fir beetle, western pine beetle, and western spruce budworm, as delineated by Jorgenson and others (2013).

Susceptibility of the analysis area to disturbance would continue to increase without treatment. Specifically, PVGs 2 and 5 would continue to exhibit increases in understory/overstory grand fir and Douglas-fir densities, leading to more ladder fuels. Densities in PVG 6, 7, and 11 will continue to increase, which will lead to increased mortality, decreased growth, and increased ladder fuels. If a landscape-level disturbance were to occur, large expanses of mature forests could be converted to GFSS, creating a single large cohort of GFSS instead of multiple smaller cohorts (i.e., GFSS, seedling, sapling, and small),

which would not perpetuate size class differentiation. Conversely, if no disturbance were to occur, then the size class distribution would continue to not meet desired conditions. Therefore, we do not expect that Alternative 1 would reach desired conditions in the short to long term.

Commonalities of All Action Alternatives

All action alternatives are designed to maintain large tree size class stands by managing densities to enhance the resiliency and resistance of the stands to disturbance events such as wildfire and insects. These alternatives also promote the development of medium tree size class stands by promoting the growth of desired trees to accelerate development of the large tree size class with desired tree species compositions. Alternative 4 would treat the most acres to both maintain and promote the large tree size class; Alternative 3 would treat the fewest acres maintained and promoted. See Table 3-12, below, for a comparison of acres treated by alternative.

Table 3-12. Acres treated to maintain and promote large tree size class, by alternative

Measurement	Desired	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Acres Treated to Promote the Large Tree Size Class	-	0	2,114	2,084	2,291
Acres Treated to Maintain the Large Tree Size Class	-	0	7,474	6,761	8,358
Total Acres Treated to Promote or Maintain the Large Tree Size Class	8,965–14,462	0	9,588	8,845	10,649

Measurement: Distribution of tree size classes

Effects Common to All Action Alternatives

None of the alternatives' proposed treatments would affect tree size class distribution immediately post-treatment. No large tree size class stands would shift to smaller size classes with any of the alternatives. For example, in a large tree stand proposed for prescribed fire-only treatment that is also on the cusp of having enough canopy cover of trees greater than 20 inches in diameter, silvicultural prescriptions and burn plans would be limited to ensure that the stand would not reduce to a smaller size class. All vegetative treatments, including mechanical treatments and prescribed burning, would retain stands in their existing tree size classes.

None of the alternatives would move toward the desired GFSS and sapling tree size class objectives (PVGs 6, 7, 9, 10, and 11)—such actions are not consistent with the Forest Plan. Additionally, Agee (2007) stated that ecosystem management using HRV should recognize the importance of scale and avoid focusing on individual structural stages (maintaining only large tree size classes) because it creates a quasi-static system. Although regeneration treatments are proposed in Alternatives 2, 3, and 4, these treatments would retain too much canopy cover in the large and medium tree stands to qualify as GFSS stands; however, portions of each stand would have openings with reserve trees that allow for some regeneration (but not enough to classify a stand as GFSS). The proposed regeneration treatments are designed to retain clumps of untreated areas within each unit, as well as to retain biological legacies such as legacy trees, snags, and CWD to maintain structure and ecological processes identified in the applicable science (USDA Forest Service 1997; ICBEMP 1999; Perera et al. 2004; Franklin et al. 2008; Lindenmayer et al. 2008). The

proposed regeneration treatments attempt to mimic a disturbance of moderate severity, with a mosaic created within the proposed regenerated stands.

Alternative 2

This alternative proposes 6 types of treatments that could affect tree size class and growth of stands into the next larger size class: NCT, burned areas/plantations (BA/PL), commercial thin-mature plantations (CT-MP), CT-FT, conifer removal in aspen (CT-ASP), and free thin, patch cut, modified shelterwood harvest (FT-PC-MSw) treatments. These treatments, which are based on how they affect individual tree growth, could increase tree size class and growth via direct mortality and/or removal of trees. BA/PL represents a combination of replanting burned areas and NCT; both types of treatments could positively affect tree size class and growth of stands.

Noncommercial treatments (including NCT, BA/PL, SFB, and fuels reduction within a riparian conservation area [FR-RCA]) outside of harvest units could occur on up to 4,904 acres in both mature forests and plantations (Table 3-13). Understory thinning would occur in all commercial treatments (CT-ASP, CT-FT, CT-MP, and FT-PC-MSw) and LSQ, equating to 10,345 acres. The CT-MP treatment would occur on up to 1,080 acres. The CT-FT treatment would occur on up to 2,875 acres. All treatments would promote growth of residual trees by removing shade-tolerant species, increasing available growing space, and reducing competition for moisture, sunlight, and nutrients (Oliver and Larson 1996; Cochran and Barrett 1993; Cochran and Barrett 1999a; Cochran and Barrett 1999b; Basford et al. 2010; Fiedler et al. 2010). These treatments would reduce tree densities and promote maintenance and development of early-seral species, large trees, and legacy trees. CT-FT post-treatment canopy cover would generally be less than 40%. Canopy closure in these stands would average 25%.

The FT-PC-MSw treatments would occur on up to 4,602 acres. In some areas, FT-PC-MSw units receiving free thin treatments would exhibit effects similar to those described for CT-FT treatments (above). In areas receiving the patch cut, 4 to 9 of the larger-diameter trees per acre would be retained. In areas treated with a modified shelterwood, 10 to 20 of the larger-diameter trees per acre would be retained, with 5–10% of each stand retained in untreated reserve areas (skips). Overall, the FT-PC-MSw treatment would maintain the large tree size class by leaving the larger, more fire-resistant ponderosa pine, Douglas-fir, and western larch, if available. Specifically, intermediate treatments (i.e., the FT portion of the FT-PC-MSw treatment) would occur in both medium and large size classes in order to reduce stocking, which would, in turn, improve diameter growth and reduce competition. It is expected that regeneration treatments (PC and MSw) would occur only on a portion of these stands, with the intent that large tree size classes (in any PVG) would not be reduced. After completing harvest and site preparation treatments, the average canopy closure in these stands would be below 25%. Canopy closure in the created openings would be around 10%. Canopy closure in the thinned areas would average 25%; canopy closure could be greater than 40% in untreated areas.

CT-ASP would treat approximately 1,087 acres. The interspaces between aspen clones would receive FT-PC-MSw treatments; effects would be similar to those described above. Within an area adjacent to the clones (50 feet to the north and east and 100 feet to the south and west), treatments would promote growth of aspen by removing most conifers (excluding legacy trees), increasing available growing space, and reducing competition for moisture, sunlight, and nutrients. Overall, the CT-ASP treatment would maintain the large tree size class by

leaving the larger, more fire-resistant ponderosa pine, Douglas-fir, and western larch within the interspaces between clones. The average canopy closure in these CT-ASP treatment areas would be below 25%. Canopy closure in the created openings would be around 10%. Canopy closure in the thinned areas would average 25%; canopy closure could be greater than 40% in untreated areas. Legacy ponderosa pine, Douglas-fir, and western larch would be retained with the clones.

In the short to long term (5 to 30 years), these NCT, CT-MP, BA/PL, and CT-FT treatments are anticipated to increase the rate of diameter growth (Basford et al. 2010; Cochran and Barrett 1999a; Cochran and Barrett 1999b), which would aid in moving the treated medium tree size stands (approximately 2,517 acres) toward the large tree size class and maintain existing large tree stands in that tree size class.

The proposed burns (6,881 acres of prescribed burning only) would be low-intensity ground fires not anticipated to reduce the tree size class, as larger-diameter trees are generally more resistant to mortality than the smaller-diameter trees in a stand, primarily due to thicker bark. Although some mortality of large-diameter trees (including some legacy trees) is anticipated, past experience and monitoring indicate that prescribed burning typically kills less than 5% of the largest tree size class trees in a stand. This alternative has a moderate amount of untreated stands (3,418 acres) as compared to Alternative 3 (high end) and Alternative 4 (low end), which equates to moderately higher densities across the landscape, making the residual trees more susceptible to spruce budworm and other insects (as compared to Alternative 4).

In stands mechanically treated prior to burning, additional trees would be retained or the timing of the burn would be altered to account for the increased mortality and to aid in meeting treatment objectives.

Alternative 2 would treat portions of the analysis area that are more susceptible (specifically, PVGs 7, 9, 10 and 11) and less resistant and resilient to insects and wildfire. Following implementation of Alternative 2 it is expected that these treated acres in PVGs 7, 9, 10, and 11 (i.e., 30%) would experience a mosaic disturbance of fire and/or insect/disease outbreak instead of a landscape-level disturbance. Agee (2003) described that in higher elevation areas, late successional patches are likely to move around throughout the landscape, as one patch is burned by high-severity fire but elsewhere another is developing, thus creating a continuous mosaic. Therefore, increasing landscape mosaic (e.g., heterogeneity) could, in turn, lead to positive effects on tree size class objectives, especially in light of climate change and associated predictions regarding wildfire and insects outbreaks (Kliejunas 2011; National Resource Council 2011). Specifically, following disturbance (insect or fire), only portions of these PVGs would move into GFSS, creating multiple age–class cohorts moving through time, which would perpetuate the differentiation between size classes. This would, in the long term, meet desired conditions.

In summary, the immediate effect of all mechanical and hand vegetative treatments (20,096 acres) would be to retain stands in their current size class. In the short term, the NCT, CT-MP, CT-FT, and free thin portions of FT-PC-MSw and CT-ASP stands would promote the growth of residual trees. This expedited growth would accelerate movement of GFSS, sapling, and small and medium tree size class stands into the next larger tree size class. Alternative 2 treats more acres than Alternative 3 and fewer acres than Alternative 4.

Table 3-13. Alternative 2—Acres of commercial and noncommercial treatment type by Potential Vegetation Group (PVG) in small, medium, and large tree size class

PVGs	Treatment Types												
	CT-FT		FT-PC-MSw		CT-MP			CT-ASP			LSQ		
	Medium	Large	Medium	Large	Small	Medium	Large	Small	Medium	Large	Small	Medium	Large
2	101	125	31	127	96	0	0	0	0	0	60	109	36
5	196	316	243	728	322	0	0	10	105	199	0	189	17
6	139	1,717	671	3,036	589	11	9	15	191	332	7	174	32
7	0	155	55	321	53	0	0	0	8	138	0	62	48
9	0	12	0	35	0	0	0	47	0	42	0	0	0
10	0	10	0	43	0	0	0	0	0	0	0	0	11
11	0	23	0	40	0	0	0	0	0	0	0	16	30
Total	436	2,358	1,000	3,602	1,060	11	9	72	304	711	67	550	174

PVGs	Treatment Types					
	NCT[a]			BA/PL		
	Small	Medium	Large	Small	Medium	Large
2	277	115	5	492	839	35
5	68	57	0	117	215	0
6	244	122	21	806	429	125
7	0	172	104	0	8	6
9	1	0	0	0	27	0
10	7	64	20	6	22	<1
11[b]	0	0	0	0	0	0
Total	597	530	150	1,421	1,540	167

Note: **CT-FT** = commercial thin-free thin; **FT-PC-MSw** = free thin, patch cut, modified shelterwood harvest; **CT-MP** = commercial thin-mature plantations; **CT-ASP** = conifer removal in aspen; **LSQ** = ; **NCT** = noncommercial thinning; **BA/PL** = burned areas/plantations.

[a]NCT does not include understory thinning following commercial harvest. Additionally, NCT treatments within the medium and large size classes are fuels treatments designed to reduce the understory densities.

[b]PVG11 wet meadow/nonforested treatments will be designed to promote/maintain whitebark pine populations. There are 4 acres of nonforested treatment in PVG11 in Alternative 2 –total treatment in this PVG equates to 113 acres.

Alternative 3

This alternative proposes 6 types of treatments that could affect tree size class and growth of stands into the next larger size class: NCT, burned areas/plantations (BA/PL), commercial thin-mature plantations (CT-MP), CT-FT, conifer removal in aspen (CT-ASP), and free thin, patch cut, modified shelterwood harvest (FT-PC-MSw) treatments. These treatments, which are based on how they affect individual tree growth, could increase tree size class and growth via direct mortality and/or removal of trees. BA/PL represents a combination of replanting burned areas and NCT; both types of treatments could positively affect tree size class and growth of stands (see Table 3-14).

The effects of Alternative 3 on tree size class would be similar to those described for Alternative 2, except that fewer acres would be considered for treatment (fewer than in any of the other action alternatives). PVGs 7, 8, 9, 10, and 11 would not be treated in Alternative 3.

Noncommercial treatments (including NCT, BA/PL, SFB, and fuels reduction within a riparian conservation area [FR-RCA]) outside of harvest units could occur on up to 4,099 acres in both mature forests and plantations. Understory thinning would occur in all commercial treatments (CT-ASP, CT-FT, CT-MP, and FT-PC-MSw) and LSQ, equating to 10,061 acres. The CT-MP treatment would occur on up to 1,039 acres. The CT-FT treatment would occur on up to 2,697 acres. All treatments would promote growth of residual trees by removing shade-tolerant species, increasing available growing space, and reducing competition for moisture, sunlight, and nutrients (Oliver and Larson 1996; Cochran and Barrett 1993; Cochran and Barrett 1999a; Cochran and Barrett 1999b; Basford et al. 1991; Fiedler et al. 2010). These treatments would reduce tree densities and promote maintenance and development of early-seral species, large trees, and legacy trees. Post-treatment canopy cover would be the same as that detailed in Alternative 2.

The FT-PC-MSw treatments would occur on up to 4,836acres. In some areas, FT-PC-MSw units receiving free thin treatments would exhibit effects similar to those described for CT-FT treatments (above). In areas receiving the patch cut treatment, 4 to 9 of the larger-diameter trees per acre would be retained. In areas treated with a modified shelterwood, 10 to 20 of the larger-diameter trees per acre would be retained, with 5%–10% of each stand retained in untreated reserve areas (skips). Overall, the FT-PC-MSw treatment would maintain the large tree size class by leaving the larger, more fire-resistant ponderosa pine, Douglas-fir, and western larch, if available. Post-treatment canopy cover would be the same as Alternative 2.

CT-ASP would treat approximately 900 acres. The interspaces between aspen clones would receive FT-PC-MSw treatments; effects would be similar to those described above. Within an area adjacent to the clones (50 feet to the north and east and 100 feet to the south and west), treatments would promote growth of aspen by removing most conifers (excluding legacy trees), increasing available growing space, and reducing competition for moisture, sunlight, and nutrients. Overall, the CT-ASP treatment would maintain the large tree size class by leaving the larger, more fire-resistant ponderosa pine, Douglas-fir, and western larch within the interspaces between clones. Post-treatment canopy cover would be the same as Alternative 2.

Legacy ponderosa pine, Douglas-fir, and western larch would be retained with the clones.

In the short to long term (5 to 30 years), these NCT, CT-MP, BA/PL, and CT-FT treatments are anticipated to increase the rate of diameter growth (Basford et al. 2010; Cochran and Barrett 1999a; Cochran and Barrett 1999b), which would aid in moving the treated medium tree size stands (approximately 2,230 acres) toward the large tree size class and maintain existing large tree stands in that tree size class.

The proposed burns (5,658 acres of prescribed burning and no commercial harvest) would be low-intensity ground fires not anticipated to reduce the tree size class, as larger-diameter trees are generally more resistant to mortality than the smaller-diameter trees in a stand, primarily due to thicker bark. Although some mortality of large-diameter trees (including some legacy trees) is anticipated, past experience and monitoring indicate that prescribed burning typically kills less than 5% of the largest tree size class trees in a stand. In stands mechanically treated prior to burning, additional trees would be retained or the timing of the burn would be altered to account for the increased mortality and to aid in meeting treatment objectives.

The result of these differences is that stand growth in burn-only stands would be affected (improved) for a shorter period of time before competition would begin (Long and Shaw 2005; Shaw and Long 2010; Long and Shaw 2012). In addition, density levels would leave some stands (especially those left in the moderate canopy cover class) more susceptible to insects, which in the case of western pine beetle and douglas-fir beetle could affect the number of large early-seral trees per acre. Alternative 3 has the greatest amount of untreated stands (5,849 acres) of all the action alternatives, which equates to higher densities across the landscape, making the residual trees more susceptible to spruce budworm, balsam woolly adelgid, spruce beetle, and other insects/diseases (Jorgenson 2013). If current outbreaks worsen in the analysis area, the effect on residual trees would be a decrease in diameter growth.

No SBA or FR-RCA treatment under this alternative.

Alternative 3 proposes the least mechanized and hand vegetation treatment acres (18,028 acres, which is 2,111 acres and 4,119 acres less than Alternative 2 and Alternative 4, respectively), thus having the least beneficial effect on increasing tree size class in the short to long term when compared to other action alternatives. This alternative would also leave portions of the analysis area (specifically, PVGs 7, 9, 10, and 11) more susceptible, less resistant, and less resilient to insects, and also less resilient to wildfire, than any of the other action alternatives. If Alternative 3 is implemented, a large percentage (up to 100%) of these PVGs (7–11) would likely be susceptible to stand-replacing fire or insect outbreak. This could lead to undesirable effects on tree size class objectives, especially in light of climate change and associated predictions regarding wildfire and insects (Klienjunas 2011; National Resource Council 2011). Specifically, following disturbances large expanses of these PVGs would shift into GFSS, which would not meet desired conditions. We expect these stands to move as a single cohort through time and, with the continued fire exclusion, small-scale fire disturbance would still be limited, further perpetuating the limited differentiation between size classes. It is unclear as to whether the project area would attain desired conditions in the long term under Alternative 3.

Table 3-14 displays commercially and noncommercially treated acres by tree size class and by PVG for Alternative 3. Alternative 3 would commercially treat (i.e., CT-ASP, CT-FT, CT-MP, and FT-PC-MSw) and implement LSQ on 2,184 acres of medium tree size class and 6,770 acres of large tree stands.

Table 3-14. Alternative 3—Acres of commercial and noncommercial treatment type by Potential Vegetation Group (PVG) in small, medium, and large tree size class

PVGs	Treatment Types												
	CT-FT		FT-PC-MSw		CT-MP			CT-ASP			LSQ		
	Medium	Large	Medium	Large	Small	Medium	Large	Small	Medium	Large	Small	Medium	Large
2	101	125	31	127	96	0	0	0	0	0	60	109	36
5	196	338	243	728	322	0	0	10	105	199	0	212	18
6	139	1,790	671	3,036	597	15	9	15	191	332	7	171	32
7	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	436	2,253	945	3,891	1,015	15	9	25	296	531	67	492	86

PVGs	Treatment Types					
	NCT[a]			BA/PL		
	Small	Medium	Large	Small	Medium	Large
2	277	115	5	492	839	35
5	68	57	0	117	215	0
6	244	122	21	806	429	125
7	0	0	0	0	0	0
9	0	0	0	0	0	0
10	0	0	0	0	0	0
11	0	0	0	0	0	0
Total	589	294	26	1,415	1,483	165

Note: **CT-FT** = commercial thin-free thin; **FT-PC-MSw** = free thin, patch cut, modified shelterwood harvest; **CT-MP** = commercial thin-mature plantations; **CT-ASP** = conifer removal in aspen; **LSQ** = ; **NCT** = noncommercial thinning; **BA/PL** = burned areas/plantations. removal in aspen; LSQ = ; NCT = noncommercial thinning; BA/PL = burned areas/plantations .

[a]NCT does not include understory thinning following commercial harvest. Additionally, NCT treatments within the medium and large size classes are fuels treatments designed to reduce the understory densities.

Alternative 4

Alternative 4 proposes 6 types of treatments that could affect tree size class and growth of stands into the next larger size class: NCT, burned areas/plantations (BA/PL), commercial thin-mature plantations (CT-MP), CT-FT, conifer removal in aspen (CT-ASP), and free thin, patch cut, modified shelterwood harvest (FT-PC-MSw) treatments. These treatments, which are based on how they affect individual tree growth, could increase tree size class and growth via direct mortality and/or removal of trees. BA/PL represents a combination of replanting burned areas and NCT; both types of treatments could positively affect tree size class and growth of stands (see Table 3-15).

Noncommercial treatments (NCT, SFB, BA/PL, and FR-RCA) outside of harvest units could occur on up to 5,668 acres, in both mature forests and plantations. Understory thinning would occur in all commercial treatments (CT-ASP, CT-FT, CT-MP, and FT-PC-MSw) and LSQ, equating to 12,455 acres. The CT-MP treatment would occur on up to 1,090 acres, and the CT-FT treatment would occur on up to 2,999 acres. All treatments would promote growth of residual trees by removing shade-tolerant species, increasing available growing space, and reducing competition for moisture, sunlight, and nutrients (Basford et al. 1991; Cochran and Barrett 1993; Oliver and Larson 1996; Cochran and Barrett 1999a; Cochran and Barrett 1999b; Fiedler et al. 2010). These treatments would reduce tree densities and promote maintenance and development of early seral species, large trees, and legacy trees. Post-treatment canopy cover would be the same as the treatment seen under Alternative 2.

In the short to long term (5 to 30 years), the NCT, CT-MP, BA/PL, and CT-FT treatments would likely, according to research, increase the rate of diameter growth (Basford et al. 1991; Cochran and Barrett 1999a; Cochran and Barrett 1999b), which would aid in shifting the treated medium tree size stands (approximately 2,496 acres) toward the large tree size class and maintain existing large tree stands in that tree size class.

The FT-PC-MSw treatment would occur on up to 6,076 acres. In areas receiving the patch cut treatment, 4 to 9 of the larger-diameter trees per acre would be retained. In areas treated with a modified shelterwood, 10 to 20 of the larger-diameter trees per acre would be retained, with 5–10% of each stand retained in untreated reserve areas (skips). Overall, the shelterwood treatment would maintain the large tree size class in the short and long term by leaving the larger, more fire-resistant ponderosa pine, Douglas-fir, and western larch, if available. Canopy estimates would be the same as Alternative 2.

The proposed burns (7,352 acres of prescribed burning and no commercial harvest in forested areas) would be low-intensity ground fires not anticipated to reduce the tree size class, as larger-diameter trees are generally more resistant to mortality than the smaller-diameter trees in a stand, primarily due to thicker bark. Although some mortality of large-diameter trees (including some legacy trees) is anticipated, past experience and monitoring indicate that prescribed burning typically kills less than 5% of the largest tree size class trees in a stand. In stands mechanically treated prior to burning, additional trees would be retained or the timing of the burn would be altered to account for the increased mortality and to aid in meeting treatment objectives.

Alternative 4 represents the most acres of vegetative commercial treatments (CT-ASP, CT-FT, CT-MP, LSQ, and FT-PC-MSw), equating to 12,455 acres, and also would represent the largest amount of acres destined for mechanical treatment.

The effect of this alternative on tree size class is expected to be similar to those effects described in Alternatives 2 and 3, except that more acres would be affected. Alternative 4 is the most beneficial action alternative for tree size class in the short to long term when compared to other action alternatives. With respect to the other action alternatives, Alternative 4 would also treat more portions of the analysis area (specifically, PVGs 7, 9, 10, and 11) that are more susceptible, less resistant, and less resilient to insects, and also less resilient to wildfire.

When compared to the no-action alternative and other action alternatives, Alternative 4 would create conditions in treated stands and across the landscape that would result in lower susceptibility when confronted with large areas of high-intensity/severity, landscape-scale disturbances (e.g., wildfire or insects) (Klienjunas 2011; National Resource Council 2011, Jorgensen 2013). Specifically, following a disturbance (insect or fire), only portions of these PVGs would likely shift into GFSS, creating multiple age–class cohorts moving through time, which would perpetuate the differentiation between size classes. This would, in the long term, meet desired conditions.

Table 3-15. displays, for Alternative 4, acres treated by tree size class by PVG. Alternative 4 would commercially treat (i.e., CT-ASP, CT-FT, CT-MP, and FT-PC-MSw) and implement LSQ on 1,152 acres of small tree size class (products include post and pole, biomass, and firewood), 2,545 acres of medium tree size class, and 8,579 acres of large tree stands.

Table 3-15. Alternative 4—Acres of commercial and noncommercial treatment type by Potential Vegetation Group (PVG) in small, medium, and large tree size class

PVGs	Treatment Types												
	CT-FT		FT-PC-MSw		CT-MP			CT-ASP			LSQ		
	Medium	Large	Medium	Large	Small	Medium	Large	Small	Medium	Large	Small	Medium	Large
2	101	125	31	127	96	0	0	0	0	0	60	109	36
5	196	338	243	728	322	0	0	10	105	199	0	189	17
6	138	1,771	671	3,045	589	11	9	15	191	332	7	174	32
7	23	228	62	734	53	10	0	0	8	138	0	175	141
9	0	0	2	35	0	0	0	0	0	42	0	27	0
10	0	11	13	229	0	0	0	0	0	0	0	32	36
11	0	47	0	112	0	0	0	0	0	0	0	34	67
Total	458	2,520	1,022	5,010	1,060	21	9	25	304	711	67	740	329

PVGs	Treatment Types					
	NCT[a]			BA/PL		
	Small	Medium	Large	Small	Medium	Large
2	277	115	5	492	839	35
5	68	57	0	117	215	0
6	244	122	21	806	429	125
7	0	134	0	0	8	6
9	1	0	0	0	27	0
10	7	49	0	6	22	<1
11[b]	0	22	57	0	0	0
Total	597	499	83	1,421	1,540	167

Notes: **CT-FT** = commercial thin-free thin; **FT-PC-MSw** = free thin, patch cut, modified shelterwood harvest; **CT-MP** = commercial thin-mature plantations; **CT-ASP** = conifer removal in aspen; **LSQ** = ; **NCT** = noncommercial thinning; **BA/PL** = burned areas/plantations.

[a]NCT does not include understory thinning following commercial harvest. Additionally, NCT treatments within the medium and large size classes are fuels treatments designed to reduce the understory densities.

[b]PVG11 wet meadow/nonforested treatments will be designed to promote/maintain whitebark pine populations. There are 18 acres of nonforested treatment in PVG11 in Alternative 2 –total treatment in this PVG equates to 357 acres

Summary of Tree Size Class

Currently, the landscape is less resilient to disturbance from wildfire and more susceptible to disturbance from insects such as western spruce budworm, balsam woolly adelgid, douglas-fir beetle, and western pine beetle. In Alternative 1, PVGs 2 and 5 would continue to have increased understory/overstory grand fir and Douglas-fir densities, leading to more ladder fuels. Densities in PVGs 6, 7, 9, 10, and 11 would continue to increase, which could lead to increased mortality, decreased growth, and increased ladder fuels. Without treatment, susceptibility of undesired effects to the landscape from disturbance would continue to increase. If a landscape-level disturbance were to occur, large expanses of mature forests could be converted to GFSS, creating a single, large cohort of GFSS instead of multiple smaller cohorts (i.e., GFSS, seedling, sapling, and small); this scenario would not perpetuate size class differentiation. Conversely, if no disturbance were to occur, the size class distribution would continue to not meet desired conditions. Therefore, we do not expect that Alternative 1 would reach desired conditions, not even in the long term.

By reducing competition, all action alternatives would help move medium tree size class stands toward the large tree size class; Alternatives 2 and 4 would treat the most acres across all PVGs. Additionally, all action alternatives would retain acres in the large tree size class, with Alternative 2 and Alternative 4 treating the most acres to maintain these stand conditions (due to treating PVGs 7–11). In the long term, trees in all treated stands would likely grow enough to shift these stands into the next larger size; in other words, all action alternatives would perpetuate large tree size classes.

In all action alternatives, PVGs 2 and 5 would move closer to desired conditions for large tree size class; an overabundance would perpetuate in PVGs 6, 7, 9, 10, and 11, in the short and long term. The continued overabundance in large tree size classes in the higher PVGs and, consequently, the deficit in GFSS would neither meet desired conditions in the short term nor in the long term. In the long term (without disturbance and at the stand level), seedling, sapling, and small tree size classes for PVGs 6, 7, 9, 10, and 11 would remain below the desired range for all action alternatives (see Table 3-8 and Table 3-9). The treatments in Alternatives 2 and 4, however, would create a mosaic of openings (mimicking disturbance) that would allow regeneration and differentiation of size classes (just not at the stand level).

Of the action alternatives, Alternative 3 would treat the fewest acres commercially and noncommercially. Therefore, the benefits of increased tree growth and the duration of benefits on treated acres would be less than those found in the other action alternatives; however, Alternative 3 would still be more beneficial to individual tree growth than Alternative 1. Alternative 3 would not utilize SFB/FT-RCA treatments and contains the largest amount of untreated acres (5,849 acres, approximately 11% of the landscape), which would leave more acres at higher risk of crown fire (especially PVGs 6, 7, 9, 10, and 11) and which could adversely affect tree size class.

Alternative 4 would have the greatest effect on shifting stands toward the large tree size class because, with respect to Alternatives 2 and 3, it would treat more acres intensively (e.g., CT-ASP and FT-PC-MSw), which would reduce competition and increase the growth rates of residual trees. Alternative 4 would allow for more noncommercial treatments than any other alternative and would therefore create more resilient landscapes than Alternatives 2 and 3; Alternative 4 would contain the least amount of untreated acres (877 acres).

In all the action alternatives, large tree size class stands would be harvested or treated with prescribed burning to reduce densities and canopy cover. All the proposed treatments would maintain these stands as large tree stands by retaining large trees in sufficient numbers to meet large tree size class stand requirements. Because the treatments would follow a skip, open patch, and thin patch mosaic pattern, variations in densities of residual trees would occur, creating both vertical and horizontal diversity. The regeneration, restoration, and burn-only treatments would increase the growth in these stands (for all PVGs) and make them less susceptible to uncharacteristic wildfire.

3.2.5.2. Canopy Cover Class

Canopy cover class would be affected by all the alternatives. Desired conditions and current conditions for canopy cover class are displayed, by PVG, in Table 3-8. The desired conditions for canopy cover class apply only to stands in the large tree size class.

Measurement: Percentage of area (acres) in each canopy cover class in the large tree size class

Alternative 1

The immediate effect of Alternative 1 would be that stands remain in their current canopy cover classes (see Figure 3-2). No acres would move toward desired conditions for canopy cover.

Specifically, PVGs 2, 5, 6, 7, 10, and 11 would continue to exhibit an excess of high canopy cover class. PVG 2 would exhibit a continued excess of high and moderate canopy cover classes and a deficit of the low canopy cover class. In PVGs 6 and 7, an excess of the high canopy cover class would continue, along with a deficit of the moderate canopy cover class; the low canopy cover class would remain at the bottom end of the desired range. In PVGs 10 and 11, an excess of the low and high canopy cover classes would continue, along with a deficit of the moderate canopy cover class. In PVG 9, an excess of the low canopy cover class would continue, and the deficits of high and moderate canopy cover classes would remain at the low ends of their desired ranges.

In the long term, increased tree densities from natural regeneration and growth of crown diameters in the more vigorous trees would cause stands with low and moderate canopy covers to eventually become stands with moderate and high canopy covers, moving further from the desired conditions. Over time, canopy cover would continue to increase, moving still further from desired conditions (excluding PVG 6 in the low canopy cover class). As less light reaches the forest floor, favoring shade-tolerant species, an increased susceptibility to uncharacteristic disturbance events exists in PVGs with nonlethal and mixed 1 fire regimes (i.e., PVGs 2, 5, and 6). Increased susceptibility of PVGs 6, 7, 9, 10, and 11 to disturbance events is especially undesirable given the PVGs' proximities to private land (including the Tamarack Resort). Alternative 1 increases the likelihood of continued departures from desired vegetative conditions and, if continued over the long term, would perpetuate scenarios making it difficult to restore to those desired conditions.

Alternative 2

The effects of the treatments proposed in Alternative 2 (mechanical vegetative treatments and prescribed burning) on canopy cover classes are shown in Figure 3-3 and Table 3-16.

The immediate post-treatment effect of Alternative 2 in PVG 2 would be a reduction in acres of the moderate and high canopy cover classes and an increase in acres of the low canopy cover class. Treatments in PVG 2 do not convert enough moderate/high canopy cover to low canopy cover to meet desired conditions, primarily due to limited commercial treatment within RCAs. The use of prescribed burning would be a priority in PVGs 2 and 5 and is expected to help maintain these stands near desired conditions (i.e., low to moderate canopy closures).

PVGs 6 and 7 would exhibit fewer acres of the moderate and high canopy cover classes, and the low canopy cover class would move to the high end of the desired conditions range. Alternative 2, then, does not move canopy cover into desired conditions post treatment.

We anticipate the overabundance of the low canopy cover class in PVGs 5, 6, 7, 9, and 11 to be a short-term effect, as much of the treatment proposed for these PVGs would leave stand canopy cover toward the high end of the low canopy cover class (for instance, much of the CT-FT treatment would retain greater than 25% canopy cover). PVG 10 exhibits an increase in low canopy cover and a reduction in high canopy cover, while moderate has only a slight reduction; this is due to only 30% of PVGs 7–11 being treated (due to lynx management) under this alternative.

Within all PVGs, the residual tree crowns and natural regeneration are projected to add 1%–2% of canopy cover per year in thinned stands. Canopy expansion is expected to last approximately 25 years; then it will taper off (Moeur 1985). Therefore, in the short term many stands in the low canopy cover class would likely move into the moderate canopy cover class, thus moving stands toward desired conditions. Specifically, in units where canopy cover is reduced to below 30% (i.e., CT-FT, CT-ASP, and FT-PC-MSw units would be reduced to approximately 20%–40% canopy cover in all PVGs), canopy cover is expected to remain in the low to moderate canopy cover class for the long term, especially where prescribed burning is proposed to maintain desired conditions. For example, in an Aspen treatment if we reduced the canopy cover to 20%, in 15 years, the expectation (based on the assumption of a 1%–2% decrease in canopy cover per year) is that the resulting canopy cover would be between 35% and 50% (i.e., low to moderate canopy cover).

In PVGs 5, 6, 7, 9, 10, and 11, treatments initially move canopy cover away from desired conditions (i.e., an overabundance in low canopy cover exists). The treatments would move moderate canopy cover to low canopy cover, which moves the canopy cover away from desired conditions in the temporary to short term. However, these treatments are needed in the moderate canopy cover class to 1) alter species composition, 2) alter spatial arrangement of residual trees, and 3) maintain the moderate canopy closure in the long term.

Without treatment, stands within the moderate canopy cover class would move into the high canopy cover class within the short term (assuming no disturbance). Therefore, by reducing canopy cover to 20%–39% (the low canopy cover class) via thinning, it is expected that stands would move into the moderate canopy cover class in the short term and maintain moderate canopy cover in the long term.

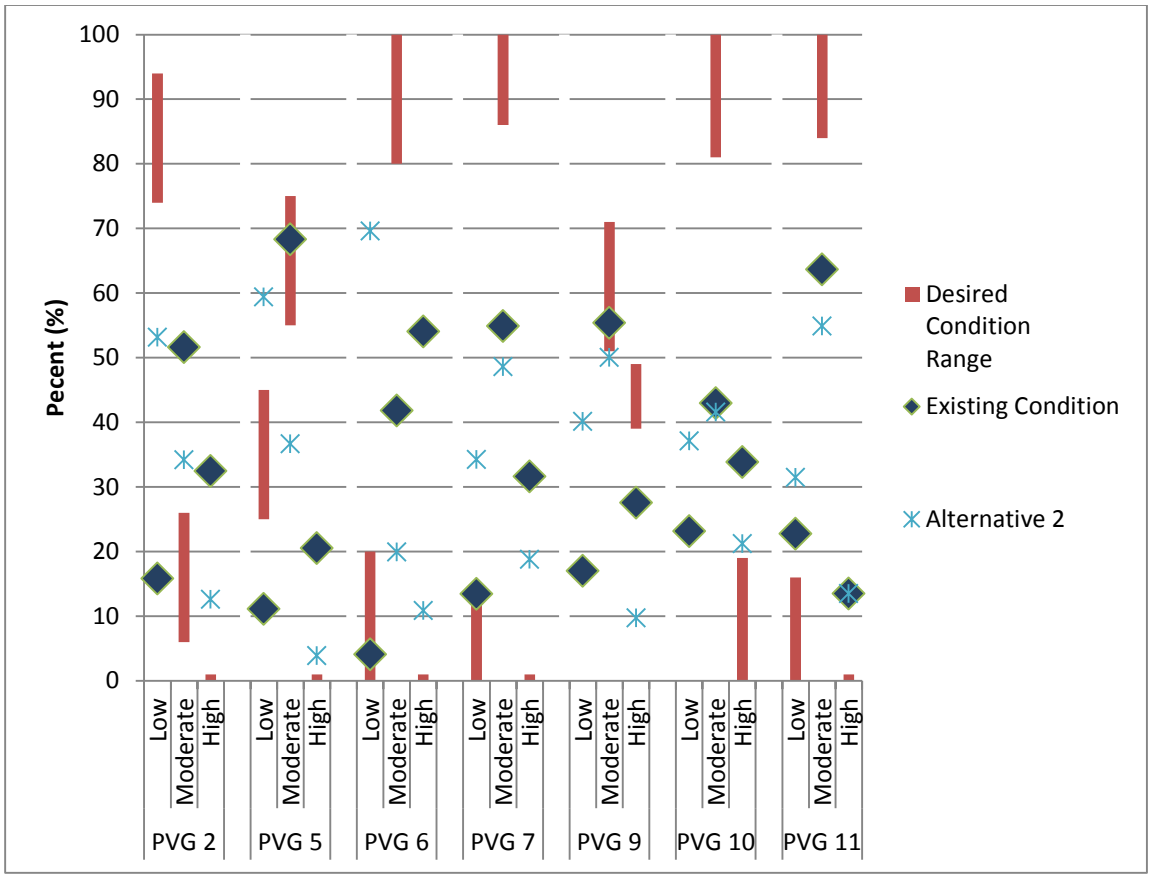


Figure 3-3. Large tree class (medium tree class in PVG 10) canopy cover by Potential Vegetation Group (PVG): comparison of desired and existing conditions and Alternative 2. The desired condition range in the low canopy cover class for PVGs 9 and 10 are 0%.

Table 3-16. Alternative 2—canopy cover class effects (applies only to large tree size class stands) by Potential Vegetation Group (PVG)

Canopy Cover	PVG 2			PVG 5			PVG 6		
	Desired Condition	**Existing Condition**	**Post Treatment**	**Desired Condition**	**Existing Condition**	**Post Treatment**	**Desired Condition**	**Existing Condition**	**Post Treatment**
Low	483–614 acres (74–94%)	104 acres (16%)	347 acres (53%)	512–923 acres (25–45%)	228 acres (11%)	1,219 acres (59%)	0–1,617 acres (0–20%)	331 acres (4%)	5,560 acres (69%)
Moderate	39–170 acres (6–26%)	337 acres (52%)	223 acres (34%)	1,128–1,538 acres (55–75%)	1,402 acres (68%)	752 acres (37%)	6,470–8,087 acres (80–100%)	3,348 acres (42%)	1,613 acres (20%)
High	0	212 acres (32%)	82 acres (13%)	0	421 acres (21%)	80 acres (4%)	0	4,373 acres (54%)	882 acres (11%)
Canopy Cover	**PVG 7**			**PVG 9**			**PVG 10[a]**		
	Desired Condition	**Existing Condition**	**Post Treatment**	**Desired Condition**	**Existing Condition**	**Post Treatment**	**Desired Condition**	**Existing Condition**	**Post Treatment**
Low	0–486 acres (0–14%)	468 acres (13%)	1,191 acres (34%)	0	70 acres (17%)	165 acres (40%)	0	199 acres (23%)	319 acres (37%)
Moderate	2,987–3,476 acres (80–100%)	1,907 acres (55%)	1,688 acres (49%)	210–292 acres (51–71%)	228 acres (56%)	206 acres (50%)	697–860 acres (81–100%)	369 acres (43%)	358 acres (42%)
High	0	1,098 acres (32%)	654 acres (19%)	161–202 acres (29–49%)	114 acres (27%)	40 acres (10%)	0–163 acres (0–19%)	291 acres (34%)	183 acres (23%)
Canopy Cover	**PVG 11**								
	Desired Condition	**Existing Condition**	**Post Treatment**						
Low	0–57 acres (0–16%)	79 acres (23%)	110 acres (32%)						
Moderate	292–348 acres (84–100%)	221 acres (64%)	191 acres (55%)						
High	0	47 acres (14%)	47 acres (14%)						

[a]References to PVG 10 are to be applied to the medium tree size class (overstory tree average diameter ranges from 12.0–19.9 inches DBH [diameter at breast height]). The overstory trees in PVG 10 stands (persistent lodgepole) generally do not attain an average diameter within the large tree size class (DBH) even though individual trees may equal or exceed 20 inches DBH.

Portions of large tree size class stands in PVG 2, 5, 6, 7, 10, and 11 that would remain in the high canopy cover class have been deferred from treatment for various reasons, including IRA/RNA management objectives, RCA protection, wildlife concerns (primarily northern goshawk nest stands and lynx restrictions in higher PVGs 7–11), inaccessibility, and nonfederal land ownership.

Alternative 2 does not address the overabundance of high canopy closure in PVG 11; it swaps acres (moving them from moderate to low), an action resulting from a lynx management goal (i.e., remaining below 30% unsuitable habitat in the lynx management unit). In PVG 11 treatments are essentially moving this PVG further away from desired conditions and the only potential is to move them back to current condition. however, in PVG 11 a reduction in canopy cover of subalpine fir, where whitebark pine are present, is expected. Essentially, this alternative does not move PVG 11 closer to desired canopy cover conditions, but it does reduce the impacts of subalpine fir competition with whitebark pine. Without management or fire, most seral whitebark pine forests would be successionally replaced by subalpine fir or other shade-tolerant, high-elevation species (Keane et al. 2012).

In the short term, Alternative 2 moves PVG 9 further away from desired conditions, as compared to Alternative 3. It is, however, expected that in the long term, canopy cover would increase in the moderate and high canopy cover classes and decrease in the low, thus moving this PVG closer to desired conditions. Additionally, with treatment, species composition would be modified (e.g., reductions of grand fir, subalpine fir, and Douglas-fir).

Alternative 3

Alternative 3 would retain the largest amount of moderate and high canopy cover of any of the action alternatives, in all PVGs. No immediate effects to canopy cover class in PVGs 7–11 would take place because they are not treated under this alternative (see Figure 3-4).

PVGs 2, 5, and 6 have the same responses as those found under Alternative 2.

Overall, Alternative 3 results in the least movement of any of the action alternatives toward desired canopy cover conditions, both immediately post treatment and in the short to long term (5–30 years), especially in PVGs 7 and 11(Table 3-17). This lesser temporary to short-term achievement of desired canopy cover conditions would stem from not treating the higher- PVGs. Specifically, low canopy cover stands are expected to continue to decrease while moderate and high canopy cover stands are expected to increase. In the long term it is expected that, without disturbance, PVGs 7 and 11 would move out of their desired conditions because of an overabundance of high canopy cover.

In the short term, PVGs 9 and 10 are the only vegetation groups in the higher PVGs that would move toward desired conditions.

Like all action alternatives, portions of large tree size class stands in PVGs 2, 5, and 6 would remain in the high canopy cover class. These portions have been deferred from treatment due to public comments regarding retention of habitat for species that utilize dense forest habitat types (e.g., as regards elk security, northern goshawk nest stands, and pileated woodpeckers). Treatments performed in PVGs 7–11 would continue to maintain and promote large tree size in a high canopy cover until disturbance. These PVGs typically experience stand-replacement disturbance; therefore, instead of affecting canopy cover in the large tree size class, disturbance would change the size class.

Unlike Alternatives 2 and 4, in PVG 11 it is expected there would be no reduction in canopy cover of subalpine fir where whitebark pine are present.

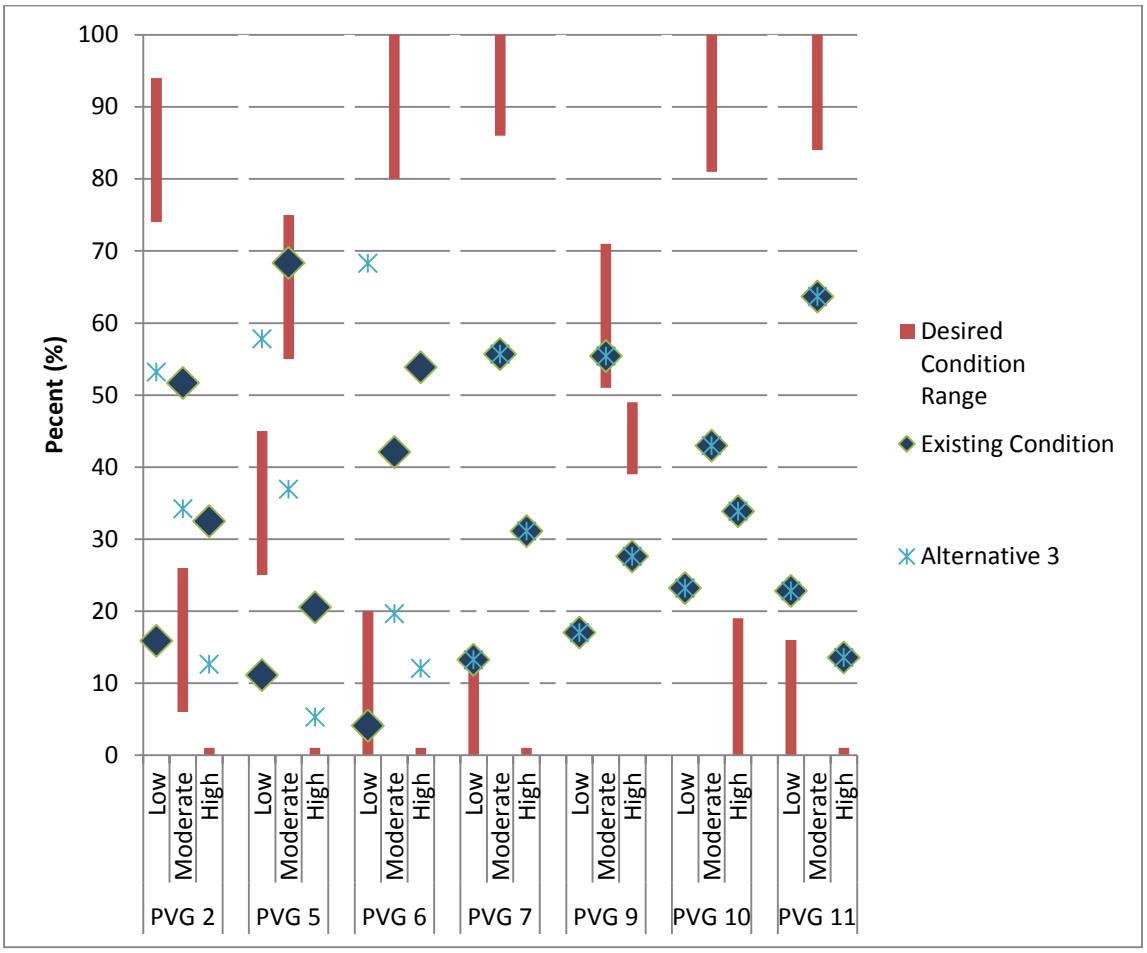


Figure 3-4. Large tree class (medium size class for Potential Vegetation Group [PVG] 10) canopy cover by PVG: comparison of desired and existing conditions in Alternative 3. The desired condition range in the low canopy cover class for PVGs 9 and 10 are 0%.

Table 3-17. Alternative 3—canopy cover class effects (applies only to large tree size class stands) by Potential Vegetation Group (PVG)

Canopy Cover	PVG 2			PVG 5			PVG 6		
	Desired Condition	**Existing Condition**	**Post Treatment**	**Desired Condition**	**Existing Condition**	**Post Treatment**	**Desired Condition**	**Existing Condition**	**Post Treatment**
Low	483–614 acres (74–94%)	104 acres (16%)	347 acres (53%)	512–923 acres (25–45%)	228 acres (11%)	1,186 acres (58%)	0–1,617 acres (0–20%)	331 acres (4%)	5,549 acres (68%)
Moderate	39–170 acres (6–26%)	337 acres (52%)	223 acres (34%)	1,128–1,538 acres (55–75%)	1,402 acres (68%)	758 acres (37%)	6,470–8,087 acres (80–100%)	3,348 acres (42%)	1,597 acres (20%)
High	0	212 acres (32%)	82 acres (13%)	0	421 acres (21%)	108 acres (5%)	0	4,373 acres (54%)	972 acres (12%)
Canopy Cover	PVG 7			PVG 9			PVG 10[a]		
	Desired Condition	**Existing Condition**	**Post Treatment**	**Desired Condition**	**Existing Condition**	**Post Treatment**	**Desired Condition**	**Existing Condition**	**Post Treatment**
Low	0–486 acres (0–14%)	335 acres (4%)	335 acres (4%)	0	70 acres (17%)	70 acres (17%)	0	199 acres (23%)	199 acres (23%)
Moderate	2,987–3,476 acres (80–100%)	1,967 acres (42%)	1,967 acres (42%)	210–292 acres (51–71%)	228 acres (56%)	228 acres (56%)	697–860 acres (81–100%)	369 acres (43%)	369 acres (43%)
High	0	1,098 acres (32%)	1,098 acres (32%)	161–202 acres (29–49%)	114 acres (27%)	114 acres (27%)	0–163 acres (0–19%)	291 acres (34%)	291 acres (34%)
Canopy Cover	PVG 11								
	Desired Condition	**Existing Condition**	**Post Treatment**						
Low	0–57 acres (0–16%)	79 acres (23%)	79 acres (23%)						
Moderate	292–348 acres (84–100%)	221 acres (64%)	221 acres (64%)						
High	0	47 acres (14%)	47 acres (14%)						

[a]References to PVG 10e are to be applied to the medium tree size class (overstory tree average diameter ranges from 12.0–19.9 inches DBH [diameter at breast height]). The overstory trees in PVG 10 stands (persistent lodgepole) generally do not attain an average diameter within the large tree size class (DBH) even though individual trees may equal or exceed 20 inches DBH.

Alternative 4

The effects of the treatments proposed in Alternative 4 (mechanical vegetative treatments and prescribed burning) on canopy cover classes are shown in Figure 3-5 and Table 3-18.

PVGs 2, 5, and 6 have the same responses as those found under Alternatives 2 and 3.

Unlike Alternatives 2 and 3, Alternative 4 treats more acres of high canopy closure in PVGs 7–11; treatments would not be limited to less than 30% of the LAU. Therefore, in the short to long term, the high canopy cover class in PVGs 7, 10, and 11 moves closer to desired conditions than under either of the other action alternatives. Specifically, PVGs 10 and 11 are within desired conditions for the high canopy cover class. Of all the action alternatives, Alternative 4 would move PVG 11 closer to desired canopy cover conditions in the long term. As compared to other action alternatives, Alternative 4 would potentially see the greatest reduction (acres treated) of subalpine fir competition with whitebark pine, therefore improving the whitebark pine probability of survival (Keane et al. 2012). Temporarily, Alternative 4 moves PVG 9 the furthest away from desired conditions, further than either Alternative 2 or Alternative 3. Under this alternative, PVGs 7, 9, 10, and 11 would exhibit a temporary shift of canopy cover away from desired conditions (i.e., an overabundance of low canopy cover would result). Specifically, treatments would shift moderate canopy cover to low canopy cover, which moves the landscape away from desired canopy cover conditions in the temporary to short term. However, these treatments are needed in the moderate canopy cover class to 1) alter species composition; 2) alter spatial arrangement of residual trees; and 3) maintain the moderate canopy closure in the long term.

Without treatment, stands within the moderate canopy cover class would move into the high canopy cover class within the short term (assuming no disturbance). Therefore, by reducing canopy cover to 20%–39%, after treatment it is expected that, in the short term, stands would move into moderate and maintain moderate canopy cover in the long term.

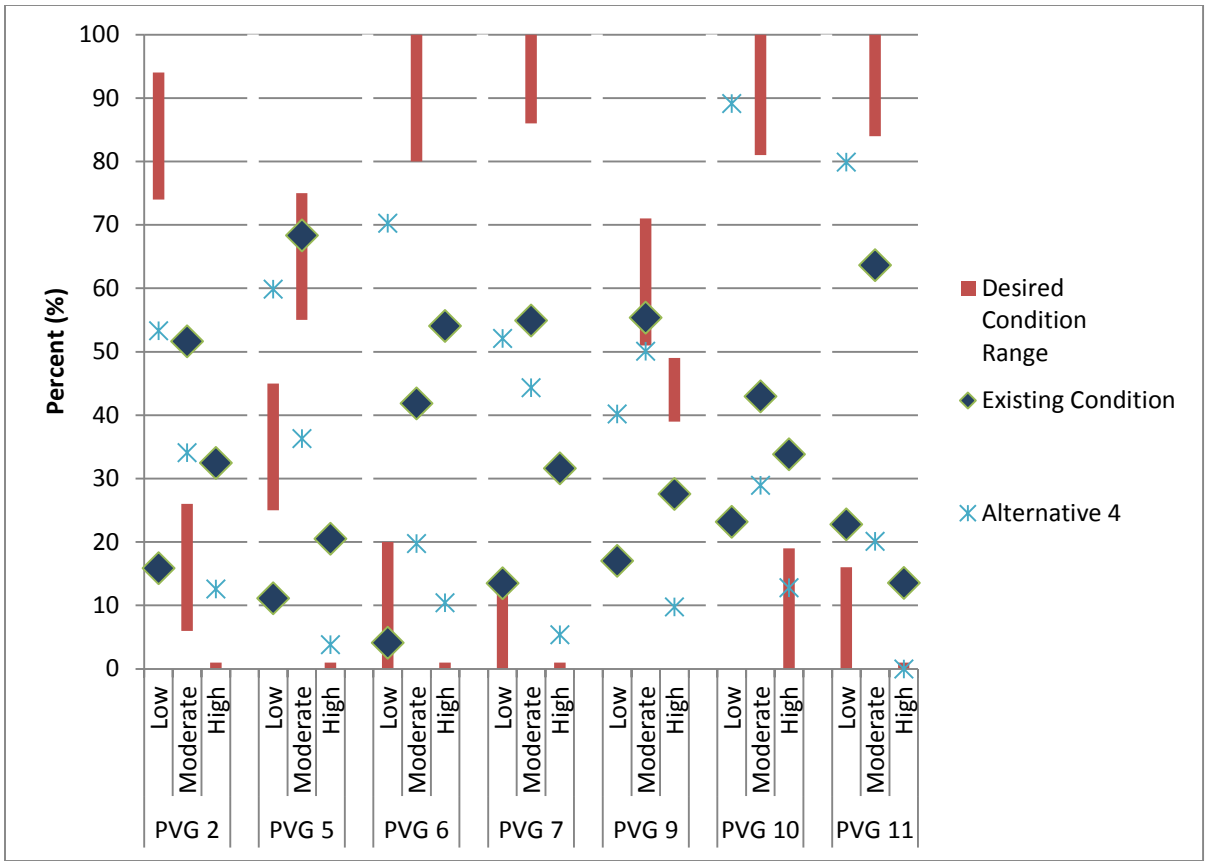


Figure 3-5. Large tree class (medium size class for Potential Vegetation Group [PVG] 10) canopy cover by PVG: comparison of desired and existing conditions in Alternative 4. The desired condition range in the low canopy cover class for PVGs 9 and 10 are 0%.

Table 3-18. Alternative 4—canopy cover class effects (applies only to large tree size class stands) by Potential Vegetation Group (PVG)

Canopy Cover	PVG 2			PVG 5			PVG 6		
	Desired Condition	**Existing Condition**	**Post Treatment**	**Desired Condition**	**Existing Condition**	**Post Treatment**	**Desired Condition**	**Existing Condition**	**Post Treatment**
Low	483–614 acres (74–94%)	104 acres (16%)	347 acres (53%)	512–923 acres (25–45%)	228 acres (11%)	1,253 acres (61%)	0–1,617 acres (0–20%)	331 acres (4%)	5,645 acres (70%)
Moderate	39–170 acres (6–26%)	337 acres (52%)	223 acres (34%)	1,128–1,538 acres (55–75%)	1,402 acres (68%)	718 acres (35%)	6,470–8,087 acres (80–100%)	3,348 acres (42%)	1,598 acres (20%)
High	0	212 acres (32%)	82 acres (13%)	0	421 acres (21%)	80 acres (4%)	0	4,373 acres (54%)	882 acres (10%)
Canopy Cover	PVG 7			PVG 9			PVG 10[a]		
	Desired Condition	**Existing Condition**	**Post Treatment**	**Desired Condition**	**Existing Condition**	**Post Treatment**	**Desired Condition**	**Existing Condition**	**Post Treatment**
Low	0–486 acres (0–14%)	468 acres (13%)	1,809 acres (51%)	0	70 acres (17%)	166 acres (40%)	0	199 acres (23%)	586 acres (89%)
Moderate	2,987–3,476 acres (80–100%)	1,907 acres (55%)	1,539 acres (44%)	210–292 acres (51–71%)	228 acres (56%)	206 acres (50%)	697–860 acres (81–100%)	369 acres (43%)	190 acres (29%)
High	0	1,098 acres (32%)	40 acres (5%)	161–202 acres (29–49%)	114 acres (27%)	40 acres (10%)	0–163 acres (0–19%)	291 acres (34%)	84 acres (13%)
Canopy Cover	PVG 11								
	Desired Condition	**Existing Condition**	**Post Treatment**						
Low	0–57 acres (0–16%)	79 acres (23%)	277 acres (80%)						
Moderate	292–348 acres (84–100%)	221 acres (64%)	70 acres (20%)						
High	0	47 acres (14%)	0						

[a]References to PVG 10 are to be applied to the medium tree size class (overstory tree average diameter ranges from 12.0–19.9 inches DBH [diameter at breast height]). The overstory trees in PVG 10 stands (persistent lodgepole) generally do not attain an average diameter within the large tree size class (DBH) even though individual trees may equal or exceed 20 inches DB

Summary of Canopy Cover Class

The canopy closure discussion considers large tree size class stands only. No change in canopy cover class would occur under the temporary timeframe in Alternative 1. This alternative would move further from the desired conditions for canopy cover class in the short to long term for all PVGs except PVG 9.

The immediate post-treatment effect of all action alternatives in PVG 2 would be a reduction in acres of the moderate and high canopy cover classes and an increase in acres of the low canopy cover class. Treatments in PVG 2 do not convert enough moderate/high canopy cover to low canopy cover to meet desired conditions in any of the action alternatives. Use of prescribed burning would be a priority in this PVG across all alternatives and is expected to help maintain these stands near desired conditions in the long term.

In PVGs 5 and 6, all action alternatives would move canopy cover conditions away from the desired conditions in the temporary time frame and short term by creating an overabundance of the low canopy cover class; however, in the next 15 to 25 years, it is expected that these PVGs would move closer to desired conditions, as we anticipate crown growth and ingrowth would shift the low canopy cover class stands into moderate canopy cover class stands. These conditions would likely stabilize for 10 to 30 years depending on the site, the vigor of residual trees, and a variety of other factors (e.g., climate conditions, insect activity, and disease activity). The creation of this overabundance in the low canopy cover class would be performed in order to move toward and/or maintain the desired conditions in the short to long term for the following other vegetative characteristics: 1) species composition, 2) spatial arrangement, and 3) canopy closure.

In PVGs 7, 9, 10, and 11, no acres would shift toward the desired conditions under Alternative 3. Specifically, with no immediate movement of stands into the low canopy cover class, limited movement into the moderate canopy cover class would occur. Acres in the moderate canopy cover class would likely move in the short term into the high canopy cover class under Alternative 3, thus further increasing high canopy cover. Unlike Alternatives 2 and 4, no short-term reduction of the high canopy cover class would occur in PVGs 7, 9, 10, and 11.

In PVGs 7, 9, 10, and 11, Alternative 4 would shift more acres of high and moderate canopy cover into low canopy cover than any of the other action alternatives in the temporary to short term (0–10 years post treatment). As growth and ingrowth occur, however, acres moved into the low canopy cover class are expected to move into the moderate canopy cover class, similar to expectations under Alternative 2. Although creating an excess in low canopy cover would move PVG 9 further from desired conditions in the short term, it is expected with canopy ingrowth that PVG 9 would move back toward desired conditions in the long term.

Alternative 4 is the only alternative where PVGs 10 and 11 are within desired conditions for the high canopy cover class; however, an overabundance of the low canopy cover class is anticipated for 15 to 25 years. The creation of this overabundance under Alternative 4 possesses the greatest potential for reduction (acres treated) of subalpine fir competition with whitebark pine, therefore improving the whitebark pine probability of survival.

In summary, all action alternatives would move moderate canopy cover in PVGs 2, 5, and 6 away from the desired canopy cover conditions, creating a temporary to short-term overabundance in low canopy cover. This overabundance would be relatively short lived, as the overabundance of the low canopy cover class is anticipated to shift into the moderate canopy cover class approximately 3 to 15 years post treatment. Additionally, all action

alternatives would reduce the acres of high canopy cover classes in PVGs 2, 5, and 6, thus moving those PVGs closer to desired conditions. (However, due to limitations in treatment areas [i.e., RCAs and IRAs], none of these PVGs would attain desired conditions in the high cover class.) Conversely, in the temporary to short term, Alternative 1 would maintain some canopy cover classes in desired conditions (PVG 5 moderate, PVGs 6 and 7 low), while other cover classes would not meet desired conditions. Alternative 1 would continue to increase canopy cover, thus moving PVGs 2, 5, 6, 7, and 11) further from desired conditions in the long term (or until disturbance occurs).

We expect that Alternatives 2 and 4 would move PVGs 7 and 9 toward desired conditions in the long term; only Alternative 4 would move PVGs 10 and 11 toward desired conditions in the short term and the long term. Tradeoffs in achievement of species compositions versus canopy cover desired conditions exist among the alternatives, which is consistent with Forest Plan direction.

After treatment, in all action alternatives, the residual trees in treated stands would respond to increased growing space and resources. Additionally, the increased sunlight and exposed seedbeds would result in the establishment and growth of understory trees. For all PVGs, we anticipate future maintenance underburn and thinning treatments every 10 to 30 years in order to maintain desired conditions.

3.2.5.3. Species Composition

Table 3-19. Acres of treatment proposed to benefit species composition displays the acres of treatment, per alternative, that would improve species compositions.

Table 3-19. Acres of treatment proposed to benefit species composition

Alternative	Acres of Treatment Proposed to Benefit Species Composition							
	NCT	CT-FT	FT-PC-MSw	CT-MP	CT-ASP	LSQ	BA/PL	Total
1	0	0	0	0	0	0	0	0
2	1,279	2,875	5,343	1,080	1,087	850	3,240	15,754
3	921	2,697	4,946	1,039	900	715	3,178	14,396
4	2,039	2,999	6,076	1,090	1,087	1,203	3,244	17,738

Note: Only forested acres identified as targeted (with the exception of targeted burn) are included in these estimations.

Alternative 1

Because no treatments would be implemented, Alternative 1 would result in vegetative conditions continuing to move away from desired conditions for species composition. Species composition would continue to trend toward shade-tolerant climax species, primarily grand fir (PVGs 5 and 6), Douglas-fir (PVG 2 and 5), subalpine fir (PVGs 6, 7, 9, 10, and 11) and to some extent Engelmann spruce (PVGs 7, 10, and 11) as stand densities increase (Fiedler et. al. 2010). This alternative would cause long-term departure from the desired conditions. This long-term departure would create conditions (e.g., continued mortality of early seral species, large scale wildfire susceptibility) making it difficult to restore to desired conditions in the future. Under Alternative 1, PVGs 2 and 5 would continue to exhibit increased understory/overstory grand fir and Douglas-fir densities, leading to more ladder

fuels. Subalpine fir in PVGs 7–11 would continue to increase; whitebark pine would continue to decrease in PVG 11. Based on Keane et al. (2012), whitebark pine is declining across most of its range. Specifically, whitebark pines are experiencing the greatest mortality from beetles and rust (Kendall and Keane 2001), although even the driest, coldest parts of the range now experience blister rust infections (Bockino 2008; Resler and Tomback 2008). With no reduction in subalpine fir or planting of rust-resistant seedlings, whitebark pine populations are expected to further decline. It can take 50 to 250 years for subalpine fir to replace whitebark pine in the overstory, depending on the local environment and previous fire history (Arno and Hoff 1990; Keane 2000).

Recorded fire history in the area began in approximately 1956 (i.e., 59 years ago); no large (i.e., greater than 100 acres) fires have occurred within PVG 11. Research within the Rocky Mountains has determined that fire exclusion has caused a caused a cascading effect on population decline throughout whitebark pine ecosystems (Keane et al. 2002). Observations during field data collection on this project are consistent with these research findings. Whitebark pine is in decline in the project area, and we anticipate further declines under Alternative 1 primarily due to blister rust and competition with later successional species (primarily subalpine fir). Bark beetles also pose concerns, due to existing density.

Aspen would continue to decrease across all PVGs.

It is expected that with the no-action alternative, mortality in western larch, Douglas-fir (PVGs 6 and 7), and ponderosa pine would not only continue, but increase. Additionally, mortality in grand fir, lodgepole pine, subalpine fir, whitebark pine, and Engelmann spruce is also expected to increase, creating potential for increased fuel loading throughout the analysis area. The increase in mortality is expected given the current trends in dense, multi-layered stand conditions and recent insect activity (e.g., western pine beetle, western spruce budworm, spruce beetle, and douglas-fir beetle; see Jorgenson 2013) across all PVGs in the analysis area.

Alternative 2

This alternative would treat up to 15,754 acres in the project area and would move species compositions toward desired conditions. Treatments are broken into the following categories: 1) NCT, 2) CT-FT, 3) CT-ASP, 4) LSQ, 5) BA/PL, 6) CT-MP, and 7) FT-PC-MSw.

NCT, commercial harvest, understory thinning following commercial harvest, and burn treatments would improve species compositions by reducing the abundance of climax species (such as grand fir and subalpine fir). Anywhere aspen is present (in all PVGs), these thin-and-burn treatments would aid in aspen regeneration by increasing light to the forest floor, creating a seed bed, and stimulating aspen suckers (Seager et al. 2013). Prescribed burning and associated NCT would also favor desired species compositions. For example, in PVGs 5 and 6, ponderosa pine, western larch and, to some extent, Douglas-fir would be the preferred species because they are generally more fire resistant and resilient to low-intensity fire. An example of species preference in PVG 11 would be the thinning of subalpine fir in favor of whitebark pine.

The regeneration treatments proposed in this alternative are patch cuts with reserves and modified shelterwoods; these would occur on approximately 5,343 acres. Regeneration treatments (such as FT-PC-MSw) would move stands dominated by climax species to conditions that contribute to the desired species compositions by retaining early seral species (which would contribute to the desired conditions). Although these regeneration treatments

would be effective at re-establishing the desired species compositions in portions of stands, research and past experience indicate that growth rates would not see their full potentials in comparison to other regeneration methods (e.g., shelterwood, seed tree, clearcut; see York et al. 2004). The light intensity due to retention of reserve trees and the small size (<10 acres) of the patch cuts is anticipated to reduce the growth rates of regenerated trees relative to the more intensive regeneration methods.

In large tree stands treated with CT-FT, CT-ASP, LSQ, and FT-PC-MSw, all PVGs would retain 25–45% canopy cover. Because canopy cover is based on total non-overlapping canopy cover, small openings within each stand require that excess canopy cover be left in forested areas. Therefore, it is expected that retention of basal areas in excess of 100–120 square feet in forested portions of each stand, especially when post-treatment average canopy cover in excess of 35% is desired. Deficit species, by PVG, would generally comprise the preferred leave trees across all PVGs.

NCT and, to a lesser extent, prescribed burning would also favor the desired species compositions by PVG. Specifically, desired species would be retained following NCT, and openings created by fire would allow more light to the forest floor, allowing for potential regeneration of desired species. An example of species preference in PVG 11 would be the thinning of subalpine fir in favor of whitebark pine (as well as planting rust-resistant trees); this treatment would improve the probability of white bark pine survival by reducing competition for resources and planting potentially rust resistant trees.

Western larch

Of the action alternatives, Alternative 2 proposes a moderate amount of forested treatment acres, thus, having a moderate potential to maintain and promote western larch in the analysis area. All treatments would emphasize western larch restoration where they are present and healthy.

Whitebark pine

Alternative 2 proposes 113 acres of treatments in PVG 11, thus providing a moderate potential to maintain and promote whitebark pine in the analysis area. All treatments would emphasize whitebark pine restoration where they are present and would involve, specifically, reducing subalpine fir densities, collecting cones, and planting rust-resistant seedlings. All treatments across (PVGs 7, 10, and 11) would emphasize western larch restoration where they are present and healthy.

Alternative 3

This alternative would treat up to 14,396 acres that would move species compositions toward desired conditions. Treatments have been broken into the following categories 1) NCT, 2) CT-FT, 3) CT-ASP, 4) LSQ, 5) BA/PL, 6) CT-MP, and 7) FT-PC-MSw.

The NCT, commercial harvest, understory thinning following commercial harvest, and burn treatments would improve species compositions by reducing the abundance of climax species (such as grand fir and subalpine fir). Anywhere aspen is present and in PVGs 2, 5, and 6, thin-and-burn treatments would aid in aspen regeneration by increasing light to the forest floor, creating a seed bed, and stimulating aspen suckers. Alternative 3 has the least amount of aspen treatment potential of all the action alternatives.

The regeneration treatments would have the same effect for PVG 6 as those under Alternatives 2 and 4; PVGs 7–11 would not be treated.

Prescribed burning and associated NCT would also favor the desired species compositions. For example, in PVGs 5 and 6, ponderosa pine, western larch and, to some extent, Douglas-fir would be the preferred species because they are generally more fire resistant and resilient to low-intensity fire. Under Alternative 3, however, PVGs 7–11 would not be treated; therefore, subalpine fir would continue to increase while early-seral species such as Douglas-fir, aspen, and whitebark pine would continue to decrease in prevalence. Similar to Alternative 1, Alternative 3 would implement no treatments in stands containing whitebark pine; therefore the probability of whitebark pine survival would not improve.

Western larch

Alternative 3 proposes the least forested treatment acres of all action alternatives, thus having the least potential to maintain and promote western larch in the analysis area. Similar to Alternatives 2 and 4, all treatments would emphasize western larch restoration where they are present and healthy.

Whitebark pine

Alternative 3 proposes no acres of treatment in PVG 11, thus having the least potential of all the action alternatives to maintain and promote whitebark pine in the analysis area. Whitebark pine would continue to decline.

Alternative 4

The effects of Alternative 4 would be similar to those under Alternative 2. The difference is that more acres would be treated, specifically in PVGs 7–11. Alternative 4 has the most potential, of all alternatives, to move species composition toward desired conditions on 17,738 acres. Not only would this alternative treat the most acres, but the treatments would be more intensive (e.g., more FT-PC-MSw treatments) and have greater immediate benefits to changing species composition. The longevity of these benefits would also be greater than any of the other action alternatives, due to creating more openings that are favorable for regeneration of early seral species.

The overall effect of this alternative is that species compositions would shift further toward the desired conditions than in any of the other alternatives, as more of the grand and subalpine fir would be removed and some stands with high percentages of grand fir and Douglas-fir would be regenerated, with western larch and ponderosa pine being the favored species to regenerate.

Western larch

Alternative 4 has the most forested treatment acres of all action alternatives, thus, having the most potential to maintain and promote western larch in the analysis area. All treatments would emphasize western larch restoration where they are present and healthy.

Whitebark pine

Alternative 4 proposes 357 acres of potential treatments in PVG 11 and thus possesses the most potential to maintain and promote whitebark pine in the analysis area. All treatments would emphasize whitebark pine restoration where they are present and would involve, specifically, reducing subalpine fir densities, collecting cones, and planting rust-resistant seedlings. All treatments across (PVGs 7, 10, and 11) would emphasize western larch restoration where they are present and healthy.

Summary of Species Composition

Overall, Alternative 4 would move species composition furthest toward the desired conditions in the fastest time frame, as the treatments proposed are more intensive and would restore the most acreage. The intensity of the treatments in both Alternatives 2 and 4 would benefit the species composition objectives for a longer duration, primarily due to reduction in competition. Alternative 3 would aid in moving toward the desired conditions but, with respect to Alternatives 2 and 4, the movement would not be as great nor would be the effectiveness of the treatments because Alternative 3 does not treat PVGs 7, 9, 10, and 11. Additionally, Alternatives 2 and 4 would improve the probability of whitebark pine survival, while Alternatives 1 and 3 would not. Alternative 1 would continue to move species compositions further from the desired conditions in the long term.

Alternatives 2, 3, and 4 are generally consistent with the Forest Plan direction for vegetation and timberland resources. Forest-wide guideline VEGU01 acknowledges that tradeoffs in the achievement of desired conditions may need to be considered at different time scales. This analysis identifies areas where tradeoffs exist (e.g., Alternatives 2 and 4 would move more stands into the low canopy cover class in the short term while better achieving desired canopy cover and species compositions in the mid to long term). In PVGs 6, 7, 9, 10, and 11, none of the action alternatives create GFSS, sapling, and small size classes at a stand level in the short to long term, which is inconsistent with the Forest Plan.

Under Alternatives 2 and 4, with proposed treatments in PVG 11 to maintain and promote whitebark pine, tradeoffs exist with respect to wildlife species: specifically, one must also consider that what is best for whitebark pine in the long term may not be what is best for other species in that ecosystem, especially in the short term (Keane et al. 2012).

3.2.5.4. Spatial Pattern

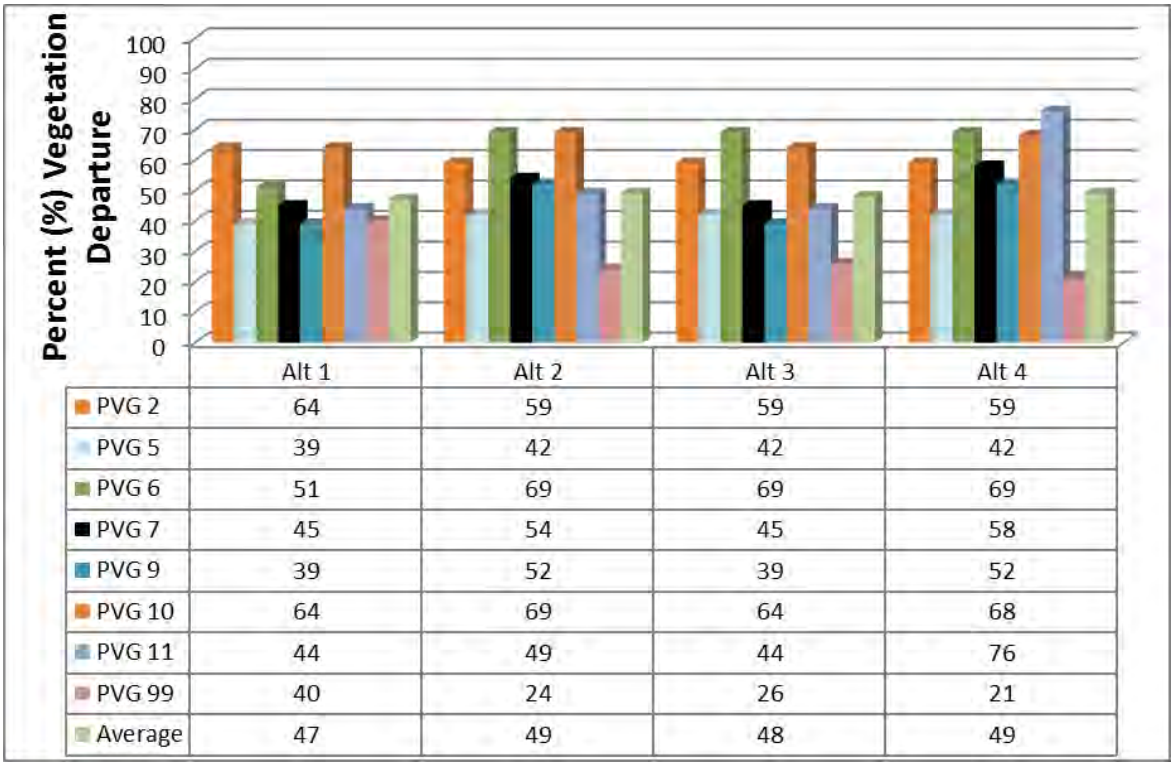
Alternative 1

Alternative 1 would, in the short term, have slightly (1%–2%) lower vegetation departure rates than all of the action alternatives (Figure 3-6). However, in the long term (without disturbance), the vegetation departure increases to 70% (Figure 3-7). The reason for this increase in departure is due to the continuation of increasing canopy closures and no size class differentiation. Essentially, all stands would move away from desired conditions in the long term.

Alternative 1 is the only alternative that would move further from the desired conditions in the long term.

Effects Common to All Action Alternatives

Restoration harvest treatments proposed in all alternatives would create more open large tree stands in the short term. Emphasis on regeneration treatments would create a mosaic of skips, open patches, and thinned areas similar to those created where fire was more intense in the mixed1 and mixed2 fire regimes. Aspen treatments would create more open patches and promote aspen regeneration, emphasizing the mid-elevation aspen belt throughout the analysis area. The burn-only stands would reduce fuels and help prevent uncharacteristic wildfires. The combination of these treatment types are designed to create a heterogeneous spatial mosaic that would break up fuel continuity across the landscape in the analysis area, thus reducing the percentage of vegetation departure rating in the long term.



	Alt 1	Alt 2	Alt 3	Alt 4
PVG 2	64	59	59	59
PVG 5	39	42	42	42
PVG 6	51	69	69	69
PVG 7	45	54	45	58
PVG 9	39	52	39	52
PVG 10	64	69	64	68
PVG 11	44	49	44	76
PVG 99	40	24	26	21
Average	47	49	48	49

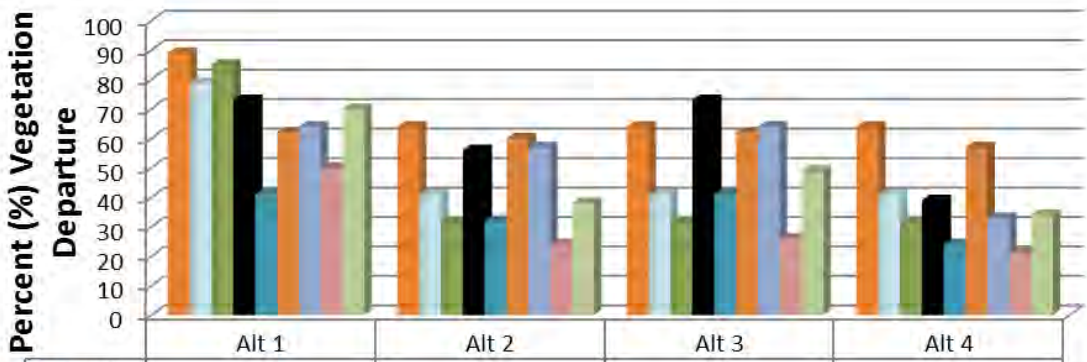
Figure 3-6. Immediate post-treatment vegetation departure, by Potential Vegetation Group (PVG) and alternative (Note: PVG 99 is nonforested [grassland/shrubland].)

The immediate responses under Alternatives 2 and 4 constitute a greater percent vegetation departure in all PVGs except 2, 11, and 99 (e.g., nonforested shrublands and grasslands). Alternative 3 exhibits lower departure rates in PVGs 2 and 99, while PVGs 7, 9, 10, and 11 reflect Alternative 1 (because, under Alternative 1,no treatments were to be implemented in those PVGs). PVG 6 has the most acres of departure of all forested PVGs.

Additionally, all the action alternatives are designed to maintain large tree size class stands by managing densities to enhance the resiliency and resistance of the stands to disturbance events such as wildfire and insects. These alternatives would also promote the development of medium tree size class stands by promoting the growth of desired trees to accelerate development of the large tree size class with desired tree species compositions. All of these stands would be reduced to a low canopy cover class, which meets desired conditions for PVGs 2 and 5 but not PVGs 6, 7, 9, 10, and 11.

The consequence is that none of the action alternatives would move toward the desired GFSS and sapling tree size class objectives, and the larger tree size classes would be moved to the lower canopy cover class. Although regeneration treatments have been proposed in Alternatives 2, 3, and 4, these treatments would retain too much canopy cover in the large and medium trees to qualify as GFSS stands.

Due to the combination of not reducing the size class in any PVG and converting all the canopy cover to low at the stand level (especially in PVG 6), the vegetation departure ratings for all action alternatives is 1–2% higher than that seen under Alternative 1; however, this is a short-term effect. Specifically, while prescribed burns in PVGs 2 and 5 are expected to maintain low canopy closure, PVG 6 is expected to increase canopy closure approximately 1–2% per year.



	Alt 1	Alt 2	Alt 3	Alt 4
PVG 2	89	64	64	64
PVG 5	79	41	41	41
PVG 6	85	31	31	31
PVG 7	73	56	73	39
PVG 9	41	32	41	24
PVG 10	62	60	62	57
PVG 11	64	57	64	33
PVG 99	50	24	26	21
Average	70	38	49	34

Figure 3-7. 25 years post-treatment vegetation departure, by Potential Vegetation Group (PVG) and alternative (Note: PVG 99 is nonforested [grassland/shrubland].)

The long-term responses of Alternatives 2 and 4 represent a lower percent vegetation departure in all PVGs as compared to Alternative 1. Alternative 3 has a lower percent departure in PVGs 2, 5, and 6, while PVGs 7, 9, 10, and 11 remain the same as the no-action alternative. Alternative 3 experiences no change from Alternative 1 in PVGs 7–11 (due to Alternative 1 having no treatments in those PVGs). Alternative 4 has the lowest departure rating of all the action alternatives.

In the long term, the stand spatial pattern heterogeneity within Alternatives 2 and 4 would increase. Increases in spatial pattern heterogeneity are due to the type of regeneration treatments implemented, which create a mosaic of openings, thinned areas, and untreated clumps within each stand.

Alternative 3 has higher percent departure rates than Alternatives 2 and 4 because 1) it does not have as many acres of FT-PC-MSw treatments that increase spatial pattern heterogeneity, and 2) it does not treat any acres in PVGs 7–11.

Although in Alternatives 2 and 4 the long-term percent vegetation departure is less than Alternative 1, to effectively reduce the spatial homogeneity and reduce the vegetative departure rating at the landscape level more intensive treatments (e.g., converting stands to GFSS) are needed in PVGs 6, 7, 9, 10, and 11. The project design feature that limits reducing

the tree size class of any stands limits our ability to move closer to the desired conditions (for tree size class [and hence spatial patterns]) with any of the action alternatives.

3.2.5.5. Acres of Aspen Treated

3.2.5.5.1. Aspen

Alternative 1

Alternative 1 would, in the short to long term, continue to be above the desired canopy cover until a disturbance (e.g., wildfire or future management activities) occurs. There are three potential outcomes with a natural disturbance: 1) uncharacteristic landscape-level fires (currently aspen [mixed1 severity], approximately 2.7 missed fire return intervals), 2) a characteristic mosaic fire that does not effectively reduce canopy closure (e.g., conifer encroachment), and 3) a characteristic fire that burns in a mosaic and effectively reduces canopy closure. The probability that the aspen would burn with a mixed-1 severity diminishes with time.

Effects Common to All Action Alternatives

Many aspen stands throughout the analysis area have been negatively impacted by conifer competition and lack of grove/landscape disturbance factors such as wildfire. Conifer species tend to draw a significant amount of water away from aspen stands affecting riparian, meadow, and aspen communities, which ultimately changes the structure and composition of the forest. In all action alternatives there would be a re-establishment of aspen stands where they have departed from desired conditions as described in Campbell and Bartos (2000). Specifically, all action alternatives reduce conifer canopy cover in the short term to approximately 25% or less; prescribed burning would maintain a mosaic canopy closure in the long term (Table 3-20). All action alternatives would promote aspen stands that vary by patch sizes, size classes, and densities. The primary difference is that Alternatives 2 and 4 have more aspen treatment acres. Restoration of aspen ecosystems is also expected to support vegetation diversity and increase habitat quality for terrestrial wildlife species.

Unlike Alternative 1, all action alternatives allow treatments that would reduce conifer encroachment and probability for uncharacteristic wildfire within aspen stands. Additionally, maintaining these stands with fire would further promote aspen within the analysis area for the long term.

Alternative 2

<u>Aspen in both climax stands and as a seral component of coniferous stands</u>

Alternative 2 has 1,087 acres of aspen treatments (CT-ASP) in PVGs 5, 6, 7, and 9. Aspen also occur throughout PVGs 2, 10, and 11. Other treatments (e.g., CT-FT, NCT, FT-PC-MSw) would also enhance aspen in areas where there is incidental aspen but the densities of aspen are not high enough to justify aspen enhancement as the primary purpose of treatment. Alternative 2 has less aspen treatment as compared to Alternative 4, since it treats less of PVGs 7, 9, 10, and 11. All treatments would emphasize aspen restoration where they are present.

Alternative 3

Aspen in both climax stands and as a seral component of coniferous stands

Alternative 3 has 900 acres of aspen treatments (CT-ASP) in PVGs 5 and 6. Aspen also occurs throughout PVGs 2, 7, 9, 10, and 11. Other treatments (e.g., CT-FT, NCT, FT-PC-MSw) would also enhance aspen in areas where there is incidental aspen but the densities of aspen are not high enough to justify aspen enhancement as the primary purpose of treatment. Alternative 3 has the least potential to treat aspen in these PVGs, since it does not treat PVGs 7, 9, 10, and 11. Similar to Alternatives 2 and 4, all treatments would emphasize aspen restoration where they are present

Alternative 4

Aspen in both climax stands and as a seral component of coniferous stands

Similar to Alternative 2, Alternative 4 has 1,087 acres of aspen treatments (CT-ASP) in PVGs 5, 6, 7, and 9. Aspen also occur throughout PVGs 2, 10, and 11. Other treatments (e.g., CT-FT, NCT, FT-PC-MSw) would also enhance aspen in areas where there is incidental aspen but the densities of aspen are not high enough to justify aspen enhancement as the primary purpose of treatment. Alternative 4 has the most treatment potential in these PVGs (e.g., more than Alternative 2). All treatments would emphasize aspen restoration where they are present.

Table 3-20. Acres of treatment aspen and post-treatment canopy cover (CC)

Canopy Cover Class	No Action	Alternative 2	Alternative 3	Alternative 4
Acres Treated	**0**	**1,087**	**921**	**1,087**
Post-treatment Condition	0–25% CC	0–25% CC	0–25% CC	0–25% CC

3.2.5.6. Acres of Nonforested Vegetation and Meadow Treatment

3.2.5.6.1. Nonforested Vegetation

Alternative 1

In the long term, Alternative 1 would continue to move nonforested areas further from the desired conditions until disturbance changes the successional path. There are three potential outcomes with a natural disturbance: 1) uncharacteristic landscape-level fire creating a single cohort, 2) a characteristic mosaic fire that does not effectively reduce canopy closure (e.g., conifer encroachment), and 3) a characteristic fire that burns in a mosaic and effectively reduces canopy closure. The probability that nonforested vegetation types would burn with a mixed-1/mixed-2 severity diminishes with time.

Effects Common to All Action Alternatives

The nonforested treatment areas include grasslands, sagebrush, scablands, and dry meadows. Fire exclusion has led to expansion of young conifers along the edges as well as a decadency of upland shrubs, grasses, and forbs. For all action alternatives, the post-treatment canopy cover would be at desired condition range (e.g., <10% conifer cover). It is expected that all

action alternatives would enhance upland meadow species, increase meadow acreage, improve plant diversity and vigor, and provide habitat for native species Additionally, treatments would move the project area toward a pre-fire suppression vegetative condition related to stand density, tree size class, and species composition to enable the reintroduction of fire into a fire-adapted ecosystem. The only difference between action alternatives is the amount of acres treated. Alternative 4 treats the most nonforested vegetation, whereas Alternative 3 treats the least (Table 3-21).

Unlike Alternative 1, all action alternatives allow treatments that would promote grass, forb, and shrub regeneration while reducing conifer encroachment, shrub decadence, and probability for uncharacteristic wildfire within nonforested areas. Additionally, maintaining low canopy cover with prescribed burning would further promote nonforested vegetation within the analysis area for the long term.

Alternative 2

Native herbaceous understory in shrub communities

Compared to other action alternatives, Alternative 2 has a moderate amount of nonforested treatment acres, thus having a moderate potential to maintain and promote herbaceous and shrub components in the analysis area. All treatments would emphasize reducing conifer encroachment and reintroducing fire into the ecosystem.

Alternative 3

Native herbaceous understory in shrub communities

Alternative 3 has the least nonforested treatment acres of all the action alternatives, thus having the least potential to maintain and promote herbaceous and shrub components in the analysis area. Similar to Alternatives 2 and 4, all treatments would emphasize reducing conifer encroachment and reintroducing fire into the ecosystem.

Alternative 4

Native herbaceous understory in shrub communities

Alternative 4 has the most nonforested treatment acres of all action alternatives, thus having the most potential to maintain and promote herbaceous and shrub components in the analysis area. All treatments would emphasize reducing conifer encroachment and reintroducing fire into the ecosystem.

Table 3-21. Acres of treatment of nonforested vegetation and post-treatment canopy cover (CC)

Canopy Cover Class	No Action	Alternative 2	Alternative 3	Alternative 4
Acres Treated	0	4,519	3,592	4,999
Post-treatment Condition	10% CC	10% CC	10% CC	10% CC

3.2.5.6.2. Wet Meadow

Table 3-22 displays how each alternative responds to the measurement for wet meadows.

Table 3-22. Acres of treatment proposed to benefit wet meadow and post-treatment canopy cover (CC)

Canopy Cover Class	No Action	Alternative 2	Alternative 3	Alternative 4
Acres Treated	0	55	43	271
Post-treatment Condition	10% CC	10% CC	10% CC	10% CC

Alternative 1

Alternative 1 would, in the short to long term, continue to be above the desired canopy cover until a disturbance. A disturbance (e.g., wildfire or insect outbreak) in a wet meadow would have the potential to reduce the canopy cover to 10% or less in the short term; conifer encroachment would occur in the short to long term.

Effects Common to All Action Alternatives

For all action alternatives, the post-treatment canopy cover would move toward desired conditions (e.g., <10%). Alternative 4 treats the most wet meadow acres. Alternative 3 treats the least amount of wet meadow acres.

It is expected that under all action alternatives conifer encroachment would be reduced, thus promoting native grasses, forbs, shrubs, and trees. Additionally, prescribed fire is expected to burn in a mosaic pattern that creates diversity in forest structure and species composition. Restoration of wet meadow ecosystems is also expected to support and increase habitat quality for terrestrial wildlife species.

Unlike Alternative 1, all action alternatives allow treatments that would reduce conifer encroachment within wet meadows. Additionally, maintaining with fire would further promote wet meadows within the analysis area for the long term.

Alternative 2

<u>Woody riparian species</u>

Compared to the other action alternatives, Alternative 2 has a moderate amount of wet meadow treatment acres, thus having a moderate potential to maintain and promote herbaceous and shrub components in the analysis area. All treatments would emphasize reducing conifer encroachment and reintroducing fire into the ecosystem.

Alternative 3

<u>Woody riparian species</u>

Alternative 3 has the least wet meadow treatment acres of all action alternatives, thus having the least potential to maintain and promote herbaceous and shrub components in the analysis area. Similar to Alternatives 2 and 4, all treatments would emphasize reducing conifer encroachment and reintroducing fire into the ecosystem.

Alternative 4

Woody riparian species

Alternative 4 has the most wet meadow treatment acres of all action alternatives, thus having the most potential to maintain and promote herbaceous and shrub components in the analysis area. All treatments would emphasize reducing conifer encroachment and reintroducing fire into the ecosystem.

Summary of Wet Meadow

Overall, Alternatives 2 and 4 would shift more acres toward the desired conditions in the analysis area. Alternative 3 would also move acres toward desired conditions, but the movement would not be as great due to less acres being treated. Alternative 1 would continue to move wet meadows further from the desired conditions until disturbance changes the successional path (this could be a short to long-term time scale).

3.2.6. Cumulative Effects

The analysis area for cumulative effects is the project area. Cumulative effects combine the effects of the proposed action with conditions in, and in the vicinity of, the project area created by past, present, and reasonably foreseeable actions. A more detailed list and descriptions of other projects and actions that may contribute to cumulative effects can be found in Appendix 3 of this document.

3.2.6.1.1. Past Actions

Past Fire Suppression

Federal fire suppression activities began as early as 1900, with significant improvements in funding and organization as early as the 1920s (Bean and Preston 2000). Fire suppression effectiveness increased throughout the 1920s and 1930s and the suppression has resulted in increased regeneration of fire-prone species, creating a landscape that is not within the desired range for species composition or tree density. The percentage of grand fir and the number of trees per acre of other climax species is increasing.

Past Wildfire

Recent records indicate one large wildfire in the project area, the Grays Creek fire (approximately 24,000 acres) in 2007. Prior to fire suppression efforts, wildfire was the primary disturbance agent responsible for stand development and succession.

Past Timber Harvest

The Project area has been intensively managed for timber production. Available data sets indicate that timber harvest has occurred on approximately 12,021 acres within the project area; this is 31% of the forested area. This number is likely low because the utilized data set only records relatively intense treatments occurring in the past 40 to 50 years. Field examinations of stands classified as unmanaged indicate that some harvest did occur in many of the accessible areas classified unmanaged prior to this time. Although harvests in these unmanaged areas were not as intensive as in areas where the data indicate management has

occurred, evidence exists that scattered harvests (typically of the large-diameter ponderosa pine, Douglas-fir and western larch) did occur within some of these stands. Further general discussion of timber management practices on the Forest and in the project area can be found in the documents by Rinehart (1994) and Hockaday (1968).

Timber harvest has included regeneration treatments (primarily clearcuts and some shelterwood with reserve and clearcut with reserve) on approximately 3,627 acres and intermediate treatments (primarily improvement cutting and thinning with some sanitation and salvage) on the remaining 8,394 acres.

The majority of the regeneration treatments were completed prior to 1990. Records indicate that the regeneration treatments were initiated during the following time periods: approximately 38% prior to 1980; 26% from 1981 to 1990; and 36% from 1991 to 2000. The remaining 1% of the regeneration treatments have been initiated since 2001. These regeneration treatments were typically planted with natural regeneration occurring on a relatively small percentage of the area and resulted in a variety of conditions ranging from stands with a variety of structure (25,005 acres are considered medium and large tree stands) to stands in the small tree size class (2,368 acres) to stands in the GFSS and sapling stages (1,527 acres). In the older clearcuts (primarily the small tree stands), limited/no remnant overstory or other biological legacies occur. In more recently regenerated areas, objectives to retain biological legacies (i.e., snags, legacy trees, CWD) were often included and more structure and diversity exists within regenerated stands beginning in late 1980s, with varying degrees of remnant trees, snags, and coarse wood retained.

The intermediate treatments have resulted in a range of results including that where the forest canopy was sufficiently opened, early-seral species (ponderosa pine, Douglas-fir and western larch) are now growing in even-aged and multi-cohort stands. In more dense areas, and in habitat types where more light is required to successfully regenerate early-seral species, grand fir and other climax species have often successfully regenerated.

Recent projects that have harvested timber within the project area include the Middle Fork Blowdown 2001 (approximately 146 acres). The Mill Creek-Council Mountain (MCCM) projects have also harvested timber immediately adjacent to the project area in the recent past. Numerous older sales were completed prior to the above sales listed that have affected the landscape through harvest; the effects of these have been captured in the description of the existing conditions.

Past timber harvests on private ground occurred primarily in 1990 and 2008 (4,797 and 3,698 acres, respectively). All acres were tractor logged.

Past Vegetation Management

A number of vegetation management activities besides timber harvest have occurred in the project area. These include prescribed burning and timber stand improvement (NCT). Past activities have been included in the development of the alternatives and in the analysis of effects.

Past Road Management

Road construction, maintenance, and decommissioning have occurred in the project area. The effect of these activities on the ability to manage vegetation with traditional equipment is analyzed in the Transportation section of this document.

Present Actions

Current Projects

There are no current USFS contracts or projects in the project area; however, Potlach has active timber sale contracts at the current time (2015).

Numerous prescribed burning projects have also been planned in the project area. The Prescribed Fire and Fuels section of this document explains ongoing prescribed fire activities.

Future Actions

Fire Suppression and Wildfire

Continued fire suppression in the project area is likely to occur. Although the success of initial attack activities is high, the probability that a large wildfire would affect the project area is difficult to predict.

Continued fire suppression is anticipated to result in the continued growth and establishment of climax tree species and increased tree densities.

Summary

The effects of all past, present, and reasonably foreseeable actions were considered in disclosing the current conditions and direct and indirect effects in this analysis. The alternatives, along with past and future actions, would cumulatively affect the forested vegetation component by either maintaining or moving it toward the desired conditions, as described in the direct and indirect effects portion of this analysis.

3.2.7. Irreversible and Irretrievable Commitments

Regarding forested vegetation, there are no irreversible or irretrievable commitments with any of the action alternatives.

3.2.8. Forest Plan Consistency

3.2.8.1.1. Timberland Resources

Alternative 1

Alternative 1 would not be consistent with Forest Plan direction for timberland resources, because no treatments are proposed and stands would not contribute to Timberland Resources Goals TRGO01 or TRGO02.

3.2.8.1.2. Common to All Action Alternatives

Desired Vegetative Conditions for this Project

The desired vegetative conditions (USDA Forest Service 2003a, Appendix A) for outside of MPC 5.2—Commodity Production Emphasis within Forested Landscapes have been utilized for the Project area, in order to incorporate recent science regarding the importance of managing within the desired conditions for conservation of wildlife species of the greatest

concern and to address climate change considerations (Mellen-McLean et al. 2013; Millar et al. 2007; Dale et al. 2001; Morgan and Parsons 2001; ICMEBP 1999). This affects approximately 20,517 acres within the analysis area.

3.2.8.1.3. Vegetation Resources

Alternative 1

Alternative 1 is not consistent with Forest Plan direction for vegetation resources because no treatments are proposed and because stands would continue to move away from the desired conditions in the short to long term. No treatments would occur maintaining and/or promoting aspen, nonforested vegetation, wet meadow vegetation, western larch, or whitebark pine.

3.2.8.1.4. National Forest Management Act of 1976

Forest Service Manual and Handbook direction describes *National Forest Management Act of 1976* consistency requirements. FSM 1921.12 and FSH 1909.12, Chapter 20–Section 29 and Chapter 60–Section 61 identify specific direction.

The following findings are required to be made when making project-level decisions involving timber harvest:

Suitability for Timber Production (16 USC 1604(k)): No timber harvest, other than salvage sales or sales to protect other multiple-use values, shall occur on lands not suited for timber production.

FS Response: Proposed timber harvest within PVGs 1 and 11 (USDA Forest Service 2003b, Appendix E) and in RCAs (USDA Forest Service 2003, pp. II-28 to II-30, TRST04, pp. III-43) are outside lands designated as suitable for timber production. Timber harvest in these areas in all action alternatives has been proposed to manage vegetation within the desired conditions specified in the Forest Plan for these areas. The action alternatives are designed to minimize potential impacts to other resources in these areas and PDFs were developed to mitigate potentially damaging actions. Although NCT and commercial treatments would occur in PVGs 1 and 11, no salvage harvest or even-aged regeneration treatments would occur in lands not suited for timber production (e.g., in RCAs or in PVG 1).

Timber Harvest on National Forest Lands (16 USC 1604(g) (3) (E)): A Responsible Official may authorize site-specific projects and activities to harvest timber on NFS lands only where:

FS Response: Mitigation measures have been provided in the soil, watershed, and fisheries analyses and would be incorporated into the project implementation design to ensure that soil, slope, and watershed conditions would be adequately protected.

- There is assurance that the lands can be adequately restocked within 5 years after final regeneration harvest (16 USC 1604(g) (3) (E) (ii)).

FS Response: According to local studies and forest records, natural regeneration of ponderosa pine, western larch, and Douglas-fir is variable depending upon the timing of activities and available cone crops. For this reason, artificial regeneration has been proposed as an option for any regeneration treatments. The desired reforestation goals for areas treated with regeneration treatments (e.g., patch cut or shelterwood) are consistent with TRST01 on page III-42 of the Forest Plan (USDA Forest Service 2003). Monitoring of regeneration success would begin one year after all proposed actions have been implemented (generally

late summer, early fall). Monitoring would continue on a schedule of Year 1, Year 3, and Year 5. If natural regeneration is attempted, by exam Year 3 if exams indicate that natural regeneration is not progressing toward the desired seedling-per-acre goal and species composition, planting of trees suitable for the site (such as ponderosa pine, western larch, and/or Douglas-fir) would be considered. In some units, planting of ponderosa pine and/or western larch, regardless of natural regeneration success, is planned to ensure the desired mix of species occurs. In units where regeneration treatment occurs, if initial surveys indicate that advanced regeneration is present in levels to meet DFCs, a post-harvest evaluation would be done to ensure minimum reforestation stocking levels (per TRST01) are retained after salvage harvest.

FS Response: Protection from detrimental changes is provided for streams, stream banks, wetlands, and other bodies of water. Disclosure regarding the protection of stream, riparian, and fish habitats is contained in the soil, hydrology, and fisheries analyses, by alternative. All action alternatives are consistent with the Forest Plan and would provide protection of stream, riparian, and fish habitat.

- The harvesting system to be used is not selected primarily because it would give the best dollar return of the greatest output of timber (16 USC 1604(g) (3) (E) (iv)).

FS Response: The harvesting system proposed is the system determined to meet the purpose and need most effectively. The economic feasibility of this project was not the reason for developing the alternatives; some of the more expensive treatment units (i.e., units with helicopter logging systems and mature plantations) were dropped due to concerns identified by the public regarding the overall cost of the project.

Clearcutting and Even-aged Management (16 USC 1604(G)(3)(F)): Ensure that clearcutting, seed tree cutting, shelterwood cutting, and other cuts designed to regenerate an even-aged stand of timber would be used as a cutting method on NFS lands only where applicable.

- (i) for clearcutting, it is determined to be the optimum method, and for other such cuts it is determined to be appropriate, to meet the objectives and requirements of the relevant land management plan;
- (ii) the interdisciplinary review as determined by the Secretary has been completed and the potential environmental, biological, esthetic, engineering, and economic impacts on each advertised sale area have been assessed, as well as the consistency of the sale with the multiple use of the general area;
- (iii) cut blocks, patches, or strips are shaped and blended to the extent practicable with the natural terrain;
- (iv) there are established according to geographic areas, forest types, or other suitable classifications the maximum size limits for areas to be cut in one harvest operation, including provision to exceed the established limits after appropriate public notice and review by the responsible Forest Service officer one level above the Forest Service officer who normally would approve the harvest proposal: Provided, that such limits shall not apply to the size of areas harvested as a result of natural catastrophic conditions such as fire, insect and disease attack, or windstorm; and
- (v) such cuts are carried out in a manner consistent with the protection of soil, watershed, fish, wildlife, recreation, and esthetic resources, and the regeneration of the timber resource.

FS Response: The patch clearcuts and shelterwood regeneration methods proposed are designed to be consistent with Forest Plan direction and the desired conditions for the project. These treatments have been proposed in lands determined to be suitable for timber production. Due to these stands' current conditions, they no longer contribute to the desired conditions for vegetation in at least one aspect.

- Protection is provided for streams, stream banks, shorelines, lakes, wetlands, and other bodies of water 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 (16 USC 1604(g)(3)(E)(iii)) The harvesting system to be used is not selected primarily because it will give the best dollar return of the greatest output of timber (16 USC 1604(g) (3) (E) (iv)).

To meet the Forest Plan standard for vegetation management (USDA Forest Service 2003, pp. III-29 and III-41), even-aged harvesting (patch cuts and/or shelterwood) would occur on lands suitable for timber production, as it is the appropriate and optimum method for the timber type and would contribute to meeting vegetative objectives for the site. Such harvest would be consistent with the protection of soil, watershed, fish, wildlife, recreation, and aesthetic resources. Harvest areas would be blended to the extent practicable with the natural terrain and would retain reserve trees to meet wildlife, ecological, soil, visual, and other resource objectives. In addition, the regeneration treatments proposed would not technically qualify as openings due to reserve trees and clumps retained for purposes other than vegetation management in regenerated stands that would retain greater than 10% canopy cover. The maximum size of openings created by one regeneration harvest operation would not exceed 40 acres. A project design feature has been incorporated to limit regeneration treatments to less than 40 acres in size; therefore, no regeneration harvest (or opening) larger than 40 acres is proposed.

Establishment of standards to ensure culmination of mean annual increment of growth; silvicultural practices; salvage harvesting; exceptions (16 USC 1604(G)(3)(m))
The Secretary shall establish—

- (1) standards to insure that, prior to harvest, stands of trees throughout the NFS shall generally have reached the culmination of mean annual increment of growth (calculated on the basis of cubic measurement or other methods of calculation at the discretion of the Secretary): Provided, That these standards shall not preclude the use of sound silvicultural practices, such as thinning or other stand improvement measures: Provided further, That these standards shall not preclude the Secretary from salvage or sanitation harvesting of timber stands which are substantially damaged by fire, windthrow or other catastrophe, or which are in imminent danger from insect or disease attack; and
- (2) exceptions to these standards for the harvest of particular species of trees in management units after consideration has been given to the multiple uses of the forest including, but not limited to, recreation, wildlife habitat, and range and after completion of public participation processes utilizing the procedures of subsection (d) of this section.

FS Response: Silvicultural prescriptions will be developed to ensure consistency with this requirement. The proposed regeneration treatments would occur in overmature stands. Intermediate treatments that would harvest trees are proposed in stands that have not yet reached the culmination of mean annual increment, but these treatments are consistent with

the above exceptions and have considered the desired conditions and potential effects to recreation, wildlife, range, soils, water, economic, and fisheries resources.

3.2.9. Project Record

This DEIS hereby incorporates by reference the Forested Vegetation specialist report in the project record (40 CFR 1502.21). The report is located in the Forested Vegetation section of the project record and contains the data, methodologies, analysis, maps, references, and technical documentation that the specialist relied upon to reach the conclusions in this DEIS.

3.3. Fire and Fuels

3.3.1. Analysis Scale, Data Sources, and Methodology

3.3.1.1. Analysis Scale

3.3.1.1.1. Direct and Indirect Effects Analysis Area

The scope of the direct and indirect effects analysis for fire and fuels (forested and nonforested) is the Project area, outside the East Fork Weiser River (EFWR) subwatershed and the IRAs, on NFS lands. This analysis area comprises approximately 76,304 acres; it was chosen because it is large enough to represent differences in vegetative characteristics affected both by environmental factors (e.g., historical fire regimes) and past management activities. The EFWR subwatershed portion and the IRAs were not analyzed in the vegetation section because no fuels treatments are proposed in these areas.

3.3.1.1.2. Cumulative Effects Area

The cumulative effects analysis area for fire and fuels is all lands within a 1-mile radius of the Project area (including private lands and IRAs).

3.3.1.2. Temporal Scale of Analysis

Time frames as defined in the Forest Plan are used for this analysis of effects: temporary (1–3 years), short term (3–15 years), and long term (15 or more years) (USDA Forest Service 2003a). The temporal scale of this analysis is 20–30 years post treatment, which is considered an appropriate time scale for analysis because maintenance and future management will need to determine the appropriate objectives for management within the next 15 to 30 years for this project area. In addition, this time period is within the historical disturbance regime for much of the project area—in other words, some disturbance, whether natural or human induced, is needed to maintain desired conditions within the next 10 to 30 years.

3.3.1.3. Data Sources and Methodology

3.3.1.3.1. Walk-Through Surveys

Current stand conditions are based on walk-though surveys. Field crews performed the walk-through surveys on most forested stands on NFS lands (excluding the IRAs) within the project area during the 2013 and 2014 field seasons. Additionally, in 2014, some stands designated as nonforested (predominately high-elevation meadows) were also visited.

The walk-through surveys categorize into restoration, burn only, reserve/regeneration, pre-commercial thinning (PCT) needed, PCT not needed, and not sure. The restoration category includes stands primarily composed of vigorous seral species at densities higher than desired conditions. The reserve/regeneration stands are stands primarily composed of climax species, low-vigor serals, and stands with severe insect infestations and disease infections. Burn-only stands are similar to restoration stands but have been thinned or underburned in the past; densities are within range of desired conditions.

3.3.2. Analysis Process and Objectives

3.3.2.1. Design of Treatment Areas

Fuels treatments include prescribed fire, SFBs, and associated actions.

Prescribed fire treatments are needed to reduce fuel loading and restore fire regimes. In some portions of the Project area, the vegetation conditions are outside of desired conditions with regard to tree size class distributions, species composition, and canopy cover distributions (Middle Fork Weiser River Landscape Assessment 2014).

SFBs are needed to improve firefighter and public safety, improve the defensible space adjacent to private lands, and provide protection to infrastructure to the east of the Project area.

Additional commercial and noncommercial harvests include combinations of nonforested treatments, wet meadow treatments, vegetation treatments in stands with LSQ, SFBs, and fuel reduction within an RCA.

3.3.2.2. Objectives and Measurements

The objectives and associated measurements below will be used to compare alternatives, ascertain achievement of treatment objectives, and determine compliance with design features and the 2003 Forest Plan standards and guidelines (USDA Forest Service 2003a).

Objective 3: Restore and maintain desirable fuel levels, fire regimes, and ecological processes.

Measurement: Amount of departure from historical fire regimes

Objective 4: Establish and maintain strategically placed SFBs to improve firefighter and public safety, improve the defensible space adjacent to private lands, and provide protection to infrastructure to the east of the Project area.

Measurement: Acres of SFBs

3.3.3. Affected Environment

3.3.3.1. Current Conditions

The analysis area is dominated by forested vegetation. In addition, much of the grassland/shrubland contains scattered trees; however, these lands do not contain the minimum canopy coverage to be considered forest. The project area is dominated by forest types and fire regimes that were historically open ponderosa pine forest with a mosaic of mixed conifer (primarily grand fir, Douglas-fir, and western larch) forest types. The distribution of forest types and historical vegetation in the project area are driven primarily by subtle changes in elevation, aspect, and topography. Prior to European settlement, fire was the principal disturbance process shaping vegetation distribution, development, and succession on the landscape; insects and other disturbance processes also played minor roles (Mehl et al. 1998; Morgan and Parsons 2001).

Fire History

Aggressive suppression directives constituted the past fire management actions within and adjacent to the Project area. Historically, wildfire disturbances helped shape forested

landscapes across the Project area. Decades of fire exclusion, forest management, wildfires, insect outbreaks, and other factors have substantially altered forest structures, especially in the low to mid-elevation ponderosa pine forests comprising about 53% of the forested acres in the Project area.

Due to suppression efforts, the Project area has not experienced many significant wildfires in the last decade. The largest wildfire on record, the Grays Creek fire, occurred in 2007 (Table 3-23). The fire began adjacent to the Forest and grew to 24,900 acres; 12,685 acres were within the Project area. Only one other large fire (>100 acres, in 2006) has occurred within the Project area since the start of fire suppression (Table 3-23). Records indicate the Project area experienced 142 fire starts from 1956 to 2013, an average of 2.5 fire starts per year. The majority of these fires were contained to 1.0 acre or less.

Table 3-23. Significant recorded wildfires (>100 acres) within the Project area

Fire Name	Year	Acres
Grays Creek	2007	12,685
Messenger	2006	262

Many starts have been recorded adjacent to the Project area but were also suppressed. The primary natural disturbance process has been excluded for approximately the last century.

No fire history studies have been performed in the Project area; however, fire history studies on the Forest have been performed in the nearby Bear/Indian Creek drainages and the Rapid River drainage. The results of Barrett's (1987 and 1994) studies are summarized below.

Bear and Indian Creek Drainages

The Bear Creek drainage is 30 miles to the northwest of the Project area. Barrett (1994) was able to produce a relatively continuous 4-century record of fire history in these drainages. Within the dry ponderosa pine stands, the pre-1919 fire interval was 14 to 30 years. As of 1993, these stands had not burned for the past 74 to 115 years (i.e., 95 to 135 years as measured from 2013). Within the ponderosa pine/Douglas-fir/grand fir vegetation type, the historical fire interval was 25 to 40 years; as of 1993, the mean fire-free interval was 107 years, or 127 as measured from 2013 (Barrett 1994a).

Rapid River Drainage

In his paper on the Rapid River drainage, Barrett (1987) concludes that (with the exception of the ponderosa pine cover type) fire suppression has not yet markedly affected succession within most stands, the result of relatively long past fire cycles in stands comprised primarily of Douglas-fir and grand fir and between 4,000 and 7,000 feet in elevation. Barrett (1987) states the most vulnerable stands, from the standpoint of succession, are the moist ponderosa pine stands within the mid-elevation grand fir habitat types. In the Rapid River drainage, these sites have not experienced fire in 74 years or more, while the natural frequency range was from 43 to 69 years.

Drier south-facing aspects have a mean fire interval of approximately 55 years; Barrett (1987) states that the minimum fire interval is 10 years. This particular study site sits 40 miles to the northwest of the Project area.

In summary, although no specific data exist with respect to the Project area, we can infer from nearby fire history studies that, before the start of aggressive fire suppression in the early 1900s, primarily low-severity–high-frequency fires (14–40 year intervals) occurred in

the drier habitat types (ponderosa pine/Douglas-fir forests), and mixed-severity fires of less frequency (43–69 year intervals) occurred in stands dominated by Douglas-fir and grand fir. It is important to note that tree ring research of historical fire frequency is generally conservative, as very-low-severity fires do not consistently produce fire scars.

Current Conditions

The current condition in each stand is characterized by assigning PVG, strata, and working group (USDA Forest Service 2004) to describe the existing forested vegetation. For this analysis, strata and PVG assignments were updated using the 2013 and 2014 walk-through survey data. Strata are groups of stands relatively homogeneous in age, productivity, and density (USDA Forest Service 2004) that can be used to assess landscape and stand-level conditions of forested and nonforested vegetation. Strata are combined into working groups sharing similar species composition and productivity. The strata and working group classifications comprise a snapshot of existing vegetative conditions and account for past management activities (such as timber harvest), as well as for natural disturbance events (such as wildfires). The PVG, strata, and working group data are compiled for the project area and used to compare existing conditions to desired conditions (Table 3-24).

Nonlethal to Mixed-Severity Fire Regimes

Decades of commercial timber harvests have removed the larger and more fire-resilient tree species (such as ponderosa pine, Douglas-fir, and western larch), favoring species that are less fire resilient (grand fir). Fire suppression has led to a buildup of ground, surface, and canopy fuels and favored the maturation of less fire-resilient species. Recurrent commercial harvests, fire suppression, and grazing have led to

- An increase in canopy densities
- A decrease in canopy base heights (height to live crown)
- A change in species composition, from a majority of more fire-resilient to less fire-resilient tree species
- An increase in ground and surface fuels

As a result, vegetation and fuel conditions are outside the historical range of natural conditions. Historically, the Project area's drier forest types (PVGs 1 and 2 and drier sites in PVG 5) have consisted of a diverse understory of grasses, forbs, and low shrubs, with a large-diameter, fire-resilient overstory; this condition has been maintained over time by frequent, low-intensity fires. The mixed-severity fire regimes of PVGs 3, 4, 5, 6, 7, and 11 have occurred in the Douglas-fir, grand fir, and whitebark pine communities.

The nonlethal areas of the Grays Creek Fire are now 7 years into the range of the historical fire return interval and in the next 5 to 7 years will have missed 1 interval (Table 3-25).

Stand Replacement Fire Regimes

The PVGs historically experiencing stand replacement fires exhibit the least departure from historical conditions. Due to the long fire return interval (an average of 221 years), these areas have not been significantly altered by modern fire suppression.

Approximately 21,662 acres, of the Project area have missed 2 or more fire return intervals. The extent to which a system has departed from historical conditions influences the extent to which key ecosystem components, critical to the integrity of the ecosystem, are altered.

Within the project area, many of the nonlethal and mixed-severity I fire regime acres have transitioned to mixed-severity II and stand replacement regimes. This finding is consistent with the research performed on the Forest by Sanders (1998) and Barrett (1987 and 1994), which indicates a shift in the fire regimes.

This shift in fire regimes indicates that a higher percentage of the Project area acres would likely burn at higher severities, as well as in larger patch sizes, given a wildfire event. Table 3-26 displays the departure from historical fire return intervals and displays the current fire potential within the Project area. Uncharacteristic fire effects threaten desirable plant communities, ecological processes, and the ability to protect life, investments, and other valuable resources (Barrett et al. 2010).

Weiser River Drainage, Management Area 3

Due to lack of disturbance, succession is moving the Weiser River drainage's stands outside their HRV. In the shrubland and grassland groups (mountain big sagebrush and bitterbrush), past fire exclusion and grazing impacts have contributed to old, decadent stand conditions that are less resilient to fire and other disturbances (USDA Forest Service 2003a, p. III-124).

Table 3-24. Fire regime descriptions

Fire Regime	Fire Interval	Potential Vegetation Groups (PVGs) and Vegetation Type	Fire Intensity	Vegetation Patterns (Agee 1998)
Nonlethal	5–25 years	**PVG:** 1, 2, 3, and 5	Low—10% mortality or less	Relatively homogenous with small patches generally <1.0 acre of different seral stages, densities, and compositions created from mortality
Mixed1	5–70 years	**PVG:** 3, 4, 5, 6, 7, and 10 **Vegetation Types:** Aspen, Perennial Grass Slopes, Perennial Grass Montane, Mountain Big Sagebrush, Montane Shrub, and Bitterbrush	Low to moderate—10–50% mortality	Relatively homogenous with patches created from mortality ranging in size from <1.0 to 600 acres of different seral stages, densities, and compositions
Mixed2	70–300 years	**PVG:** 6, 7, 8, 9, 10, and 11 Vegetation Types: Perennial Grass Slopes, Perennial Grass Montane, Mountain Big Sagebrush, Montane Shrub, and Bitterbrush	Moderate to high—50–90% mortality	Relatively diverse with patches created by mixes of mortality and unburned or underburned areas ranging in size from <1.0 to 25,000 acres of different seral stages, densities, and compositions
Lethal	100–400 years	**PVG:** 8, 9, and 10	High—over 90% mortality	Relatively homogenous with patches sometimes >25,000 acres of similar seral stages, densities, and compositions; small inclusions of different seral stages, densities, and compositions often result from unburned or underburned areas

Table 3-25. Departure from historical fire return interval in the Project area excluding E. Fork Weiser River

Historical Fire Regimes	Acres	Range of Historical Fire Return Intervals (years)	Average Historical Fire Return Intervals (years)	Missed Intervals
Nonlethal	5,423	5–25	15	6.8
Mixed Severity I	16,239	5–70	37.5	2.7
Mixed Severity II	14,822	70–300	185	0.6
Lethal	589	100–400	250	0

Notes:
These data assume aggressive suppression efforts since 1911; only 2 significant fire events are recorded within the project area (i.e., 102 years of fire exclusion).
Potential vegetation groups (PVGs) falling into multiple regimes are split evenly between the regimes.

Table 3-26. Current fire potential within the Project area

Fire Regime	Fire Type	Flame Lengths (ft)		Rate of Spread (chains**/hour)	
		Surface	Canopy	Surface	Canopy
Nonlethal	Active Crown	11	44	108	90
Mixed Severity I	Conditional Crown	2/5[a]	45	5	90
Mixed Severity II	Conditional Crown	2/5 [a]	37	5	85
Lethal	Conditional Crown	2	36	6	80

Source: Table results modeled via NEXUS 2.0
[a] Indicates professional opinion ** chain equals 66 ft.

3.3.4. Desired Condition

According to the Forest Plan (USDA Forest Service 2003a, p. III-38), the desired condition for fire management in the forest is as follows:

> Fire—both prescribed and wildland—is used as a tool to achieve and maintain vegetative conditions and desired fuel levels. Fire plays a natural role where appropriate and desirable, but is actively suppressed where necessary to protect life, investments, and valuable resources. Fire operates within historical fire regimes appropriate to the vegetation type and management objectives.

"Historical fire regime" represents a general classification of the role fire plays across a landscape in the absence of modern human mechanical intervention, but including the influence of aboriginal burning (Agee 1993). Coarse-scale definitions for historical fire regimes have been developed by Hardy et al. (2001) and interpreted for fire and fuels management by Hann and Bunnell (2001). The 4 historical fire regimes recognized on the Forest are classified based on the average number of years between fires (fire frequency) and the effects on the dominant overstory vegetation (Table 3-25).

Because fire exclusion is the primary factor resulting in significant change in landscape condition, the desired condition can best be depicted via the historical fire regimes of each PVG within the Project area (Table 3-27). Historically, 49% of the Project area has experienced frequent fires (low severity, high frequency); 48% of the Project area has experienced less frequent fires of mixed severities; and only 3% of the Project area has experienced very infrequent fires of high severity. (Percentages only include vegetated acres within the Project area.)

Table 3-27. Historical fire regimes on the Payette National Forest by Potential Vegetation Groups (PVGs) within the Project area (acres and percent)

PVG	Acres within Project Area (NFS Lands Only)	Percent of Project Area
PVG 1—Dry Ponderosa Pine/Xeric Douglas Fir	254	<1%
PVG 2—Warm Dry Douglas Fir/Moist Ponderosa Pine	3,300	9%
PVG 3—Cool Moist Douglas Fir	0	0%
PVG 4—Cool Dry Douglas Fir	138	<1%
PVG 5—Dry Grand Fir	4,246	11%
PVG 6—Cool Moist Grand Fir	12,426	33%
PVG 7—Warm Dry Subalpine Fir	4,702	13%
PVG 8—Warm Moist Subalpine Fir	56	<1%
PVG 9—Hydric Subalpine Fir	576	2%
PVG 10—Persistent Lodgepole Pine	903	2%
PVG 11—High-Elevation Subalpine Fir	419	1%
Total Forested Vegetation	**27,020**	**73%**
Grassland/Shrubland	10,061	27%
Analysis Area Total (NFS Lands)	**38,519***	

Note:
Acres represent all lands within the Middle Fork Weiser River watershed in the project area.

PVGs were classified into fire regimes according to the Forest Plan and based on local knowledge of conditions in this Project area. Frequent fires in adjacent areas most likely spread into this landscape more frequently than they might have in other areas of the Forest.

3.3.5. Environmental Effects

3.3.5.1. Direct and Indirect Effects

3.3.5.1.1. Fuel Levels, Fire Regimes, and Ecological Processes and Shaded Fuelbreaks

Alternative 1

The No-Action Alternative would move conditions in the project area further from desired conditions, primarily due to continued exclusion of fire from the ecosystem. Natural ignitions would not be capable of restoring fire, given multiple values at risk that are adjacent to the project area. Without prescribed burning, fire frequencies will continue to decrease, severities will continue to increase, and fire regimes will continue to move away from historical conditions (Table 3-25). Additionally, risk to the public, private property, fire suppression crews, and other values within and adjacent to the project area will continue to increase.

Alternative 2

Alternative 2 would significantly improve and maintain fire regime conditions across approximately 24,236 acres where vegetation and fuels treatments, along with prescribed burning, are proposed (Table 3-28). Additional improvements in fire regime conditions would occur among the following:

- 24,236 acres of total prescribed burning (approximately 20% of these acres are nonforested grasslands). Types of prescribed burning proposed are:
    - 17,354 of mechanical and nonmechanical vegetation treatments followed by prescribed burning
    - 6,882 acres of prescribed burn only

Treatments that only thin vegetation without the application of fire would aid in restoring historical fire regimes. The potential for sustained crown fire spread would be significantly reduced, but individual tree torching and uncharacteristically high severities remain as surface fuels and individual crown base heights remain low (Graham et al. 2004, Agee and Skinner 2005). Additionally, the ecological function of fire within this fire-dependent system would not be restored.

In areas where fire is the only treatment prescribed, fire regimes would move toward historical conditions, but changes in vegetative conditions within forested areas would occur at a slower rate than in areas thinned prior to the application of fire (Brown et al. 2004). In many of the drier habitat types that remain dominated by seral tree species, fire alone would sufficiently move current conditions toward desired conditions.

Where stand structure and species composition would be altered mechanically or by hand to restore desired conditions and where fire is reintroduced, fire regimes would move toward historical conditions at the greatest rate (Brown et al. 2004, Stephens and Moghaddas 2004, Agee and Skinner 2005).

Restoring vegetative structure and composition as well as the primary disturbance process (fire) would improve the integrity of the landscape and its resilience to wildland fires; however, “ecosystem restoration treatment and fuel treatment are not synonymous” (Reinhardt et al. 2008). In some stand conditions, opening stands would increase the rates of spread and increase the average number of days that a stand would carry fire (due to reduction in both shading from the sun and sheltering from the wind). Restoring fire regimes within the Project area would alter predicted fire types from conditional to active crown fires, to primarily surface fires with passive crown fires.

Table 3-28. Acres of movement toward historical fire regimes within Middle Fork Weiser River, by alternative

Historical Fire Regime	Vegetated Project Area Acres	Percent of Each Fire Regime Improved by Alternative (%)		
		Alternative 2	Alternative 3	Alternative 4
Nonlethal	5,677	84	73	84
Mixed Severity I	16,152	65	42	73
Mixed Severity II	14,626	60	49	72
Stand Replacement	617	25	0	63
TOTAL / Percent of project Area Improved	37,072	6	50	74

Note: We assume that stand treatments consisting of both thinning and burning would have the greatest impact in restoring fire regimes. Additionally, grasslands proposed for burning are included in these acres of improvement.

Restoring historical fire regimes in fire-adapted systems leads to a multitude of desirable stand and landscape-scale effects (Keane et al. 2002), for example:

- Decreases in shade-tolerant tree species, increases in forage quality, increases in plant vigor and stand productivity, decreases in canopy closure, increases in early seral communities, decreases in landscape homogeneity, decreases in dominance of single patch type, and increases in patch diversity
- Decreases in vertical fuel ladders and their continuities, reduction in ground and surface fuel loadings, and increases in decomposition rates
- Decreases in fire intensities and severities, reduction in potential for crown fires (pre and 1-year post treatment fire behavior modeled using NEXUS version 2.0 and assuming stands are both thinned and burned):
    - Fire types would move from active or conditional crown fires to surface fires under historically representative weather and fuel conditions (see Table 3-29)
    - Surface flame lengths in the
        - historically nonlethal fire regimes would decrease from 11 to 3 feet
        - historically mixed-severity and stand replacement fire regimes would decrease from 5 and 2 feet to 1 foot
    - Rates of spread in the
        - historically nonlethal fire regimes would decrease from 108 to 21 chains per hour (1 chain equals 66 feet)
        - historically mixed-severity and stand replacement fire regimes would decrease from 85 to 1 chain per hour
- Decreases in risk to the public, private property, suppression crew, and other values within and adjacent to the project area

Table 3-29. Comparison of critical thresholds initiating crown fire conditions within units proposed for both treated and prescribed fires

Fire Regime	Critical Fire Indices	Current Conditions	Post Treatment Conditions
Nonlethal	Torching Index	0	61
	Crowning Index	18	25
	Flame Length Initiation	3	7
Mixed Severity I	Torching Index	29	100+
	Crowning Index	16	22
	Flame Length Initiation	3	7
Mixed Severity II	Torching Index	21	100+
	Crowning Index	19	32
	Flame Length Initiation	2	9
Stand Replacement	Torching Index	30	100+
	Crowning Index	20	34
	Flame Length Initiation	2	9

Notes: Torching Index = the 20-ft wind speed at which some kind of crown fire (passive or active) is expected (miles/hour).
Crowning Index = the 20-ft wind speed at which active crown fire is possible (miles/hour).
Flame Length Initiation = the minimum surface fire flame length required to initiate some kind of crown fire (feet).

Alternative 3

Alternative 3 would significantly improve fire regime conditions across approximately 16,618 acres where vegetation and fuels treatments, along with prescribed burning, are proposed (Table 3-28). Additional improvements in fire regime conditions would occur among the following:

- 16,618 acres of total prescribed burning (approximately 18% of these acres are nonforested grasslands). Types of prescribed burning proposed are:
  - 10,909 of mechanical and nonmechanical vegetation treatments followed by prescribed burning
  - 5,658 acres of prescribed burn only

Additionally, 3,942 acres of mechanical and nonmechanical treatment with no prescribed burning is proposed which will aid in restoring historical fire regimes. Hand and/or machine piling followed by pile burning would occur in areas of heavy fuel loading. The reduction of prescribed burning compared to the Proposed Action is due to economics, fire fighter safety and the abilitiy to keep fire out of the higher PVG's.

Direct and indirect effects of Alternative 3 to the indicator (acres moved toward the historical fire regime) are consistent with those found under Alternative 2, except in the amount of total acres improved. Changes in predicted fire type, flame length, and rates of spread remain constant between the action alternatives.

Alternative 4

Alternative 4 would significantly improve fire regime conditions across approximately 27,435 acres where vegetation and fuels treatments, along with prescribed burning, are proposed (Table 3-28). Additional improvements in fire regime conditions would occur among the following:

- 27,435 acres of total prescribed burning (approximately 20% of these acres are nonforested grasslands). Types of prescribed burning proposed are:
    - 20,083 of mechanical and nonmechanical vegetation treatments followed by prescribed burning
    - 7,352 acres of prescribed burn only

Direct and indirect effects of Alternative 4 to the indicator (acres moved toward the historical fire regime) are consistent with those found under Alternative 2, except in the amount of total acres improved. Changes in predicted fire type, flame length, and rates of spread remain constant between the action alternatives.

3.3.6. Cumulative Effects

Cumulative effects were assessed over the last century and the next 3 decades of activities. Greater emphasis has been given to more recent activities. Cumulative effects were analyzed within the project boundaries and the area immediately adjacent (within 1 mile) to the project perimeter. Actions occurring outside this analysis area are not likely to affect the fire and fuels indicators associated with the project. None of the action alternatives would affect wildfire susceptibility (i.e., fuel loads, ladder fuels, and stand densities) that overlap in time and space with similar effects outside the Project area. These treatments might decrease the likelihood of a fire to spread into untreated areas, but they would not affect how those areas would burn if the fire reached them. Essentially, cumulative effects upon the fire and fuels indicator remain constant across all action alternatives. Differences lie within acres moved towards historical fire regimes and associated effects. These effects are discussed in direct and indirect effects analysis.

Past Fire Suppression

The need for this project is in part a result of past fire suppression actions. It is most likely that fires will continue to be managed with a suppression objective due to the immediate values at risk (e.g., adjacent private, State, and BLM-managed lands). Therefore, restoring/maintaining the historical fire regimes within the project area would be accomplished primarily through management ignitions.

Past Timber Harvest

The need for this project is partly a result of past timber harvests. Past harvests favored the removal of large fire-adapted species and left less fire-tolerant size classes and species. This contributed to the altered fire severities across the project area, moving primary fire severity from low to mixed and from mixed to high.

Timber Stand Improvement/Pre-commercial Thinning

Current and future thinning activities consistent with the current Forest Plan would aid in moving conditions toward desired/historical conditions because the thinning prescription would support the development of vegetative structure and composition of conditions defined

in Appendix A of the Forest Plan. The current condition of many of these plantations is not conducive to supporting historical fire frequencies and severities (i.e., fire severities are likely to be much higher than those within the historical range).

Range Allotment and Historical Livestock Use

Livestock use has led to minor effects to the fire regimes within the project area, both positive and negative. Grazing decreases the available flashy fuels contributing to fire spread. Therefore, grazing may decrease the amount of fire (natural disturbance) across the landscape, but this may benefit efforts to protect local values at risk.

Noxious Weeds and Invasive Plant Management

Noxious weeds have the potential to affect the fire regime, but due to limited densities and current weed management actions, weeds are not likely to impact the fire regime. Weeds will be inventoried, monitored, and treated accordingly.

Past and Ongoing Activities within and Adjacent to the Project Area

A number of vegetation management activities besides timber harvests have occurred in the project area. These include prescribed burning and timber stand improvement (NCT). Past activities have been included in the development of the alternatives and in the analysis of effects.

No current USFS contracts or projects exist in the project area; however, Potlach has active timber sale contracts in 2016.

Private Lands and Other Ownerships

Private lands and lands managed by other agencies adjacent to the project area have led, and will continue to lead, to the suppression of wildland fires within and outside the project area. This will result in a constant demand for prescribed burning in order to support efforts to restore/maintain the historical fire regime.

3.3.7. Irreversible and Irretrievable Commitments

Regarding fire and fuels management, there are no irreversible or irretrievable commitments with any of the action alternatives.

3.3.8. Forest Plan Consistency

All 3 action alternatives are consistent with the Forest Plan direction for fire management standards and guidelines. These action alternatives would move the current conditions toward desired conditions.

3.3.9. Project Record

This DEIS hereby incorporates by reference the fire and fuels specialist report in the project record (40 CFR 1502.21). The report is located in the Fire and Fuels section of the project record and contains the data, methodologies, analysis, maps, references, and technical documentation that the specialist relied upon to reach the conclusions in this EIS.

3.4. Wildlife Resources

This section describes existing conditions of the wildlife resource in the Project area and adjacent areas of concern, and addresses the effects of three action alternatives and the no action alternative on wildlife species and habitats, with respect to the indicators and measurements identified in Chapter 1.

3.4.1. Analysis Scale and Data Sources

3.4.1.1. Analysis Area

The wildlife analysis area for baseline conditions and direct and indirect effects, in most cases, is the Project area. The analysis area for Canada lynx is based on lynx analysis units (LAUs), following the *Canada Lynx Conservation Assessment and Strategy* (Ruediger et al. 2000) and as developed for the Forest Plan (USDA Forest Service 2003), in consultation with the USDI FWS. The analysis of wolverine habitat is based on a persistent snow model (Copeland et al. 2010) that extends outside the Project area. The cumulative effects wildlife analysis area is the Project area plus the Council Mountain IRA. The IRA totals 16,568 acres, of which 7,916 acres occur in the Project area.

3.4.1.2. Temporal Scale

Timeframes were defined in the Forest Plan as temporary (0–3 years), short-term (3–15 years), and long-term (>15 years). These timeframes are used to qualitatively define the effects of management actions on the wildlife resource.

3.4.1.3. Data Sources

Appendix A of the Forest Plan identifies desired conditions for tree size class, canopy cover class, species composition, snags, and CWD, using the HRV as the reference condition. Effects to these desired conditions are analyzed in the section 3.2 of this EIS. These same components are used to model changes in source habitat for wildlife species at a landscape scale. Project and site-specific data on patterns of habitat distribution and specific habitat features are used for the wildlife analysis. For many wildlife species, the complexity of habitat structure and juxtaposition with other resources adds a level of fine-scale analysis that is simply not possible to conduct at the landscape scale.

Change in habitat for wildlife species of concern was determined using habitat models designed for the 2003 Forest Plan revision and revised with the best available science, including the Wildlife Conservation Strategy (WCS) Technical Report (Egnew et al. 2015) analysis and more recent literature. A summary of modeling parameters for source habitat for each species analyzed is documented in the Project record. The Project Silviculturist (section 3.2) provided vegetation data for the habitat models; habitat modeling was verified by field review of a representative sample of forested stands in 2014 and 2015, coupled with documented wildlife species observations and numerous field surveys for wildlife species of concern. The baseline data for this analysis were drawn from the following wildlife species records:

- Forest Service corporate database, Natural Resources Inventory System (NRIS) Wildlife

- Idaho Department of Fish and Game (IDFG) database, Idaho Fish and Wildlife Information System (IFWIS)

Wildlife surveys have been conducted in different portions of the Project area for many years, with applicable inventory data documented in the Project record. The Project area contains 14 Forest Plan MIS transects for white-headed or pileated woodpeckers.

3.4.2. Measurements and Indicators

Objective: Project Objective 5 is to improve habitat for Family 1 wildlife species, as represented by the white-headed woodpecker, a Region 4 Sensitive species (Egnew et al. 2015) and Forest MIS, by restoring Forest conditions that contribute to source habitat for these species. Forested stands providing these source habitats should be restored to desired conditions within, or near, the HRV (Morgan and Parsons 2001).

Measurement:

Quantity and quality of Family 1—white-headed woodpecker habitat restored to conditions within HRV. Quantity is measured by acres of PVGs 2, 5, and portions of PVG 6 in the large tree size class and low canopy cover class. Quality is measured by the presence of old forest characteristics (e.g., legacy trees, snags, CWD, canopy gaps, understory patchiness) as described in the Forest Plan.

The following issues were identified as affecting wildlife in the Project area; the indicators for each issue statement were used to compare alternatives:

Issue Statement:

High open road densities affect wildlife (e.g., elk) security and can lead to the removal of important habitat components (e.g., snags).

Indicators:

- Change in elk security areas (Hillis et al. 1991)
- Effects of opening closed roads to allow for additional firewood harvest

  (Based on the description in section 2.3.2.2.5 for “Firewood Availability”, it was determined that the effects are adequately addressed on a road-by-road basis, and that this indicator needs no further analysis for wildlife.)
- Estimated effectiveness of closures and/or decommissioning
- Miles of NFS roads and unauthorized roads decommissioned by 1) physical closure and 2) obliteration

Issue Statement:

Treatments may adversely affect source habitat for wildlife species dependent on mixed-conifer forests with multi-layer structural characteristics. Such forests are associated with mixed to lethal fire regimes and associated processes (larger scales of insect and disease outbreaks and fire effects). Species of concern include ESA-listed and Region 4 sensitive species and MIS.

Background: A primary need, Forest-wide and in the Project area, is to maintain and promote dry, lower elevation, large tree and old forest characteristics for the associated wildlife species and reduce fragmentation that negatively affects species of concern. The

processes, function, patch size, and diversity of forested habitats must all be considered, in order to properly address wildlife habitat needs.

Indicators:

- Quantity (acres) and distribution of habitat for species of concern
- Quality (specifically old forest, snags, patch and pattern) and distribution of habitat for species of concern

Issue Statement:

Project activities (logging, log haul, prescribed burning, and temporary road construction) may cause disturbance to wildlife species of concern.

Indicators:

- Disturbance effects to species of concern

3.4.3. Desired Condition, Forest Plan Direction, and Relation to the Wildlife Conservation Strategy

3.4.3.1. Desired Condition

The desired condition for wildlife resources identified in the Forest Plan (USDA Forest Service 2003) is that, "the amount, distribution, and characteristics of vegetation are present at levels necessary to maintain viable populations of native and desired non-native species." This desired condition ties to the desired vegetation conditions identified in Appendix A of the Forest Plan (USDA Forest Service 2003a, Appendix A), with a goal of supporting diverse wildlife habitats.

3.4.3.2. Forest Plan Direction

Forest-wide goals, objectives, standards, and guidelines for wildlife resources are found in the Forest Plan (USDA Forest Service 2003a, pp. III-8 to III-15 and III-25 to III-28). Forest Plan direction (standards and guidelines) specifically applicable to the Project for wildlife resources is listed below; goals are listed in section 1.5.1:

3.4.3.2.1. Standards

- TEST06—Management actions shall be designed to avoid or minimize adverse effects to listed species and their habitats.
- TEST12—Vegetative management activities within lynx foraging habitat in LAUs shall not degrade, nor retard attainment of, desired habitat for the lynx and its prey.

- TEST15—Unless a broad-scale assessment has been completed that substantiates different historical levels of unsuitable habitat, limit disturbance within each LAU as follows: If more than 30% of lynx habitat within a LAU is currently in unsuitable condition, no additional habitat may be changed to unsuitable habitat as a result of vegetative management projects. Fire use, or fire hazard reduction and associated vegetation management activities within the WUI watersheds, that develop or maintain fuel profiles needed to reduce the risk of wildfire threats to the WUI areas, are NOT bound by this standard.
- WIST02—Design and implement projects within occupied habitats of Sensitive wildlife species to help prevent them from becoming [federally] listed.
- WIST03—Mitigate management actions within known nesting or denning sites of MIS or Sensitive Species, if those actions would disrupt the reproductive success of those sites during the nesting or denning period.
- WIST05—In goshawk territories with known active nest stands, identify alternate and replacement nest stands during project-level planning, when it is determined that the proposed activity is likely to degrade nest stand habitat.

3.4.3.2.2. Guidelines

- WIGU01—Vegetation management should consider the following habitat conditions or features:
  - The amount, quality, and distribution of habitats;
  - Fragmentation within habitats;
  - Juxtaposition and connectivity to other habitats;
  - The influence of road-related degradation; and
  - Ecosystem processes that develop and modify habitat.
- WIGU05—Habitat should be determined for MIS or Sensitive wildlife species within or near the Project area. Surveys to determine presence should be conducted for those species with suitable habitat.
- WIGU07—Use appropriate research to help define active, alternate and replacement nest stands for goshawks, and configuration of PFAs.
- WIGU08—Big game [Rocky Mountain elk] vulnerability to road-related mortality should be evaluated during mid-, fine-, or site/project-level travel management planning to help assess effects of potential travel management decisions on state population objectives.
- WIGU09—Even-aged regeneration cuts should be considered to provide big game hiding cover when the vegetation conditions in the unit meet the definition of hiding cover in the Glossary.
- WIGU11—Management actions should neither degrade nor retard attainment of winter range desired conditions except where outweighed by demonstrable short- or long-term benefits to winter range or where the Forest Service has limited authority.

- WIGU12—Calving and fawning areas should be protected from project-related disturbance during big game calving or fawning. Calving/fawning areas and periods should be determined during site/project-level planning.
- WIGU13—To address big game [Rocky Mountain elk] vulnerability to mortality, components of habitat security should be identified and managed during project planning and implementation.
- WIGU14—To address big game stress and exposure during critical wintering periods, thermal cover components on winter/spring ranges should be identified and managed during project planning and implementation. Management requirements or mitigation measures needed to maintain these components should be determined during site/project-level planning. As a general guideline, at least 15% thermal cover should be retained on big game winter ranges where this cover presently exists. Cover should be maintained in at least 30-acre patch sizes where available. Thermal and hiding cover may or may not occur on the same acres.

The Project area is in MA 3; additional wildlife management direction pertinent specifically for this MA includes the following objectives and guideline (USDA Forest Service 2003; pp. III-132–133):

3.4.3.2.3. Management Area 3 Objectives

- Objective 0333—Improve enforcement of year-long and seasonal road closures through signing and on-the-ground patrols to allow for improved big game security.
- Objective 0334—Coordinate with IDFG to reduce bull elk vulnerability through the use of security areas and reductions in open road density to move toward State herd composition objectives.
- Objective 0335—Maintain or restore the quality and abundance of forage in the Mountain Big Sagebrush and Bitterbrush vegetation groups to improve big game winter/spring range habitat.
- Objective 0337—Increase white-headed woodpecker habitat by managing ponderosa pine stands within the Ponderosa Pine/Xeric Douglas-fir, Warm Dry Douglas-fir/Moist Ponderosa Pine, and Dry Grand Fir vegetation groups toward the desired ranges of size classes, canopy closures, species composition, snags, and CWD, as described in Appendix A [of the Forest Plan]. The ranges of these components may vary by management prescription.
- Objective 0338—Increase flammulated owl habitat by managing ponderosa pine stands within the Warm Dry Douglas-fir/Moist Ponderosa Pine and Dry Grand Fir vegetation groups toward the desired ranges of size classes, canopy closures, species composition, snags, and CWD, as described in Appendix A [of the Forest Plan]. The ranges of these components may vary by MPC.

3.4.3.2.4. Management Area 3 Guidelines

- Guideline 0341—An increase in the white-headed woodpecker or flammulated owl habitat may be achieved by the following methods: a) Reducing tree densities and ladder fuels under and around existing large ponderosa pine trees and snags to reduce the risk of stand replacing fire and to restore more open canopy conditions and b) Managing the firewood program to retain large-diameter ponderosa pine and large snags of other species through signing, public education, size restriction, area closures, or other appropriate methods.

3.4.3.3. Wildlife Conservation Strategy

In 2006, the Payette National Forest began developing a comprehensive WCS, to address the direction of Forest Plan objective WIOB03 that states: "Prioritize wildlife habitats to be restored at a mid- or Forest-scale…. Initiate restoration activities on priority wildlife habitats to move current conditions towards desired conditions." The WCS is similar to the ACS (USDA Forest Service 2003a), in that it is a long-term strategy to restore and maintain the ecological health of ecosystems used by wildlife. Planning and project design are embedded within the WCS. The WCS analysis follows the methods described in the WCS Technical Report (Egnew et al. 2015), which provides habitat models tailored to both the west and east sides of the Forest; this document is the best information available for this EIS, as it applies to the Project area.

The WCS for the Payette National Forest was developed from the final *Wildlife Technical Report for the 2010 Boise National Forest Plan Amendment to Implement a Forest Wildlife Conservation Strategy* (Nutt et al. 2010), which draws on scientific principles and analysis methods generated as part of the Interior Columbia Basin Ecosystem Management Project (ICBEMP) (Raphael et al. 2000; Wisdom et al. 2000). The WCS analysis includes several key terms, including source habitat, habitat family, and focal species.

3.4.3.3.1. Source Habitat

Source habitat is defined by those characteristics of macro-vegetation that contribute to stationary or positive population growth. The WCS analysis compares source habitat conditions that existed prior to Euro-American settlement (HRV) (Morgan and Parsons 2001, Morgan et al. 1994) with the level of change in those habitats, as noted in existing landscape conditions (Wisdom et al. 2000). The WCS analysis was conducted for the Forest; however, the source habitats, described in terms of tree size and canopy cover, are well-suited for analysis of effects for proposed actions at the landscape, watershed, subwatershed, and small project levels. Therefore, the source habitats developed for the WCS Technical Report are used in this EIS.

A fundamental concept of the 2003 Forest Plan and the WCS analysis is that if the amount and structure of source habitats across landscapes are within the HRV, wildlife species associated with these habitats would have a greater likelihood of sustainability than if the amount and structure of source habitats across landscapes are outside their HRV. The desired condition for wildlife habitats on the Forest is to be within the HRV. Habitat Families

The WCS analysis groups source habitats for terrestrial wildlife species. These source habitat groups fit into a hierarchical system of 4 broad Habitat Suites: 1) Forest Only;
2) Combination of Forest and Rangeland; 3) Rangeland Only; and 4) Riverine and

Non-riverine Riparian and Wetland. These four suites are further refined by categorizing similar source habitats into 14 Habitat Families: Families 1–4 are within Suite 1; Families 5–9 are within Suite 2; Families 10–12 are within Suite 3; and Families 13 and 14 are within Suite 4. Habitat families are a collection of species that share similarities in source habitats, which are arranged along major vegetative themes, such as ecological communities, vegetative structure, and fire regime.

A key finding of the WCS analysis was that wildlife species associated with low- to mid-elevation ponderosa pine forests had experienced the greatest loss of habitat, compared to historical conditions, and that these habitats should have the highest priority for restoration activities. These species and habitats are grouped into Habitat Family 1.

The wildlife analysis is structured to reflect the relation between Project effects on habitat families with effects on focal species.

3.4.3.3.2. Focal Species

Focal species are selected from habitat families to represent key environmental correlates (KEC) and ecological functions that may be affected by management activities. KEC are the biotic or abiotic habitat elements that species use on the landscape to survive and reproduce. Key ecological functions (KEF) are the set of ecological roles performed by a species in its ecosystem. These ecological roles are the primary ways organisms use, influence, and alter their biotic and abiotic environments.

Focal species are used in this Project to address expected or potential changes to key ecosystem attributes. The focal species concept is discussed more extensively in the ICBEMP (Wisdom et al. 2000), Raphael et al. (2000)), the *Wildlife Technical Report for the 2010 Boise National Forest Plan Amendment to Implement a Forest Wildlife Conservation Strategy* (Nutt et al. 2010), and the WCS Technical Report (Egnew et al. 2015).

3.4.4. Analysis Methodology

The wildlife analysis addresses habitat or habitat elements for species in Family 1 (Low Elevation, Old Forest [OF]), Family 2 (Broad Elevation, OF), Family 3 (Forest Mosaic), Family 5 (Forest and Range Mosaic), and Family 12 (Grassland/Open Canopy Sage. Of these six habitat families, 14/ wildlife species were identified as focal species to evaluate in this EIS section. These species include the white-headed woodpecker (*Picoides albolarvatus*), pileated woodpecker (*Drycopus pileatus*), flammulated owl (*Otus flammeolus*), American three-toed woodpecker (*Picoides tridactylus*), black-backed woodpecker (*Picoides arcticus*), boreal owl (*Aegolius funereus*), fisher (*Martes pennanti*), great gray owl (*Strix nebulosa*), northern goshawk (*Accipiter gentilis*), Canada lynx (*Lynx canadensis*), mountain quail (*Oreortyx pictus*), wolverine (*Gulo gulo luscus*),Rocky Mountain elk (*Cervus elaphus*), and northern Idaho ground squirrel (*Urocitellus brunneus*).

The remaining species of concern (i.e., Region 4 Sensitive species), not chosen as focal species, were analyzed to the extent necessary to meet disclosure requirements, based on their status. These species are discussed in the Wildlife Specialist Report, located in the Project record.

Wildlife species considered for analysis in the Project area include animals listed under the ESA of 1973, as amended; animals classified as Proposed or Candidate species for listing under ESA; animals classified as Forest Service Region 4 Sensitive species; Forest Species

of Special Interest (SOSI); animals designated as Management Indicators Species (MIS); and animals selected as focal species (Table 3-30). These species are grouped by suite and family. Although 25 wildlife species are listed in this table, not all of these species are included in the landscape analysis, because either source habitat for these excluded species does not exist in the Project area, or source habitat exists, but the species has not been documented in the Project area. Species occurrence records and survey data are valid through October 2015. A draft Biological Assessment has been prepared for ESA-listed wildlife species (Canada lynx and northern Idaho ground squirrel; Threatened) and is included in the Project record; no Endangered, Proposed, or Candidate wildlife species occur in the Project area.

Table 3-30. Wildlife species and modeled source habitat considered for analysis in the Project area

Suite	Habitat Family	Focal Species Considered in this Analysis	Species Status[a]	Status in the Project Area
Forest Only	1—Low Elevation, Old Forest	White-headed Woodpecker	S/MIS	Payette National Forest (PNF) Management Indicator Species (MIS), focal species for Habitat Family 1. Species and modeled source habitat occurs in the Project area.
	2—Broad Elevation, Old Forest	American Three-toed Woodpecker	S	Source habitat occurs in the Project area. Dependent mostly on disturbance events, such as fire or insect infestation. Species observed in the Project area. Selected focal species.
		Black-backed Woodpecker	SOSI	Source habitat occurs in the Project area. Dependent mostly on disturbance events, such as fire or insect infestation. Proposed as focal species for Family 2–disturbance events. Species observed in the Project area. Selected focal species.
		Boreal Owl	S	Source habitat occurs mostly at higher elevations in the Project area. No known occurrences. Selected focal species.
		Fisher	S	Source habitat occurs in the Project area. No known occurrences. FWS is reviewing this species, to see if warranted for ESA listing. Selected focal species.
		Flammulated Owl	S	Species and source habitat occurs in the Project area. Selected focal species.
		Great Gray Owl	S	Species and source habitat occurs in the Project area. Selected focal species.
		Northern Goshawk	S	Species and source habitat occurs throughout the Project area. Selected focal species.
		Pileated Woodpecker	MIS	Species and source habitat occurs throughout the Project area. Selected focal species.
	3—Forest Mosaic	Canada Lynx	T	Endangered Species Act (ESA) listed—Threatened. Middle Fork Weiser Lynx Analysis Unit (LAU) in watershed. No lynx reported in or near the Project area. Selected focal species.
		Mountain Quail	S	Species and source habitat (i.e., riparian areas) occurs in the Project area. Selected focal species.
		Wolverine	S	Source habitat present in the Project area. Potential denning habitat (i.e., high elevation cirques and forests) present. No known observations in the Project area. Selected focal species.
Combination of Forest & Rangeland	5—Forest & Range Mosaic	Gray Wolf (Species not analyzed in EIS)	S	Source habitat present in the Project area. Relies on appropriate prey species management (see elk discussion). Up to three packs of wolves may occupy the Project area.

		Peregrine Falcon (Species not analyzed in EIS)	S	Extremely limited source habitat occurs in the Project area. No known nesting sites in the Project area. No recent observations in the Project area.
		Rocky Mountain Bighorn Sheep (Species not analyzed in EIS)	S	Modeled summer range source habitat exists on east and south portions of Project area. No known observations in the Project area.
		Rocky Mountain Elk	SOSI	PNF Species of Special Interest (SOSI) and Idaho Department of Fish and Game (IDFG) species of concern. Source habitat present throughout the Project area. Population managed by IDFG; habitat managed by Forest Service. Selected focal species.
	7—Forests, Woodlands, & Sagebrush (Not addressed in the analysis)	Spotted Bat (Species not analyzed in EIS)	S	No suitable roost sites known within approximately 30 miles of the Project area. No known observations in the Project area.
		Townsend's Big-eared Bat (Species not analyzed in EIS)	S	Source habitat present in the Project area. No known observations in the Project area.
Rangeland Only	11—Sagebrush (Not addressed in the analysis)	Greater Sage Grouse (Species not analyzed in EIS)	S	ESA status—Removed from Candidate Species List. Remains a R4 Sensitive species. No source habitat in the Project area. No known populations on the Forest, but could provide sites for birds moving between occupied sites off-Forest.
	12—Grassland/ Open-Canopy Sagebrush	Columbian Sharp-tailed Grouse (Species not analyzed in EIS)	S	No source habitat in Project area. No known observations in the Project area.
		Northern Idaho Ground Squirrel	T	ESA listed—Threatened. Modeled source habitat present in the Project area. No known observations in the Project area.
Riverine & Non-riverine Riparian & Wetland	13—Riverine Riparian & Wetland(Not addressed in the analysis)	Bald Eagle (Species not analyzed in EIS)	S	Riverine source habitat present in the Project area. Species observed in the Project area. No known nests in the Project area.
		Columbia Spotted Frog (Species not analyzed in EIS)	S	Source habitat occurs in riparian & wetland areas. Species documented in the Project area.
		Harlequin Duck (Species not analyzed in EIS)	S	Source habitat present in some low-gradient sections of the Project area. No known observations in the Project area.
		Yellow-billed Cuckoo (Species not analyzed in EIS)	S	No modeled source habitat in the Project area. No known observations on the PNF, West Zone.

[a]Species Status (USDI FWS 2010): T = ESA Threatened; C = ESA Candidate; P = ESA Proposed; S = Region 4 Sensitive; MIS = Payette National Forest Management Indicator Species; SOSI = Payette National Forest Species of Special Interest

3.4.5. Affected Environment

Due to the reliance of many terrestrial wildlife species on old forest habitat and snags, this section begins with a discussion of these important habitat components and their presence in the Project area. The important habitat component discussion is followed by descriptions of current conditions of modeled habitat for species in Habitat Family 1 (white-headed woodpecker); Family 2 (pileated, three-toed, and black-backed woodpeckers, flammulated and boreal owls, and fishers); Family 3 (Canada lynx, mountain quail, and wolverine); Family 5 (Rocky Mountain elk); and Family 12 (northern Idaho ground squirrel).

3.4.5.1. Old Forest

OF habitat is an important source habitat condition that provides denning, nesting, foraging, and cover habitats for many wildlife species. OF habitat is distinguished by old trees in the large tree size class (Egnew et al. 2015, Nutt et al. 2010). OF characteristics within stands are defined as follows:

- Tree species composition of the large tree size class
- Presence of tree decadence in the stand
- Number of snags per acre, by size class
- Tons per acre of CWD, by size class
- All characteristics must be present, whether in single-story or multi-story conditions, and must be associated with fire regimes historically prevalent in central Idaho.

Stands identified with, or trending toward, OF characteristics may be treated to enhance OF characteristics, or to improve the probability of the stand trending toward OF characteristics. For example, a stand that was identified as trending toward OF characteristics may be treated by removing a number of smaller diameter tress, in order to promote growth of the larger trees in the stand. The decision to treat these stands will come from a cooperative evaluation of each stand on a case-by-case basis, with involvement by, at a minimum, the West Zone Silviculturist, Wildlife Biologist, and District Ranger.

Three large tree ponderosa pine stands in the Project area were identified by the Ponderosa Pine Task Force (Mehl and Haufler 2004) as priority stands for restoration. Egnew et al. (2015) also rated these stands with a higher priority for treatment. Two of these stands were burned by the Grays Creek Fire in 2007.

3.4.5.2. Snag Habitat

For many wildlife species, snags—particularly large-diameter snags—are an important habitat component. Snags are difficult to inventory because they occur in scattered, random clumps across the landscape. In general, snag numbers are higher when away from open roads, in dense stands where competition for resources makes trees less vigorous and less able to resist insect and disease damage, and in areas where wildfires have occurred. The information presented here is based on recent Forest-wide inventories analyzed for the WCS DEIS (Egnew et al. 2015). Forest wide, total snag numbers are within the HRV for PVGs 1, 2, and 5 but are above the high end of the HRV for all other PVGs (Egnew et al. 2015). Across the west side of the Forest, where the Project area is located, snag numbers are

generally within the HRV, but in some areas, snags are lacking due to the influence of roads or previous harvest activities.

Snag numbers are often found to be below historical or desired amounts in roaded areas managed for timber products, or in areas accessible to firewood cutters (Mannan et al. 1980; Zarnowitz and Manuwal 1985; Thomas 2002). Road densities are much higher on the west side of the Forest than the east side of the Forest, and while snag numbers are within the HRV on the west side, a notable difference in the numbers between the two areas exists (Egnew et al. 2015). Of the 7 PVGs with sufficient west side data, 5 (PVGs 2, 4, 5, 6, and 10) are within the HRV, and PVGs 7 and 8/9 are above the high end of the range for the number of snags per acre by diameter group. When PVGs making up the nonlethal and mixed1 fire regimes are combined, all but medium snags in the mixed1 fire regime are within the HRV (Table 3-31).

Table 3-31. Number of snags per acre by diameter group (DBH) and Potential Vegetation Group (PVG) and relationship to the historical conditions for the Westside of the Payette National Forest

Diameter Group	Fire Regimes of the West Side of the Payette National Forest									
	Nonlethal			Mixed1		Mixed2			Lethal	
	PVG 1	PVG 2	PVG 5	PVG 3	PVG 6	PVG 4	PVG 7	PVG 11	PVG 8/9	PVG 10
10.0–19.9 inches	--[a]	<1	7	--[a]	7	0	21	--[a]	24	8
≥20.0 inches	--[a]	1	0	--[a]	1	2	3	--[a]	4	N/A
Total	--[a]	2	7	--[a]	8	2	24	--[a]	28	8
Relationship to Historical Conditions										
10.0–19.9 inches	N/A	-1.3	+1.5	N/A	+1.5	-1.8	+15.5	N/A	+16.5	+0.3
≥20.0 inches	N/A	In	-0.4	N/A	In	In	In	N/A	+1.0	N/A
Total	N/A	-1.7	In	N/A	In	In	+15.0	N/A	+17.5	+0.3

[a] Insufficient number of samples to evaluate
In = Inside of Historical Range of Variability; Out = Outside of Historical Range of Variability

In timber MAs, an emphasis on spacing to increase growth likely has resulted in unnatural snag distributions (i.e., isolated snags rather than clumps). Cavity nesting birds tend to select snags in clumps, rather than those uniformly spaced (Saab and Dudley 1998). Snags in managed areas have also been found to be more homogenous in size and decay class than would be expected under more natural conditions (Spiering and Knight 2005).

Despite these concerns, assuming that the westside inventory data are applicable to the Project area, the anticipated number of snags per acre at current condition is within, or above, the desired range in almost all snag size classes for all PVGs. An exception would be for PVGs 2, 4, and 5, because these forest types have been heavily managed in the past.

3.4.5.3. Habitat Family 1—Low-Elevation, Old Forest

Family 1 includes species associated with low elevation, old forest vegetation types and has been identified in the WCS Technical Report (Egnew et al. 2015) as a habitat family of greatest conservation concern, due to widespread and substantial declines in habitat quantity on the Forest. This finding is consistent with assessments at other scales in Idaho and the

Interior Columbia Basin (Northwest Power and Conservation Council [NPPC] 2004; Ritter 2000; Wisdom et al. 2000, Nutt et al. 2010, Mellen-McLean et al. 2013).

Family 1 wildlife species depend on single-story, and, to a lesser extent, multi-story, lower elevation old forests as source habitats (Nutt et al. 2010). Family 1 source habitat occurs in large tree, low canopy cover conditions in PVGs 1, 2, 3, and 5, and in those habitat types of PVG 6 where ponderosa pine is a major seral component (Nutt et al. 2010). Special features of this source habitat are large-diameter live trees and snags (Wisdom et al. 2000, Nutt et al. 2010). Historically, these habitat types were maintained in a relatively open condition by frequent, nonlethal fire.

Timber harvest and exclusion of low-intensity frequent fires have altered or removed habitat and changed natural disturbance regimes, contributing to widespread, strong declines in Family 1 source habitat on the Forest and in the Project area. The 2007 Grays Creek Fire (12,685 acres within the Project area) burned uncharacteristically and altered approximately 11,109 acres of Family 1 source habitats. Past timber harvest removed large diameter ponderosa pine and, coupled with fire suppression, resulted in higher ladder fuel levels in the understory and greater proportions of climax tree species (i.e., grand fir) compared with historical conditions. Based on the concepts developed from the ICBEMP (Wisdom et al. 2000), as applied in the WCS Technical Report (Egnew et al. 2015), and the Boise National Forest WCS (Nutt et al. 2010), open, large tree ponderosa pine source habitats are less common than historically occurred in the Project area. Past timber harvest activities also created a road network that persists today and provides access for removal of snags from Family 1 habitat, mostly for firewood harvest by the public.

The landscape occurs in the Middle Fork Weiser River 5th HUC watershed, which is a high priority watershed for Family 1 habitat restoration. These areas are a restoration priority because they include white-headed woodpecker observations and nesting, or remnant patches of low-elevation late-seral forest habitat required by white-headed woodpeckers. The amount of source habitat for the white-headed woodpecker has decreased from the HRV in this watershed.

3.4.5.3.1. White-headed Woodpecker

The white-headed woodpecker is a Region 4 Sensitive species, a Payette National Forest MIS, and an IDFG species of greatest conservation need. The white-headed woodpecker was selected as a focal species for Habitat Family 1 because it is believed to represent the KEC and KEF of this family (Nutt et al. 2010, Egnew et al. 2015). KECs for the white-headed woodpecker are biotic or abiotic elements that species use on the landscape to survive and reproduce. White-headed woodpecker KECs include forested habitats comprised of legacy trees, live trees, and snags $\geq$15 inches DBH (Marcot 1997, O'Neil et al. 2001). White-headed woodpeckers use the dead parts of live trees, as well as existing tree cavities, despite their status as primary excavators (O'Neil et al. 2001, Mellen-McLean et al. 2013).

The white-headed woodpecker is closely tied to mature ponderosa pine forests with live and dead ponderosa pine trees $\geq$20 inches DBH in open canopy conditions (Blair and Servheen 1995, Dixon 1998, Frederick and Moore 1991, Mellen-McLean et al. 2013). Although the white-headed woodpecker prefers open canopy stands of mature and older ponderosa pine, it also uses mixed-species stands of ponderosa pine and Douglas-fir (Frederick and Moore 1991; Wisdom et al. 2000). Open canopy conditions range from 20%–26% (Blair and Servheen 1995) to 56% (Frederick and Moore 1991). A central Oregon study found a mean canopy closure of 24% at nest sites and 44% at roosts (Dixon 1995a), with

most nest and roost trees in ponderosa pine forest types having <57% canopy closure (Dixon 1995b).

KEFs are the set of ecological roles performed by a species in its ecosystem. These ecological roles are the main ways organisms use, influence, and alter their biotic, or abiotic, environments. KEFs for the white-headed woodpecker are as a primary consumer of ponderosa pine seeds and a secondary consumer of terrestrial invertebrates (Marcot 1997, O'Neil et al. 2001). White-headed woodpeckers forage on insects throughout the summer months. During the fall and early winter, conifer seeds supplement the insect diet. Large diameter, and typically older, ponderosa pine are important, because they contain the cones, bark cracks, and crevices to support insects. Late summer through winter, ponderosa pine seeds are the primary food source for white-headed woodpeckers, but seeds from other tree species may help provide a consistent food supply. white-headed woodpeckers also play an ecological role in excavating cavities and in tree seed dispersal (Garrett et al. 1996).

Current Condition

Source habitat for white-headed woodpeckers is defined as forests in PVGs 1, 2, 3, 5, or 6, with large tree size class and low canopy cover class (Nutt et al. 2010, Egnew et al. 2015). Approximately 760 acres of modeled white-headed woodpecker source habitat on NFS lands is currently identified in the Project area (Table 3-32, Figure 3-8). Only 18 acres of white-headed woodpecker source habitat occurs on private lands in the Project area, likely due largely to extensive past timber harvest. As shown in Figure 3-8, white-headed woodpecker source habitat stands are small, fragmented, and widely distributed, which does not meet the guiding WCS wildlife conservation principles presented at the beginning of section 3.4.6 Environmental Effects).

Table 3-32. Current condition of white-headed woodpecker source habitat (acres), by tree size/canopy cover classes and Potential Vegetation Group (PVG), in the Project area

Tree Size/Canopy Cover Class	PVG 1	PVG 2	PVG 3	PVG 5	PVG 6	Totals
Large/Low NFS Lands	79	104	0	228	331	742
Large/Low Private Lands	5	12	0	0	0	18
Total All Ownership	**84**	**116**	**0**	**228**	**331**	**760**

In PVGs 2, 5, and 6, less than 15% of large tree, forested stands are currently in the low canopy cover class. This level is far below the desired range of large tree, forested stands for PVG 2 (74%–94%) and PVG 5 (25%–45%). PVG 6 large tree size class stands are within the desired range (0%–20%), in the low canopy cover class.

White-headed woodpecker home range sizes were 125 acres in central Oregon (Dixon 1995b) and 245 acres in central Washington (Mellen-McLean et al. 2013). Mellen-McLean et al. (2013) also noted research showing overlap in home ranges of neighboring pairs. Using the total amount of source habitat (760 acres) within the Project area (including private land inholdings) as the base amount of habitat at current conditions, the Project area could support only 3–6 white-headed woodpecker home ranges. NFS lands alone, with 742 acres of source habitat, could still support only 3–6 white-headed woodpecker home ranges. However, because the current source habitat is widely distributed, and because the source habitat model does not account for microsite habitat requirements (such as the need for dense patches of large ponderosa pines to be located within 300 feet of

the nest tree [Hollenbeck et al. 2011; Hollenbeck, personal communication 2009]), the number of home ranges supported by current habitat conditions may be even lower.

As of 2015, 23 white-headed woodpecker observations had been recorded within the Project area (Forest Service Wildlife Sightings Database 2012; IDFG database, Idaho Fish and Wildlife Information System [IFWIS] 2014). From 2003–2015, white-headed woodpecker surveys were conducted on 2 transects in the Project area on MIS transects, as part of a Forest-wide MIS monitoring program. From 2009–2015, only 2 white-headed woodpecker detections were recorded on those transects; these are in addition to the observations mentioned above from the IFWIS database. The USFS Rocky Mountain Research Station (RMRS) has conducted nest searches since 2012 in the Cooperative Forest Landscape Restoration (CFLR) project areas on the Council Ranger District. white-headed woodpecker information gleaned from those surveys will be applied to Project activities and implementation, in order to protect known nest sites (see Project Design Features in Chapter 2).

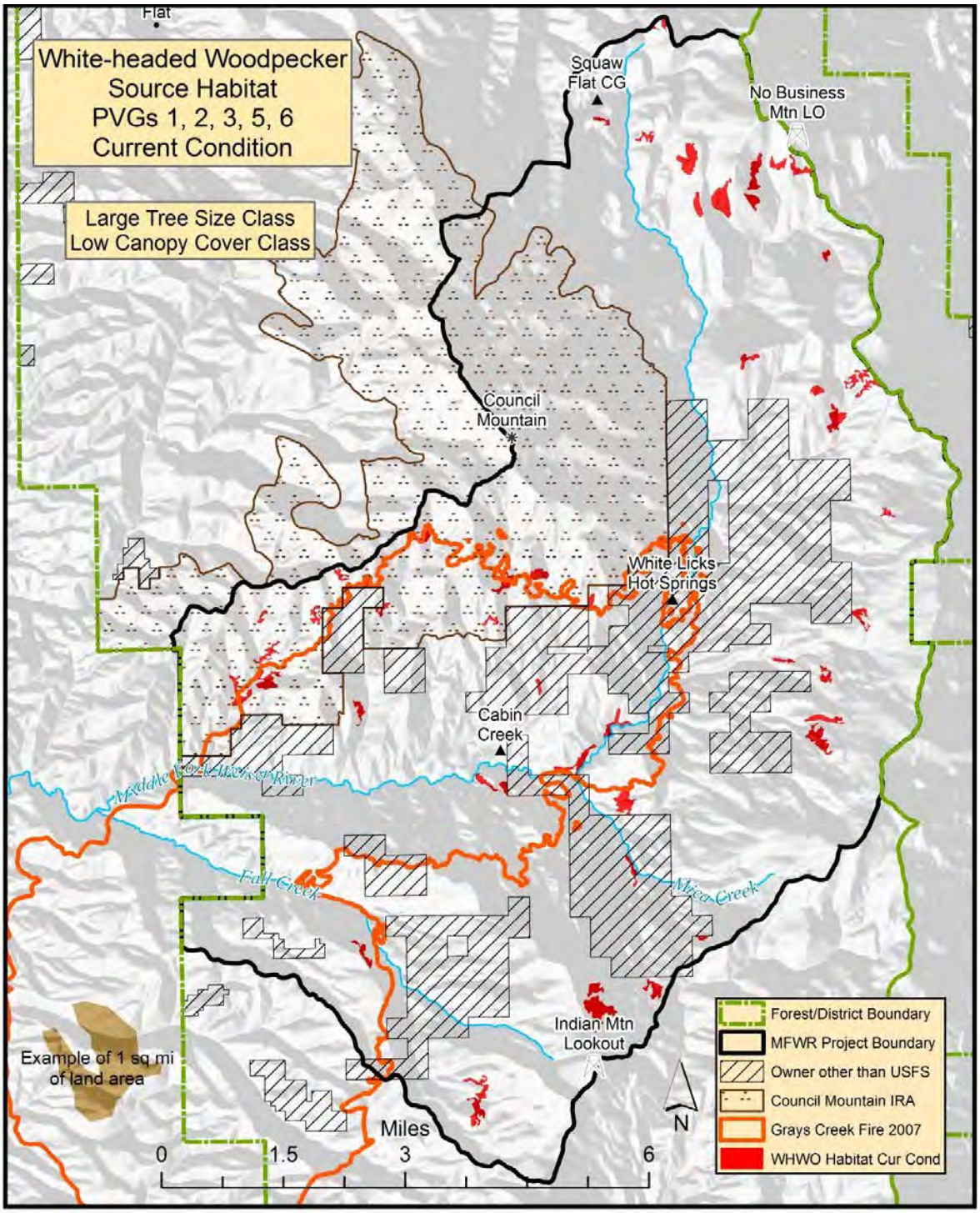


Figure 3-8. Current condition of white-headed woodpecker source habitat for PVGs 1, 2, 3, 5, and 6 in the Project area

3.4.5.4. Habitat Family 2—Broad-Elevation, Old Forest

Species in Habitat Family 2 use late seral, multi- and single-storied montane forests as source habitat (Wisdom et al. 2000, Nutt et al. 2010). Habitat Family 2 source habitats overlap those of Habitat Family 1, but encompass a broader array of cover types and elevations. Special features of Habitat Family 2 source habitats are snags, often of larger diameter (>20 inches DBH), and downed logs. Some species that use these habitats depend on juxtaposition of certain seral stages (shrubfields, tree regeneration patches, dense tree canopy patches), while others exhibit a negative response to older forest structural stages adjacent to younger structural stages. Many species are able to take advantage of departed vegetative conditions, benefitting as structural stages develop larger tree size classes and denser conditions. Habitat Family 2 species have acquired habitats that were historically Family 1 habitats. Hence, even though Family 2 habitats, particularly large tree and old forest, have substantially departed from the HRV, Family 2 wildlife species have been able to take advantage of departed source habitats historically used by Habitat Family 1 species.

3.4.5.4.1. Pileated Woodpecker

The Payette National Forest selected the pileated woodpecker as a MIS, because it is believed to be functionally linked to a suite of other wildlife species that use source habitats with large trees, snags and logs, and old forest habitat, in mixed-conifer forests that occur across broad elevations and developed under mixed fire regimes (Aubry and Raley 2003, USDA Forest Service 2003). This species is also a focal species for the Project area. The pileated woodpecker is considered a resident, non-migratory, nongame species.

Pileated woodpeckers occupy dense deciduous, coniferous, or mixed-species forests; open woodlands; second growth forests; and parks and wooded residential areas (NatureServe 2008, Nutt et al. 2010). The woodpecker prefers habitats with tall, closed canopies and high basal areas. Their preferred habitat includes large diameter trees and snags; multiple canopy layers; decaying wood on the forest floor; and a somewhat moist environment that promotes fungal decay and ant, termite, and beetle foraging (NatureServe 2008).

Pileated woodpeckers perform KEFs as secondary consumers of terrestrial invertebrates (e.g., carpenter ants) and primary cavity excavators of snags and live trees. KECs for this species include snags and living trees >20 inches DBH, logs, hollow living trees, and dead portions of live trees (Bull et al. 1992). The pileated woodpecker typically uses portions of dying trees and snags in the hard and moderate decay classes (early-to-mid stages of decomposition).

Current Condition

Source habitats for pileated woodpeckers are typically multilayer, late-seral stage montane and subalpine forests in PVGs 2, 3, 5, 6, 8, and 9, with large tree size class and moderate-to-high canopy closure class. Approximately 11,701 acres of modeled pileated woodpecker source habitat currently occurs in the Project area with 10,690 acres occurring on NFS lands (Table 3-33, Figure 3-9). Although the 10 individual habitat patches are mostly less than 1.0 square mile in area, the connectivity of multiple polygons creates a mosaic of habitats that is widely distributed throughout the area, with a variety of forest structure and patch size.

Pileated woodpecker home ranges in northeastern Oregon ranged from 316 to 593 acres (mean = 455 acres) (Bull and Meslow 1977). Using this mean home range size, NFS lands

within the Project area could currently support approximately 23 pileated woodpecker home ranges. Larger home ranges may be expected in the presence of lesser quality pileated woodpecker habitat.

Twenty-five pileated woodpecker observations have been recorded in the Project area (2014 Forest Service Wildlife Sightings Database, 2014 IFWIS). From 2003–2015, pileated woodpecker surveys were conducted on one transect in the Project area as part of a Forest-wide MIS monitoring program. From 2009-2015, no pileated woodpecker were detected from broadcast vocal surveys conducted on that transect; however, during that same period, 18 pileated woodpecker detections were recorded on the 4 white-headed woodpecker transects in the Project area; these detections are in addition to the observations mentioned above from the IFWIS database. The numbers of observations may indicate that pileated woodpecker are taking advantage of white-headed woodpecker habitat that has departed from historical conditions.

Table 3-33. Current condition of pileated woodpecker source habitat (acres), by PVG, in the Project area

Tree Size/Canopy Cover Class	PVG 2	PVG 3	PVG 5	PVG 6	PVG 8	PVG 9	Totals
Large/Moderate NFS Lands	337	0	1,402	3,414		228	5,381
Large/High NFS Lands	212	0	421	4,381	13	282	5,309
Total NFS Lands	**549**	**0**	**1,823**	**7,795**	**13**	**510**	**10,690**
Large/Moderate Private Lands	110	0	186	351		64	711
Large/High Private Lands	29	0	18	253		0	300
Total Private Lands	**139**	**0**	**204**	**604**		**64**	**1,011**
Total All Ownership	**688**	**0**	**2,027**	**8,399**	**13**	**574**	**11,701**

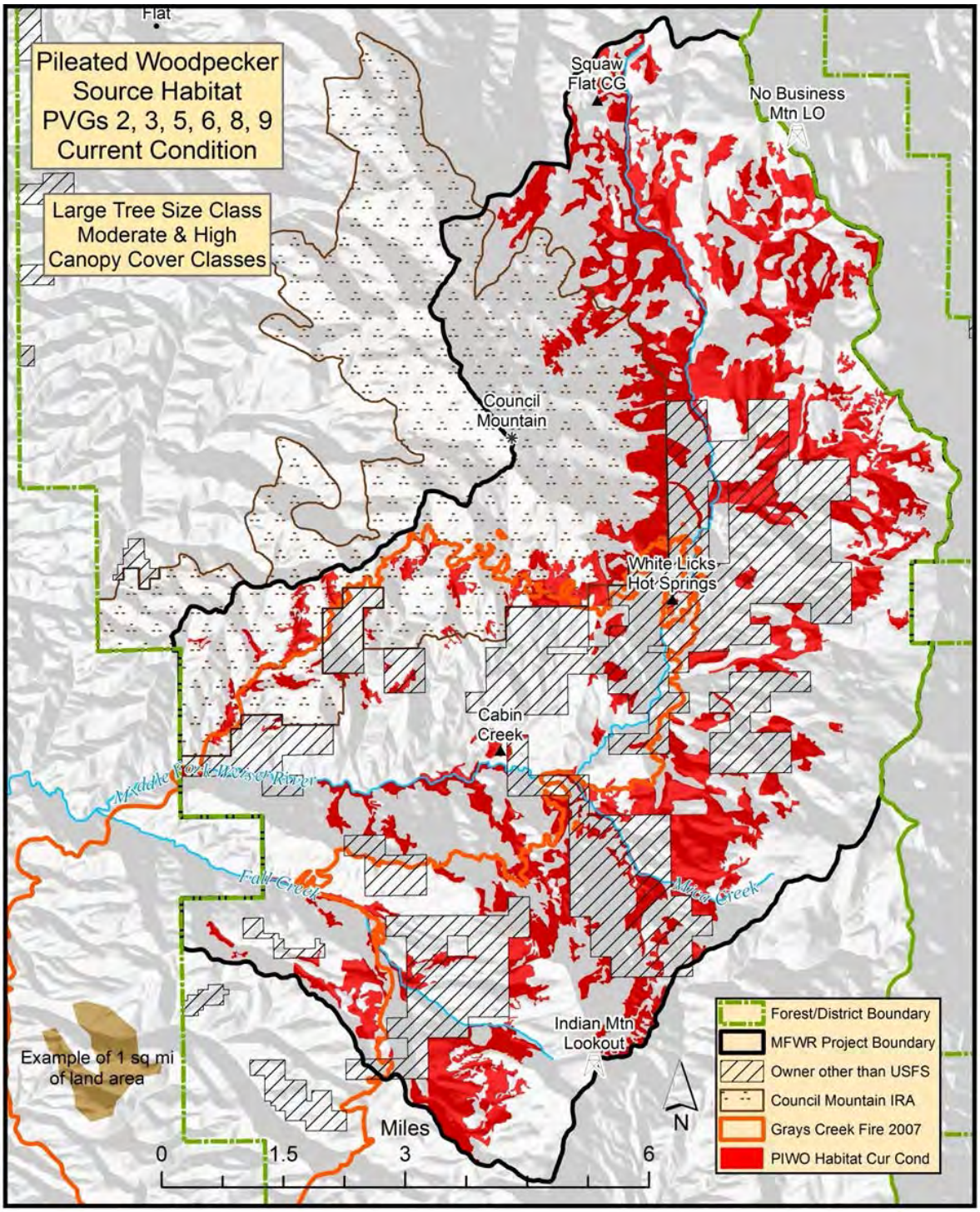


Figure 3-9. Current condition of pileated woodpecker source habitat Potential Vegetation Groups (PVGs) 2, 3, 5, 6, 8, and 9 in the Project area

3.4.5.4.2. Flammulated Owl

The flammulated owl is a Region 4 Sensitive species and an IDFG Species of greatest conservation need. It is selected as a focal species for the Project area because of its association with broad-elevation, old forest habitats. Flammulated owls are neo-tropical migrants, wintering in Central America. KEFs of the flammulated owl include being a secondary consumer of terrestrial invertebrates, as well as prey for secondary or tertiary consumers (Marcot 1997, O'Neil et al. 2001). KECs for this species include an association with forested habitats, comprised of live trees and snags >10 inches DBH (Marcot 1997, O'Neil et al. 2001). Flammulated owls are secondary cavity nesters, occupying natural cavities and, more commonly, old woodpecker cavities (Marcot 1997, O'Neil et al. 2001, Barnes 2007).

Breeding habitat for the flammulated owl combines open, mature, montane pine forests for nesting; scattered thickets of saplings or shrubs for roosting and calling; and grassland edge habitat for foraging (Goggans 1986, Reynolds and Linkhart 1992). This bird requires these habitat components across multiple spatial scales (i.e., microhabitat, home range, and landscape) (Wright 1996). In Idaho, flammulated owls have been documented in mid-elevation, old forest habitat, and in mature stands of open ponderosa pine and/or Douglas-fir (Groves et al. 1997). Old forests of ponderosa pine and Douglas-fir are key habitat components for the flammulated owl (Reynolds and Linkhart 1992), as these forest types support an abundance of favored Lepidoptera (moths and butterflies) prey (McCallum 1994). However, flammulated owls will also use old forest with multilayered canopies in aspen, cottonwood, and willow. Flammulated owl habitat is strongly associated with the upper slopes of ridges (Bull et al. 1990, Groves et al. 1997, Barnes 2007). Flammulated owls nest in cavities excavated by other bird species in snags and live, large diameter trees (McCallum and Gehlback 1988, Bull et al. 1990). These owls are obligate cavity nesters and can take advantage of insect irruptions, as from western spruce budworm (Choristoneura occidentalis) (McCallum 1994, Marcot 1997, O'Neil et al. 2001).

Current Condition

Source habitat for flammulated owls in the Project area is found in PVGs 1, 2, 3, 5, and 6. These habitats also overlap with several source habitats used by Habitat Family 1 wildlife species. These PVGs are most likely to have habitat types that develop late-seral stages of forest with stands dominated by ponderosa pine and/or Douglas-fir. Historical fire regimes in these PVGs include nonlethal, mixed1, and mixed2. Flammulated owls use the medium and large tree size classes and moderate canopy closure class. Unlike most species in Habitat Family 2, the flammulated owl does not use vegetative conditions departed from the HRV (Egnew et al. 2015, Nutt et al. 2010).

Approximately 7,647 acres of modeled flammulated owl source habitat currently occurs on NFS lands in the Project area; the majority of the available habitat occurs in PVGs 2, 5, and 6 (Table 3-34, Figure 3-10). Using an average home range size of 31 acres (based on a range of 25 to 49 acres [Nutt et al. 2010]), the NFS lands within the Project area could theoretically support approximately 246 flammulated owl home ranges. This home range number is likely artificially inflated, because the source habitat model cannot account for the availability or juxtaposition of required microsite components, such as snags with appropriate nest cavities; saplings and shrubs for roosting and calling; grassland edge habitat for foraging on moths and butterflies; and flammulated owl preference for using habitats on the upper portion of a

given slope. These microsite requirements likely restrict the number of flammulated owl home ranges and nests in the Project area.

Note that the modeled flammulated owl source habitat (Figure 3-10) occurs in polygons with a larger size, tighter distribution, and more connectivity than modeled source habitat for white-headed woodpeckers (Figure 3-8), but with a smaller size, wider distribution, and less connectivity than modeled source habitat polygons for pileated woodpeckers (Figure 3-9). An outbreak of western spruce budworm began during the past 2 years, so an increase in microsite habitat quality is expected in the Project area, due to the increased presence of flying insect and larval prey.

Seventeen flammulated owl observations have been recorded for the Project area (Forest Service Wildlife Sightings Database 2012, IFWIS 2014). Four flammulated owl survey transects are located in the Project area. To date, no vocal responses have been recorded during the spring vocal broadcast surveys on these transects. No nest search has been conducted for flammulated owls in the Project area. Additional flammulated owl transects were established in the Project area during fall 2015; these new transects will be evaluated for future use.

Table 3-34. Current condition of flammulated owl summer source habitat (acres), by Potential Vegetation Group (PVG), in the Project area on private and National Forest System (NFS) lands

Tree Size/Canopy Cover Class	PVG 1	PVG 2	PVG 3	PVG 5	PVG 6	Totals
Medium/Moderate NFS Lands	0	368	0	678	1,433	2,479
Large/Moderate NFS Lands	15	337	0	1,402	3,414	5,168
Total NFS Lands	**15**	**705**	**0**	**2,080**	**4,847**	**7,647**
Medium/Moderate Private Lands	0	893	0	1,180	2,021	4,094
Large/Moderate Private Lands	4	110	0	186	351	651
Total Private Lands	**4**	**1,003**	**0**	**1,366**	**2,372**	**4,746**
Total All Ownership	**19**	**1,709**	**0**	**3,446**	**7,219**	**12,393**

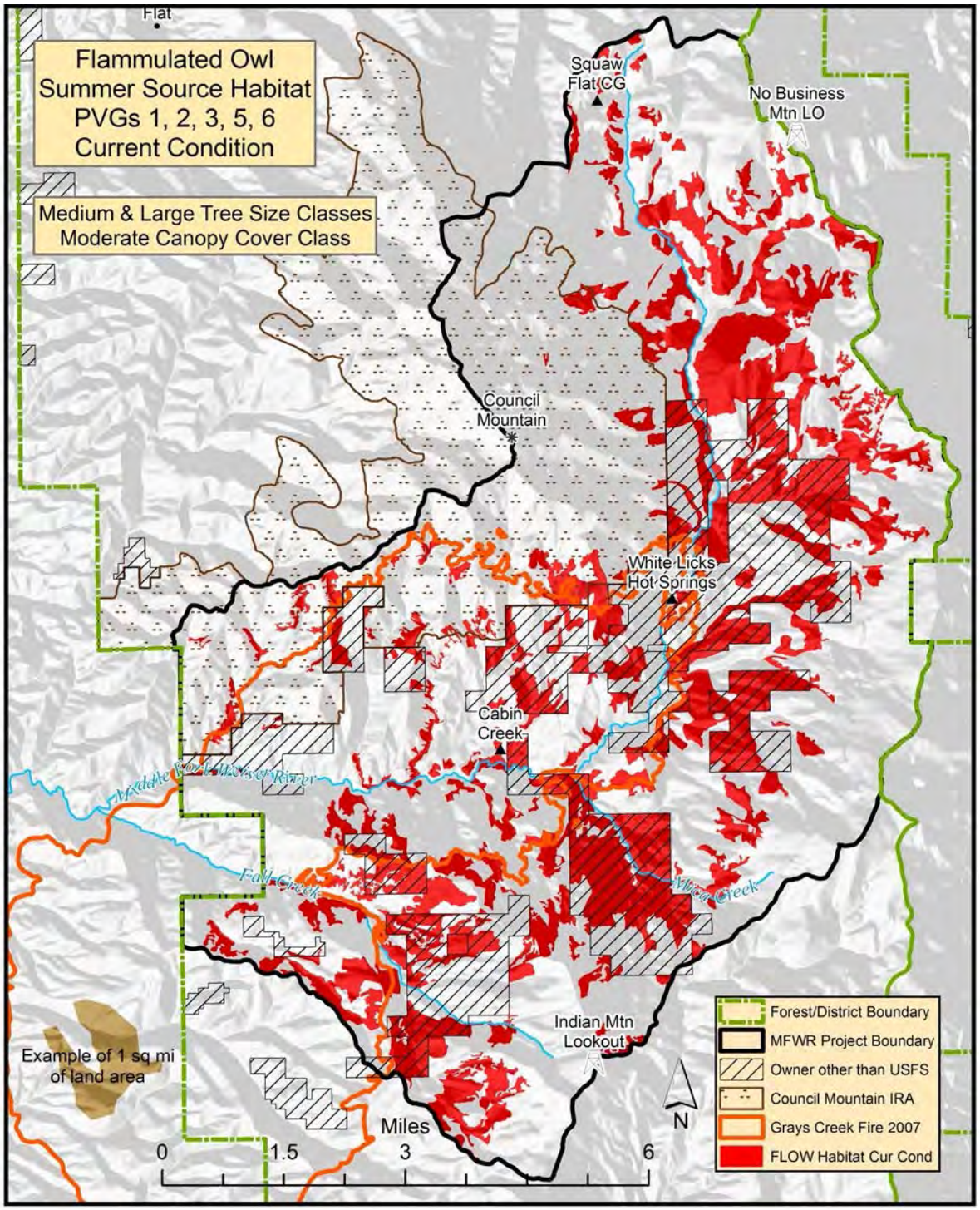


Figure 3-10. Current condition of flammulated owl summer source habitat for Potential Vegetation Groups (PVGs) 1, 2, 3, 5, and 6 in the Project area

3.4.5.4.3. American Three-toed Woodpecker

The American three-toed woodpecker is a Region 4 Sensitive species. This woodpecker performs a number of KEFs; it is a primary excavator of snags and live trees; its foraging and nesting behavior physically fragments standing and downed wood (Marcot 1997; O'Neil et al. 2001). A sap feeder, the American three-toed woodpecker is a secondary consumer of terrestrial invertebrates (Marcot 1997), and plays a role in regulating timber-damaging beetles (Leonard 2001) and beetle outbreaks (Marcot 1997; O'Neil et al. 2001). American three-toed woodpecker populations typically peak during the first 3–5 years after a fire. KECs for this species include an association with forested habitats that include snags showing little to moderate evidence of decay, as well as partially dead trees, in late-seral forests (Marcot 1997; O'Neil et al. 2001).

American three-toed woodpeckers inhabit mature and overmature stands containing bark beetles, disease, and heart rot (Goggans et al. 1988), and recent stand-replacing burns with abundant woodboring insects (Caton 1996, Hutto 1995). Trees with heart rot may be necessary for nest sites (Lester 1980) and the presence of trees affected by insects and diseases is important for a sufficient prey base (Goggans et al. 1988). Foraging has been described on dead trees averaging 9 inches DBH (Bull et al. 1986) and 15.5 inches DBH (Goggans et al. 1989). Although these tree sizes are not the larger-diameter classes typically found in late-seral old forests, studies have found that use of 9- to 15-inch diameter trees for nesting and foraging are not occurring in mid-seral stands, where this is a common size range, but rather in late-seral forest, where dead and dying trees in the 9- to 15-inch diameter range occur within a matrix of larger, densely spaced trees. Late-seral old forest would be expected to have higher incidences of heart rot, disease, and early stages of decay compared to mid-seral forests (Goggans et al. 1989, Bull et al. 1986).

Current Condition

On the Forest, vegetative communities that could provide American three-toed woodpecker source habitat conditions include PVGs 8, 9, 10, and 11 in the medium and large tree size classes and with moderate and high canopy cover class (Egnew et al. 2015)). PVGs 5 and 6 can also provide source habitat when outside of HRV in a high canopy cover class. Primary American three-toed woodpecker habitat is associated with higher elevation forests subject to mixed 1 and 2 and lethal fire regimes (PVGs 8, 9, 10, 11). Insect infestations and/or high intensity fire events are primary recycling agents in these PVGs, and these disturbances are associated with American three-toed woodpecker habitat and population irruptions.

Approximately 6,045 acres of modeled American three toed woodpecker source habitat is currently identified across all land ownerships in the Project area. NFS lands support about 5,699 acres of source habitat (Table 3-35, Figure 3-11). PVGs 5 and 6 provide 5,073 acres of source habitat on the NFS portion of the Project area in the large tree, high canopy cover condition. Given the current departed conditions of PVGs 5 and 6, far more potential habitat likely occurs than historically. Core American three toed woodpecker source habitat is composed of high elevation spruce/fir/lodgepole pine stands (Nutt et al. 2010). These stands make up about 1,000 acres of the American three toed woodpecker modeled habitat in the Project area.

Home range size for American three toed woodpecker is highly variable (Leonard 2001). Home range sizes for 3 radio-marked birds in central Oregon were 131, 363, and 751 acres (Goggans et al. 1988). An average of these documented home range sizes (415 acres) was used for this analysis. Using this average home range size, about 14 American three toed woodpecker home ranges may be currently supported on NFS lands in the Project area.

Table 3-35. Current condition of American three-toed woodpecker source habitat (acres), by Potential Vegetation Group (PVG), in the Project area on private and National Forest System (NFS) lands

Tree Size/Canopy Cover Class	PVG 5	PVG 6	PVG 8	PVG 9	PVG 10	PVG 11	Totals
Medium/Moderate NFS Lands	0	0	37	41	85	0	163
Large/Moderate NFS Lands	0	0	0	228	285	221	734
Large/High NFS Lands	421	4,381					4,802
Total NFS Lands	**421**	**4,381**	**37**	**269**	**369**	**221**	**5,699**
Medium/Moderate Private Lands	0	0	0	0	11	0	11
Large/Moderate Private Lands	0	0	0	64	0	0	64
Large/High Private Lands	18	253	0	0	0	0	271
Total Private Lands	**18**	**253**	**0**	**64**	**11**	**0**	**346**
Total All Ownership	**440**	**4,633**	**37**	**334**	**381**	**221**	**6,045**

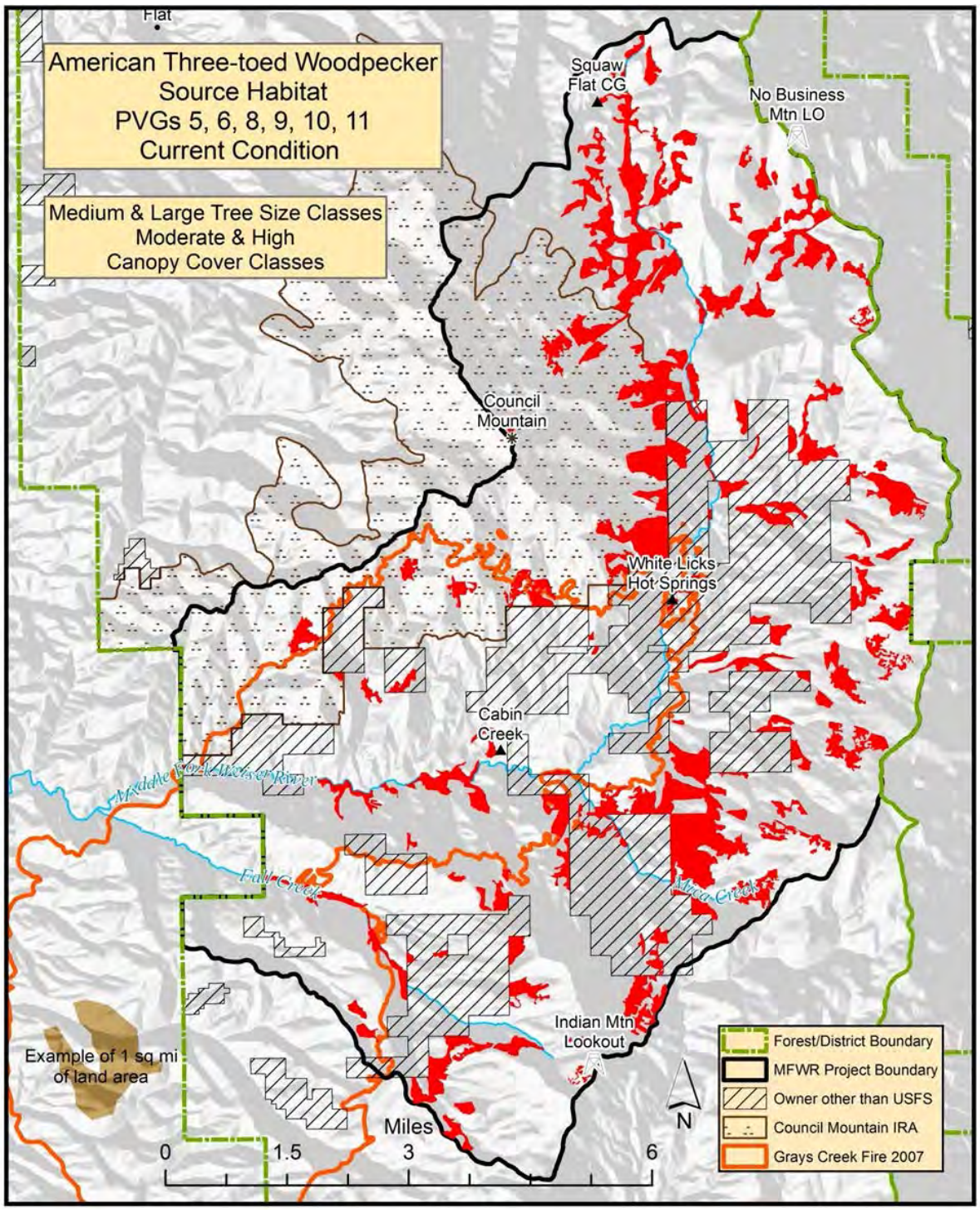


Figure 3-11. Current condition of American three-toed woodpecker source habitat for Potential Vegetation Groups (PVGs) 5, 6, 8, 9, 10, and 11 in the Project area

No observations of American three toed woodpecker have been documented within the Project area (Forest Service Wildlife Sightings Database 2012, IFWIS 2014). Several unconfirmed observations have been verbally reported for the Project drainage, but no written record is available for these reports. No monitoring surveys are conducted on the Forest specifically for American three toed woodpecker. This species has been included in the analysis because of its potential occurrence due to the 2007 Grays Creek Fire and the ongoing infestation of western spruce budworm in the Middle Fork Weiser River drainage. Monitoring survey transects are planned for the Project area, starting with mapping in fall 2015 and marking in the field in spring 2016. These new transects will be surveyed in conjunction with black-backed woodpeckers and Lewis' woodpeckers and will be located in stands of snags from the Grays Creek Fire and in stands of dead and dying trees from the ongoing localized insect infestation.

3.4.5.4.4. Black-backed Woodpecker

The black-backed woodpecker is a Forest SOSI and a proposed focal species for the Project area, because of its association with insect outbreaks. Large portions of the Project area are currently experiencing an outbreak of spruce budworm. This is the kind of natural habitat change that provides prime feeding in source habitat for the black-backed woodpecker. Source habitat is found in stands of medium and large tree size classes and moderate to high canopy cover classes.

Black-backed woodpecker KEFs are as a secondary consumer of terrestrial invertebrates. Population levels are often synchronous with insect outbreaks and targeted feeding can control or depress such outbreaks. The species is a primary cavity nester and, by the nature of its foraging and nesting behavior, it physically fragments standing and downed wood.

KECs for black-backed woodpeckers are associated with medium sized snags and live trees with heart rot. Fire can be beneficial to this species by stimulating bark beetle outbreaks, an important food source. Black-backed woodpecker populations typically peak in the first 3–5 years after a fire (Marcot et al. 1997, Nutt et al. 2010, Egnew et al. 2015).

The black-backed woodpecker is a year-round resident that occurs in various forest types throughout the Interior Columbia Basin (ICB), except in southern Idaho Ecological Reporting Units (ERUs) (Wisdom et al. 2000; Vol. 2, Fig. 27). Source habitats of the black-backed woodpecker include old forest stages of subalpine, montane, and lower montane forests and riparian woodlands (Wisdom et al. 2000; Vol. 3, Appendix 1, Table 1). Both managed and unmanaged young-forest stages of lodgepole pine also provide source habitat (Wisdom et al. 2000; vol. 3, Appendix 1, Table 1). Burned conifer forests (Saab and Dudley 1998, Hoffman 1997, Caton 1996, Hutto 1995, Marshall 1992) and other insect-infested forests (Goggans et al. 1988) provide key conditions necessary for both nesting and foraging. Habitat requirements for nesting include mature and old trees infested with disease or heart rot, or in early stages of decay (Goggans et al. 1988).

This species forages almost exclusively on the larvae of bark beetles (*Scolytidae*) and wood-boring beetles (*Cerambycidae* and *Buprestridae*) (Marshall 1992). Larvae are collected from trees by scaling or flaking bark (Bull et al. 1986) or by excavating logs and tree trunks. Populations of black-backed woodpeckers are irruptive in response to bark beetle outbreaks in recently fire-killed or over-mature forests (Lester 1980). Both live and dead trees are used for foraging. Bark beetle outbreaks decline 2–3 years post-fire, and use by black-backed woodpeckers declines accordingly (Bull 1980). In the northern Rockies, early post-fire conditions (1–5 years post-fire) were critical for supporting black-backed woodpecker

populations; abundance was correlated to the number of small snags remaining after fire (Hutto 1995).

Summer home ranges for single birds differ in size from 178–810 acres (72–328 ha), with an average of 250 acres noted, depending on the quality of habitat (Goggans et al. 1988). Goggans et al. (1988) estimated that a single black-backed woodpecker requires an area of 477 acres (193 ha), of which 59% should be mature to old forest conditions. The authors also suggested that a minimum MA for a nesting pair in lodgepole forests should be 956 acres (387 ha) of mature or old forest conditions.

Current Condition

Wisdom et al (2000) identified source habitat in the ICB for black-backed woodpeckers, using forest cover types and structural stages. That description was cross-walked to PVGs and structural stages (crown closures and tree size classes) to characterize and assess vegetation in the Forest Plan (USDA Forest Service 2003; vol. 3, appendix 6). Under historical disturbance conditions, PVGs 3, 4, 6, 7, 8, 9 and 10; structural stages medium or large (12–19 inches DBH or >20 inches DBH, respectively), and moderate crown closure (40%–69%) can provide source habitat for black-backed woodpeckers (Nutt et al. 2010). When outside the HRV, PVGs 2 and 5 in the medium or large tree size classes with high crown closure (>69%) conditions could also provide habitat. Irrespective of structural stage or crown closure, PVGs 2–10 that have burned within 5 years and are 75 acres or more in size also provide source habitat (Nutt et al. 2010).

Approximately 13,874 acres of modeled black-backed woodpecker source habitat currently occurs on NFS lands in the Project area (Table 3-36, Figure 3-12). PVGs 4, 6, and 7 in high canopy cover provide source habitat, when in a departed condition, and contribute bulk amount of modeled source habitat. Although the 2007 Grays Creek Fire provided additional source habitat to black-backed woodpecker, the quality of the burned area would likely decrease over time and may no longer contribute to black-backed woodpecker source habitat. Given the current departed conditions of PVG 6, far more potential habitat likely occurs than historically.

The average home range size for the black-backed woodpecker was documented as 178 to 810 acres, depending on the quality of habitat (Goggans et al. 1988). A study in California (Tingley et al. 2014) noted that in earlier literature, black-backed woodpeckers were documented as having relatively large home ranges, typically 250 acres (100 ha) (Goggans et al. 1989, Dudley and Saab 2007, Tremblay et al. 2009, Rota et al. 2014). The authors noted that home range size appears to vary with habitat type and time since fire (Dudley and Saab 2007, Rota et al. 2014). As populations of wood-boring beetle larvae decrease over time, it is believed that black-backed woodpeckers first expand their home ranges, before eventually abandoning burned areas altogether (Dudley and Saab 2007, Rota et al. 2014). Using an average home range size of about 250 acres (100 ha), the source habitat on NFS lands in the Project area could support approximately 55 black-backed woodpecker home ranges.

Four black-backed woodpecker observations have been documented within the Project area (Forest Service Wildlife Sightings Database 2012, IDFG IFWIS 2014). All of these observations were within the Grays Creek Fire boundary, in the Fall Creek and Cabin Creek areas. No monitoring surveys are conducted on the Forest specifically for black-backed woodpecker. There are plans to survey new monitoring transects for black-backed woodpecker, American three toed woodpecker, and Lewis' woodpeckers starting spring of 2016. This species has been included in the analysis because of its potential for occurrence in the area due to the 2007 Grays Creek Fire and the ongoing infestation of western spruce budworm in the Project drainage.

Table 3-36. Current condition of black-backed woodpecker source habitat (acres), by PVG, in the Project area on private and National Forest System (NFS) lands

Tree Size/Canopy Cover Class	PVG4	PVG 6	PVG 7	PVG 8	PVG 9	PVG 10	Totals
Medium/Moderate NFS Lands	0	1,433	273	37	41	85	1,869
Large/Moderate NFS Lands	13	3,414	2,248	0	228	285	6,187
Large/High NFS Lands		4,381	1,437	0	0	0	5,818
Total NFS Lands	**13**	**9,228**	**3,958**	**37**	**269**	**369**	**13,874**
Medium/Moderate Private Lands	0	2,021	164	0	0	11	2,196
Large/Moderate Private Lands	0	351	106	0	64	0	521
Large/High Private Lands	0	253	31	0	0	0	284
Total Private Lands	0	**2,625**	**301**	**0**	**64**	**11**	**3,001**
Total All Ownership	**13**	**11,852**	**4,258**	**37**	**334**	**381**	**16,875**

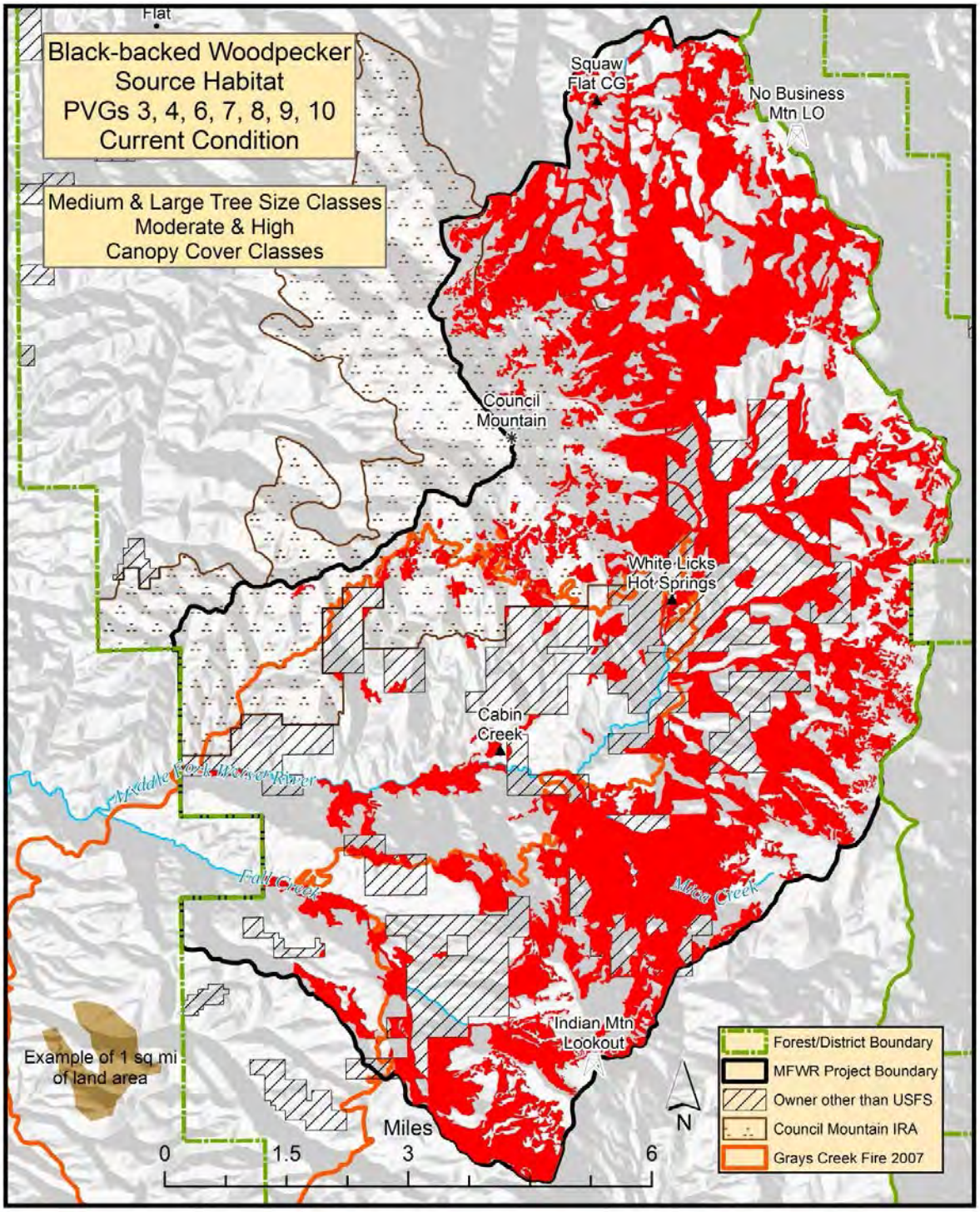


Figure 3-12. Current condition of black-backed woodpecker source habitat for Potential Vegetation Groups (PVGs) 3, 4, 6, 7, 8, 9, and 10 in the Project area

3.4.5.4.5. Boreal Owl

The boreal owl is a Region 4 Sensitive species and designated as a species of greatest conservation need in Idaho (per the Idaho Comprehensive Wildlife Conservation Strategy, IDFG 2005). The boreal owl KEFs are as secondary consumers of terrestrial vertebrates and secondary cavity nesters (Marcot 1997, O'Neil et al. 2001). KECs for the boreal owl include an association with forested habitats comprised of live trees and snags in the range of 10–14 inches DBH to >30 inches DBH, cavities, CWD, and edge habitat (Marcot 1997, O'Neil et al.2001).

Source habitat for boreal owls includes old forest and unmanaged, young-forest stages of subalpine and montane forests and riparian woodlands (Wisdom et al. 2000). Specific cover types and structural stages that provide source habitat are old forest, multi-story stages of Engelmann spruce/subalpine fir, Pacific silver fir/mountain hemlock, and aspen; and the old forest single- and multi-story stages of interior Douglas-fir, western larch, and lodgepole pine. Unmanaged young-forest stages of all these cover types and of grand fir/white fir also serve as source habitats if suitable large-diameter snags are present. Source habitats typically support abundant lichens and fungal sporocarps (fruiting body), which provide important foods for southern red-backed voles, the principal prey of boreal owls (Hayward and Verner 1994). These lichens and fungi are associated with CWD. Boreal owls are secondary cavity nesters and readily use artificial nest boxes and structures. Habitat for this species is generally within the mixed2 and lethal fire regimes, where disturbance intervals may be long (70–300 and 100–400 years, respectively).

Current Condition

On the Forest, vegetative communities that could provide source habitat conditions include PVGs 3, 4, 6, 7, 8, 9, and 11 above 5,000 feet (Egnew et al. 2015) (Table 3-37, Figure 3-13). Like many species in Family 2, the boreal owl can take advantage of departed vegetative conditions. PVG 6 provides boreal owl habitat when it occurs in the cooler habitat types or is mixed with higher elevation PVGs. Boreal owls utilize both the medium and large tree size classes and moderate- and high- canopy cover classes. Source habitat for the boreal owl is found throughout the higher elevations of the Project area; most of it within PVGs 6 and 7.

Past timber harvest has occurred in some source habitat for boreal owls, mainly in PVG 6. This PVG is not always associated with boreal owls. PVG 6 was included in the source habitat model for the Forest based on studies of boreal owls conducted on the Forest in the 1980s (Hayward et al. 1993). In the past, we acknowledged that including PVG 6 may overestimate source habitat for this species, but recent surveys on the Forest have found boreal owl in PVG 5 and 6 at elevations below 5,000 feet.

Home range size of boreal owls is variable in the literature; a study in central Idaho reported home ranges of 3,585 acres in winter and 2,921 acres in summer (Hayward et al. 1993). Given an estimated 14,068 acres of source habitat on FS lands and an average home range of 3,253 acres (based on the central Idaho ranges), the Project area could provide for 4 boreal owl home ranges.

While no observations of boreal owls have been documented within the Project area, (Forest Service Wildlife Sightings Database 2012, IFWIS 2014), numerous occurrences of boreal owls have been documented on the east side of the Forest (Hayward et al. 1993). The lack of boreal owl observations does not imply low population numbers, but could be caused by the small amount of sampling conducted for the species on the west side of the Forest. Two

monitoring survey transects were established in conjunction with great gray owl surveys in the Project area in 2015. No vocal responses were detected during these broadcast vocal surveys; however, several boreal owl vocal responses were recorded on great gray owl /boreal owl transects in other locations on the Council Ranger District, at elevations below 5,000 feet, and in drier habitats. Four additional great gray owl /boreal owl transects were established in fall 2015, for future spring sampling (April through June). Transects specifically for boreal owls will also be established, for winter/spring sampling (February through April). If observations or vocal responses occur during future surveys, nest searches will be initiated to identify nest stands for protection from adverse structural alteration from vegetation treatments.

Table 3-37. Current condition of boreal owl source habitat (acres) above 5,000 feet elevation, by PVG, in the Project area on private and National Forest System (NFS) lands

Tree Size/Canopy Cover Class	PVG 3	PVG 4	PVG 6	PVG 7	PVG 8	PVG 9	PVG 11	Totals
Medium/Moderate NFS Lands	0	0	1,433	273	37	41	0	1,784
Large/Moderate NFS Lands	0	13	3,414	2,248	0	228	221	6,124
Large/High NFS Lands	0	0	4,381	1,437	13	282	47	6,160
Total NFS Lands	**0**	**13**	**9,228**	**3,958**	**50**	**552**	**268**	**14,068**
Medium/Moderate Private Lands	0	0	2,021	164	0	0	0	2,185
Large/Moderate Private Lands	0	0	351	106	0	64	0	521
Large/High Private Lands	0	0	253	31	0	0	0	284
Total Private Lands	**0**	**0**	**2,625**	**301**	**0**	**64**	**0**	**2,990**
Total All Ownership	**0**	**13**	**11,852**	**4,258**	**50**	**616**	**268**	**17,057**

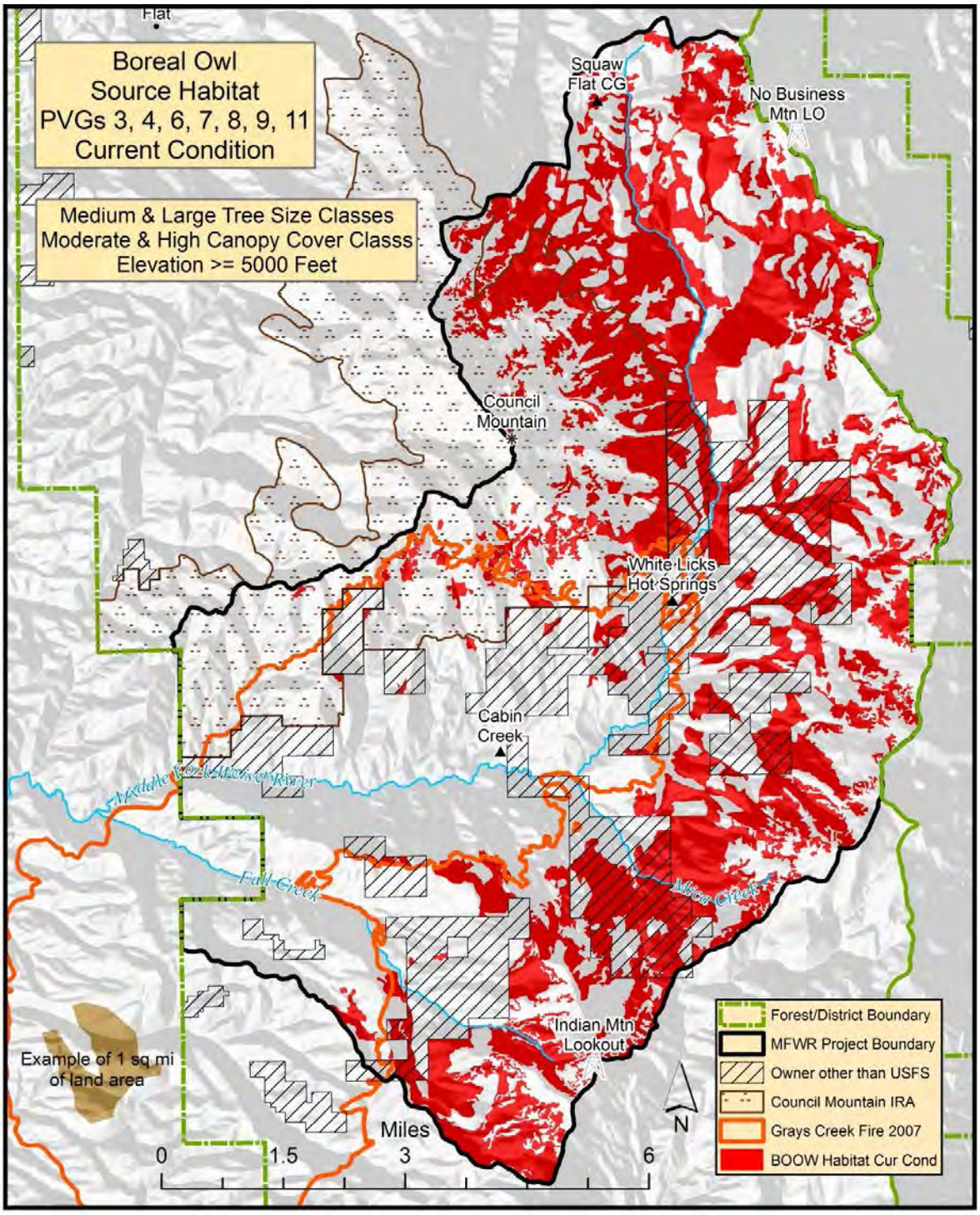


Figure 3-13. Current condition of boreal owl source habitat for Potential Vegetation Groups (PVGs) 3, 4, 6, 7, 8, 9, and 11 in the Project area

3.4.5.4.6. Fisher

The fisher is a Region 4 Sensitive species and a State of Idaho species of greatest conservation concern. In January 2016, the FWS began a species review for the fisher, to provide background information that would help determine if ESA listing of the species is warranted. Fisher KEFs are as a secondary consumer of terrestrial vertebrates and a consumer of eggs and carrion (Marcot 1997; O'Neil et al. 2001). Fishers help disperse seeds and fruits and control vertebrate populations through predation or displacement. Fishers can be prey for other carnivores. KECs of the fisher include an association with forested habitats that include snags and live trees in large (20–29 inches DBH) and very large (≥30 inches DBH) size classes; logs in riparian and upland habitats; and legacy trees (Marcot 1997; O'Neil et al. 2001). Fishers are secondary cavity users and use large live tree branches, mistletoe brooms, and dead parts of live trees for den sites. A shrub layer is important for snow interception (O'Neil et al. 2001).

The diverse diet of the fisher probably requires a mix of forest habitat types to provide optimal foraging conditions (Arthur et al. 1989). In the Rocky Mountains, fishers show a preference for late-seral coniferous forests (Jones and Garton 1994). Late-seral forests are used preferentially during summer, while early or late-seral forests may be used in winter (Jones 1991). Deep snow accumulation appears to limit fisher movements and distribution (Arthur et al. 1989, Aubry and Houston 1992, Heinemeyer 1993). Fishers tend to select forests with relatively high canopy cover, although tree cover may be discontinuous (Aubry and Houston 1992, Buskirk and Powell 1994). Riparian corridors provide important travel routes, and the structural complexity of riparian habitat supports relatively abundant and diverse populations of prey (small mammals and birds).

The fisher may benefit from management that conserves forested riparian habitats. High canopy cover class conditions, snags, and logs are important habitat features for the fisher. These habitat characteristics have been retained along streams Forest-wide, to meet habitat needs for aquatic species, and maintain riparian functions and processes. The fisher benefits from these riparian conservation measures.

Male and female fisher home ranges vary widely, depending on local habitat conditions and seasonal movement associated with breeding (Ruggiero et al. 1994). Males have larger home ranges than females, and their ranges overlap to some degree. In Idaho, Jones (1991) estimated male fisher home ranges at approximately 20,000 acres; female home ranges were estimated at approximately 10,000 acres. The average dispersal distance for central Idaho fishers was estimated by Jones (1991) at 24 miles. Similar or slightly larger home ranges and dispersal distances could be expected on the Forest, because Forest habitat may provide less connectivity than habitat in the Jones (1991) study area.

Current Condition

Source habitat for the fisher is found throughout most of the Forest with the possible exception of the southwestern portion (including the Project area), which may be outside its range (Egnew et al. 2015). Vegetative communities that could provide source habitat conditions include PVGs 3, 6, 8, 9, and 10, in medium and large tree size classes and moderate or high canopy cover classes. These PVGs have the capability to develop mesic, old forest, multilayer conditions with moderate and high canopy closures that would provide for the structural diversity characteristic of fisher source habitat.

Currently, approximately 10,489 acres of source habitat for fishers occur on NFS lands in the Project area (Table 3-38, Figure 3-14). Using the male home range size of 20,000 acres, NFS lands in the Project area could support only one-half of a home range for a male fisher.

Past timber harvest has occurred in the PVGs with source habitat capacity for fisher. Large trees and snags were often selectively removed during harvest treatments, effectively reducing the recruitment potential for snags and, eventually CWD, used by fisher for denning and resting structures. Roads originally built for timber harvest continue to contribute to loss of snags by providing access for cutting firewood. Because special habitat features, such as snags, cannot be factored into the fisher habitat model, the modeled numbers likely overestimate the amount of source habitat available.

No fishers have been documented within the Project area (Forest Service Wildlife Sightings Database 2014, IFWIS 2014). Trail cameras have been deployed in the Project area since 2008 with no detections of fishers. In August 2015, two fisher hair snag devices were deployed at separate trail camera stations in dense canopy stands on the west slope of West Mountain, with the hope of confirming fisher presence by DNA and/or photograph. No fisher detections were noted from the hair snag devices or the cameras. The hair snag devices were removed in October 2015; however, the cameras were left in place for the winter, with retrieval planned for May 2016.

Table 3-38. Current condition of fisher source habitat (acres), by Potential Vegetation Group (PVG), in the Project area on private and National Forest System (NFS) lands

Tree Size/Canopy Cover Class	PVG 3	PVG 6	PVG 8	PVG 9	PVG 10	Total
Medium/Moderate NFS Lands	0	1,433	37	41	85	1,596
Large/Moderate NFS Lands	0	3,414	0	228	285	3,927
Large/High NFS Lands	0	4,381	13	282	291	4,967
Total NFS Lands	**0**	**9,228**	**50**	**552**	**661**	**10,489**
Medium/Moderate Private Lands	0	2,021	0	0	11	2,032
Large/Moderate Private Lands	0	351	0	64	0	415
Large/High Private Lands	0	253	0	0	0	253
Total Private Lands	**0**	**2,625**	**0**	**64**	**11**	**2,700**
Total All Ownership	**0**	**11,852**	**50**	**616**	**672**	**13,190**

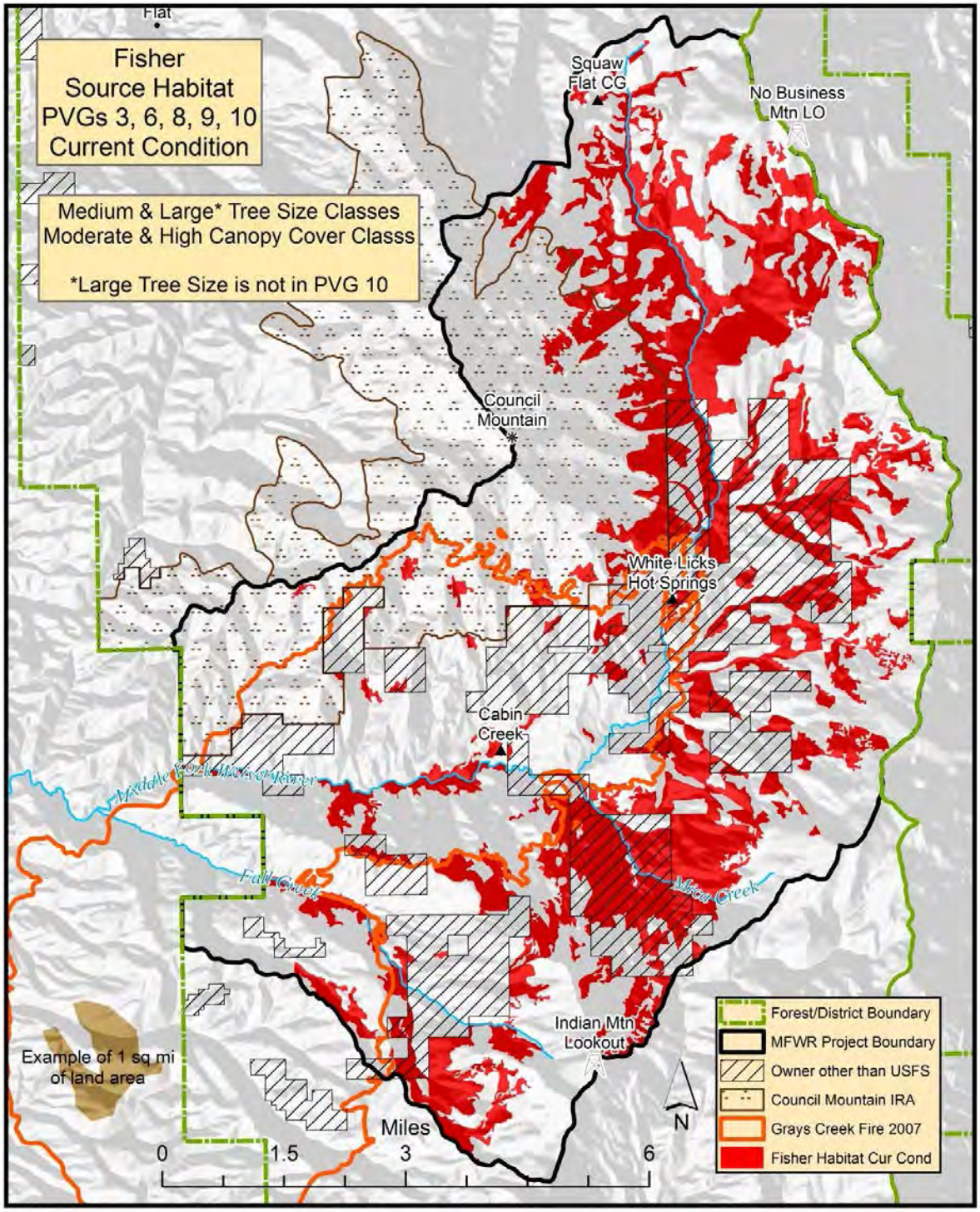


Figure 3-14. Current condition of fisher source habitat for Potential Vegetation Groups (PVGs) 3, 6, 8, 9, and 10 in the Project area

3.4.5.4.7. Great Gray Owl

The great gray owl is a Region 4 Sensitive species. The Forest is on the southern periphery of the North American geographical distribution for this species. KEFs for the great gray owl include its role as a secondary consumer of terrestrial vertebrates (Marcot 1997; O'Neil et al. 2001). The species depresses or controls prey species populations and uses aerial structures built by other species for nesting (Marcot 1997; O'Neil et al. 2001). KECs for the great gray owl include an association with forested habitats close to meadows, marshes, bogs, open forests, and herbaceous habitats (Duncan and Hayward 1994). Key forested features include remnant, very large- to medium-sized trees and snags (15–30 inches DBH) (Marcot 1997; O'Neil et al. 2001; Wisdom et al. 2000). Great gray owls rely on existing stick nests built by other large birds; natural platforms formed by dwarf mistletoe brooms; broken-topped snags; stumps; and supplemental boxes for nesting (Duncan and Hayward 1994; Marcot 1997; O'Neil et al. 2001). Live, remnant, legacy trees and hollow, living trees are KECs for this species. Wildfires and prescribed burns help maintain meadows and open areas used by this species.

Great gray owl source habitat includes old forests (multi- and single-story); unharvested, young, multistory forests; and stand-initiation stages of subalpine and montane forests (Wisdom et al. 2000). The habitat components considered most important for great gray owl are suitable nesting sites in mature or older forest, and suitable foraging areas in non-stocked and seedling forests, meadows, and open riparian habitats adjacent to meadows. Large diameter trees or snags are special habitat features for the great gray owl.

Great gray owls hunt from perches and capture their prey (usually small rodents) on the ground (Groves et al. 1997). They do not build their own nest; instead, they use nests built by other species, debris platforms, or broken-topped trees and snags (Duncan and Hayward 1994 and Hayward and Verner 1994; Bull et al. 1997; Marcot 1997; O'Neil et al. 2001). Nests are typically in mature stands, with large diameter, decadent trees and snags present, often within 200 feet of a meadow, or forest opening.

Juvenile great gray owls are flightless and depend on leaning and deformed trees to navigate from the forest floor to tree canopies (Bull et al. 1988; Franklin 1988). Dense cover near nests is important for fledgling protection from predators. After leaving the nest, fledglings generally stay within forested stands with >60% canopy cover (Bull et al. 1988).

Current Conditions

Vegetative communities capable of providing great gray owl source habitat conditions include PVGs 3, 6, 7, 8, 9, and 11 (Table 3-39, Figure 3-15). Many of these PVGs historically had mixed2 and lethal fire regimes, which can create the juxtaposition of open and forested habitats used by the owls. The model likely greatly overestimates the amount of source habitat, because it does not account for forest stands proximate to open meadows or other foraging habitats.

For example, although the model estimates that 15,819 acres of NFS lands in the Project area exhibit source habitat conditions, most of these acres are likely unsuitable because they do not occur in juxtaposition to meadows or other foraging habitats. Risk factors for this species include loss of potential nest sites, due to removal of large trees, diseased trees, snags, and leaning trees (used by juveniles); fire exclusion; loss of residual trees, or snags, in foraging habitat; high road densities; and rodent poisoning (not currently occurring on the West Zone of the Forest). Changes in patch dynamics also may have affected the size and juxtaposition

of stands with large diameter trees and high crown closures, which great gray owls use for nest sites, relative to stands with variable seral stages and crown closures, which they use for foraging.

Table 3-39. Current condition of great gray owl source habitat (acres), by Potential Vegetation Group (PVG), in the Project area on private and National Forest System (NFS) lands

Tree Size/Canopy Cover Class	PVG 6	PVG 7	PVG 8	PVG 9	PVG 11	Totals
Medium/Low NFS Lands	0	897	6	139	72	1,114
Medium/Moderate NFS Lands	1,433	273	37	41		1,784
Large/Low NFS Lands	0	501	0	70	79	650
Large/Moderate NFS Lands	3,414	2,248	0	228	221	6,111
Large/High NFS Lands	4,381	1,437	13	282	47	6,160
Total NFS Lands	**9,228**	**5,356**	**56**	**760**	**419**	**15,819**
Medium/Low Private Lands	0	84	0	0	0	84
Medium/Moderate Private Lands	2,021	164	0	0	0	2,185
Large/Low Private Lands	0	0	0	0	0	0
Large/Moderate Private Lands	351	106	0	64	0	521
Large/High Private Lands	253	31	0	0	0	284
Total Private Lands	**2,625**	**385**		**64**		**3,074**
Total All Ownership	**11,852**	**5,741**	**56**	**825**	**419**	**18,893**

The average home range size reported for great gray owls ranged from 1,112–16,630 acres for first-year dispersing birds and 1,483–5,436 acres for adults (Bull and Henjum 1990). Using the larger adult home range size in our evaluation, source habitat on NFS lands in the Project area could support approximately 3 great gray owl home ranges.

Six great gray owl observations have been recorded in the Project area (Forest Service Wildlife Sightings Database 2012 [available in the project record], IFWIS 2014). However, spring-broadcast, vocal surveys for great gray owl in 2013 and 2014 did not document the species in the Project area. Great gray owls were not detected on additional great gray owl/boreal owl transects established in 2015. Additionally, no great gray owls were detected during early summer walk-though nest searches conducted in areas of historical great gray owl observations and in areas near meadows and large forest openings.

Four new great gray owl/boreal owl transects were established in the Project area in fall 2015. All of these transects will be sampled in spring during the Project and for an additional 5 years after completion of the Project. Early summer walk-through surveys will also be conducted during this time frame. If great gray owls are detected during transect or walk-through surveys, the area, per Project design features, will be evaluated for retaining a forested buffer around meadows; protecting potential nest sites; and restricting activities in the area if an active nest is found.

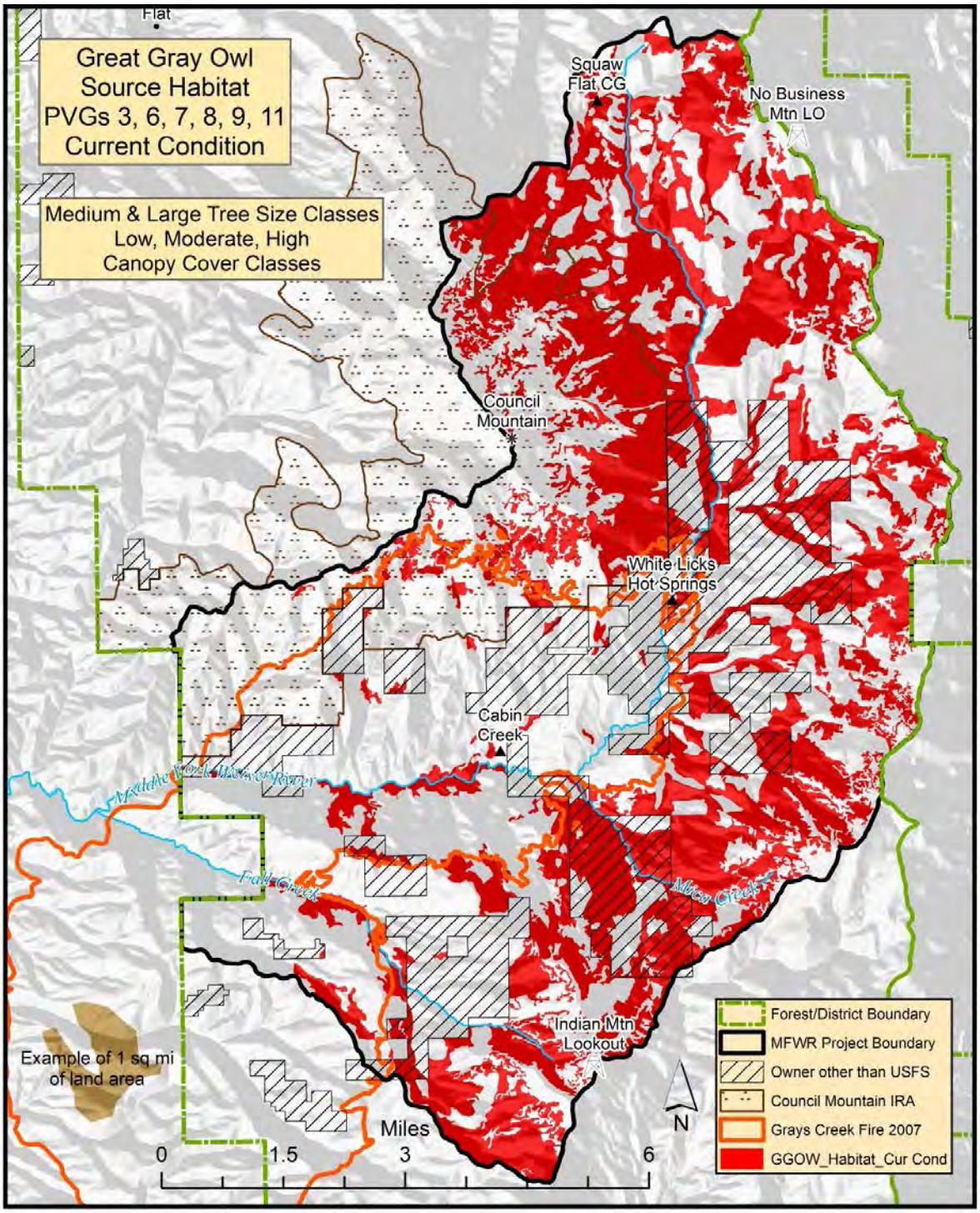


Figure 3-15. Current condition of great gray owl source habitat for Potential Vegetation Groups (PVGs) 3, 6, 7, 8, 9, and 11 in the Project area

3.4.5.4.8. Northern Goshawk

The northern goshawk is a Region 4 Sensitive species. Northern goshawk management follows the Southwest Guidelines (Reynolds et al. 1992), as directed by the Forest Plan. KEFs include the goshawk's role as a secondary and tertiary consumer of terrestrial herbivores and predators (Marcot 1997; O'Neil et al. 2001). According to Kennedy (2003), northern goshawks are prey generalists. The species affects terrestrial vertebrate populations through predation and/or displacement, and builds nests often used by other species (Marcot 1997; O'Neil et al. 2001). Northern goshawks typically move to lower elevation valleys during winter, because prey species migrate out of the upper forests for fall, winter, and very early spring. For this reason, northern goshawk management is centered on summer habitat for the species. KECs for northern goshawk summer habitat include an association with forested habitats, with live trees and large snags; mistletoe brooms; legacy trees; CWD; and edge habitat (Marcot 1997; O'Neil et al. 2001). Deformities (i.e., multiple trunks and mistletoe [*Arceuthobium* spp.]), especially in smaller diameter trees, are also used as nest site substrates. A shrub layer is important to support northern goshawk prey habitat (O'Neil et al. 2001).

Northern goshawks use forests of different ages, structural conditions, and successional stages. Riparian zones and mosaics of forested and open areas are equally important, including shrub and grassland habitats. Goshawks prefer transitional zones for hunting. Home range size for northern goshawks is estimated at more than 5,900 acres and includes three components: nesting, foraging, and PFAs (Reynolds et al. 1992, Youtz et al. 2008).

Risk factors for this species include nest tree removal and/or habitat modification from timber management activities; alteration of prey base habitats through vegetation management; stand-replacing wildfires, as a result of fire-excluded stands; and/or disturbance from human activities during the northern goshawk breeding season (Egnew et al. 2015). The northern goshawk is believed to respond negatively to openings, or linear edges created by roads, and is known to be sensitive to disturbance, especially during the breeding season and particularly when the female is incubating eggs.

Current Condition

Modeled suitable summer habitat for the northern goshawk includes PVGs 3, 4, 6, 7, 8, and 9, within the HRV, and PVGs 2, 3, 4, 5, 6, and 7 when outside of the HRV (Table 3-40, Figure 3-16).PVGs 2 and 5 have the potential to develop medium and large tree sizes in a high canopy class; however, these conditions would not occur under historical disturbance regimes (Hauffler 1994, Hauffler et al. 1996). The literature shows that northern goshawks use open canopy stands (Reynolds et al. 1982, Hargis et al. 1994), likely for foraging. Use of mature forest stands with a high canopy closure (≥70%) is more commonly described (Hayward and Escaño 1989, Patla 1991, Hayward 1997), most likely due to nesting and rearing requirements. PVGs 2 and 5 have a limited capability to develop suitable nesting habitat for northern goshawks, except when outside historical disturbance regimes. For modeling northern goshawk nesting and foraging habitat, the literature supports selecting the moderate (12.0–19.0 inch DBH) and large tree size classes (≥20 inch DBH) with moderate and high canopy closures (Hayward and Escaño 1989, Hayward 1997, Patla 1991).

While all of the PVGs that contain source habitat for goshawks occur in the Project area, PVGs 3, 4, and 8 comprise a negligible area. The PVG 3 area is so miniscule, it was removed from the analysis.

Table 3-40. Current condition of northern goshawk (summer) source habitat (acres) in the Project area on private and National Forest System (NFS) lands

Tree Size/Canopy Cover Class	PVG 2	PVG 4	PVG 5	PVG 6	PVG 7	PVG 8	PVG 9	Totals
Medium/Moderate NFS Lands	0	0	0	1,433	273	37	41	1,784
Large/Moderate NFS Lands	0	13	0	3,414	2,248	0	228	5,903
Large/High NFS Lands	212	0	421	4,381	1,437	13	282	6,746
Total NFS Lands	**212**	**13**	**421**	**9,228**	**3,958**	**50**	**552**	**14,433**
Medium/Moderate Private Lands	0	0	0	2,021	164	0	0	2,185
Large/Moderate Private Lands	0	0	0	351	106	0	64	521
Large/High Private Lands	29	0	18	253	31	0	0	331
Total Private Lands	**29**	**0**	**18**	**2,625**	**301**	**0**	**64**	**3,037**
Total All Ownership	**241**	**13**	**440**	**11,852**	**4,258**	**50**	**616**	**17,469**

The Forest Plan provides direction for the management of northern goshawk nesting and PFAs (WIST05 and WIGU07). Since northern goshawks are habitat generalists throughout much of their range, this direction covers the more sensitive areas of their source habitat. Maintenance of the recommended canopy closure in PFAs is especially important for conservation of goshawk habitat. Northern goshawks also can use moderate and large tree size classes in medium and high canopy closure classes. This flexibility provides a cushion against loss, or declines, in old forest habitat. Large-diameter snags are an important habitat component for some northern goshawk prey species and are future sources of large-diameter logs, another important habitat component for other prey species.

Management recommendations for the northern goshawk in the Southwestern United States (Reynolds et al. 1992, Youtz et al. 2008), referred to as the Southwest Guidelines, identify three major components of the northern goshawk home range: six nest areas, measuring at least 30 acres each and totaling about 180 acres; linked to a PFA of approximately 420 acres (for a total of 600 acres associated with the PFA and nest stands); and a territory area of approximately 5,400 acres. Goshawk home range sizes have been documented from 1,409–8,649 acres (Squires and Reynolds 1997), with a mean of roughly 5,400 acres. Although northern goshawk nest stands should be at least 30 acres, nest stand size and shape will depend on local forest conditions and structural components, which, in turn, dictate the size and shape of the PFA. Nine potential northern goshawk PFAs have been identified for the known active nests in the Project area. Using the average home range size of 5,400 acres, the 14,433acres of northern goshawk source habitat on FS lands within the Project area could support approximately 3 northern goshawk home ranges.

Theoretically, each PFA should be associated with a separate northern goshawk territory; however, it is unlikely that all nine PFAs, which were created administratively on a map, actually associate to only one territory for each PFA. The construction of PFAs on a map does not mean that a northern goshawk pair uses that administrative PFA in perpetuity; it is simply a method to provide appropriate nesting and post-fledgling habitat throughout a Project area (Figure 3-17).

Goshawk observations and active nests have been recorded throughout the Project area for many years. However, in the past 4 years, none of the known nests have been active and no northern goshawks have been detected in the constructed PFAs. Northern goshawk surveys have been conducted each spring and summer since 2006 for nest activity, presence of adults and/or young in the PFA, and presence of adults and/or young in the drainage. Surveys will continue each year to determine current active nests and PFAs in the Project area. Observations of 17 northern goshawks were recorded for the Middle Fork Weiser River drainage in the past 8 years (Forest Service Wildlife Sightings Database 2014; J. Almack field notes, Project record).

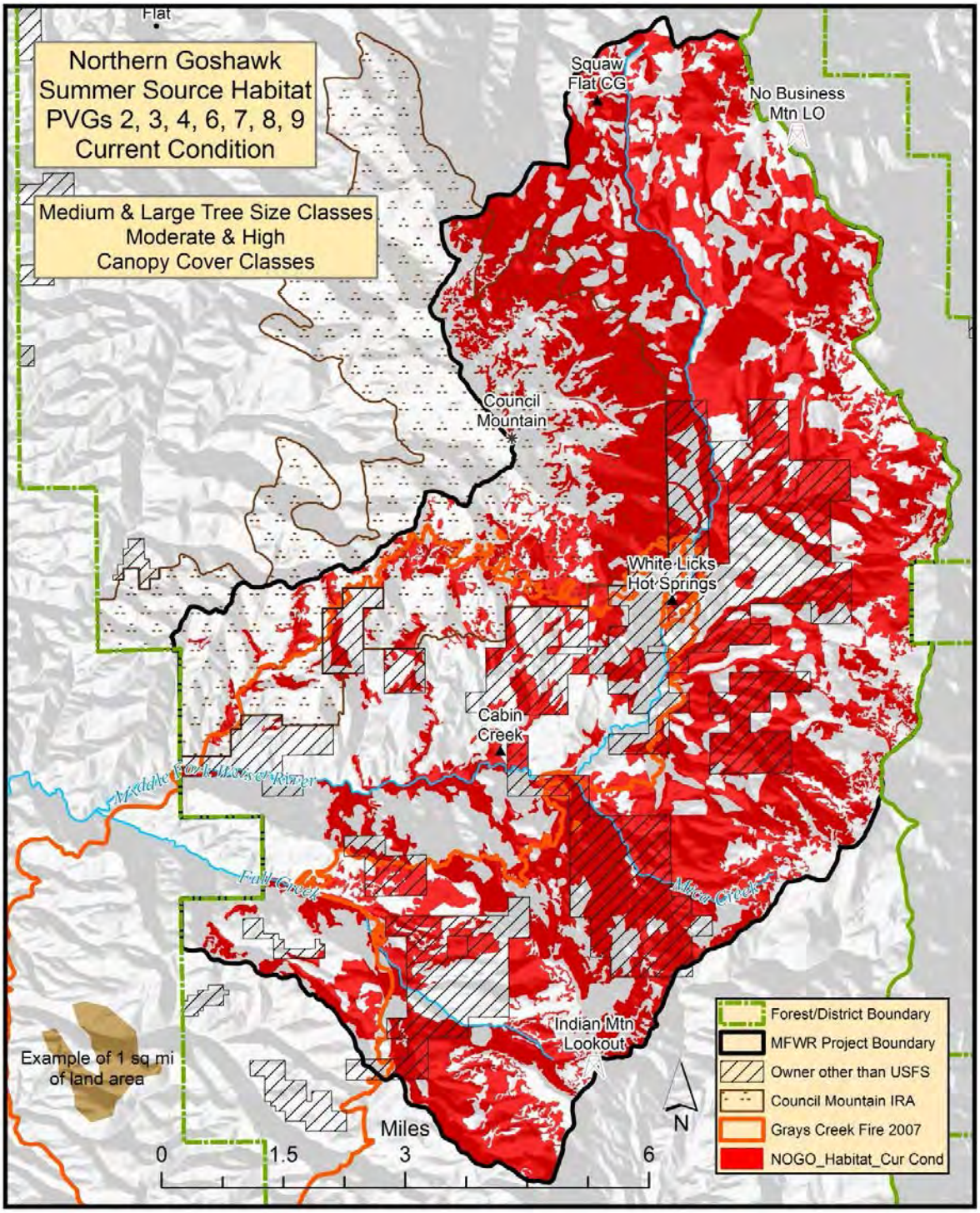


Figure 3-16. Current condition of northern goshawk (summer) source habitat for PVGs 2, 3, 4, 6, 7, 8, and 9, including post-fledgling areas (PFAs), in the Project area

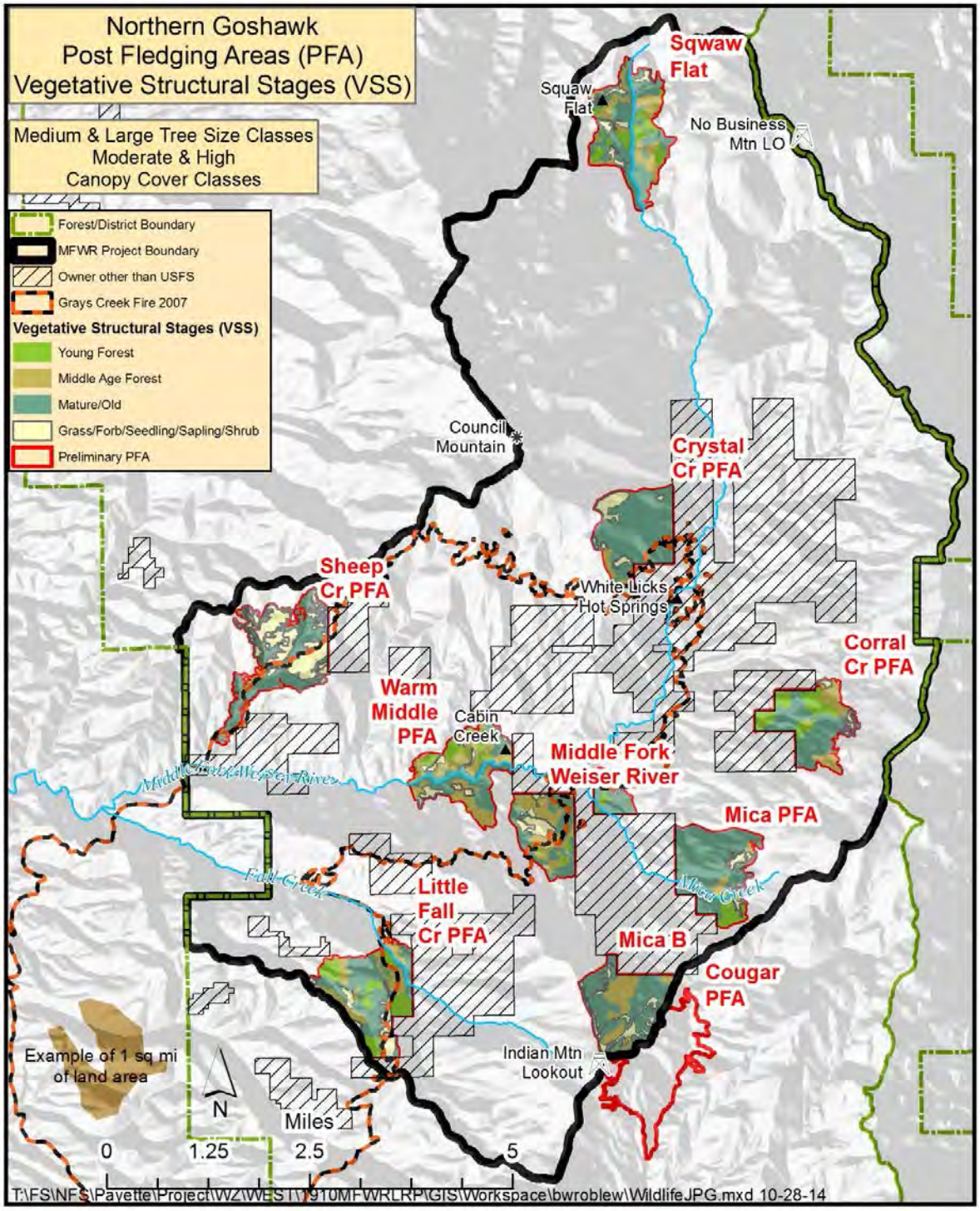


Figure 3-17. Potential northern goshawk post-fledgling areas (PFAs) in the Project area

3.4.5.5. Habitat Family 3—Forest Mosaic

Source habitats for Habitat Family 3 include the full spectrum of forest communities and structural stages. Wildlife species in Family 3 tend to be habitat generalists, but some (i.e., lynx and wolverine) have low or isolated populations.

Family 3 source habitats have exhibited some decline in the large tree size class, but overall, no major changes were noted from historical to current times. Modeling indicates that the amount of habitat available to Family 3 wildlife species is currently within the HRV, largely because species in this family tend to be habitat generalists (Egnew et al. 2015). While source habitat quantity does not appear to be a concern, source habitat quality changes in the source environment may be a limiting factor for this family. The source environment is composed of vegetative and non-vegetative factors (e.g., human-caused disturbance) that can influence relative abundance and distribution of the wildlife species throughout available source habitats (Nutt et al. 2010, Egnew et al. 2015).

3.4.5.5.1. Canada Lynx

The Canada lynx is listed as a threatened species under the ESA, as amended. Several documents guide lynx management on federal lands.

The 2003 Forest Plan adopted the 2000 Canada Lynx Conservation Assessment and Strategy (2000 LCAS, Ruediger et al. 2000), by adopting conservation measures dependent on risk factors for lynx as Forest Plan Standards, Guidelines, Goals, or Objectives. The 2000 LCAS conservation measures identified the delineation of Lynx Analysis Units (LAUs) and additional measures, such as TEST15, for those LAUs (The roughly 6,000-acre size of, and habitat classes found within, LAUs mimics an adult female lynx home range). The 2000 LCAS identified science limitations for lynx and lynx habitat. Since then, many additional studies have occurred, advancing what is known about lynx and lynx habitat. Revision of the 2000 LCAS was initiated in September 2010. The 2013 LCAS (Interagency Lynx Biology Team 2013) is a full revision of the 2000 LCAS, incorporating all prior amendments and clarifications, substantial new scientific information that has emerged since 2000, including related parts of the Lynx Recovery Outline, as well as drawing on experience gained in implementing the 2000 LCAS (Interagency Lynx Biology Team 2013). The 2013 LCAS made several major changes to the 2000 LCAS, including stratifying lynx habitat into core areas and secondary/peripheral areas, along with conservation measures for those habitat areas.

In the 2000 LCAS (Ruediger et al. 2000); management of lynx is addressed within LAUs. Lynx analysis units are defined as units that approximate an area of source habitat sufficient to provide a home range for an adult female lynx. LAUs (Figure 3-18) and a lynx source habitat model (Figure 3-19) were identified through consultation with the U.S. FWS and are used to evaluate lynx habitat and the effects on lynx of agency activities. The modeled lynx source habitat (Figure 3-19) was produced using habitat classes used by lynx and removing mapped habitat polygons less than 10 acres in size (Egnew et al. 2015). The model also accounts for habitat polygon distribution, selecting against polygons that are more than 300 feet distant from another lynx habitat polygon.

The lynx is identified as a focal species for Habitat Family 3 on the Forest. The KEF for lynx is as a primary predator of herbivorous vertebrates (Marcot 1997, O'Neil et al. 2001). Key components of lynx habitat include denning habitat, foraging habitat, and travel corridors, provided by a mosaic of forest structures (Ruggiero et al. 1994). In winter, lynx are associated with persistent, deep snow conditions (O'Neil et al. 2001). Roads and/or over-the-snow trails increase the potential for human interactions, disturbance, and vulnerability to trapping (Wisdom et al. 2000, O'Neil et al. 2001).

Lynx use late-seral forests for denning, rearing their young, and hunting alternative sources of prey (Ruggiero et al. 1999). Small patches of old forest with down wood provide denning

habitat (Wisdom et al. 2000). The common component of denning habitat is large amounts of either logs or root wads, which provide escape and thermal cover for kittens. These late-successional forest stands also may provide refuge from inclement winter weather and summer drought.

Lynx foraging habitat supports its primary prey, the snowshoe hare (*Lepus americanus*) and/or important alternate prey, particularly red squirrels (*Tamiasciurus hudsonicus*), but also mice and grouse (especially during summer) (Ruggiero et al. 1994). Lynx primarily forage in early seral forests and in some mid-seral forests that support high numbers of prey. The best quality snowshoe hare habitats support a high density of young trees or shrubs (4,500 stems or branches per acre), especially with branches that protrude above the snow. These conditions may occur in early successional stands, following some type of disturbance, or in older forests, with a substantial understory of shrubs and young conifers. Red squirrel densities tend to be highest in mature cone-bearing forests with high quantities of logs (Ruediger et al. 2000).

Lynx are known to move long distances, but open areas are avoided by lynx and will disrupt their movements (Ruggiero et al. 1994). In general, suitable travel cover consists of coniferous or deciduous vegetation, 2 feet taller than the average snowfall, with a closed canopy forest adjacent to foraging habitat. Travel cover allows lynx movement within their home ranges and provides access to denning sites and foraging habitats.

In Idaho, lynx typically use montane and subalpine coniferous forests above 4,000 feet; primary habitat includes lodgepole pine, subalpine fir, and Engelmann spruce forests, and cool, moist Douglas-fir forests, interspersed with subalpine fir forests (Ruediger et al. 2000). Most coniferous forest structural stages provide lynx source habitats with the exception of old forest, single-storied stands. Riparian woodlands and shrubfields also are source habitats.

Based on the 2000 LCAS, the Forest Plan direction states:

> TEST15—Unless a broad-scale assessment has been completed that substantiates different historical levels of unsuitable habitat, limit disturbance within each LAU as follows: If more than 30% of lynx habitat within a LAU is currently in unsuitable condition, no additional habitat may be changed to unsuitable habitat as a result of vegetative management projects. Fire use, or fire hazard reduction and associated vegetation management activities within the wildland urban interface watersheds, that develop or maintain fuel profiles needed to reduce the risk of wildfire threats to the wildland urban interface areas, are NOT bound by this standard.

Current Condition

Vegetative communities capable of providing source habitat conditions include PVGs 3, 7, 8, 9, 10, and 11 (Egnew et al. 2015) (Figure 3-19). Source habitat for lynx was assessed within the Middle Fork Weiser LAU. The Project area contains 7,427 acres of lynx habitat (referred to as “source habitat capacity”); currently, approximately 6,812 acres (92%) is in a suitable condition (“source habitat”).

No lynx observations have been documented within the Project area. Incidental track surveys were conducted by snowmobile, while conducting trail camera surveys during the winters of 2006 through 2013, along the mountain crest running north–south on the east boundary of the Project area; no lynx tracks or photos were identified. Although the Project area contains the MFWR LAU, and abuts three other LAUs (established with the Forest Plans for the Payette and Boise national Forests), this portion of the Forest is not considered part of a core lynx

population, due to the lack of observations, lack of documented reproduction, and habitat that is isolated from core lynx populations. Lynx are more likely to occur in the more remote areas of the northwest and northeast parts of the Forest, but even in those areas, no recent observations have been reported. This viewpoint is supported by the revised, third edition of the LCAS (2013 LCAS, Interagency Lynx Biology Team 2013), which identifies the Project area as secondary habitat for lynx. The 2013 LCAS suggests habitat should be managed for a mosaic of habitat classes that would provide for lynx foraging, traveling, and denning year round. The secondary habitat would support any lynx that may use the area while moving from one core area to another.

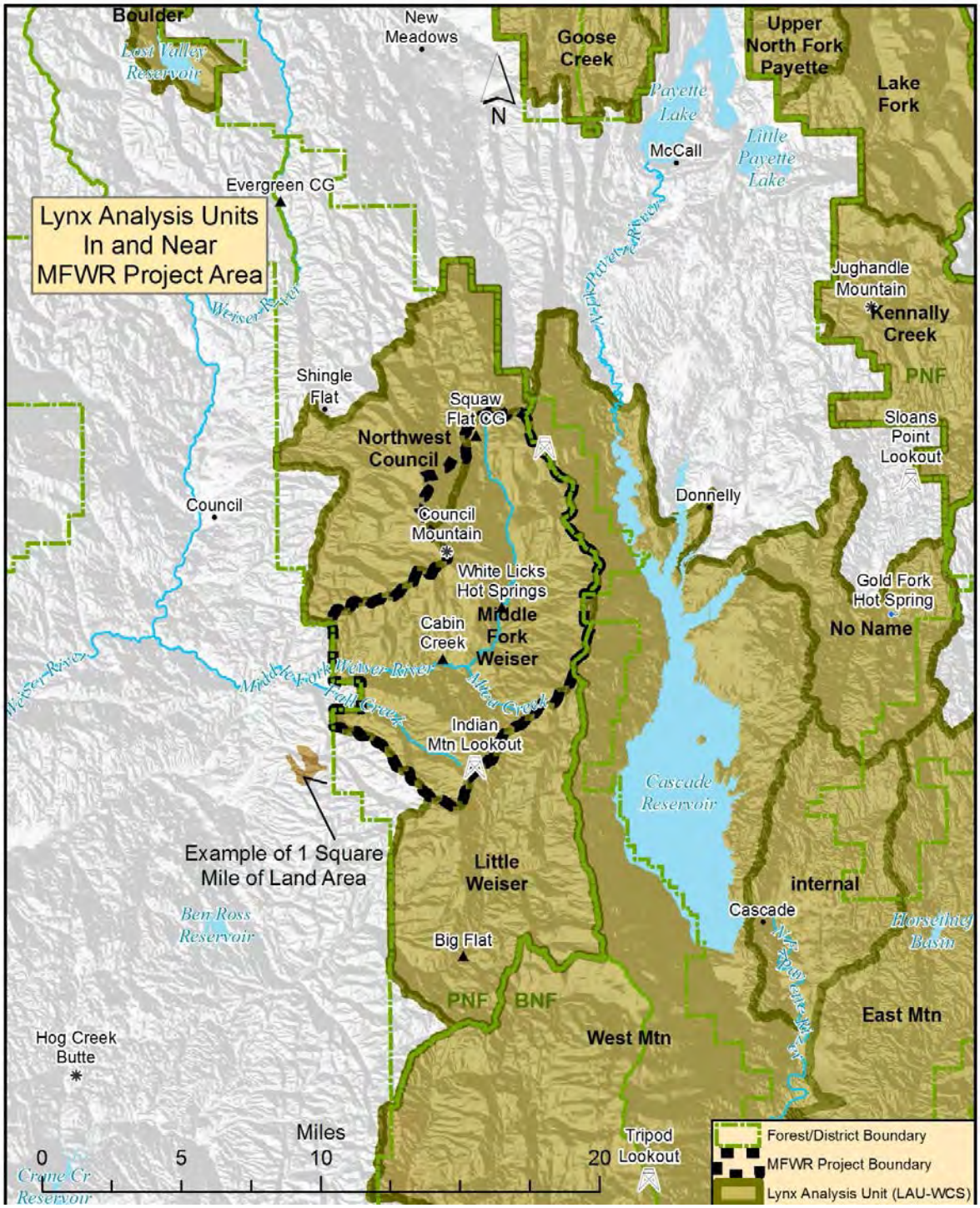


Figure 3-18. Lynx analysis units (LAUs) identified in and adjacent to the Project area

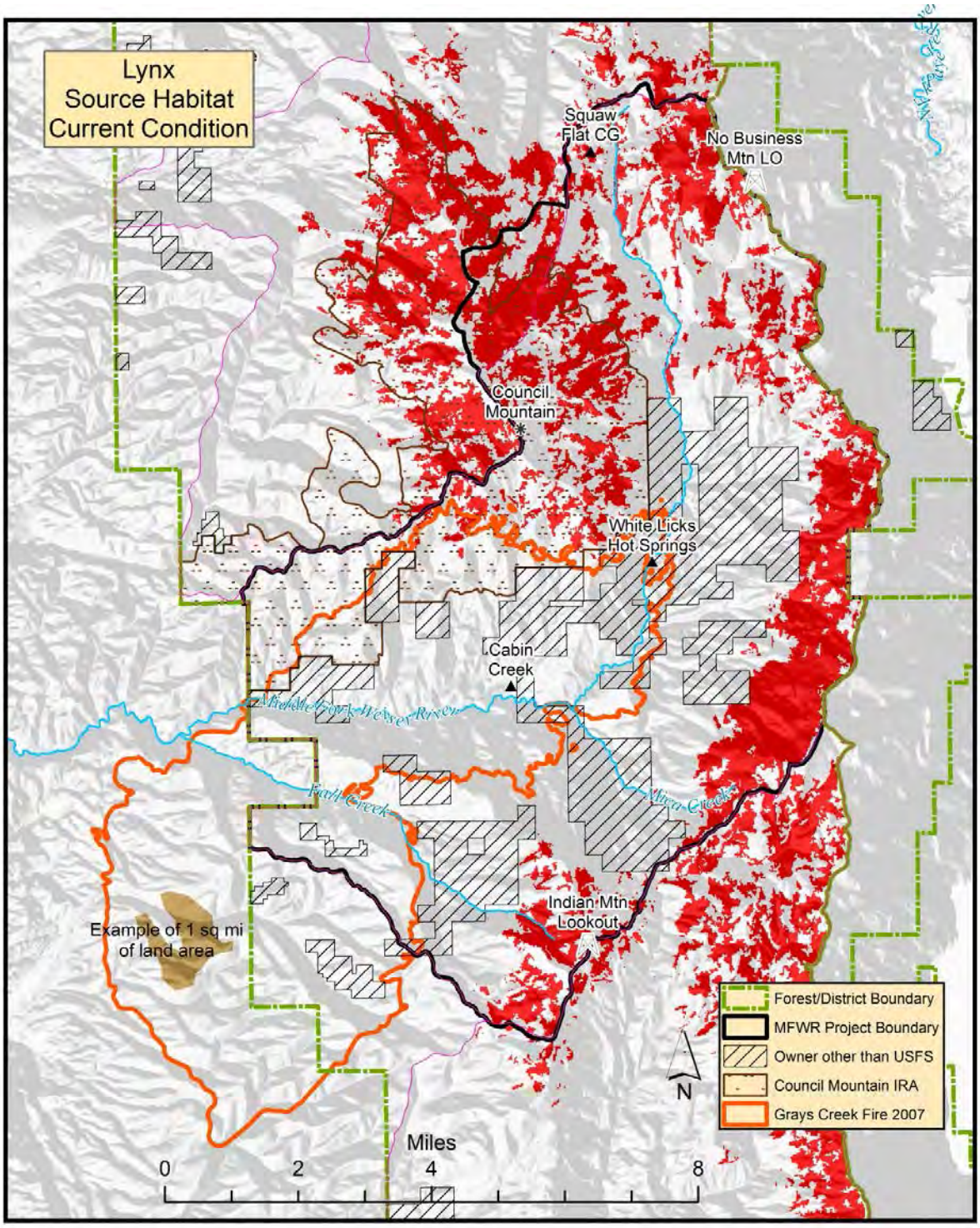


Figure 3-19. Current condition of modeled lynx source habitat in the Project area

3.4.5.5.2. Mountain Quail

The mountain quail is a Region 4 Sensitive species and a species of greatest conservation need in Idaho. The mountain quail was selected as a focal species, because of its association with transitional mountain and riparian shrubland communities, within broader forested habitats.

Mountain quail feed on insects and plants, including seeds, fruit, leaves, bulbs, roots, and tubers, and play an ecological role in seed and fruit dispersal (Marcot 1997; O'Neil et al. 2001). They also are an important prey species for many predators. KECs for this species include an association with forested habitats and shrub/grassland habitats (Marcot 1997; O'Neil et al. 2001). Mountain quail are typically associated with shrub and herbaceous layers, often in interfaces between upland and riparian environments, including seeps and springs. Medium and large shrubs (2–16.5 feet tall) with dense cover are generally associated with habitat for mountain quail. Forbs and shrubs provide habitat for invertebrate prey species and produce seeds, fruits, bulbs, and tubers that are important food sources; fire can stimulate growth and development of these conditions, benefitting this species. Human influences on mountain quail and its habitat are both positive and negative. Beneficial effects of human influence include creation of edge habitats, such as those created along power line corridors; supplemental feeding of other bird species; and creation of water developments. Mountain quail are dependent on free water, particularly in arid habitats (Rahm 1938). Negative effects include introduced quail species (some food overlap between young Mountain quail and adult California quail) (Gutierrez and Delehanty 1999), competitive exclusion from introduced California quail and chukar, water developments lacking escape ramps (Gutierrez and Delehanty 1999), and water impoundments throughout low-elevation habitats.

Source habitats for mountain quail include all structural stages, except stem exclusion, of interior Douglas-fir, interior ponderosa pine, and chokecherry (*Prunus virginiana*), serviceberry (*Amelanchier* spp.), and rose (*Rosa* spp.) (Wisdom et al. 2000). Source habitat is characterized by shrub-dominated communities, ranging from 2,300 to over 9,850 feet elevation. This quail species is most often associated with steep slopes, or rugged terrain, but these characteristics are not always present in occupied habitat (Brennan et al. 1987). Mountain quail often breed at high elevations, during spring and summer, and generally migrate to lower elevations prior to snowfall. Mountain quail also use high-elevation aspen stands surrounded by sagebrush and riparian areas in forested habitats with a significant shrub component (Brennan et al. 1987). Fires in source habitat can have a negative effect on source habitat in the short term, but can promote growth and development of shrub habitats in the long term (Gutierrez and Delehanty 1999).

In Idaho, mountain quail distribution appears to be closely associated with riparian shrub habitats (Vogel and Reese 1995). These areas may, or may not, have an associated forest canopy; they typically occur along waterways and secondary drainages that are within a few hundred yards of water (Vogel and Reese 1995). In the ICB, mountain quail are usually found within 328 to 656 feet of a water source (Brennan et al. 1987). Mountain quail require drinking water in hot weather; chicks must drink soon after hatching to survive (Brennan et al. 1987). South-facing slopes are arid and dominated by grasses, such as bluebunch wheatgrass (*Pseudoroegneria spicata*) and Idaho fescue (*Festuca idahoensis*), together with several species of forbs. In draws, or on north-facing slopes, serviceberry (*Amelanchier* spp.), hawthorn (*Crataegus douglasii*), ninebark (*Physocarpus malvaceus*), snowberry (*Symphoricarpus* spp.), and wild rose (*Rosa spp.*) are common. Moist sites have elderberry

(*Sambucus* spp.), alder (*Alnus sinuata*), red osier dogwood (*Cornus stolonifera*), and cottonwood (*Populus trichocarpa*); higher elevation sites may include ponderosa pine and Douglas-fir (Vogel and Reese 1995).

On the Forest, vegetative communities capable of providing source habitat conditions include PVGs 1, 2, 4, 5, 7, and 11 (Egnew et al. 2015). Historical fire regimes are nonlethal in low-elevation types (PVGs 1, 2, and 5) and mixed1 or mixed2 in other PVGs. Riparian shrubland is a special habitat feature for mountain quail. Mountain quail are known to seasonally migrate between lower and higher elevations. The Forest likely contributes to year-round habitat, but some fall and all winter habitats are probably below the boundary of the Forest.

Habitat on the Forest does not appear to be the limiting factor for this species; however, off-Forest, lower elevation habitat conditions, or human influences on the species or its habitat may be limiting factors. Brennan (1990) suspected water impoundments have inundated thousands of acres of important low-elevation winter habitat. Others have suggested competitive exclusion by introduced game birds, or food overlap between their young, may negatively affect mountain quail (Gutierrez and Delehanty 1999).

The population trend of mountain quail is unknown. Evidence suggests populations have undergone considerable range-wide declines, particularly in xeric habitat east of the Cascade Mountains and Sierra Nevada Mountains (Gutierrez and Delehanty 1999; Vogel and Reese 2002). Occupied habitat in Idaho declined more than 95% from 1938 to 1989 (Brennan 1990). Remaining populations occur in the lower Salmon and Snake River drainages and the foothill and mountain areas of the Boise River drainage (IDFG 2005).

Current Condition

Mountain quail source habitat within the Project area was mapped using PVGs 1, 2, 4, 5, 7, and 11 (all including a crosswalk from Forested Strata 29, 41, 60, and 70), including all tree size classes and a buffer of 650 feet on perennial streams. This 650-foot buffer includes habitat outside of the 220 feet that is considered by the Forest as part of the RCA. Approximately 13,075 acres of source habitat were identified in the Project area at current condition (Table 3-41, Figure 3-20); 8,570 acres exists on NFS lands in the Project area. This total acreage includes only the modeled vegetal habitat, even though Figure 3-20 shows the buffered perennial streams as well. The riparian zones that lack the appropriate vegetative characteristics are not included in this source habitat total. Source habitat for mountain quail is likely overestimated by this model, because current GIS technology does not allow the identification, or measurement, of the shrub layer under tree canopies, nor the identification of shrub species, and the 650-foot buffer does not allow the extraction of non-habitat sites.

A number of historical records of mountain quail exist from the north-central portion of the Forest, with a total of 19 records since 1994 (Conservation Data Center [CDC] and Payette National Forest databases, Project Files). One mountain quail observation exists for the Middle Fork Weiser River drainage (J. Almack field notes 2007, available in the project record). This bird was observed just west of the Project area, along the Middle Fork Weiser River, during the Grays Creek Fire in September of 2007

Table 3-41. Current condition of mountain quail source habitat (acres) in the Project area on private and National Forest System (NFS) lands by Potential Vegetation Group (PVG)

Canopy Cover Class	PVG 1	PVG 2	PVG 4	PVG 5	PVG 6	PVG 7	PVG 8	PVG 9	PVG 10	PVG 11	PVG 99	Totals
GFSS NFS Lands	0	0	0	0	0	0	0	0	0	0	279	279
Low NFS Lands	149	866	61	463	694	496	6	139	108	79	0	3,061
Moderate NFS Lands	1	175	7	762	2,586	1,087	19	204	254	109	0	5,204
High NFS Lands	0	15	0	0	10	0	0	0	0	0	0	25
Total NFS Lands	**150**	**1,057**	**67**	**1,225**	**3,290**	**1,583**	**25**	**343**	**362**	**188**	**279**	**8,570**
GFSS Private Lands	0	0	0	0	0	0	0	0	0	0	131	131
Low Private Lands	9	291	0	846	635	39	0	0	0	0	0	1,820
Moderate Private Lands	0	377	0	624	1,388	128	0	27	11	0	0	2,555
High NFS Private Lands	0	0	0	0	0	0	0	0	0	0	0	**0**
Total Private Lands	**9**	**668**	**0**	**1,470**	**2,023**	**167**	**0**	**27**	**11**	**0**	**131**	**4,506**
Total All Ownership	**159**	**1,725**	**67**	**2,696**	**5,313**	**1,750**	**25**	**370**	**372**	**188**	**410**	**13,075**

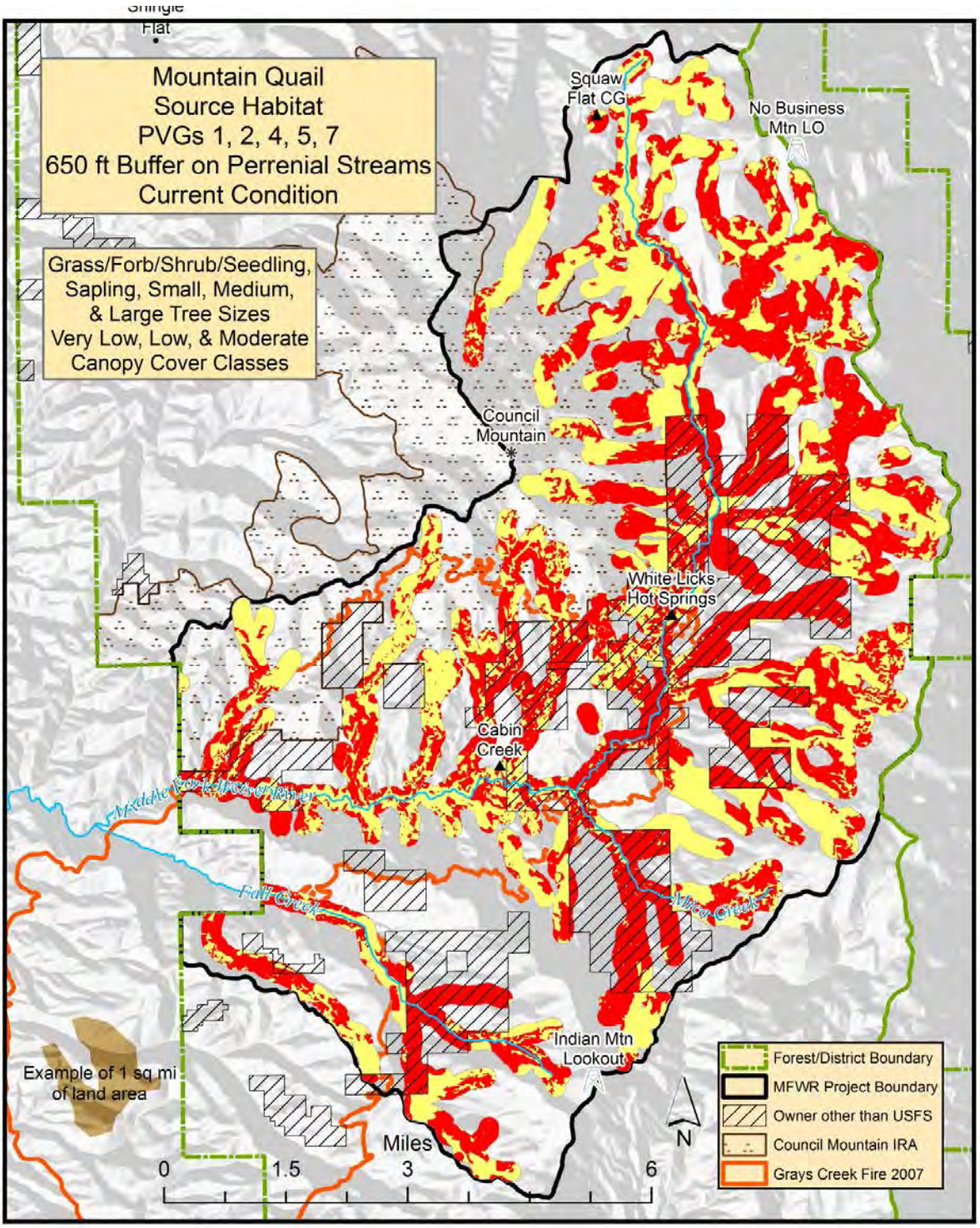


Figure 3-20. Current condition of mountain quail source habitat for Potential Vegetation Groups (PVGs) 1, 2, 4, 5, and 7 in the Project area (source habitat shown in red; yellow denotes 650-foot buffer on perennial streams)

3.4.5.5.3. Wolverine

The wolverine, a Region 4 Sensitive species, has a circumboreal distribution, occurring in Europe, Asia, and North America. In western North America, the wolverine historically occurred in Alaska, Canada, Washington, Oregon, California, Nevada, Colorado, Utah, Montana, Wyoming, and Idaho. Wolverines occur in the higher elevations of Idaho, including the Forest and the surrounding areas of west-central Idaho. No estimate of population trend occurs for either the Forest, or Idaho.

Habitats used by wolverines include alpine tundra and all subalpine and montane forests (Wisdom et al. 2000, Vol. 3). Within the forest types, all structural stages (except the closed canopy, stem-exclusion stage) provide source habitat. In a central Idaho study (Copeland 1996), wolverines used modestly higher elevations in summer versus winter, and they shifted use of cover types from whitebark pine (*Pinus albicaulis*) in summer, to lower elevation Douglas-fir and lodgepole pine (*Pinus contorta*) communities in winter. Wolverine habitat use was explained better by elevation than any other variable in both summer and winter. A persistent snow pack from late winter through late spring is thought to be critical for the reproductive denning success of the wolverine, because of the insulating warmth it provides to the newborn kits and for the protection afforded against predators. This dependence on persistent snow would likely move wolverines away from the Project area as drier winter conditions increase in the future, due to climate change. As less snow would be present, wolverines would likely move to parts of the Forest that still have a persistent snow pack, such as the high elevation sites in the backcountry of the wilderness areas on the east side of the Payette National Forest.

Wolverines use large home ranges. Females average 98 square miles (63,000 acres) and males 588 square miles (376,000 acres) per home range in central Idaho (Copeland et al. 1996). Denning usually occurs in February, typically on north to east facing slopes of talus or mixtures of forest and talus.

Wolverines are predominantly scavengers, especially in winter, when their diets consist primarily of ungulate carcasses (Banci 1994). In summer, they use a wider variety of foods, including small mammals, birds, carrion, and berries (Weaver et al. 1996). Copeland (1996) found that carrion-related food supplied 46% of wolverine diets in Idaho, during both summer and winter. Banci (1994) suggested that diversity of habitats and foods is important to wolverines.

Current Condition

Recent studies have provided a strong correlation between wolverine habitat and a persistent snowpack (Copeland et al. 2010). The authors developed a spatial data layer of spring snow cover in the Northern Hemisphere for a 7-year period from 2000–2006, using moderate-resolution imaging spectroradiometer (MODIS)-classified daily snow data (500 m spatial resolution) from the Terra satellite (Hall et al. 2006, Copeland et al. 2010). Areas that exhibited snow cover in years 6 and 7 showed the strongest correlation with wolverine radio locations (Figure 3-21).

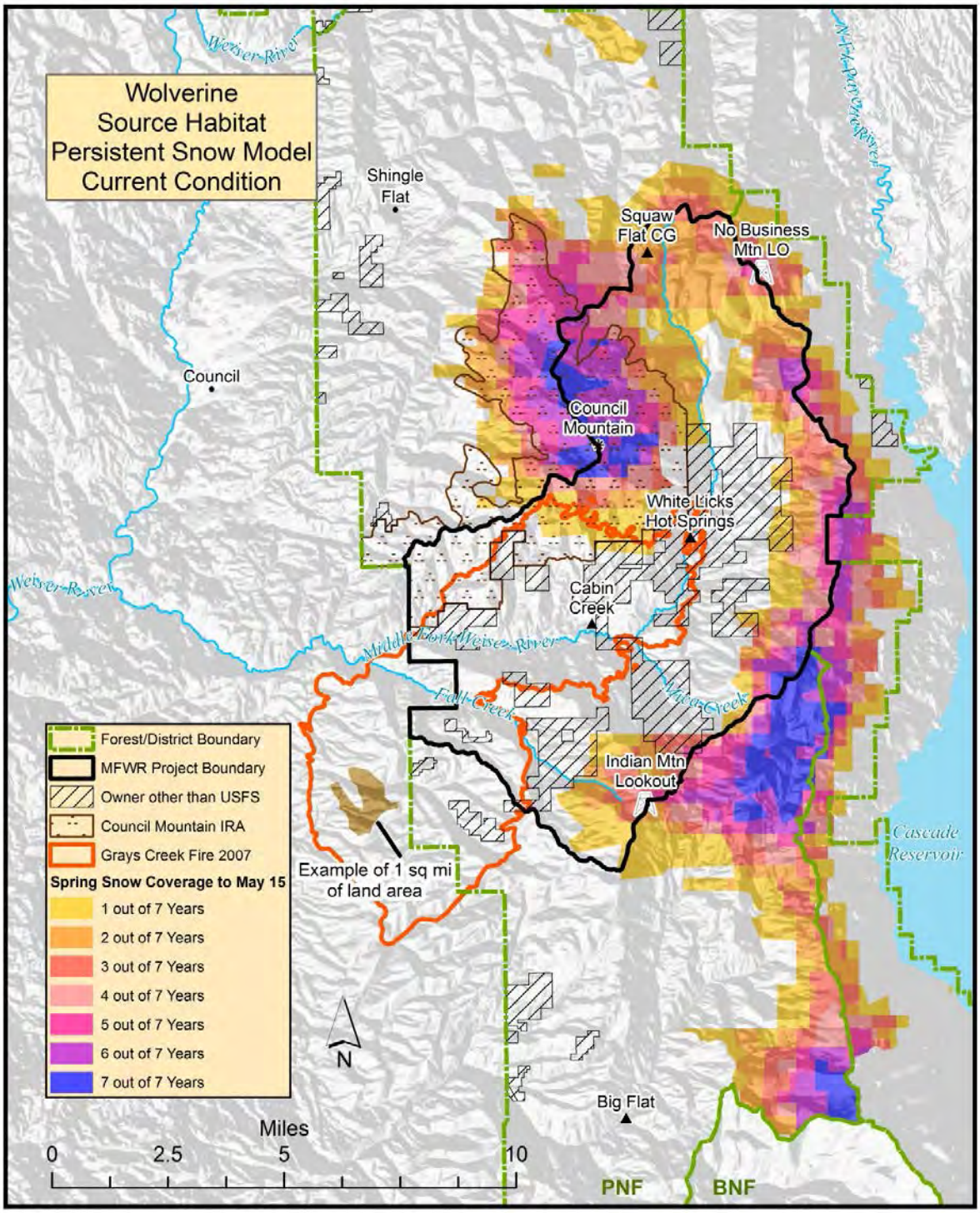


Figure 3-21. Wolverine modeled source habitat for the Project vicinity, using the persistent snow model, as described by Copeland et al. (2010)

IDFG recently released a management plan for the conservation of wolverines in Idaho for the period 2014–2019 (State of Idaho IDFG 2014). This management plan includes life history information, current range distribution, habitat requirements, source habitat distribution (using the Copeland et al. {2010} Persistent Snow Model), observation records, and estimated population capacity in Idaho. The management plan suggests that west-central Idaho has appropriate habitat and a small number of confirmed and unconfirmed wolverine observations, as well as potential dispersal corridors from larger populations, such as the Selway-Bitterroot and Yellowstone ecosystems. The Payette, Boise, and Sawtooth national forests are collaborating with the RMRS, Round River Conservation Studies, IDFG, and other government and non-government organizations, to investigate the wolverine population in western Idaho and to identify potential impacts to wolverines from winter recreation. Research efforts include using a unique combination of approaches to simultaneously and intensively monitor both wolverines and winter recreation, including GPS monitoring of wolverines and winter recreationists. Since the winter of 2010-2011, investigators have captured and radio-collared wolverines on the east side of the Forest. The study area does not include the Project area, and no confirmed wolverine observations have been reported within the Project area (Forest Service Wildlife Sightings Database 2014, IFWIS 2014). One animal that had been collared on the Sawtooth National Forest as part of the wolverine-recreation study moved to the Payette National Forest, indicating the potential for immigration from other occupied areas to the Forest.

3.4.5.6. Habitat Family 5—Forest and Range Mosaic

Source habitat for wildlife species in Habitat Family 5 is characterized by habitat requirements for Rocky Mountain elk. No focal species were designated for Family 5; however, elk is included in this analysis because of its importance to local forest management and special interest to local communities.

3.4.5.6.1. Rocky Mountain Elk

The Rocky Mountain elk is designated as a SOSI for the Forest (Forest Plan), but it is not a focal species (USDA Forest Service 2003a). Elk populations are managed by the IDFG, using Hunting Units designed to provide for a controlled harvest in late summer and fall hunting seasons. The Project area is encompassed by Big Game Hunting Unit 23A.

Elk occur throughout the Forest and use a variety of habitats, ranging from open sagebrush-grasslands for foraging, to dense conifer stands for year-round hiding cover and winter thermal regulation. Forest Plan direction for elk habitat management requires identifying and protecting calving areas, wallows, travel corridors (if known), mineral licks, security polygons, and winter range. Conifer stringers on open grassland hillsides create a classic elk habitat mosaic, which is used through much of the snow-free season. Dense vegetation plays an important role in reducing vulnerability of elk to hunting mortality. Elk calving areas consist of moderate- to open-density conifer stands on southerly slopes, with a moderate-to-dense shrub layer in the understory. Elk winter range consists of large areas that provide grass and browse forage with dense forested stands nearby for thermal and hiding cover.

Road density plays an important role in elk management. Numerous studies consider wildlife habitat to be at risk when road densities exceed 1.0–1.7 miles of open road per square mile (Wisdom 2007, Rowland et al. 2005, Frederick 1991, Hillis et al. 1991, Lyon 1983). Elk habitat effectiveness and security is influenced by amount and proximity of forage and cover

components, adequacy of hiding and thermal cover, and open road densities. As hiding cover dissipates, the influence of open roads on elk habitat effectiveness is magnified (S. Reinecker, IDFG Comment Letter for the Lost Creek-Boulder Creek Project, dated March 27, 2013).

Typically, road densities >1.0 mile of drivable road per square mile are considered detrimental to elk use and will likely increase vulnerability to hunting mortality (Hillis et al. 1991, Frederick 1991). Frederick (1991) noted results from several studies that show elk habitat effectiveness declines to 75% at an open road density of 1.0 miles of open road per square mile of land. At road densities of 2.0–3.0 miles of open road per square mile of land, elk habitat effectiveness declines to 25%.

Current Condition

Current road density on NFS lands in the Project area is 1.2 miles of Forest Travel Plan open and seasonally-open NFS roads per square mile of land. When unauthorized roads are added to this mileage, road density on NFS lands in the Project area increases to 3.4 miles of road per square mile of land. The definition of drivable road can be legal or physical. Legally, the MVUM displays those NFS roads, trails, and areas designated for motor vehicle use. These are authorized "open" routes. Other routes on the landscape may be physically drivable, but public use of those routes is unauthorized. As stated in FSM 7715.78: "If unauthorized routes are not designated, motor vehicle use on these routes is prohibited (36 CFR 261.13)."

Many unauthorized routes occur in the Project area. The following routes occur along the Middle Fork Weiser River road (FS Road 186), which runs 13.3 miles through the center of the entire Project area: 37 unauthorized roads (all driven illegally) originating from Road 186; 5 open roads and 2 gated roads (gates have been breached by ATVs) closed year-round or seasonally; and 35 ATV routes pioneered off of Road 186. By far, the greatest number of roads in the Project area are classified as unauthorized. Many of these unauthorized roads may be physically drivable, which adds to the degradation of elk security in the drainage. These road miles illustrate an important opportunity to better manage the NFS road system in the Project area.

Elk Security Area Analysis

Elk Security Areas (SAs) (Hillis et al. 1991) are often used as a measure of the effects of road density on bull elk vulnerability to hunting mortality. An area of 0.5 miles on either side of an open NFS road, or motorized trail, is considered unsecure. The remaining blocks of suitable habitat outside of this buffer are defined as Elk Security Polygons, if they also have vegetation and/or terrain features that provide appropriate hiding cover for elk and are at least 250 acres in size. The total acreages of the SAs should be at least 30% of the area being analyzed, which, in this case, is the roughly 50,000-acre Project area (USDA Forest Service 2003, Thomas et al. 1979). Security polygons that do not meet these criteria are dropped from the analysis, because they are not SAs. An analysis unit may have large security polygons, but if the requisite hiding cover is not present in a polygon, the polygon is dropped from the security analysis.

Hiding cover was defined by Thomas et al. (1979) as "vegetation capable of hiding 90% of a standing adult deer or elk from the view of a human at a distance equal to or less than 60 meters (200 feet)." On the Forest, vegetative structure that would typically provide hiding cover is found in Strata 23, 24, 34, and 35. Tree plantations (Stratum 32) may provide hiding cover, but should be field verified. Plantations, *per se*, are not SAs, because they would have

to meet the other criteria of size and distance away from roads. Although terrain features do not provide vegetative cover, they may provide a visual block of a deer or elk to the hunter, adding to the hiding cover quality of a particular site. Currently, GIS does not have the capability to appropriately model terrain features. The Forest Plan directs 2 elk sight distances (400 feet) are provided as a buffer around wallows and mineral licks. This buffer is not usually a circle around the site, but an uneven line that follows the vegetation and terrain features present.

In particular, FS roads 50166 and 50485, south of Squaw Flat are currently closed to motorized vehicles year round. When applying the 0.5 mile buffer on open roads, there are three Elk Security Polygons created in this area. One of the polygons lies between Roads 50166 and 50485. Habitat in this location is a mix of untreated forested stands and multiple blocks of old clear cuts, which now are tree plantations. Other than the open areas along these roads, there are sites within this one polygon that likely provide hiding cover for elk; however, the size of this polygon is less than the required 250 acres, so the polygon *does not* meet the criteria to be classified as an SA and is dropped from further analysis, even in the description of current condition. The other two polygons meet the hiding cover and size criteria and are classified as SAs (Table 3-42 and Table 3-43, Figure 3-22).

The above example illustrates an issue created by the application of the "Hillis Paradigm" (Hillis et al. 1991). The Paradigm applies only to a specific time frame: the high-powered rifle season, because this is when adult bull elk are most vulnerable to hunting mortality. However, because of this hunting season window, the quality and quantity of elk habitat that is available outside of the high-powered rifle hunting season is not considered in the elk security analysis. Therefore, the sensitivity of elk to human disturbance during winter foraging and use of thermal cover, or spring calving and summer calf rearing, are not considered. The polygon that was dropped from the analysis, as noted above, supports a high density of elk and includes areas of habitat that are undisturbed by humans throughout the year, due to the year-round road closures in that location. Changing the status of these roads to seasonally-open, following the creation of the OHV loop, would change the availability and effectiveness of this area as elk habitat (see Elk Security Area Analysis in section 3.4.6.5 of the Environmental Effects Analysis).

Unauthorized Routes and Closed National Forest System Roads

The EIS analysis addresses open roads, but, as discussed above, unauthorized use of closed roads also effects elk security and habitat use. The public has legal access on open NFS or authorized roads, but since many unauthorized roads exist on the landscape, these routes may be used for illegal access (Table 3-42). Illegal use of unauthorized roads reduces the effectiveness of SAs, increasing the vulnerability of bull elk to hunting mortality. Table 3-43 illustrates this problem. For example, SA #2 meets all of the criteria for an SA, but note how the size of the area shrinks for #2A, when the 0.5-mile buffer is applied to all drivable roads. Each of the SAs in the Project area shrinks significantly when all drivable roads are included in the analysis (Figure 3-22).

Table 3-42. National Forest System (NFS) roads and unauthorized routes in the Project area, on NFS lands that may contribute to effects to elk security

Open Roads (miles)	Closed Roads (miles)	Seasonal Roads (miles)	Unauthorized Routes (miles)
73.3	75.8	27.7	63.8

Table 3-43. Elk security by elk polygon, owner, alternative and type of road, route and motorized trail buffer (minimum polygon area is 250 acres) on private and National Forest System (NFS) lands

0.5-mile Buffer of Roads, Routes or Motorized Trails		Elk Security Polygon Area (in acres) by Alternative Open Year-round Routes				Elk Security Polygon Area (in acres) by Alternative Open Year-round and Seasonally Open Routes				Elk Security Polygon Area (in acres) by Alternative All Roads and Unauthorized Routes			
Elk Security Polygon Number Shown on Figure 3-15	**Land Ownership**	**Alt 1**	**Alt 2**	**Alt 3**	**Alt 4**	**Alt 1**	**Alt 2**	**Alt 3**	**Alt 4**	**Alt 1**	**Alt 2**	**Alt 3**	**Alt 4**
2	NFS lands	596	596	596	596	307	307	307	307	0	0	226	0
5	NFS lands	318	319	319	319	318	319	319	319	0	0	0	0
7	NFS lands	1,672	1,672	1,672	1,672	1,672	1,672	1,672	1,672	195	194	282	194
10	NFS lands	1,207	1,207	1,207	1,207	1,207	1,207	1,207	1,207	109	109	109	109
10	Private	213	213	213	213	213	213	213	213	148	148	148	148
12	NFS lands	640	295	295	295	640	295	295	295	437	276	276	276
15	NFS lands	1,075	710	710	710	1,075	710	710	710	841	582	582	582
18	NFS lands	436	436	436	436	75	75	126	75	0	0	54	0

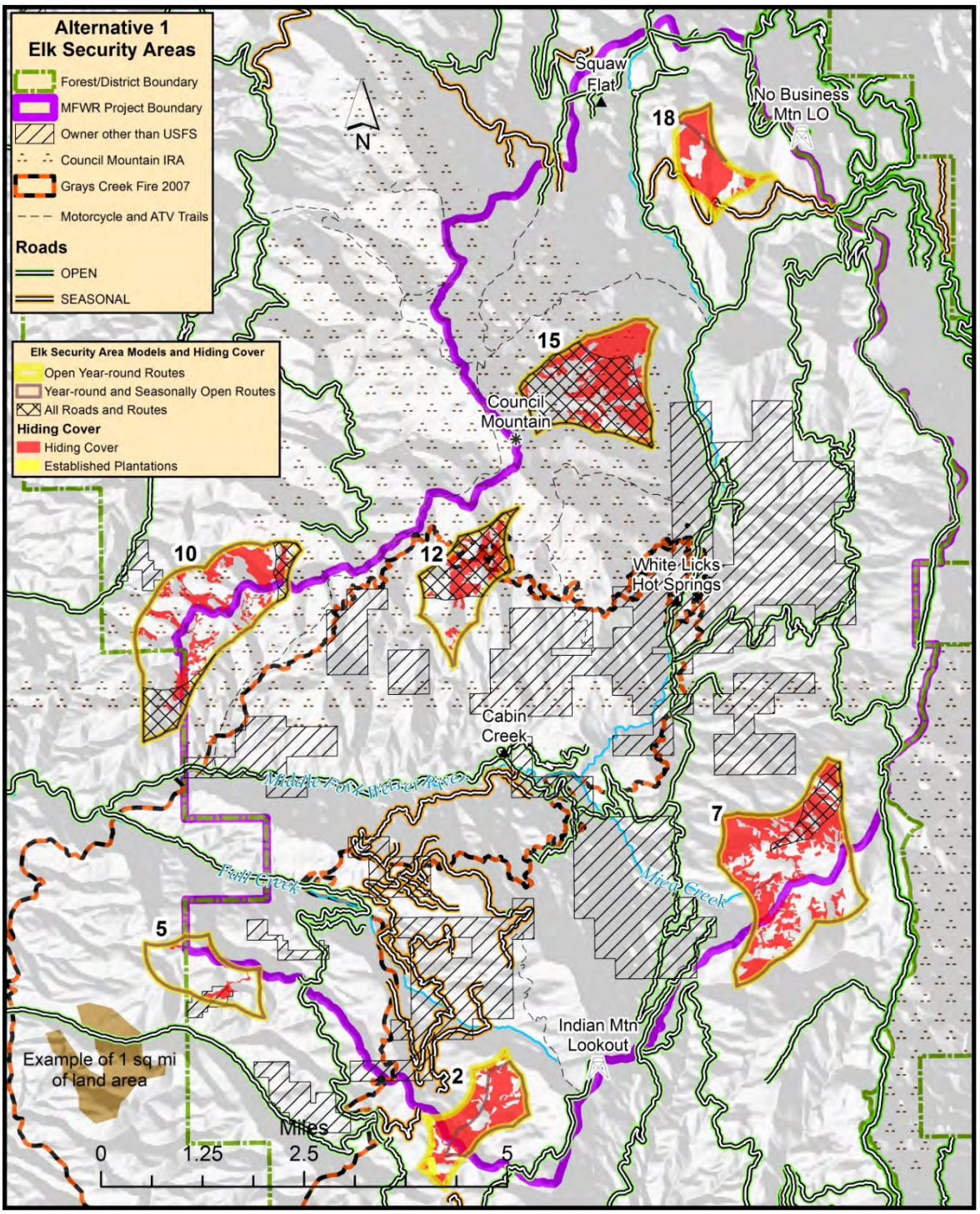


Figure 3-22. Elk security areas at current condition in the Project area, identified by a 0.5-mile buffer on roads, unauthorized routes, and motorized trails

Elk Winter Range

Relative to other wildlife species, elk are considered habitat generalists. They favor a mix of grassland/shrub and forested landscapes that provide important security cover. Habitat adaptability has allowed for the wide distribution of elk in the west. Generally considered grazing animals, elk feed on grasses, sedges, and forbs all year. They shift to shrubs more in the winter, as non-woody plants become less available and nutritious. Sagebrush (*Artemisia* spp.), bitterbrush (*Purshia tridentata*), serviceberry (*Amelanchier alnifolia*), curl-leaf mahogany (*Cercocarpus ledifolius*), and aspen increase in importance as foods for elk in the winter (Kufeld 1973, Wambolt 1998). In search of winter habitat, elk move to areas with less snow depth, typically at relatively low elevations. Areas with little human disturbance often provide elk winter range.

Elk winter range exists in the Project area, primarily depending on snow depths at lower elevations, in the lower elevation sagebrush/grasslands that dominate the western foothills adjacent to the Project area. This habitat abuts large acreages of private land. As a result, substantial winter range habitat exists west of the Project area, including much of the Weiser River Valley, which primarily is private land and several small blocks of state land.

Elk Calving

The calving habitat model uses lands at an elevation of 5,000 feet or lower, on less than 35% slope, with generally southern aspects. This model likely overestimates the amount of calving habitat, because sufficient hiding cover is also necessary, but not included in the model. At the macrohabitat scale, elk select for cover components in combination with physical landscape characteristics (southern aspect) and forage components associated with deciduous shrub cover (Barbknecht 2010). It is difficult to determine specific areas where elk may calve in the Project area; choice of calving sites by the pregnant cows is a function of adequate hiding cover for the calf, forage for the lactating cow, and elevational limitations, due to persistent spring snowpack.

3.4.5.7. Habitat Family 12—Grassland/Open-canopy Sage

3.4.5.7.1. Northern Idaho Ground Squirrel

Northern Idaho ground squirrels have the most restricted geographical range of any ground squirrel species and one of the smallest home ranges among North American land mammals (Gill and Yensen 1992). The historical distribution of northern Idaho ground squirrels included parts of west-central Idaho in Adams and Valley counties. Originally considered to be one species, the Idaho ground squirrel is comprised of two subspecies: the northern (listed as *Spermophilus brunneus brunneus*, but now recognized as *Urocitellus brunneus brunneus*) and southern (*Urocitellus brunneus endemicus*) (Yensen 1991).

The Northern Idaho ground squirrels is a Threatened species under the ESA (65 FR 17779). The FWS approved a Recovery Plan for this species in 2003 (USDI Fish and Wildlife Service 2003). On the Forest, the northern Idaho ground squirrel occurs only on the Council and New Meadows ranger districts.

Sagebrush source habitats for northern Idaho ground squirrel typically include "scab" habitat, consisting of bunch grasses, high desert forbs, sagebrush, basalt boulders or outcrops, and basalt loamy soils. These sites can have an open canopy of conifers, typically ponderosa pine, with a

density roughly equivalent to around ≤50-foot spacing between trees. Trees usually occur in unevenly distributed clumps, but some restored sites may have more even tree spacing due to a tie-to-timber management procedure used in earlier restoration projects. Adjacent stands of denser tree distribution and/or a dense shrub component are generally not used by the northern Idaho ground squirrel, although altering sites with appropriate habitat components seems to be successful. Restoring northern Idaho ground squirrel habitat in Family 12 sites is a goal in the Recovery Plan for the northern Idaho Ground Squirrel (USDI Fish and Wildlife Service 2003).

Northern Idaho ground squirrels emerge in late March or early April and cease aboveground activity in late July or early August (Yensen 1991). Adult (≥2 years old) males emerge first, followed by adult females, then yearlings. Entrance into seasonal torpor is in the same approximate order, with pups active approximately one month later than adult males. Ground squirrels are diurnally active (Sherman 1989). Hibernation in shallow soils makes the squirrel susceptible to freezing mortality during periods of lower snow depths and colder temperatures, particularly if individuals have an inadequate fat reserve.

In suitable habitat, the squirrels are usually associated with deeper, well-drained soils generally on south-facing slopes with <30% slope. Occupied, xeric meadows typically have a shallow (<3 feet to bedrock), reddish-brown to yellowish-red skeletal-loam or clay-loam soil (Yensen 1991). Vegetation in these drier meadows is often dominated by stiff sage (*Artemisia rigida*) or mountain big sage (*Artemisia tridentata vaseyana*), with *Lomatium* species, worm-leaf stonecrop (*Sedum stenopetalum*), *Allium* species, scarlet gilia (*Gilia aggregate*), (*Brodiaea douglasii*), and various bunchgrasses and other forbs. Figure 3-23 shows the current distribution of northern Idaho ground squirrel modeled source habitat in the Project area.

The northern Idaho ground squirrel is primarily granivorous; it ingests large amounts of grass seeds, stems, and herbs to store energy for the long period—August through late March—it spends in torpor (Yensen 1991). Habitat loss and fragmentation, caused by wildfire exclusion and forest encroachment into former meadow habitats, were likely the main causes of population decline (USDI Fish and Wildlife Service 2003). Other limiting factors include competition with Columbian ground squirrels, changes in land use (vegetation altered by fire suppression, road construction, and some logging practices), increased public access (OHV use and recreational shooting), and environmental stochastic events (winter mortality, predation, and disease) (E. Yensen, College of Idaho, pers. commun. 2010).

Current Condition

No northern Idaho ground squirrel have been documented in the Forest or IFWIS databases for the Project area, although potentially suitable habitat occurs (NRIS 2015 [USDA Forest Service 2015a], IFWIS 2015 [USDA Forest Service 2015b]) (Figure 3-23). The nearest known northern Idaho ground squirrel sites are the Lost Valley Reservoir site, approximately 20 miles northwest of the Project area, and the Mud Creek site, approximately 20 miles to the northeast of the Project area. A cooperative northern Idaho ground squirrel research project is currently investigating food habits, habitat use, population monitoring techniques, use of thinning and prescribed fire to enhance northern Idaho ground squirrel habitat, and the occurrence and treatment of plague in the northern Idaho ground squirrel population on the Forest. This study does not include the Project area, because it is centered on sites occupied by northern Idaho ground squirrel. However, information acquired from the study may provide future opportunities to improve northern Idaho ground squirrel habitat in areas currently unoccupied, thereby increasing the potential for northern Idaho ground squirrel range expansion.

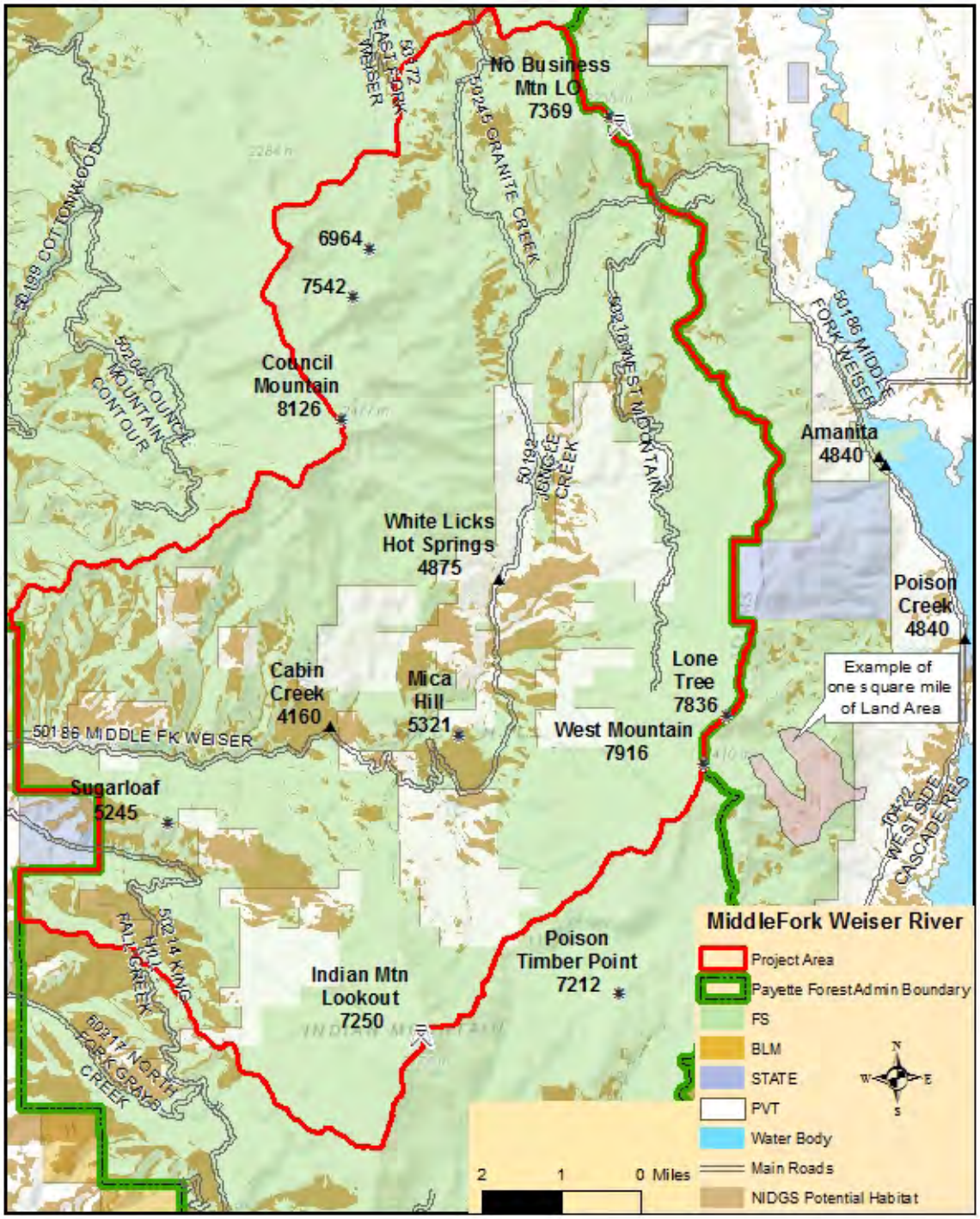


Figure 3-23. Northern Idaho ground squirrel modeled potential source habitat at current condition in the Project area

3.4.6. Environmental Effects

Comparisons of effects are organized by species or habitat (e.g, white-headed woodpecker, snags) rather than by alternative. This organization is used for a clearer depiction of habitat changes by alternative for each species or habitat component (e.g, old forest). Direct, indirect, and cumulative effects are discussed for each species or important habitat component.

Effects analyses focus on the indicators described for wildlife in Chapter 1 and in section 3.4.2. In particular, the analyses include discussions of the effects on the forested habitat quantity (acres) and quality (old forest and snags, patch, and pattern) for the following species of concern: white-headed woodpecker, pileated woodpecker, flammulated owl, three-toed woodpecker, boreal owl, fisher, great gray owl, northern goshawk, Canada lynx, and wolverine. The effects analyses also consider changes in open and unauthorized road densities and associated effects to snags and elk security, as well as the effects of other Project activities that may cause disturbance or affect nonforested habitats, particularly rangeland habitats used by the northern Idaho ground squirrel. Preliminary effects determinations for ESA-listed and Region 4 Sensitive species are included for each species analyzed. Final effects determinations will be documented in the Biological Assessment for ESA-listed and Region 4 Sensitive wildlife species, located in the Project Record.

3.4.6.1. Wildlife Conservation Principles

The wildlife analysis considers six general conservation principles summarized in the WCS analysis and based on recent literature and research (Raphael et al. 2000, Wisdom et al. 2000, Nutt et al. 2010, Egnew et al. 2015):

- Blocks of habitat close together are better than blocks far apart
- Blocks of habitat that are in areas where the direct or indirect effects of human disturbance are low are more likely to provide all elements of a species' source environments than areas where it is not
- Habitat in contiguous blocks is better than fragmented habitat
- Interconnected blocks of fragmented habitat are better than isolated blocks, and dispersing individuals travel more readily through habitat resembling that preferred by the species in question
- Large blocks of habitat, containing large populations of species, are superior to small blocks of habitat, containing small populations
- Species well-distributed across their range are less susceptible to extinction than species confined to small portions of their range

3.4.6.2. Old Forest Habitat

3.4.6.2.1. Direct and Indirect Effects

Alternative 1 (No Action Alternative)

No OF habitat has been identified in the Project area. Under Alternative 1, no direct effects would occur to OF habitat, because no Project-related activities would occur.

Indirectly, the effects of the No Action alternative on old forest habitat would vary, depending on forest stand conditions and wildfire frequency and intensity. Stands composed of PVGs that are typically denser and with longer fire return intervals (e.g, wetter PVG 6) should naturally develop OF characteristics in the long term. Conversely, forest vegetation types that typically experience a more frequent fire interval are expected to move away from OF conditions due to decreased understory tree and shrub densities and an increased percentage of seral tree species. The lack of prescribed fires in the denser, wetter PVGs would allow for movement toward characteristics. Continued fire suppression and the lack of prescribed burns in the lower-elevation, dry PVGs would ultimately move these stands toward OF conditions. This is the problem currently faced in the low elevation ponderosa pine stands in the Project area. Instead of being maintained by wildlfires, as large tree and open understory stands, these sites have become dense stands of mixed tree species in the overstory and thick ladder fuels in the understory. These stands are outside of HRV and are increasingly vulnerable to stand-replacement wildfires. Uncharacteristic wildfires have the potential to alter these forests to a successional stage that could further slow the attainment of OF characteristics for many years.

Effects Common to All Action Alternatives

Restoration treatments are expected to enhance stand conditions in the long term and allow medium trees to more quickly achieve, and large trees to maintain large tree size class than if left untreated. Stands would be composed of a higher percentage of seral tree species, which would be beneficial for Habitat Family 1. Conversely, the stands would be more open with fewer signs of decay and aging present, which would be less beneficial for most wildlife species in Habitat Family 2.

3.4.6.2.2. Cumulative Effects

Cumulatively, all alternatives would contribute to the development of future OF characteristics on NFS lands, even though the action alternatives use timber harvest and reintroduction of fire in an attempt to restore desired, OF habitat conditions more rapidly. Timber harvest activities on state and private lands within the Project area boundary are expected to remove large trees and impede conservation of OF habitats within those stands.

3.4.6.3. Habitat Family 1—Low-Elevation, Old Forest.

3.4.6.3.1. White-headed Woodpecker

Alternative 1 (No Action Alternative)

Under Alternative 1, there would be no direct effects from restoration treatments, because no treatments would occur. Indirectly, white-headed woodpecker source habitat would remain on a

downward trend, which would prevent the white-headed woodpecker population from increasing and expanding its range in the Project area.

Effects Common to All Action Alternatives

All of the action alternatives would increase source habitat for white-headed woodpecker (Table 3-44, Table 3-45,Table 3-46; Figure 3-24, Figure 3-25, Figure 3-26). The Project restoration treatments would lead to a substantial increase in white-headed woodpecker source habitat, under all action alternatives, in both the short and long term.

Direct and Indirect Effects from Alternatives 2, 3, and 4

On NFS lands, the 742 acres of currently occurring source habitat (Table 3-32) would increase to 3,985, 4,054, and 4,039 acres, respectively, under Alternatives 2, 3, and 4 (Table 3-44, Table 3-45,Table 3-46 and Figure 3-24, Figure 3-25, Figure 3-26). Potential home ranges provided currently for white-headed woodpecker would increase from 3–6 to 16–31 home ranges under Alternative 2 and 16–32 home ranges under Alternatives 3 and 4. Approximately 3,300 acres of forest stands receiving treatments would not meet modeled white-headed woodpecker source habitat needs in the short term (0-5 years), because the canopy cover would be reduced below 25%. These forest stands are expected to provide suitable habitat for white-headed woodpecker within 15–20 years and in the long term (>30 years). Considering only white-headed woodpecker habitat management, any of the action alternatives would be an acceptable management option.

Cumulative Effects

Actions on NFS lands include ongoing fuelwood removal along open NFS roads and short-term decisions to open closed roads specifically for fuelwood access. Some fuelwood cutters pioneer trails off of existing roads and unauthorized routes to access fuelwood. Such actions would continue to negatively impact snag levels. Currently, private and State lands open to timber harvest are expected to have low levels of large trees and high canopy cover. Alternative 3 would enhance more source habitat for white-headed woodpeckers, obliterate more unauthorized roads, and reduce overall road density more than the other action alternatives. Prescribed fire under all action alternatives would create snags, thus indirectly benefiting white-headed woodpeckers. The Council Mountain IRA provides small and widely separated patches of source habitat under all action alternatives.

Determinations

In the short term (0–5 years), Alternatives 2, 3, and 4 *may impact individuals* or habitat, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species. In the mid term (5–30 years), Alternatives 2, 3, and 4 would provide beneficial impacts to the species.

Table 3-44. Alternative 2 white-headed woodpecker source habitat (acres), by tree size/canopy cover classes and Potential Vegetation Group (PVG), in the Project area on private and National Forest System (NFS) lands

Tree Size/Canopy Cover Class	PVG 1	PVG 2	PVG 3	PVG 5	PVG 6	Totals
Large/Low NFS Lands	88	278	0	740	2,879	3,985
Large/Low Private Lands	5	12	0	0	0	18
Total All Ownership	**93**	**290**	**0**	**740**	**2,879**	**4,003**

Table 3-45. Alternative 3 white-headed woodpecker source habitat (acres), by tree size/canopy cover classes and Potential Vegetation Group (PVG), in the Project area on private and National Forest System (NFS) lands

Tree Size/Canopy Cover Class	PVG 1	PVG 2	PVG 3	PVG 5	PVG 6	Totals
Large/Low NFS Lands	88	278	0	740	2,949	4,054
Large/Low Private Lands	5	12	0	0	0	18
Total All Ownership	**93**	**290**	**0**	**740**	**2,949**	**4,072**

Table 3-46. Alternative 4 white-headed woodpecker source habitat (acres), by tree size/canopy cover classes and Potential Vegetation Group (PVG), in the Project area on private and National Forest System (NFS) lands

Tree Size/Canopy Cover Class	PVG 1	PVG 2	PVG 3	PVG 5	PVG 6	Totals
Large/Low NFS Lands	88	279	0	749	2,923	4,039
Large/Low Private Lands	5	12	0	0	0	18
Total All Ownership	**93**	**291**	**0**	**749**	**2,923**	**4,057**

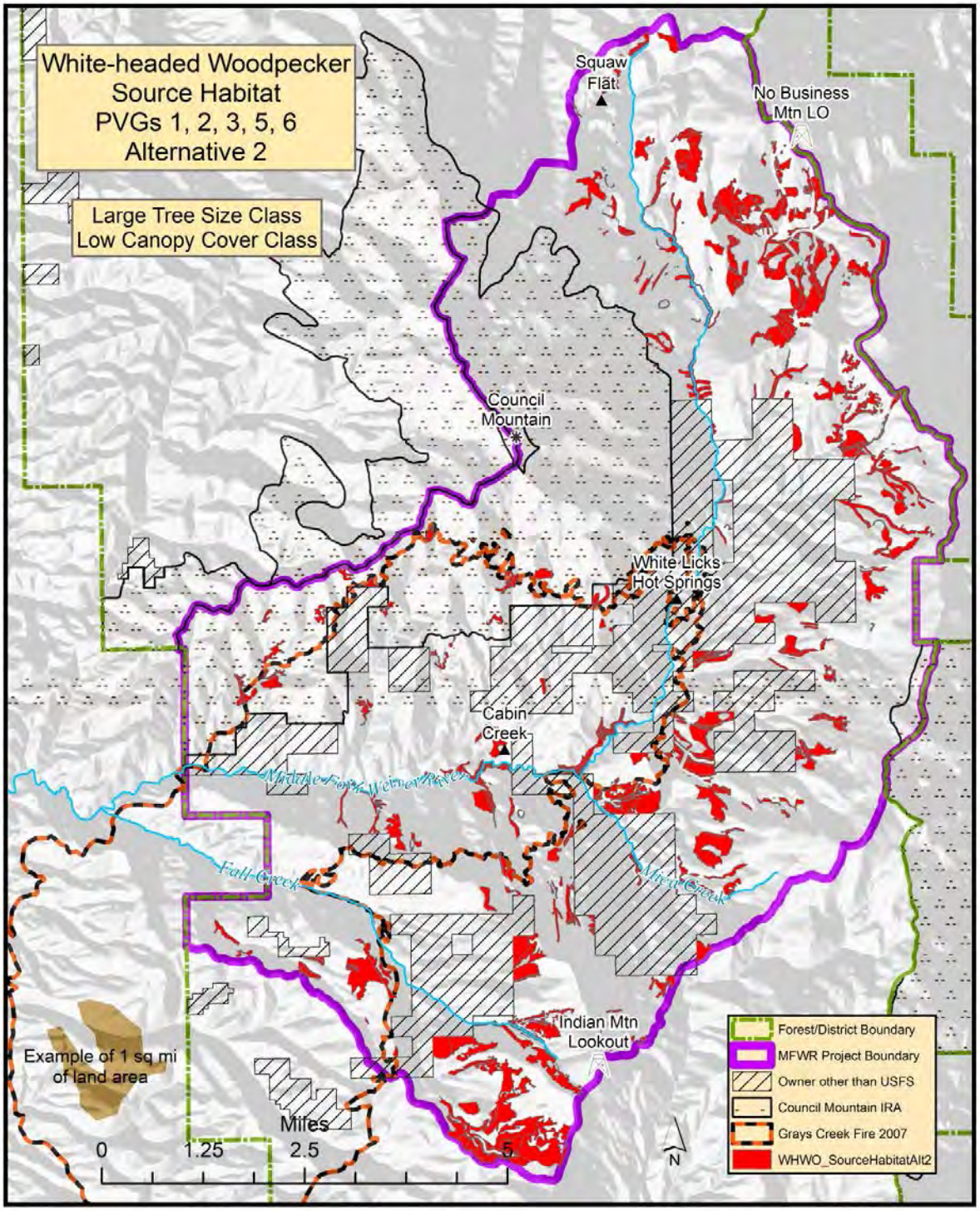


Figure 3-24. White-headed woodpecker source habitat for Potential Vegetation Groups (PVGs) 1, 2, 3, 5, and 6 in the Project area under Alternative 2

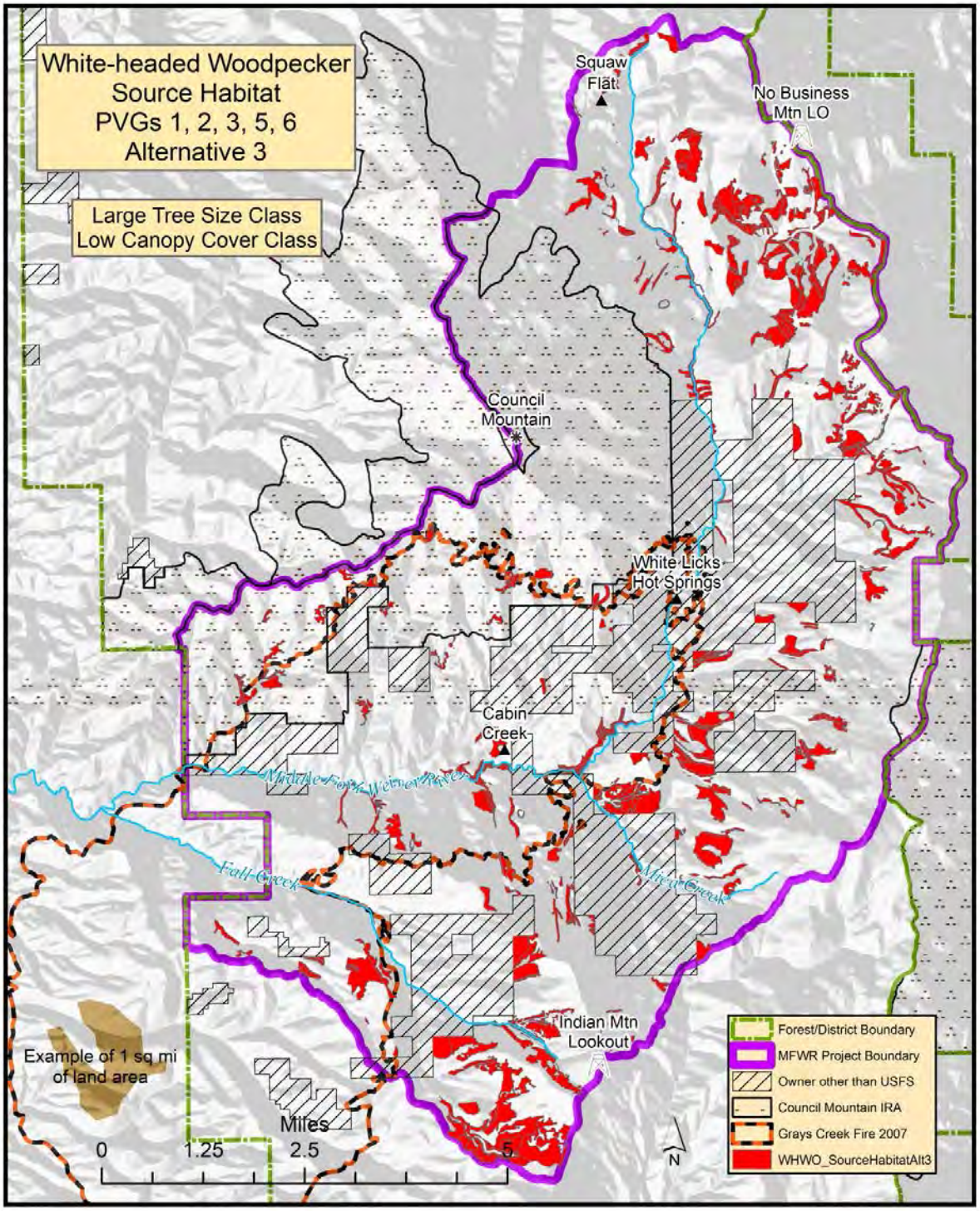


Figure 3-25. White-headed woodpecker source habitat for Potential Vegetation Groups (PVGs) 1, 2, 3, 5, and 6 in the Project area under Alternative 3

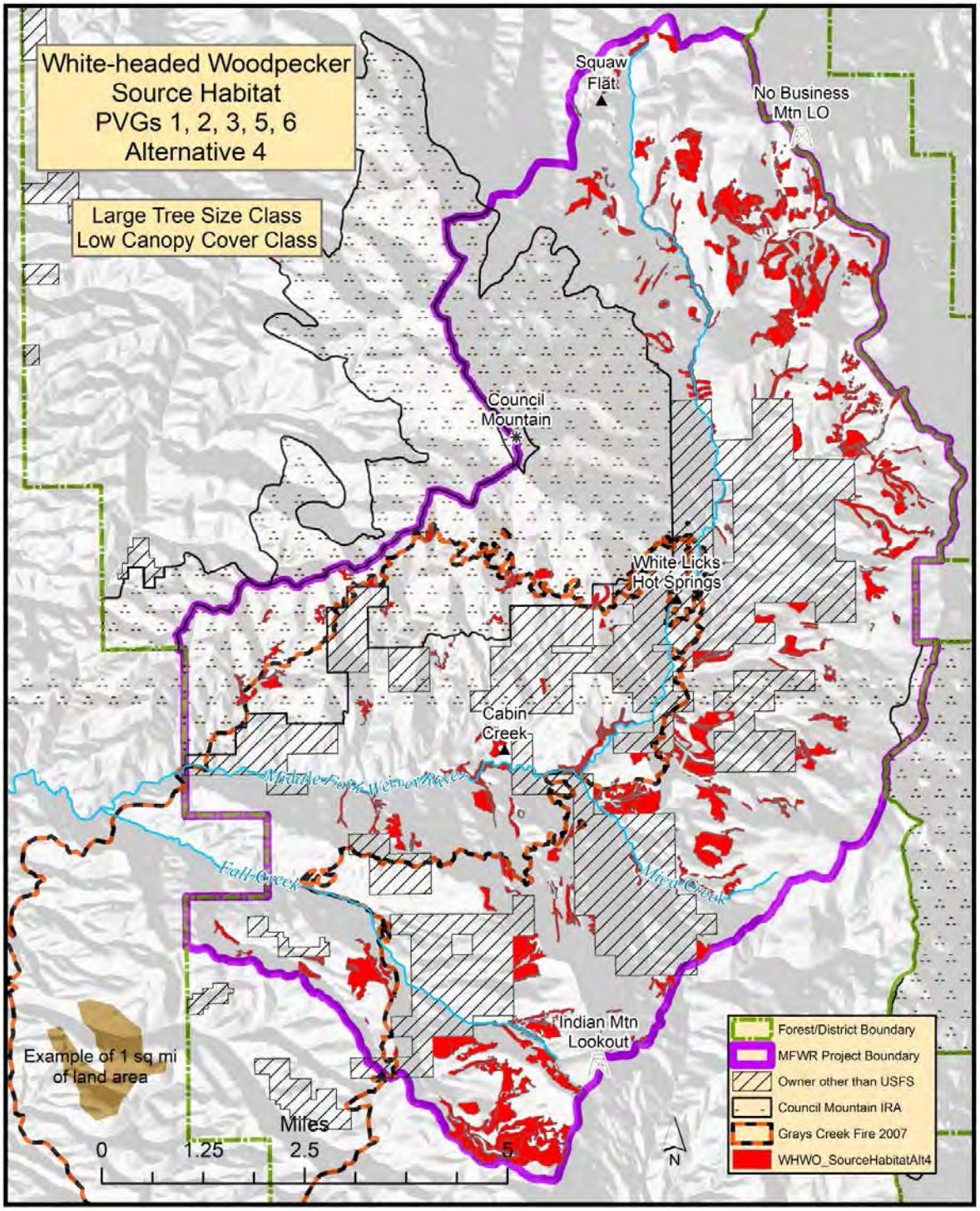


Figure 3-26. White-headed woodpecker source habitat for Potential Vegetation Groups (PVGs) 1, 2, 3, 5, 6 in the Project area under Alternative 4

3.4.6.4. Habitat Family 2—Broad-Elevation, Old Forest

3.4.6.4.1. Pileated Woodpecker

Alternative 1 (No Action Alternative)

Alternative 1 would not change the quantity or quality of source habitat for pileated woodpeckers, as no new management actions would be implemented. Combined with the lack of source habitat improvement for Habitat Family 1, the Project area forests would be more susceptible under the No Action Alternative to long-term alteration from uncharacteristic, stand-replacement wildfire.

Effects Common to All Action Alternatives

Source habitat for pileated woodpeckers would decrease under each action alternative through timber harvest activities.

Direct and Indirect Effects from Alternatives 2, 3, and 4

Pileated woodpecker source habitat on NFS lands in the Project area (10,690 acres) would decrease by 7,252, 7,253, and 7,315 acres, respectively, under Alternatives 2, 3, and 4 (Table 3-47,

Table 3-48,

Table 3-49 and Figure 3-27, Figure 3-28, Figure 3-29). The source habitat reduction would simply be a function of the amount of harvest activity in PVGs 2, 5, and 6. However, these figures are misleading, as the harvested areas would not be denuded, they would simply be altered from the current condition. Using acres as the only measure of effects to species habitats creates a false picture of the changes taking place. The free thin and patch cuts would not remove the stands, but would change the structure and species composition of those stands. In theory, the restoration treatments used should improve the quality of pileated woodpecker habitat in the Project area, even though the quantity of source habitat would decrease for pileated woodpeckers under each action alternative.

Under all action alternatives, the number of potential pileated woodpecker home ranges on NFS lands would decrease from an estimated 23 potential pileated woodpecker home ranges to approximately 7. Because NFS lands in the Project area are departed from HRV, it would be expected that, under any restoration treatment scenario for the Project area, the number of potential pileated woodpecker home ranges would decrease, which would likely lead to a lower pileated woodpecker population over time.

Cumulative Effects

Actions of NFS lands that could cumulatively impact pileated woodpeckers include ongoing fuelwood removal. Currently, private and state lands open to timber harvest are expected to have low levels of large tree, mixed-species forests, old forest conditions, and snags. Future actions on these lands are expected to further reduce these important habitat components. All action alternatives would decrease pileated woodpecker habitat in the Project area in the short term. While these losses are likely to be cumulative, with other negative effects to pileated woodpecker source habitat across the Project area, they are expected to be relatively short term and minor. In

addition, the losses in pileated woodpecker source habitat would result in corresponding increases in Family 1 habitats and white-headed woodpecker source habitat, which are habitats at greater risk. Alternative 3 would obliterate more roads and unauthorized routes than the other alternatives. These road obliterations would benefit pileated woodpecker plus other Habitat Family 2 species by decreasing human access into sourced habitats.

While Forest-wide, long-term increases in pileated woodpecker source habitat are anticipated (Egnew et al. 2015), temporary and/or short-term negative impacts to habitat quality, or distribution, may occur when restoring forest conditions departed from the HRV to meet the habitat needs of wildlife species of greater conservation need (e.g., white-headed woodpecker).

Determination

No effects determination is required for the pileated woodpecker because this species is not a Region 4 Sensitive species.

Table 3-47. Alternative 2 pileated woodpecker source habitat (acres), by Potential Vegetation Group (PVG), in the Project area on private and National Forest System (NFS) lands

Tree Size/Canopy Cover Class	PVG 2	PVG 3	PVG 5	PVG 6	PVG 8	PVG 9	Totals
Large/Moderate NFS Lands	82	0	80	882	0	209	1,254
Large/High NFS Lands	165	0	494	1,320	13	206	2,185
Total NFS Lands	**247**	**0**	**574**	**2,203**	**13**	**415**	**3,438**
Large/Moderate Private Lands	29	0	18	253	0	0	300
Large/High Private Lands	110	0	186	351	0	64	711
Total NFS Private Lands	**139**	**0**	**204**	**604**	**0**	**64**	**1,011**
Total All Ownership	**386**	**0**	**778**	**2,807**	**13**	**479**	**4,449**

Table 3-48. Alternative 3 pileated woodpecker source habitat (acres), by Potential Vegetation Group (PVG), in the Project area on private and National Forest System (NFS) lands

Tree Size/Canopy Cover Class	PVG 2	PVG 3	PVG 5	PVG 6	PVG 8	PVG 9	Totals
Large/Moderate NFS Lands	82	0	80	884	0	282	1,328
Large/High NFS Lands	165	0	494	1,250	13	200	2,108
Total NFS Lands	**247**	**0**	**574**	**2,133**	**13**	**482**	**3,437**
Large/Moderate Private Lands	29	0	18	253	0	0	300
Large/High Private Lands	110	0	186	351	0	64	711
Total NFS Private Lands	**139**	**0**	**204**	**604**	**0**	**64**	**1,011**
Total All Ownership	**386**	**0**	**778**	**2,737**	**13**	**546**	**4,447**

Table 3-49. Alternative 4 pileated woodpecker source habitat (acres), by Potential Vegetation Group (PVG), in the Project area on private and National Forest System (NFS) lands

Tree Size/Canopy Cover Class	PVG 2	PVG 3	PVG 5	PVG 6	PVG 8	PVG 9	Totals
Large/Moderate NFS Lands	82	0	78	843	0	209	1,213
Large/High NFS Lands	164	0	486	1,306	13	206	2,162
Total NFS Lands	**246**	**0**	**565**	**2,149**	**13**	**415**	**3,375**
Large/Moderate Private Lands	29	0	18	253	0		300
Large/High Private Lands	110	0	186	351	0	64	711
Total NFS Private Lands	**139**	**0**	**204**	**604**	**0**	**64**	**1,011**
Total All Ownership	**385**	**0**	**769**	**2,753**	**13**	**479**	**4,386**

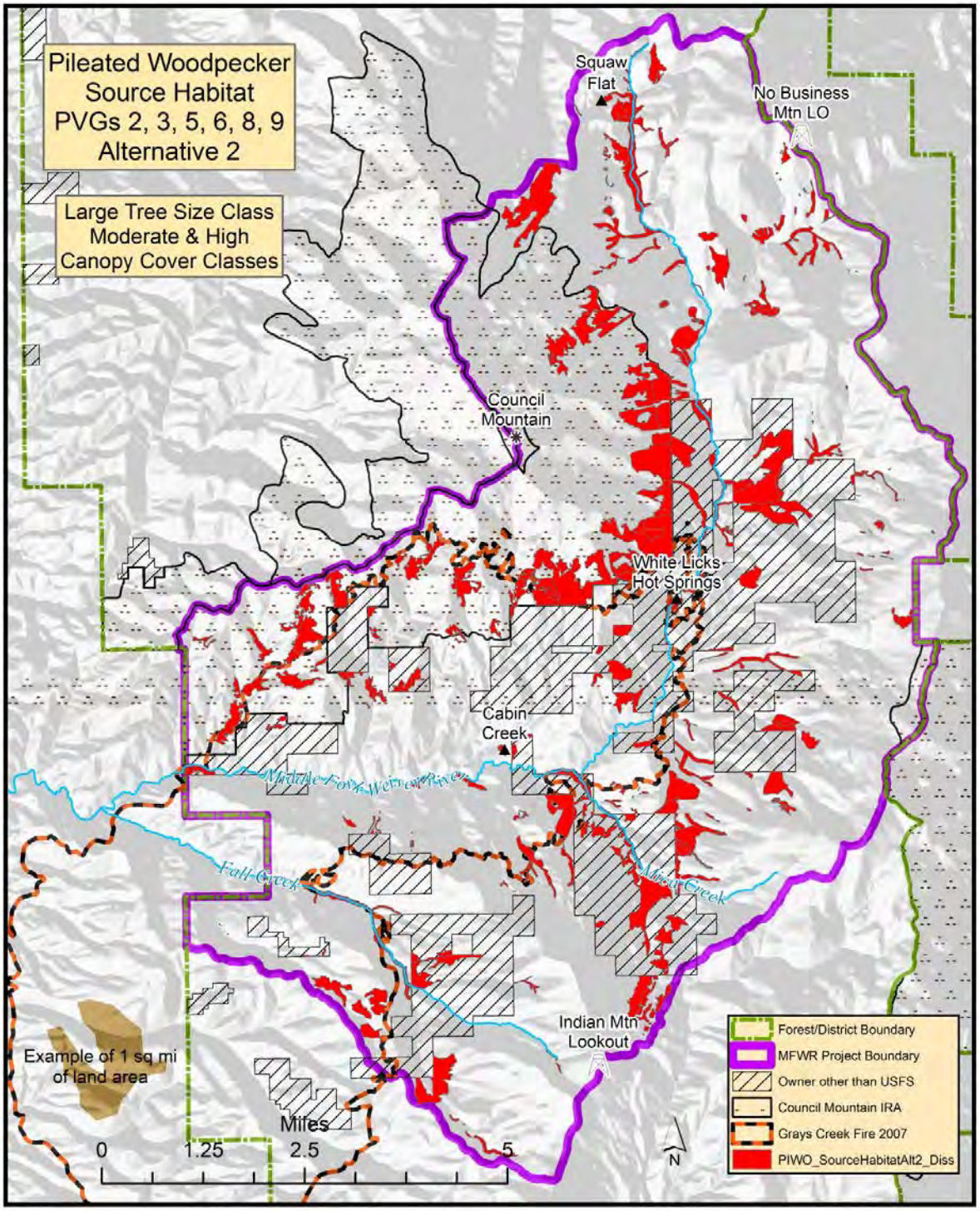


Figure 3-27. Pileated woodpecker source habitat for Potential Vegetation Groups (PVGs) 2, 3, 5, 6, 8, and 9 in the Project area under Alternative 2

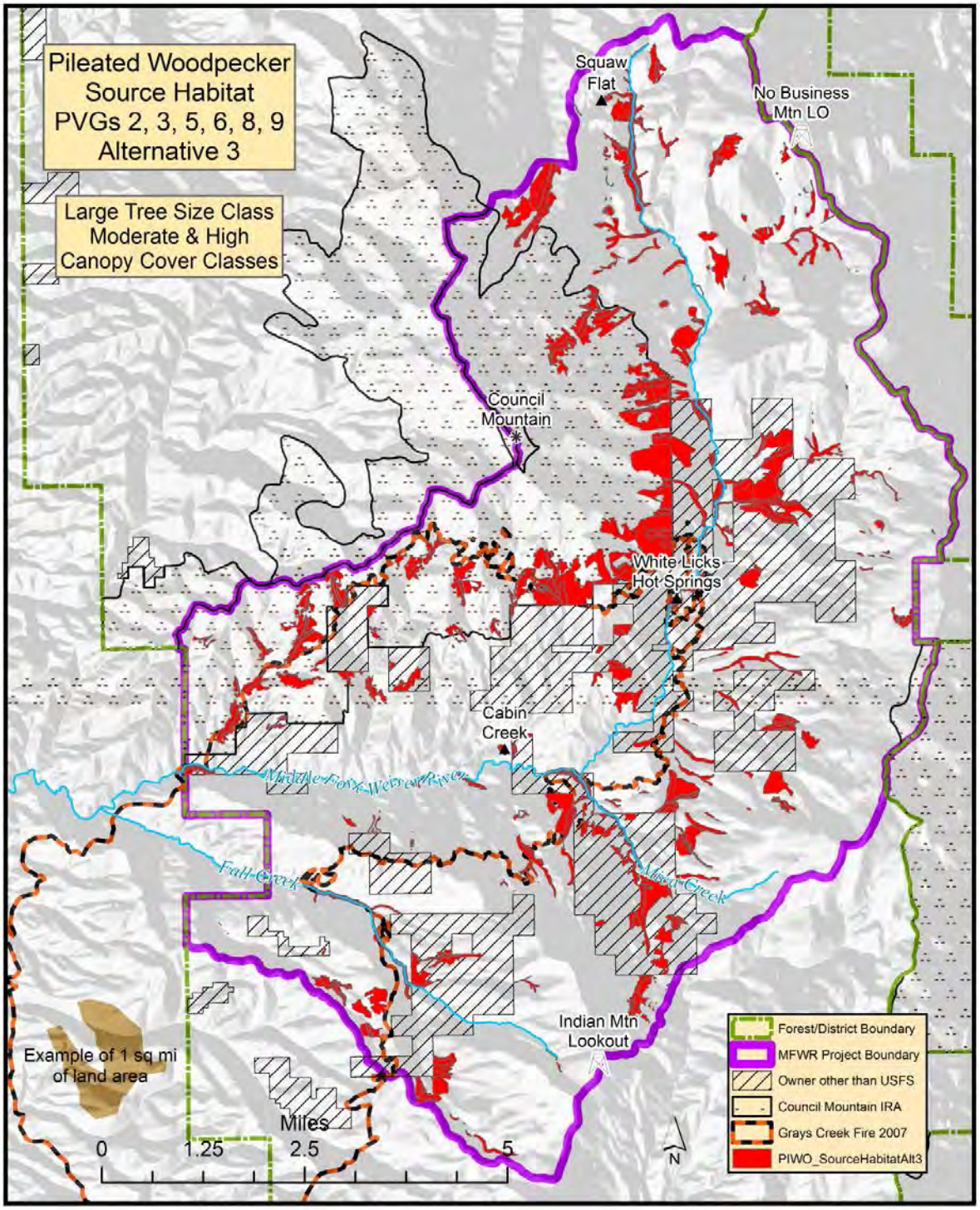


Figure 3-28. Pileated woodpecker source habitat for Potential Vegetation Groups (PVGs) 2, 3, 5, 6, 8, and 9 in the Project area under Alternative 3

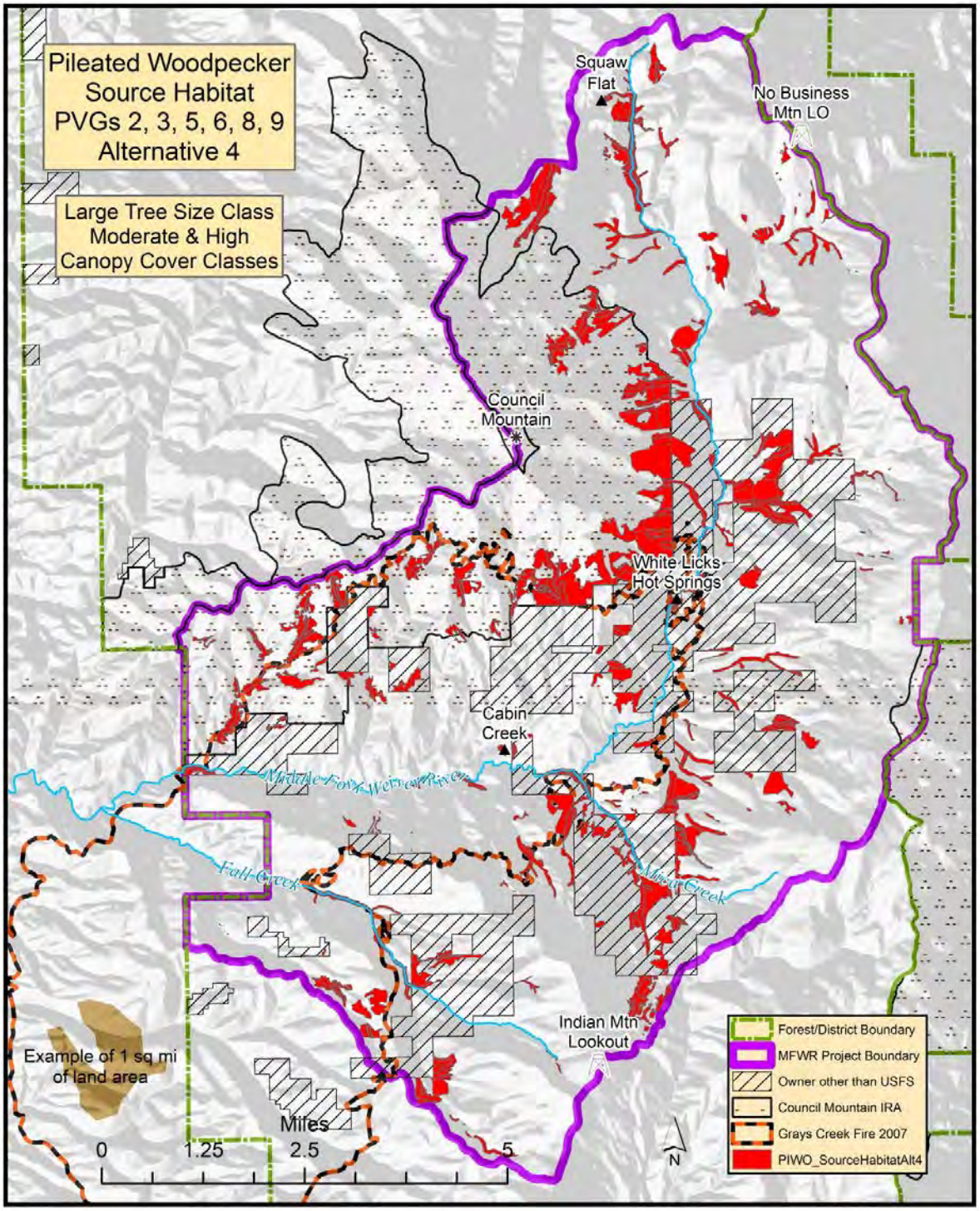


Figure 3-29. Pileated woodpecker source habitat for Potential Vegetation Groups (PVGs) 2, 3, 5, 6, 8, and 9 in the Project area under Alternative 4

3.4.6.4.2. Flammulated Owl

Alternative 1 (No Action Alternative)

Alternative 1 would not change the quantity or quality of source habitat for flammulated owls, as described for pileated woodpeckers.

Effects Common to All Action Alternatives

Restoration treatments designed to improve habitat for Family 1 species and reduce insect infestation would decrease source habitat for flammulated owls under all action alternatives. These treatments would lead to more rapid tree growth (large trees), but would reduce canopy cover classes in the short term (0-5 years). It is likely that many treated stands that would shift canopy cover from moderate to low cover class would still provide some flammulated owl source habitat; therefore, actual source habitat declines likely would not be as great as indicated by modeled habitat.

Effects to patch and pattern of source habitat for flammulated owls would include larger patch size, closer distribution, and increased habitat connectivity. As tree density and size increases in the future, the local flammulated owl population would gradually increase.

Direct and Indirect Effects from Alternatives 2, 3, and 4

Flammulated owl source habitat on NFS lands within the Project area would decrease from 15 acres to 6 acres of PVG 1 under each action alternative; from 705 acres of PVG 2 to 332 acres under Alternatives 2 and 3, and 331 acres under Alternative 4; from 2,080 acres of PVG 5 to 624 acres under Alternatives 2 and 3, and 610 acres under Alternative 4; from 4,847 acres under PVG 6 to 1,644 acres under Alternative 2, 1,573 acres under Alternative 3, and 1,617 acres under Alternative 4 (Table 3-50,Table 3-51, Table 3-52; Figure 3-30, Figure 3-31, Figure 3-32). Most of the change in source habitat acreage would be from reduction of canopy cover in the medium and large tree size classes in PVGs 5 and 6. These stands are also key stands for application of restoration treatments. Although white-headed woodpeckers could benefit from these treatments, flammulated owls would likely lose source habitats. The number of potential flammulated owl home ranges on NFS lands in the Project area would decrease from 246 to 84, 81, and 82, respectively under Alternatives 2, 3, and 4.

If vocal responses occur during spring monitoring surveys, nest searches will be initiated to identify nest stands that for protection from adverse structural alteration from vegetation treatments (see Project Design Features in Chapter 2).

Cumulative Effects

Actions on NFS lands that may cumulatively impact flammulated owls include ongoing fuelwood removal, as described for pileated woodpecker. All action alternatives would decrease flammulated owl habitat in the Project area in the short term, as described for pileated woodpecker. Road obliteration would benefit flammulated owl and other Habitat Family 2 species, as described for pileated woodpecker.

Because the flammulated owl is a neotropical migrant, the Forest Service cannot influence management of flammulated owl seasonal habitats outside of the Forest, especially not in

countries in Central America. Changes in habitat availability, quantity, and quality in those countries could ultimately affect the long-term survival of this species.

Determinations

Alternatives 2, 3, and 4 *may impact individuals* or habitat, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Table 3-50. Alternative 2 flammulated owl summer source habitat (acres), by Potential Vegetation Group (PVG), in the Project area on private and National Forest System (NFS) lands

Tree Size/Canopy Cover Class	PVG 1	PVG 2	PVG 3	PVG 5	PVG 6	Totals
Medium/Moderate NFS Lands	0	167	0	130	323	620
Large/Moderate NFS Lands	6	165	0	494	1,320	1,985
Total NFS Lands	**6**	**332**	**0**	**624**	**1,644**	**2,606**
Medium/Moderate Private Lands	0	893	0	1,180	2,021	4,094
Large/Moderate Private Lands	4	110	0	186	351	651
Total Private Lands	**4**	**1,003**	**0**	**1,366**	**2,372**	**4,746**
Total All Ownership	**10**	**1,335**	**0**	**1,990**	**4,016**	**7,351**

Table 3-51. Alternative 3 flammulated owl summer source habitat (acres), by Potential Vegetation Group (PVG), in the Project area on private and National Forest System (NFS) lands

Tree Size/Canopy Cover Class	PVG 1	PVG 2	PVG 3	PVG 5	PVG 6	Totals
Medium/Moderate NFS Lands	0	167	0	130	323	620
Large/Moderate NFS Lands	6	165	0	494	1,250	1,914
Total NFS Lands	**6**	**332**	**0**	**624**	**1,573**	**2,535**
Medium/Moderate Private Lands	0	893	0	1,180	2,021	4,094
Large/Moderate Private Lands	4	110	0	186	351	651
Total Private Lands	**4**	**1,003**	**0**	**1,366**	**2,372**	**4,746**
Total All Ownership	**10**	**1,335**	**0**	**1,990**	**3,945**	**7,281**

Table 3-52. Alternative 4 flammulated owl summer source habitat (acres), by Potential Vegetation Group (PVG), in the Project area on private and National Forest System (NFS) lands

Tree Size/Canopy Cover Class	PVG 1	PVG 2	PVG 3	PVG 5	PVG 6	Totals
Medium/Moderate NFS Lands	0	167	0	123	311	602
Large/Moderate NFS Lands	6	164	0	486	1,306	1,963
Total NFS Lands	**6**	**331**	**0**	**610**	**1,617**	**2,564**
Medium/Moderate Private Lands	0	893	0	1,180	2,021	4,094
Large/Moderate Private Lands	4	110	0	186	351	651
Total Private Lands	**4**	**1,003**	**0**	**1,366**	**2,372**	**4,746**
Total All Ownership	**10**	**1,334**	**0**	**1,976**	**3,989**	**7,310**

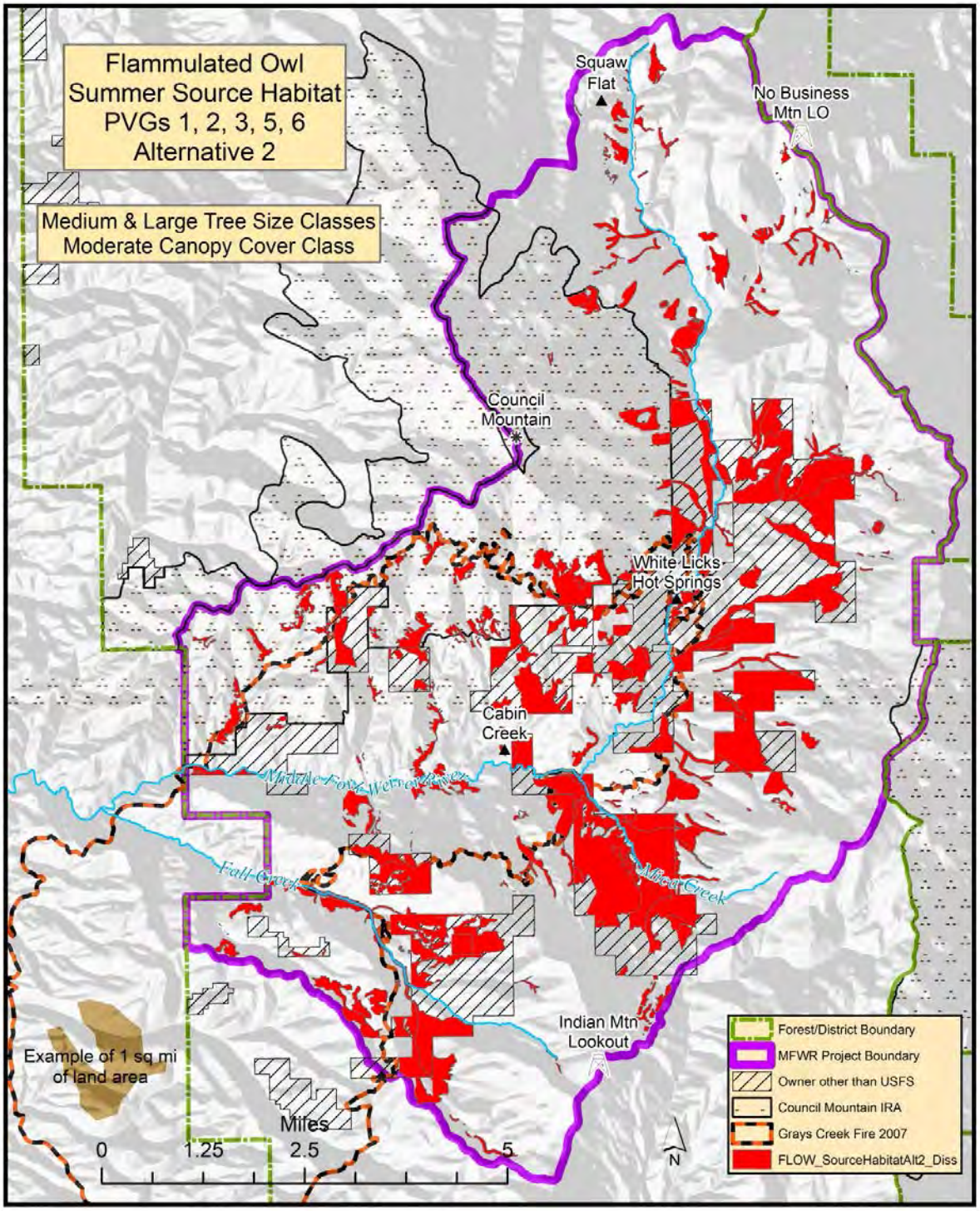


Figure 3-30. Flammulated owl summer source habitat for Potential Vegetation Groups (PVGs) 1, 2, 3, 5, and 6 in the Project area under Alternative 2

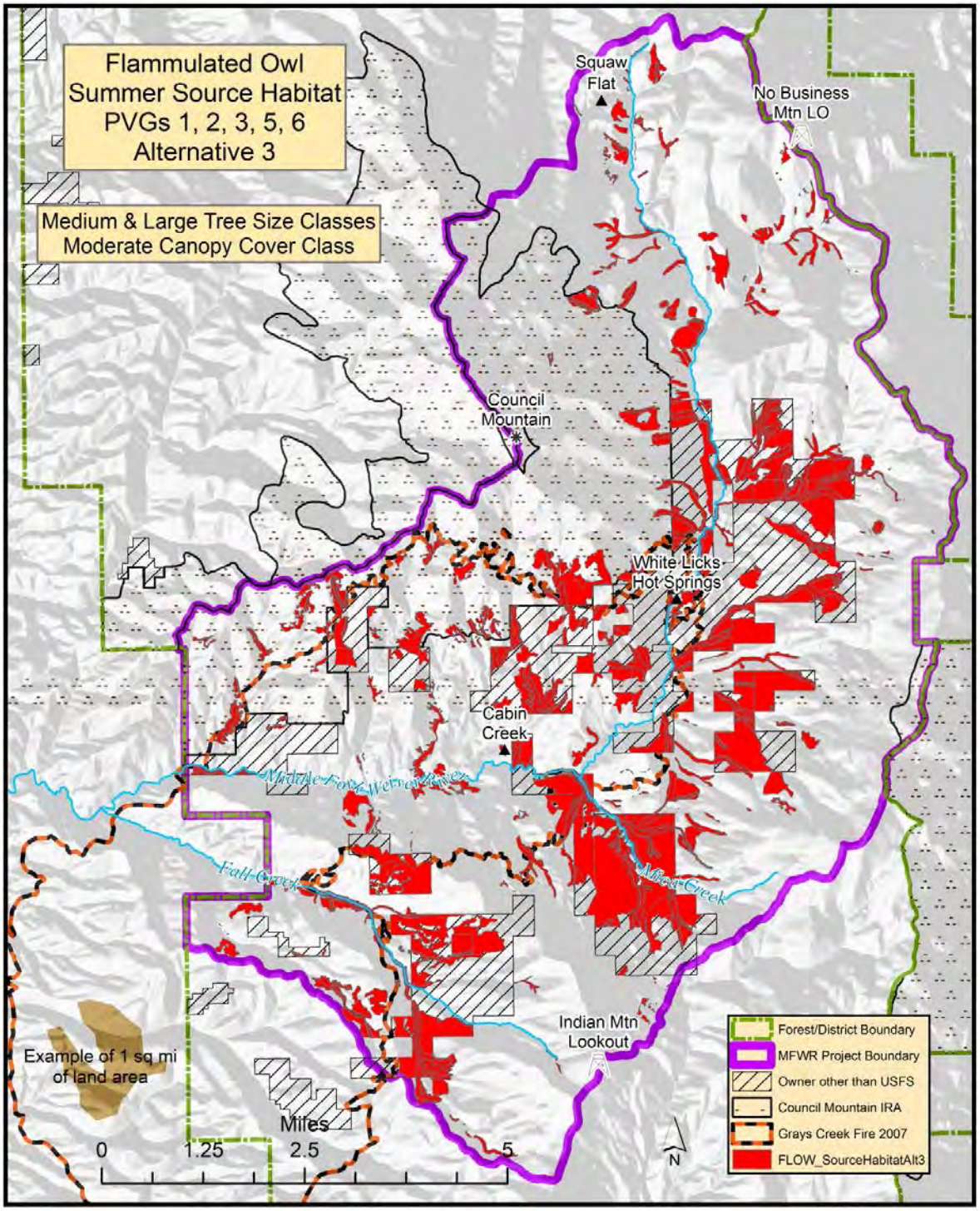


Figure 3-31. Flammulated owl summer source habitat for Potential Vegetation Groups (PVGs) 1, 2, 3, 5, and 6 in the Project area under Alternative 3

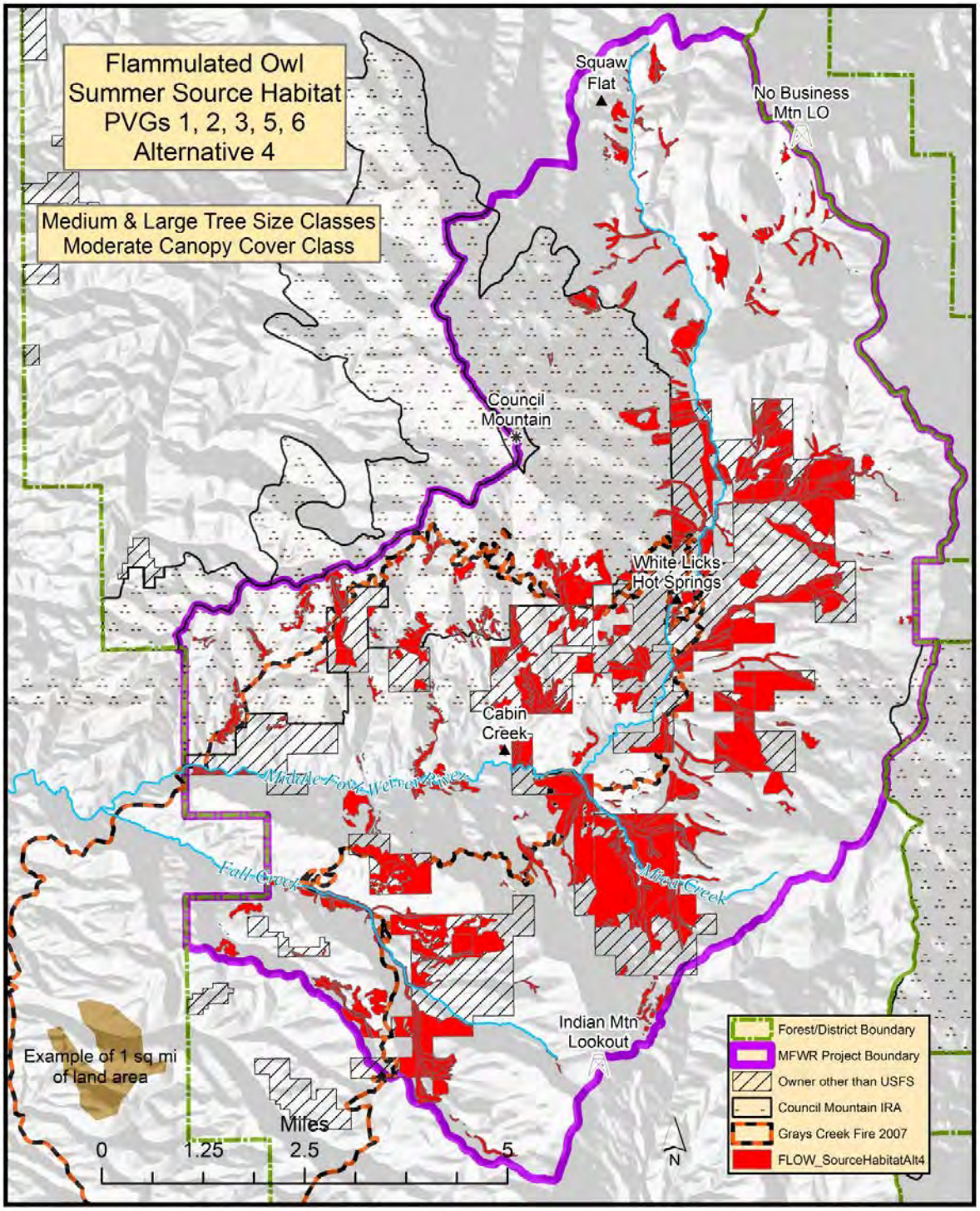


Figure 3-32. Flammulated owl summer source habitat for Potential Vegetation Groups (PVGs) 1, 2, 3, 5, and 6 in the Project area under Alternative 4

3.4.6.4.3. American Three-toed Woodpecker

Alternative 1 (No Action Alternative)

Alternative 1 would not change the quantity or quality of source habitat for American three toed woodpecker s, as described for pileated woodpeckers. The American three toed woodpecker would likely benefit under the No Action Alternative from the increased susceptibility of forest stands to uncharacteristic wildfires, and the resulting provision of snags as feeding sites.

Direct and Indirect Effect from Alternatives 2, 3, and 4

Source habitat for American three toed woodpecker would decrease on NFS lands in the Project area by roughly 4,000 acres under each action alternative (Table 3-53, Table 3-54, Table 3-55; Figure 3-33, Figure 3-34, Figure 3-35). The action alternatives would differ only by approximately 400 acres in the total acreage of source habitat remaining after restoration treatments, from 1,388 to 1,790 acres on NFS lands, hence each action alternative would have similar effects to the species. Most of the habitat decrease would occur in PVG 6 stands. For example, under Alternative 2 in PVG 6 stands, 882 acres of American three toed woodpecker source habitat remains of the current 4,381 acres available on NFS lands in the Project area. This reduction in acres would be due to the need to reduce the large number of stands in the large tree size class/high canopy cover class, to move the Project area toward the Forest Plan desired condition. Because the American three toed woodpeckers use specific microsite characteristics in forest stands, the amount of source habitat is likely overestimated under all Alternatives. Assuming an increase in tree mortality, (due to the western spruce budworm and other insect species infestation), the number of dead and dying trees available for American three toed woodpecker foraging could increase significantly, but the actual number of acres of source habitat would remain the same as that shown in Table 3-53, Table 3-54, and Table 3-55. Again, this illustrates the failure of the model to identify microsite habitat characteristics.

Potential American three toed woodpecker home ranges remaining in the Project area following restoration treatments would be approximately 4 for Alternatives 2 and 3, and 3 for Alternative 4, a reduction of roughly 10 potential home ranges from current condition.

Cumulative Effects

Actions on NFS lands that may cumulatively impact American three toed woodpecker include ongoing fuelwood removal, as described for pileated woodpecker. All action alternatives would decrease American three toed woodpecker habitat in the Project area in the short term, as described for pileated woodpecker. American three toed woodpecker source habitat is currently in small, isolated stands; this habitat distribution would not improve under any of the action alternatives. Road obliteration would benefit American three toed woodpecker and other Habitat Family 2 species, as described for pileated woodpecker.

Determinations

Alternatives 2, 3, and 4 *may impact individuals* or habitat, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Table 3-53. Alternative 2 American three-toed woodpecker source habitat (acres), by Potential Vegetation Group (PVG), in the Project area on private and National Forest System (NFS) lands

Tree Size/Canopy Cover Class	PVG 5	PVG 6	PVG 8	PVG 9	PVG 10	PVG 11	Totals
Medium/Moderate NFS Lands	0	0	37	41	65	0	143
Large/Moderate NFS Lands	0	0	0	206	288	191	684
Large/High NFS Lands	80	882	0	0	0	0	962
Total NFS Lands	**80**	**882**	**37**	**247**	**353**	**191**	**1,790**
Medium/Moderate Private Lands	0	0	0	0	11	0	11
Large/Moderate Private Lands	0	0	0	64	0	0	64
Large/High Private Lands	18	253	0	0	0	0	271
Total Private Lands	**18**	**253**	**0**	**64**	**11**	**0**	**346**
Total All Ownership	**98**	**1,135**	**37**	**311**	**364**	**191**	**2,136**

Table 3-54. Alternative 3 American three-toed woodpecker source habitat (acres), by Potential Vegetation Group (PVG), in the Project area on private and National Forest System (NFS) lands

Tree Size/Canopy Cover Class	PVG 5	PVG 6	PVG 8	PVG 9	PVG 10	PVG 11	Totals
Medium/Moderate NFS Lands	0	0	37	41	79	0	157
Large/Moderate NFS Lands	0	0	0	200	278	191	669
Large/High NFS Lands	80	884	0	0	0	0	964
Total NFS Lands	**80**	**884**	**37**	**241**	**357**	**191**	**1,790**
Medium/Moderate Private Lands	0	0	0	0	11	0	11
Large/Moderate Private Lands	0	0	0	64	0	0	64
Large/High Private Lands	18	253	0	0	0	0	271
Total Private Lands	**18**	**253**	**0**	**64**	**11**	**0**	**346**
Total All Ownership	**98**	**1,136**	**37**	**306**	**368**	**191**	**2,136**

Table 3-55. Alternative 4 American three-toed woodpecker source habitat (acres), by Potential Vegetation Group (PVG), in the Project area on private and National Forest System (NFS) lands

Tree Size/Canopy Cover Class	PVG 5	PVG 6	PVG 8	PVG 9	PVG 10	PVG 11	Totals
Medium/Moderate NFS Lands	0	0	0	39	13	0	52
Large/Moderate NFS Lands	0	0	0	206	139	69	414
Large/High NFS Lands	78	843	0	0	0	0	922
Total NFS Lands	**78**	**843**		**245**	**152**	**69**	**1,388**
Medium/Moderate Private Lands	0	0	0	0	11	0	11
Large/Moderate Private Lands	0	0	0	64	0	0	64
Large/High Private Lands	18	253	0	0	0	0	271
Total Private Lands	**18**	**253**	**0**	**64**	**11**	**0**	**346**
Total All Ownership	**97**	**1,096**	**0**	**309**	**163**	**69**	**1,734**

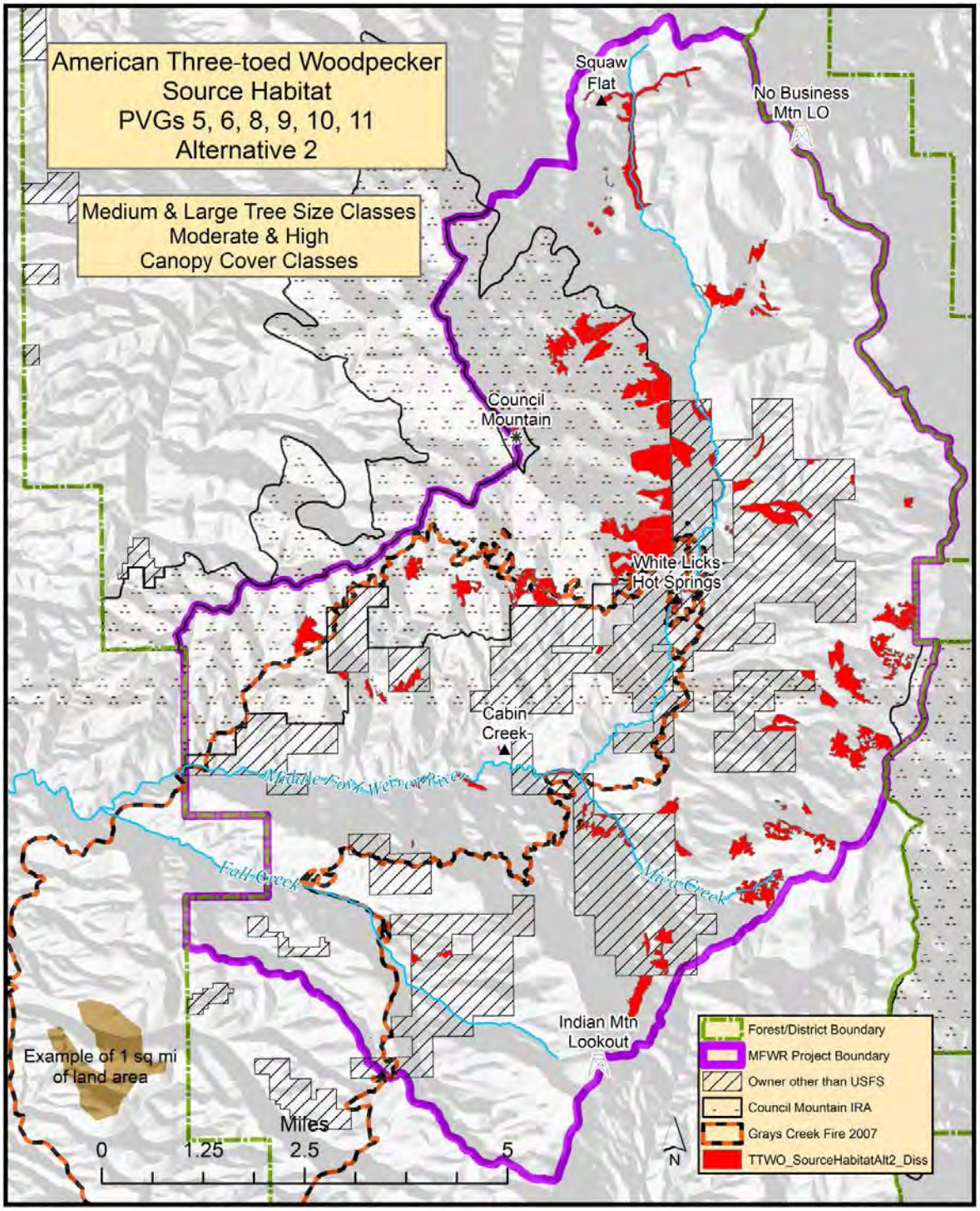


Figure 3-33. American three-toed woodpecker source habitat for Potential Vegetation Groups (PVGs) 5, 6, 8, 9, 10, and 11 in the Project area under Alternative 2

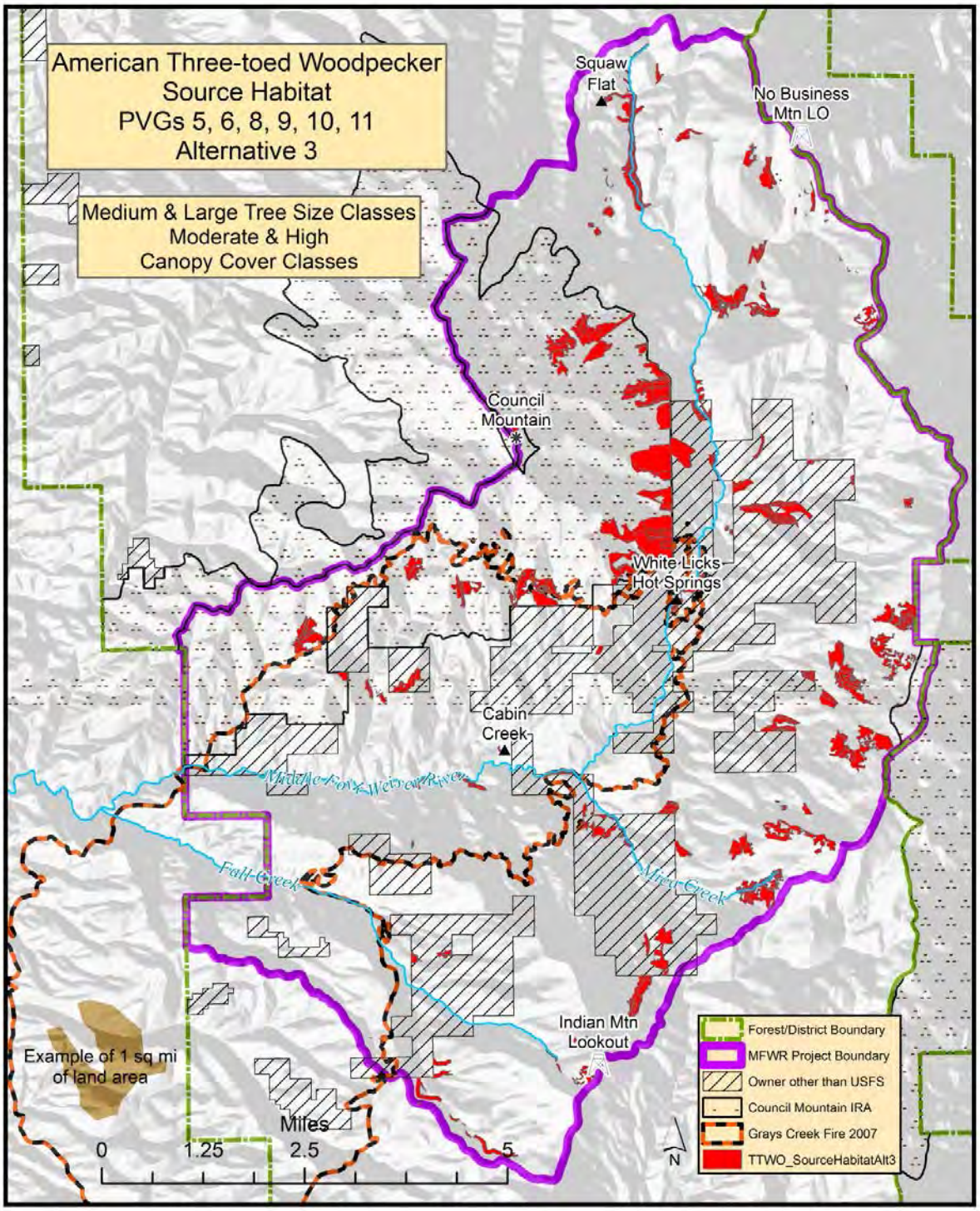


Figure 3-34. American three-toed woodpecker source habitat for Potential Vegetation Groups (PVGs) 5, 6, 8, 9, 10, and 11 in the Project area under Alternative 3

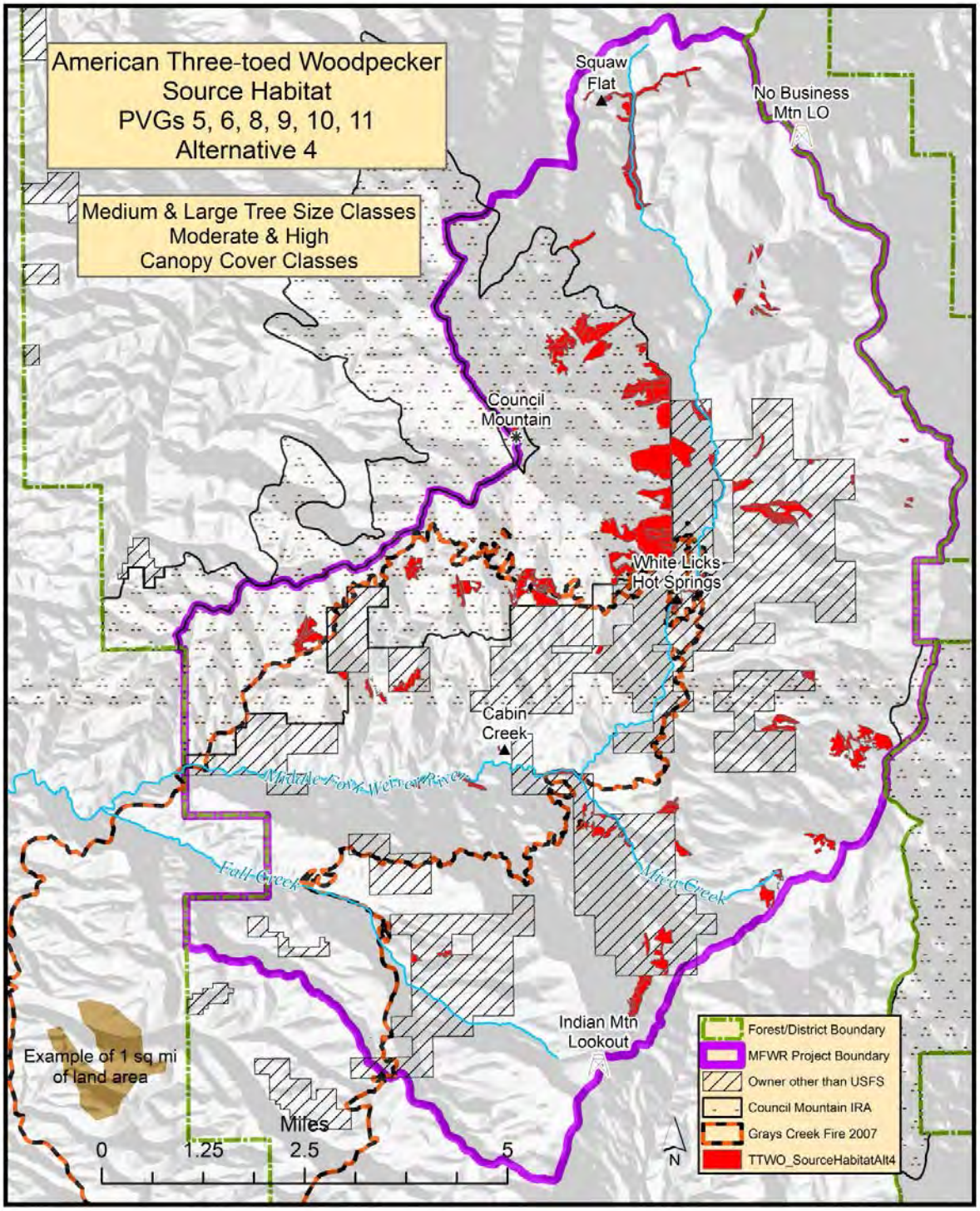


Figure 3-35. American three-toed woodpecker source habitat for Potential Vegetation Groups (PVGs) 5, 6, 8, 9, 10, and 11 in the Project area under Alternative 4

3.4.6.4.4. Black-backed Woodpecker

Alternative 1 (No Action Alternative)

Alternative 1 would not change the quantity or quality of source habitat for black-backed woodpeckers, as described for pileated woodpeckers.

Effects Common to All Action Alternatives

Restoration treatments designed to improve habitat for Family 2 species and to reduce insect infestation would decrease source habitat for black-backed woodpeckers under all action alternatives. These treatments would lead more rapid tree growth, but reduced canopy cover in the short term, as described for flammulated owl.

Alternatives 2, 3, and 4

Source habitat for black-backed woodpecker (13,874 acres) would decrease by approximately 7,600, 7,155, and 8,590 acres, respectively, for Alternatives 2, 3, and 4. (Table 3-56, Table 3-57, Table 3-58; Figure 3-36, Figure 3-37, Figure 3-38). Changes in black-backed woodpecker source habitat would differ from changes in American three toed woodpecker source habitat because PVG 7 is included in the black-backed woodpecker habitat model. Most of the habitat decrease would occur in PVG 6 stands. For example, under Alternative 2 in PVG 6 stands, 882 acres of black-backed woodpecker source habitat would remain of the current 4,381 acres available. This would be due to the need to reduce the large number of stands in the large tree size class, to move toward the Forest Plan desired condition. As was noted for American three toed woodpecker, because the black-backed woodpecker uses specific microsite characteristics in the stand, the source habitat acreage changes are likely overestimated for all Alternatives. Assuming an increase in tree mortality (due to the western spruce budworm and other insect species infestation), the number of dead and dying trees available for black-backed woodpecker foraging could increase significantly. However, the actual number of acres of source habitat would remain the same as that shown for each action alternative because the habitat analysis shows only acres of source habitat by PVG, which does not provide the level of microsite measurements required to show use of individual trees. Potential black-backed woodpecker home ranges remaining in the Project area following restoration treatments would be approximately 25, 27, and 21, respectively for Alternatives 2, 3 and 4, a reduction of roughly 28 to 34 potential home ranges from current condition.

Effects to patch and pattern of source habitat for black-backed woodpeckers essentially would not change under Alternative 3, but under Alternatives 2 and 4, patch size and distribution would be reduced because of harvest at higher elevations.

Cumulative Effects

Actions on NFS lands that may cumulatively impact black-backed woodpeckers include ongoing fuelwood removal, as described for pileated woodpecker. All action alternatives would decrease black-backed woodpecker habitat in the Project area in the short term, as described for pileated woodpecker. Road obliteration would benefit black-backed woodpecker and other Habitat Family 2 species, as described for pileated woodpecker.

Determinations

Alternatives 2, 3, and 4 *may impact individuals or habitat*, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Table 3-56. Alternative 2 black-backed woodpecker source habitat (acres), by Potential Vegetation Group (PVG), in the Project area on private and National Forest System (NFS) lands

Tree Size/Canopy Cover Class	PVG4	PVG 6	PVG 7	PVG 8	PVG 9	PVG 10	Totals
Medium/Moderate NFS Lands	0	323	161	37	41	65	627
Large/Moderate NFS Lands	0	1,320	1,958	0	206	288	3,772
Large/High NFS Lands	0	882	994	0	0	0	1,876
Total NFS Lands	**0**	**2,526**	**3,112**	**37**	**247**	**353**	**6,274**
Medium/Moderate Private Lands	0	2,021	164	0	0	11	2,196
Large/Moderate Private Lands	0	351	106	0	64	0	521
Large/High Private Lands	0	253	31	0	0	0	284
Total Private Lands	0	**2,625**	**301**	**0**	**64**	**11**	**3,001**
Total All Ownership	0	5,151	3,412	37	311	364	9,275

Table 3-57. Alternative 3 black-backed woodpecker source habitat (acres), by Potential Vegetation Group (PVG), in the Project area on private and National Forest System (NFS) lands

Tree Size/Canopy Cover Class	PVG4	PVG 6	PVG 7	PVG 8	PVG 9	PVG 10	Totals
Medium/Moderate NFS Lands	0	323	182	37	41	79	663
Large/Moderate NFS Lands	0	1,250	2,108		200	278	3,835
Large/High NFS Lands	0	884	1,337				2,221
Total NFS Lands	**0**	**2,457**	**3,627**	**37**	**241**	**357**	**6,719**
Medium/Moderate Private Lands	0	2,021	164			11	2,196
Large/Moderate Private Lands	0	351	106		64		521
Large/High Private Lands	0	253	31				284
Total Private Lands	0	**2,625**	**301**		**64**	**11**	**3,001**
Total All Ownership	**0**	**5,082**	**3,928**	**37**	**306**	**368**	**9,720**

Table 3-58. Alternative 4 black-backed woodpecker source habitat (acres), by Potential Vegetation Group (PVG), in the Project area on private and National Forest System (NFS) lands

Tree Size/Canopy Cover Class	PVG4	PVG 6	PVG 7	PVG 8	PVG 9	PVG 10	Totals
Medium/Moderate NFS Lands	0	311	96	0	39	13	459
Large/Moderate NFS Lands	0	1,306	1,799	0	206	139	3,450
Large/High NFS Lands	0	843	528	0	0		1,372
Total NFS Lands	**0**	**2,460**	**2,424**	**0**	**245**	**152**	**5,281**
Medium/Moderate Private Lands	0	2,021	164	0	0	11	2,196
Large/Moderate Private Lands	0	351	106	0	64	0	521
Large/High Private Lands	0	253	31	0	0	0	284
Total Private Lands	0	**2,625**	**301**	0	**64**	**11**	**3,001**
Total All Ownership	0	5,085	2,724	0	309	163	8,282

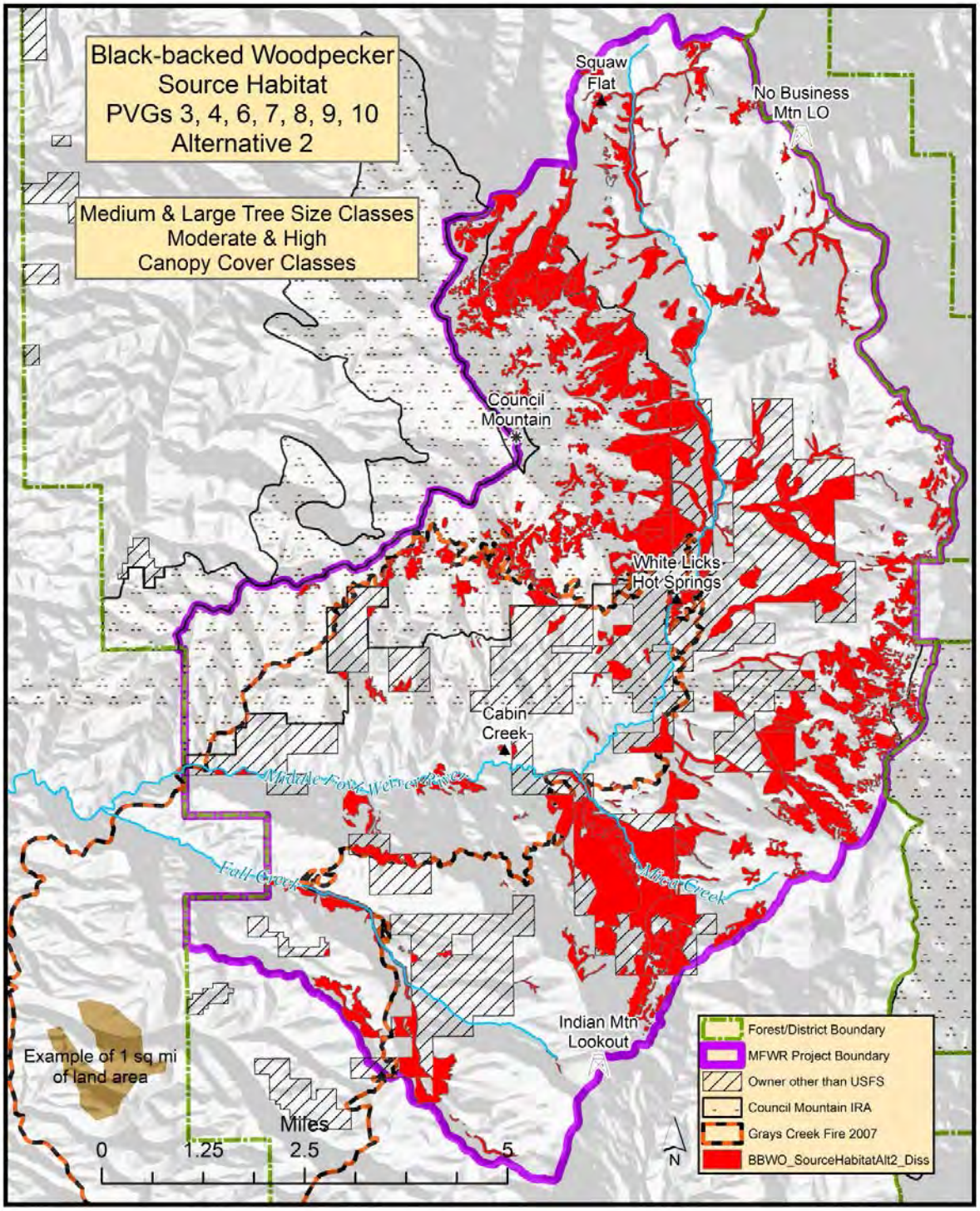


Figure 3-36. Black-backed woodpecker source habitat for Potential Vegetation Groups (PVGs) 3, 4, 6, 7, 8, 9, and 10 in the Project area under Alternative 2

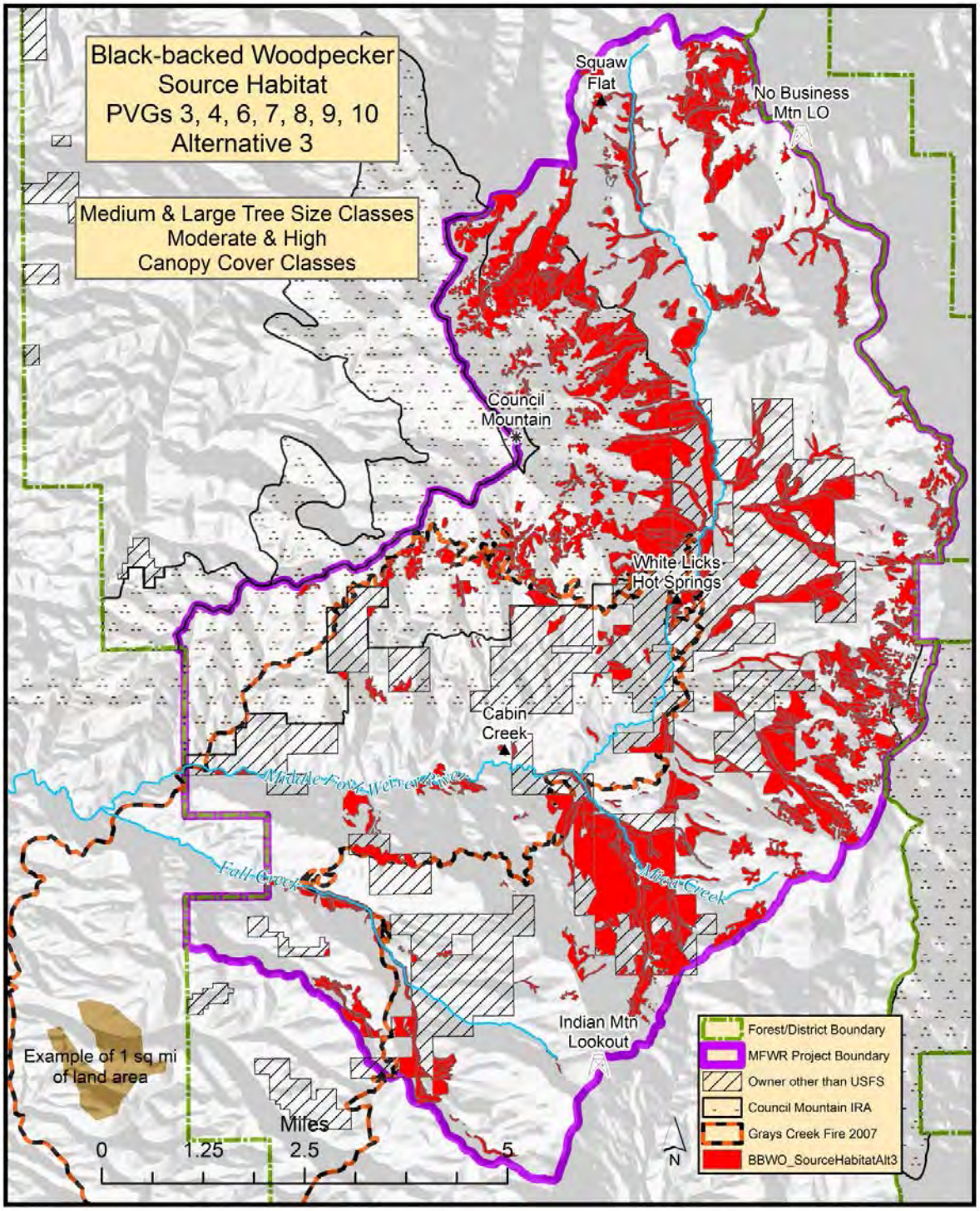


Figure 3-37. Black-backed woodpecker source habitat for Potential Vegetation Groups (PVGs) 3, 4, 6, 7, 8, 9, and 10 in the Project area under Alternative 3

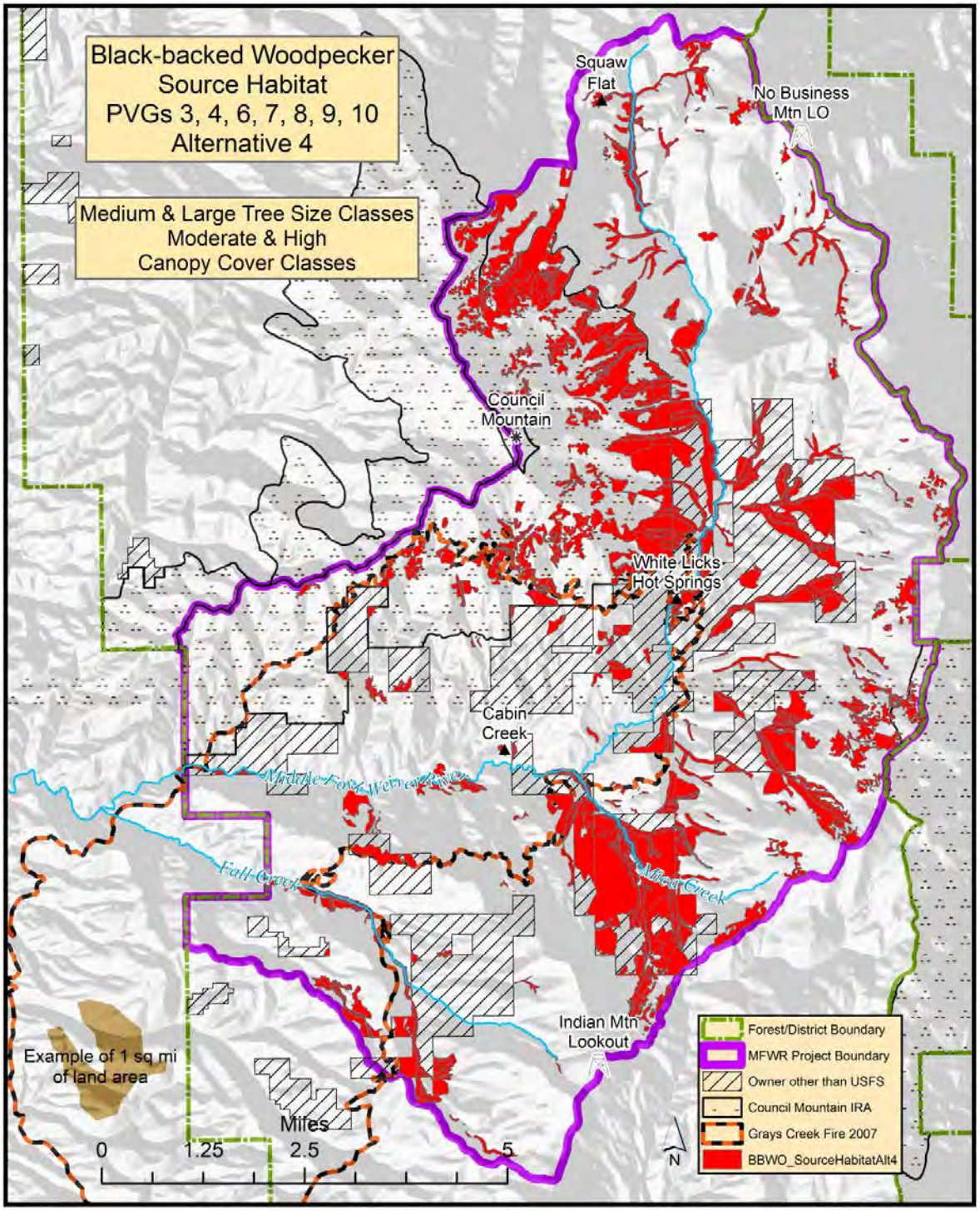


Figure 3-38. Black-backed woodpecker source habitat for Potential Vegetation Groups (PVGs) 3, 4, 6, 7, 8, 9, and 10 in the Project area under Alternative 4

3.4.6.4.5. Boreal Owl

Alternative 1 (No Action Alternative)

Alternative 1 would not change the quantity or quality of source habitat for boreal owls, as described for pileated woodpeckers.

Effects Common to All Action Alternatives

Restoration treatments designed to improve habitat for Family 2 species and to reduce insect infestation would decrease source habitat for boreal owls under all action alternatives. These treatments would lead more rapid tree growth (large trees), but reduced canopy cover in the short term, as described for flammulated owl.

Direct and Indirect Effects from Alternatives 2, 3, and 4

Source habitat for boreal owl on NFS lands (14,068 acres) would decrease under all action alternatives. Decreases in habitat following restoration treatments would be similar under Alternative 2 (7,699-acre decrease) and Alternative 3 (7,186-acre decrease), with most changes occurring within PVGs 6 and 7 (Table 3-59 and Table 3-60; Figure 3-39 and Figure 3-40). Slightly smaller decreases (8,661-acre decrease) would occur under Alternative 4 (Table 3-61 and Figure 3-41). The number of potential boreal owl home ranges would decrease under all action alternatives, from 4 home ranges at current condition, to two under Alternatives 2 and 3, and one under Alternative 4. Recognizing the current low number (4) of boreal owl potential home ranges, substantial decreases in source habitat with associated decreases in potential home ranges could have a large effect on the viability of this species in the Project area. This effect would be due mostly to treatments proposed at higher elevations. However, boreal owl viability would not likely be affected at the Forest level. Most of the boreal owl habitat occurs on the east side of the Forest. The low number of observations of boreal owls in the Project area may reflect this situation. Another reason for the low number of observations in the Project area could be the small number of boreal owl surveys conducted in the area over the past decade, which could lead to a false low number of boreal owl detections.

Effects to patch and pattern of source habitat for boreal owls under Alternatives 2 and 4 would be smaller patch size, wider distribution, and decreased habitat connectivity in the short term (0-5 years). As tree density and size increases at higher elevations in the future (>15 years), the local boreal owl population should gradually increase.

Cumulative Effects

Actions on NFS lands that may cumulatively impact boreal owls include ongoing fuelwood removal, as described for pileated woodpecker. All action alternatives would decrease boreal owl habitat in the Project area in the short term. These losses are likely to be cumulative, with other negative effects to boreal owl source habitat across the Project area. The losses in boreal owl source habitat would be a result of corresponding increases in Family 1 habitats and white-headed woodpecker source habitat, which are habitats at greater risk. Alternative 3 would obliterate more roads and unauthorized routes than the other action alternatives; decreased human access into source habitats, because of road obliterations, would benefit boreal owl and other Habitat Family 2 species.

Determinations

Alternative 1 would have *no impact* on the boreal owl.

Alternatives 2, 3, and 4 *may impact individuals or habitat*, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Table 3-59. Alternative 2 boreal owl source habitat (acres), above 5,000 feet elevation, by PVG, in the Project area on private and National Forest System (NFS) lands

Tree Size/Canopy Cover Class	PVG 3	PVG 4	PVG 6	PVG 7	PVG 8	PVG 9	PVG 11	Totals
Medium/Moderate NFS Lands	0	0	323	161	37	41	0	562
Large/Moderate NFS Lands	0	0	1,320	1,958	0	206	191	3,675
Large/High NFS Lands	0	0	882	994	0	209	47	2,132
Total NFS Lands	**0**	**0**	**2,526**	**3,112**	**37**	**456**	**238**	**6,369**
Medium/Moderate Private Lands	0	0	2,021	164	0	0	0	2,185
Large/Moderate Private Lands	0	0	351	106	0	64	0	521
Large/High Private Lands	0	0	253	31	0	0	0	284
Total Private Lands	**0**	**0**	**2,625**	**301**	**0**	**64**	**0**	**2,990**
Total All Ownership	**0**	**0**	**5,151**	**3,412**	**37**	**520**	**238**	**9,358**

Table 3-60. Alternative 3 boreal owl source habitat (acres), above 5,000 feet elevation, by PVG, in the Project area on private and National Forest System (NFS) lands

Tree Size/Canopy Cover Class	PVG 3	PVG 4	PVG 6	PVG 7	PVG 8	PVG 9	PVG 11	Totals
Medium/Moderate NFS Lands	0	0	323	182	37	41	0	584
Large/Moderate NFS Lands	0	0	1,250	2,108	0	200	191	3,748
Large/High NFS Lands	0	0	884	1,337	0	282	47	2,550
Total NFS Lands	**0**	**0**	**2,457**	**3,627**	**37**	**524**	**238**	**6,882**
Medium/Moderate Private Lands	0	0	2,021	164	0	0	0	2,185
Large/Moderate Private Lands	0	0	351	106	0	64	0	521
Large/High Private Lands	0	0	253	31	0	0	0	284
Total Private Lands	**0**	**0**	**2,625**	**301**	**0**	**64**	**0**	**2,990**
Total All Ownership	**0**	**0**	**5,082**	**3,928**	**37**	**588**	**238**	**9,872**

Table 3-61. Alternative 4 boreal owl source habitat (acres), above 5,000 feet elevation, by PVG, in the Project area on private and National Forest System (NFS) lands

Tree Size/Canopy Cover Class	PVG 3	PVG 4	PVG 6	PVG 7	PVG 8	PVG 9	PVG 11	Totals
Medium/Moderate NFS Lands	0	0	311	96	0	39	0	447
Large/Moderate NFS Lands	0	0	1,306	1,799	0	206	69	3,380
Large/High NFS Lands	0	0	843	528	0	209	0	1,580
Total NFS Lands	**0**	**0**	**2,460**	**2,424**	**0**	**454**	**69**	**5,407**
Medium/Moderate Private Lands	0	0	2,021	164	0	0	0	2,185
Large/Moderate Private Lands	0	0	351	106	0	64	0	521
Large/High Private Lands	0	0	253	31	0	0	0	284
Total Private Lands	**0**	**0**	**2,625**	**301**	**0**	**64**	**0**	**2,990**
Total All Ownership	**0**	**0**	**5,085**	**2,724**	**0**	**518**	**69**	**8,397**

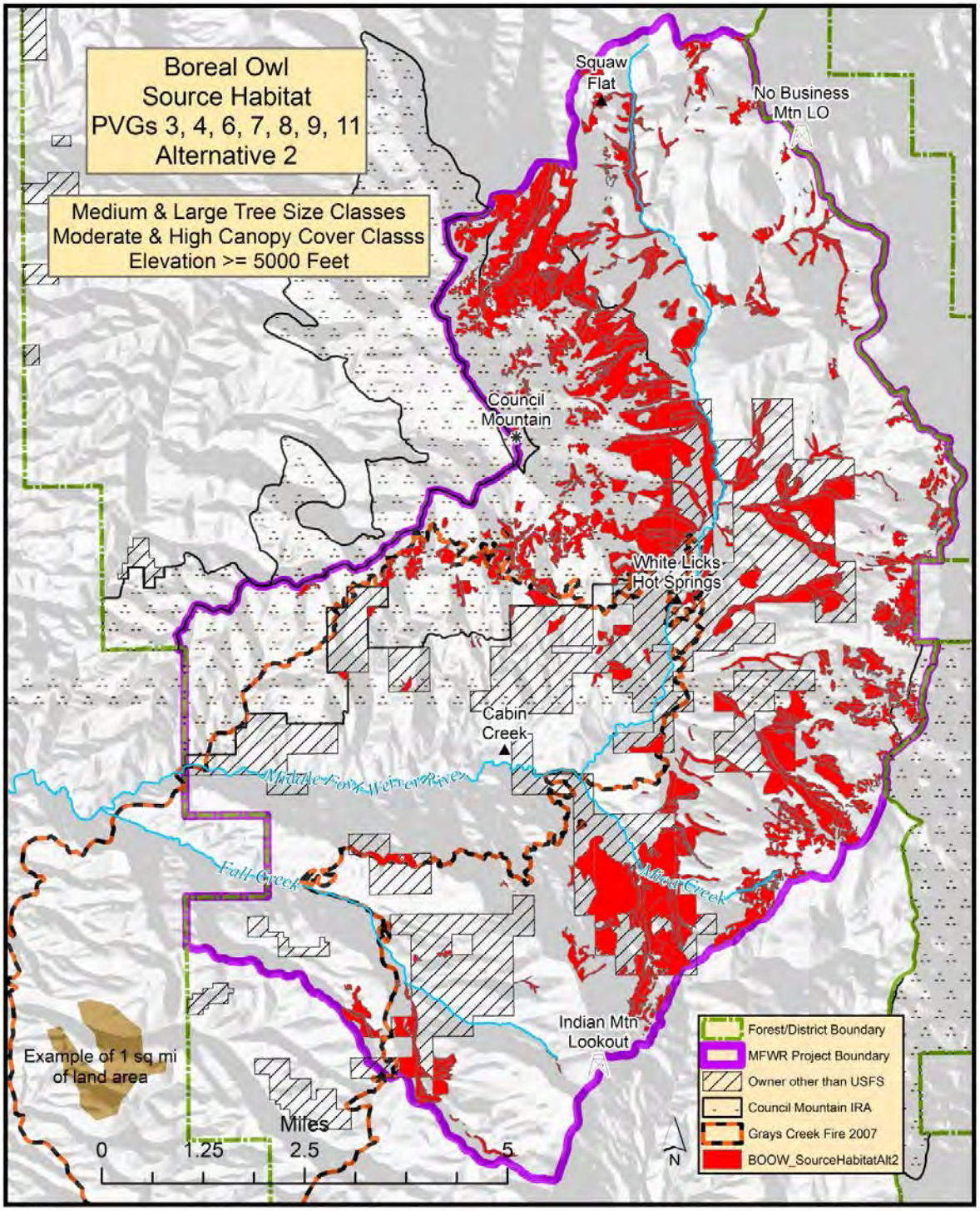


Figure 3-39. Boreal owl source habitat for Potential Vegetation Groups (PVGs) 3, 4, 6, 7, 8, 9, and 11 in the Project area under Alternative 2

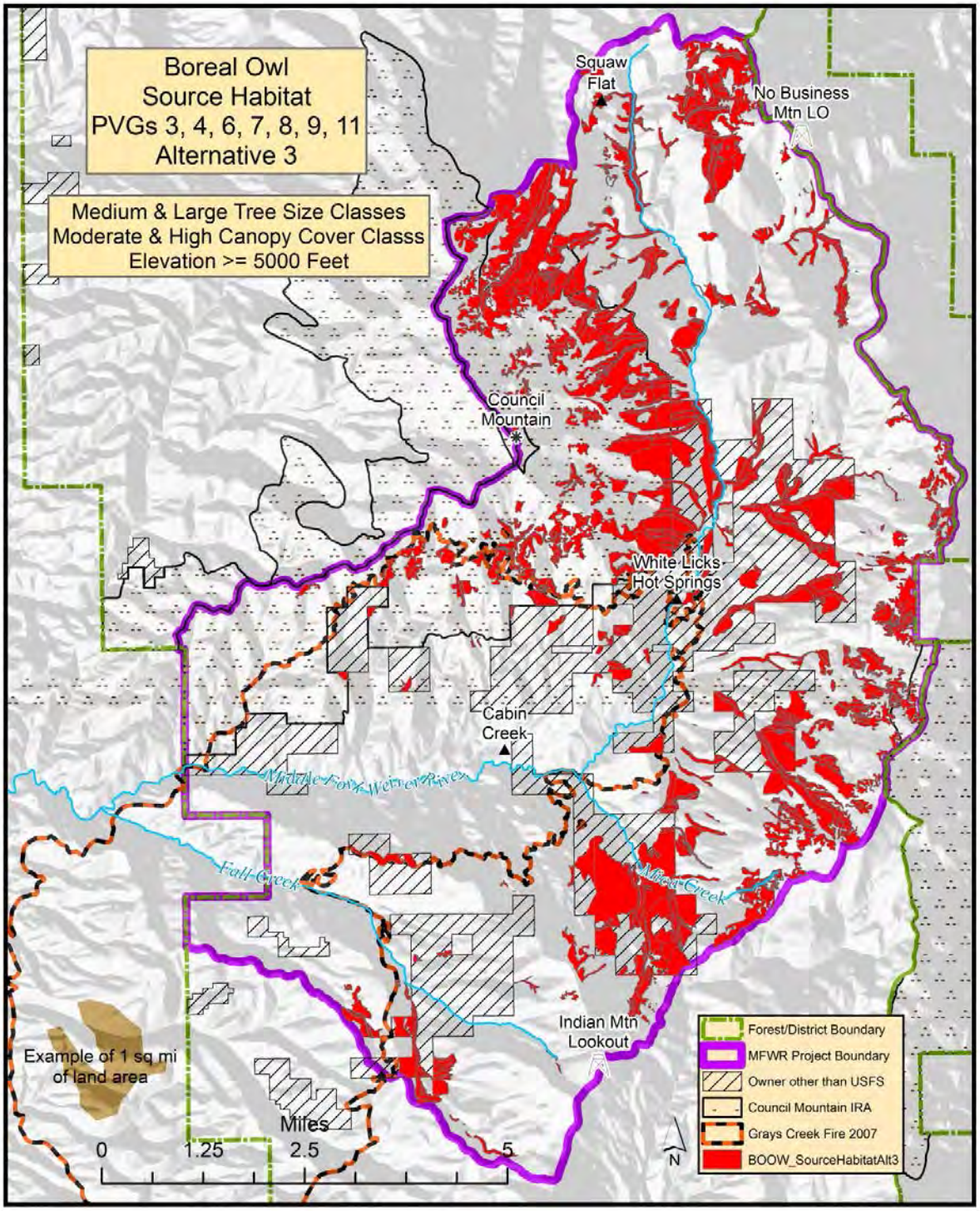


Figure 3-40. Boreal owl source habitat for Potential Vegetation Groups (PVGs) 3, 4, 6, 7, 8, 9, and 11 in the Project area under Alternative 3

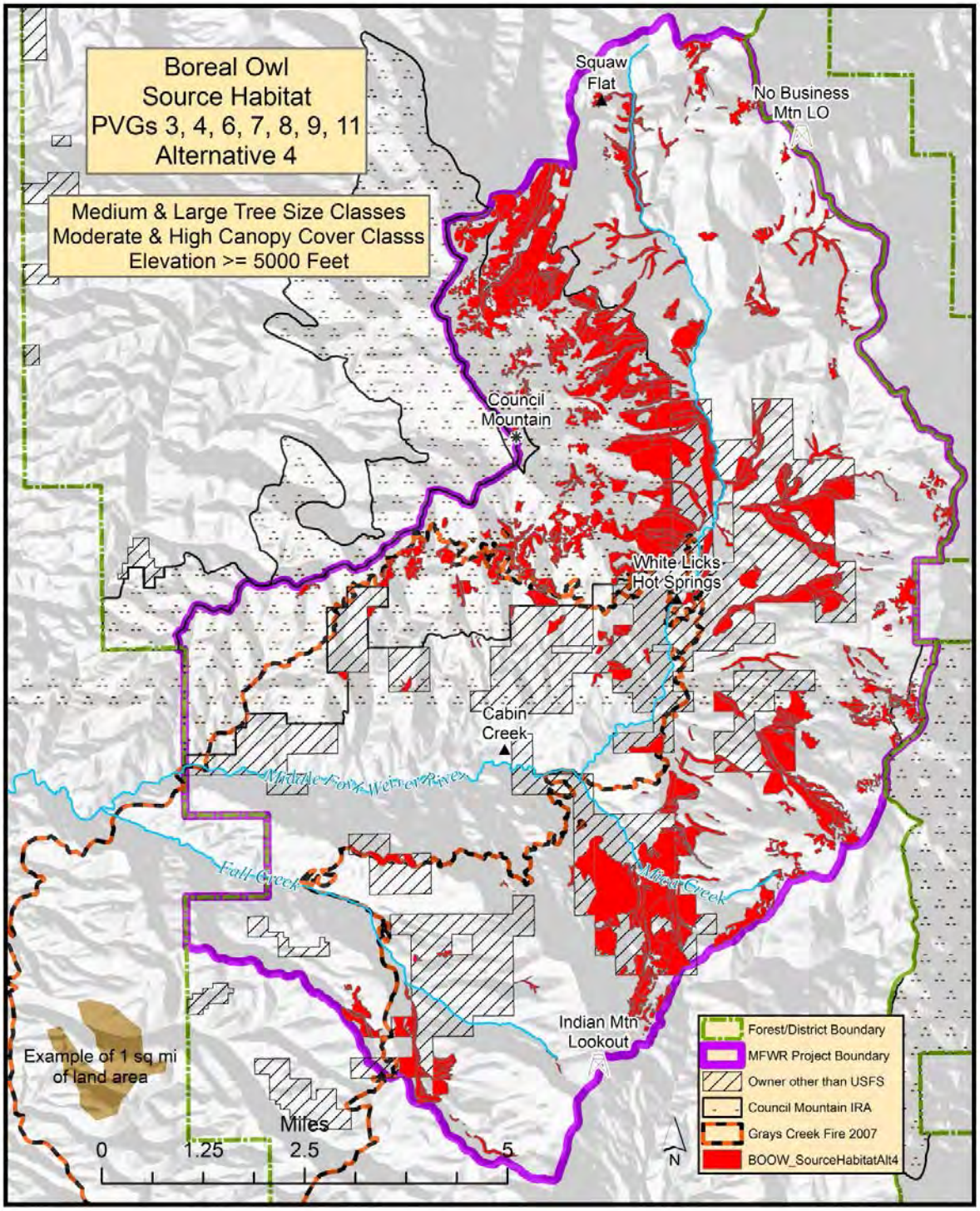


Figure 3-41. Boreal owl source habitat for Potential Vegetation Groups (PVGs) 3, 4, 6, 7, 8, 9, and 11 in the Project area under Alternative 4

3.4.6.4.6. Fisher

Alternative 1 (No Action Alternative)

Alternative 1 would not change the quantity or quality of source habitat for fishers, as no new management actions would be implemented. Combined with the lack of source habitat improvement for Habitat Family 1, the Project area forests would be more susceptible under the No Action Alternative to long-term alteration from uncharacteristic, or even stand-replacement wildfire.

Effects Common to All Action Alternatives

Restoration treatments designed to improve habitat for Family 1 species and reduce insect infestation would decrease source habitat for fishers under all action alternatives. These treatments would lead to more rapid tree growth, but would reduce canopy cover classes in the short term. Effects to patch and pattern of source habitat for fishers would include smaller patch size, wider distribution, and decreased habitat connectivity.

Direct and Indirect Effects from Alternatives 2, 3, and 4

Source habitat for fishers on NFS lands (10,489 acres) would decrease under all action alternatives by roughly 7,000 acres (Table 3-62, Table 3-63, Table 3-64; Figure 3-42, Figure 3-43, Figure 3-44). Habitat reductions would be greater under Alternative 4 than for the other action alternatives, with the largest difference noted for PVG 10. Road decommissioning and long-term road closures proposed as watershed improvements for all action alternatives would improve the quality of fisher source habitat.

Cumulative Effects

Actions on NFS lands that may cumulatively impact fishers include ongoing fuelwood removal, as described for pileated woodpecker. All action alternatives would decrease fisher habitat in the Project area in the short term (0-5 years). These losses are likely to be cumulative, with other negative effects to fisher source habitat across the Project area. The losses in fisher source habitat would result from corresponding increases in Family 1 habitats and white-headed woodpecker source habitat, which are habitats at greater risk. Alternative 3 would obliterate more roads and unauthorized routes than the other action alternatives; decreased human access into source habitats because of road obliterations would benefit fisher and other Habitat Family 2 species.

Determinations

Alternatives 2, 3, and 4 *may impact individuals or habitat*, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Table 3-62. Alternative 2 fisher source habitat (acres), by Potential Vegetation Group (PVG), in the Project area on private and National Forest System (NFS) lands

Tree Size/Canopy Cover Class	PVG 3	PVG 6	PVG 8	PVG 9	PVG 10	Total
Medium/Moderate NFS Lands	0	323	37	41	65	466
Large/Moderate NFS Lands	0	1,320	0	206	288	1,814
Large/High NFS Lands	0	882	0	209	183	1,274
Total NFS Lands	**0**	**2,526**	**37**	**456**	**536**	**3,555**
Medium/Moderate Private Lands	0	2,021	0	0	11	2,032
Large/Moderate Private Lands	0	351	0	64	0	415
Large/High Private Lands	0	253	0	0	0	253
Total Private Lands	**0**	**2,625**	**0**	**64**	**11**	**2,700**
Total All Ownership	**0**	**5,151**	**37**	**520**	**547**	**6,255**

Table 3-63. Alternative 3 fisher source habitat (acres), by Potential Vegetation Group (PVG), in the Project area on private and National Forest System (NFS) lands

Tree Size/Canopy Cover Class	PVG 3	PVG 6	PVG 8	PVG 9	PVG 10	Total
Medium/Moderate NFS Lands	0	323	37	41	79	480
Large/Moderate NFS Lands	0	1,250		200	278	1,727
Large/High NFS Lands	0	884		282	250	1,416
Total NFS Lands	**0**	**2,457**	**37**	**524**	**607**	**3,624**
Medium/Moderate Private Lands	0	2,021			11	2,032
Large/Moderate Private Lands	0	351		64		415
Large/High Private Lands	0	253		0		253
Total Private Lands	**0**	**2,625**		**64**	**11**	**2,700**
Total All Ownership	**0**	**5,082**	**37**	**588**	**618**	**6,324**

Table 3-64. Alternative 4 fisher source habitat (acres), by Potential Vegetation Group (PVG), in the Project area on private and National Forest System (NFS) lands

Tree Size/Canopy Cover Class	PVG 3	PVG 6	PVG 8	PVG 9	PVG 10	Total
Medium/Moderate NFS Lands	0	311	0	39	13	363
Large/Moderate NFS Lands	0	1,306	0	206	139	1,651
Large/High NFS Lands	0	843	0	209	84	1,136
Total NFS Lands	**0**	**2,460**	**0**	**454**	**236**	**3,150**
Medium/Moderate Private Lands	0	2,021	0	0	11	2,032
Large/Moderate Private Lands	0	351	0	64	0	415
Large/High Private Lands	0	253	0	0	0	253
Total Private Lands	**0**	**2,625**	**0**	**64**	**11**	**2,700**
Total All Ownership	**0**	**5,085**	**0**	**518**	**247**	**5,851**

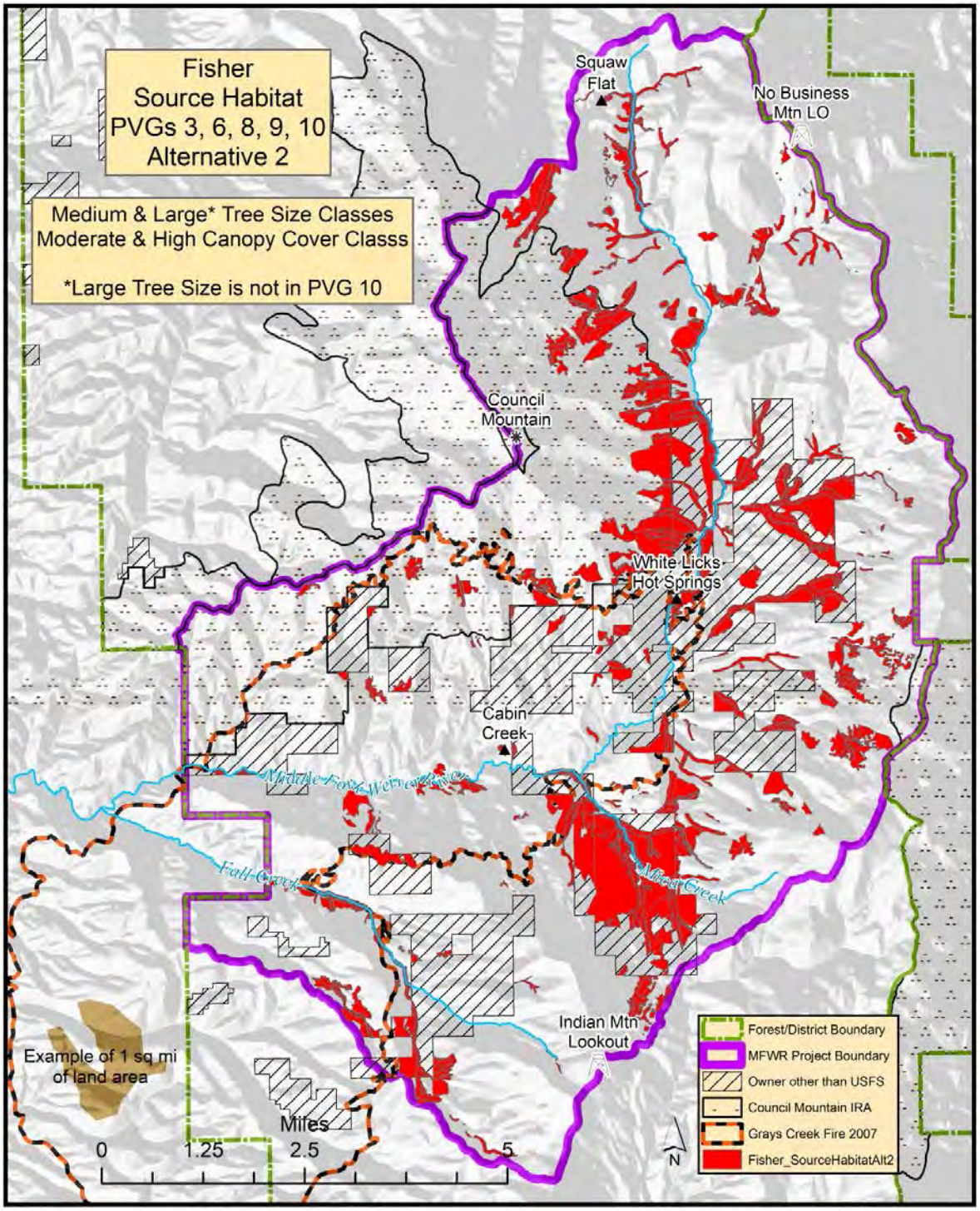


Figure 3-42. Fisher source habitat for Potential Vegetation Groups (PVGs) 3, 6, 8, 9, and 10 in the Project area under Alternative 2

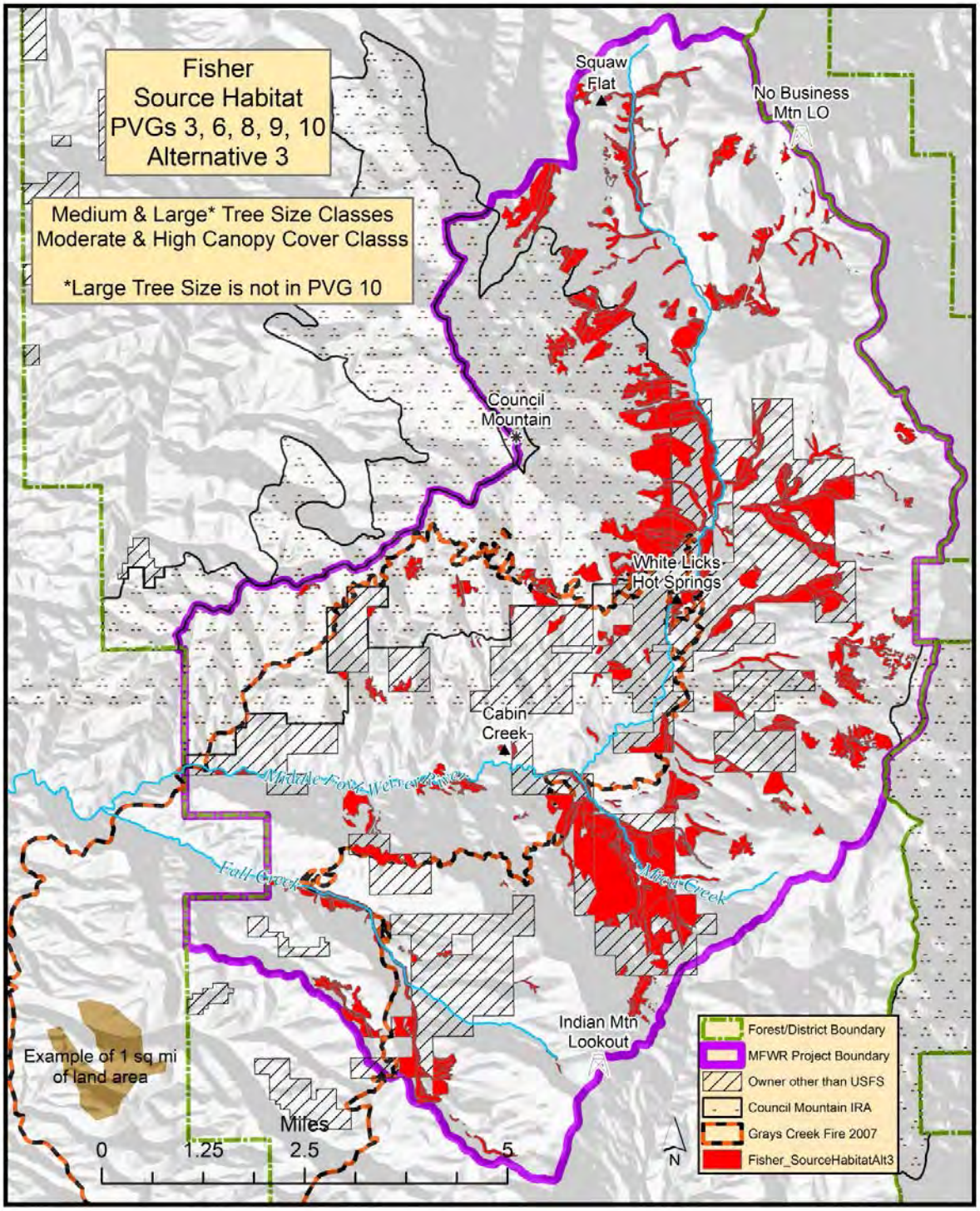


Figure 3-43. Fisher source habitat for Potential Vegetation Groups (PVGs) 3, 6, 8, 9, and 10 in the Project area under Alternative 3

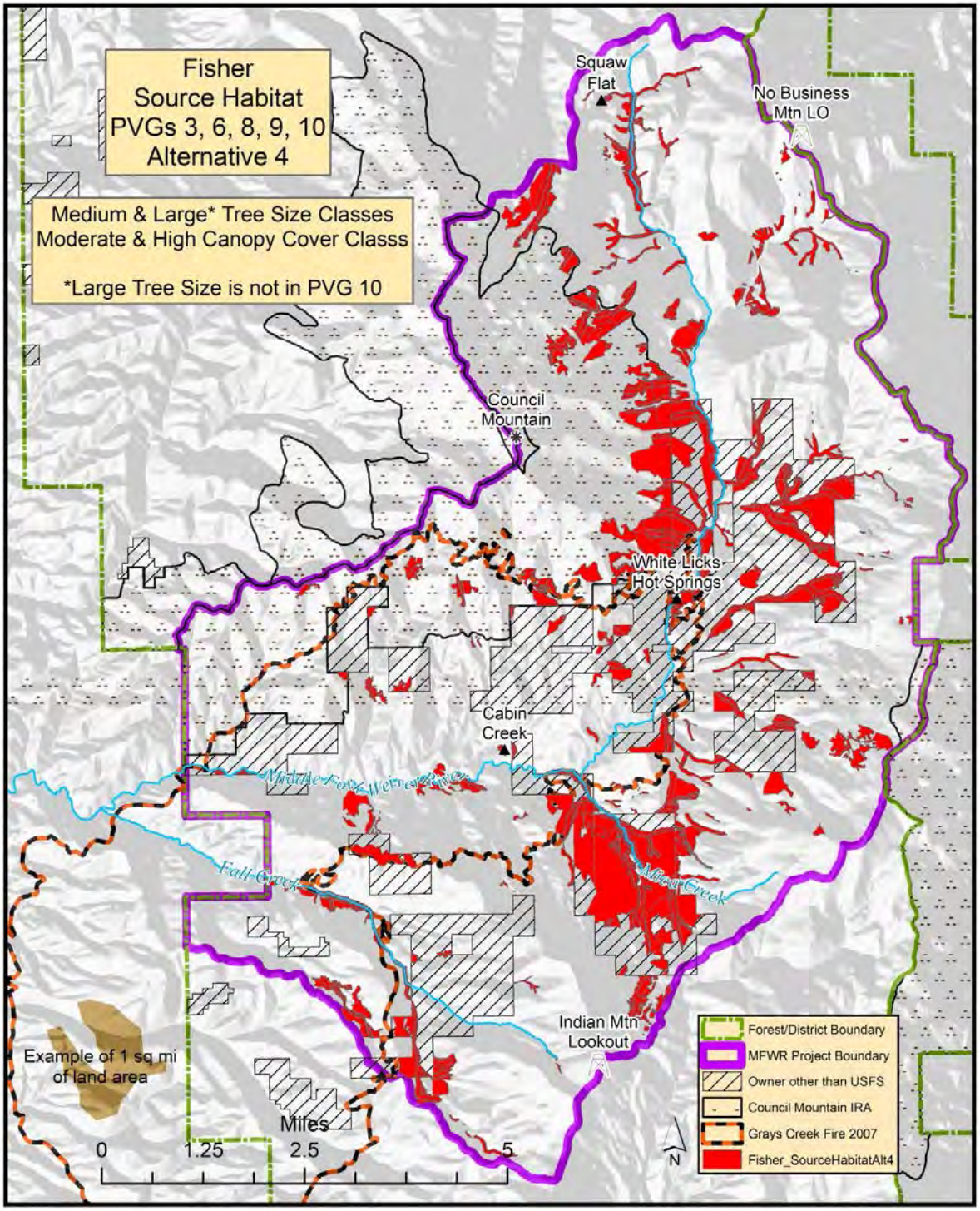


Figure 3-44. Fisher source habitat for Potential Vegetation Groups (PVGs) 3, 6, 8, 9, and 10 in the Project area under Alternative 4'

3.4.6.4.7. Great Gray Owl

Alternative 1 (No Action Alternative)

Alternative 1 would not change the quantity or quality of source habitat for great gray owls, as described for pileated woodpeckers.

Effects Common to All Action Alternatives

Restoration treatments designed to improve habitat for Family 1 species and reduce insect infestation would decrease source habitat for great gray owls under all action alternatives. These treatments would lead to more rapid tree growth (large trees), but would reduce canopy cover in the short term. It is likely that many treated stands that move canopy cover from moderate to low cover class would still provide some great gray owl source habitat, and that actual habitat declines would not be as great as indicated by the habitat model.

Effects to patch and pattern of source habitat for great gray owls would be smaller patch size, wider distribution, and decreased habitat connectivity. As tree density and size increases in the future, the local great gray owl population should gradually increase.

Direct and Indirect Effects from Alternatives 2, 3, and 4

Source habitat for great gray owl on NFS lands (15,819 acres) would decrease under all action alternatives, with reductions ranging from approximately 6,770 acres to 7,770 acres. The majority of source habitat would be reduced in PVG 6 (6,702- to 6,771-acre decreases), followed to a lesser extent, by PVG 7 (0- to 827-acre reductions). (Table 3-65, Table 3-66, Table 3-67; Figure 3-45, Figure 3-46, Figure 3-47).The decrease in source habitat may be overestimated by the model, because of the microsite requirements of juxtaposition of meadows with forested stands. Changes in patch dynamics also may have affected the size and juxtaposition of stands with large diameter trees and high crown closures, which great gray owls use for nest sites, foraging, and roosting. After implementing any of the action alternatives, remaining great gray owl source habitat would support approximately 1.5 great gray owl home ranges, a decrease from 3 home ranges at current conditions. Road decommissioning and long-term road closures proposed for all action alternatives would improve the quality of great gray owl habitat by decreasing the amount of human disturbance to great gray owls; beneficial effects would be greatest under Alternative 3, due to the increase in miles of roads proposed for closure and decommissioning.

Wet meadow treatment would occur under each action alternative (55 acres for Alternative 2, 43 acres for Alternative 3, and 271 acres for Alternative 4), with the greatest acres treated under Alternative 4. In general, great gray owls would benefit from wet meadow treatment, when implemented outside of the nesting and rearing seasons. Surveys for great gray owls would need to be conducted prior to beginning restoration activities to ensure potentially occurring owls are not disturbed. The restoration vegetation and fuels treatments would allow for a number of larger trees and/or snags to remain standing in each meadow, which would provide perch habitat for hunting great gray owls. Removal of encroaching trees in a meadow would typically involve cutting regenerating trees of smaller size than those required by great gray owls for perching. The area surrounding the wet meadows would provide a dense, forested buffer of 200 feet for great gray owl nesting, roosting, and thermoregulation in hot weather conditions.

Cumulative Effects

Actions on NFS lands that may cumulatively impact great gray owls include ongoing fuelwood removal, as described for pileated woodpecker. All action alternatives would decrease great gray owl habitat in the Project area in the short term, as described for pileated woodpecker. Road obliteration would benefit great gray owl and other Habitat Family 2 species, as described for pileated woodpecker.

Determinations

Alternatives 2, 3, and 4 *may impact individuals or habitat*, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Table 3-65. Alternative 2 great gray owl source habitat (acres), by Potential Vegetation Group (PVG), in the Project area on private and National Forest System (NFS) lands

Tree Size/Canopy Cover Class	PVG 6	PVG 7	PVG 8	PVG 9	PVG 11	Totals
Medium/Low NFS Lands	0	953	6	139	72	1,170
Medium/Moderate NFS Lands	323	161	37	41	0	562
Large/Low NFS Lands	0	901	13	130	68	1,111
Large/Moderate NFS Lands	1,320	1,958	0	206	191	3,675
Large/High NFS Lands	882	994	0	209	47	2,132
Total NFS Lands	**2,526**	**4,965**	**56**	**725**	**378**	**8,650**
Medium/Low Private Lands	0	84	0	0	0	84
Medium/Moderate Private Lands	2,021	164	0	0	0	2,185
Large/Low Private Lands	0	0	0	0	0	0
Large/Moderate Private Lands	351	106	0	64	0	521
Large/High Private Lands	253	31	0	0	0	284
Total Private Lands	**2,625**	**385**	**0**	**64**	**0**	**3,074**
Total All Ownership	**5,151**	**5,350**	**56**	**789**	**378**	**11,724**

Table 3-66. Alternative 3 great gray owl source habitat (acres), by Potential Vegetation Group (PVG), in the Project area on private and National Forest System (NFS) lands

Tree Size/Canopy Cover Class	PVG 6	PVG 7	PVG 8	PVG 9	PVG 11	Totals
Medium/Low NFS Lands	0	988	6	139	72	1,205
Medium/Moderate NFS Lands	323	182	37	41	0	584
Large/Low NFS Lands	0	741	13	98	110	961
Large/Moderate NFS Lands	1,250	2,108	0	200	191	3,748
Large/High NFS Lands	884	1,337	0	282	47	2,550
Total NFS Lands	**2,457**	**5,356**	**56**	**760**	**419**	**9,048**
Medium/Low Private Lands	0	84	0	0	0	84
Medium/Moderate Private Lands	2,021	164	0	0	0	2,185
Large/Low Private Lands	0	0	0	0	0	0
Large/Moderate Private Lands	351	106	0	64	0	521
Large/High Private Lands	253	31	0	0	0	284
Total Private Lands	**2,625**	**385**	**0**	**64**	**0**	**3,074**
Total All Ownership	**5,082**	**5,741**	**56**	**825**	**419**	**12,122**

Table 3-67. Alternative 4 great gray owl source habitat (acres), by Potential Vegetation Group (PVG), in the Project area on private and National Forest System (NFS) lands

Tree Size/Canopy Cover Class	PVG 6	PVG 7	PVG 8	PVG 9	PVG 11	Totals
Medium/Low NFS Lands	0	1,005	16	139	72	1,232
Medium/Moderate NFS Lands	311	96	0	39		447
Large/Low NFS Lands	0	1,100	13	130	161	1,405
Large/Moderate NFS Lands	1,306	1,799	0	206	69	3,380
Large/High NFS Lands	843	528	0	209	0	1,580
Total NFS Lands	**2,460**	**4,529**	**29**	**723**	**302**	**8,044**
Medium/Low Private Lands	0	84	0	0	0	84
Medium/Moderate Private Lands	2,021	164	0	0	0	2,185
Large/Low Private Lands	0	0	0	0	0	0
Large/Moderate Private Lands	351	106	0	64	0	521
Large/High Private Lands	253	31	0	0	0	284
Total Private Lands	**2,625**	**385**	**0**	**64**	**0**	**3,074**
Total All Ownership	**5,085**	**4,914**	**29**	**787**	**302**	**11,118**

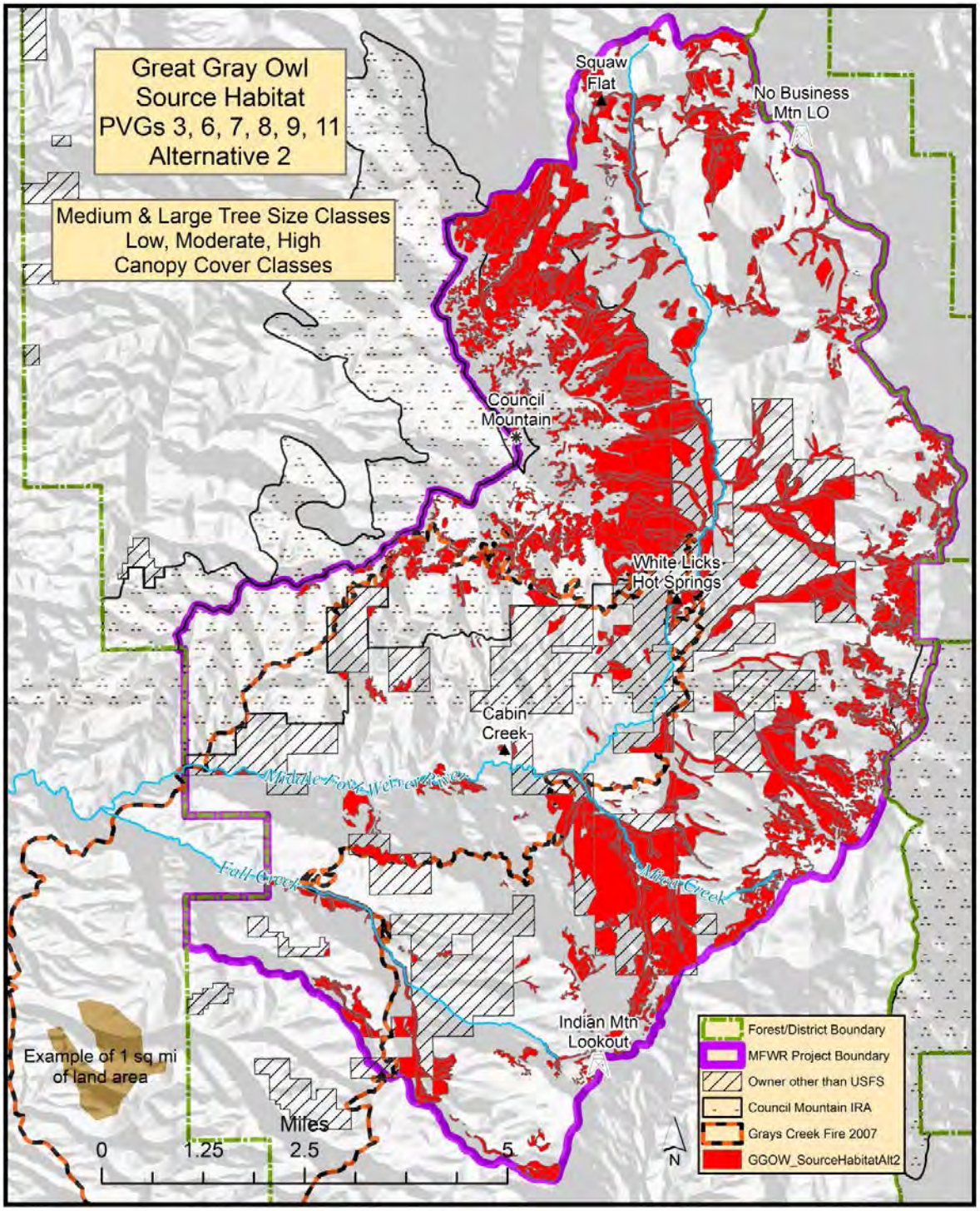


Figure 3-45. Great gray owl source habitat for Potential Vegetation Groups (PVGs) 3, 6, 7, 8, 9, and 11 in the Project area under Alternative 2

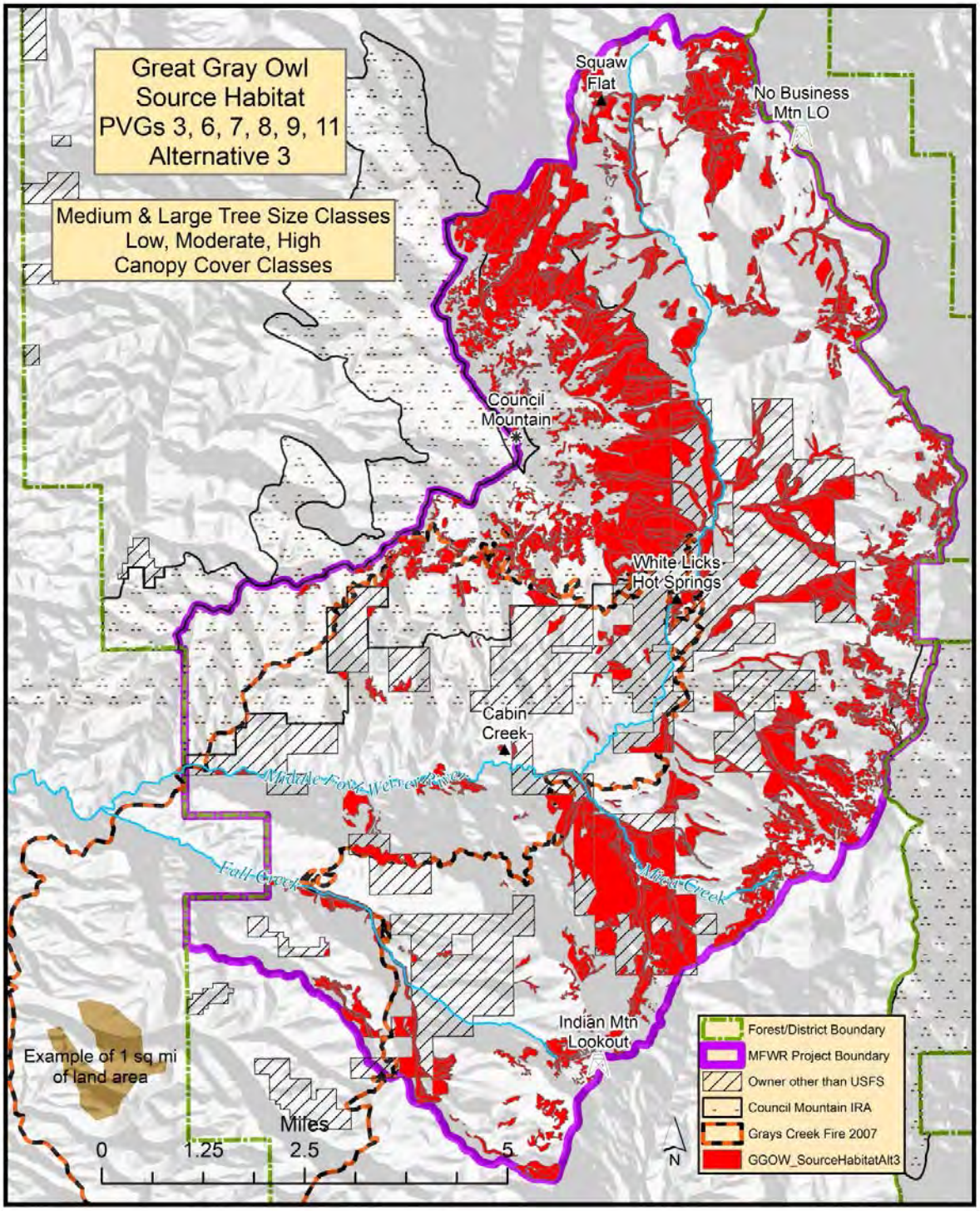


Figure 3-46. Great gray owl source habitat for Potential Vegetation Groups (PVGs) 3, 6, 7, 8, 9, and 11 in the Project area under Alternative 3

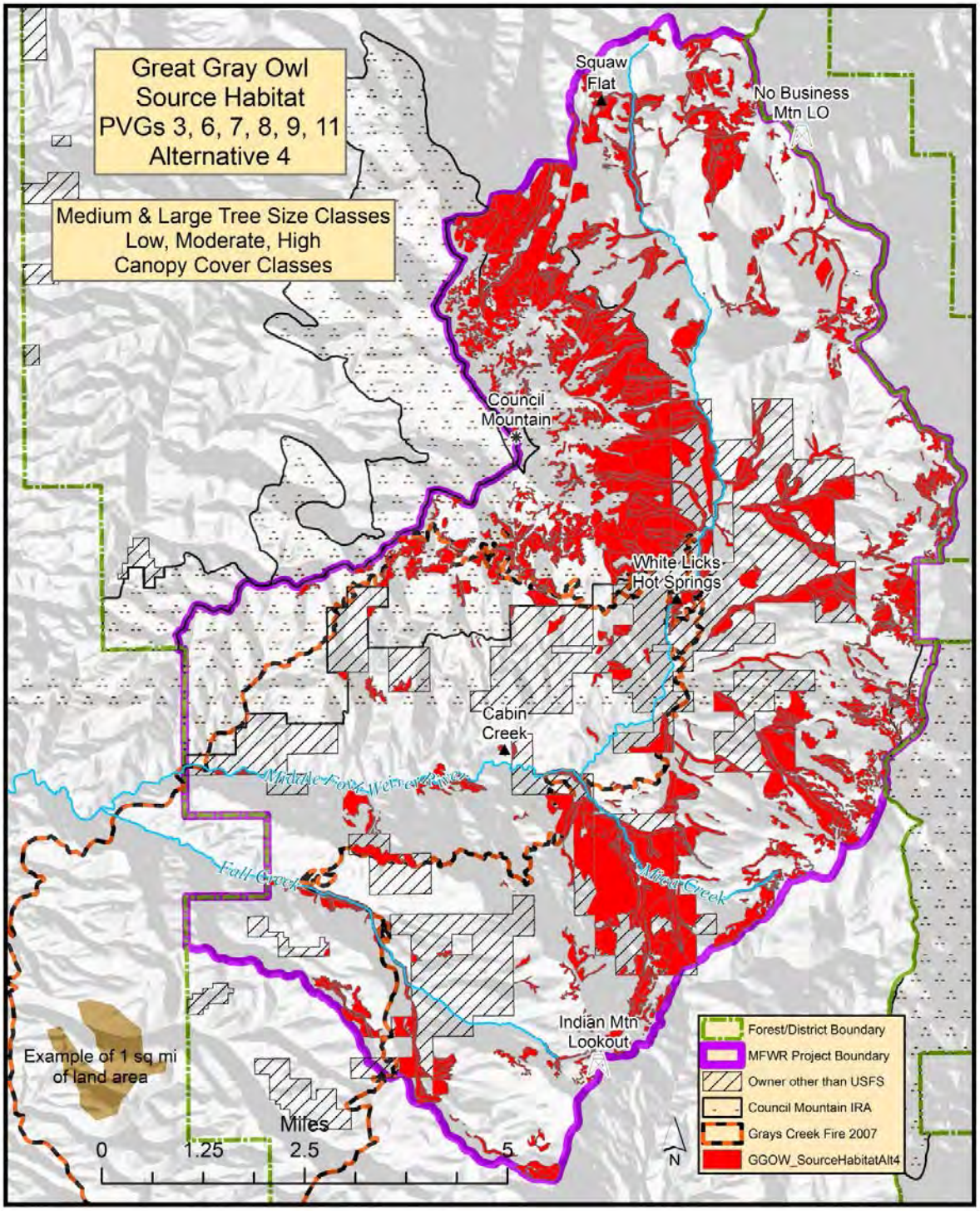


Figure 3-47. Great gray owl source habitat for Potential Vegetation Groups (PVGs) 3, 6, 7, 8, 9, and 11 in the Project area under Alternative 4

3.4.6.4.8. Northern Goshawk

Alternative 1 (No Action Alternative)

Alternative 1 would not change the quantity or quality of source habitat for northern goshawks, as described for pileated woodpeckers.

Effects Common to All Action Alternatives

Restoration treatments designed to improve habitat for Family 1 species and to reduce insect infestation would decrease source habitat for northern goshawks under all action alternatives. These treatments would lead to more rapid tree growth, but would reduce canopy cover in the short term, as described for great gray owls. Treatments in PFAs would be restricted to specific timing and prescription, based on Southwest Guideline requirements (Reynolds et al. 1992).

Outside of PFAs, the effects to patch and pattern of source habitat for northern goshawks would include smaller patch size, wider distribution, and decreased habitat connectivity. As tree density and size increases within and outside of PFAs in the future, the local northern goshawk population should gradually increase.

Direct and Indirect Effects from Alternatives 2, 3, and 4

Source habitat for northern goshawks on NFS lands (14,433 acres) would decrease under all action alternatives, with most habitat reductions in PVGs 6, 7, and 9 (Table 3-68, Table 3-69, Table 3-70; Figure 3-48, Figure 3-49, Figure 3-50). Overall, for all PVGs combined, there would be a reduction to 6,293, 6,807, and 5,499 acres of northern goshawk source habitat on NFS lands under Alternatives 2, 3, and 4, respectively; the greatest reduction in habitat would be realized under Alternative 4.

The Southwest Guidelines (Reynolds et al. 1992) suggest a mix of Vegetation Structural Stages (VSS) required by northern goshawks that provide a variety of plant communities, which in turn, provide a variety of prey species. In constructing the PFAs around known northern goshawk nests, each VSS should be present, in different percentages, within each PFA. The grass/forb/seedling VSS should be 10%, the sapling VSS should be 10%, the young forest VSS should be 20%, the medium age forest VSS should be 20%, and the combined mature and old forest should be 40% of the PFA. The Guidelines also suggest that vegetation treatments can occur, as planned, outside of the PFAs. Within the PFAs, the active nest stands and the alternate nest stands could be thinned of sub-merchantable, smaller diameter, understory trees, up to the height of the nest; but no overstory removal should occur. In the replacement nest stands, which are designed for future use, vegetation treatments could occur, but overstory canopy requirements would apply, depending on the dominate tree species in the stand. Since the treatment restrictions would be within the PFA, stands outside the PFA could still receive the planned treatments to meet Project objectives. In theory, the 9 PFAs would provide appropriate source habitats for nesting and rearing young within each northern goshawk territory. Human activities within the PFAs would be restricted to a period outside of March 1 through September 30. Any new northern goshawk nests found during Project planning or implementation would have a PFA constructed around the nest, per Project design features.

These habitat decreases in northern goshawk source habitat would be offset somewhat by the designation of the 9 PFAs, as shown in Figure 3-17, and the application of specific management

guidelines within the PFAs. The Southwest Guidelines and Forest Plan direction require the construction of a PFA around each known active nest. The PFA contains 6 nest stands of 30 acres each: the active nest stand, alternate nest stands that may be used over a period of a few years, and replacement nest stands that will provide future nesting opportunities. Each nest stand has specific management guidelines, based on the type of nest stand and the dominant tree species in the stand. Silvicultural treatments could occur in the PFA and in the nest stands, but a timing restriction of no activity in the PFA would be in place from March 1 through September 30. Activities could occur in the PFA during this timing restriction, if the Forest Wildlife Biologist can verify that no northern goshawks are using the PFA, per Project design features. Specifics of these management requirements are presented in detail in the Southwest Guidelines.

Cumulative Effects

Actions on NFS lands that may cumulatively impact northern goshawks include ongoing fuelwood removal, as described for pileated woodpecker. All action alternatives would decrease northern goshawk habitat in the Project area in the short term. These losses should be offset by the construction and management of PFAs in the Project area. Losses in habitat would likely be cumulative, with other negative effects to northern goshawk source habitat across the Project area. Losses in northern goshawk source habitat would be a result of corresponding increases in Family 1 habitats and white-headed woodpecker source habitat. Road obliteration would benefit northern goshawks and other Habitat Family 2 species, as described for pileated woodpecker.

Determinations

Alternatives 2, 3, and 4 *may impact individuals or habitat*, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Table 3-68. Alternative 2 northern goshawk (summer) source habitat (acres) in the Project area on private and National Forest System (NFS) lands

Tree Size/Canopy Cover Class	PVG 2	PVG 4	PVG 5	PVG 6	PVG 7	PVG 8	PVG 9	Totals
Medium/Moderate NFS Lands	0	0	0	323	161	37	41	562
Large/Moderate NFS Lands	0	0	0	1,320	1,958	0	206	3,484
Large/High NFS Lands	82	0	80	882	994	0	209	2,247
Total NFS Lands	**82**	**0**	**80**	**2,526**	**3,112**	**37**	**456**	**6,293**
Medium/Moderate Private Lands	0	0	0	2,021	164	0	0	2,185
Large/Moderate Private Lands	0	0	0	351	106	0	64	521
Large/High Private Lands	29	0	18	253	31	0	0	331
Total Private Lands	**29**	**0**	**18**	**2,625**	**301**	**0**	**64**	**3,037**
Total All Ownership	**111**	**0**	**98**	**5,151**	**3,412**	**37**	**520**	**9,330**

Table 3-69. Alternative 3 northern goshawk (summer) source habitat (acres) in the Project area on private and National Forest System (NFS) lands

Tree Size/Canopy Cover Class	PVG 2	PVG 4	PVG 5	PVG 6	PVG 7	PVG 8	PVG 9	Totals
Medium/Moderate NFS Lands	0	0	0	323	182	37	41	584
Large/Moderate NFS Lands	0	0	0	1,250	2,108	0	200	3,557
Large/High NFS Lands	82	0	80	884	1,337	0	282	2,666
Total NFS Lands	**82**	**0**	**80**	**2,457**	**3,627**	**37**	**524**	**6,807**
Medium/Moderate Private Lands	0	0	0	2,021	164	0	0	2,185
Large/Moderate Private Lands	0	0	0	351	106	0	64	521
Large/High Private Lands	29	0	18	253	31	0	0	331
Total Private Lands	**29**	**0**	**18**	**2,625**	**301**	**0**	**64**	**3,037**
Total All Ownership	**111**	**0**	**98**	**5,082**	**3,928**	**37**	**588**	**9,843**

Table 3-70. Alternative 4 northern goshawk (summer) source habitat (acres) in the Project area on private and National Forest System (NFS) lands

Tree Size/Canopy Cover Class	PVG 2	PVG 4	PVG 5	PVG 6	PVG 7	PVG 8	PVG 9	Totals
Medium/Moderate NFS Lands	0	0	0	311	96	0	39	447
Large/Moderate NFS Lands	0	0	0	1,306	1,799	0	206	3,311
Large/High NFS Lands	82	0	78	843	528	0	209	1,741
Total NFS Lands	**82**	**0**	**78**	**2,460**	**2,424**	**0**	**454**	**5,499**
Medium/Moderate Private Lands	0	0	0	2,021	164	0	0	2,185
Large/Moderate Private Lands	0	0	0	351	106	0	64	521
Large/High Private Lands	29	0	18	253	31	0	0	331
Total Private Lands	**29**	**0**	**18**	**2,625**	**301**	**0**	**64**	**3,037**
Total All Ownership	**111**	**0**	**97**	**5,085**	**2,724**	**0**	**518**	**8,535**

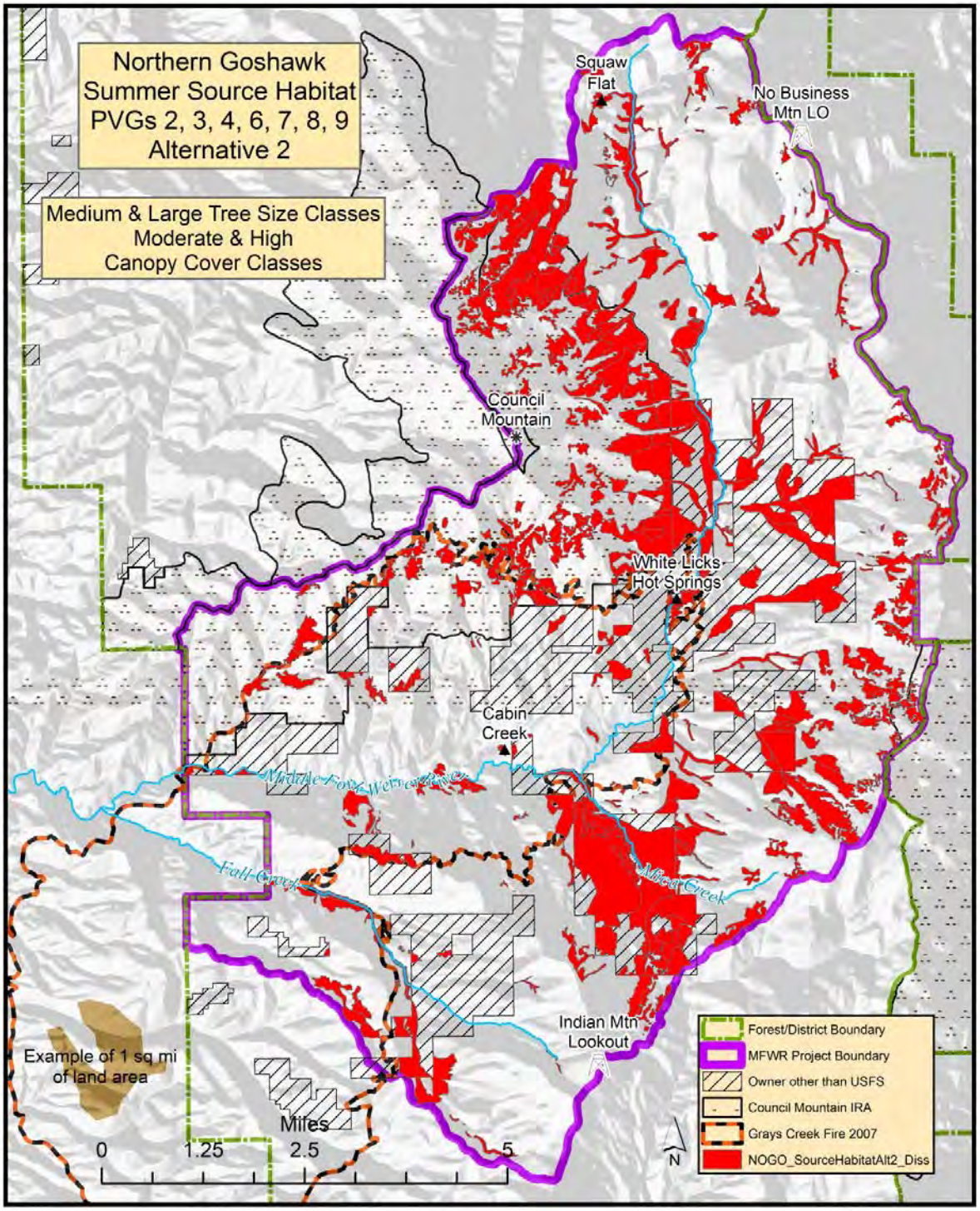


Figure 3-48. Northern goshawk (summer) source habitat for Potential Vegetation Groups (PVGs) 2, 3, 4, 6, 7, 8, and 9 in the Project area under Alternative 2

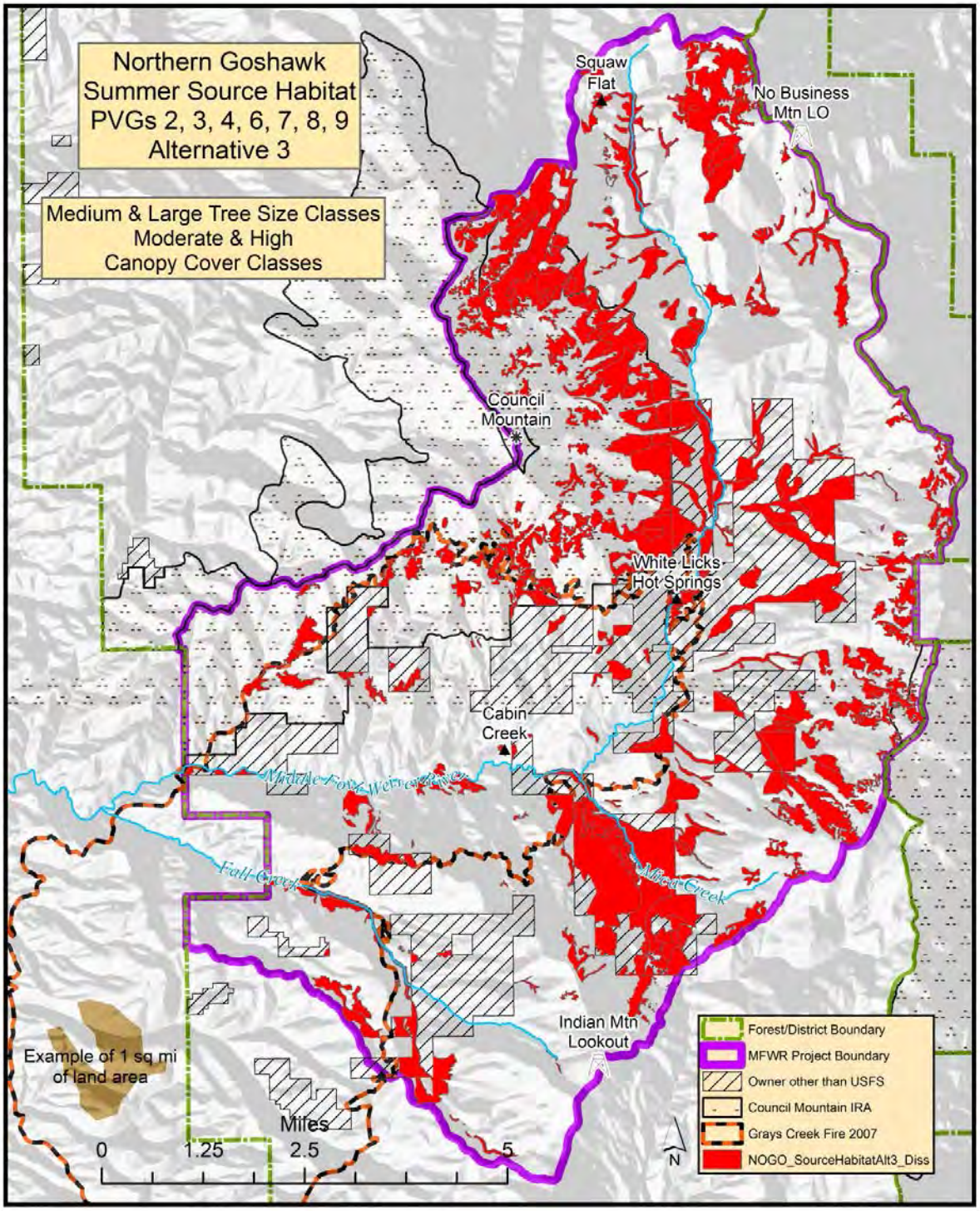


Figure 3-49. Northern goshawk (summer) source habitat for Potential Vegetation Groups (PVGs) 2, 3, 4, 6, 7, 8, and 9 in the Project area under Alternative 3

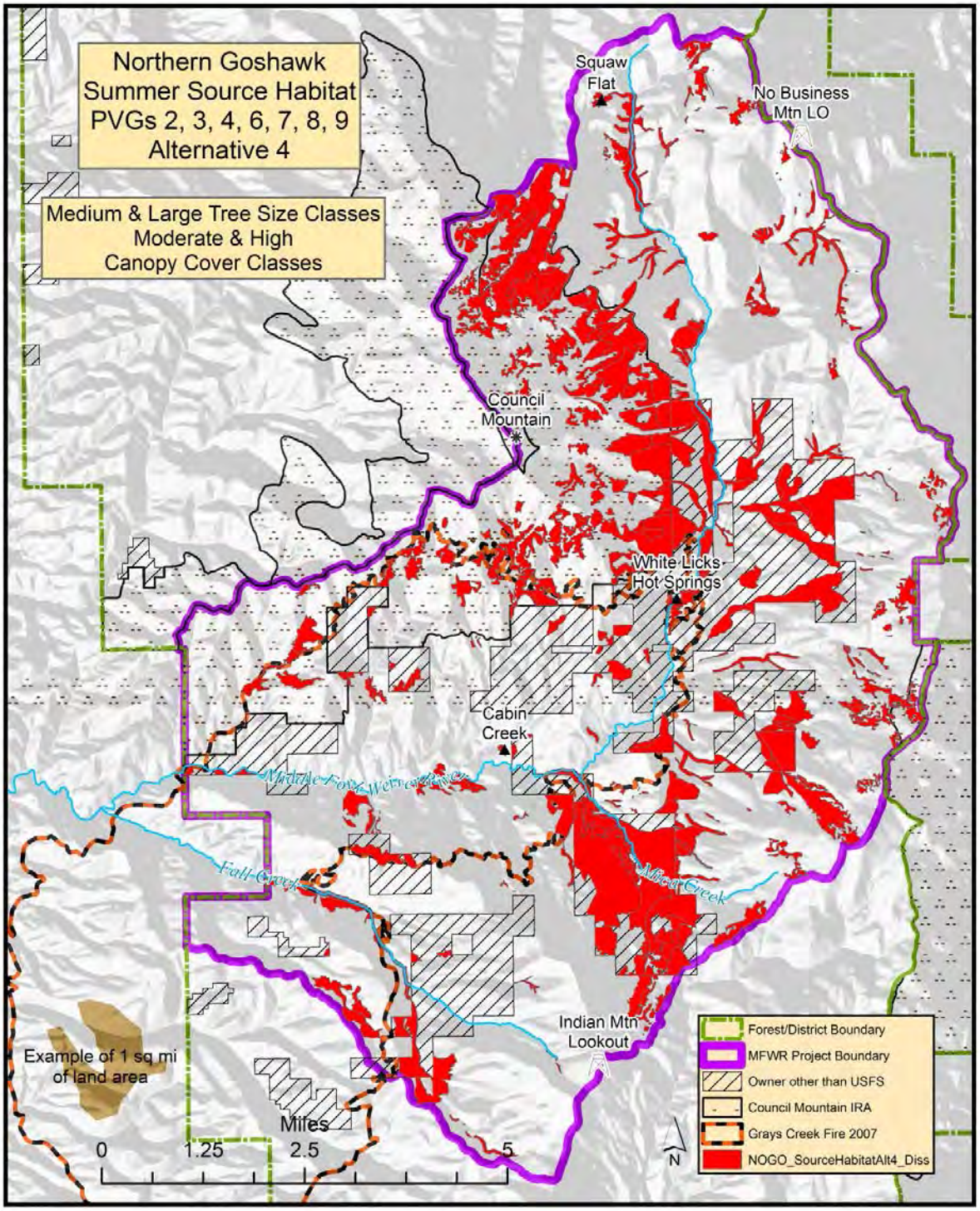


Figure 3-50. Northern goshawk (summer) source habitat for Potential Vegetation Groups (PVGs) 2, 3, 4, 6, 7, 8, and 9 in the Project area under Alternative 4

3.4.6.5. Habitat Family 3—Forest Mosaic

3.4.6.5.1. Canada Lynx

Alternative 1 (No Action Alternative)

Under Alternative 1, no source habitat would be changed for lynx, as no new management actions would be implemented. Combined with the lack of source habitat improvement for Habitat Family 1, the Project area forests would be more susceptible under the No Action Alternative to long term alteration from uncharacteristic, or even stand-replacement wildfire.

Effects Common to All Action Alternatives

Under all of the action alternatives, prescribed fire would be used to reduce wildfire fuel loads on the ground. These burns would not occur in forested stands in lynx habitat. Because the PVGs used to describe lynx source habitats are all forested components of the LAU, the burns do not show as an effect to lynx habitat under the lynx habitat model. Some burning outside of the nonforested patches, removing small amounts of trees along the edges of adjacent forested stands. This small number of trees burned would be negligible and unmeasurable.

Direct and Indirect Effects from Alternatives 2, 3, and 4

Alternative 2 would result in 5,523 acres of lynx source habitat (in suitable condition) remaining from the 6,812 acres of source habitat in the Middle Fork Weiser LAU in the Project area (Figure 3-51). Under Alternative 2, 74% of the lynx habitat in the Project area would be “source habitat”, compared to “source habitat capacity”. Following the Forest Plan direction, no more than 30% of suitable lynx habitat would be moved to an unsuitable condition for lynx (2000 LCAS, Ruediger et al. 2000). Although this alternative would not exceed the 30% rule, the change in habitat structure and species composition that would follow the current, ongoing insect infestation would likely lead to an overabundance of denning habitat and an increase in wildfire fuel loading at higher elevations due to the increase in dead, dying, and down trees in those stands. This alternative would likely not provide a mosaic of habitat classes at higher elevations in the future, due to the increase in denning habitat. The potential of a stand-replacement fire at upper elevations would be increased, due to the increase in fuels.

Alternative 3 would result in 6,784 acres of lynx source habitat (Figure 3-52), a minor reduction in habitat compared to current conditions (6,812 acres). Under this alternative, the Project area would have 91% source habitat, compared to source habitat capacity. No harvest treatments are proposed in forested stands of PVGs 7–11. This small loss of lynx source habitat would partially be due to the use of prescribed burns in open habitat adjacent to forested stands at higher elevations. Small islands of forested habitat within this open habitat could lose understory structure from the burn. If these forested islands are smaller than 10 acres, they would be removed from the lynx analysis; however, if the forested island are within 300 feet of a larger forested stand, it would still be considered lynx habitat, but could be altered from the burn that would surround it. Because open, nonforested, grassland sites are not considered lynx source habitat, burns in these areas would not alter lynx suitable habitat.

As with Alternative 2, Alternative 3 would likely produce a change in habitat structure and species composition that will follow the ongoing insect infestation and would likely lead to an overabundance of denning habitat and an increase in wildfire fuel loading, due to the increase in

dead, dying, and down trees in the upper elevation stands. This alternative would likely not provide as much of a mosaic of habitat classes in the future, due to the increase in denning habitat. The potential of a stand replacement fire at upper elevations would be increased, due to the increase in fire fuels.

Alternative 4 would result in 3,499 acres of lynx source habitat (Figure 3-53). Under this alternative, the Project area would have 47% of source habitat, compared to source habitat capacity. The types of treatments in this alternative would be identical to Alternative 2. Alternative 4 addresses internal and external comments concerning additional restoration in higher elevation stands that contain a viable seral tree component. This alternative would treat stands in PVGs 7–11 that have a viable seral species component of mature ponderosa pine, Douglas-fir, and western larch, in addition to those stands proposed for treatment under Alternative 2. This viewpoint is supported by the revised, third edition of the LCAS (2013 LCAS, Interagency Lynx Biology Team 2013), which identifies the Project area as secondary habitat for lynx.

Alternative 4 would alter more than 30% of suitable lynx habitat to an unsuitable condition in the short term (2000 LCAS). However, with an infestation of multiple species of insects ongoing in most of the high elevation stands, if these sites are left to natural conditions created by this infestation, much of the area would become denning habitat, which would mean a large conversion from foraging and traveling habitats to denning habitat. The 2000 LCAS suggests denning habitat be maintained in patches greater than 5 acres, so that at least 10% of the LAU is denning habitat. The insect infestation would likely create more dead, dying, and down trees, increasing denning habitat. These conditions would also increase the wildfire fuel load in these stands.

Patch cuts in insect-infested areas would provide small, scattered openings that would promote the maintenance of shrubs, such as Coulter's willow (*Salix* sp.), huckleberry (*Vaccinium* spp.), rose (*Rosa* spp.), spirea (*Spirea* spp.), snowberry (*Symphoricarpos* spp.), and western service berry (*Amelanchier alnifolia*). Patch cuts would also provide sites for regeneration of spruce, subalpine fir, and lodgepole pine, all of which support snowshoe hare source habitats. Patch cuts also provide areas of lower fuel loads, which have the potential to shift a crown fire to a ground fire, possibly preventing a stand-replacement wildfire. Free thin harvest would also open the canopy, providing sites where shrub and regenerating trees can support snowshoe hare habitat. Both treatment approaches would provide lynx foraging habitat directly adjacent to, or very close to, denning habitat (Ruediger et al. 2000). In the long-term, Alternative 4 would provide the best support of lynx source habitat in the LAUs, while producing a mosaic of habitats, which would provide lynx foraging, traveling, and denning habitat in the long term.

The PFC has expressed interest in exploring ways to increase the diversity in forested stands at higher elevations. As a Secondary Area in the lynx recovery effort, the Forest could play an important role in providing a greater mosaic of lynx habitats. The Forest could provide security, foraging, and denning support to lynx that may be moving among core lynx populations. If the Forest Service manages the Forest to enhance this habitat mosaic, and to maintain it into the future, this area could better support the recovery of lynx in Idaho, by providing conditions for genetic interchange among core populations. The following discussion is presented to provide some basic background information that partially explains the application of the 2013 LCAS for the Project, especially as support for Alternative 4.

Synopsis of major changes from the 2000 LCAS to the 2013 LCAS, as presented by Richards (2014).

This edition (2013 LCAS) provides a full revision, incorporating all prior amendments and clarifications, substantial new scientific information that has emerged since 2000, including related parts of the Lynx Recovery Plan Outline, as well as drawing on experience gained in implementing the 2000 LCAS. The document has been reorganized and condensed to improve readability and reduce redundancy.

Chapter 3, Lynx Geographic Areas, has been substantially revised to incorporate new information about lynx and lynx habitat. The map (of geographic areas) (Fig. 3.1) has also been updated.

Chapter 4, formerly titled Risk Factors, is here retitled as Anthropogenic Influences on Lynx and Lynx Habitat. The anthropogenic influences are grouped into 2 tiers based on the potential magnitude of effects on lynx and their habitats. For each anthropogenic influence, there is an explanation of how it may influence key drivers of lynx population dynamics: the snowshoe hare (Lepus americanus) prey base, direct mortality of lynx, and the risks associated with small population size.

The chapters that formerly described Planning Area and Project Level were eliminated in this edition. The original intent was to provide the perspective of a multi-tier spatial hierarchy in discussing status, trends, and concerns relative to lynx and lynx habitat. In retrospect, however, these 2 chapters were redundant to material already presented in the previous chapters.

Chapter 5, Conservation Strategy, incorporates concepts from the Canada Lynx Recovery Outline (USDI Fish and Wildlife Service 2005). Specifically, conservation efforts for lynx are not to be applied equally across the range of the species, but instead more focus is given to high priority areas: the CAs. Further, we combined secondary areas and peripheral areas (which were also identified in the recovery outline) into one category, because they have similar characteristics and management recommendations. The intent is to place more emphasis on protection of the CAs, which support persistent lynx populations and have evidence of recent reproduction, and less stringent protection and greater flexibility in secondary/peripheral areas, which only support lynx intermittently. Chapter 5 presents conservation measures only for those anthropogenic influences that are within the authority of the federal agencies, and identifies areas where they should be applied.

Guidance provided in the revised LCAS is no longer written in the framework of objectives, standards, and guidelines as used in land management planning, but rather as conservation measures. This change was made to more clearly distinguish between the management direction that has been established through the public planning and decision-making process, versus conservation measures that are meant to synthesize and interpret evolving scientific information.

Cumulative Effects

Actions on NFS lands that could cumulatively impact lynx include ongoing fuelwood removal and alteration of habitat in PVGs 7–11. Currently, private and state lands open to timber harvest are expected to have low levels of large tree, mixed-species forests, old forest conditions, and snags. Future forest practices on these lands are expected to further reduce these important habitat components. Alternatives 2 and 4 would alter lynx habitat in the Project area in the short term. Because Alternative 4 would alter suitable lynx habitat in the LAU above the 30% limit, a Forest Plan amendment would be required to proceed with this alternative. Even though Alternative 4 would alter lynx habitat above the 30% limit, most of the altered habitat would actually be improved, because much of the lynx habitat at higher elevations is dense, fuel laden,

denning habitat. Treating in a small amount of these dense stands would shift the stands from denning habitat to foraging and traveling habitat. Alternative 3 would not alter lynx habitats in PVGs 7–11, nor would it alter suitable habitat above the 30% level. Alternative 3 would also obliterate more roads and unauthorized routes than other alternatives, which would benefit lynx and other Habitat Family 3 species, by decreasing human access into sourced habitats.

Determinations

Alternatives 2, 3, and 4 *May Effect, but are Not Likely to Adversely Affect* the Canada lynx or its habitat.

3.4.6.5.2. Mountain Quail

Alternative 1 (No Action Alternative)

Under the no action alternative, no source habitat would be changed for mountain quail, as described for lynx.

Effects Common to All Action Alternatives

Source habitat for mountain quail in NFS lands in the Project area would be increased under all of the action alternatives by implementing restoration treatments.

Direct and Indirect Effects from Alternatives 2, 3, and 4

The effect of implementing management actions on mountain quail source habitat would vary little by action alternative (Table 3-71,

Table 3-72, Table 3-73; Figure 3-51, Figure 3-52, Figure 3-53), because this species migrates through the Project area using mostly riparian areas as movement corridors. The RCA treatments proposed in the action alternatives would produce small increases in mountain quail source habitat. On NFS lands, the 8,570 acres of currently occurring mountain quail source habitat would increase to 9,527, 9,329, and 9,704 acres, respectively, under Alternatives 2, 3, and 4. It is possible mitigation measures would be required for RCA treatments involving mountain quail surveys prior to vegetation manipulation and that timing restrictions would be implemented restricting the periods of treatments to late summer or fall, when the birds have likely completed their seasonal migration to high elevation areas of the Project. The RCA treatments would be coordinated with the Forest Fisheries and Wildlife Biologists, so that the seasonal needs of fish and terrestrial wildlife species are accommodated.

Restoration treatments designed to improve habitat for Family 1 species and to reduce insect infestation would increase source habitat for mountain quail, mostly on sites where the treated unit is directly adjacent to a riparian corridor. These treatments would lead to more rapid growth of trees, but would reduce canopy cover classes in the short term. It is likely that many treated stands that would move canopy cover from moderate to low cover class would still provide an increase in mountain quail source habitat.

Effects to patch and pattern of source habitat for mountain quail would include larger patch size, tighter distribution, and increased habitat connectivity. As overstory and understory density increases in the future, the local mountain quail population could gradually increase.

Cumulative Effects

Actions on NFS lands that may cumulatively impact mountain quail include ongoing fuelwood removal in, or adjacent to, riparian corridors. Currently, private and State lands open to timber harvest are expected to have low levels of large tree, mixed-species forests, old forest conditions, and snags. Future actions on these lands are expected to improve these important habitat components, but the key habitat structure of concern for mountain quail would be the riparian corridor and the understory of adjacent stands. All action alternatives would increase mountain quail habitat in the Project area in the short term. The increases in mountain quail source habitat are a result of corresponding increases in Family 1 habitats and white-headed woodpecker source habitat, which are habitats at greater risk. Alternative 3 provides for more obliteration of roads and unauthorized routes than other alternatives. These road obliterations also benefit other Habitat Family 2 species, by decreasing human access into sourced habitats.

Determinations

Alternatives 2, 3, and 4 would *benefit* mountain quail by increasing source habitat for this species.

Table 3-71. Alternative 2 mountain quail source habitat (acres) in the Project area on private and National Forest System (NFS) lands

Canopy Cover Class	PVG 1	PVG 2	PVG 4	PVG 5	PVG 6	PVG 7	PVG 8	PVG 9	PVG 10	PVG 11	PVG 99	Totals
GFSS NFS Lands	0	0	0	0	0	0	0	0	0	0	279	279
Low NFS Lands	149	866	61	463	694	496	6	139	108	79	0	3,061
Moderate NFS Lands	9	265	7	800	2,590	1,091	19	204	255	109	0	5,349
High NFS Lands	0	196	0	423	20	199	0	0	0	0	0	837
Total NFS Lands	**158**	**1,327**	**68**	**1,686**	**3,304**	**1,786**	**25**	**344**	**362**	**188**	**279**	**9,527**
GFSS Private Lands	0	0	0	0	0	0	0	0	0	0	131	131
Low Private Lands	9	291	0	846	635	39	0	0	0	0	0	1,820
Moderate Private Lands	0	377	0	624	1,388	128	0	27	11	0	0	2,555
High NFS Private Lands	0	0	0	0	0	0	0	0	0	0	0	**0**
Total Private Lands	**9**	**668**	**0**	**1,470**	**2,023**	**167**	**0**	**27**	**11**	**0**	**131**	**4,506**
Total All Ownership	**167**	**1,996**	**68**	**3,156**	**5,327**	**1,953**	**25**	**370**	**373**	**188**	**410**	**14,032**

Table 3-72. Alternative 3 mountain quail source habitat (acres) in the Project area on private and National Forest System (NFS) lands

Canopy Cover Class	PVG 1	PVG 2	PVG 4	PVG 5	PVG 6	PVG 7	PVG 8	PVG 9	PVG 10	PVG 11	PVG 99	Totals
GFSS NFS Lands	0	0	0	0	0	0	0	0	0	0	279	279
Low NFS Lands	149	866	61	463	694	496	6	139	108	79	0	3,061
Moderate NFS Lands	9	265	7	800	2,590	1,090	19	204	254	109	0	5,348
High NFS Lands	0	196	0	423	20	2	0	0	0	0	0	641
Total NFS Lands	**158**	**1,327**	**68**	**1,686**	**3,304**	**1,589**	**25**	**344**	**362**	**188**	**279**	**9,329**
GFSS Private Lands	0	0	0	0	0	0	0	0	0	0	131	131
Low Private Lands	9	291	0	846	635	39	0	0	0	0	0	1,820
Moderate Private Lands	0	377	0	624	1,388	128	0	27	11	0	0	2,555
High NFS Private Lands	0	0	0	0	0	0	0	0	0	0	0	**0**
Total Private Lands	**9**	**668**	**0**	**1,470**	**2,023**	**167**	**0**	**27**	**11**	**0**	**131**	**4,506**
Total All Ownership	**167**	**1,996**	**68**	**3,156**	**5,327**	**1,756**	**25**	**370**	**372**	**188**	**410**	**13,834**

Table 3-73. Alternative 4 mountain quail source habitat (acres) in the Project area on private and National Forest System (NFS) lands

Canopy Cover Class	PVG 1	PVG 2	PVG 4	PVG 5	PVG 6	PVG 7	PVG 8	PVG 9	PVG 10	PVG 11	PVG 99	Totals
GFSS NFS Lands	0	0	0	0	0	0	0	0	0	0	279	279
Low NFS Lands	149	866	61	463	694	496	6	139	108	79	0	3,061
Moderate NFS Lands	9	265	7	800	2,590	1,094	19	204	255	109	0	5,352
High NFS Lands	0	196	0	423	20	372	0	0	2	0	0	1,012
Total NFS Lands	**158**	**1,327**	**68**	**1,686**	**3,304**	**1,961**	**25**	**344**	**364**	**188**	**279**	**9,704**
GFSS Private Lands	0	0	0	0	0	0	0	0	0	0	131	131
Low Private Lands	9	291	0	846	635	39	0	0	0	0	0	1,820
Moderate Private Lands	0	377	0	624	1,388	128	0	27	11	0	0	2,555
High NFS Private Lands	0	0	0	0	0	0	0	0	0	0	0	**0**
Total Private Lands	**9**	**668**	**0**	**1,470**	**2,023**	**167**	**0**	**27**	**11**	**0**	**131**	**4,506**
Total All Ownership	**167**	**1,996**	**68**	**3,157**	**5,327**	**2,128**	**25**	**370**	**375**	**188**	**410**	**14,210**

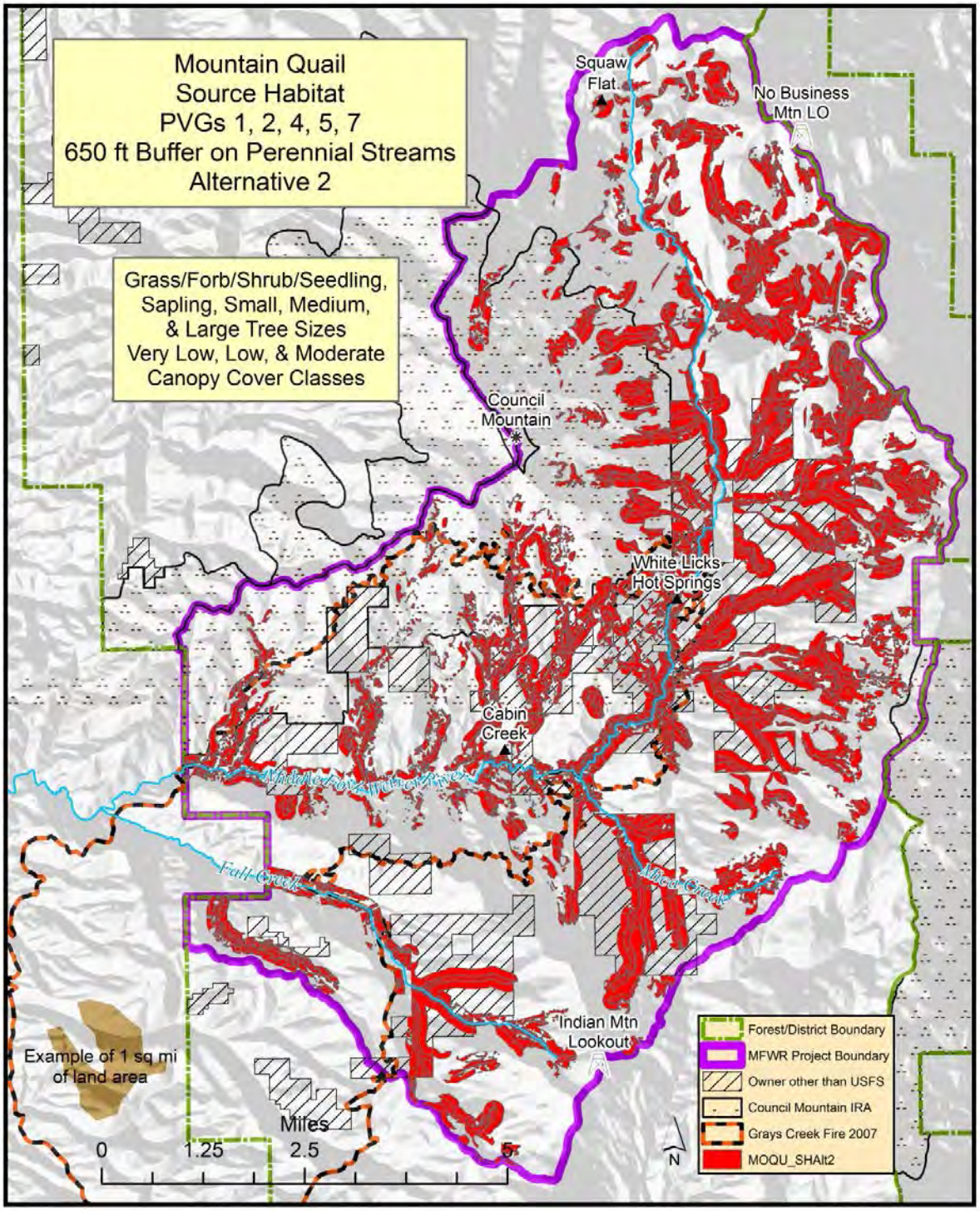


Figure 3-51. Mountain quail source habitat for Potential Vegetation Groups (PVGs) 1, 2, 4, 5, and 7 in the Project area under Alternative 2

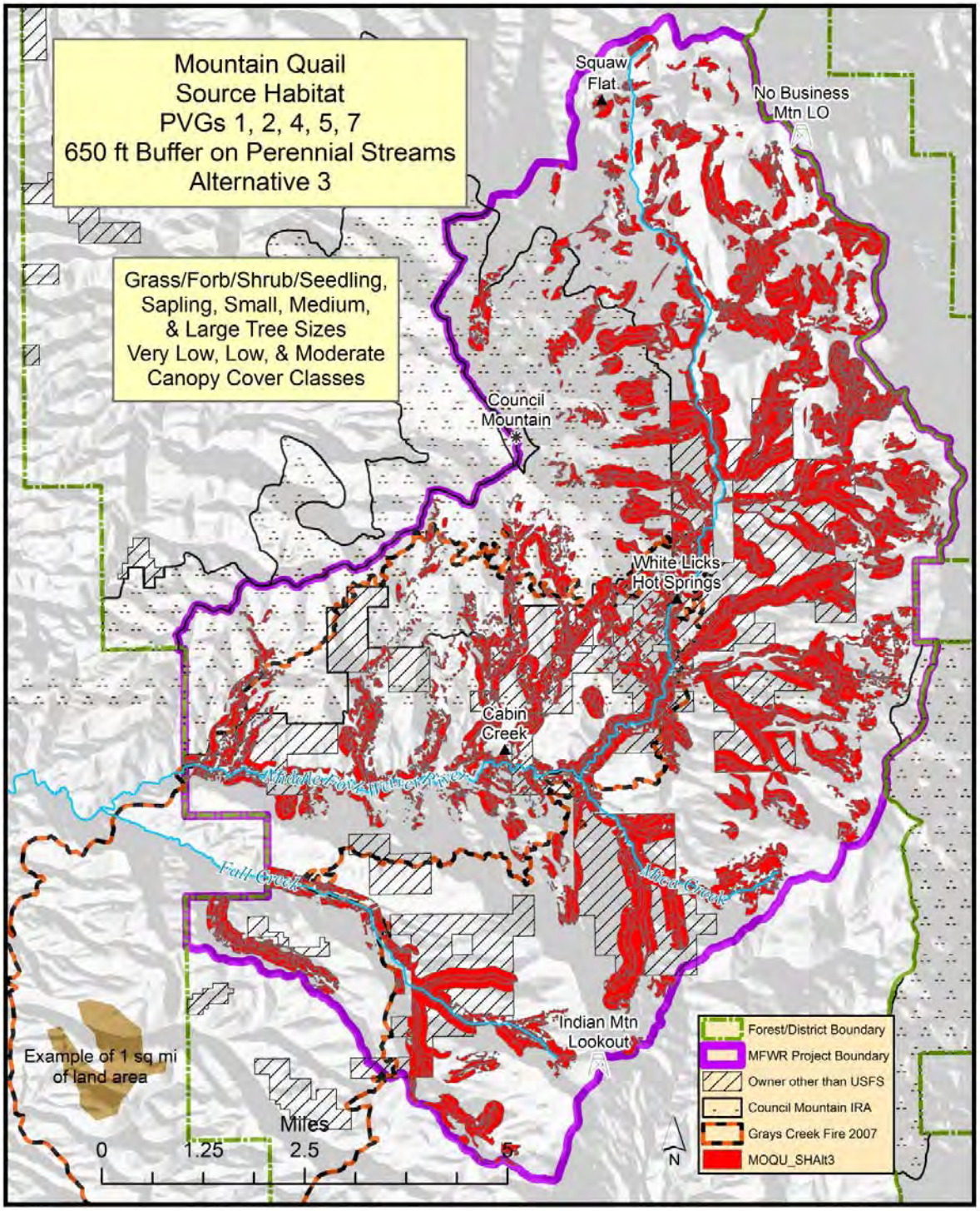


Figure 3-52. Mountain quail source habitat for Potential Vegetation Groups (PVGs) 1, 2, 4, 5, and 7 in the Project area under Alternative 3

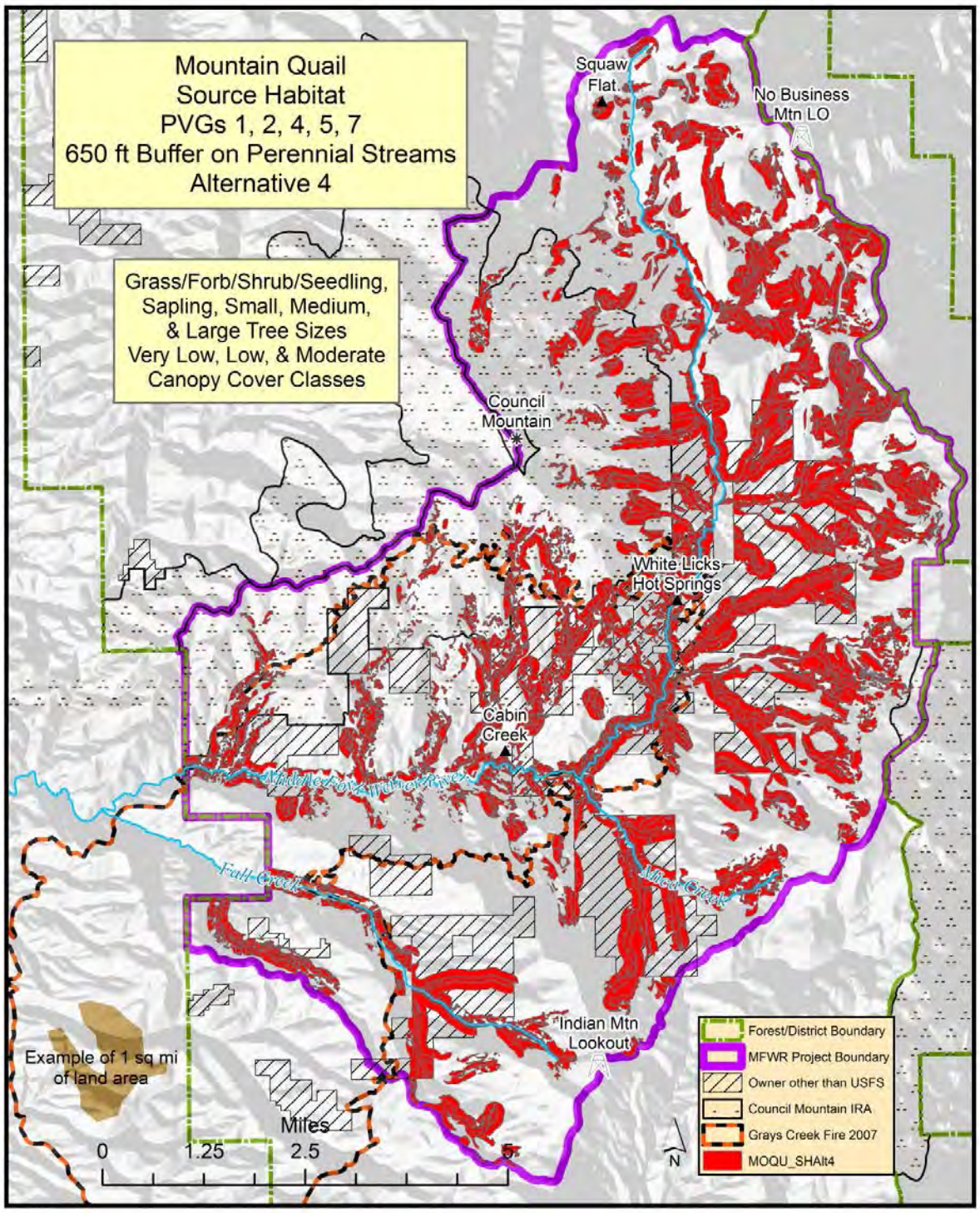


Figure 3-53. Mountain quail source habitat for Potential Vegetation Groups (PVGs) 1, 2, 4, 5, and 7 in the Project area under Alternative 4

3.4.6.5.3. Wolverine

Alternative 1 (No Action Alternative)

Under the no action alternative, no source habitat would be changed for wolverines. With no action, there would be no source habitat improvement for Habitat Family 1, and the Project area would be more susceptible to long-term alteration from uncharacteristic, or even stand-replacement wildfire.

Effects Common to All Action Alternatives

Restoration treatments designed to improve habitat for Family 1 species and to reduce insect infestation would not affect source habitat for wolverines under all action alternatives. These treatments would lead to more rapid tree growth, but would reduce canopy cover classes in the short term. Effects to patch and pattern of source habitat for wolverines would be smaller patch size, wider distribution, and decreased habitat connectivity in the forested stands below the higher elevation ridges, which could be used as travel corridors by wolverines. As tree density and size increases in the future, the effects to these lower forested stands should gradually decrease.

Direct and Indirect Effects from Alternatives 2, 3, and 4

Alternatives 2 and 3 would have no direct effect on wolverine habitat in the Project area, because no treatments are proposed at the higher elevations where wolverine habitat exists (Figure 3-21). However, wolverines could travel outside of these high elevation sites, whether foraging for food, or moving to other source habitat on another ridge system a distance away from the Project area. Conflicts caused by human disturbance in the high elevation sites and at lower elevations could result from snowmobiling, hiking and ATV use, and vehicle traffic on open roads. The amount of long-term road closures and road decommissioning planned for each action alternative would greatly decrease the potential for these human conflicts from occurring, with the greatest decreased potential under Alternative 3. Under Alternative 4, the restoration treatments planned for higher elevation sites could pose a disturbance conflict for wolverines that might enter the area, leading to further isolation of occupied source habitat, and could affect the distribution and/or abundance of wolverine prey species and animal carcasses used for food.

Cumulative Effects

Actions on NFS lands that may cumulatively impact wolverines include over-the-snow recreation (snowmobiling, cross country skiing, snowshoeing), forest restoration treatments at high elevation sites, ongoing fuelwood removal, especially at higher elevation sites. Currently, private and State lands open to timber harvest are expected to have low levels of large tree, mixed-species forests, old forest conditions, and snags. Future forest practices on these lands are expected to further reduce these important habitat components. Treatments that occur in forested stands at higher elevations, especially near ridge tops would have the most effect on wolverine use of the area. Alternative 3 provides for more obliteration of roads and unauthorized routes than other alternatives. These road obliterations would benefit wolverines by decreasing human access into source habitats at high elevations.

3.4.6.6. Habitat Family 5—Forest and Range Mosaic

Source habitat for wildlife species in Habitat Family 5 is characterized by habitat requirements for Rocky Mountain elk. No focal species was designated for Family 5; however, elk is included in this analysis, because of its importance to local forest management and of special interest in elk management by the local communities.

3.4.6.6.1. Rocky Mountain Elk

Elk occur throughout the Forest and use a variety of habitats, ranging from open sagebrush-grasslands for foraging, to dense conifer stands for year-round hiding cover and winter thermal regulation. Forest Plan direction for elk habitat requires identifying and protecting calving areas, wallows, travel corridors (if known), mineral licks, security polygons, and winter range. Conifer stringers on open grassland hillsides create a classic elk habitat mosaic, which is used through much of the snow-free season. Dense vegetation plays an important role in reducing the vulnerability of elk to hunting mortality. Elk calving areas consist of moderate- to open-density conifer stands on southerly slopes, with a moderate-to-dense shrub layer in the understory. Elk winter range consists of large areas that provide grass and browse forage with dense forested stands nearby for thermal and hiding cover.

Numerous studies consider wildlife habitat to be at risk when road densities exceed 1.0 to 1.7 miles of open road per square mile (Wisdom 2007, Rowland et al. 2005, Frederick 1991, Hillis et al. 1991, Lyon 1983). Elk habitat effectiveness and security is influenced by amount and proximity of forage and cover components, adequacy of hiding and thermal cover, and open road densities. As hiding cover dissipates, the influence of open roads on elk habitat effectiveness is magnified (S. Reinecker, IDFG Comment Letter for the Lost Creek-Boulder Creek Project, dated March 27, 2013).

Road density plays an important role in elk management. Typically, road densities > 1.0 mile of drivable road per square mile are considered detrimental to elk use and will likely increase vulnerability to hunting mortality (Hillis et al. 1991, Frederick 1991). Frederick (1991) noted results from several studies that show elk habitat effectiveness declines to 75% at an open road density of 1.0 miles of open road per square mile of land. At road densities of 2.0 to 3.0 miles of open road per square mile of land, elk habitat effectiveness declines to 25%.

Elk Security Area Analysis

SAs (Hillis et al. 1991) are used as a measure of the effects of road density on bull elk vulnerability to hunting mortality. An area of 0.5 miles on either side of an open NFS road, or motorized trail, is considered unsecure. The remaining blocks of suitable habitat are defined as Elk Security Polygons. SAs must have vegetation and/or terrain features that provide appropriate hiding cover for elk and should be at least 250 acres in size. The total acreages of the SAs should be at least 30% of the analysis unit, which, in this case, is the roughly 50,000-acre Project area (USDA Forest Service 2003, Thomas et al. 1979). Security polygons that do not meet these criteria are dropped from the analysis, because they are not SAs. An analysis unit may have large security polygons, but if the requisite hiding cover is not present in a polygon, the polygon is dropped from the security analysis. Hiding cover was defined by Thomas et al. (1979) as "vegetation capable of hiding 90% of a standing adult deer or elk from the view of a human at a distance equal to or less than 60 meters (200 ft)." On the Forest, vegetative structure that would typically provide hiding cover is found in Strata 23, 24, 34, and 35. Plantations (Stratum 32) may

provide hiding cover, but should be field verified. Plantations, *per se*, are not SAs, because they would have to meet the other criteria of size and distance away from roads. Although terrain features do not provide vegetative cover, they may provide a visual block of a deer or elk to the hunter, adding to the hiding cover quality of a particular site. Currently, GIS does not have the capability to appropriately model terrain features.

Under Alternatives 2 and 4, a loop OHV trail would be designated by linking NFS roads 50166 and 50485 with a constructed trail. As noted earlier in this chapter, this location does not have a designated SA, because the polygon did not meet the minimum size criterion of 250 acres. However, also as discussed earlier, this area does currently support a healthy elk herd, largely because of the current year-round closures on these two roads. Applying the Hillis Paradigm (Hills et al. 1991) to the analysis of this location gives a false impression of overall elk security, because the analysis used in the Paradigm only applies to the high-powered rifle season in late summer and early fall. Creation and use of a loop OHV trail through this area would affect elk use of the area during spring calving and summer calf rearing. These new human disturbance factors could be intense enough to push elk out of the drainage at important seasons of elk behavior.

Additionally, having these two roads and the connector open during most of the snow-free season could provide motorized vehicle access to the ridges surrounding the area, which could lead to vehicles accessing a large, currently un-roaded, area. If OHV use of this area follows the use pattern noted in much of the Project area, access to the area would likely lead to a system of pioneered routes, some of which could easily access the Council Mountain Inventoried Roadless Area. For these reasons, the proposed OHV loop trail could have detrimental impacts to the local elk herd and the area supporting that herd.

Under Alternative 3, the OHV route discussed above would not be created. Therefore, the impacts to the local elk herd would remain minimal, as noted at current conditions.

Unauthorized Routes and Closed National Forest System Roads

The EIS analysis addresses open roads, but, as discussed above, unauthorized use of closed roads also effects elk security and habitat use. The public has legal access on open NFS or authorized roads, but since many unauthorized roads exist on the landscape, these routes may be used for illegal access (Table 3-43). Illegal use of unauthorized roads reduces the effectiveness of SAs, increasing the vulnerability of bull elk to hunting mortality. Figure 3-54, Figure 3-55, Figure 3-56 illustrate this problem and the changes in SAs for each action alternative. For example, SA #2 meets all of the criteria for an SA, but note how the size of the area shrinks, when the 0.5-mile buffer is applied to all drivable roads. Each of the SAs in the Project area shrinks significantly when all drivable roads are included in the analysis.

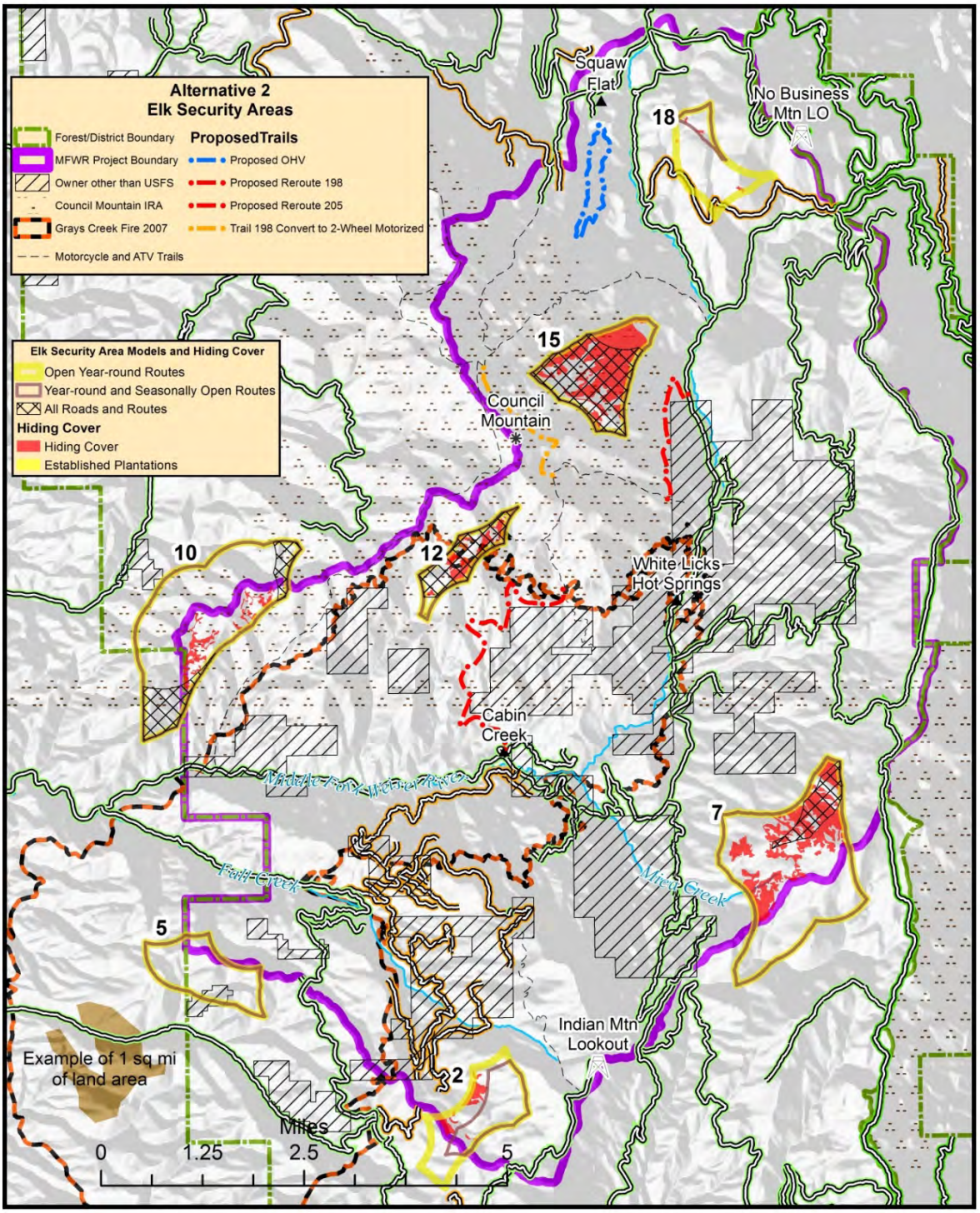


Figure 3-54. Elk security areas in the Project area, identified by a 0.5-mile buffer on roads, unauthorized routes, and motorized trails under Alternative 2

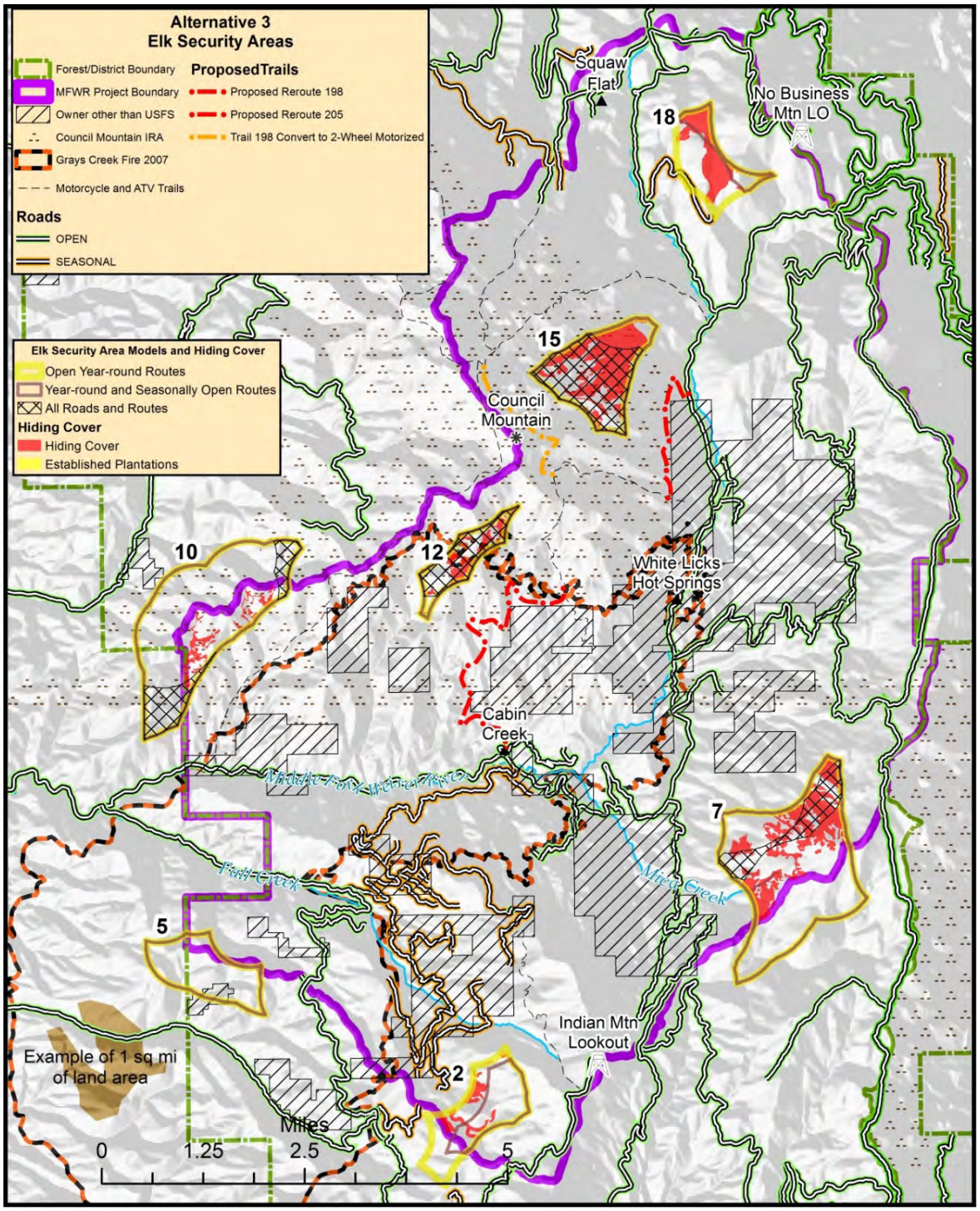


Figure 3-55. Elk security areas in the Project area, identified by a 0.5-mile buffer on roads, unauthorized routes, and motorized trails under Alternative 3

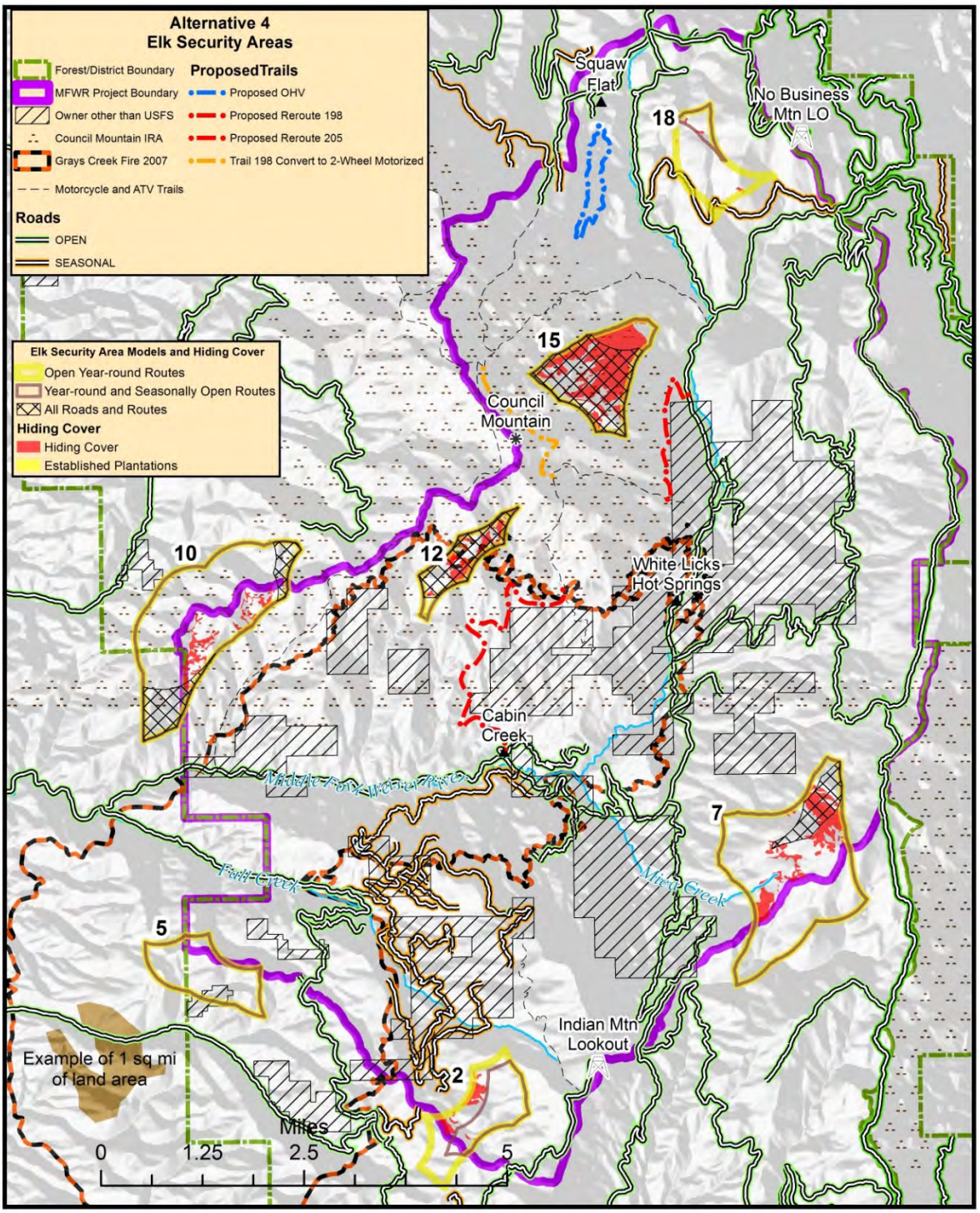


Figure 3-56. Elk security areas in the Project area, identified by a 0.5-mile buffer on roads, unauthorized routes, and motorized trails under Alternative 4

Elk Winter Range

Elk favor a mix of grassland/shrub landscapes and forested landscapes that provide important security cover.

Elk winter range exists in the Project area, primarily depending on snow depths at lower elevations, in the lower elevation sagebrush/grasslands that dominate the western foothills adjacent to the Project area. This habitat abuts large acreages of private land. As a result, substantial winter range habitat exists west of the Project area, including much of the Weiser River Valley, which primarily is private land and several small blocks of State land.

Elk Calving

Elk calving areas will be identified and evaluated, once individual harvest or burn units have been identified within the Project area. These important sites will be protected on a case-by-case basis, as the sites are located.

Cumulative Effects

The cumulative effects on elk for the Project are the effects of the road system on the vulnerability of bull elk to hunting mortality. These effects are presented in the maps that are presented as Figure 3-54, Figure 3-55, Figure 3-56, which show the changes in SAs, depending on the road system management for each action alternative.

Determination

No determination is required for elk as this species is a species of special interest, but not a federally-listed or Region 4 Sensitive species.

3.4.6.7. Habitat Family 12. Grassland/Open-Canopy Sage

3.4.6.7.1. Northern Idaho Ground Squirrel

Alternative 1—No Action

No northern Idaho ground squirrel populations are known to occur in the Project area, and no potential habitat would be altered under Alternative 1. Because northern Idaho ground squirrel habitat exists typically in the scabland community, the lack of prescribed fire treatments in these areas would most likely affect potential habitat for this species (Figure 3-23). The prescribed burns proposed for scabland habitats for the action alternatives would not occur, so fire stimulation of bunchgrasses, forbs, and some shrubs would not occur. In the long term, lack of fire would lead to a decrease in quantity and quality of modeled source habitat for northern Idaho ground squirrel due to the encroachment of conifers and shrubs into the scabland communities and the loss of vigor in the bunchgrasses, forbs, and some shrubs.

Direct and Indirect Effects from Alternatives 2, 3, and 4

No northern Idaho ground squirrel have been reported from surveys conducted over the past decade in the Project area or on the east side of the Council Ranger District, hence, there would be no direct effect to individual northern Idaho ground squirrels from implementing any of the

action alternatives. Indirectly, habitat for northern Idaho ground squirrel would be improved by the prescribed burns in the scabland habitats. The burns would restrict the encroachment of conifers and shrubs; improve the vigor of grasses, forbs, and some shrubs; and reduce the potential for stand-replacement fires. There is an unmeasurable potential for incidental habitat damage, due to machinery and vehicles being moved off of established roads and onto potential northern Idaho ground squirrel habitat for turn arounds and parking. These activities are not allowed under the project design features, so it would be expected that these incidents would be few and minor.

Cumulative Effects

No cumulative effects are expected to individuals of this species, since no northern Idaho ground squirrel occur in the area. Prescribed burning would be cumulatively beneficial to northern Idaho ground squirrel, by invigorating the grass/forb component of source habitat. Northern Idaho ground squirrel habitat management is guided by direction in the Forest Plan, the northern Idaho ground squirrel Recovery Plan (USDI Fish and Wildlife Service 2003), and the ESA. Specific mitigation measures would be used to ensure that northern Idaho ground squirrel habitat would not be altered, or made unavailable to northern Idaho ground squirrel, which would be considered "take", under the ESA. Because of the low potential for habitat alteration, the following determination was made for the action alternatives.

Determinations

Alternatives 2, 3, and 4 *May Effect, but are Not Likely to Adversely Affect* the northern Idaho ground squirrel or its habitat.

3.4.7. Irreversible and Irretrievable Commitments

The action alternatives are not expected to create any impacts that would cause irreversible or irretrievable commitment of terrestrial wildlife habitat.

3.4.8. Forest Plan Consistency

Alternative 1 (no action) does not meet all Forest Plan standards and guidelines for wildlife resources. The amount, quality, and distribution of wildlife habitats has declined throughout the Forest over the past 50 years, due to aggressive fire suppression, clear cut logging practices, and the increase of roads to support these two activities.

For Alternatives 2–4 (action alternatives), consistency with the Forest Plan is proposed to be achieved with the implementation of Project Design Features. Project Design Features and mitigation measures are designed to minimize effects to wildlife resources. Monitoring plans (Appendix 4) are incorporated into this DEIS to document that Project Design Features are implemented and effective in reducing effects and impacts to wildlife resources.

3.4.9. Project Record

This DEIS hereby incorporates, by reference, the wildlife specialist report in the Project record (40 CFR 1502.21). The report is located in the Wildlife Section of the Project record and contains the data, methods, analyses, maps, references, and technical documentation that the wildlife biologist relied upon to reach the conclusions in this DEIS.

3.5. Watershed Resources

3.5.1. Analysis Scale, Data Sources, and Methodology

3.5.1.1. Scope and Scale of Analysis: Direct and Indirect Effects and Cumulative Effects

The watershed analysis for both direct and indirect effects and cumulative effects, like the fisheries analysis, was completed at the subwatershed scale (6th field HUC), which is larger than the Project area and includes all ownership within each subwatershed (Figure 3-57). The analysis area chosen to assess current conditions, direct and indirect effects, and cumulative effects includes Granite Creek—Middle Fork Weiser River (170501240401), Jungle Creek—Middle Fork Weiser River (170501240402), Little Fall Creek—Middle Fork Weiser River (170501240404), and Mica Creek—Middle Fork Weiser River (170501240403) 6th field HUCs.

Note: the only activity proposed for the East Fork Weiser River subwatershed (170501240203) is the addition of an existing nonmotorized trail to the National Forest trail system. Therefore, we will not include analysis of objectives and indicators for this subwatershed in this chapter. See the fisheries section of this chapter for more information.

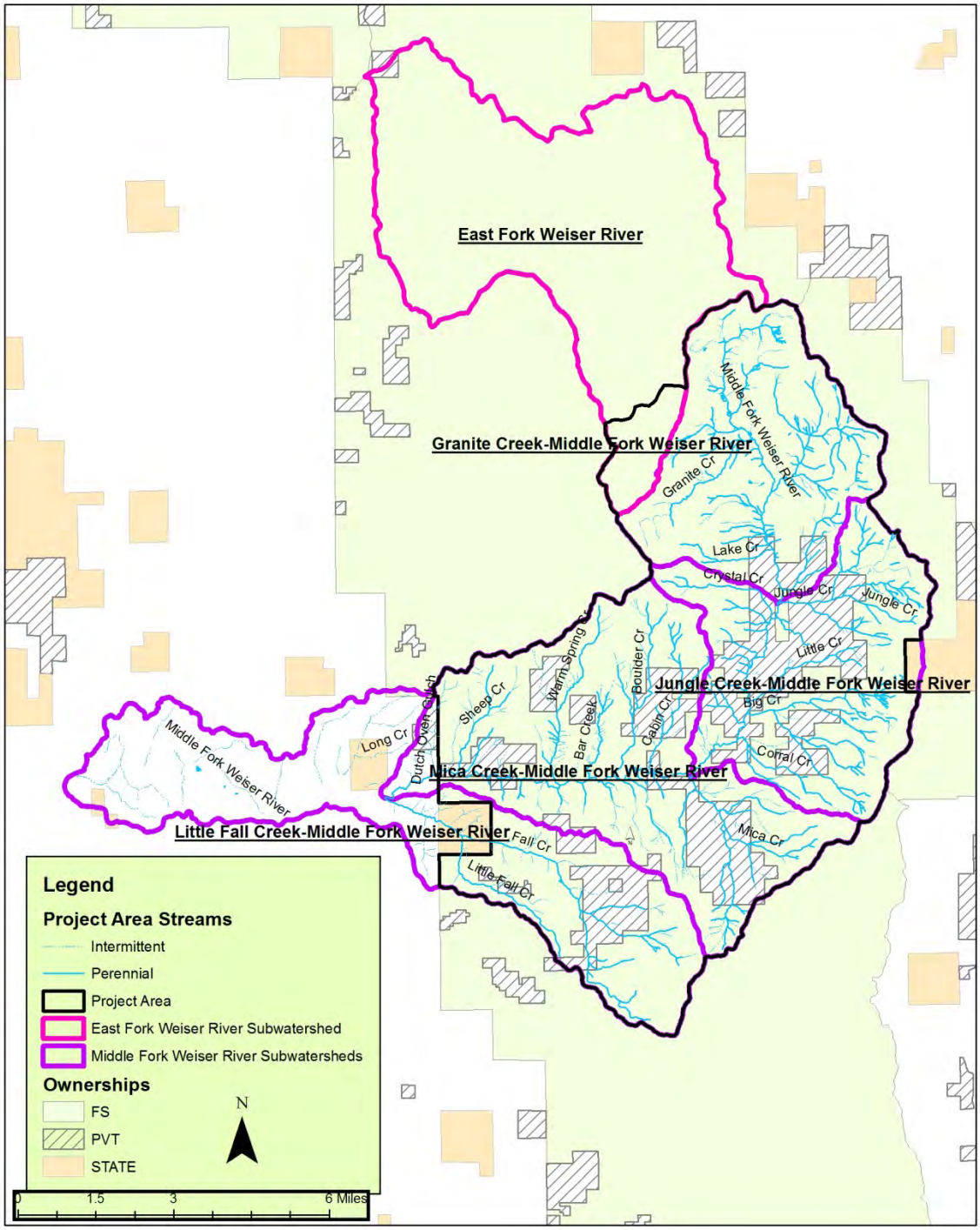


Figure 3-57. Watershed analysis—Middle Fork Weiser River landscape restoration project area and subwatersheds

3.5.1.2. Temporal Scale of Analysis

Time frames as defined in the Forest Plan are used for analysis of effects: temporary (0–3 years), short term (3–15 years), and long term (15 or more years) (USDA Forest Service 2003a).

3.5.1.3. Analysis Process/Measurements and Indicators

The measurements and indicators described below are used to compare alternatives, ascertain achievement of treatment objectives, and determine compliance with Forest Plan standards and guidelines (USDA Forest Service 2003a).

Need 8 in Chapter 1 describes the restoration need for improved watershed function and integrity. Objective 6 addresses this purpose and calls for improving watershed function and integrity and moving watersheds toward Forest Plan desired conditions through a variety of actions:

Improve watershed and aquatic function and integrity by moving all watersheds within the project area toward the desired condition for the soil, water, aquatic, and riparian resources.

The measurements for this objective are described below; proposed restoration actions focus on reducing the detrimental effects of roads on stream channels and watershed function and, through this, restoring resiliency and vigor to stream channels and adjacent riparian habitat.

Measurements:

Water Quality (Sediment)

- Amount of road-generated sediment reduced through road decommissioning and long-term closure over the long term as modeled by GRAIP and GRAIP Lite

Hydrologic Function (Channel Conditions, Changes in Peak and Base Flows, Floodplain Connectivity, and Road Density and Location)

- Total road density
- Road density within RCAs

Other proposed Project actions could affect SWRA resources. The following issue statements will allow for tracking this potential through the associated indicators:

Proposed activities for roads, vegetation treatments, and prescribed fire may degrade water quality by increasing soil erosion and sediment delivery.

Indicators:

- Miles of temporary roads constructed, including use of unauthorized roads
- Miles of road realignment and reconstruction
- Miles of new long-term road closures (road storage)
- Miles of roads decommissioned
- Acres of ground-based mechanical vegetation treatment
- Acres of prescribed burn

Proposed activities may change timing and duration of peak runoff, which may affect bank stability in sensitive channels.

Indicators:

- Total road density
- Number of drainages over 25% equivalent clearcut area, or ECA ("high" category)

3.5.1.4. Data Sources and Methodology

3.5.1.4.1. GRAIP

The U.S. Forest Service's RMRS collected road sediment data over the summers of 2013 and 2014 for use in their GRAIP model. The model uses highly detailed road survey data to feed into a GIS-based model that quantifies road sediment production and delivery, mass wasting potential, and habitat fragmentation (Black et al. 2007). The intense survey protocol yields site-specific data on roads or road segments most affecting a stream reach or subwatershed. The RMRS completed GRAIP surveys for the entire Granite Creek subwatershed and prioritized roads within the Mica Creek, Jungle Creek, and Little Fall Creek subwatersheds for use in this Project. These data were used to identify and recommend specific road improvements or decommissioning treatments; however, the data are too incomplete to use to quantify sediment delivery from the road network as a whole. Instead, GRAIP Lite was used for sediment analysis at the subwatershed scale.

3.5.1.4.2. GRAIP Lite

Developed by the RMRS, GRAIP Lite (Nelson et al. 2014) is a GIS-based sediment delivery model for roads. A simplified version of GRAIP (Black et al. 2012 GRAIP Lite is designed to provide sediment delivery estimates utilizing existing geospatial information (road layers, stream networks, and digital elevation models) to simulate road erosion and probability of sediment delivery based on road segment slope, surface type, maintenance level, and proximity to the stream. Although the GRAIP model is a highly accurate field inventory of road drainage features combined with a sediment delivery model that can identify site-specific road surface erosion and sedimentation problems, using GRAIP to field inventory an entire watershed can be time consuming and costly. GRAIP Lite identifies potential road sediment problems and provides a higher level of detail than existing sediment models (many of which do not account for proximity of roads to streams). GRAIP Lite does not provide the level of detail that GRAIP does with regard to identification of discrete drainage features and stream connection; however, it does include information about several processes that are important drivers for sediment delivery, including road slope, road surface material, maintenance level (amount of use), and probability of drain-point connection (proximity to a stream). Results from GRAIP Lite should be interpreted with caution because the model outputs may include large uncertainties at site-specific locations. At larger scales, however, the accuracy of GRAIP Lite compared to GRAIP increases (Nelson et al. 2014).

With regard to the model results for the Project area, GRAIP Lite appears to predict what was anticipated with regard to sediment delivery. Native surface roads located near streams are responsible for the majority of sediment delivery associated with the transportation system, and roads located on ridges or midslopes only contribute sediment at stream crossings. This

representation of the road system is an improvement over other road sediment models where only more general road attributes can be modeled.

3.5.1.4.3. Other Data

Road Condition Surveys

Data were collected on the general condition of roads, both system and unauthorized, over the summers of 2013, 2014, and 2015. Information recorded included road surface condition as evidenced by erosional features like ruts and gullies, road–stream connectivity (number of crossings and/or culverts), and cut and fill slope stability. Road survey forms and photographs are on file at the Council Ranger District, in the hydrology office. This information was used to recommend specific road treatments such as surfacing, crossing upgrade or removal, or decommissioning.

Stream Condition Surveys

Stream surveys using the Forest Service R1/R4, Rosgen Level II, and Payette PACFISH/INFISH Biological Opinion (PIBO) stream survey protocols described the existing conditions of streams in the project area and summarized conditions and stream type (Rosgen) as part of the channel condition risk indicator. Data used were collected between 1998 and 2012.

GIS Data

The Forest Service (Payette National Forest-specific) GIS library of roads, strata, and stream layers was used as a source for analyzing road density, miles of roads in RCAs, drainage network density, and ECA. The definition of RCA for road-related analysis in this Project was any road or unauthorized route within 300 feet of a perennial, or 150 feet of an intermittent, stream channel; these widths are consistent with Forest Plan Option 1 for RCA delineation; actual RCA widths proposed in a project may change with further analysis and project planning. RCA widths used for proposed management activities are described in Chapter 2.

3.5.1.5. Desired Condition

Desired conditions for SWRA resources are described in the Forest Plan (USDA Forest Service 2003). The Forest Plan states that 1) riparian and aquatic ecosystems have appropriate types and amounts of vegetation; 2) appropriate LWD is sufficient in land and stream channel forms to maintain water quality, filter sediment, aid floodplain development, improve floodwater retention and groundwater discharge, and contribute to diverse habitat components; 3) instream flows are sufficient to support healthy riparian and aquatic habitats, the stability and effective function of stream channels, and the ability to route flood discharges and provide for downstream uses; and 4) the amount, distribution, and characteristics of life-stage habitats are present to maintain or reach viable populations of native and desired nonnative species (USDA Forest Service 2003, pp. III–18).

Chapter 1 of this document includes relevant Forest Plan and MA specific direction for SWRA resources.

The desired condition is for Watershed Condition Indicators (WCIs) to move toward a Functioning Appropriately (FA) level wherever achievable. Many WCIs for the drainages in the

project area are in the Functioning at Risk (FR) or Functioning at Unacceptable Risk (FUR) categories. In general, restoration activities that reduce road density through road decommissioning and/or improve soil-hydrologic function, especially in RCAs and landslide-prone (LSP) areas, help move SWRA resources toward desired conditions. Improvement or removal of stream crossings, improvement (graveling, hardening, drainage) of existing roads, and improvement of recreation sites also contribute to movement toward desired conditions.

Pathways and Watershed Condition Indicators

WCIs represent an integrated suite of aquatic (including biophysical components), riparian (including riparian-associated vegetation species), and hydrologic (including uplands) condition measures that are intended to be used at a variety of scales. WCIs assist in determining the current condition of a watershed and should be used to help design appropriate management actions or to alter or mitigate proposed and/or ongoing actions, in order to move watersheds toward desired conditions. WCIs represent a diagnostic means to determine factors of current condition and to assist in determining future conditions associated with implementation of management actions or natural restoration over time (USDA Forest Service 2003a, p. GL-40).

Twenty-six WCIs are outlined in Forest Plan Appendix B to characterize current and desired SWRA resource conditions and the effects of land management activities on water quality (including temperature and sediment), habitat access, habitat elements, channel conditions and dynamics, flow/hydrology, watershed conditions, and the integration of species and habitat conditions (USDA Forest Service 2003a, pp. B-12 to B-21). Indicators are classified as FA, FR, or FUR.

See section 3.6 of this document (fisheries analysis) for WCI baseline tables that describe current conditions in the project area relevant to the fisheries analysis; entire Forest Plan Appendix B baseline tables for each subwatershed can be found in the watershed fisheries specialist reports. Information used to complete the baseline includes the Forest Plan and WARS database (USDA Forest Service 2003b), the Fisheries Information Database (USDA Forest Service 2014, FID unpublished data), GRAIP and GRAIP Lite data, Forest Service GIS databases, ranger district surveys, other agency information, and professional judgment.

Watershed Condition Framework (WCF), Aquatic Conservation Strategy (ACS), and Watershed and Aquatic Recovery Strategy (WARS)

See Chapter 1 of this document for background information on the Forest Service's WCF and on the Forest Plan's ACS and WARS. Although the WCF designates no focus subwatersheds in this project area, one objective is to improve watershed conditions and move subwatersheds toward the next best condition class. None of the subwatersheds are ACS priorities either, but the objective is to move them toward the desired condition as defined in the Forest Plan.

3.5.2. Affected Environment

3.5.2.1. Current Condition

All 5 subwatersheds in the analysis area drain into the Weiser River; the East Fork Weiser River flows into the Weiser River north of the rest of the subwatersheds, which enter the Weiser River via the Middle Fork Weiser.

The measurements and indicators analyzed for the water resource in this project relate to water quality, channel conditions and dynamics, and streamflow/hydrology WCIs.

3.5.2.1.1. Indicators Derived from WCIs Pertinent to this Project

Water Quality (Sediment)

Sediment can move efficiently along flowpaths such as roads (via ditch lines and the road surface) before either being retained by existing vegetation or routed to a stream via overland flow, channelized flow, or at a road–stream crossing. Road-related sediment can be a major contributor to stream sediment levels in heavily roaded watersheds. The subwatersheds in the analysis are all considered FUR for road density and location.

Road-related sediment rates predicted by the GRAIP and GRAIP Lite models are shown below (Table 3-74), along with the average natural erosion rate for a forested watershed of the inland Northwest (USDA Forest Service 1981). The full GRAIP inventory, which characterizes in detail sediment delivery from roads in a watershed, was completed for most (94%) of the Granite Creek subwatershed and, due to time constraints, for parts of each of the other subwatersheds. The GRAIP Lite model, which is reliable as a "big picture" of sediment delivery from a subwatershed but not at a site-specific level, was run for the entire project area (N. Nelson 2015). GRAIP results for each subwatershed only describe the sediment delivered from the roads surveyed, so they are not useful for characterizing sediment delivery from the subwatershed as a whole (other than perhaps in Granite Creek). Note that Granite Creek GRAIP and GRAIP Lite results are in good agreement.

GRAIP Lite modeled sediment accounts for all roads in the Project area, including those on private lands, NFS roads, and unauthorized roads on NFS lands. Table 3-75 displays the breakdown of roads within the Project area.

Table 3-74. Road-related sediment as modeled by GRAIP and GRAIP Lite

Erosion Predicted	GRAIP Lite Sediment Delivery[a] (tons/year)	GRAIP (tons/year)[a] (% roads inventoried)	Natural Erosion Rate (tons/year) (USDA Forest Service 1981)
Granite Creek—Middle Fork Weiser River	47.3	47.0 (94%)	25
Jungle Creek—Middle Fork Weiser River	61.7	45.8 (36%)	25
Mica Creek—Middle Fork Weiser River	71.9	7.7 (9%)	25
Little Fall Creek—Middle Fork Weiser River	36.9	0.02 (4%)	25

[a]GRAIP Lite is not appropriate for prioritizing treatments by specific road segment; it is used to estimate overall sediment impacts to the stream network of a subwatershed as a result of road sediment production (N. Nelson 2015).

Table 3-75. Miles of road by type within the Project area

Road Type	Number of Miles
National Forest System Open Year-round	55.2
County Open Year-round	18.1
National Forest System Open Seasonally	27.7
National Forest System Closed	74.8
Unauthorized Routes	64.9
Private (off-Forest) Roads	144.0
TOTAL ROADS	384.7
National Forest System Two-wheel Motorized Trail	21.8
National Forest System ATV Trail	2.4
National Forest System Nonmotorized Trail	3.8
TOTAL TRAILS	28.0

Many of the main, open roads within the Project area are located in RCAs along the Middle Fork Weiser River and its major tributaries (e.g., No Business Canyon, Little Creek, and Big Creek). Portions of these routes where the road is directly adjacent to the stream result in chronic sediment input that has been punctuated by larger sediment-producing events such as the 2010 flooding, when a whole section of the Middle Fork Weiser River Road (over 200 feet) failed into the stream (Figure 3-58, below). (See fisheries, section 3.6, for miles of roads located in RCAs.)

Unauthorized routes are not maintained as part of the NFS; any are producing sediment where drainage infrastructure has failed over time. In addition, some of these routes are still used by the public, which contributes to surface erosion via soil disturbance.

The condition of roads on private lands varies; some are regularly maintained to ensure adequate drainage and others are chronic sediment producers where rutting or crossing failures channelize flow from roads to streams.

Hydrologic Function (Channel Conditions, Changes in Peak and Base Flows, Floodplain Connectivity, and Road Density and Location)

Nearby roads can impair a stream's ability to access its floodplain. This can have detrimental effects on bank stability, bank erosion, and the channel's ability to handle peak flows. Loss of floodplain connectivity can increase the flooding potential downstream: flood flows no longer have access to the associated wetlands that naturally evolved adjacent to the stream to disperse water volume and energy. In the analysis area, a total of 126.4 miles of open and closed roads are located within RCAs, many of which contribute to a loss of floodplain connectivity. Currently floodplain connectivity is FUR, as is road density and location.

One example of the effects of loss of floodplain connectivity due to road encroachment into floodplains occurred during summer 2010 flooding in the Middle Fork Weiser River watershed (Figure 3-58). Rainfall totaling almost 6 inches fell over 2 days, in higher elevations on top of remaining winter snow pack, resulting in flooding and the failure of the Middle Fork Weiser River Road in several places, along with the loss of infrastructure (culverts) at several major tributaries. Water levels had clearly exceeded the capacity of the culverts and rip rap armoring the fill slope of the river road, rising well above bankfull and compromising road stability.

Figure 3-58. Damage to the Middle Fork Weiser River Road (NFS road 50186) shown during and immediately following summer 2010 flooding

High road densities can affect watershed function in a variety of ways. Roads are efficient at routing runoff and sediment to stream channels and can increase the volume and affect the timing of peak flows, thus contributing fine sediment to stream channels and affecting both fish habitat and channel function (Belt et al. 1992; Jones et al. 2000). High road densities in riparian areas can decrease stream shade and pose an increased risk of road prism failure and mass wasting into the stream channel during flood events, which in turn can cause greater damage downstream and also degrade fish habitat (Luce and Wemple 2001, N. Nelson et al. 2004).

In the project area subwatersheds, road densities (including NFS and unauthorized routes) range from 2.6 to 4.2 miles per square mile on NFS lands and from 4.5 to 5.9 miles per square mile on all ownerships (Table 3-76). With respect to Forest Plan Appendix B, all subwatersheds with road densities above 1.7 miles per square mile are considered FUR.

Table 3-76. Overall road density (miles per square mile) and Riparian Conservation Area (RCA) road density by subwatershed within the Project area (see fisheries section for additional related indicators, such as number of stream crossings)

Subwatershed	Road Density (National Forest System)	Road Density (All Ownership)
Granite Creek—Weiser River	4.2	4.5
Jungle Creek—Weiser River	3.1	5.9
Little Fall Creek—Weiser River	3.9	5.3
Mica Creek—Weiser River	2.6	4.8
Subwatershed	**RCA Road Density (National Forest System)**	**RCA Road Density (All Ownership)**
Granite Creek—Weiser River	4.8	5.5
Jungle Creek—Weiser River	3.2	7.1
Little Fall Creek—Weiser River	5.1	5.2
Mica Creek—Weiser River	2.8	5.3

As is evident from the table, road densities are considered FUR. Road densities within RCAs are also high, and evidence of roads impeding RCA function is apparent throughout the project area, but no Forest Plan WCI exists for this. Twenty-eight percent of NFS roads and unauthorized routes on NFS lands within the Project area are located within RCAs.

Because roads are efficient at routing sediment and water to stream channels much more quickly than natural hillslope processes, these high road densities also contribute to FR or FUR ratings for Middle Fork subwatershed WCIs related to channel conditions, including the Floodplain Connectivity, Change in Peak and Base Flow, and Change in Drainage Network WCIs.

Forest canopy condition in a watershed can affect both the magnitude and timing of streamflows (Burroughs and King 1989, Stednick 1996). Trees can influence the way snowfall is distributed and how it melts, and also extract and use a certain amount of water from the soil in transpiration (IDL 2000). As a result of this relationship between precipitation and vegetation, streamflows can be influenced to some degree by alteration of the canopy in a watershed. The ECA concept is used as a measure to assess potential effects of changes in forest vegetation on water yields and peak flows. ECA is a general index of hydrologically immature vegetation conditions in forested watersheds and can correlate to increases in water yield and changes in the timing of peak flows; however, research on the removal of live forest vegetation through harvest and road building has shown considerable variability in stream responses. Some studies indicate that 15%–25% of a drainage must be harvested in order for a measurable increase in water yield to occur, although the relationship between harvest and streamflow was poor at 15% (Stednick 1996). Another study indicated no measurable increase in water yield when 22%–50% of a drainage was harvested (Fowler et al. 1997). *Note: the amount of ECA does not equate to acres of clearcuts.*

The Forest Plan Appendix B WCI for ECA is described at the watershed scale (5th level HUC). ECA above 15% in a watershed is considered FUR. This WCI is based on both ECA percentage and whether or not ECA is concentrated in sensitive areas like RCAs or LSP areas (USDA Forest Service 2003a). In a white paper updating and expanding on the ECA WCI for the Forest in 2004, Bailey referred to an ECA of 25% at the watershed scale above as “high” and an ECA between 16% and 25% as “moderate,” with everything below 16% “low.” The ECA percentages in Table 3-77 are at the subwatershed scale, as this size is more closely related to drainages studied in ECA research. Currently, ECA on NFS lands for the entire Middle Fork Weiser River watershed is 14.7%, or FR; for all ownerships, ECA is 21.7%, or FUR, with respect to the Forest Plan WCI.

Table 3-77. Equivalent Clearcut Area (ECA), Watershed Condition Indicators (WCIs), and general channel conditions in the Project area by subwatershed

Subwatershed	ECA	Forest Plan WCI Rating	General Channel Condition/Notes[a]
Granite Creek—Middle Fork Weiser River			
All Ownerships	15.3%	n/a	Fair to good; overall data indicate stable channel but road-related bank failures due to recent flooding (2010) are still evident and unstable
National Forest System (NFS) Lands Only	13.0%	Functioning Appropriately	
Concentrated in Landslide-prone Areas or Riparian Conservation Areas (RCAs)[b]	No		
Jungle Creek—Middle Fork Weiser River			
All Ownerships	25.9%	n/a	Fair; effects of 2007 Grays Creek Fire coupled with presence of recreational impacts (old hot springs camping site, other dispersed sites) contribute to channel instability in tributaries
NFS Lands Only	12.0%	Functioning Appropriately	
Concentrated in Landslide-prone Areas or RCAs[b]	No	*Majority of ECA concentrated on private land*	
Mica Creek—Middle Fork Weiser River			
All Ownerships	24.7%	n/a	Fair to poor; recent flooding has caused stream crossing failures at several major tributaries; instability is still evident at these sites
NFS Lands Only	19.2%	FUR	
Concentrated in Landslide-prone Areas or RCAs[b]	*Yes; ECA in Boulder Creek and Warm Springs Creek drainages due to the Grays Creek Fire is concentrated in RCAs and appears to be influencing timing and magnitude of peak flows*	*Majority of ECA result of Grays Creek Fire*	
Little Fall Creek—Middle Fork Weiser River			
All Ownerships	20.9%	n/a	Fair to poor; same impacts as can be seen in Mica Creek subwatershed. Impacts from recent flooding have caused road-related damage to stream banks
NFS Lands Only	14.4%	Functioning Appropriately	
Concentrated in Landslide-prone Areas or RCAs[b]	No		
TOTAL			
All Ownerships within Project Area (Middle Fork Weiser River HUC 5)	21.7%	n/a	*Some ECA concentrated in RCAs and landslide-prone areas*
NFS Lands Only within Project Area (Middle Fork Weiser River HUC 5)	14.7%	FR	

[a]Sources: 2007–2014 stream survey data and professional observation

[b]Concentration, in this case, means more than 50% of the total ECA occurred in RCA or landslide-prone areas. ECA in the Boulder Creek drainage (a portion of the channel is shown in Figure 3-59) is high, or over 25% (Bailey 2004), after the Grays Creek Fire (2007) burned much of the headwaters. Debris plugged a concrete box culvert, after which the stream scoured out the culvert footings; debris and bank scour affected the channel over a half mile downstream. This occurred again in July 2015 after several days of summer thundershowers.

Figure 3-59. Failed concrete box culvert on National Forest System road 50677 at the lower end of the Boulder Creek drainage in the Mica Creek subwatershed after June 2010 flooding; streamflow is right to left in photos

Beneficial Uses for the Middle Fork Weiser River

The CWA requires Idaho to recognize existing uses, which are uses that are actually attained in a water body on or after November 28, 1975, whether or not they are designated uses. Idaho presumes most undesignated waters will support cold water aquatic life and primary or secondary contact recreation. These are termed presumed uses. Designated, existing, and presumed uses must all be protected. Those water bodies not found to be meeting water quality criteria are to be listed as water-quality impaired under section 303(d) of the CWA. Designated beneficial uses for the Middle Fork Weiser River are cold water aquatic life, salmonid spawning, and primary contact recreation. The upper portions of the river are recognized as fully supporting these uses, but the lowest portion, from the mouth to 0.2 miles below its confluence with Sheep Creek, is not supporting these uses and is on the state 303(d) list for *Escherichia coli* and fish biological assessments. A small reach of this stream segment is on NFS land, but the reach is less than 0.5 miles long. No associated Total Maximum Daily Load is established for *E. coli* or other pollutants for the Middle Fork Weiser River at this time.

3.5.3. Environmental Effects

3.5.3.1. Direct and Indirect Effects

The following section discusses how each alternative meets the watershed restoration objective of the Project (objective/measurements) and how proposed Project activities affect the water resource (issues/indicators). Each measurement and indicator is discussed at the temporary, short-term, and long-term time scale.

Objective 6: *Improve watershed and aquatic function and integrity by moving all watersheds within the project area toward the desired condition for the soil, water, aquatic, and riparian resources.*

Measurements:

Water Quality (Sediment)

- Percent of road-generated sediment reduced through road decommissioning and long-term closure as modeled by GRAIP and GRAIP Lite

Hydrologic Function (Channel Conditions)

- Road density by subwatershed
- RCA road density by subwatershed

Issue 1: *Proposed activities for roads, vegetation treatments, and prescribed fire may degrade water quality by increasing soil erosion and sediment delivery.*

Indicators:

- Miles of temporary road constructed, including unauthorized road used as temporary road
- Miles of road realignment and reconstruction
- Miles of new long-term closures (road storage)
- Miles of system and unauthorized roads decommissioned
- Acres of mechanical vegetation treatment
- Acres of prescribed fire

Scale of analysis*: Subwatershed, Forest Service managed lands*

Issue 2*: Proposed activities may change timing and duration of peak runoff, which may affect bank stability in sensitive channels.*

Indicators:

- Total road density (all ownerships)
- Number of subwatersheds that are over 25% ECA ("high" category, as defined in Bailey [2004])

Scale of analysis: *Subwatershed*

3.5.3.1.1. Alternative 1 (No Action)

This alternative proposes no vegetation or watershed restoration treatments. Erosion from existing roads within the analysis area would continue at current levels as the primary management-induced cause of sediment generation and delivery to streams. The location at which the Grays Creek Fire burned in the Mica Creek and Little Fall Creek subwatersheds would continue to exhibit effects upon peak flow timing, peak flow magnitude, and sedimentation, especially in the Warm Springs, Bar, and Boulder Creek drainages, where burning in the south-facing headwaters of each has already resulted in channel scour and hillslope erosion.

With this alternative, road density would remain the same within the project area (see Table 3-74). Roads would not incur increased use as haul routes, and no new road would be constructed as a reroute to replace a poorly located existing road. No additional road maintenance would occur beyond that normally scheduled. No stream crossings would be removed or improved. The MRS would remain the same (i.e., all the roads currently included on the Forest System for each subwatershed).

No increase in ECA would occur and, therefore, no change in timing or duration of peak flows. Only one subwatershed is above 25% ECA; one is near the 25% mark (see Table 3-77).

Table 3-77 exhibits the existing condition for ECA for all subwatersheds and for the watershed as a whole. Over time and as past harvest treatment areas mature, all ECA levels would gradually drop, but high-severity wildfire, wind events, insects, or other natural disturbances can also affect future ECA levels.

3.5.3.1.2. Proposed Management Activities Common to All Action Alternatives

The following section discusses information about proposed management activities common to all of the action alternatives. The differences in the magnitude of effects and the degree to which the watershed restoration objective is met for each alternative specifically will follow.

Vegetation Management

Timber harvest within the analysis area has the potential to increase erosion rates and sediment delivery to streams—according to one study, up to 1.6 times natural rates (Ice and Stednick 2004). The level of surface disturbance and erosion attributed to logging is dependent on several factors, including logging systems used and the steepness of slopes. Logging systems, ranked from most to least potential disturbance, are ground-based (tractor, skidder, feller-buncher), cable, and helicopter yarding. Logging systems proposed to accomplish vegetation treatments include tractor, tractor/jammer, and skyline/cable.

Project design features and mitigation measures identified for this project in Chapter 2 have been proven, through research and on-the-ground monitoring, to be effective at mitigating erosion from vegetation harvest units themselves (Ranger District monitoring reports from 2011 to 2014, available in the project record). These features and measures include proper skid trail location and rehabilitation, vegetation buffer strips, and avoidance or placement of timing restrictions for harvest on the more erosive soils. Sediment can be expected to increase over the temporary time frame relative to implementation, but with vegetation treatments most sediment increases would be attributable to roads (Ice and Stednick 2004).

Road actions associated with timber harvest (temporary road construction, road maintenance for haul routes) increase erosion and sedimentation on a much greater scale than vegetation treatments themselves, up to 500 times natural erosion rates (Ice and Stednick 2004). Project design features and mitigation measures are expected to limit these occurrences; any increase in sedimentation is expected to occur only within the temporary time frame relative to implementation. See the Table 2-28 in Chapter 2 for project design features specific to vegetation harvest and associated roads and skid trails.

Riparian Conservation Area–Proposed Treatments

Within the project area, approximately 2,600–3,400 acres of RCA treatments (using both mechanical means and by hand) are proposed, mostly within the outer half of designated RCAs. These treatments are discussed in detail in Chapter 2 and in Appendix 5 of this document. Differences between alternatives include a limited number of acres in the inner RCAs for Alternative 2 and Alternative 4; these are discussed specifically in the fisheries section of this chapter and in the “Water Quality (Sediment)” section below.

The suitability of an RCA for treatment would be determined by appropriate soil, water, aquatic, or riparian trained resource professionals in the field (pre-implementation) by assessing a representative cross-section characteristic of RCAs in the project area. If professionals determine that the RCA treatments have potential for erosion on the slope directly below the activity in a 10-year precipitation event, RCA treatments would be

precluded. Project design features have been established (see Chapter 2, Table 2-28) to reduce the potential for sedimentation, loss of shade, and LWD within the RCA.

In general, the further one gets from a stream channel, the less effect forested vegetation has on stream processes. Generalized curves (see Figure 3-60) depicting microclimate and shade contributions to streams as a function of distance from the channel in site-potential tree height indicate that processes controlling stream shade and micro-climatic variables decrease exponentially with distance from the channel. Eighty percent of effective shade comes from approximately one-half site-potential tree height distance from the channel (FEMAT 1993). For this project, the bulk of riparian treatments are proposed more than 60 feet (one-half site-potential tree height) from intermittent and 120 feet (one site-potential tree height) from perennial channels. See the fisheries section for a discussion of effects of RCA treatments on stream shade and temperature.

Belt et al. (1992) summarized scientific literature related to the design of vegetation buffer strips to protect water quality. For preventing sediment delivery via overland flow (sheet erosion) from road fill slopes on basalt-derived soils, they reported that buffer strips of 35–127 feet were capable of trapping 83.5% of sediment; adding 60 feet in length to those resulted in 97.5% efficiency. For this project, the bulk of riparian treatments are proposed more than 60 feet from intermittent and 120 feet from perennial channels. Treatments proposed closer than these distances are on slopes less than 20%, which would limit the potential for erosion over and above the project design features included in Chapter 2.

For all alternatives, a temporary increase in sediment as a result of vegetation treatments is expected, but project design features detailed in Chapter 2 and Appendix 5, which include riparian buffer strips and restriction of equipment to operations outside riparian areas, are anticipated to protect SWRA resources—including water quality (sediment and temperature) and channel conditions—over the long term (see Figure 3-61). No degradation of hydrologic function (channel or RCA conditions) is expected with proposed RCA treatments.

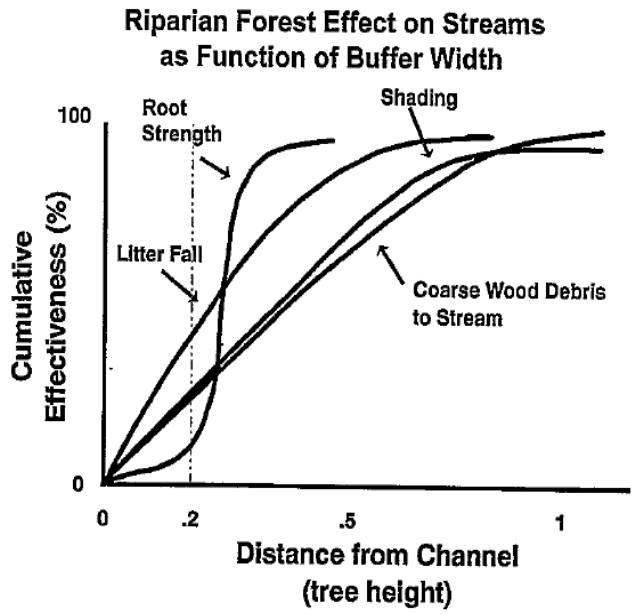


Figure V-12. Generalized curves indicating percent of riparian ecological functions and processes occurring within varying distances from the edge of a forest stand.

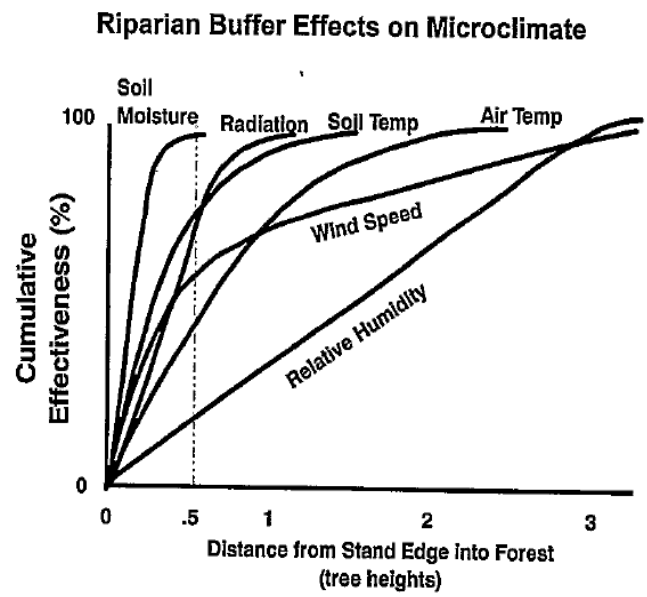


Figure V-13. Generalized curves indicating percent of microclimatic attributes occurring within varying distances of the edge of a riparian forest stand (after Chen, J 1991).

Figure 3-60. Generalized curves indicating percent of riparian functions and processes occurring within varying distances from the edge of a forest stand (FEMAT 1993)

Figure 3-61. Example of Riparian Conservation Area (RCA) unit harvested using an off-road jammer, which worked from outside the RCA; little-to-no soil disturbance was noted post-harvest; note in the photo at right that conifers were removed to make room for aspen, which are regenerating as of a summer 2015 monitoring visit

With the exception of limited specific locations proposed in Alternative 4, no treatments would occur within 120 feet for perennial streams (one site-potential tree height) or 60 feet for intermittent streams. Slope and equipment use restrictions, as described in the project design features, are designed to limit sediment delivery. The total proposed acres of RCA treatments (for acres proposed in RCAs by subwatershed, see fisheries, section 3.6) are likely to be reduced during the layout stage of the project, as some would likely not meet the requirements necessary to protect SWRA resources and prevent sediment delivery to channels.

The proposed treatments within RCAs for all alternatives are to be implemented with the design features and best management practices (BMPs) described above and under the guidance of the recent publication *National best management practices for water quality management on National Forest System lands, Volume 1: National core BMP technical guide* (USDA 2012) to achieve attainment of soil, water, riparian, and aquatic desired conditions.

Post-Harvest Activities

Excavator piling for brush disposal and reforestation site preparation disturbs forest litter and duff layers and exposes soil to increased surface erosion. These activities have the potential for transporting additional sediment to streams (Ice and Stednick 2004). Site preparation (slash burning or broadcast burning) increases total sediment output temporarily, until vegetation is established.

Action alternatives would include excavator piling with design features such as soil moisture limits and designated skid trails as a means of minimizing ground disturbance (see Chapter 2, Table 2-28). Perennial and intermittent streams would have RCA buffers between post-

harvest activities and stream courses. Any post-harvest slash piling or other treatment would be performed by hand if within an RCA. Perennial streams would have a minimum of a 240-foot buffer, and intermittent channels would have 120-foot buffers between any mechanical post-harvest activities and the channel. These design features would decrease the likelihood of disturbance to soils and resulting sediment delivery to streams from post-harvest activities.

Prescribed Fire

Broadcast burning for slash reduction would occur on the vegetation acres treated in each alternative. Additionally, prescribed fire is proposed to reduce fuel loading on 17,000–28,000 additional acres (depending on the alternative). It is estimated that the majority of prescribed fire would result in low soil burn severity. The amount of fire that would actually occur in any given year depends on many factors that allow a burn "window" for implementation. Therefore, the amount of sediment generated may vary by year, but it is estimated that the burning effects would predominantly exist over the temporary time frame for the range of alternatives.

The main concern with prescribed fire is the increased potential for surface erosion due to duff reduction and subsequent mineral soil exposure. There is a curvilinear relationship between duff reduction and mineral soil exposure, with mineral soil exposure increasing as duff consumption rises (Ice and Stednick 2004; Sandberg 1980). Prescribed burn operations attempt to leave sites with the surface condition of a low-severity burn; however, some of the areas (especially burn piles) often experience surface conditions associated with a high-severity burn that may result in hydrophobic or water-repellent conditions. With increasing duff and litter moisture content, soil temperatures are reduced, preventing soil hydrophobicity and reducing surface erosion (Robichaud and Waldrop 1994). Burn plan prescriptions would include objectives to limit duff consumption and mineral soil exposure.

Prescribed Fire within Riparian Conservation Areas

Prescribed fire treatment within RCAs is proposed in all alternatives, with the objective of stimulating new vegetation growth and making the upland vegetation located within RCAs more resilient in the event of wildfire. Approximately 25% of the total acres of RCAs within the treatment area may actually receive fire and ladder fuel treatments. The proposed ladder fuel treatment includes hand pruning and limbing in the understory; this material would be lopped and scattered or hand-piled. Design features to protect the soil, water, riparian, and aquatic conditions are included in Chapter 2, Table 2-28.

Prescribed fire would be allowed to back into RCAs and may be ignited within RCAs. Less fireline (ground disturbance and loss of ground cover) construction overall is expected with the additional flexibility to ignite within RCAs. Prescribed fire would possess the potential for sediment delivery, although implementation of the project design features included in Chapter 2, Table 2-28 would retain ground cover; limiting the burn to low severity minimizes this risk. Burning is not expected to have adverse effects to water quality over either the short or long term.

Guideline FMGU06 states: "Direct ignition of prescribed fire in RCAs should not be used unless site/project scale effects analysis demonstrates that it would not retard attainment of soil, water, riparian, and aquatic desired conditions." The proposed treatments within RCAs, when implemented with the above design features, are not expected to retard attainment of soil, water, riparian, and aquatic desired conditions.

Road Restoration Treatments: Decommissioning and Long-term Closure

Proposed decommissioning treatments of system roads and unauthorized routes are designed to restore long-term soil productivity and hydrologic function to the road prism—and in a majority of cases, the most effective treatment is full obliteration of the road. This includes recontouring the road prism as closely as possible to the natural slope profile, restoration of stream crossings to match natural channel dimensions, placement of woody debris as represented in the adjacent forest, methods to relieve soil compaction, closure of the road to motorized use with rocks or natural barriers, and the establishment of native vegetative ground cover. Full obliteration of a road may be unattainable under various conditions found during the implementation process; these may include:

- Excessive cuts and fills (i.e., 25 feet of cut)
- Excessive rock in the treadway (i.e., bedrock)
- Wetlands
- Lack of fill material
- Through cuts (a cut slope on both sides of road, without a fill slope)

Where a full recontour is not attainable or road conditions warrant a lesser treatment that would still meet restoration objectives, one or more of the following would be used to achieve restoration over the long term: outsloping, revegetation, stream-crossing restoration, or physically blocking or disguising the entrance.

Treatments reduce or eliminate road-related sediment generated from road prisms (travelway, cut and fill). Many of these roads are closed to the public and have erosion issues due to lack of maintenance. Obliteration of roads effectively reduces the overall road density in all the subwatersheds within the analysis area (see Table 3-78). In all alternatives, road reconstruction, temporary road use, and restoration treatments could create a slight temporary sediment increase, but those roads decommissioned after use would exhibit reduced effects the first year after treatment and would greatly reduce long-term sediment production. Those roads with range access or other permitted needs have been identified during the TAP and would have some level of access maintained.

Table 3-78. Road density and Riparian Conservation Area (RCA) road density by subwatershed (miles per square mile [mi/mi^2])

Subwatershed	Alternative 1 (No Action) (mi/mi^2)	Alternative 2 (Proposed Action) (mi/mi^2)	Alternative 3 (mi/mi^2)	Alternative 4 (mi/mi^2)
Granite Creek	4.6/4.5	3.0/2.5	2.6/2.1	3.1/2.6
Jungle Creek	5.9/3.1	5.3/2.1	5.3/2.1	5.4/2.2
Little Fall Creek	3.4/3.9	2.7/1.8	2.7/1.8	2.8/1.9
Mica Creek	4.8/2.6	4.0/1.6	4.0/1.6	4.1/1.6
RCA Road Density by Subwatershed				
Granite Creek	5.5/4.8	3.7/2.8	3.3/2.4	3.8/2.9
Jungle Creek	7.1/3.2	6.1/1.8	6.1/1.8	6.2/1.9
Little Fall Creek	5.2/5.1	4.1/1.8	4.1/1.8	4.1/2.0
Mica Creek	5.3/2.8	4.6/1.8	4.6/1.8	4.6/1.9

Note: Road densities are presented for all ownership/National Forest System lands only

Not all miles of unauthorized routes are proposed for treatment because some of the routes are considered a low priority for restoration. The low-priority designation for unauthorized routes is due to one or more of the following:

- Adequate ground cover or vegetation
- No documented erosion issues
- Inaccessible without excessive disturbance
- Located outside of RCA or LSP areas
- No stream crossing issues
- Minimal cut and fill

A natural event such as a flood or fire may remove vegetation and ground cover, and these roads could become a higher priority for treatment in the future. If any erosion events were to occur or future management were to utilize those events, restoration priority would be re-determined.

System roads not needed for at least 30 years but still identified as important for future management are proposed for long-term closure. This treatment leaves the road prism in place but stabilizes the surface and cut and fill slopes. Stream crossings are restored to natural contours, and ephemeral and relief culverts, if stable enough to leave in place, are treated by building a bypass channel so that water can still drain across the road should the culvert plug. Although this treatment does not restore soil productivity or hillslope hydrologic function, watershed benefit is realized at stream crossings, and sources of sediment associated with open or poorly draining roads are eliminated.

Over the long term, all road treatments would contribute to improving hydrologic function and channel conditions in the project area subwatersheds.

Reducing Impacts from Dispersed Camping and System Trails

MA 3 (Weiser River) direction in the Forest Plan specifically discusses reducing sediment impacts from dispersed camping sites along the Middle Fork of the Weiser River, near its

confluence with Cabin Creek (aka "Horse Cabin Flat") and at the horse camping area near the confluence with Jungle Creek.

Treatment for all alternatives at the Jungle Creek site includes hardening and narrowing the crossing of the Middle Fork Weiser River at the dispersed camping area to accommodate stock use while minimizing bank and bed erosion and focusing motorized access to the existing bridge, which is approximately 300 feet upstream. These treatments would improve bank stability and vegetation at a discrete location along the Middle Fork and also better enable this area to handle runoff generated by the Middle Fork road to the west/southwest. Improvements to the site in general (hardening, providing physical barriers to direct use) would also be made in order to minimize impacts to the adjacent Middle Fork Weiser River. The end result of this work would be a minor improvement to sediment delivery and streambank/floodplain function along the Middle Fork Weiser River in the Jungle Creek subwatershed.

All alternatives propose making improvements to the "Horse Cabin Flat" dispersed site, including installing up to four hitch rails; designating camping sites using boulders, graveling, and site signs to mark the allowed camping locations; and adding a single vault toilet. The end result of this work would be an incremental improvement to soil productivity and vegetation within the RCA of the Middle Fork Weiser River in the Mica Creek subwatershed.

The sediment improvements resulting from the above actions are accounted for in the GRAIP Lite modeling (Table 3-74) results included in this chapter.

All alternatives propose improvements to NFS trails that would incrementally improve SWRA resources. Specific actions include rerouting a small section of the NFS trail 212 in the East Fork Weiser River subwatershed to mediate current steep sections causing undue soil erosion, and rerouting portions of NFS trail 198 in the headwaters of Granite Creek (Granite Creek subwatershed) to reduce resource impacts in sensitive soil types and improve sustainability of the trail system. Overdue trail maintenance would also be performed on 24 miles of existing trail within the project area. These actions would result in incremental improvements to sediment delivery and soil productivity in all subwatersheds, with the most improvement in the headwaters of Granite Creek, as a result of trail reroutes and improvements.

Wetlands and Floodplains

Forest Plan standards protect streams and wetlands in RCAs so that riparian-dependent resources receive primary emphasis; management activities are subject to specific standards and guidelines. Wetlands and floodplains help to maintain the integrity of aquatic ecosystems.

Existing roads would continue to affect floodplains along streams and at stream crossing locations. Some of these sites constrict the floodplain and change channel geometry, which directly affects wetlands and floodplains.

The action alternatives propose to decommission up to 26.2 miles of road in RCAs, which includes the areas near floodplains. Removal of these roads would improve floodplain function and channel conditions, and benefit riparian-dependent species. Riparian buffers around wetlands and streams (and their associated floodplains) would be delineated to exclude harvest unless a specific objective were associated with tree removal (see Chapter 2,

"Wet Meadow Treatment"); project design features (i.e., winter logging) would result in maintaining the function of these areas.

Some floodplains and wetlands may be lightly burned, but the effect should not be significant. Due to the season when burning would occur (fall or spring) the result is expected to be a patchy, low-severity fire that would therefore retain ground cover and soil productivity and result in minimal and insignificant effects on floodplains and riparian vegetation.

For the action alternatives, direct and indirect effects to wetlands and floodplains would be minimized through the application of BMPs and designation of RCAs.

Project Design Features for Soil and Water

Management requirements and project design features reduce the risk of sediment delivery via channelized and diffused flows from disturbed areas such as landings, skid trails, and harvested acres, as well as from harvest-associated haul routes and decommissioned roads (Chapter 2, Table 2-10 and Table 2-13). These flows have been documented over the years through research findings and on-the-ground monitoring (West Zone monitoring results from 2010 to 2015, available in the project record; Foltz 2007; Belt et al. 1992; Borroughs and King 1989).

Best Management Practices

Compliance with the CWA is achieved through the proper site-specific design, implementation, and monitoring of BMPs; these BMPs are incorporated into the project design features table in Chapter 2, both specifically and by reference to the *National best management practices for water quality management on National Forest System lands, Volume 1: National core BMP technical guide* (USDA 2012). Approved by the state and the U.S. Environmental Protection Agency (EPA), BMPs are intended to result in compliance with state water quality standards for nonpoint pollution. Timber harvest practices identified by EPA include measures to protect sensitive areas (such as stream banks, wetlands, estuaries, ponds, lake shores, and riparian zones). Such measures include:

- Designated skid trails
- Graveling of roads and stream crossings
- Winter logging
- Skid trail rehabilitation
- Avoidance of mechanical equipment on steep slopes or saturated soil

Protection is to be achieved by reducing the physical disturbance to soils and maintaining ground cover to reduce erosion.

A key concept of BMPs is that if monitoring identifies any circumstance of noncompliance with state water quality standards, the Forest Service is then obligated to respond to the situation in order to restore compliance. As long as BMPs have been applied and monitoring and adjustments are ongoing, the Forest Service is in compliance with the CWA (IDEQ 2008). BMP monitoring on the West Zone of the Forest, where the project is located, occurs annually; these annual reports indicate that BMPs have been effective (West Zone monitoring results from 2011 to 2015, available in the project record).

The effectiveness of forestry BMPs has been studied extensively (Belt et al. 1992; Seyedbagheri 1996). Application of BMPs would be a requirement for the project. BMPs are incorporated into a project through B and C provisions in the Timber Sale Contract. BMP effectiveness ratings are based on research literature and on-the-ground experience. These practices have proven effective in minimizing off-site impacts (e.g., sediment movement to draws or channels).

3.5.3.1.3. Water Quality (Sediment)

Indicator: *Miles of Temporary Roads and Miles of Road Realignment and Reconstruction*

Alternative 2 (Proposed Action)

This alternative proposes that 2.2 miles of permanent system roads be constructed on existing unauthorized road beds as reroutes for 3 miles of poorly located existing system roads (to be decommissioned for SWRA resource benefit); the net reduction in system roads is 0.8 miles. These roads would be constructed for future management access and put into Level 2 closed status when project activities are complete. These miles, considered road realignment, are counted as part of the total miles of road reconstruction below and in Table 3-79.

Road reconstruction is planned for 10.9 miles; actions include replacing undersized or aging culverts and, in addition, surfacing areas with gravel or coarser material (pit run).

This alternative also proposes constructing 44.1miles of temporary roads (34.3 miles utilizing existing unauthorized roads and 9.8 miles of new construction). Temporary road construction would temporarily increase sediment, but sediment would be reduced over the short and long term, as these roads would be fully recontoured within 3 years of use. If not used for project access, roads would still be decommissioned and evaluated for the appropriate level of treatment to still meet the ecological objective of soil-hydrologic restoration.

Road realignment/reconstruction would temporarily increase sediment; sediment production would decrease over the short term as disturbed cut and fill slopes revegetate and stabilize. Over the long term, with the new road located outside RCAs, properly closed to public use, and maintained, sediment contribution would be minimal.

Road reconstruction and temporary road construction would temporarily increase sediment, especially where road reconstruction involves culvert replacement or disturbance at stream crossings. With implementation of project design features over the short and long term, however, sediment would be reduced as road reconstruction improves existing roads and as temporary roads are returned to natural slope profiles and soil productivity.

The seasonally open off highway vehicle (OHV) trail described in Chapter 2 would be built on existing NFS roads 50166 and 50485, which are currently closed to public use. Building the OHV trail would slightly increase sediment over the long term as a result of regular use. Because these roads are existing and currently not well-vegetated or maintained, however, the current sediment contribution is close to what would result from use by OHVs.

Alternative 3

No new road construction (realignment) as part of road rerouting is proposed under this alternative. Roads proposed for decommissioning under Alternative 2 as part of rerouting would still be decommissioned, but the reroutes would not be built.

Road reconstruction is proposed for 8.8 miles; actions include replacing undersized or aging culverts and, in addition, surfacing areas with gravel or coarser material (pit run).

This alternative also proposes constructing 35.3 miles of temporary roads (27.1 miles utilizing existing unauthorized roads and 8.2 miles of new construction). Temporary road construction would temporarily increase sediment production, but sediment would be reduced over the short and long term, as these roads would be fully recontoured within 3 years of use. If not used for project access, roads would be evaluated for the appropriate level of treatment to still meet the ecological objective of soil-hydrologic restoration.

Road reconstruction would temporarily increase sediment; sediment production would decrease over the short term as disturbed cut and fill slopes revegetate and stabilize. Over the long term, with the new road located outside RCAs, properly closed to public use, and maintained, sediment contribution would be minimal.

With this alternative, the OHV trail described on NFS roads 50166 and 50485 would not be built; instead, these roads would be decommissioned, resulting in a temporary increase in sediment but reducing long-term sediment contribution and restoring soil-hydrologic function in the headwaters of Granite Creek.

Because no new road construction (reconstruction as part of realignment) is associated with this alternative, it carries the least risk of sediment impacts over both the short and long term.

Alternative 4

This alternative proposes constructing 2.5 miles of permanent system roads on existing unauthorized road beds as reroutes for 4.5 miles of poorly located existing NFS roads (to be decommissioned for SWRA resource benefit); the net reduction in system roads is 2.0 miles. These roads would be constructed for future management access and be put into ML 2 closed status when project activities are complete. These miles, considered road realignment, are counted as part of the total miles of road reconstruction below and in Table 3-79.

Road reconstruction is planned for 17.3 miles; actions include replacing undersized or aging culverts and, in addition, surfacing areas with gravel or coarser material (pit run). Road reconstruction includes road realignment (discussed above), as well as adding approximately 4 miles of unauthorized road to the NFS to facilitate access to vegetation and fuels treatments both for this project and in the future. These roads were reviewed by the IDT during the TAP process, and resource concerns associated with adding them to the transportation system were minimal. Under Alternative 4, these roads would be closed (Maintenance Level 2 roads when completed). Entrances would be gated and road prism stabilized (cut and fill slopes seeded, drainage features installed and maintained) but would still be available for administrative access.

This alternative also proposes constructing 48.0 miles of temporary roads (39.7 miles utilizing existing unauthorized roads and 8.3 miles of new construction). Temporary road construction would temporarily increase sediment production, but sediment production would decrease over the short and long term as these roads would be fully recontoured within 3 years of use. If not used for project access, roads would be evaluated for the appropriate level of treatment to still meet the ecological objective of soil-hydrologic restoration.

Road realignment/reconstruction would temporarily increase sediment; sediment production would decrease over the short term as disturbed cut and fill slopes revegetate and stabilize. Over the long term, with the new road located outside RCAs, properly closed to public use, and maintained, sediment contribution would be minimal.

Action regarding the OHV trail on NFs roads 50166 and 50485 (described in Alternative 2) would be the same for this alternative.

Regarding road-related sediment, the greatest potential for short to long-term impacts is seen with this alternative because it involves the most road construction and reconstruction. Road decommissioning and long-term storage would, however, more than offset this increase.

Table 3-79. Miles of National Forest System (NFS) road construction and reconstruction, and temporary road construction, by subwatershed and alternative (*Note: Road miles are slightly different from Table 2-8 because of rounding and a small amount occurs outside the analysis area)*

Subwatershed		Alternative 2 (Proposed Action)	Alternative 3	Alternative 4
Granite Creek—Middle Fork Weiser River				
Miles of NFS road construction (includes unauthorized road [existing prism] added to system)		0	0	1.8
Miles of NFS reconstruction (includes reconstruction as part of proposed realignment in Alternatives 2 and 4)		6.3	5.1	9.0
Miles temporary road	New	2.9	2.9	2.3
	Utilize existing prism (unauthorized road)	12.1	9.2	15.0
Jungle Creek—Middle Fork Weiser River				
Miles of NFS road construction (includes unauthorized road [existing prism] added to system)		0	0	0.6
Miles of NFS reconstruction (includes reconstruction as part of proposed realignment in Alternatives 2 and 4)		1.5	1.2	2.1
Miles temporary road	New	1.6	1.6	2.2
	Utilize existing prism (unauthorized road)	7.2	2.9	8.3
Mica Creek—Middle Fork Weiser River				
Miles of NFS road construction (includes unauthorized road [existing prism] added to system)		0	0	0.4
Miles of NFS reconstruction (includes reconstruction as part of proposed realignment in Alternatives 2 and 4)		0.6	0	1.3
Miles temporary road	New	2.4	1.9	2.1
	Utilize existing prism (unauthorized road)	8.8	8.8	10.1
Little Fall Creek—Middle Fork Weiser River				
Miles of NFS road construction (includes unauthorized road [existing prism] added to system)		0	0	1.3
Miles of NFS reconstruction (includes reconstruction as part of proposed realignment in Alternatives 2 and 4)		2.5	2.5	4.9
Miles temporary road	New	2.9	1.8	1.7
	Utilize existing prism (unauthorized road)	6.2	6.2	6.3

Indicator: *Acres of Mechanical Treatment and Acres of Prescribed Fire*

Alternative 2 (Proposed Action)

This alternative proposes approximately 21,600 acres of vegetation treatments and 24,240 acres of prescribed fire (see Table 3-80 and previous section, "Effects Common to Action Alternatives"). The most treatment is proposed in Granite and Mica creeks, with just over 6,500 acres proposed in each subwatershed. These subwatersheds also contain the highest percentage of NFS lands.

Both mechanical treatment and prescribed burning would result in temporary sediment increases but, over the short term, sediment where the ground is disturbed would return to pre-treatment levels, as long as project design features and BMPs listed in Chapter 2 are implemented. The closer treatment units and associated skid trails, temporary roads, and equipment come to the edge of RCA buffers, the greater the statistical chance of sediment entering a stream channel, but with project design features in place, this chance would be minimized.

The acres proposed for mechanical treatment would likely be much smaller, as on-the-ground layout and implementation results in dropped areas due to site-specific resource concerns such as sensitive soils, rocky ground, or inaccessibility.

Alternative 3

This alternative proposes approximately 18,880 acres of vegetation treatments and 16,630 acres of prescribed fire. Granite Creek and Mica Creek subwatersheds would still receive the most treatment, but in this alternative Mica Creek would receive approximately 1,300 more acres of treatment than Granite Creek.

Unlike Alternatives 2 and 4, no treatment is proposed for certain higher-elevation areas (PVGs) and, unlike Alternative 4, no treatment is proposed in the inner portions of RCAs (the inner 60 feet of intermittent and inner 120 feet of perennial streams). This decrease in acreage and avoidance of areas closer to water bodies reduces sediment over the temporary time frame. Over the short term, like other alternatives, sediment is expected to return to pre-treatment levels.

Alternative 4

This alternative proposes approximately 24,195 acres of vegetation treatments and 27,440 acres of prescribed fire, the greatest number of acres of the action alternatives. Treatment in this alternative would include more acres of certain high-elevation PVGs (as described in Chapter 2), more acres of RCA treatment and acres within the inner RCA of some water bodies (also described in Chapter 2, and in the fisheries section of this chapter). Compared to Alternative 2, approximately 440 more acres would be treated in Granite Creek, 1,850 more in Jungle Creek, 10 more in Little Fall Creek, and 300 more in Mica Creek.

This increased treatment acreage, along with the increase in treatment closer to water bodies, would result in an increase in sediment over the temporary time frame as compared to Alternative 2, and more so with Alternative 3. Over the short term, like other alternatives, sediment is expected to return to pre-treatment levels.

Table 3-80. Acres of mechanical treatment and prescribed fire by alternative

Subwatershed	Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3	Alternative 4
Granite Creek—Middle Fork Weiser River				
Mechanical Treatment	0	6,570	4,830	7,010
Prescribed Fire	0	7,630	3,330	8,120
Jungle Creek—Middle Fork Weiser River				
Mechanical Treatment	0	3,580	3,320	5,435
Prescribed Fire	0	4,150	3,380	6,460
Little Fall Creek—Middle Fork Weiser River				
Mechanical Treatment	0	4,900	4,620	4,910
Prescribed Fire	0	5,370	3,200	5,380
Mica Creek—Middle Fork Weiser River				
Mechanical Treatment	0	6,550	6,110	6,840
Prescribed Fire	0	7,090	6,720	7,480

Measurement: *Percent of Road-generated Sediment Reduced over the Long Term, as Modeled by GRAIP and GRAIP Lite*

Alternative 2 (Proposed Action)

Over the long term, as a result of road decommissioning and long-term closure, with Alternative 2 the GRAIP Lite model indicates a net reduction in sediment for all subwatersheds (Table 3-81). The least amount of sediment reduction would be in Jungle Creek, with a 1.1% reduction through long-term closure and a 14.6% reduction through decommissioning; the most reduction would be in Granite Creek and Little Fall Creek, with reductions of 10.6% and 3.7%, respectively, through long-term closure and reductions of 25.5% and 37.4%, respectively, for decommissioning. Decommissioning and long-term closure treatments would result in a small increase in sediment over the temporary time frame where stream crossings are rehabilitated and roads decommissioned adjacent to stream channels. However, recovery would begin almost immediately, and over the short to long term the sediment reduction would be realized.

Note: while a sediment increase from decommissioning is always planned for, recent GRAIP surveys on decommissioned roads immediately after treatment and after a 10-year recurrence interval rain event have shown almost no sediment leaving the recontoured road prism, even with heavy rains. Placing slash and mulch as erosion control and decompacting the road surface to allow water to infiltrate (rather than pool and run off) has been validated as an effective means of preventing erosion, even over the temporary time frame (Nelson et al. 2010).

Alternative 3

Over the long term, as a result of road decommissioning and long-term closure, the GRAIP Lite model indicates a net reduction in sediment for all subwatersheds (Table 3-81.). The

least amount of sediment reduction would be in Jungle Creek, with a 1.1% reduction through long-term closure and a 14.6% reduction through decommissioning; the most reduction would be in Granite Creek and Little Fall Creek, with reductions of 7.7% and 3.7%, respectively, through long-term closure and reductions of 40.6% and 37.4%, respectively, for decommissioning. Decommissioning and long-term closure treatments would result in a small increase in sediment over the temporary time frame where stream crossings are rehabilitated and roads decommissioned adjacent to stream channels. However, recovery would begin almost immediately, and over the short to long term the sediment reduction would be realized.

Alternative 3, overall, results in the greatest reduction in sediment at the Middle Fork Weiser River watershed scale and in all subwatersheds. The greatest contrast with the other alternatives is in the Granite Creek subwatershed, where sediment reduction from decommissioning is 15% greater than in Alternative 2. Reduction through long-term closure is 2.9% less because roads proposed for long-term closure in the other alternatives would be decommissioned in Alternative 3.

Alternative 4

Over the long term, as a result of road decommissioning and long-term closure, the GRAIP Lite model indicates a net reduction in sediment for all subwatersheds (Table 3-81.). The least amount of sediment reduction would be in Jungle Creek, with a 1.1% reduction through long-term closure and a 13.4% reduction through decommissioning; the most reduction would be in Granite Creek and Little Fall Creek, with reductions of 10.6% and 3.7%, respectively, through long-term closure and reductions of 24.9% and 37.3%, respectively, for decommissioning. Decommissioning and long-term closure treatments would result in a small increase in sediment over the temporary time frame where stream crossings are rehabilitated and roads decommissioned adjacent to stream channels. However, recovery would begin almost immediately, and over the short to long term the sediment reduction would be realized.

This alternative includes slightly less road decommissioning and long-term closure than Alternative 2. Coupled with proposed new road construction (as part of road realignment) and the proposed OHV trail, Alternative 4 results in the least sediment reduction over the long term for all subwatersheds.

Table 3-81. Long-term sediment reduction through road decommissioning and long-term closure by subwatershed and alternative as modeled by GRAIP Lite

Treatment	Alternative			
	1 (No Action)	2 (Proposed Action)	3	4
Granite Creek—Weiser River GRAIP Lite modeled sediment (existing condition, whole subwatershed): 47.4 tons/year				
Decommissioning				
Tons/year reduced	0	12.1	19.2	11.8
Percent reduced	0	25.5%	40.6%	24.9%
Long-term Closure*				
Tons/year reduced	0	5.0	3.7	5.0
Percent reduced	0	10.6%	7.7%	10.6%
Jungle Creek—Weiser River GRAIP Lite modeled sediment (existing condition, whole subwatershed): 61.8 tons/year				
Decommissioning				
Tons/year reduced	0	9.0	9.1	8.3
Percent reduced	0	14.6%	14.6%	13.4%
Long-term Closure[a]				
Tons/year reduced	0	0.7	0.7	0.7
Percent reduced	0	1.1%	1.1%	1.1%
Little Fall Creek—Weiser River GRAIP Lite modeled sediment (existing condition, whole subwatershed): 36.9 tons/year				
Decommissioning				
Tons/year reduced	0	13.8	13.8	13.7
Percent reduced	0	37.4%	37.4%	37.3%
Long-term Closure[a]				
Tons/year reduced	0	1.4	1.4	1.4
Percent reduced	0	3.7%	3.7%	3.7%
Mica Creek—Weiser River GRAIP Lite modeled sediment (existing condition, whole subwatershed): 72.1 tons/year				
Decommissioning				
Tons/year reduced	0	10.5	10.5	10.3
Percent reduced	0	14.5%	14.5%	14.3%
Long-term Closurea				
Tons/year reduced	0	2.6	2.6	2.6
Percent reduced	0	3.6%	3.6%	3.6%

[a]This row reflects an assumed elimination of all sediment delivery points.

3.5.3.1.4. Hydrologic Function (Channel Conditions, Changes in Peak and Base Flows, Floodplain Connectivity, and Road Density and Location)

Indicator: *Miles of Road Decommissioning and Long-term Closure*

Measurement: *Road Density by Subwatershed and Riparian Conservation Area Road Density*

Alternative 2 (Proposed Action)

This alternative proposes 16.1 miles of system road decommissioning and 64.5 miles of unauthorized road decommissioning (Table 3-82). Approximately 24.6 of these miles are located in RCAs. All of these roads adversely affect watershed conditions by constricting floodplains, contributing sediment, intercepting subsurface flow and routing runoff to channels (influencing peak or base flows), or affecting riparian vegetation and stream shade. Decommissioning roads reduces the overall road density in all subwatersheds within the analysis area by between 1.0 and 2.1 miles per square mile on NFS lands and by between 0.6 and 1.6 miles per square mile if all ownerships are included (see Table 3-78). This reduction would, over the long term, improve channel conditions as floodplains are restored, sediment input is reduced, hillslope hydrology is restored, and riparian and upland vegetation replaces road-related soil issues such as compaction and erosion.

Road treatments would also decrease the risk of larger, discrete channel-impacting events such as culvert and road prism failure (caused by flooding or wildfire) followed by precipitation. The alternative would maintain recreation and range access, where needs are identified.

Additional reductions in road-related effects on channel conditions are addressed by 17.7 miles of system road long-term closures. These are currently closed ML 1 and 2 system roads that generally have not been maintained nor had BMPs implemented. This long-term closure treatment would move all of these roads to the ML 1 category once stabilization treatments such as removal of culverts, outsloping, waterbarring, and scarification/seeding have been completed. Two roads in the Granite Creek subwatershed, totaling approximately 3 miles, would be classified as long-term closures but would be part of the proposed OHV trail loop described in Chapter 2; therefore, restoration would not be fully realized on these roads, and some impacts to channels at and downstream of trail fords would be present over the long term.

Overall, this alternative would result in isolated disturbance and impacts on channel conditions over the temporary time frame as crossings and roads adjacent to channels are treated, but would result in restoration of conditions over the short and long term, especially where restoration takes place in RCAs. See the fisheries section for a discussion specific to stream-crossing restoration. This restoration offsets the impacts of new road construction associated with road realignment over the short and long term. Figure 3-62 depicts the results obtained from road decommissioning.

Alternative 3

This alternative proposes 23.5 miles of system road decommissioning and 64.5 miles of unauthorized road decommissioning (Table 3-82). Approximately 26.2 of these miles are located in RCAs. Decommissioning roads reduces the overall road density in all subwatersheds within the analysis area by between 1.0 and 2.4 miles per square mile for

NFS lands and by between 0.6 and 2.0 miles per square mile if all ownerships are included (Table 3-78).

Additional reductions in road-related effects on channel conditions are addressed by 14.8 miles of system road long-term closures.

This alternative results in the most decommissioning both outside of and within the RCAs. It results in slightly less long-term closure because roads proposed for this treatment in Alternatives 2 and 4 would be decommissioned. Overall, this alternative results in a slightly greater impact to channel conditions over the temporary time frame but provides the greatest restoration of channel conditions over the short and long term, as a result of decommissioning and long-term closures. It offsets the impacts of new road construction associated with road realignment over the short and long term.

Alternative 4

This alternative proposes 16.1 miles of system road decommissioning and 60.6 miles of unauthorized road decommissioning (Table 3-82). Approximately 23.6 of these miles are located in RCAs. Decommissioning roads reduces the overall road density in all subwatersheds within the analysis area by between 0.9 and 1.9 miles per square mile for NFS lands and by between 0.5 and 1.5 miles per square mile if all ownerships are included (Table 3-78).

Additional reductions in road-related effects on channel conditions are addressed by 17.7 miles of new system road long-term closures. Similar to Alternative 2, two roads in the Granite Creek subwatershed, totaling approximately 3 miles, would be classified as long-term closure but would be part of the proposed OHV trail loop described in Chapter 2; therefore, restoration would not be fully realized on these roads, and some impacts to channel conditions at and downstream of trail fords would be present over the long term.

This alternative includes the least number of miles of decommissioning in RCAs. It results in slightly less impact to channel conditions over the temporary time frame as a result of less decommissioning and long-term closure related disturbance, but the alternative also realizes the least benefit to channel conditions over the short and long term. It offsets the impacts of new road construction associated with road realignment over the short and long term.

Table 3-82. Miles of road decommissioning and long-term closure by subwatershed (*Note: Road miles are slightly different from Table 2-8 because of rounding and a small amount occurs outside the analysis area)*

Subwatershed	Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3	Alternative 4
Granite Creek—Middle Fork Weiser River				
Decommissioning	0	30.1	36.8	28.3
Long-term Closure	0	9.1	6.3	9.1
Jungle Creek—Middle Fork Weiser River				
Decommissioning	0	11.9	11.9	11.6
Long-term Closure	0	0.7	0.7	0.7
Little Fall Creek—Middle Fork Weiser River				
Decommissioning	0	17.6	17.6	16.3
Long-term Closure	0	3.2	3.2	3.2
Mica Creek—Middle Fork Weiser River				
Decommissioning	0	20.0	20.2	19.7
Long-term Closure	0	4.7	4.6	4.7

Figure 3-62. Examples of before and after road decommissioning showing soil decompaction, restoration to natural slope profile, and revegetation to restore hillslope hydrologic function

Indicator: *Total Road Density and Number of Subwatersheds over 25% ECA*

Alternative 2 (Proposed Action)

For all the action alternatives, vegetation treatments that propose removing more than 20% of the crown cover would affect ECA. Prescribed burning, proposed in all action alternatives, does not affect ECA because it is not expected to remove more than 20% of the existing

crown cover. Some vegetation prescriptions (patch cuts and shelterwood) do propose activities that would result in net increases in ECA.

As displayed in Table 3-77, ECA class would not change in any of the subwatersheds with Alternative 2. The greatest increase in ECA would occur in the Granite Creek—Middle Fork Weiser River subwatershed, with ECA increasing by 4.3%. ECA would move from below 25% to above 25% in the Mica Creek—Weiser River subwatershed, but only to 26% (Table 3-83). Research indicates a change in ECA of 15% or greater (some research shows closer to 20%) is required for measurable change in peak or base flows (Stednick 1996). In summary, no significant change in peak and base flows, and by translation no increase in channel condition risk, is expected to occur with this alternative as a result of vegetation treatments.

Roads are also efficient at routing runoff more quickly to a channel than natural hillslope processes. Reducing road density reduces the man-made drainage network in a watershed. With this alternative, total road density (all ownerships) would be reduced by 0.6–1.6 miles per square mile, with the greatest reduction coming in the Granite Creek subwatershed, at the head of the Middle Fork watershed, with a 1.6 mile per square mile reduction. This overall reduction in the drainage network would contribute to improving channel conditions by reducing unnaturally high peak flows and allowing more water to reach streams via natural hillslope processes (Jones et al. 2000).

Alternative 3

The least increase in ECA overall would occur with Alternative 3. ECA would move from below 25% to above 25% in the Mica Creek—Weiser River subwatershed, but only to 26% (Table 3-83). In summary, no significant change in peak and base flows, and by translation no increase in channel condition risk, is expected to occur with this alternative.

The greatest reduction in total road density would be realized with this alternative, with reductions of between 0.6 and 2.0 miles per square mile. This would result in the greatest contribution toward channel restoration in the short to long term.

Alternative 4

The greatest increases in ECA would occur with Alternative 4. The largest increase would be in the Granite Creek—Middle Fork Weiser River subwatershed, with ECA increasing by 4.6%. ECA would move from below 25% to above 25% in the Mica Creek—Weiser River subwatershed, but only to 26% (Table 3-83). In summary, no significant change in peak and base flows, and by translation no increase in channel condition risk, is expected to occur with this alternative.

The least reduction in total road density would be realized with this alternative—although only slightly less than in Alternative 2—with reductions of between 0.5 and 1.5 miles per square mile. This would result in the least contribution toward channel restoration over the short to long term.

Table 3-83. Equivalent Clearcut Area (ECA) percentage by subwatershed and alternative (all ownerships)

Subwatershed	Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3	Alternative 4
Granite Creek—Middle Fork Weiser River	15.3%	19.6%	18.3%	19.9%
Jungle Creek—Middle Fork Weiser River	25.9%	28.1%	28.1%	29.1%
Mica Creek—Middle Fork Weiser River	24.7%	25.9%	26.0%	26.0%
Little Fall Creek—Middle Fork Weiser River	20.9%	24.2%	24.0%	24.2%

3.5.3.2. Summary of Direct and Indirect Effects

3.5.3.2.1. Water Quality (Sediment)

For all alternatives, the proposed vegetation harvest, prescribed fire, road reconstruction, road decommissioning, and long-term closures would result in temporary increases in sediment, as the ground is disturbed in implementing management activities. These activities would be spread out over several years, so the temporary spike would be smaller than if all were implemented at once, but the effects would also last longer. Over the short and long term, natural vegetation recovery and erosion-control measures would stabilize soil, and sediment would return to pre-treatment levels and then drop below those levels as decommissioned roads recover. See Table 3-81 for GRAIP Lite sediment analysis that compares the long-term outcomes for each alternative.

Over the temporary time frame, Alternative 4, with more road reconstruction/realignment, more temporary road construction, and more acres of vegetation treatment and prescribed fire, would result in the greatest sediment impact over both the temporary and long term. Alternative 3 would result in the least sediment increase over the temporary, with the fewest miles of road reconstruction and temporary road use, and the fewest acres of vegetation treatment and prescribed fire.

All alternatives meet the objective of promoting watershed restoration over the long term and identify roads for decommissioning, especially in RCAs; however, Alternative 3 provides the biggest sediment reduction. This is due to the increased level of watershed restoration that road decommissioning and long-term closure treatments accomplish within the project area and to the least amount of new long-term (chronic) sediment introduced by the addition of system roads and an OHV trail in Alternatives 2 and 4.

3.5.3.2.2. Hydrologic Function (Channel Conditions, Changes in Peak and Base Flows, Floodplain Connectivity, Road Density and Location)

For all alternatives, the proposed vegetation harvest, prescribed fire, temporary road construction, and road reconstruction would result in temporary impacts to hydrologic function at the subwatershed scale. These activities would be spread out over several years, so the temporary impact would be smaller than if all were implemented at once, but the potential effects would also last longer. Over the short and long term, natural vegetation recovery and road decommissioning would result in a decrease in drainage density and help

restore subwatershed hydrologic function to a more natural state. Road decommissioning adjacent to streams and road–stream crossing restoration would immediately help to restore floodplain function and therefore contribute to an improvement in channel conditions. See Table 3-83, Table 3-84, and Table 3-85 for changes in ECA and road densities that compare the long-term outcome for each alternative.

For all alternatives, the ECA analysis indicates that drainages within the project area are at only a slightly elevated risk for increased peak flows. Over time, as harvest treatment areas mature and re-grow, all ECA levels would generally slowly decrease. However, natural disturbance events can also affect ECA levels.

Over the temporary time frame, Alternative 4, with more road reconstruction/realignment, more temporary road construction, and more acres of vegetation treatment and prescribed fire, would result in the greatest potential impact to hydrologic function by temporarily increasing the drainage network via increasing road density. It also would result in the least road decommissioning, so over the short and long term it would achieve the least in terms of hydrologic function restoration. Alternative 3 calls for the fewest acres treated and the least numbers of temporary roads, so it would result in the least temporary increase in drainage network. It also would result in the greatest amount of hydrologic function restoration over the long term, with the most road decommissioning and long-term closures.

3.5.3.2.3. Conclusion

Overall, Alternative 3 does the most to move all project-area subwatersheds furthest toward the desired conditions in the Forest Plan. The difference between Alternative 3, as compared to Alternatives 2 or 4, is most pronounced in Granite Creek.

The alternatives provide a range of options for implementing current road policy and for managing system roads and unauthorized routes. For all action alternatives, reduction in long-term sediment yields and improvements in hydrologic function at the subwatershed scale are achieved over the long term.

Table 3-84. Subwatershed indicators for direct and indirect effects and project objective (measurements for objectives are in italics), comparison by alternative

	Measurement/Indicator Category	Indicator/ Measurement	Alt 1	Alt 2	Alt 3	Alt 4
Granite Creek	Water Quality (Sediment)	Miles of temporary road constructed (new/existing prism)	0	2.9/12.1	2.9/9.2	2.9/15
		Miles system road reconstructed (includes reconstruction as part of proposed realignment in Alternatives 2 and 4)	0	6.3	5.1	9.0
		Mile system road construction (includes unauthorized road added to system)	0	0	0	1.8
		Total miles of road decommissioned	0	30.1	36.8	28.2
		Total miles of road put into long-term closure	0	9.1	6.3	9.1
		Acres of mechanical vegetation treatment	0	6,570	4,830	7,010
		Acres of prescribed fire	0	7,630	3,380	8,120
		Percent over natural rates reduced (decommissioning/long-term closure) (GRAIP Lite)	0	25.5%/ 10.6%	40.6%/ 7.7%	24.9%/ 10.6%
	Hydrologic Function (Channel Conditions, Changes in Peak and Base Flows, Floodplain Connectivity, Road Density and Location)	*Road density (all lands/NFS lands)*	4.6/4.5	3.0/2.5	2.6/2.1	3.1/2.6
		RCA road density (all lands/NFS lands)	5.5/4.8	3.7/2.8	3.3/2.4	3.8/2.9
		ECA, subwatershed	15.3%	19.6%	18.3%	19.9%
		Total road density all lands (mi/sq. mi)	4.6	3.0	2.6	3.1
Jungle Creek	Water Quality (Sediment)	Miles of temporary road constructed (new/existing prism)	0	1.6/7.2	1.6/2.9	1.6/8.3

	Measurement/Indicator Category	Indicator/ Measurement	Alt 1	Alt 2	Alt 3	Alt 4
		Miles system road reconstructed (includes reconstruction as part of proposed realignment in Alternatives 2 and 4)	0	1.5	1.2	2.1
		Mile system road construction (includes unauthorized road added to system)	0	0	0	0.6
		Total miles of road decommissioned	0	11.9	11.9	11.6
		Total miles of road put into long-term closure	0	0.7	0.7	0.7
		Acres of mechanical vegetation treatment	0	3,580	3,320	5,435
		Acres of prescribed fire	0	4,150	3,380	6,460
		Percent over natural rates reduced (decommissioning/long-term closure) (GRAIP Lite)	0	14.6%/ 1.1%	14.6%/ 1.1%	13.4%/ 1.1%
	Hydrologic Function (Channel Conditions, Changes in Peak and Base Flows, Floodplain Connectivity, Road Density and Location)	*Road density (all lands/NFS lands)*	5.9/3.1	5.3/2.1	5.3/2.1	5.4/2.2
		RCA road density (all lands/NFS lands)	7.1/3.2	6.1/1.8	6.1/1.8	6.2/1.9
		ECA, subwatershed	25.9%	28.1%	28.1%	29.1%
		Total road density all lands (mi/mi^2)	5.9	5.3	5.3	5.4
Little Fall Creek	Water Quality (Sediment)	Miles of temporary road constructed (new/existing prism)	0	2.9/6.2	1.8/6.2	2.9/6.3
		Miles system road reconstructed (includes reconstruction as part of proposed realignment in Alternatives 2 and 4)	0	2.5	2.5	4.9
		Mile system road construction (includes unauthorized road added to system)	0	0	0	1.3
		Total miles of road decommissioned	0	17.6	17.6	16.3
		Total miles of road put into long-term closure	0	3.2	3.2	3.2
		Acres of mechanical vegetation treatment	0	4,900	4,620	4,910
		Acres of prescribed fire	0	5,370	3,200	5,380
		Percent over natural rates reduced (decommissioning/long-term closure) (GRAIP Lite)	0	37.4%/ 3.7%	37.4%/ 3.7%	37.3%/ 3.7%
		Road density (all lands/NFS lands)	3.4/3.9	2.7/1.8	2.7/1.8	2.8/1.9

	Measurement/Indicator Category	Indicator/ Measurement	Alt 1	Alt 2	Alt 3	Alt 4
	Hydrologic Function (Channel Conditions, Changes in Peak and Base Flows, Floodplain Connectivity, Road Density and Location)	*RCA road density (all lands/NFS lands)*	5.2/5.1	4.1/1.8	4.1/1.8	4.1/2.0
		ECA, subwatershed	20.9%	24.2%	24.0%	24.3%
		Total road density all lands (mi/mi^2)	3.4	2.7	2.7	2.7
Mica Creek	Water Quality (Sediment)	Miles of temporary road constructed (new/existing prism)	0	2.4/8.8	1.9/8.8	2.4/10.1
		Miles system road reconstructed (includes reconstruction as part of proposed realignment in Alternatives 2 and 4)	0	0.6	0	1.3
		Mile system road construction (includes unauthorized road added to system)	0	0	0	0.4
		Total miles of road decommissioned	0	20.0	20.2	19.7
		Total miles of road put into long-term closure	0	4.7	4.6	4.7
		Acres of mechanical vegetation treatment	0	6,550	6,110	6,840
		Acres of prescribed fire	0	7,090	6,720	7,480
		Percent over natural rates reduced (decommissioning/long-term closure) (GRAIP Lite)	0	14.5%/ 13.6%	14.5%/ 3.6%	14.3%/ 3.6%
	Hydrologic Function (Channel Conditions, Changes in Peak and Base Flows, Floodplain Connectivity, Road Density and Location)	*Road density (all lands/NFS lands)*	4.8/2.6	4.0/1.6	4.0/1.6	4.1/1.6
		RCA road density (all lands/NFS lands)	5.3/2.8	4.6/1.8	4.6/1.8	4.6/1.9
		ECA, subwatershed	24.7%	25.9%	26.0%	26.0%
		Total road density all lands (mi/mi^2)	4.8	4.0	4.0	4.1

3.5.3.3. Cumulative Effects

Within the Weiser River subbasin, the entire Middle Fork of the Weiser River watershed and the East Fork Weiser River subwatershed are analyzed. The cumulative effects area totals 78,765 acres, or approximately 123 square miles. Figure 3-63 displays the area analyzed for direct, indirect, and cumulative effects for watershed resources. Table 3-85 lists indicators for the direct and indirect effects analysis generalized over the cumulative effects area. Note that the only activity proposed for the East Fork Weiser River is adding a NFS trail and performing trail maintenance and reroutes intended to decrease the grade and prevent erosion on this trail.

Past management activities, including roads, grazing, timber harvest, residential development, agriculture, and recreation, have increased background levels of sediment in streams within the cumulative effects analysis area. A summary of projects that may contribute to cumulative effects within the project area can be found in Appendix 3.

The same indicators used for the direct and indirect effects analysis were extrapolated to the cumulative effects area (Table 3-85). Effects were assessed in a qualitative manner.

Alternative 1 (No Action) would not contribute to the cumulative amount of sediment reaching the Weiser River, either via the East Fork Weiser or the Middle Fork. It would not contribute to a change in peak or base flows, or implement any prescribed fire, vegetation, or watershed restoration activities.

Under the action alternatives, beneficial uses for the Middle Fork Weiser River would not be impaired, and no Forest Plan WCI would be degraded. Generally, proposed actions would result in a slight increase in sediment in the short term and a decrease in sediment over the long term. The GRAIP Lite model indicates that all action alternatives would result in a decrease in the cumulative amount of sediment over the long term. It is unlikely that this change in sediment levels would be measurable at the mouth of the East Fork Weiser River (due to very little proposed activity with this project), nor would it be measurable for the Middle Fork Weiser River, due to remaining high road densities on private land and the large and fairly regular fill-slope failures and chronic erosion of the Middle Fork Weiser River Road (50186). At least for the foreseeable future, the regular sediment input from the recently burned (Grays Creek Fire, 2007) Warm Springs and Boulder Creek drainages, which have already experienced major runoff events and contributed large amounts of sediment to the Middle Fork 3 times since 2007, would be significant. The GRAIP Lite model was not used to model the entire cumulative effects area, so the results presented are qualitative.

Over the temporary time frame, hydrologic function at the subwatershed or watershed scale could be affected by a temporary increase in road density as temporary roads are constructed to facilitate vegetation treatments. These roads would contribute to already high road densities on private lands interspersed with NFS lands throughout the project area. Over the long term, however, road density would be reduced on NFS lands and the cumulative road density over the entire watershed would be reduced, with approximately one-third of this reduction occurring in RCAs on NFS lands. This, coupled with removal of culverts on system roads proposed as part of long-term storage, would result in a reduced impact and risk to hydrologic function at the subwatershed and watershed scale for all alternatives. Because of the very limited amount of activity proposed in the East Fork subwatershed, no change in current or future conditions is expected, and the proposed activity would not contribute cumulatively to any change in the subwatershed

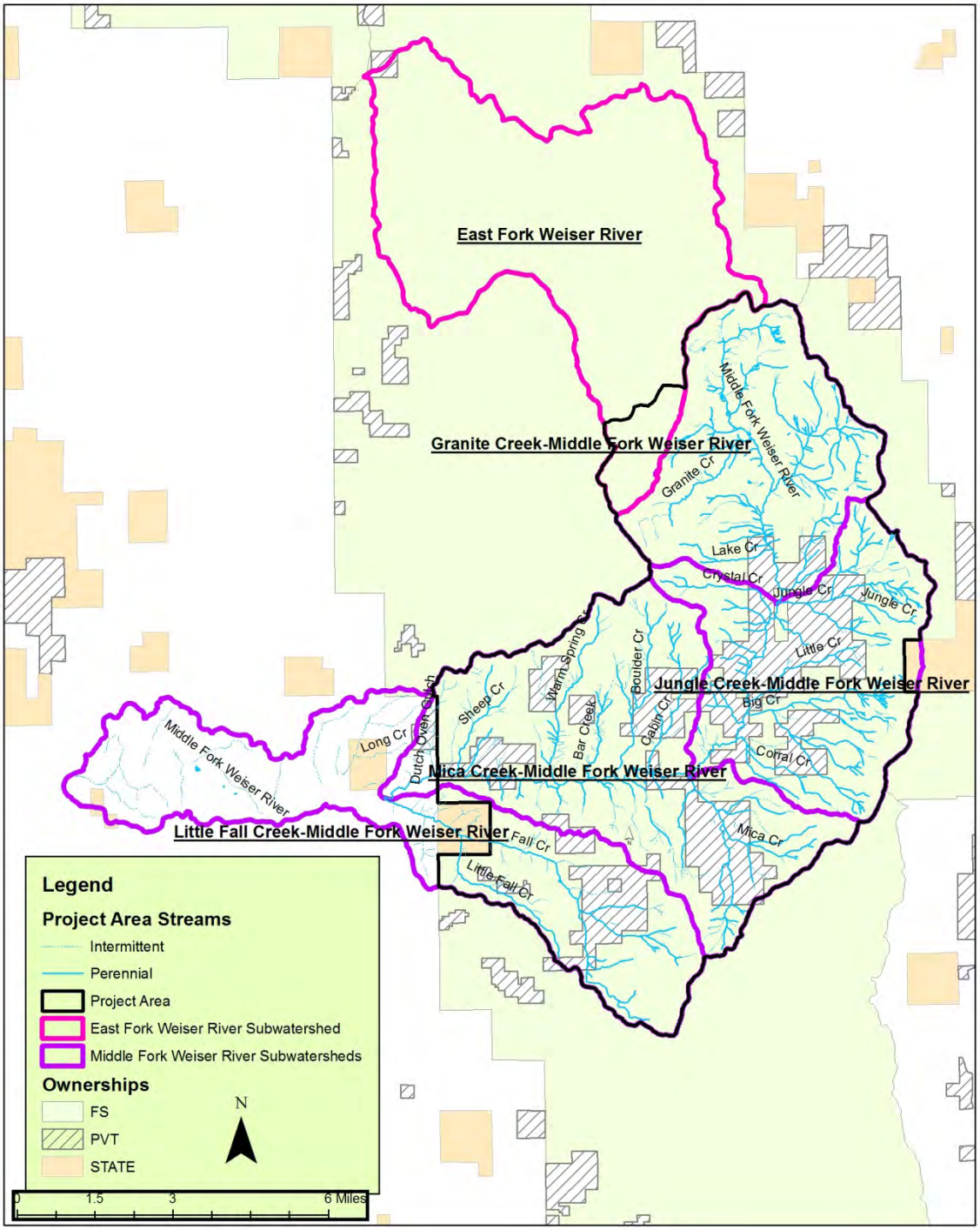


Figure 3-63. Cumulative effects analysis area

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Table 3-85. Cumulative effects in the Middle Fork and East Fork Weiser rivers

WCI	Indicator	River System	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Sediment in Cumulative Effects Area	Temporary road constructed (new/existing prism)	East Fork Weiser River	No change	No change	No change	No change
		Middle Fork Weiser River	No change	Slight increase, temporary	Slight increase, temporary	Slight increase, temporary
	System road reconstructed (includes road added to system as realignment)	East Fork Weiser River	No change	No change	No change	No change
		Middle Fork Weiser River	No change	Slight decrease; reroutes include roads replacing system roads in RCAs	Slight decrease	Slight increase; unauthorized roads added to system outnumber roads they replace in RCAs
	Long-term closure	East Fork Weiser River	No change	No change	No change	No change
		Middle Fork Weiser River	No change	Slight decrease	Slight decrease	Slight decrease
	System and unauthorized road decommissioning	East Fork Weiser River	No change	*estimated to be small reduction due to trail reroute	*estimated to be small reduction due to trail reroute	*estimated to be small reduction due to trail reroute
		Middle Fork Weiser River	No change	Decrease	Decrease	Decrease
	Mechanical thinning and prescribed fire	East Fork Weiser River	No change	No change	No change	No change
		Middle Fork Weiser River	No change	Slight increase, temporary	Slight increase, temporary	Slight increase, temporary
Hydrologic Function	Road density	East Fork Weiser River	No change	No change	No change	No change
		Middle Fork Weiser River	No change	Decrease	Decrease	Decrease
	ECA	East Fork Weiser River	No change	No change	No change	No change
		Middle Fork Weiser River	No change	Slight increase	Slight increase	Slight increase

3.5.3.3.1. Past Actions

Roads

Historic roads and skid trails contribute to a loss in soil productivity and hydrologic function. If not revegetated or recontoured, they can also channel overland flow and cause rills and gullies. Past harvest may have affected the timing and duration of peak flows in the drainages.

The cumulative effects area includes off-forest roads that deliver sediment, especially those located within 200 feet of streams or water bodies, which contribute to the cumulative condition for sediment, floodplain connectivity, and (in specific locations, such as the Middle Fork Weiser River Road [50186]) streambank condition.

3.5.3.3.2. Ongoing and Proposed Actions

Travel Management Plan

The Forest has, within the last decade, revised motorized travel management on the Forest, including within the cumulative effects area for this project. Indiscriminate cross-country travel by motorized vehicles, including ATVs, motorcycles, four-wheel drives, etc. is prohibited except as authorized by valid permits. All motorized travel is restricted to designated roads and trails, including short distances off of those travelways for the purpose of dispersed camping.

Changes in areas designated for cross-country motorized travel and designated OHV trails, especially in areas with highly erodible soils, can benefit water quality by reducing erosion and sediment delivered to streams.

Noxious Weed Management

Mitigation measures have been developed to minimize the risk of adverse effects of noxious weed treatment to water quality. Implementing these weed-treatment measures would be expected to yield no (or negligible) effects on sediment, temperature, and other WCIs, and would not be expected to contribute to the cumulative condition of the watershed.

Road Maintenance

Routine road maintenance occurs on most open roads within the area. Maintenance on gravel and native surface roads is mainly surface grading, culvert cleaning, and replacement of gravel on the road. Road maintenance on NFS roads would not be expected to appreciably affect sediment within the effects area, as long as associated BMPs are followed.

Livestock Grazing

Actively grazed range allotments, both on NFS and private lands, within the cumulative effects area contribute to loss of ground cover in RCAs and conversion of desirable native vegetation to less favorable weedy species. Wetlands are at risk for compaction as well, and possible effects to shallow water tables exist.

Proposed and Ongoing Timber Harvest/Vegetation Treatment

The East Fork Integrated Resource Stewardship Contract in the East Fork Weiser River, as well as road decommissioning, long-term closure, and maintenance associated with the MCCM Landscape Restoration project in the same subwatershed, are ongoing projects. Timber harvest on private lands is ongoing in the Middle Fork Weiser River. These projects are considered as part of the existing condition baseline for the effects analysis and, as well, included in the analysis for cumulative environmental effects. Prescribed fire activities are expected to occur in the East Fork Weiser River (also part of MCCM) within the next 5 years.

Recreation

A myriad of other recreational activities occur within the cumulative effects area year-long. One developed campground exists, located near the confluence of Cabin Creek and the Middle Fork Weiser River (see Recreation section), and dispersed camping is found throughout the entire cumulative effects area during the snow-free months. The area is popular with hunters and berry pickers in the fall and snowmobilers in the winter. Authorized, groomed snowmobile trail routes traverse the area. Snow machines, road and trail use by OHVs, motorcycles, and mountain bikes cause erosion and ground disturbance; the use is expected to increase as the human population increases and development continues. These activities are expected to adversely affect sedimentation and water quality in the cumulative effects area.

Designation of dispersed camping in some high-use areas, installation of new toilets, and closure and rehabilitation of unauthorized motorized routes in the Middle Fork Weiser River would result in reductions to soil erosion and improvements to water quality.

3.5.3.3.3. Wetlands and Floodplains

Within the cumulative effects area, wetlands and floodplains are an important part of the hydrologic functionality. Floodplains of varying extent are associated with streams within the cumulative effects area. Past activities have had an effect on wetlands and floodplains. Impacts have been related to historic logging in riparian areas, road construction, placement of drainage structures, cattle grazing, and flow alteration. The floodplains and wetlands along the Middle Fork Weiser River, especially below the Granite Creek subwatershed, and numerous other roads within RCAs have been affected by road fill, altering flow patterns and restricting flood flows. Action alternatives propose to decommission 23–26 miles of road within RCAs. Removal of these roads would improve floodplain function and benefit riparian-dependent species. This could result in an incremental improvement for hydrologic functionality in the cumulative effects area. No adverse cumulative effects on wetlands and floodplains are expected from the proposed project.

3.5.3.3.4. Cumulative Effects Summary

Existing harvest units and roads (especially roads in RCAs), road maintenance, livestock grazing, and recreational activities may affect stream conditions and watershed indicators within the cumulative effects area and would be expected to continue to affect watershed conditions and water quality parameters such as stream temperature, nutrients, bacteria, and sediment. In combination with the other activities in the cumulative effects area, the proposed project is not expected to have any additional detectable negative cumulative effect on

watershed resources or water quality in the Middle Fork or East Fork Weiser River drainages or their tributaries. Road decommissioning planned within the cumulative effects area is expected to result in an incremental reduction of sediment produced by roads over time.

3.5.4. Irreversible and Irretrievable Commitments

The action alternatives are not expected to create any impacts that would cause irreversible or irretrievable commitment of aquatic habitat, water quality, or watershed conditions.

3.5.5. Forest Plan Consistency

Alternative 1 (no action) meets all Forest Plan standards and guidelines for water and riparian resources, as no management activity is proposed to increase sediment or cause land disturbance. WCIs are maintained or improved. Alternative 1 does not propose any restoration of unneeded roads.

For the action alternatives, consistency with the Forest Plan is proposed to be achieved with the implementation of project design features and BMPs. Although temporary and short-term increases in sediment may occur, long-term reductions in road-related sediment are documented in the effects analysis as a result of road decommissioning and long-term closure. Project design features and mitigation measures are designed to minimize effects to water and riparian resources. Monitoring plans (Appendix 4) are incorporated into this DEIS to document that BMPs and project design features are implemented and effective in reducing nonpoint source pollutants.

3.5.6. Project Record

This DEIS hereby incorporates by reference the Watershed Specialist Report in the project record (40 CFR 1502.21). The report is located in the watershed section of the project record and contains the data, methodologies, analysis, maps, references, and technical documentation relied upon to reach the conclusions in this DEIS

3.6. Fisheries Resources

3.6.1. Analysis Scale and Data Sources

3.6.1.1. Scope of Analysis

3.6.1.1.1. Direct, Indirect and Cumulative Effects Analysis Area

The fisheries analysis area for baseline conditions and for direct, indirect, and cumulative effects was completed at the subwatershed scale (6th field HU), which is larger than the Project area (Figure 3-64). The analysis area includes the East Fork Weiser River (170501240203), Granite Creek—Middle Fork Weiser River (170501240401), Jungle Creek—Middle Fork Weiser River (170501240402), Little Fall Creek—Middle Fork Weiser River (170501240404) and Mica Creek—Middle Fork Weiser River (170501240403) 6th field HUs. The subwatershed was used as a reporting unit because that scale is biologically and physically relevant and allows for an operational way to understand the spatial context of the existing conditions. Where appropriate for some WCIs, the analysis was also completed at a more site-specific level. Although only a portion of the East Fork Weiser River is included in the project area, the baseline was completed at the subwatershed scale. The effects analysis will be completed at several scales, as directed in the Forest Plan, including both the subwatershed and site-specific scale. The current Watershed Boundary Dataset (WBD) created by the NRCS was used to delineate subwatersheds.

3.6.1.1.2. Temporal Scale of Analysis

Timeframes were defined in the Forest Plan as temporary (0 to 3 years), short-term (3 to 15 years), and long-term (>15 years). These timeframes will be used to qualitatively define the effects of management actions on the WCIs. The long-term effects to the fisheries resource from the proposed actions cannot be said to have an “end point” (i.e., sometime after 15 years) with any accuracy. Therefore, effects were assumed to persist in perpetuity or until a natural event or new management action is introduced.

3.6.1.1.3. Data Sources

The baseline (current condition) information and descriptions in this analysis were compiled using the WFC (USDA Forest Service 2011), Payette National Forest Fisheries Inventory Database (FID) (unpublished data), Payette National Forest WARS database (USDA Forest Service 2003), GIS coverages[2], Idaho Department of Environmental Quality information, Forest survey data, and online information and/or professional judgment. Habitat data were collected using modified methods described within the R1/R4 method (Overton et al. 1997) and the Payette National Forest PIBO Method developed by the Forest Fisheries Biologists (Nelson and Bonaminio 2011). Figure 3-67 displays fish, habitat and temperature survey sites from the FID (unpublished data) and National Aquatic Survey (AqS) database (USDA Forest

[2] The GIS analysis completed by individual specialists sometimes results in slight variations in summarized values. Total acre values and total road miles in this analysis may not always equal those in other resource specialist reports. The direct, indirect, and cumulative effects for indicators are not sensitive to these minor differences at this analysis scale.

Service 2015). District and Forest GIS information was used to create maps. See the fisheries specialist report (available in the project record) for a complete list of references.

The Forest Plan (USDA Forest Service 2003a, Appendix B) and the best information available were used to calculate the baseline and analyze effects to WCIs. Existing literature and scientific data were reviewed to determine potential effects to species, habitat requirements, and other physical and biological parameters resulting from the proposed activities.

The measurements and indicators described below will be used to compare alternatives, determine effects of treatments, and determine compliance with Forest Plan standards and guidelines (USDA Forest Service 2003a).

3.6.2. Analysis Process/Measurements and Indicators

Objective: Project Objective 6 is to improve watershed function and integrity by moving watersheds toward Forest Plan SWRA resource desired conditions. Part of the objective (see "Watershed" section for the other parts) includes improving aquatic habitat, restoring riparian vegetation, and reconnecting streams by obliterating and realigning roads within RCAs, reducing the size of and hardening dispersed recreation sites, and removing or upgrading culverts.

Measurements:

- Aquatic Habitat Improved (stream miles)
  - Number of fish barriers replaced
  - Miles of fish habitat reconnected
  - Miles of roads within RCAs

In addition, the issue statement below addresses the potential for other effects to SWRA resource conditions.

Issue Statement: *Proposed vegetation treatment and prescribed burning in RCAs may negatively affect stream temperatures and LWD.*

Indicators:

- Acres of vegetation treatments and prescribed fire within RCAs.
- Acres treated within one site-potential tree height.

The Forest Plan (USDA Forest Service, Appendix B) and the best information available were used to calculate the baseline and analyze effects to WCIs. Existing literature and scientific data were reviewed to determine potential effects to species, habitat requirements, and other physical and biological parameters resulting from the proposed activities. WCIs were evaluated at multiple scales including the subwatershed scale and, where appropriate, at the site-specific scale. See the fisheries specialist report (project record) for more detailed information

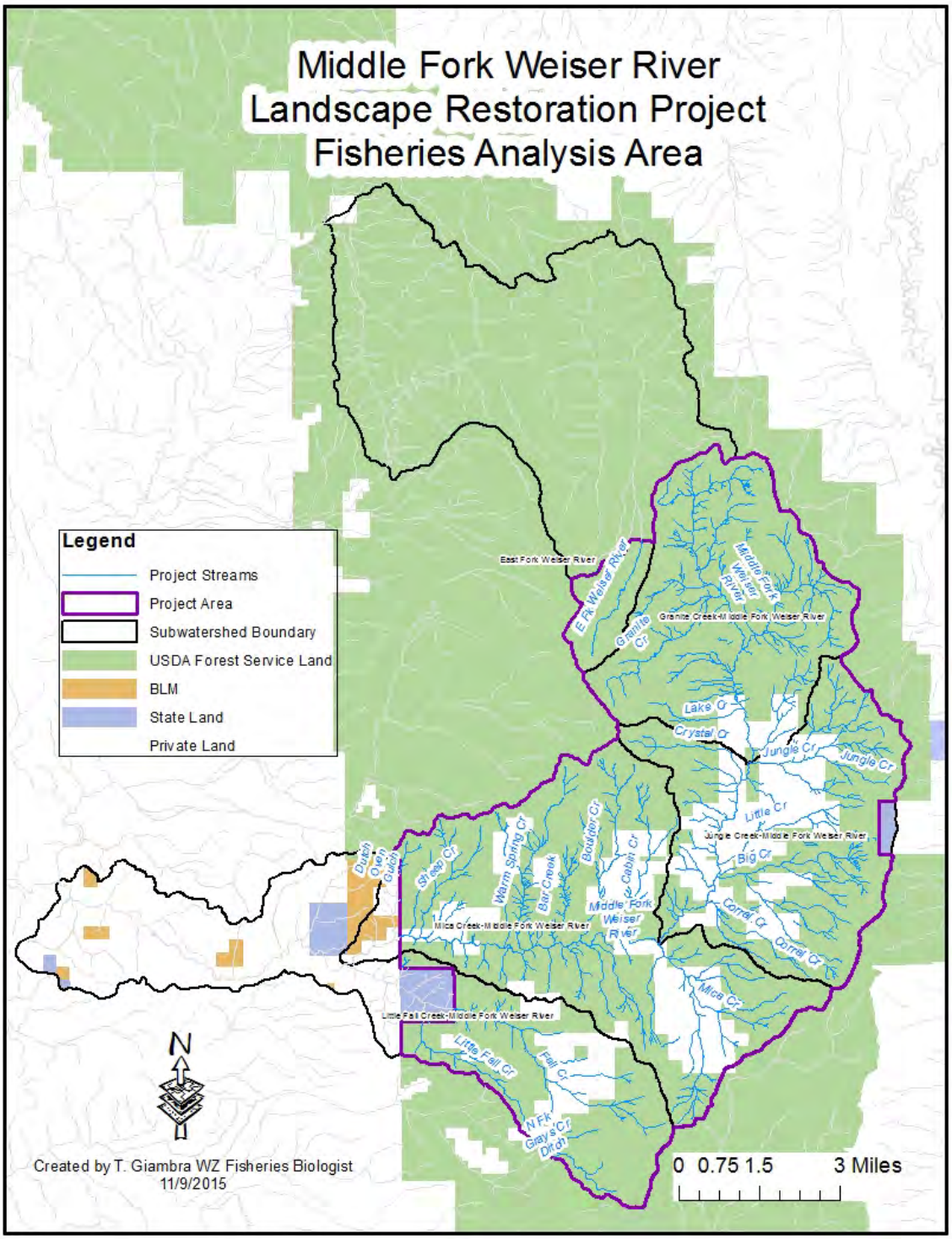


Figure 3-64. Fisheries analysis area

3.6.3. Affected Environment

3.6.3.1. Description of the Project Area

Two main drainages occur in the Project area: the Middle Fork Weiser River and the East Fork Weiser River. The Project includes NFS lands in the entire Middle Fork Weiser River drainage, which is a 5th field HU, or watershed. It also includes a portion of the East Fork Weiser River, which is a 6th field HU, or subwatershed.

3.6.3.1.1. Middle Fork Weiser River Watershed

The Middle Fork Weiser River watershed (5th field HUC #1705012404) comprises the majority of the Project area and contains four subwatersheds (Figure 3-64), totaling approximately 57,900 acres (Table 3-86). Portions of the subwatersheds are located on private land outside Forest Service jurisdiction. The watershed contains approximately 91 miles of perennial streams and 56 miles intermittent streams (USDA Forest Service 2003b, WARS database). Natural waterfalls ranging from partial to full barriers to fish passage occur within the watershed. A large bedrock waterfall about 40 feet high located in the Middle Fork Weiser River between Cabin Creek and Mica Creek is likely a barrier to upstream fish migration (section 3.6.3.1.7) (McGee and Burns 2001). There have been anecdotal accounts of bull trout in the drainage; however, intensive fish surveys have not found any bull trout. A large portion of the watershed is privately owned.

3.6.3.1.2. East Fork Weiser River Subwatershed

The East Fork Weiser River subwatershed (6th field HUC #170501240203) is approximately 20,906 acres (Table 3-86). The entire subwatershed contains approximately 30 miles of perennial streams and 53 miles of intermittent streams (USDA Forest Service 2003b, WARS database). However, only about 1,440 acres in the upper portion of the subwatershed is included in the Project area (Figure 3-64; Table 3-86). Mainstem East Fork Weiser River and Dewey Creek support a local population of bull trout and are designated critical habitat (USDI FWS 2010, 75 FR 63898). Brook trout are present in the subwatershed.

Table 3-86. Watershed Aquatic Recovery Strategy (WARS) and Aquatic Conservation Strategy (ACS) designations for the subwatersheds in the Project

Subwatershed	6th Field HUC	6th HUC acreage (mi^2)	Project Acres	WARS Restoration	WARS Priority	ACS Priority	WCF Class
East Fork Weiser River	170501240203	20,906 (32.7)	1,438	Active	Moderate	Yes	3
Granite Creek – Middle Fork Weiser River	170501240401	11,672 (18.2)	11,672	Active	Low	No	3
Jungle Creek – Middle Fork Weiser River	170501240402	12,384 (19.4)	12,187	Active	Low	No	2
Little Fall Creek – Middle Fork Weiser River	170501240404	16,200 (25.3)	7,122	Active	Low	No	2
Mica Creek-Middle Fork Weiser	170501240403	17,564 (27.4)	16,857	Active	Low	No	3

3.6.3.1.3. Current Condition

3.6.3.1.4. Columbia River Bull Trout—Listed Species

Columbia River bull trout are the only federally listed fish species in the Weiser River subbasin (USDI FWS 2015). The FWS listed bull trout (*Salvelinus confluentus*) as threatened under the ESA on June 10, 1998 (USDI FWS 1998, 63FR31647).

In 2015, the FWS finalized the Recovery Plan for the Coterminous United States Population of Bull Trout (*Salvelinus confluentus*) (USDI FWS 2015a). The Recovery Plan outlines actions believed to be necessary to protect and recover the species. The goal of the Recovery Plan is "…to manage threats and ensure sufficient distribution and abundance to improve the status of bull trout throughout their extant range in the coterminous United States so that protection under the Act is no longer necessary" (USDI FWS 2015a, p. vi). The biology and ecology of bull trout in the Columbia River Distinct Population Segment are described in the Recovery Plan. The Recovery Plan includes Recovery Unit Implementation Plans (RUIPs) for each of the six Recovery Units. The Project is located in the Upper Snake Recovery Unit in the Weiser River Core Area (CA). Within the Weiser River CA, populations are known to exist in the East Fork Weiser River, Little Weiser River, and in the headwaters of Hornet Creek; however, these local populations isolated and are considered vulnerable (USDI FWS 2015a). The East Fork Weiser River is the only bull trout local population within the Project analysis area. No bull trout local populations or potential local populations were identified within the Middle Fork Weiser River drainage.

In 2010, the RMRS developed a scientifically defensible bull trout monitoring protocol based on Isaak et al. (2009). The RMRS identified habitat patches on the Forest with the potential to support bull trout using elevation, stream slope, and contributing drainage area. A bull trout patch is considered a contributing drainage area greater than 500 hectares in size above 1600 meters elevation (Isaak et al. 2009; Rieman and McIntyre 1995). Twelve patches occur within the analysis area with 11 in the Middle Fork Weiser River drainage and one in the East Fork Weiser River drainage (Figure 3-65).

In 2014, the Forest Fisheries program initiated a strategy to sample bull trout patches throughout the Forest. A temperature monitoring device was placed in-stream at the bottom of identified patches and a habitat survey using the Forest PIBO 100 protocol was completed to determine if suitable habitat exists. An environmental DNA (eDNA) water sample was collected near each site to determine if bull trout are present (Figure 3-65). Nine of the 11 patches within the Project were sampled in 2014. Two eDNA samples were collected in 2015 – upper East Fork Weiser River above the potential natural barrier and Big Creek. The Little Creek patch was not sampled because Little Creek is located primarily on private land. The temperature data were analyzed and included in the baseline data above. The RMRS analyzed the eDNA samples collected in 2014 and 2015 and found bull trout were present in only the East Fork Weiser River patch below the potential natural barrier. Bull trout were not found in the sample collected above the potential barrier (Carim et al. 2015, unpublished data). Bull trout were not found in any of the Middle Fork Weiser River drainage samples.

Burns et al. (2005) evaluated bull trout viability and trend on the Forest and concluded bull trout viability is low in the Weiser River subbasin. A single adult bull trout (200–300 millimeters [mm]) was reported by Hurley (1995) in the mainstem Middle Fork Weiser River above the mouth of Warm Springs Creek in 1994 (Figure 3-65). Bull trout have also been reported near Jungle Creek and anglers have reported catching bull trout high in the headwaters of the Middle Fork Weiser River (McGee and Burns 2001). Veach (1998)

reported that a fisheries technician caught bull trout in the Middle Fork Weiser River near Jungle Creek, between Warm Springs Creek and Cabin Creek and downstream from the mouth of Fall Creek. Although anecdotal accounts of bull trout have been reported, extensive electrofishing and snorkel surveys completed after those sightings were reported have failed to document bull trout presence in any streams in the Middle Fork Weiser River drainage (USDA Forest Service 2015 FID unpublished data; McGee and Burns 2001; Hogen and Burns 2003; Nelson and James 2010; Williams and Veach 1999). Surveys in 1999 were intense enough to detect a population of bull trout that was larger than 0.74 fish per 100 meters (Hogen and Burns 2003). Brook trout are prevalent throughout the watershed, especially in headwater reaches, and have likely been misidentified as bull trout (Figure 3-66). Based on over 250 surveys in the drainage, bull trout are not likely present in the Middle Fork Weiser River, considering a natural waterfall near Cabin Creek, the absence of bull trout critical habitat and potential local populations, and no connectivity with other occupied patches. Nelson and James (2010) concluded bull trout were naturally absent from the Middle Fork Weiser River drainage.

Critical Habitat

On October 18, 2010, the US FWS (USDI FWS 2010) designated critical habitat for bull trout (75 FR 63898). Within the analysis area, designated critical habitat occurs only within the East Fork Weiser River (Figure 3-65). Although critical habitat was proposed in the Middle Fork Weiser River in 2009 (75 FR 2270), it was not included in the final designation based in part on bull trout distribution information provided by the Forest fisheries group to the FWS in Nelson and James (2010).

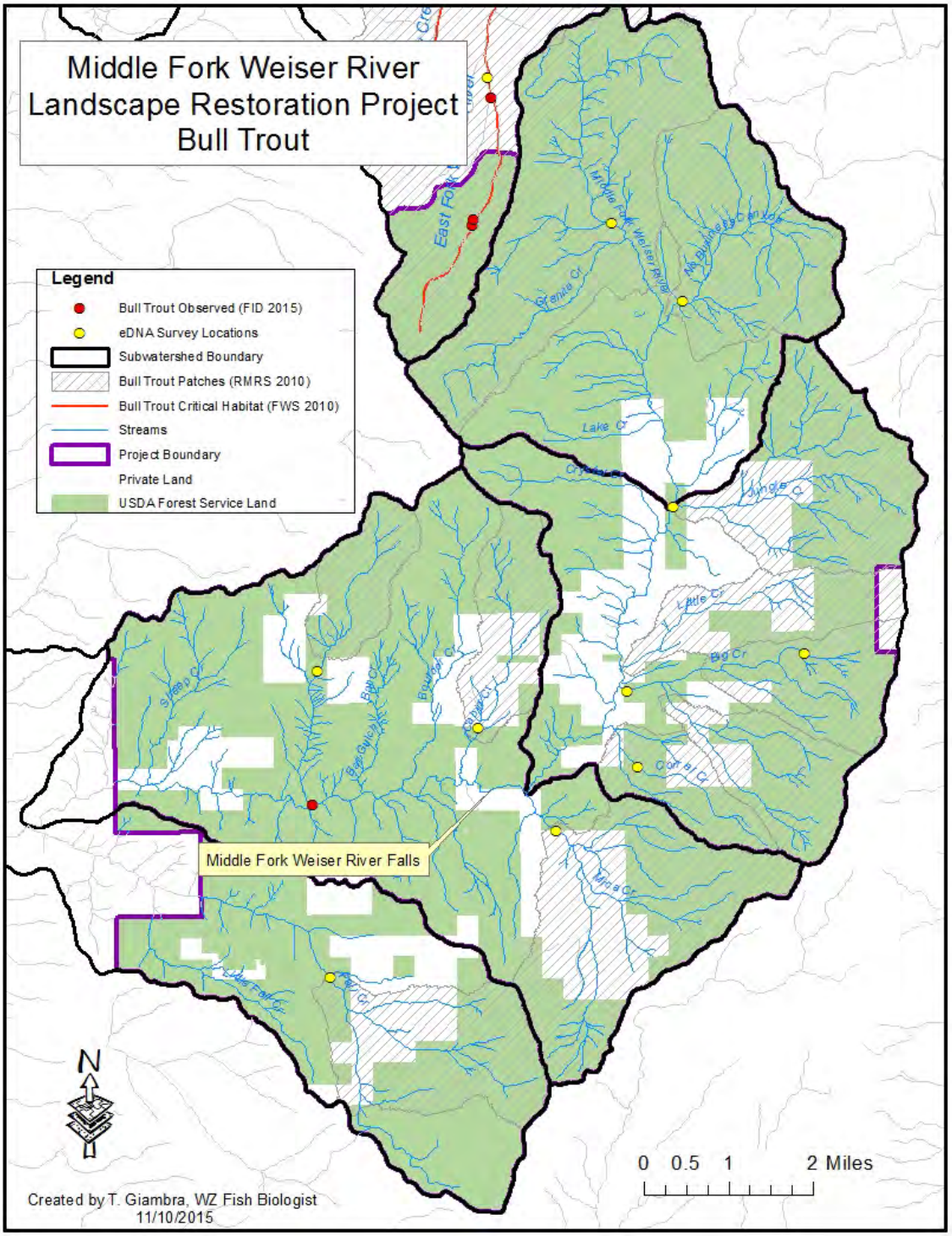


Figure 3-65. Bull trout patches, observations, eDNA sample sites and critical habitat within the Project area

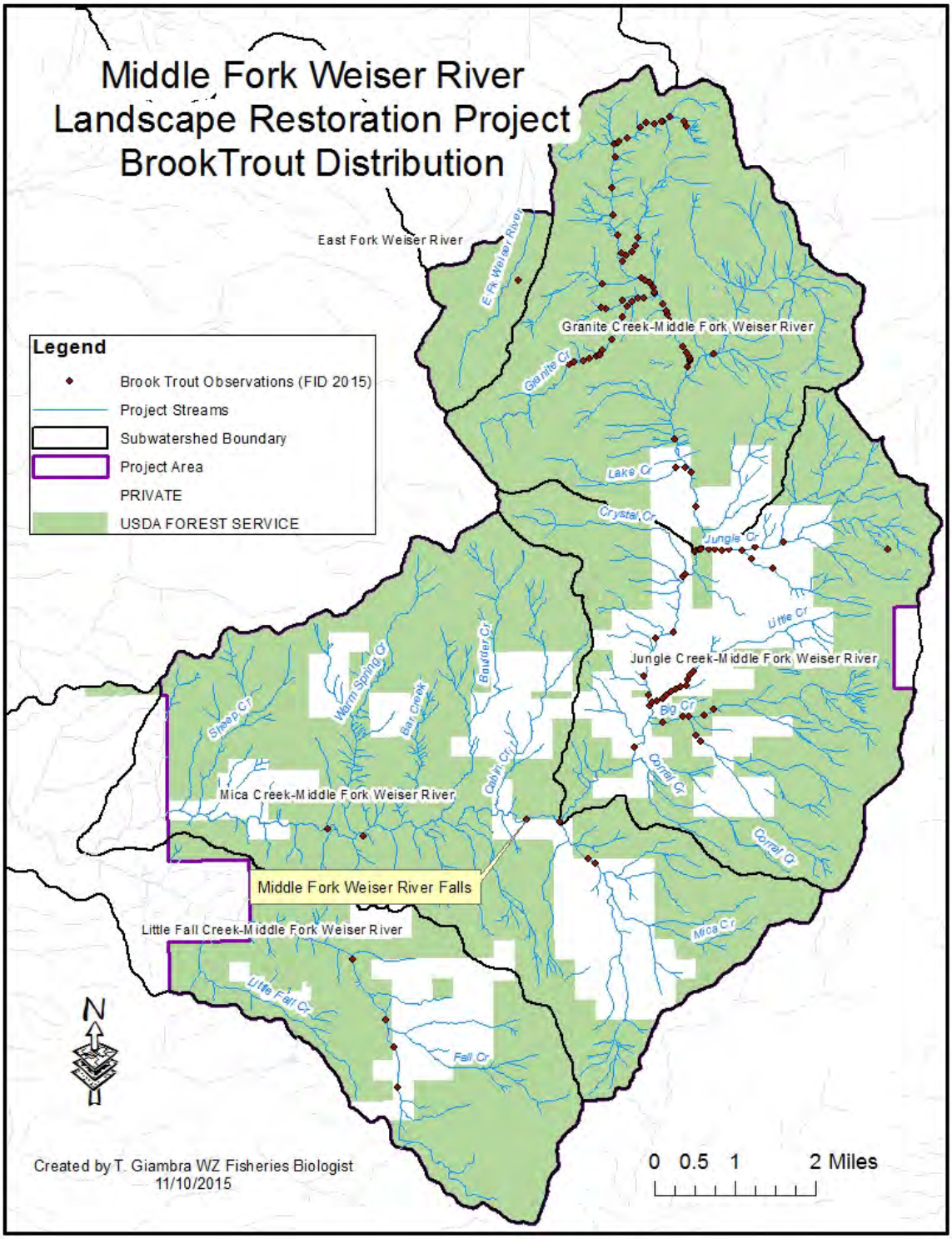


Figure 3-66. Brook trout distribution in the Project area

Snake River spring/summer and fall Chinook salmon and steelhead

Snake River spring/summer and fall Chinook salmon (*Oncorhynchus tshawytscha*) and steelhead (*O. mykiss*) are listed as Threatened under the ESA, but have been extirpated from the Weiser River system (USDA Forest Service 2003, p. III-123). Construction of Hells Canyon Dam complex eliminated all anadromous runs of salmon and steelhead upstream of the dam. No designated or proposed critical habitat or essential fish habitat exists in the Weiser River system for Snake River spring/summer and fall Chinook salmon or steelhead.

3.6.3.1.5. Westslope Cutthroat Trout—Sensitive Species

Westslope cutthroat trout (*O. clarkii lewisi*) are listed as a sensitive species by the Regional Forester (USDA Forest Service 2013c). Westslope cutthroat trout are not listed under the ESA. Westslope cutthroat trout are not known to be native to the Weiser River drainage (Behnke 1992) and are not known to inhabit any streams within the Project area.

3.6.3.1.6. Columbia River Bull Trout—Management Indicator Species

The Columbia River bull trout is the only aquatic MIS identified in the Forest Plan (USDA Forest Service 2003a, p. E-3). See bull trout description above.

3.6.3.1.7. Other Fishes

The Forest FID (USDA Forest Service 2014, unpublished data) indicates that several non-ESA listed fish species occur within the analysis area (Figure 3-67) including rainbow/redband trout (*O. mykiss*), brook trout (*S. fontinalis*), mountain whitefish (*Prosopium williamsoni*), and sculpin (*Cottus* spp.).

The Middle Fork Weiser River waterfall (Figure 3-68) is approximately 40 feet high located about 0.5 miles upstream from the Cabin Creek Campground and is a likely migration barrier to young life stages of fish (Hogen and Burns 2003). Mountain whitefish were found below the waterfall but not above it (Williams and Veach 1999). In 2002, an Idaho Department of Environmental Quality (IDEQ) Beneficial Use Reconnaissance Program (BURP) survey found mottled sculpin (*Cottus bairdi*), redside shiner (*Richardsonius balteatus*), northern pikeminnow (*Ptychocheilus oregonensis*), smallmouth bass (*Micropterus dolomieu*), largescale sucker (*Catostomus macrocheilus*), speckled dace (*Rhinichthys osculus*) and longnose dace (*Rhyinichthys cataractae*) in the Middle Fork Weiser River near the confluence with the main Weiser River (State of Idaho 2013a). In 2005, a BURP survey near Warm Springs Creek found rainbow trout, shorthead sculpin (*Cottus confusus*), longnose dace and mountain whitefish (IDEQ 2013). Below Granite Creek, rainbow trout, shorthead sculpin and brook trout were observed. Bridgelip suckers (*Catostomus columbianus*) have also been reported in the lower Middle Fork Weiser River below the falls (USDA Forest Service 2001).

Several strains of rainbow trout have been stocked in the Middle Fork Weiser River since 1968 and in Granite Creek since 1970 (IDFG 2013). Brook trout were stocked in Granite Creek in 1987. No other historical fish stocking information was found for the analysis area.

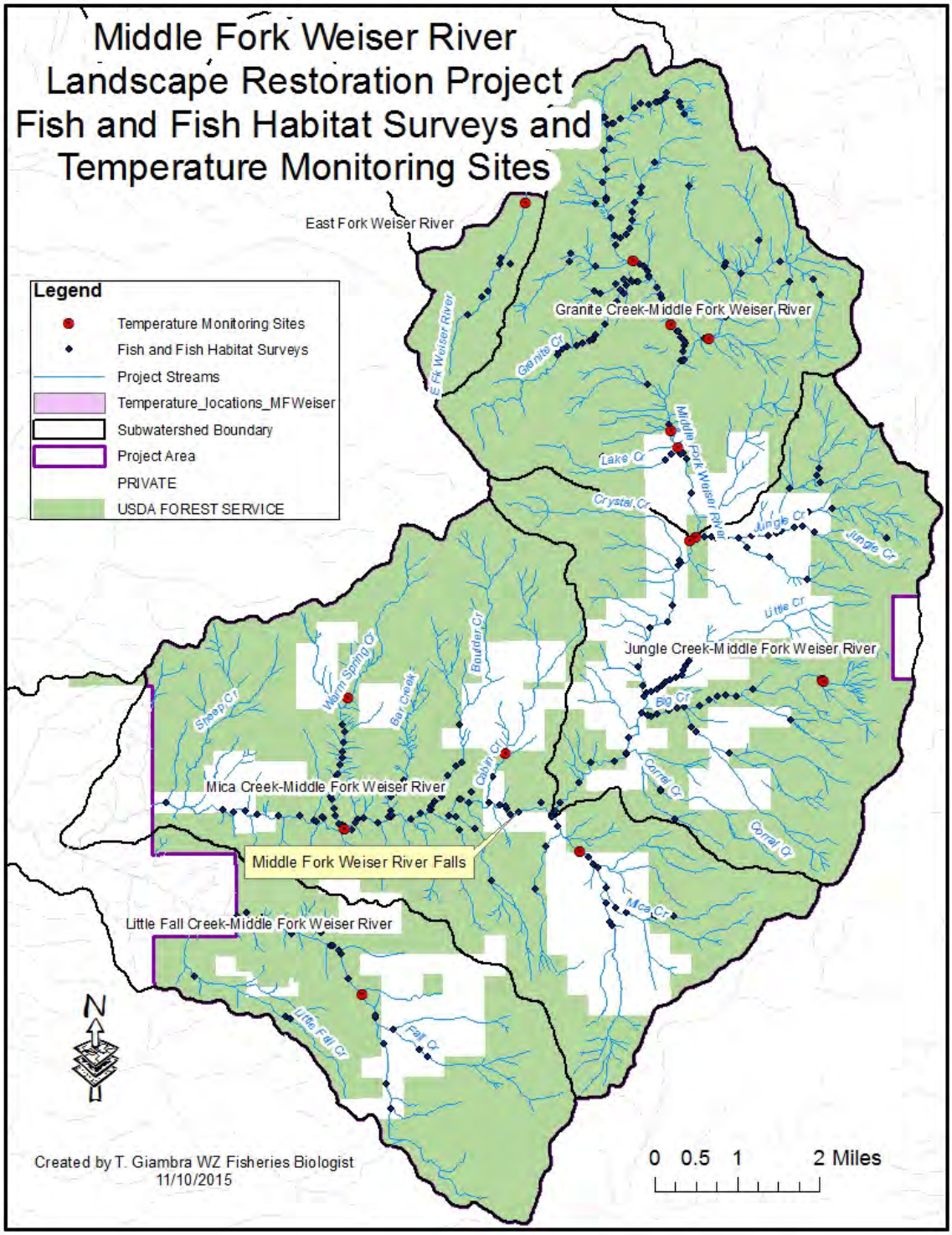


Figure 3-67. Locations of fish, habitat and temperature surveys in the Project area (USDA Forest Service, FID 2015)

Figure 3-68. Middle Fork Weiser River falls (photo by T. Giambra 2015)

3.6.3.2. Environmental Baseline (Current Conditions)

A variety of past natural events and management actions have affected the current conditions. Past natural events include flooding and wildland fire. Management actions that have affected current fish habitat conditions include vegetation management, prescribed fire, fire suppression, road building, livestock grazing, irrigation diversions and development and land management on private lands. Physical barriers and sediment delivery to streams are affecting fish habitat in the analysis area.

3.6.3.2.1. Desired Condition

Desired conditions for SWRA resources are described in the Forest Plan (USDA Forest Service 2003a). The Forest Plan lists the following desired condition for SWRA resources (USDA Forest Service 2003a, p. III-18):

- Riparian and aquatic ecosystems have appropriate types and amounts of vegetation
- Appropriate LWD is sufficient in land and stream channel forms to maintain water quality, filter sediment, aid floodplain development, improve floodwater retention and groundwater discharge and contribute to diverse habitat components
- Instream flows are sufficient to support healthy riparian and aquatic habitats, the stability and effective function of stream channels, and the ability to route flood discharges and provide for downstream uses
- The amount, distribution and characteristics of life-stage habitats are present to maintain or reach viable populations of native and desired non-native species

Desired conditions for Threatened and Endangered Species as described in the Forest Plan are as follows (USDA Forest Service 2003a, p. III-8):

- Habitats for Threatened and Endangered (TE) species are managed consistent with established and approved Recovery Plans
- Management actions either contribute to or do not prevent recovery or de-listing of these species
- Habitats for Proposed or Candidate species are managed to help preclude listings as TE under the ESA
- Degrading effects from Forest programs are at levels that do not threaten the persistence of Threatened, Endangered, Proposed or Candidate (TEPC) species populations

3.6.3.2.2. Pathways and Watershed Condition Indicators

WCIs and the associated matrices in Appendix B of the Forest Plan (USDA Forest Service 2003a, p. B-12) represent a diagnostic means to determine current conditions and assist in determining future SWRA resource and fish habitat conditions associated with implementing management actions (USDA Forest Service 2003a, GL-40). The matrix tables are intended to be used at a variety of scales. The Forest Plan allows managers to apply functional levels for each WCI: FA, FR, and FUR. Current Condition (Baseline) tables include a description of the desired conditions, current conditions, and the functional rating for the WCIs. The tables were taken and modified, where appropriate, from the Forest Plan (USDA Forest Service 2003a, p. B-22).

There are 26 WCIs outlined in the Forest Plan (USDA Forest Service 2003a, pp. B-12 to B-21); however, the WCIs most relevant to fish and fish habitat that may be affected by implementing this project include Temperature, Sediment/Turbidity, Physical Barriers, LWD, and Road Density and Location. Road Location is analyzed in this fisheries section while Road Density is discussed in the watershed section. Current functional ratings for those WCIs are summarized in Table 3-87. The environmental baselines were developed at the subwatershed scale and indicate current conditions in the subwatershed, including effects from past management actions. More information on all the WCIs can be found in the fisheries specialist report in the Project Record.

Table 3-87. Subwatershed baseline summary for the Watershed Condition Indicators (WCIs) analyzed for fisheries

Subwatershed	Bull Trout WCIs[a]	Temperature WCI	Sediment/Turbidity WCI	Physical Barriers WCI	Large Woody Debris WCI	Road Density and Location WCI
East Fork Weiser River	FR[b]	FR (bull trout)	FUR (bull trout)	FR	FA	FUR
Granite Creek	NA	FR	FA	FUR	FA	FUR
Jungle Creek	NA	FR	FA	FUR	FR	FUR
Little Fall Creek	NA	FR	FA	FUR	FA	FUR
Mica Creek	NA	FR	FA	FUR	FUR	FUR

[a] Includes the relevant WCIs – Local Population Size and Growth and Survival
[b] FA – Functioning Appropriately; FR – Functioning at Risk; FUR – Functioning at Unacceptable Risk; NA- Not Applicable

Bull Trout Subpopulation Character Pathway

The desired condition for the Bull Trout WCIs is applicable to the East Fork Weiser River only. Only the Local Population Size and Growth and Survival WCIs are applicable to the project. No effect to Life History Diversity and Isolation and Persistence and Genetic Integrity WCIs would occur because connectivity would not be affected. The functional level descriptions for the Local Population Size WCI and Growth and Survival WCI are described in Table 3-88. See the bull trout description above and the fisheries specialist report for more information. Table 3-89 displays the desired and current conditions for the Local Population Size and Growth and Survival WCIs.

Table 3-88. Local Population Size and Growth and Survival Watershed Condition Indicators (WCIs) functional level description as identified in the Forest Plan (USDA Forest Service 2003a)

WCI	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk
Local Population Size	Mean total local population size or local habitat capacity more than several thousand individuals. Adults in local population >500. All life stages are represented within the local population.	Adults in local populations <500 but >50	Adults in local populations <50
Growth and Survival	Local population has the resilience to recover from temporary or short-term disturbances (e.g., catastrophic events) or local population declines within 1–2 generations (5–10 years). The local population is characterized as increasing or stable. At least 10 years of data support this estimate.	When disturbed, the local population will not recover to pre-disturbance conditions within 1 generation (5 years). Survival or growth rates have been reduced from those in the best habitat. The local population is reduced in size but the reduction does not represent a long-term trend. At least 10 years of data support this characterization. If less data are available and a trend cannot be confirmed, a local population will be considered at risk until enough data is available to accurately determine the trend.	The local population is characterized as in rapid decline or is maintaining at alarmingly low numbers. Under current management, the local population condition will not improve with 2 generations. This is supported by a minimum of 5 years of data.

Table 3-89. Current Local Population Size and Growth and Survival conditions in the project area.

Subwatershed	Desired Conditions	Current Conditions	Functional Rating
East Fork Weiser River	Mean total local population size or local habitat capacity more than several thousand individuals. Adults in local population > 500. All life stages are represented within the local population.	Bull trout have been found in Dewey Creek and upper East Fork Weiser River above Bench Creek (Greenway 2005; USDA Forest Service 2014 FID). In 2001, IDFG electrofished in Dewey Creek and East Fork Weiser River and they estimated bull trout densities in Dewey Creek to be 0.06 fish per m2 and 0.008 fish per m2 in the upper East Fork Weiser River. A bull trout (225 mm) that was collected 100 m downstream of the East Fork Ditch diversion (Greenway 2005) was the furthest downstream bull trout have been observed in the East Fork Weiser River.	Functioning at Risk
	Local population has the resilience to recover from temporary or short-term disturbances (e.g., catastrophic events) or local population declines within 1–2 generations (5–10 years). The local population is characterized as increasing or stable. At least 10 years of data support this estimate.	Sufficient data (>10 years) are not available to support an estimate of growth and survival. Therefore, the baseline is described as FR as directed in the Forest Plan (USDA Forest Service, Table B-1).	Functioning at Risk
Granite Creek	NA	NA	NA
Jungle Creek			
Little Fall Creek			
Mica Creek			

Temperature Watershed Condition Indicator

Direct solar radiation is the primary factor influencing summer stream temperatures (Betscha et al. 1987; Chamberlin et al. 1991; Johnson 2004), and stream temperature is directly proportional to the amount of direct sunlight that reaches the stream. As shade in the riparian area increases, water temperature decreases. Consequently, riparian vegetation maintains stream temperatures (Murphy and Meehan 1991). Cross (2002) indicates that stream temperatures are the result of several factors including direct radiation, air temperature, relative humidity, groundwater input, substrate composition, discharge rate, and reach length.

Removing riparian and overhanging vegetation, including overstory, can increase direct solar radiation and insolation during summer months, resulting in elevated water temperatures.

Water temperature influences the metabolism, distribution, behavior, and mortality of fish and other organisms in their environment (Magnuson et al. 1979; Dunham et al. 2003). Fish can often withstand short durations of temperatures above or below their preferred range. Although fish may survive at temperatures near the extremes of their suitable range, growth is reduced at low temperatures because all metabolic processes are slowed and at high temperatures because most or all food must be used for maintenance (Bjornn and Reiser 1991).

The desired condition for the bull trout temperature WCI is applicable to the East Fork Weiser River only. The desired conditions for bull trout are a maximum weekly (7-day average) mean temperature (MWMT) of a reach during the following life history stages: incubation 2–5 °C, rearing 4–12 °C, and spawning 4–9 °C. Table 3-90 displays the Forest Plan descriptions of functional ratings for the Temperature WCIs.

Temperature criteria for other fishes were not developed in the Forest Plan. Nelson and Burns (2007) proposed temperature WCIs specific to redband trout. This temperature criterion will be used for all subwatersheds in the Middle Fork Weiser River drainage portion of the analysis area because bull trout are not present and it is likely more appropriate for the resident species found there.

Temperature data are not available for all streams in the analysis area. Project area temperature monitoring sites are displayed in Figure 3-67. Table 3-91 displays the current conditions for stream temperatures in the project area.

Table 3-90. Temperature Watershed Condition Indicator functional level description as identified in the Forest Plan (USDA Forest Service 2003a)

WCI	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk
Temperature (bull trout)	7-day maximum temperature in a reach during the following life history stages: • Incubation 2–5 °C • Rearing 4–12 °C • Spawning 4–9 °C Also, temperatures do not exceed 15 °C or 59.0 °F in areas used by adults during migration (no thermal barriers)	7-day maximum temperature in a reach during the following life history stages: • Incubation <2–6 °C • Rearing <4°C or 13-15°C • Spawning <4–10 °C Also temperatures in areas used by adults during migration sometimes exceed 15 °C or 59°F	7-day maximum temperature in a reach during the following life history stages: • Incubation <1 or >6 °C • Rearing >15 °C • Spawning <4 or >10 °C Also temperatures in areas used by adults during migration regularly exceed 15 °C or 59°F (thermal barriers present)
Temperature (other fishes: i.e. Redband Trout*) (all life stages)	Summer MWMT is 17–20 °C	Summer MWMT is >20 ° and ≤27 °C Or <17 °C and ≥15 °C	Summer MWMT >27 °C or <15 °C

Source: Nelson and Burns (2007).

Table 3-91. Current temperature conditions in the project area

Subwatershed	Desired Conditions	Current Conditions (°C)	Functional Rating
East Fork Weiser River	7-day maximum temperature in a reach during the following life history stages: Incubation 2–5 °C Rearing 4–12 °C Spawning 4–9 °C Also temperatures do not exceed 15°C or 59.0°F in areas used by adults during migration (no thermal barriers)	13.3	Functioning at Risk
Granite Creek	Summer MWMT is 17–20 °C	14.0	Functioning at Risk
Jungle Creek		15.8	Functioning at Risk
Little Fall Creek		16.5	Functioning at Risk
Mica Creek		20.1	Functioning at Risk

Sediment Watershed Condition Indicator

High levels of fine sediment in streams can have many deleterious effects to salmonids and their habitats. Fine sediment can reduce the quality of habitat by filling the interstitial spaces and silt spawning gravels, which can reduce overall stream productivity and fill in pool habitat (Quigley and Arbelbide 1997). Zurstadt and Nelson (2009) state that, "Excess sediment can degrade spawning gravels, reduce embryo survival and emergence, impair growth and survival of juvenile salmonids, fill pool habitat, and reduce the productivity of aquatic macroinvertebrates and other prey items for fish (Bjornn et al. 1977, Suttle et al. 2004)". When spawning gravel exceeds approximately 20% fines, trout embryo survival begins to sharply decrease (McCuddin 1977; Chapman and McLeod 1987). Harvey et al. (2009) observed reduced survival of rainbow trout when habitat complexity was decreased as a result of an increase in sediment in riffles that decreased habitat complexity.

Potential anthropogenic causes of instream fine sediment (≤6 mm) include roads, livestock grazing, recreation, past and ongoing timber harvest, and activities on private and State property.

The Forest Plan desired condition for sediment/turbidity in bull trout spawning areas is <12% fines (<0.85 mm) in gravel or ≤20% surface fines (≤6 mm) (Table 3-92; USDA Forest Service 2003a). The desired condition for substrate embeddedness is a dominant substrate of gravel or cobble (interstitial spaces clear) or embeddedness is <20% (Table 3-93).

Since criteria for sediment for other fishes was not developed in the Forest Plan (USDA Forest Service 2003b), the desired condition was developed for the Project using the Natural Conditions Database (Overton et al. 1995). The default criteria was defined as streams with <27% surface fines (≤6 mm) with a standard deviation of 22 for volcanic 'B' type streams (Table 3-92). The Natural Conditions Database was used to describe the desired condition because the document describes stream conditions in areas that have not been extensively managed by humans.

Table 3-92. Sediment/Turbidity Watershed Condition Indicator (WCI) functional level description as identified in the Forest Plan (USDA Forest Service 2003a) and Overton et al. (1995)

WCI	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk
Sediment/Turbidity (bull trout)	<12% surface fins (<0.85mm) in gravel, surface fines (≤6mm) ≤12%	12%–17% surface fines (<0.85mm) in gravel, surface fines (≤6mm) are 12-20%	>17% surface fines (<0.85 mm) in gravel, surface fines (≤6 mm) or depth fines >20% in spawning habitat
Sediment/Turbidity (other fishes: redband trout)	<27% surface fines (Overton et al. 1995)	>27% surface fines (Overton et al. 1995)	

Table 3-93. Environmental baseline for Sediment/Turbidity Watershed Condition Indicator in the Project area

Subwatershed	Desired Conditions	Baseline Conditions	Functional Rating
East Fork Weiser River	<12% surface fins (<0.85mm) in gravel, surface fines (≤6mm) ≤12%	17.5%	Functioning at Unacceptable Risk
Granite Creek	<27% surface fines (Overton et al 1995)	23.5%	Functioning Appropriately
Jungle Creek		23%	Functioning Appropriately
Little Fall Creek		13.7%	Functioning Appropriately
Mica Creek		21%	Functioning Appropriately

Physical Barriers Watershed Condition Indicator

Stream crossings can deliver sediment to stream channels, restrict and plug during high flows, contribute to road failure, and prevent upstream and downstream passage for fish and aquatic organisms. Improperly installed culverts can fragment habitats and plug with debris during high runoff periods (Luce and Wemple 2001; Gibson et al. 2005; Colyer et al. 2005). Isolated fish populations are at higher risk of extirpation from stochastic events in habitats where culverts or bridges are inadequately sized, resulting in decreased population viability (Rieman and McIntyre 1995). Fragmented populations also affect gene flow and life history variations and result in smaller refuge habitat and smaller population size (Rieman and McIntyre 1995; Burns et al. 2005). Adams and Zurstadt (2005) estimated that 82% of the culverts surveyed on the Forest were a barrier to juvenile fish. Gibson et al. (2005) found that approximately 53% of culverts surveyed in the Labrador area of Canada impaired fish passage. A Boise National Forest culvert survey (USDA Forest Service 2003a) found that approximately 90% of the culverts on the Boise National Forest were a barrier to at least one life stage of fish at some time of the year.

The Forest Plan desired condition for the Physical Barriers WCI is that any man-made barriers present in the watershed allow upstream and downstream fish passage at all flow levels (Table 3-94). Based on survey data and GIS estimates, the Physical Barriers WCI is

FUR in all four subwatersheds (Table 3-95). Several AOP barriers were replaced with AOP structures in the past, including Warm Springs Creek, Bar Creek, Boulder Creek, Fall Creek and mainstem Middle Fork Weiser River. In July 2015, high flows from a storm damaged the Boulder Creek structure, removing the stream simulation and making it impassable to aquatic organisms.

Table 3-94. Physical barriers Watershed Condition Indicator (WCI) functional level description as identified in the Forest Plan (USDA Forest Service 2003a)

WCI	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk
Physical Barriers	Any man-made barriers present in the watershed allow upstream and downstream fish passage at all flows.	Any man-made barriers present in a watershed do not allow upstream and/or downstream fish passage at base/low flows.	Any man-made barriers present in a watershed do not allow upstream and/or downstream fish passage at a range of flows

Table 3-95. Environmental baseline for the Physical Barriers Watershed Condition Indicator by subwatershed

Subwatershed	Desired Conditions	Baseline Conditions	Functional Rating
East Fork Weiser River	Any man-made barriers present in the watershed allow upstream and downstream fish passage at all flows.	All of the mainstem East Fork Weiser River fish passage barriers and those on Dewey Creek have been replaced. A culvert at the mouth of the East Fork Weiser River on Highway 95 remains.	Functioning at Risk
Granite Creek		About 173 road-stream crossings in the subwatershed including about 151 on National Forest Service (NFS) land. Some of the culverts on major streams are currently Aquatic Organism Passage (AOP) structures. Most of the road-stream crossings are on small tributary streams including many non-fish bearing or intermittent streams.	Functioning at Unacceptable Risk
Jungle Creek		About 203 road-stream crossings in the subwatershed including about 76 on NFS land. Most of the crossings are on tributary streams on non-NFS lands and many of the crossings on NFS land are on small headwater streams.	Functioning at Unacceptable Risk
Little Fall Creek		About 87 road-stream crossings in the subwatershed, including about 33 on NFS land. The major stream crossings have been replaced with AOP structures. Many of the crossings are on non-NFS lands.	Functioning at Unacceptable Risk
Mica Creek		About 156 road-stream crossings in the subwatershed, including about 83 on NFS land. Several of the major tributary stream crossings have been replaced with AOP structures. Many of these crossings are on non-NFS lands or on small headwater streams.	Functioning at Unacceptable Risk

Large Woody Debris Watershed Condition Indicator

LWD is an important biological and physical component in forested stream ecosystems (McDade et al. 1990). LWD provides cover for fish and influences stream channel formation, pool formation, and sediment transport and deposition (Sullivan et al. 1987; Bragg et

al. 2000). Pool formation is highly correlated to LWD (Quigley and Arbelbide 1997). McDade et al. (1990) found that most LWD originates in areas immediately adjacent to the stream channel. LWD also provides thermal refuge and protection from predators.

The Forest Plan desired condition for LWD is at least 20 pieces of LWD per mile that exceed 12 inches in diameter (0.3m) and 35 feet (20.6m) in length, and adequate sources of LWD for both long and short-term recruitment (Table 3-96; USDA Forest Service 2003a). LWD were also compared to natural conditions described by Overton et al. (1995). Stream habitat surveys have collected LWD data for pieces that are smaller than those described in the Forest Plan but are consistent with Overton et al. (1995). Table 3-97 displays the current conditions for the LWD WCI.

Table 3-96. Large Woody Debris Watershed Condition Indicator (WCI) functional levels as described in the Forest Plan (USDA Forest Service 2003a)

WCI	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk
Large Woody Debris	**Forest Plan**: >20 pieces per mile, >12 inches in diameter, >35 feet long; and adequate sources of large woody debris for both long and short-term recruitment	Currently meets standards for functioning appropriately but lacks potential source of short or long-term large woody debris recruitment from RCAs to maintain that desired condition	Does not meet the standards for functioning appropriately and lacks potential large woody debris for short and/or long-term recruitment
	Natural Conditions Database (Overton et al. 1995): # pieces/100 meters (m) >0.1m diameter 3 m length **A channel Volcanic** Wetted Width #LWD/100 m 0–1.5/NA 1.5–3/NA 3–4.7/5.03 4.7–6/3.41 **B Channel Volcanic** Wetted Width #LWD/100m 1.5-3/4.16 3-4.7/12.22 4.7-6/12.82 10.7-12/2 4.03 **C Channel Volcanic** Wetted Width #LWD/100m 1.5-3/0.38 3-4.7/3.91 4.7-6/4.25	Pieces >0.1 diameter and 3.0m in length fewer than described and insufficient recruitable LWD	

Table 3-97. Environmental baseline for the Large Woody Debris Watershed Condition Indicator (WCI) in the Project area

Subwatershed	Desired Conditions	Baseline Conditions	Functional Rating
East Fork Weiser River	**Forest Plan**: >20 pieces per mile, >12 inches in diameter, >35 feet in length; and adequate sources of large woody debris for both long and short-term recruitment	39 pieces per mile	Functioning Appropriately
Granite Creek		35 pieces per mile	Functioning Appropriately
Jungle Creek		16 pieces per mile	Functioning at Risk
Little Fall Creek		33 pieces per mile	Functioning Appropriately
Mica Creek		6.7 pieces per mile	Functioning at Unacceptable Risk

Road Density and Location Watershed Condition Indicator

The fisheries section focuses on the location portion of the Road Density and Location WCI while road density is addressed in the watershed section.

High road densities can affect watershed function in a variety of ways. Roads are efficient at routing runoff and sediment to stream channels, so can increase the volume and affect the timing of peak flows and can contribute fine sediment to stream channels, affecting both fish habitat and channel function (Belt et al. 1992). High road densities in riparian areas can decrease stream shade and pose an increased risk of road prism failure and mass wasting into the stream channel during flood events, which in turn, can cause greater damage downstream and also degrade fish habitat (Luce and Wemple 2001, Nelson et al. 2004). When located in riparian areas, roads can directly influence a stream channel and floodplain, alter riparian vegetation, decrease LWD and stream shade, and create fish passage barriers at stream crossings (Furniss et al. 1991). High road density and associated chronic sediment delivery can decrease stream habitat complexity (Furniss et al. 1991; Luce at al. 2001). Nelson et al. (2004) evaluated relationships between road density and fish habitat attributes on the Forest and found sediment deposition (i.e., percent surface fines) was positively correlated with road density. High sediment levels can have deleterious effects to salmonids and their habitats. Effects of high sediment levels are described above. Table 3-98 displays the Forest Plan descriptions of functional ratings for the Road Density/Location WCI.

In the Project area subwatersheds, road densities (including NFS and unauthorized routes) range from 3.6–5.9 miles per square mile on all ownerships with 20.7 to 41.7 miles within RCAs (Table 3-99). These densities and road locations are considered FUR, with respect to the Forest Plan.

Table 3-98. Road Density and Location Watershed Condition Indicator (WCI) functional levels as described by the Forest Plan (USDA Forest Service 2003a)

WCI	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk
Road Density/Location	Total road density of <0.7 miles/square mile of subwatershed, no roads within RCAs	Total road density of 0.7–1.7 miles/square mile of subwatershed, few roads in RCAs	>1.7 miles/square miles of subwatershed, many roads within RCAs

Table 3-99. Environmental baseline for the Road Density (mi/mi^2)/Location (mi) Watershed Condition Indicator (WCI) functional rating by subwatershed and road miles in Riparian Conservation Areas (RCAs)

Subwatershed	Desired Conditions	Baseline Conditions (mi/mi^2)	Road Miles in RCAs	Functional Rating
East Fork Weiser River	Total road density of <0.7 miles/square mile of subwatershed, no roads within RCAs	4.5	25.2	Functioning at Unacceptable Risk
Granite Creek		4.5	29.2	Functioning at Unacceptable Risk
Jungle Creek		5.9	41.7	Functioning at Unacceptable Risk
Little Fall Creek		3.6	20.7	Functioning at Unacceptable Risk
Mica Creek		4.8	34.8	Functioning at Unacceptable Risk

Soil, Water, Riparian, and Aquatic Objective Measurements

The fisheries analysis section for direct, indirect, and cumulative effects will focus on the relevant WCIs and the measurements related to Objective 6 identified above, including the number of fish barriers removed or replaced, miles of fish habitat reconnected and miles of road decommissioned within RCAs. A complete analysis for all of the WCIs is included in the fisheries specialist report in the Project Record.

Stream Miles Improved

Miles of stream improved includes miles of fish habitat reconnected (from fish barriers replaced and culverts removed from road decommissioning) and miles of RCA road decommissioning and road improvements (graveling) in RCAs. Crossings would be improved to provide fish passage by either removal or replacement based on the proposed treatment for that road. For each stream crossing removed on a perennial stream, 0.2 miles was considered improved. Graveling can substantially reduce sediment production from roadways (Burroughs and King 1989; USDA Forest Service 2012) contributing to improved stream sediment conditions.

Issues

Proposed vegetation treatments and prescribed burning in RCAs may negatively affect stream temperatures and LWD.

Indicators

- Acres of vegetation treatment and prescribed burning within RCAs (Table 2-15. Comparison of alternatives by activity in section 2.3.5)
- Acres treated within one site potential tree height (Table 2-15. Comparison of alternatives by activity in section 2.3.5)

3.6.4. Environmental Effects

3.6.4.1. Direct and Indirect Effects

3.6.4.1.1. Alternative 1 (No Action Alternative)

Alternative 1 (No Action Alternative) does not propose any new management actions for the Project area. Natural processes and ongoing management activities, such as recreation, public firewood gathering, fire suppression and routine road and trail maintenance, are expected to continue in the Project area.

Physical barriers to fish passage would remain at the current level because no culverts would be removed or replaced. Streams would remain disconnected and fish would not be able to access habitat above impassable culverts. Road decommissioning/obliteration, long-term closures, and graveling would not occur and roads would continue to negatively affect sediment, stream shade, temperature, LWD, floodplain connectivity, and the drainage network. The transportation system within the analysis area would remain at current levels under this alternative. Implementing this alternative would not contribute to the goals and objectives of the Forest Plan, ACS, or SWRA resource objectives of this project.

3.6.4.1.2. Physical Barriers Watershed Condition Indicator

East Fork Weiser River Subwatershed (FR)

Alternatives 2, 3 and 4

Physical barriers would be maintained at FR in all three timeframes in the East Fork Weiser River subwatershed. The addition of the non-motorized trail and the hardening of the approaches to two crossings would not change physical barriers and would not affect stream miles improved.

Granite Creek (FUR), Jungle Creek (FUR), Little Fall Creek (FUR) and Mica Creek (FUR) Subwatersheds

Culvert Replacements

Replacing the culverts at Big Creek and the Middle Fork Weiser River near the Granite Creek trailhead with AOP structures would improve hydrologic function and fish passage at these sites under all action alternatives. PDFs would be implemented for all culvert replacements. Although many stream crossings are present on tributaries to the Middle Fork Weiser River, these streams are intermittent or small perennial headwater streams and provide little, if any, fish habitat. Some culverts, including the main crossings on Bar Creek, Warm Springs Creek, and the mainstem Middle Fork Weiser River have already been replaced with fish-passable structures.

Culvert replacements and removals would benefit native and nonnative fishes throughout the project area by reconnecting perennial streams and improving hydrologic function at the crossings, reducing the potential for failure during high-flow events in all three timeframes. Table 3-100 shows the number of road-stream crossings on NFS lands within each subwatershed in the Middle Fork Weiser River drainage. The number of culvert removals was estimated using GIS.

Trail crossings associated with the reroutes would not affect physical barriers because the crossings would be either fords or bridges which would not impede aquatic organism passage.

Alternative 1 (no action) would not remove any barriers or replace any barriers. Alternatives 2 and 4 would incrementally improve the Physical Barriers WCI with replacement of the culverts at Big Creek and the Middle Fork Weiser River. Alternative 3 would improve the WCI slightly more by replacing an additional culvert at Jungle Creek.

Although implementing the action alternatives would incrementally improve the Physical Barriers WCI in all three timeframes at all scales, improvements would not be enough to move the WCI from FUR to FR. This WCI would be maintained at all scales.

Stream Miles Improved

Stream miles improved was calculated with GIS using the miles of perennial stream upstream of a proposed replacement, either upstream to known barriers or to the headwaters if no known barriers were present, and miles of stream enhanced through road decommissioning and road improvement (graveling) within RCAs. Culvert removals associated with road decommissioning were each assumed to enhance 0.2 miles of stream. Actual stream miles may vary because not every road-stream crossing is a culvert barrier. Intermittent streams were not included in the stream miles improved because they do not provide fish habitat. No known intermittent fish-bearing streams occur in the Project area. Table 3-101 and Table 3-102 display road activities by subwatershed and stream miles improved, respectively.

Road improvement (graveling) would be 5.5 miles within RCAs for each action alternative.

Alternative 1 (no action) would not remove any barriers, decommission any roads within RCAs, replace any culverts, or maintain or gravel roads within RCAs. No stream miles would be improved with implementation of this alternative.

Alternative 2 (proposed action) would improve approximately 53.8 stream miles. This includes 24.6 miles of road decommissioning within RCAs and the removal of approximately 87 total crossings on perennial streams, which would improve about 17.4 stream miles (0.2 mile per crossing). Replacement of two culverts with AOP structures would reconnect about 6.3 miles of stream. The Big Creek culvert replacement would reconnect about 1.9 stream miles and replacement of the Middle Fork Weiser River culvert would reconnect about 4.4 stream miles in the mainstem Middle Fork Weiser River and Granite Creek. About 5.5 miles of roads would be graveled within RCAs with implementation of Alternative 2.

Alternative 3 would improve a total of approximately 57.5 stream miles. About 19.2 miles would be improved from removal of 94 total crossings on perennial streams associated with RCA road decommissioning (0.2 mile per crossing). Alternative 3 would decommission about 26.2 miles of roads within RCAs. A total of 6.8 miles of streams would be reconnected with replacement of the Big Creek, Middle Fork Weiser River and Jungle Creek culvert; about 0.5 mile more than Alternatives 2 and 4. About 5.5 miles of road graveling within RCAs would occur. Alternative 3 would result in slightly more road-stream crossings improved than the other alternatives.

Alternative 4 would improve about 52.9 stream miles. This includes 23.6 miles of road decommissioning within RCAs and the removal of approximately 87 total crossings on perennial streams, which would improve about 17.4 stream miles (0.2 mile per crossing). Replacement of two culverts with AOP structures would reconnect about 6.3 miles of stream.

The Big Creek culvert replacement would reconnect about 1.9 stream miles and replacement of the Middle Fork Weiser River culvert would reconnect about 4.4 stream miles in the mainstem Middle Fork Weiser River and Granite Creek. About 5.5 miles of roads would be graveled within RCAs with implementation of Alternative 4. Implementation of Alternative 4 would improve slightly less stream miles than the other alternatives.

Table 3-100. Road-stream crossings on National Forest System land by subwatershed and alternative

Subwatershed	Alternative 1	Alternative 2	Alternative 3	Alternative 4
	Number of crossings (# on perennial streams)	Number of crossings (# on perennial streams)	Number of crossings (# on perennial streams)	Number of crossings (# on perennial streams)
Granite Creek	151 (105)	70 (55)	63 (48)	70 (55)
Jungle Creek	76 (57)	58 (42)	57 (42)	58 (42)
Little Fall Creek	33 (14)	16 (8)	16 (8)	16 (8)
Mica Creek	83 (41)	51 (25)	50 (25)	51 (25)
Total[a]	**341**	**195**	**186**	**195**

[a]Includes culvert replacements specifically for aquatic organism passage and estimated culvert removals as part of road decommissioning and long-term closures

Table 3-101. Road activities within Riparian Conservation Areas (RCAs) by subwatershed and alternative

Subwatershed	Existing Cond.	Alt 1	Alt 2		Alt 3		Alt 4	
			RCA Road Decom (Oblit)	RCA Road Main.	RCA Road Decom (Oblit)	RCA Road Main.	RCA Road Decom (Oblit)	RCA Road Main
Granite Creek	FUR	0	9.8	14.5	11.4	14.2	9.4	14.5
Jungle Creek	FUR	0	5.6	9.2	5.6	9.1	5.3	9.2
Mica Creek	FUR	0	4.5	5.5	4.5	5.5	4.3	5.5
Little Fall Creek	FUR	0	4.7	5.8	4.7	5.7	4.6	5.8
Total Road Miles		**0**	**24.6**	**35.0**	**26.2**	**34.6**	**23.6**	**35.0**

Note: Road miles are slightly different from Table 2-8 because of rounding and a small amount occurs outside the analysis area

Table 3-102. Stream miles improved, because of miles of stream reconnected, Riparian Conservation Area (RCA) system road improvements, and RCA road decommissioning

Subwatershed	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Granite Creek	0	24.2	26.4	23.2
Jungle Creek	0	10.5	11.2	10.6
Little Fall Creek	0	5.7	5.9	5.7
Mica Creek	0	7.9	8.7	7.9
Graveling within RCAs	0	5.5	5.5	5.5
Total[a]	**0**	**53.8**	**57.7**	**52.9**

[a]Includes stream miles reconnected from culvert replacements specifically for aquatic organism passage, estimated culvert removals as part of road decommissioning, RCA road decommissioning and RCA road graveling

3.6.4.1.3. Road Density and Location Watershed Condition Indicator

Road density and location is used to determine a reduction in road-related impacts to streams; however, only road location is analyzed in the fisheries section. See the watershed section for road density information. Road decommissioning, particularly in RCAs, under all action alternatives is expected to result in long-term sediment reduction across the Project area. Road treatments are described for each of the alternatives in Chapter 2. Road activities and resulting RCA road miles are displayed in Table 3-103 below. Alternative 3 results in slightly fewer RCA road miles than either Alternative 2 or 4 which would result in slightly more benefit to SWRA resources. The miles of roads decommissioned includes NFS roads and unauthorized routes. The miles of unauthorized routes decommissioned include those proposed for treatment and any planned temporary roads located on unauthorized routes. Road mileages were calculated using the project GIS information.

Table 3-103. Riparian Conservation Area (RCA) road miles by subwatershed and alternative

Subwatershed	RCA Road Miles by Alternative			
	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Granite Creek	29.2	19.9	18.2	20.4
Jungle Creek	41.7	36.4	36.3	36.8
Little Fall Creek	20.7	16.5	16.5	16.7
Mica Creek	34.8	30.6	30.4	30.6
Total	126.4	103.4	100.4	104.5

Alternative 1 (no action) does not propose any road-related activities (Table 3-101). Road-related sediment and other road-related effects to stream channels would continue to occur. Alternative 1 does not address the SWRA resource objectives for this project.

Alternative 2 (Proposed Action) and Alternative 4 are expected result in a temporary to short-term sediment increase (potentially caused by road use, decommissioning, realignment, and reconstruction) followed by a long-term decrease in sediment delivery to streams in all of the subwatersheds (see the watershed section in this document for more information). By decommissioning roads within RCAs, sediment delivery would be reduced and shade and LWD potential would be increased in the long term. All action alternatives would address the SWRA resource objective to reduce road-related effects to streams. Because the fewest miles

of RCA road miles would remain under Alternative 3, it would result in slightly more benefit than the other action alternatives (Table 3-103).

3.6.4.1.4. Bull Trout Subpopulation Character Pathway

Local Population Size, Growth and Survival, Life History Diversity and Isolation, Persistence and Genetic Integrity WCIs

East Fork Weiser River Subwatershed

Alternatives 2, 3 and 4—The only activities proposed within the East Fork Weiser River drainage are the formal designation and signage of the former non-motorized trail 202 as non-motorized 212 trail and a trail reroute on the same trail. The non-motorized 202 trail has existed for approximately 30 years and was maintained informally by a local group. The trail crosses the upper East Fork Weiser River and an unnamed tributary stream. The topography in the contributing area of the East Fork Weiser River crossing is flat and passes between two cattle exclosure fences. The river in that location often runs dry in late summer. The topography near the trail crossing on the tributary stream is flat on one side and slopes upward on the other side. The trail crossings would be hardened with rock to stabilize the streambanks and minimize sediment delivery to the streams from trail use. See the fisheries specialist report (project record) for more information.

Trail work would be completed during low flows after spring peak flows and prior to August 15, which is the start of the bull trout spawning period. The work would be completed by hand and would occur outside the wetted stream width. Instream work would be minimized to the extent possible. Erosion control and sediment plume mitigation measures would minimize sediment delivery to the stream, however, some sediment delivery is likely unavoidable.

A natural waterfall is located approximately 0.4 mile downstream from the trail crossing. The natural waterfall is approximately 5 feet high and is likely a fish passage barrier to some life stages of fish, particularly in low flows. The waterfall has not been verified as a fish passage barrier however the closest observation of a bull trout was immediately below the waterfall. An electrofishing survey completed in 2014 did not find bull trout in either the mainstem or the tributary above the waterfall to the trail crossings. An eDNA sample collected above the waterfall in 2015 did not detect bull trout (Carim et al. 2015, unpublished data,). Effects from hardening the trail approaches may affect but are not likely to adversely affect bull trout and critical habitat because an electrofishing survey and an eDNA sample did not find bull trout in that section of river, effects from sediment generally occur up to 600 feet downstream from the site (Faurot and Burton 2005). The closest observation of a bull trout was 0.4 mile downstream from the trail crossing below a natural waterfall and work would be completed prior to August 15 to avoid the bull trout spawning period.

Approximately 530 feet of the non-motorized trail will be rerouted within the RCA of the tributary to the East Fork Weiser River. Currently, the trail within the RCA is very steep and does not disperse water properly resulting in rutting and erosion. Rerouting the trail and improved trail drainage would decrease erosion and incrementally decrease sediment delivery to the stream. No direct effects to bull trout from the trail reroute are expected because there would be no instream work. No trees are expected to be cut because the trail will be designed to avoid large trees. Stream shading and temperatures, LWD and sediment would be maintained in all three timeframes from implementation of this activity.

Granite Creek, Jungle Creek, Mica Creek and Little Fall Creek Subwatersheds

Alternatives 2, 3 and 4—There would be no effect to any of the bull trout-specific WCIs in the Middle Fork Weiser River drainage, including Local Population Size, Growth and Survival, Life History Diversity and Isolation, Persistence and Genetic Integrity, Temperature (bull trout), Sediment/Turbidity (bull trout) and Refugia because neither bull trout nor critical habitat exist within or downstream from the analysis area (USDA Forest Service 2014 FID; USDI FWS 2010).

3.6.4.1.5. Stream Temperature Watershed Condition Indicator

This indicator would be maintained under all action alternatives. Direct solar radiation is the primary factor influencing stream temperatures in the summer (Betscha et al. 1987; Chamberlin et al. 1991; Johnson 2004). Stream temperature is directly proportional to the amount of direct sunlight that reaches the stream. Riparian vegetation maintains stream temperatures and, as shade increases, water temperature decreases (Murphy and Meehan 1991, FEMAT (1993) evaluated the effectiveness of buffer widths with respect to tree height and demonstrated a buffer width of one tree height effectively maintains litter fall and root strength and retains most of the shading and LWD functions. Project activities that would remove or alter vegetation which provides shading to streams, have the potential to increase insolation and, in turn, increase stream temperatures. Vegetation treatments within RCAs have the potential to reduce stream shading and affect stream temperatures. RCA Vegetation treatment guidelines are described in Appendix 5.

Alternative 1 (No Action)

No vegetation treatments, prescribed fire, road activities or recreation improvements would occur under this alternative, so no stream shading vegetation would be altered. This alternative would be expected to maintain current stream shading vegetation and stream temperature conditions in all subwatersheds in all three timeframes.

East Fork Weiser River Subwatershed (FR)

Alternatives 2, 3, and 4—The only activity proposed in the East Fork Weiser River subwatershed is recreation improvements, including adding an existing trail to the system, hardening the approaches of two stream crossings, and rerouting a trail. Stream temperatures would be maintained because no trees would be cut within RCAs. The trail reroute would be designed to avoid cutting large trees and would not affect stream shading. Some brush and small trees may need to cut, which would not affect stream shading in any timeframe.

Granite Creek (FR), Jungle Creek (FR), Little Fall Creek (FR) and Mica Creek (FR) Subwatersheds

Riparian Conservation Area Vegetation Treatments

Alternative 2—Approximately 13,900 acres of RCAs (delineated using one or two site-potential tree heights on intermittent and perennial streams) occur within the entire Granite Creek, Jungle Creek, Little Fall Creek and Mica Creek subwatersheds—12,317 acres within the entire Project area and 9,480 acres on NFS lands within the Project area. All treatments would occur as described in Chapter 2, and thinning within RCAs would follow the RCA Management Guidelines located in Appendix 5. A no treatment buffer of 120 feet from perennial streams and 60 feet from intermittent streams would exist for most treatments

within RCAs. Treatments within the inner RCAs is described below. Alternative 2 proposes to treat up to about 2,986 acres within the outer portion of RCAs, which is approximately 31% of the total RCA acres on NFS lands within the Project area, about 24% of the RCAs on all lands within the Project area, and about 9% of the total RCA acres in all the subwatersheds. Outer RCA treatments would not be expected to measurably affect stream temperatures at the subwatershed scale because no RCA treatments would occur within one site-potential tree height (0 to 120 feet from perennial streams), which would retain shade, and only limited harvest would occur within two site-potential tree heights (120 feet to 240 feet from perennial streams). At least 30% of the canopy cover would be retained. In western Oregon, Steinblums (1977) found that buffer strips 85 feet wide are adequate to provide shading to protect stream temperatures. Also in Oregon, Brazier and Brown (1973) found that stream buffers of 80 feet are adequate to provide maximum shading and 90% of shading occurs from the first 55 feet. DeWalle (2010) found that buffer widths of approximately 59–65.6 feet provided approximately 85%–90% of total shade to streams. FEMAT (1993) evaluates the effectiveness of buffer widths with respect to tree height and demonstrated a buffer width of one-tree height effectively maintains litter fall and root strength and retains most of the shading and LWD functions. Therefore, limited treatments in the outer RCA (beyond one site-potential tree height) are expected to maintain adequate shade.

Treatments would also occur in a small fuel reduction site on a small perennial tributary to Mica Creek (Appendix 1). The fuel reduction site would be up to 15 acres in size and would treat both the outer and inner portion of RCAs. Hand thinning, ladder fuel reduction, and the introduction of fire would not occur within 15 feet of the channel but would occur from 15 feet to 120 feet. No mechanical ground-disturbing treatments would occur within 120 feet of the stream channel. If feasible, equipment may sit on the road and remove trees from the RCA. This treatment would occur on the north side of the stream and would not be expected to measurably affect stream temperatures because trees on the north side of streams do not provide much shade.

Limited vegetation treatments within one site-potential tree height would occur on intermittent streams. Alternative 2 proposes approximately 594 acres of treatment on the outer 60 feet of intermittent streams. No treatment would occur within 60 feet of intermittent stream channels. Vegetation treatment from 60 feet to 120 feet from intermittent streams is expected to maintain adequate stream shading at the subwatershed scale because the treatment acres within one site-potential tree height is small relative to the overall amount of RCAs (about 6.2%) and intermittent streams are expected to be dry during the hottest months when increases in water temperatures from reduced shading would most likely occur.

Based on the PDFs (RCA distances, no treatment buffers and PDF #13; literature cited above; the fact that at least 30% of the canopy cover would be retained; and that intermittent streams would be dry during the hottest months, vegetation treatments within RCAs is expected to maintain stream shading and temperature in all three timeframes at the subwatershed scale. Treatments within RCAs of wet meadows would not affect stream temperatures.

Alternative 3—Alternative 3 proposes treating 2,668 acres within the outer portion of RCAs, which would be approximately 28% of the total RCA acres on NFS lands within the Project area and about 22% of the RCAs on all lands within the Project area. Alternative 3 is expected to maintain stream temperatures. This alternative would remove less vegetation within RCAs than Alternatives 2 and 4 and no inner RCA treatments are proposed.

Alternative 4—Alternative 4 proposes treating 3,421 acres within the outer portion of RCAs, which would be approximately 35% of the total RCA acres on NFS lands within the Project area and about 28% of the RCAs on all lands within the Project area. Approximately 2,680 acres would be treated in the outer portion of perennial stream RCAs and about 619 acres treated in intermittent stream RCAs. Also, approximately 203 acres of RCA treatments would occur within inner RCAs, primarily in wet meadows and wetlands, including about 15 acres along perennial streams. Alternative 4 treats more RCA acres than Alternatives 2 and 3. Stream temperatures could be affected; however, stream temperatures are expected to be maintained at the subwatershed scale because as indicated in the literature cited above because of PDFs and because intermittent streams would be dry during the hottest months.

Prescribed Fire, Ladder Fuel Treatments and Shaded Fuelbreak

Alternative 2—Within the Granite Creek, Jungle Creek, Little Fall Creek and Mica Creek subwatersheds, burn blocks under Alternative 2 propose treating approximately 24,250 acres with prescribed fire (9,400 acres of primary target areas and 14,800 acres of secondary targets areas), including about 3,061 RCA acres (outer RCA), which may also include ladder fuel treatments (Table 2-15). A SFB of approximately 370 acres is also proposed. Commercial activities would generally be completed prior to fire application. Prescribed fire would be allowed to back into RCAs, and some ignition may occur in appropriate vegetation types. Ignition is expected to occur in the outer portion of up to 25% of RCAs located in burn blocks (personal communication, D. LaChapelle, Fuels Specialist). No ignition or ladder fuel treatments would occur within 120 feet of perennial channels or 60 feet of intermittent channels, except within the 15-acre fuel treatment area described above or where approved by a Hydrologist and/or Fisheries Biologist. All ignitions in RCAs would be subject to PDFs designed to improve or maintain riparian areas and their functions and would require approval from a Hydrologist and/or Fish Biologist. Fire would not be directly applied to non-target areas. Approximately 20% of non-target acres located within the proposed burning areas would be expected to receive fire through backing (low intensity fire spread, without additional lighting).

Fire allowed to back into RCAs could alter stream shade by changing the structure of both overstory and understory vegetation and a few trees may be directly or indirectly killed by prescribed fire. However, prescribed burning, including active ignition within RCAs, is not expected to measurably change stream temperatures in the Project area because mortality would not be substantial as prescriptions would require low intensity fire and would not target overstory vegetation. The seasonal timing of burning (spring or fall) and anticipated lower fire intensities due to higher soil moisture and relative humidity would not be expected to measurably alter stream shade. Much of the riparian vegetation would either not burn or burn at a low intensity, resulting in a mosaic of low intensity and unburned areas. Ladder fuel treatments may also occur, which would reduce ladder fuels with the intent of keeping fire from entering the overstory, which would also maintain stream shade. Revegetation after prescribed fire treatments is expected to occur quickly. Prescribed fire research on the Forest shows that riparian effects are often not observed (Arkle and Pilliod 2010). Halfosky and Hibbs (2009) found that riparian functions are resilient and rapid regeneration of vegetation within riparian areas followed wildland fires in Oregon.

The 370-acre SFB is expected to maintain stream temperatures because no vegetation would be cut within 120 feet of perennial streams and 60 feet of intermittent streams, ignition may

occur with approval from the Hydrologist and/or Fisheries Biologist in areas where SWRA resource conditions can be maintained, and ignition would only occur in the outer RCAs.

Alternative 3—Approximately 22,300 acres of prescribed fire (8,400 acres of primary target and of 13,900 acres secondary target), including about 2,180 RCA acres (outer RCA), are proposed under Alternative 3. Anticipated effects to stream temperatures would be less than and similar to those described under Alternative 2.

Alternative 4—Approximately 27,400 acres of prescribed fire (9,400 acres of primary target and 18,000 acres of secondary target), including 3,513 RCA acres (outer RCA), are proposed under Alternative 4. Effects to stream temperatures from prescribed fire under Alternative 4 would be similar to and slightly greater than effects under Alternative 2.

Road Activities (including decommissioning, reroutes, realignments and temporary roads)

Within RCAs, road reconstruction, road maintenance and planned new temporary roads may reduce stream shading when trees or other vegetation are removed near streams. About 1.2 miles of planned new temporary roads within RCAs are included under each action alternative. Developing these new temporary roads would not measurably change stream temperatures at the subwatershed scale in any timeframe because the mileage is small relative to the entire subwatershed and few shade-providing trees would be cut. In addition, about 50 miles of unauthorized roads would be decommissioned after use. These activities would occur primarily on existing roadbeds where the vegetation is likely not substantially contributing to stream shade; the trees are generally not large enough to provide shade. Therefore, removing vegetation on existing roadbeds and on planned new temporary roads would not measurably affect stream temperatures at the subwatershed scale. Expanding gravel pits or their access roads or developing new gravel pits would not affect stream shading because they are not located within any RCA.

Incidental temporary roads (up to 7 miles total) would be approved by the Hydrologist and/or Fisheries Biologist prior to construction, and all temporary roads would be decommissioned after vegetation treatments/project activities are completed. These roads are expected to be located outside RCAs and would not affect stream temperatures.

Decommissioning (obliteration) of roads within RCAs would incrementally increase riparian vegetation in the short- and long-term as the areas revegetate. Increased riparian vegetation would provide more trees that would potentially provide stream shade, depending on the aspect and their distance from stream channels, with a corresponding incremental decrease in stream temperature over the long term. Localized, site-specific reductions in stream shading may occur in the temporary to short term from road decommissioning adjacent to streams and at stream crossings, but no measurable effects are expected at the subwatershed scale because of the relatively small change in shading. Table 3-103 displays the RCA road activities by subwatershed and alternative. Under Alternative 2, approximately 24.6 miles of RCA road would be decommissioned (obliterated) in the Project area. Stream temperatures would be maintained at the subwatershed scale in all timeframes.

Alternative 3—Alternative 3 proposes decommissioning (obliterating) approximately 26.2 miles of RCA roads within the Project area. Because of the additional road miles decommissioned under Alternative 3, this alternative is expected to increase stream shading and decrease stream temperatures slightly more over the long term than the other alternatives.

Alternative 4—Alternative 4 proposes decommissioning (obliterating) approximately 23.6 miles of RCA roads within the Project area. Effects to stream temperatures from road activities are expected to be similar to those under Alternative 2.

Fish Passage Improvements and Temporary Stream Crossings

Improvements to fish passage, including culvert replacements and installation of temporary stream crossing during road reconstruction, are not expected to measurably affect stream temperatures at the site-specific or subwatershed scale because those activities would not measurably alter stream-shading vegetation. Alternatives 2 and 4 propose replacing 2 culverts for fish passage and Alternative 3 proposes replacing 3 culverts. Site-specific reductions in stream shading may occur at stream crossings where roads are reconstructed immediately adjacent to stream channels, but based on other past culvert replacements on the Forest, few trees would be removed to install or remove culverts. Culvert replacement would reduce shading at individual sites, but the disturbed areas would revegetate over time with short- and long-term increases in shading as the vegetation reestablishes.

Recreation Improvements

Alternative 2—Recreation improvements proposed in Cabin Creek campground are expected maintain stream shading and temperatures because the activities, including installing kiosks, site markers, and accessible tables; graveling an accessible trail to the toilet; relocating a vault toilet; and widening and graveling of the loop road, require few, if any, trees to be cut, and the campground is located outside RCAs.

Other activities include improvements to several dispersed camping sites (installing a vault toilet, fire rings, and hitch rails; graveling and installing signs to identify camping sites; installing boulders to direct use) and hardening a crossing of the Middle Fork Weiser River for stock is expected to maintain stream shading because the area is already disturbed and few, if any, trees would need to be cut.

Designating motorized and non-motorized routes would not be expected to measurably alter stream shading because the routes are on existing system routes, generally outside RCAs, and removing stream shading vegetation is not expected to occur. Trail reroutes would be designed to minimize or avoid cutting trees within RCAs and would not measurably affect stream shading or temperatures. Constructing and designating a new 3 mile OHV trail is not expected to affect stream shading because the trail would primarily be located on two existing OML 1 roads. A 0.5-mile section would need to be constructed to connect the two roads and complete the loop. This new road would be located outside RCAs and would not affect stream temperatures.

Maintenance on 28 miles of trails within the Project area would not remove trees or remove any trees to the extent that stream shading (or temperatures) would be measurably affected at any scale.

Alternative 3—All recreation improvements proposed under Alternative 3 are the same as those proposed under Alternative 2 except the 3-mile OHV Loop Trail is not proposed under Alternative 3. Not creating the OHV loop would have little effect on stream temperatures because stream shading is expected to remain at the current levels and the road would remain as a ML 1 road.

Alternative 4—All recreation improvements proposed under Alternative 4 are identical to Alternative 2. Effects to stream temperatures are expected to be the same as those under Alternative 2.

Summary—Stream temperatures would be maintained in all three timeframes at the subwatershed scale under any of the action alternatives. The action alternatives are expected to result in short- and long-term incremental benefits and would not retard the attainment of

properly functioning temperatures. Localized affects to stream shading may occur from prescribed burning, installation and removal of stream crossings, and RCA road reconstruction and decommissioning. These effects are expected to be negligible due to the small amount of stream shading that would be affected. Vegetation treatments within one site-potential tree height on intermittent streams are not expected to measurably affect stream temperatures because the streams are dry during the hottest time of the summer, and the number of acres proposed for treatment is relatively small. In the short and long term, RCA road decommissioning would incrementally increase stream shading.

3.6.4.1.6. Sediment/turbidity (Bull Trout) and Substrate Embeddedness Watershed Condition Indicators

Vegetation removal and mechanical disturbance increase the erodibility of forest soils and, consequently, increase the amount of soil available for transport and the likelihood of transport downslope and into streams. Once in streams, fine sediment (particles smaller than 6.3 millimeters in diameter) may be transported farther downstream or deposited in slow water areas and behind obstructions, locally altering fish habitat conditions. In particular, fine sediment has been shown to fill the interstitial spaces among larger streambed particles, which can eliminate the living space for various microorganisms, aquatic macroinvertebrates, and juvenile fish. Potential problems associated with excessive sediment have been recognized in a variety of salmonid species and at all life stages, from possible suffocation and entrapment of incubating embryos (Coble 1961; Phillips et al. 1975; Hausle and Coble 1976; McCuddin, 1977; Cederholm and Salo 1979; Peterson and Metcalfe 1981; Irving and Bjornn 1984; Tagart 1984); through loss of summer rearing and overwintering cover for juveniles (Bjornn et al. 1977; Kelley and Dettman 1980; Hillman et al. 1987; Griffith and Smith 1993); to reduced availability of invertebrate food for resident adults (Tebo 1955; Nuttall 1972; Cederholm and Lestelle 1974; Bjornn et al. 1977; Alexander and Hansen 1986).

East Fork Weiser River Subwatershed (FUR)

Hardening of the approaches to an existing stream crossing the East Fork Weiser River and one crossing on a tributary stream may deliver a small amount of sediment to the stream because from ground disturbance near the channels when rocks are placed in the ground. The work would be completed by hand during low flows prior to August 15 to avoid bull trout spawning. In-stream work would be minimized to the extent possible. Work is expected to occur outside the wetted width. The amount of sediment delivered to the stream is not expected to be measurable at either the local or the subwatershed scale with implementation of PDFs and erosion control measures, such as straw wattles, and the relatively small scope of the activity. The trail reroute would be expected to incrementally decrease sediment delivery to the East Fork Weiser River tributary stream by directing water off the trail.

Granite Creek (NA), Jungle Creek (NA), Little Fall Creek (NA) and Mica Creek (NA) Subwatersheds

There would be no effect to sediment/turbidity (bull trout) because bull trout and their critical habitat do not exist in these subwatersheds.

3.6.4.1.7. Sediment/turbidity (Other Fishes) and Substrate Embeddedness Watershed Condition Indicators

East Fork Weiser River Subwatershed (FA)

Effects would be similar to Sediment/Turbidity (Bull Trout) and Substrate Embeddedness WCI discussed above.

Granite Creek (FA), Jungle Creek (FA), Little Fall Creek (FA) and Mica Creek (FA) Subwatersheds

Riparian Conservation Area Vegetation Treatments

The watershed analysis indicates all alternatives would temporarily increase sediment with a long-term decrease. That analysis shows that Alternative 4 would impact sediment the most over all three timeframes, and Alternative 3 would have the least impact to sediment. Alternative 3 would also result reduce sediment the most over the long term.

Alternatives 2, 3 and 4—Under Alternative 2, thinning would occur on approximately 2,986 acres in the outer portions of RCAs, with about 2,303 acres occurring in the outer 120 feet of perennial streams RCAs, and on approximately 593 acres in the outer 60 feet of intermittent streams. Also, approximately 64 acres in the outer portion of wet meadow RCAs would be treated, and a total of 25 acres in the outer portion of RCAs of seeps, springs, wetlands, and bogs would be treated. Under Alternative 2, approximately 31% of the total RCAs in the project area would be thinned. Treatments in the outer portions of wet meadows would not affect fish habitat.

Inner RCA treatments include approximately 10 acres of vegetation treatments near perennial streams and 2 acres near intermittent streams and 15 acres of fuel-reduction treatments near the intersection of NFS roads 186 and 206. A no-treatment buffer of 15 feet would occur in the 15 acres proposed for fuel-reduction treatments. Vegetation treatments within one site-potential tree height of perennial and intermittent streams may increase sediment delivery to streams; however, the increase would not be measurable at the subwatershed scale due to the small amount of acreage that would be treated, the no-activity buffers within RCAs, PDFs, mitigation measures, and BMPs.

Alternative 3 would treat about 2,057 acres in the outer portions of perennial stream RCAs and about 540 acres in the outer portion of intermittent stream RCAs. No inner RCA treatment is proposed under this alternative.

Alternative 4 would treat about 3,421 acres in the outer portions of RCAs; 2,680 acres in the outer 120 feet of perennial streams RCAs; and 619 acres in the outer 60 feet of intermittent streams. Also, approximately 80 acres would be treated in the outer portions of RCAs in wet meadows and 190 acres within the inner RCA of wet meadows. Approximately 36% of the total RCAs in the project area would be treated under this alternative. Treatments within RCAs of wet meadows would not affect fish habitat.

Prescribed Fire, Ladder Fuel Treatments, and Shaded Fuelbreak

No active ignition would occur within 240 feet of perennial streams or 120 feet of intermittent streams, except where approved by a Hydrologist and/or Fisheries Biologist. Any handline that may be constructed within RCAs (for spot fires that may occur outside the main Project area boundary or if weather conditions did not produce substantial moisture to

naturally control the burn) would be minimized to the extent possible and rehabilitated after conclusion of Project activities, which would minimize sediment delivery to streams. Beche et al. (2005) found no effect on sediment in watershed streams one year after a low-to-moderate intensity prescribed fire with active ignition within RCAs. Arkle and Pilliod (2010) also did not observe effects from prescribed fire on sediment in a stream in a ponderosa pine forest with no ignition within RCAs. Effects from prescribed fire in the Project are expected to be similar to effects observed in these studies.

Road Activities (including road decommissioning, maintenance, reconstruction, and temporary roads)

GRAIP modeling analyzed sediment delivery to streams from the road network and is discussed in detail in the watershed portion of this document and in the watershed specialist report. The watershed analysis indicated that sediment delivery to streams would increase in the temporary to short term with a long-term decrease from road decommissioning, realignment, and reconstruction; long-term closures; and culvert removals and replacements. Implementing road activities proposed under the action alternatives would incrementally (not measurably) improve the Sediment/Turbidity and Substrate Embeddedness WCIs in the short and long term. See Table 2-15 for a comparison of the road decommissioning (obliteration) and RCA road decommissioning (obliteration) mileages by alternative. Alternative 2 would decommission approximately 24.6 miles of roads within RCAs, and Alternative 3 would have the most benefit for fish habitat by decommissioning about 26.2 miles within RCAs. Alternative 4 would decommission 23.6 miles of roads in RCAs. Roads were selected for decommissioning using both GIS information and field data. According to the hydrologist report, a temporary to short-term, localized increase in sediment/turbidity would result from road decommissioning (obliteration) within RCAs and culvert removals. This temporary increase in sediment is not expected to result in loss of water quality, beneficial uses, or aquatic habitat. In the short and long-term, an incremental to measurable improvement to the Sediment/Turbidity and Substrate Embeddedness WCIs would occur as the areas stabilize and revegetate. However, the functionality would remain the same.

Road maintenance (including graveling, blading, cleaning plugged culverts and replacement damaged culverts) would occur on about 137.5 miles under Alternative 2 and 4 (including 35 miles in RCAs) and 129.7 miles under Alternative 3 (including 34.6 miles within RCAs). Road maintenance is expected to reduce erosion and reduce sediment delivery to streams compared to not maintaining roads.

Fish Passage Improvements and Temporary Crossings

Some temporary sediment delivery is expected from replacing two culverts (Big Creek and Middle Fork Weiser River) under Alternative 2 and Alternative 4 and 3 culverts under Alternative 3 (Big Creek, Middle Fork Weiser River and Jungle Creek).

All culvert replacement structures would comply with Forest Plan Standards FRST02 and SWST08 and would be designed to provide fish passage for all life stages of fish at all flow levels (USDA Forest Service 2003a). The replacement structures would be equal to or greater than bankfull width. Erosion and sediment control features would be used during culvert replacements. In-stream work would be completed after spring peak flows. Culvert replacements and removals are expected to benefit fish habitat in all three timeframes by reconnecting habitat. Streams are expected to be diverted or constricted during replacement and would be replaced with a bridge or open-bottom culvert. Diversion of the stream during replacement would not change connectivity since the stream segments are not currently

connected. Turbidity may increase temporarily downstream from the culvert replacements during and immediately after work. However, erosion control measures (e.g., silt fences, straw wattles, straw bales, Sedimats) are expected to trap much of the sediment released during implementation. Effectiveness information provided by the Sedimat manufacturer indicates that, depending on the substrate, Sedimats are able to trap and remove up to 80% of the disturbed sediment. Personal observation of Sedimat use during large culvert replacements also indicates that Sedimats trap a large amount of sediment. Monitoring from a large culvert replacement on the Boise National Forest indicates that turbidity would increase immediately after water is returned to the channel, decrease by order of magnitude within an hour, and continue to decrease before returning to baseline conditions within one week (Yenko 2007). Turbidity is expected to be temporary and localized. Scaife and Hoefer (2011) identified that sediment transport would be limited to within 600 feet of the project. Sediment delivery is expected to have small, isolated impacts to fish habitat.

Recreation Improvements

Alternatives 2 and 4—Some sediment may be delivered to streams from proposed recreation improvements; however, the amount is not expected to be measurable at the subwatershed scale under any timeframe. Activities within Cabin Creek campground are not expected to deliver sediment to streams because the campground is located outside RCAs.

Other activities include improvements to several dispersed camping sites (installation of a vault toilet, fire rings and hitch rails, graveling and installation of signs to identify camping sites, installation of boulders to direct use) and hardening a crossing of the Middle Fork Weiser River for stock. Some sediment may be produced in the temporary timeframe during hardening of the crossing of the Middle Fork Weiser River for stock. Sediment will likely be produced during installation of a vault toilet, hitch rail, signs and boulders however application of PDFs and erosion control are expected to minimize or eliminate sediment delivery to streams. Sediment is not expected from these activities in the short- and long-term timeframes.

Designating motorized and non-motorized routes is not expected to deliver sediment to streams because the routes are on existing NFS roads and generally outside of RCAs. Trail reroutes and associated stream crossings would be designed to minimize sediment delivery to streams. The construction and designation of a new 3-mile OHV trail is not expected to affect sediment because the trail would be primarily located on two existing ML 1 roads. A 0.5-mile section would be constructed to connect the two roads and complete the loop. However, this new section would be located outside of RCAs and would not affect sediment.

Trail maintenance on 28 miles of trails within the Project area is not expected to disturb sediment except where stream crossings would be improved or where water bars would be installed. Trail maintenance is not expected to measurably affect sediment at any scale.

Alternative 3–All recreation improvements proposed under Alternative 3 are identical to Alternative 2 except the OHV Loop Trail is not proposed under this alternative. Not creating the OHV loop would have little effect on stream sediment because no ground disturbing activities would occur, stream shading is expected to remain at the current levels and the road will remain as an OML 1 system road.

Summary—A temporary to short-term increase in sediment delivery and a long-term incremental (not measurable) decrease in sediment would result from proposed treatments under all action alternatives in all subwatersheds. All subwatersheds in the Middle Fork Weiser River drainage are FA for sediment/turbidity. The temporary to short-term increase in

sediment would not likely be measurable in any given channel and would not change the sediment/turbidity WCI functional rating. The long-term decrease in sediment would not change functionality of the sediment or substrate embeddedness WCIs (sediment is FA in all subwatersheds) but would incrementally move those indicators toward desired conditions. In the long-term, sediment would decrease more under Alternative 3 than with the other action alternatives. See the "Watershed" section for more information.

3.6.4.1.8. Large Woody Debris Watershed Condition Indicator

Literature indicates approximately 80% of LWD comes from trees within the first 60 feet (18.3 meters) of the edge of a stream, with the remaining 20% coming from beyond 60 feet of the stream's edge (Fleece 2002; Naiman et al. 2002). Robison and Beschta (1990) found that the probability of a tree becoming LWD approaches zero when its distance from the stream equals or is greater than the tree height. Fetherston et al. (1998) and Murphy and Koski (1989) found that almost all LWD comes from within 98.4 feet (30 meters) of the stream channel. Spies et al. (2013) synthesized professional judgment and published studies on wood recruitment as it pertains to riparian thinning and found that 95% of LWD comes from 82–148 feet of the stream channel.

LWD influences channel development with more LWD creating more habitat complexity (Bragg et al. 2000). Pool formation and frequency is highly correlated to LWD (Quigley and Arbelbide 1997). Pools provide protective cover from predators, resting habitat, and thermal refuge. FEMAT (1993) evaluated the effectiveness of buffer widths with respect to tree height and demonstrated that a buffer width of one tree height effectively maintains litter fall and root strength and retains most of the shading and LWD functions.

East Fork Weiser River Subwatershed (FA)

Alternatives 2, 3 and 4—LWD would not be affected in any timeframe from implementing the action alternatives in the East Fork Weiser River subwatershed because no trees would be cut within RCAs.

Granite Creek (FA), Jungle Creek (FA), Little Fall Creek (FA) and Mica Creek (FUR) Subwatersheds

<u>Riparian Conservation Area Vegetation Treatments</u>

Alternative 2—Under Alternative 2, thinning would occur on approximately 2,998 acres in the outer portions of RCAs (2,313 acres in the outer 120 feet of perennial stream RCAs) and on approximately 594 acres in the outer 60 feet of intermittent streams. Also, approximately 64 acres in the outer portion of wet meadow RCAs would be treated, and 25 acres in the outer portion of RCAs of seeps, springs, wetlands, and bogs would be treated. Approximately 31% of the total RCAs in the subwatersheds in the project area would be treated. Treatments in the outer portion of RCAs are not expected to measurably affect LWD at the subwatershed scale because the one site-potential tree height no activity buffer is expected to maintain LWD on perennial streams. Treatments in the outer portion of wet meadows would not affect fish habitat. Vegetation treatment from 60 to 120 feet from intermittent streams would maintain adequate LWD at the subwatershed scale because the acres treated within one site-potential tree height are small relative to the overall amount of RCAs (about 6.2%) and at least 30% of the canopy cover would be retained.

Alternative 3 would treat about 2,668 acres, including 2,057 acres on perennial streams (outer portion of the RCA), and 540 acres on intermittent streams (in the outer portion of the RCA). This alternative would treat the fewest RCA acres and would not include treating inner RCAs. This alternative would affect LWD less than the other alternatives.

Alternative 4 would treat the most RCA acres (3,624) including 2,668 acres on perennial streams (outer portion of the RCA) and 203 acres on intermittent streams. This alternative would have a greater effect on temporary and short-term LWD than the other alternatives.

Inner RCA treatments include approximately 10 acres of vegetation treatments near perennial streams, two acres near intermittent streams and 15 acres of fuels reduction treatments near the intersection of NFS roads 186 and 206. A no treatment buffer of 15 feet would occur in the 15-acre fuels reduction treatment area. Vegetation treatments within one site-potential tree height of perennial and intermittent streams may decrease LWD recruitment; however, the decrease would not be expected to be measurable at the subwatershed scale due to the relatively small amount of acreage that would be treated.

Prescribed Fire, Ladder Fuel Treatments and Shaded Fuelbreaks

Alternative 2 identifies approximately 24,250 acres of prescribed fire, which may also include ladder fuel treatments (Table 2-15). Prescribed fire would be allowed to back into RCAs and some ignition may occur in appropriate vegetation types. A total of 7,422 acres of RCAs occur within burn blocks; however, not all of those RCAs would be treated. Ignition is expected to occur in the outer portion of up to 25% of RCAs located in burn blocks (personal communication, D. LaChapelle, Fuels Specialist). All ignitions in RCAs would be subject to PDFs designed to improve or maintain riparian areas and their functions and would require approval from a Hydrologist and/or Fish Biologist. No ignition or ladder fuel treatments would occur within 120 feet of perennial channels or within 60 feet of intermittent channels, except within the 15-acre fuel reduction treatment described above. Fire in RCAs that is allowed to back farther into RCAs could affect potential future LWD because a small amount of trees may be directly or indirectly killed by prescribed fire. The number of trees killed is expected to be small. Prescribed burning, including active ignition within RCAs is not expected to result in any measurable changes to LWD in the project area because fuel moisture levels are expected to be high at the time of implementation (spring or fall) and prescriptions would require low-to-moderate intensity fire and would not target overstory vegetation. Ladder fuel treatments may also occur, which would reduce ladder fuels with the intent of keeping fire from entering the overstory. Much of the riparian vegetation would either not burn or burn at a low intensity, resulting in a mosaic of low intensity and unburned areas. Revegetation after prescribed fire treatments is expected to occur quickly. Beche et al. (2005) found no effect on LWD recruitment after a low-to-moderate prescribed fire with active ignition within RCAs. Arkle and Pilliod (2010) found no effect on LWD after a prescribed fire in a ponderosa pine forest on the Forest with no ignition in RCAs. Halofsky and Hibbs (2009) found that riparian functions are resilient and rapid regeneration of vegetation occurred within riparian areas following wildland fires in Oregon.

The 370-acre SFB is expected to maintain LWD because no vegetation would be cut within 120 feet of perennial streams and 60 feet of intermittent streams, ignition may occur with approval from the Hydrologist and/or Fisheries Biologist in areas where SWRA resource conditions can be maintained, and ignition would only occur in the outer RCAs.

Alternative 3—Approximately 22,300 acres of prescribed fire (8,400 acres of primary target and 13,900 acres of secondary target) are proposed under Alternative 3. Anticipated effects to LWD are expected to be less than and similar to those described under Alternative 2.

Alternative 4—Approximately 27,400 acres of prescribed fire (9,400 acres of primary target and 18,000 acres of secondary target) are proposed under Alternative 4. Effects to LWD from prescribed fire proposed under Alternative 4 are expected to be similar to and greater than effects under Alternative 2.

Road Activities (including road decommissioning, maintenance, reconstruction, and temporary roads)

Alternatives 2 and 4—Approximately 13.8 miles of road reconstruction (including 5.5 miles proposed within RCAs under Alternative 2 and 6.9 miles proposed within RCAs under Alternative 4), 137.5 miles of road maintenance (35 miles within RCAs), 1.2 miles of planned temporary roads within RCAs in Alternative 2 and 0.9 miles of planned temporary roads within RCAs in Alternative 4 may reduce LWD when trees or other vegetation are removed near streams. These actions are not expected to measurably change LWD at the subwatershed scale in any timeframe.

Approximately 4 miles of unauthorized routes would be added to the system (only in Alternative 4) and up to 7 miles of incidental temporary roads would be added. About 0.2 miles would be constructed or added to the system within RCAs. Approximately 23.3 miles of RCA roads would be decommissioned under these alternatives for a net decrease of approximately 23.1 miles within RCAs. This net decrease in road miles within RCAs (particularly within one site-potential tree height) would be expected to incrementally improve LWD potential as the areas revegetate in the long term at the subwatershed scale.

Alternative 3—Road reconstruction (including 5.1 miles within RCAs); 129.7 miles of road maintenance (34.6 miles within RCAs); and 1.2 miles of planned temporary roads within RCAs may reduce LWD when trees or other vegetation are removed near streams. These actions are not expected to measurably change LWD at the subwatershed scale in any timeframe. No road realignment is proposed under Alternative 3.

No roads would be added to the system and up to 7 miles of incidental temporary roads are proposed. About 25.7 miles of roads within RCAs would be decommissioned. Road decommissioning is expected to incrementally improve LWD as the areas revegetate over the long term at the subwatershed scale.

Fish Passage Improvements and Temporary Crossings

Effects to LWD from culvert replacements and removals and temporary crossings are not expected to be measurable at the subwatershed scale. Few large trees would be cut to remove, install, or replace culverts because the area is located on a road and is already disturbed. The amount of trees that would be cut is small and site specific. In order to comply with SWST10, trees cut within RCAs must be left intact unless determined not to be necessary for achieving SWRA resource desired conditions or resource protection or public safety requires bucking them into smaller pieces (USDA Forest Service 2003a). No measurable effects to LWD are expected because of compliance with SWST10 and the small amount of stream channel affected by culvert activities.

Recreation Improvements

Recreation improvements proposed in Cabin Creek campground are not expected to affect LWD because the activities require few, if any, trees to be cut and the campground is located outside RCAs.

Other activities include improvements to several dispersed camping sites (installation of a vault toilet, fire rings and hitch rails, graveling and installation of signs to identify camping sites, installation of boulders to direct use) and hardening a crossing of the Middle Fork Weiser River for stock are expected to maintain LWD at all scales because few, if any, trees would need to be cut and the activities would disturb a very small area.

Designating motorized and non-motorized routes are not expected to measurably alter LWD because the routes are on existing NFS roads generally outside RCAs and removing trees is not expected to occur. Trail reroutes would occur outside RCAs and would not affect LWD. The construction and designation of a new 3-mile OHV trail would not affect LWD because the trail would be primarily located on two existing ML 1 system roads. A 0.5-mile section would need to be constructed to connect the two roads and complete the loop. This construction would be located outside RCAs and would not affect LWD.

Maintenance on 28 miles of trails within the Project area would remove few, if any, trees within RCAs and would not measurably affect LWD at the subwatershed scale.

Summary: LWD would be maintained in all three timeframes at the subwatershed scale with implementation of any of the action alternatives. The action alternatives are expected to result in short- and long-term incremental benefits and would not retard the attainment of properly functioning LWD. Localized temporary to short-term affects to LWD may occur from removing stream crossings and RCA road reconstruction and decommissioning. These effects are expected to be negligible due to the relatively small amount of area that would be affected. Treatments in the outer portion of RCAs are not expected to have a measurable effect on LWD at the subwatershed scale because the one site-potential tree height no activity buffer would maintain LWD on perennial streams. Vegetation treatments within one site-potential tree height of perennial and intermittent streams may decrease LWD recruitment; however, the effects would not be measurable at the subwatershed scale due to the relatively small amount of acreage that would be treated. In the short and long-term timeframes, RCA road decommissioning would incrementally increase LWD.

3.6.4.1.9. Summary of Effects

Implementing Alternative 1 would not contribute to the objectives of this project. SWRA resource conditions would not be improved in the subwatersheds. Implementing the action alternatives would move all the subwatersheds toward Functioning Appropriately, although the current functional ratings would not change. Alternative 3 would benefit SWRA resource conditions and fish and fish habitat the most.

3.6.4.2. Effects to Listed Species and Critical Habitat

The determination for all of the action alternatives is *May Affect, Not Likely to Adversely Affect* bull trout and their critical habitat in the East Fork Weiser River. This determination is from the addition of an existing trail to the trail system, hardening the approaches to a crossing in critical habitat, and hardening of the approaches to a crossing in a tributary to critical habitat. No other actions are proposed in the East Fork Weiser River subwatershed.

The rationale for this determination is as follows:

- The trail and crossings already exist and only the approaches to the crossings would be hardened.

- Work would occur during low flows prior to August 15 (which is considered to be the start of the bull trout spawning period).
- Work would occur outside the wetted width, which would minimize sediment delivery to the stream.
- Bull trout have not been found in the vicinity of the trail crossings. The closest observation was about 0.4 mile downstream from the crossing below a potential natural fish passage barrier.
- The trail crossing on the East Fork Weiser River and critical habitat is often dry or nearly dry in the summer.

Bull trout critical habitat includes nine Primary Constituent Elements (PCEs) (75 FR 63898). A crosswalk was developed by Nelson (2011) that links the PCEs and the Forest Plan WCIs described in the baseline and the matrices. Nelson demonstrated how analysis and disclosure of project effects and using the effects matrix adequately addresses effects to PCEs. Effects to designated critical habitat are therefore addressed by evaluation of the WCIs. Additional analysis of the bull trout critical habitat PCEs is located in the fisheries specialist report (project record) and ESA consultation documents will be included in the project record. Sediment delivery associated with the trail activities is expected to be of temporary duration. Hardening of the approaches would minimize sediment delivery from trail use in all three timeframes.

In the Middle Fork Weiser River watershed (5th field HU), the Project would have *No Effect* to bull trout or their critical habitat because neither bull trout nor their critical habitat are present within or downstream from the project area.

3.6.4.3. Cumulative Effects

Cumulative effects occur when existing soil, water resource and aquatic conditions from past, present, and reasonable and foreseeable future land management activities overlap in both spatial and temporal scales with the direct and indirect effects associated with the alternatives proposed activities. A complete list of past, present and reasonably foreseeable future actions in the cumulative effects analysis area can be referenced in Appendix 3 of the DEIS. The fisheries cumulative effects analysis area for the Project is the same as for the Direct and Indirect Effects analysis area (Section 3.3), which is the 6th level Hydrologic Units (or subwatershed), that comprise the project area.

A combination of past management actions, including timber harvest, livestock grazing, road building, irrigation diversion and development, land management on private and state property and fire suppression have altered the condition of fish habitat and WCIs in the analysis area. The existing condition (baseline) represents the impacts of past actions within the analysis area. Man-made fish passage barriers and increased sediment production and delivery to streams (primarily from roads) are affecting fish habitat in the analysis area.

Reasonably foreseeable future actions in the analysis area include prescribed fire, Forest System road use and maintenance, long-term road closures and decommissioning of roads, recreation use, motorized OHV use, firewood cutting, livestock grazing on Forest and private lands, timber harvest on Forest and private land, housing development on private land, agriculture practices, noxious weed management, wildfires, and fire suppression. See the DEIS for a detailed summary of the foreseeable future activities.

3.6.4.3.1. Alternative 1

Alternative 1 (No Action) does not propose any new management actions although natural processes and ongoing management activities are expected to continue. Implementation of Alternative 1 is expected to maintain SWRA resources at the current trends. No vegetation treatments, prescribed fire, road decommissioning, road graveling, recreation improvements, culvert replacements or removals would occur. The current road system and fish passage barriers would remain on the landscape and would continue to affect fish and fish habitat (including LWD, sediment, stream shading, and riparian functions and processes). Beneficial effects to WCIs such as from road decommissioning within RCAs including culvert removals and replacements would not occur. There would be no stream miles improved or reduction in road-related effects to streams.

3.6.4.3.2. Alternatives 2, 3 and 4

When considered in conjunction with existing conditions and other reasonably foreseeable future actions, the cumulative effect of the action alternatives on WCIs are expected to range from none to improving over the short- to long-term timeframes at the subwatershed scale given the reduction in roads (especially within RCAs) and road-related effects to fish habitat and the incremental improvement in riparian functions and processes toward desired conditions (particularly with Alternative 3). Temporary to short-term negligible increases in sediment are expected with implementation of the action alternatives and may have a temporary to short-term cumulative effect when considered with other ongoing and future projects. However, in the short- to long-term timeframes, beneficial incremental reductions in sediment are expected which would not result in cumulative effects. Negligible temporary to short-term effects to temperature and LWD are expected which may result in a negligible temporary to short-term cumulative effect.

When Alternative 1 (no action) is combined with other reasonably foreseeable future actions, SWRA resource conditions and riparian functions and processes would be maintained at the current trend. The action alternatives would decommission (obliterate) roads within RCAs and would incrementally improve SWRA resource conditions and riparian functions and processes. It is expected that the incremental effect of all action alternatives in relation to other actions on both private and public lands is a temporary to short-term increase in RCA disturbance followed by a short- to long-term incremental improvement in fish habitat and RCA condition associated with decommissioning (obliteration) roads within RCAs and culvert removals/replacements.

3.6.4.4. Irreversible and Irretrievable Commitments

The Project is not expected to result in any irreversibly or irretrievable commitments of habitat for MIS, ESA-listed, or desired native fish species. ESA-listed bull trout are found in the East Fork Weiser River. The determination for all the action alternatives is *May Affect, Not Likely to Adversely Affect* bull trout and their habitat.

3.6.4.5. Forest Plan Consistency

All of the proposed alternatives meet Forest Plan Standards and Guidelines. Forest Plan consistency is documented in an activity table and in the Appendix B matrix tables located in the Project Record.

3.6.4.6. Project Record

This DEIS hereby incorporates by reference the fisheries specialist report in the project record (40 CFR 1502.21). The report is located in the Fisheries section of the project record and contains the data, methodologies, analysis, maps, references and technical documentation that the specialist relied upon to reach the conclusions in the DEIS.

3.7. Soils Resources

3.7.1. Analysis Scale, Data Sources and Methodology

3.7.1.1. Analysis Scale

3.7.1.1.1. Direct and Indirect Effects Analysis Area

The analysis area for both direct and indirect effects on soil resources are activity areas specific to each indicator being analyzed. The Forest Plan describes the activity area as "the smallest logical land area where the effect that is being analyzed or monitored is expected to occur." The Forest Plan further describes specific activity areas that are to be used for analysis of TSRC, DD, and CWD (USDA Forest Service 2003a, p. GL-1), all of which are within the Project area (Figure 1-1).

For the DD indicator, the activity areas are each of the individual treatment units (e.g., vegetation treatment units and prescribed fire units). The effects of the project on DD are confined to individual treatment units.

For the TSRC indicator, the activity area is the NFS lands excluding IRA and private lands within the analysis area. TSRC effects can occur across the entire Project area, both within and outside of individual treatment units.

For the CWD indicator, the activity areas are each of the individual treatment units. The effects of the project on CWD are confined to individual treatment units.

3.7.1.1.2. Cumulative Effects Analysis Area

The cumulative effects analysis area is the Project area as displayed in Figure 1-1.

3.7.1.1.3. Temporal Scale of Analysis

Time frames as defined in the Forest Plan were used for analysis of effects as follows: temporary (0–3 years), short term (3–15 years) and long term (15 or more years) (USDA Forest Service 2003a).

DD, such as compaction, displacement, soil puddling, and severely burned soils, could persist for up to 50 years without restorative actions. Soil compaction and displacement DD from secondary skid trail use could result in short- to long-term impacts with natural recovery taking 5 to 20 years (Arnup 1998, Dickerson 1976). The time period used to analyze trends of DD was 50 years.

TSRC is the conversion of a productive site to an essentially nonproductive site for a period of more than 50 years and persists without restorative actions. The time period used to analyze trends of TSRC was more than 50 years.

CWD levels are very dynamic and historically have varied by fire regime (Agee 2002). Proposed actions would either maintain or trend toward the desired range of CWD. Areas currently below desired CWD levels (e.g., a plantation) may not be able to meet the desired range over the temporary to short term, while an action that promotes larger size class trees or a prescribed fire that would consume CWD and create mortality that would become snags and future CWD could meet the desired range over the long term. Since it takes several

decades to develop large trees > 15 inches DBH or larger, which provide the most benefit for soil productivity, a time period of 80 years was used to analyze trends of CWD.

3.7.1.2. Data Sources and Methodology

The soil resources current condition was evaluated using the Forest soil disturbance pace transect field form and landslide field verification form. On the ground DD surveys were conducted in the Project during summer 2013 and 2015. Surveys were stratified by focusing on previously harvested units (using the Strata GIS layer) that were predominantly tractor harvested (using a slope DEM and Forest past harvest GIS layer) and within the dominant landtypes (using the Forest Landtype GIS layer) and PVG's (using the Forest PVG GIS layer) where mechanical vegetation treatments are proposed. A total of 75 geographically dispersed potential treatment units were surveyed on the ground in 2013 and 2015 for DD, TSRC, and to view levels of CWD, as well as to document vegetation type, productivity characteristics, and validate information from the Land System Inventory (LSI).

TSRC was evaluated using a set of assumptions aided by Forest GIS layers such as the road layer, trail layer, administrative area layer. Assumptions include road width and slope adjusted area (using the Forest Landtype GIS layer), landing size and frequency, and designated primary and constructed skid trail spacing.

The Project area was analyzed for mass stability hazards using the West Zone GIS layer map based on the landslide predictive model Stability Index Mapping (SINMAP) (Pack et al. 1998) with calibration parameters developed from the 1997 landslide inventory (Dixon and Wasniewski 1998).

Inventory methods and data sources are further described in Middle Fork Weiser River Detrimental Disturbance Surveys, 2013 (Thompson 2013) and the Soil Resource Technical Report, 2015 (Dixon 2015).

3.7.1.3. Analysis Indicators

Proposed Project actions could affect SWRA resources. The following issue statement will be used to compare alternatives and allow for tracking this potential through the associated indicators:

Proposed activities may decrease long-term soil productivity and impair soil-hydrologic function.

Indicators:

- Percent DD within activity areas (Forest Plan Standard SWST02).
- Percent TSRC across the Project area (Forest Plan Standard SWST03).
- Levels of CWD retained within activity areas for long-term soil productivity.

3.7.2. Desired Condition

The desired condition for the soil resource is as follows (USDA Forest Service 2003a, p. III-18):

- "Soil protective cover, soil organic matter, and coarse woody material are at levels that maintain or restore soil productivity and soil-hydrologic functions where conditions are at risk or degraded."
- "Soils also have adequate physical, biological, and chemical properties to support desired vegetation growth."
- "Management actions result in no long-term degradation of soil resource conditions."

Forest Plan standards require management activities that may affect soil productivity to meet the following requirements for DD and TSRC (USDA Forest Service 2003a, p. III-21):

- SWST02— "In an activity area, where existing conditions of detrimentally disturbed soil are below 15 percent of the area, management activities shall leave the area in a condition of 15 percent or less detrimental disturbance following completion of the activities. In an activity area where existing conditions of DD exceed 15 percent of the area, management activities shall include mitigation and restoration so that DD levels are moved back toward 15 percent or less following completion of the activities."
- SWST03—"In an activity area, where existing conditions of TSRC exceed 5 percent of the area, management activities shall include mitigation and restoration so that TSRC levels are moved back toward 5 percent or less following completion of the activities."

3.7.3. Affected Environment

3.7.3.1. Current Condition

The geology, topography, and geomorphic processes—which helped formed the soils in the analysis area— are described in "Geology of the Payette National Forest" (Lund 2004) and the "Soil-Hydrologic Reconnaissance Council Ranger District, Payette National Forest" (Larson et al. 1973). LSP lands were identified and evaluated using the SINMAP model. Imnaha Basalt (one of two members of the Columbia River Basalt group) dominates the area. These volcanic flows occurred sometime around 15 to 18 million years ago and were followed by the Grande Ronde Basalt flows. The next most extensive formation are rocks of the Idaho Batholith, which formed between 75 and 95 million years ago. This material has a generally higher erosion risk than the basalt rock and associated soils.

At the landscape scale, ecological units are defined by general topography, geomorphic process, surficial geology, associations of soil families, and potential natural communities, patterns, and local climates. These factors affect biotic distributions, hydrologic function, natural disturbance regimes, and general land use. Local landform patterns become apparent at this level in the hierarchy, and differences among units are usually obvious to on-the-ground observers. At this level, terrestrial features and processes may also have a strong influence on ecological characteristics of aquatic habitats. Landtype association ecological units represent this scale in the hierarchy. These are groupings of landtypes or subdivisions of subsections based on similarities in geomorphic process, geologic rock types, soil complexes, stream types, lakes, wetlands, subseries, or plant association vegetation

communities. Repeatable patterns of soil complexes and plant communities are useful in delineating map units at this level. Names of landtype associations are often derived from geomorphic history and vegetation community (Wendt et al. 1975, Cleland et al. 1997).

Landtypes (subdivisions of landtype associations) are based on similarities in soils, landform, rock type, geomorphic process, and plant associations. Land surface forms that influence hydrologic function (e.g., drainage density, dissection, and relief) are often used to delineate different landtypes in mountainous terrain. Valley bottom characteristics (e.g., confinement) are commonly used in establishing riparian landtype map units (Cleland et al. 1997). This local level of mapping is described in the Soil-Hydrologic Reconnaissance for the Council Ranger District (Larson et al. 1973) and was field verified for the analysis area in the Soils Field Report, located in the project record (Thompson 2014). See Figure 3-69 for a map of landtypes within the analysis area.

Landtype associations included in the analysis area include Depositional Lands, Volcanic Glacial Trough Lands, Cryoplanated Volcanic Lands, Cryoplanated Granitic Lands, Fluvial Lands, Steep Granitic Mountain Slopes, and Structurally Controlled Lands (Plateaus and Escarpments). A description of each landtype association follows.

A list of LSI map units within the analysis area follows in Table 3-104. Descriptions of these landtypes can be found in the LSI.

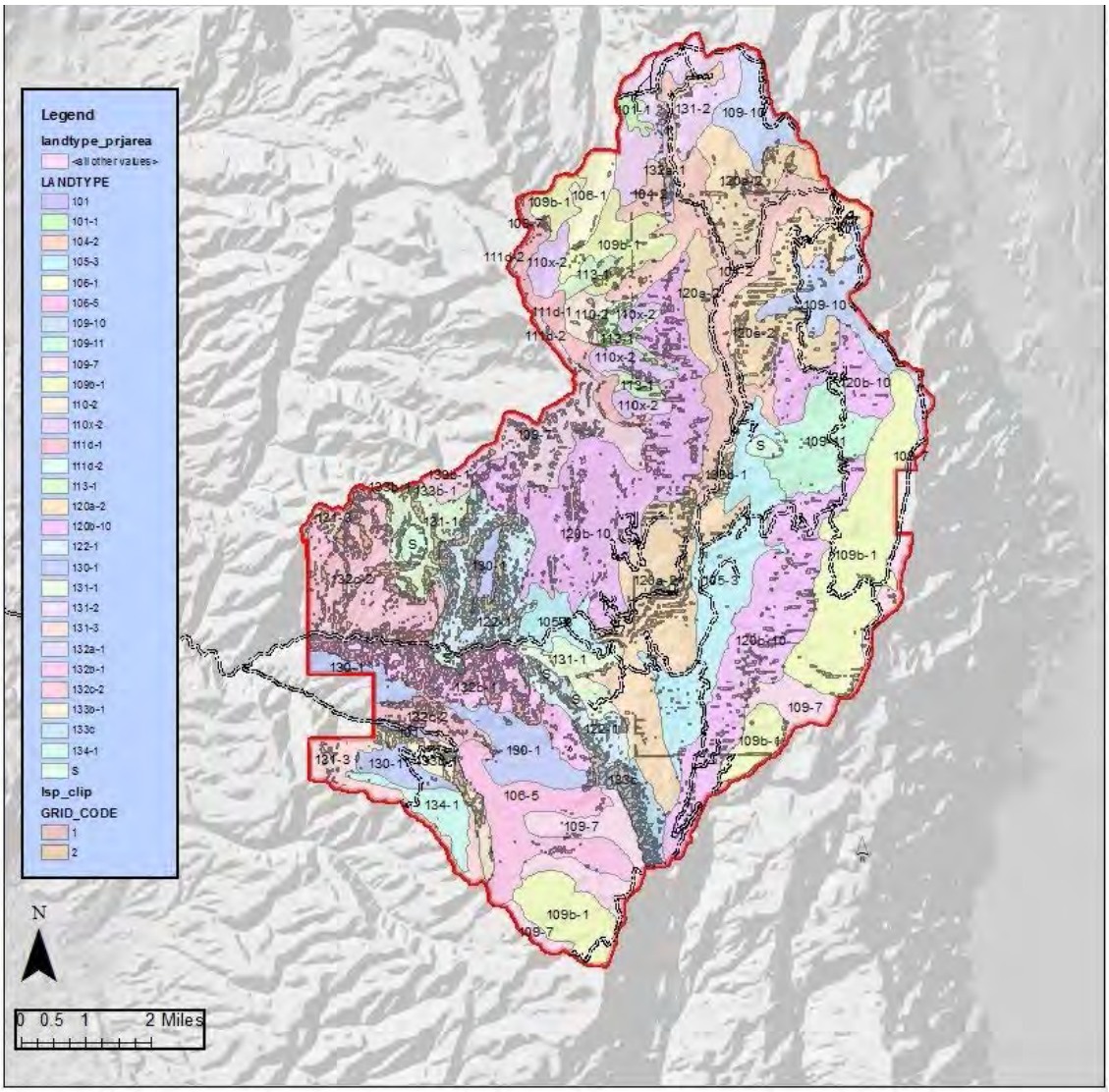


Figure 3-69. Analysis area landtypes

Depositional Lands

This landtype association (landtypes 101, 101-1, 104-2, 105-3, 106-1, and 106-5 in the analysis area) is characterized by the nearly level to gently sloping alluvial and toe slope lands that are commonly adjacent to or near water. Within the analysis area, these are along or near the Middle Fork of Weiser River, Mica Creek, and No Business Canyon. Soils are dominantly deep, with standing water and high water tables common, especially during snowmelt. These more gently sloping lands provide an important buffer to soil erosion and sediment production from the steeper surrounding uplands. The primary management concern associated with these landtypes are their close proximity to streams and the compaction and trafficability concerns related to fine textured soils and high water tables.

Cryoplanated Volcanic Lands

This landtype association (landtype 109-7 and 109b-1 in the analysis area) generally occurs in the higher elevations adjacent to glaciated areas. Lands are characterized by generally gentler slopes, weak drainage dissection, and highly fractured bedrock (which allows for high

rates of percolation). Inherent erosion hazards are generally low. Higher elevations and short growing seasons reduce timber and vegetation production. In some locations these lands have been overgrazed in the past and are slow to recover.

Cryoplanated Granitic Lands

This landtype association (landtype 109-10 and 109-11 in the analysis area) generally occurs in the higher elevations and formed adjacent to glaciated areas; see the description of Cryoplanated Volcanic Lands above; the only difference is the parent material—in this case intrusive, plutonic vs. extrusive, volcanic rock.

Fluvial Lands

This landtype association (landtypes 120a-2, 120-b10, and 122-1 in the analysis area) is essentially unglaciated and has definite drainage patterns resulting from the erosive force of running water. Although the fluvial action of stream cutting is the dominant geomorphic process, mass wasting, faulting, and uplift have also contributed to the current geomorphology. The primary management concern is risk for natural slides and slumps and failure of cut and fill slopes on constructed roads.

Structurally Controlled Lands (Plateaus and Escarpments)

This landtype association (landtypes 130-1, 131-1, 131-2, 131-3, 132a-1, 132b-1, 132c-2, 133b-1, 133c, and 134-1 in the analysis area) is characterized by relatively stable lands that have formed as the direct result of the geologic structure of basalt flows that originally produced relatively flat lands. This post-basalt-flow landscape has subsequently been tilted, uplifted, and eroded over time producing landforms (landtypes) that consist of moderately to steeply sloping dip slopes, scarp slopes, and escarpments. The primary management concerns associated with these landtypes are risks for natural slides and slumps and failure of cut and fill slopes on constructed roads.

Table 3-104. Landtypes in the analysis area

Map Unit Symbol	Map unit name
101	Alluvial land—undifferentiated soils
101-1	Alluvial land—deep fine loamy over sandy skeletal soils
104-2	Valley train land—deep loamy skeletal soils
105-3	Alluvial fan land—deep loamy skeletal and fine loamy soils
106-1	Moraine land undifferentiated—deep sandy and loamy skeletal soils
106-5	Benchy moraine land—deep sandy skeletal and loamy soils
109-7	Cryoplanated ridge land—moderately deep loamy skeletal and fine loamy soils
109-10	Cryoplanated ridge land—moderately deep loamy skeletal soils
109-11	Cryoplanated uplands—moderately deep loamy skeletal soils
109b-1	Moderately dissected cryoplanated mountain slopes—moderately deep loamy skeletal
110-2	Cirque basin land—moderately deep fine loamy and loamy skeletal soils
110x-2	Scoured cirque basin land—moderately deep and shallow loamy skeletal soils
111d-1	Steep benchy glacial headlands—moderately deep and shallow fine loamy soils
111d-2	Steep glacial headlands—moderately deep fine loamy soils
113-1	Rocky ridge land—moderately deep and shallow loamy skeletal soils
120a-2	Weakly dissected mountain slope land—moderately deep and deep loamy skeletal soils
120b-10	Moderately dissected mountain slope land—moderately deep and deep loamy skeletal soils
122-1	Rocky oversteepened canyon land—shallow and moderately deep skeletal, sandy and loamy soils
130-1	Plateau land—shallow and moderately deep loamy skeletal xeric soils
131-1	Dissected dip slope land—shallow loamy skeletal soils
131-2	Dissected dip slope land—moderately deep loamy skeletal cryic soils
131-3	Dissected dip slope land—shallow and moderately deep loamy skeletal and fine loamyxeric soils
132a-1	Weakly dissected escarpments—shallow and moderately deep loamy and loamy skeletal soils
132b-1	Moderately dissected escarpments—moderately deep and shallow loamy skeletal soils
132c-2	Strongly dissected escarpments—shallow and moderately deep loamy skeletal soils
133b-1	Moderately dissected scarp slopes—moderately deep and deep loamy skeletal soils
133c	Strongly dissected scarp slopes—moderately deep and deep loamy skeletal and coarse loamy soils
134-1	Benchy plateau slopes—moderately deep and shallow fine and loamy skeletal soils
S	Slump

3.7.3.1.1. Soil Interpretations

Soil interpretations are used by managers to predict the effect of management activities on the soil resource, and are listed in *Soil-Hydrologic Reconnaissance Council Ranger District*. Soil profile descriptions provide the information necessary to make good soil interpretations. Table 3-105 displays the soil interpretations for the selected landtypes of the analysis area.

Table 3-105. Soil interpretations for selected landtypes

Landtypes from LSI	Acres	Slope %	Soil Depth	Erosion Hazard Rating	Mass Failure Rating	Trafficability[a]
101-1	114	2-10	30-60	Mod low	Low	Good-poor
106-1	427	5-30	40-70	Mod low-mod	Mod low	Fair-poor
106-5	1,569	5-30	40-70	Mod low-mod	Mod high	Fair-poor
109-10	1,774	10-70	20-40+	Mod high	Moderate	Good-fair
109-11	1,129	5-30	20-50	Mod low-mod	Low	Fair-poor
109b-1	4,911	20-60	20-40	Mod-mod high	Mod low	Good-poor
120a-2	6,064	20-60	20-60+	Mod-mod high	Moderate	Good-poor
120b-10	8,101	20-50	20-60+	Mod-mod high	Moderate	Good-poor
122-1	2,099	50-80	<20	High	Moderate	Fair
130-1	1,743	10-25	<20-60	Mod low	Mod low	Fair
131-1	1,318	5-40	<20-50	Mod low	Low	Fair
131-2	1,387	10-40	<20-40	Moderate	Mod low	Good-poor

[a]Trafficability is the ability of a wet unsurfaced soil material to support vehicle wheel loads without rutting.

The current condition of the soil resource has been influenced by both natural processes (e.g., climatic events, floods, drought, wind, fire, etc.) and human-related disturbances (e.g., roading, grazing, timber harvest, recreation, power line development). Natural processes have been, and continue to be, the foundation of soil formation while human related disturbances have effects on soil productivity and soil hydrologic function. Management activities create various degrees of soil disturbance that can alter natural soil characteristics, resulting in the immediate and/or prolonged degradation of onsite resources or vegetation productivity. The indicators of current soil condition that will be used in the effects analysis are DD, TSRC, and CWD. All of these indicators can be affected by timber harvest, reforestation activities, and prescribed fire, as well as by the presence of roads, power lines, gravel pits, administrative sites, landings, skid trails, and firelines associated with these actions.

Detrimental Soil Disturbances

According to the Forest Plan, “Detrimental soil disturbance is the alteration of natural soil characteristics that results in immediate or prolonged loss of soil productivity and soil-hydrologic conditions” (Forest Plan page GL-10). DD are those effects on the soil resource that cause soils to be compacted, displaced, severely burned, or puddled to an extent that the disturbance meets the criteria (Forest Plan page GL-10) to be detrimental to long-term soil productivity. At least 85% of an activity area should be in a nondetrimentally disturbed condition. The Forest Plan requires DD to be below and remain below 15% within activity areas unless current conditions for DD are already above 15%. In cases where the current condition is above 15%, management activities are required to move DD toward or below 15% within those activity areas.

Detrimentally disturbed soils are often scattered throughout areas of past management and are not always readily visible. Commercial timber harvest, specifically using heavy equipment to yard logs across the ground, compacts and disturbs surface soils. Detrimental disturbances can last for decades but, normally, DD successfully recovers from a detrimental condition through natural processes (e.g., freeze/thaw processes, wet/dry cycles, root penetration, rodent burrowing, etc.) over a period of 50 years or less. Recovery of soils from compaction due to harvesting operations to preharvest conditions can take 5 to 10 years for well-drained clay soils, and 10 to 20 years for poorly drained clay soils (Arnup 1998). Coarse

textured soils like those derived from granitic parent material are less susceptible to compaction compared to finer textured soils derived from basalt. Dickerson (1976) estimated that recovery of wheel-rutted soils and log-disturbed soils would take about 10 years following whole tree yarding on silty clay loam soils.

On the ground, DD surveys were conducted in the Project area in summer 2013 and 2015. Surveys were stratified by focusing on previously harvested units that were predominantly tractor harvested and within the dominant landtypes and PVG's proposed for mechanical vegetation treatments. Of the 75 units surveyed, 61 had visible signs that they had been previously harvested. Detrimental soil disturbances were primarily from soil displacement, while soil compaction was rarely observed, and severely burned and puddled soils were not observed. Existing DD ranged from 0 to 17% and was largely 5% or less (Table 3-106). Recent salvage logging and past soil disturbance, which primarily associated slash piling with a dozer equipped with a brush blade, is the cause for two units having DD greater than 11%.

Table 3-106. Soil field survey units and percent detrimental disturbance (DD)

Percent DD	Surveyed Units (%)
0–5%	67 (89.3)
6–10%	6 (8.0)
11–15%	1 (1.3)
>16%	1 (1.3)

For the most part, the soils of the planning area are productive and suitable for timber harvest. Previous harvest activities did not result in excessive erosion, loss of effective ground cover, or slope instability that could have affected the long-term viability of the soils to support productive healthy forests. However, prior harvest with ground based equipment has resulted in residual soil displacement in many units. The adverse effects and extent of DD are within the Forest LRMP Standards and Guidelines of 15% with the exception of one unit.

Total Soil Resource Commitment

TSRC is the conversion of a productive site to an essentially nonproductive site for a period of more than 50 years (USDA Forest Service 2003). TSRC is an effect on the soil that produces conditions that are more visible, longer lasting, and generally results in greater reductions in soil productivity than DD. Examples of TSRC within the Middle Fork Weiser River analysis area include roads, landings, designated or constructed skid trails, gravel pits, recreational trails, developed camp grounds, and administrative facilities. Productivity on these areas ranges from 0 to 40% of natural (USDA Forest Service 2003). These effects do not completely recover through natural processes but soil productivity and hydrologic function can be recovered with the implementation of physical treatments, such as road obliteration.

The existing amount of TSRC within the 28,784-acre activity area that includes only NFS lands within the Project area is 3.1%. The greatest area of TSRC is associated with roads, which includes the total width of the road prism from the top of the cut slope to the bottom of the fill slope, followed by past harvest-related impacts from primary skid trails and landings. Table 3-107 displays the TSRC source, associated acres, and percent contribution to total

TSRC within the analysis area. The existing condition of 3.1% meets Forest Plan Standard SWST03.

Table 3-107. Source and extent of total soil resource commitment (TSRC) on National Forest System Lands within the activity area

TSRC Source	Estimated Acres	Percent of Analysis Area
Roads	459	1.6
Past harvest related	376	1.3
Recreation (campgrounds, dispersed sites)	40	0.1
Trails	6	0.02
Gravel pits	4	0.01
Total	885	3.1

Coarse Woody Debris

CWD is defined as "Pieces of woody material having a diameter of at least 3 inches and a length greater than 6 feet" (USDA Forest Service 2003a, p. GL-6). As CWD becomes incorporated into the soil, it contributes to long-term soil productivity by providing micro sites for moisture retention and microbial activity. The current condition of CWD within individual activity areas has not been quantified. Through site visits and observations, it is apparent that CWD amounts within activity areas are highly variable, depending both on past management activities and natural events; some areas have desired amounts while others do not. Areas most lacking in CWD are plantations. These were previously treated by clear cutting, piling and/or burning residual material, and replanting, resulting in even-aged stands with little or no coarse wood on the ground. There may also be areas within the Grays Creek Fire perimeter that burned with moderate to high intensity, resulting in the consumption of existing CWD and the creation of a "gap" in the future supply as fire-killed trees fall and the next oldest age class (post-fire seedlings) come to maturity.

The amount and size of CWD that should remain on the ground within activity areas following the completion of all proposed activities is determined by the PVG and is outlined in Appendix A of the Forest Plan (USDA Forest Service 2003a, Table A-9, p. A-9). The desired ranges of CWD tonnages and percent large CWD for PVGs identified in Table A-9 are minimums and identify the portion of the tonnage (as a percentage) that should remain in the larger size class (greater than 15 inches). The dominant PVGs represented within treatment areas (harvest, biomass, and burn units) include PVGs 2, 5, and 6. The desired range of total tonnage for these PVGs is from 4 to 14 tons, with varying desired percentages of tonnage for the larger size class (greater than 15 inches) material from greater than 65% for PVG 6 to greater than 75% for PVGs 2 and 5.

Current levels of CWD were estimated during 2015 field surveys in 35 units that had been either clearcut or partial cut harvest. Of the 14 clearcut units, 13 were estimated to be outside the desired range of CWD. Of the 21 partial cut units, 12 were estimated to be within or above the desired range of CWD.

Landslide Prone

Mass movements, or landslides, occur when earthen materials become unstable and slide downslope. These mass failures typically occur on steep, concave slopes, oversteepened upper stream banks, and headland areas where surface and subsurface water tends to concentrate, saturating these areas of deeper soil accumulation. Landslide events are most likely to occur after intense storms or during periods of rapid snowmelt and often cause

debris slides/torrents and severe gully erosion. Debris slides and torrents contribute sediment to stream channels and can change channel geomorphology, but also provide benefits to aquatic habitats through introduction of LWD and coarse substrate. Trees, rocks, and soil material are either deposited directly into streams or the finer particles may eventually reach main channels when tributary drainages flow water.

To avoid or prevent landslides, it is important to understand the primary factors that regulate slope stability (i.e., soil moisture, root strength, and slope gradient) and what disturbances (management-related or natural) have a greater potential to initiate landslides. Man-caused disturbances, such as road construction and, to a lesser extent, timber harvest, can increase the potential for and occurrence of landslides. Megahan et al. 1989, looked at management induced landslides and found that roads account for 58% of landslides, while forest vegetation removal accounts for only 9% . A "Summary of Landslide Inventory on the Westside of the Payette National Forest from the New Year 1997 Storm" (Dixon and Wasniewski 1988) looked at natural and management induced landslides. Of the 483 landslides that were identified within the 294 square mile inventory area, 15% were influenced by management activities such as roading and timber harvest. Eighty five percent of the landslides occurred in grass and brush vegetation types while only 15% occurred in timber. The majority of the inventoried area was on basalt geology. Landslide occurrence was influenced by the geologic contact zone between the Grand Ronde basalt and the Imnaha basalt on steep side slopes greater than 60% having a concave shape where water would concentrate.

The Project area was analyzed for mass stability hazards using the West Zone GIS layer map based on the landslide predictive model SINMAP (Pack et al. 1998) with calibration parameters developed from the 1997 landslide inventory (Dixon and Wasniewski 1998). Characterization and analysis of hydrologic processes and vegetation characteristics within the LSP areas (as delineated by SINMAP) identify the factors controlling slope stability and prioritize locations for field verification to validate if proposed activities have the potential to modify landslide processes. The model does not address the potential for large geologic structural failures. The 1997 landslide inventory identified nine landslides within the Project area, all were naturally caused and within grass and brush vegetation types (Dixon and Wasniewski 1998). Eight of the nine were centrally located within the Sheep Creek drainage and one within lower Fall Creek drainage.

Approximately 1,053 acres (3%) of the Project area has been identified with high to moderate LSP for shallow debris slides (Figure 3-70). Past timber harvest has occurred on 300 of these acres. During soils field surveys, seven potential harvest units having high to moderate LSP were evaluated using the LSP field verification form. None of the units had active landslides or exhibited LSP characteristics. During this field review, no other landslides were identified that could be attributed to past timber harvest activities. Evidence of past geologic structural failures were observed in several units inventoried during DD surveys as evidenced by a number of old slumps and are discussed below.

Of 1,053 acres identified with high to moderate potential for shallow debris slides, approximately 616 acres are proposed for vegetative treatments that would remove trees or fuel treatment that could result in tree mortality and effect slope stability. Concentrations of high to moderate landslide potential occur within the southwest portion of the analysis area along a prominent ridge running north–northwest from Indian Mountain, the north aspect along lower Weiser River, and in the Warms Springs Creek drainage. These areas have not been ground-truthed, but where LSP areas are modeled as having a high to moderate hazard

and falling within the boundaries of proposed vegetation treatment units, methods for avoidance and prevention of landslides may include but are not limited to (USDA 2004):

- Limited Practices—(In moderate hazard areas with low to moderate risk) Management actions are designed with review and guidance from appropriate resource specialists. Limited practices may include, but are not limited to, reducing yield or basal area, removal of forested vegetation, increased rotation lengths, and selective harvest with full or one end log suspension yarding.
- Restricted Practices—(In high or moderate hazard areas with high relative risk) Management actions are severely restricted or eliminated so as to minimize initiation of landslides and effects to other resources.

High or moderate LSP areas will be visited by a specialist trained in field identification of slope stability to determine the landslide potential and prescribe practices for the avoidance and prevention of landslides. Project design features to reduce the landslide risk are included as part of the action alternatives (see Chapter 2 of this DEIS).

Geologic structural failures are larger movements of cohesive materials that overlay hard bedrock. These types of landslides are considered to be historic slumps that were caused by slippage and faulting near the contact zone between different geologies. Although structural failures have been identified within the Project area, evidenced by old scarp and slump terrain, these features are currently stable and not active with the exception of the Cabin Creek slide. This landslide is a deep seated slump, with deposits ¾ of a mile long, approximately 750 feet wide, and potentially 20 to 30 feet thick. It existed prior to road building and has had subsequent smaller movements within the last 200 years and in 2011 when it covered NFS road 591 (GSH Geotechnical Report 2015).

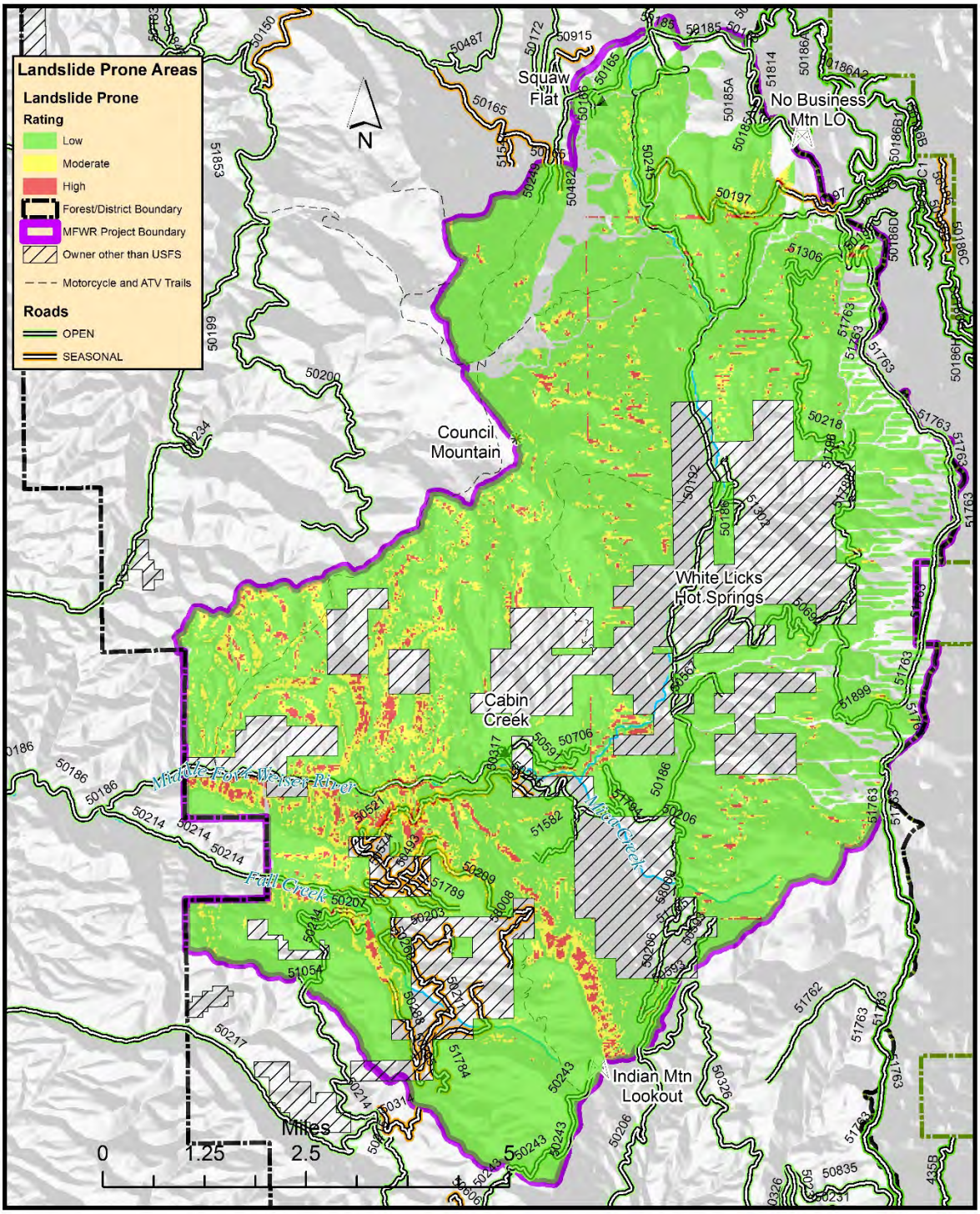


Figure 3-70. High, moderate and low landslide potential within the Project area

3.7.4. Environmental Effects

3.7.4.1. Direct and Indirect Effects

3.7.4.1.1. Detrimental Disturbance

Vegetation treatments proposed in Alternatives 2, 3, and 4 could result in soil disturbance from the use of mechanized equipment. DD would occur with operation of ground-based heavy equipment and cable yarding equipment for tree removal and thinning, primarily in areas where logging equipment traffic is concentrated or in corridors where logs are cable yarded. Log retrieval systems differ substantially in their immediate effect on soils, with tractor skidding causing the greatest area of soil disturbance within harvest units followed by jammer logging and lastly cable. Soil disturbance impacts, such as primary designated skid trails which include constructed skid trails, log landings, and temporary roads, are considered TSRC and have been evaluated in another section of this report. Detrimental soil disturbance on secondary skid trails, skyline, and cable corridors will be discussed in the following paragraphs.

For logging under "summer conditions," tractor skid trails, which are flagged on the ground prior to the start of logging operations, would typically be located in a parallel pattern in a harvest unit. Skid trail spacing of 200 feet or greater for primary or constructed skid trails is required except where converging at the log landings. Skid trail spacing of 100 feet or greater for secondary lateral trails which branch off of primary skid trails is required. These skid trails would typically receive 3 to 5 passes by machinery and could contribute to an increase in DD (Froehlich et al. 1983).

For example, with an average skid trail spacing of approximately 150 feet apart, skid trails would affect about 7% of the activity area in a tractor harvest unit (Froehlich eta al. 1981). Of this 7%, it is assumed that approximately 2.4% of these skid trails could be primary designated skid trails or constructed skid trails, spaced at 200 feet or greater, and would be considered TSRC effects and not DD. The remaining 4.6% of secondary skid trails could contribute to DD. In units that have been previously managed, a requirement to reuse the existing skid trails where available should minimize DD. For logging under "winter conditions," the amount of area impacted by log skidding would be less and is estimated to be about 3% of the activity area. Soil compaction and displacement DD from secondary skid trail use could result in short to long-term impacts with natural recovery taking 5 to 20 years (Arnup 1998, Dickerson 1976).

Detrimental soil disturbance would occur within jammer and cable yarding and skyline corridors, where the logs drag on the ground or are partially suspended while being pulled up the hill by the cable system. As with tractor skid trails, jammer and cable yarding corridors would generally be located in a parallel pattern in a harvest unit and spaced about 100 feet apart. With an average width of soil disturbance at 4 feet, jammer and cable yarding corridors could affect about 3.7% of the activity area. Skyline cable yarding disturbance would result in even less DD since the log is mostly suspended and could result in an approximate 2.0% increase in DD within an activity area (Allen 1999). In the short to long term, soils affected by detrimental disturbance would partially recover through natural processes, such as frost heave, bio-perturbation, and nutrient cycling. However, recovery of soils to predisturbance conditions could take up to 20 years.

In all activity areas, regardless of whether existing levels of DD are above 15% or not, site-specific project design features, mitigation measures, and best management practices

(BMPs) have been developed and will be implemented (Chapter 2) to reduce the potential for any additional amounts of DD to be produced. The measures stipulate the soil moisture requirements for prescribed burning and the use of heavy equipment; the slopes that heavy equipment can operate on; and the requirement that heavy equipment (other than feller buncher and excavator operations) remain on designated skidtrails except when soils are frozen and snow covered. Applying these measures should keep DD at existing levels on these units. Feller bunchers and excavators whose operations require very minimal passes over the ground (most often just a single pass) may operate off of designated skidtrails, but only under the winter conditions as described above or when soil moistures are below 20% and on slopes under 35%. Limited use of tractors, feller-bunchers and excavators on slopes between 35% and 45% may be allowed with approval of a Forest Service Soil Scientist.

All skidtrails and landings are to be designated for activity areas and all skidtrails and landings using with this proposal, as well as any compacted or displaced soil from previous harvest activities in units where existing DD is greater than 15%, will be rehabilitated to restore long-term soil productivity. The use and obliteration of existing skidtrails/landings and the restoration of productivity on compacted and displaced soils adjacent to new and existing skidtrails and landings within all tractor units will reduce the DD below current levels, meeting the Forest Plan standard.

Activity areas previously harvested using ground based tractor, cable, or skyline methods mostly have low percentages of existing DD (Table 3-106), predominantly below 5%. With the implementation of the following site-specific project design requirements, mitigation measures, and BMPs—and the rehabilitation of existing areas of DD—all activity areas within the Middle Fork Weiser Project area will meet the Forest Plan standard for DD for Alternatives 2, 3, and 4:

- Use all applicable BMPs and soil water conservation practices (SWCPs) for harvest and road activities (see Chapter 2, Mitigation Table and Project Design Features).
- Reuse existing well-located skid trails and landings and reclaim following the completion of harvest activities.
- The Forest Service will determine when the soils are too wet to operate. Approval of ground based equipment operations (including feller-bunchers and excavators) will only be considered when unacceptable soil rutting, displacement or compaction will not occur and: 1) soil moisture is below 20% (determined when soil is dry to the touch and does not form a ball when pressure is applied by hand) <u>OR</u> 2) when soil is frozen and snow covered.
- Tractor skidding and use of feller-bunchers and excavators is allowed on slopes up to 35%. Limited use of tractors, feller-bunchers, and excavators on slopes between 35% and 45% may be allowed with approval of a Forest Service Soil Scientist.
- All skid trails would be designated and preapproved by the Timber Sale Administrator and logs would be winched to the designated skidtrails. Primary or constructed skidtrails would be spaced at a maximum distance (200 feet or greater) and nonconstructed skid trails would be spaced on average at least 100 feet with consideration given to terrain and RCA location.
- Heavy equipment including off road jammers, skidding tractors, loaders, and processors must be kept on designated skidtrails at all times except in the following situations:

  - When the ground is snow covered or frozen sufficiently so that soils will not be adversely impacted by heavy equipment use. The Forest Service will determine when these conditions exist.
  - In areas with 35% or less slope where trees are being felled with a feller buncher and hand felling is required for oversize trees, skidding tractors will be allowed off of designated trails to skid these oversize trees (when soil moisture levels are below 20%). Where soil impacts from this skidding warrants, trail rehabilitation will be required

- On steep slopes, use cable, skyline, or helicopter harvest systems and limit equipment operations to roads (temporary or permanent) and landings.
- Reclaim disturbed skyline/cable corridors by pulling soil berms back to original configuration and scattering slash (as available) on all areas of soil disturbance to provide for minimum 50% and maximum of 80% effective cover.
- Reclaim all detrimentally disturbed and totally committed skid trails and landing areas immediately following harvest. Take advantage of all opportunities to reclaim soil disturbances (compaction, displacement, etc.) from past management activities—a net reduction in detrimental soil disturbance is required in harvest units 2101 and 2203 and any units not previously inventoried. Reclamation would include: sub-soiling to a depth of 16 inches (or depth of compaction) to ameliorate compaction; recontouring to the natural slope profile; replacing topsoil (if needed and as possible); scattering of organic matter to provide a minimum of 50% and maximum of 80% effective ground cover; seeding with native seed (where preexisting roads or landings are reused and then obliterated); and mulching to facilitate vegetation recovery where slash is not available.
- Reuse existing well located skid trails and landings (as determined by a Soil Scientist or Hydrologist) and reclaim (as described above) following the completion of harvest activities.
- In areas where DD is above 15%, prescribed burning must be low severity and soil moistures should be above 20% when burning.
- Reclaim all fireline following burn activities. Reclamation activities would include, but are not limited to, pulling all material removed for fireline construction back onto fireline (including mineral soil as available), pulling available slash onto the surface to achieve a minimum 50% ground cover of the disturbed soil, and constructing waterbars as necessary.

Broadcast burning and prescribed fire would be implemented to reduce existing natural fuel loads as well as harvest-related and NCT generated slash. The prescription for these treatments is to burn during the spring or fall seasons when higher fuel and soil moistures and atmospheric conditions contribute to low-to-moderate fire intensities with low soil burn severity, resulting in minimal impacts to soil quality (Parsons et al. 2010, Busse et al. 2014). Fuels treatment and prescribed fire would not result in severely burned soils and there would be no additional DD. All constructed fire line would be rehabilitated immediately after burning and would not add to DD.

Vegetation management prescriptions for hand thinning would be accomplished by crews using chainsaws or other hand tools. Access into the hand treatment units would be via

walking into the area and hand-carrying tools to the site. Hand thinning would not result in detrimental soil disturbance.

3.7.4.1.2. Total Soil Resource Commitment

Alternative 1 (No Action)

Under the No Action Alternative, none of the Proposed Action activities would be implemented and there would be no change in the current status of TSRC conditions on NFS lands. The existing TSRC of 3.1% would continue to meet the Forest Plan standard of less than 5% of the activity area.

Alternatives 2 and 4

Management activities would return 207 acres to productivity through the obliteration of 78 miles of road resulting in a 0.7% reduction in TSRC within the analysis area. New TSRC from the construction of landings, temporary roads, and primary skidtrails associated with vegetation treatment activities would result in a short-term increase and would be rehabilitated following their use resulting in no net gain in TSRC in the long term. Additional reduction in TSRC would be realized when existing skidtrails and landings from past harvest entries are reused and then returned to productivity through obliteration. New permanent road construction totaling 21.5 acres and new recreation trail construction totaling 10.1 acres would result in a 0.1% increase in TSRC within the analysis area. The Forest Plan standard threshold of 5% for TSRC would be met as TSRC is reduced by at least 207 acres, from 3.1% to 2.3 % of the activity area, Table 3-108.

Table 3-108. Total soil resource commitment (TSRC) projected by alternative

Alternative	Percent TSRC Restored (road obliteration) (%)	Percent TSRC from roads and trails (%)	Percent TSRC from past harvest (%)	Total percent TSRC (%)
1 (No Action)	0	1.6	1.3	3.1
2	0.7	1.0	1.3 (would improve slightly)	2.3
3	0.8	0.8	1.3 (would improve slightly)	2.1
4	0.7	1.0	1.3 (would improve slightly)	2.3

Alternative 3

Management activities would return 229 acres to productivity through the obliteration of 86 miles of road resulting in a 0.8% reduction in TSRC within the analysis area. New TSRC from the construction of landings, temporary roads, and primary skidtrails associated with vegetation treatment activities would result in a short-term increase and would be rehabilitated following their use resulting in no net gain in TSRC in the long term. Additional reduction in TSRC would be realized when skidtrails and landings from past harvest entries are reused and then returned to productivity through obliteration. No new permanent road construction is proposed and new recreation trail construction totaling 1.7 acres would result in a 0.01% increase in TSRC within the analysis area. The Forest Plan standard threshold of 5% for TSRC would be met as TSRC is reduced by at least 229 acres, from 3.1% to 2.1 % of the activity area (Table 3-108).

3.7.4.1.3. Coarse Woody Debris

Alternative 1 (No Action)

With the implementation of this alternative, CWD would remain at existing levels for the short term. Existing CWD levels vary, with some areas meeting desired amounts and sizes and others lacking in desired tonnage and/or size depending on past management activities and the natural processes (e.g. fire, windthrow, mortality) that have occurred. Additional changes to the amount of CWD would occur through time as natural processes add to and/or remove CWD from activity areas. CWD would trend toward the desired conditions in the Forest Plan.

Alternatives 2, 3, and 4

Removing biomass through thinning vegetation treatments and prescribed burning can potentially leave insufficient CWD organic material for future nutrient cycling. Researchers have recommended optimum amounts of coarse woody material to remain following vegetation management activities to sustain nutrient cycling and maintain long-term site productivity (Graham et al. 1994; Brown et al. 2003).

The desired condition for CWD would be met in these alternatives as CWD would be produced or retained at levels that meet desired conditions (where desired amounts and sizes are available) or trend toward desired conditions (where desired amounts and/or sizes are lacking).

Mitigation measures have been developed requiring the retention of CWD in desired amounts and sizes (or trending towards desired amounts and sizes) for all harvest units and prescribed burning units. These mitigation measures will ensure the desired amounts and sizes of CWD (or trends toward desired amounts and sizes) are immediately supplied to all activity areas. With the implementation of these alternatives, CWD would be retained at, or move toward, the desired levels for PVG's within activity areas.

In all activity areas, the retention of CWD (6-foot minimum lengths) will be as evenly distributed as possible in the tonnages and diameters described below. Total tonnage is measured following the completion of all activities and must retain the percentages of the large size class CWD (greater than 15 inches DBH) identified in Table 3-109 (USDA Forest Service 2003a). When developing burn prescriptions, ensure that CWD (in desired amounts and sizes) is retained at the desired condition. If CWD is presently below the desired condition, ensure it is maintained at existing levels or moved toward the desired condition.

Table 3-109. Desired range of coarse woody debris, in tons per acre, and desired amounts in large classes for Potential Vegetation Groups (PVGs)

Indicator	PVG 1	PVG 2	PVG 3	PVG 4	PVG 5	PVG 6	PVG 7	PVG 8	PVG 9	PVG10	PVG11
Dry weight (tons per acre in decay classes I and II	3–10	4–14	4–14	4–14	4–14	4–14	5–19	5–19	5–19	5–19	4–14
Distribution >15 inches	>75%	>75%	>65%	>65%	>75%	>65%	>50%	>25%	>25%	>25%	>25%

Note: The recommended distribution is to try to provide coarse wood in the largest size classes, preferably over 15 inches in DBH, which provide the most benefit for both wildlife and soil productivity. This table is not meant to provide an even distribution of coarse wood across every acre of the forested landscape, but to provide numbers that serve as a guide to approximate an average condition for an activity area.

These alternatives propose harvest of mature plantations on approximately 1,100 acres. Due to the homogeneity of these units as a result of past management, special consideration should be given to levels of CWD. Minimum tonnages for the appropriate PVG should be retained for all thinned mature plantation units, and while the large size class may not be available, a variety of sizes should be left on the ground, with 65-75% of the retained tonnages falling in the “large” size class for the particular plantation, which will be based on the average diameter for the stand.

The Forest Plan desired conditions for CWD for all activity areas within the Project area would be met or improved upon with the implementation of these mitigation measures in Alternatives 2, 3 and 4.

3.7.4.2. Cumulative effects

Cumulative effects for the soil resource include all past, present, and foreseeable future actions that will cause DD, TSRC, and CWD effects within the activity areas for the Project. The activity areas for the analysis of cumulative effects for DD, TSRC, and CWD are identical to the activity areas for the same indicators contained in the Direct and Indirect Effects section because these indicators do not affect, and are not affected by, soil productivity outside of those areas.

The effects of past management actions on DD, TSRC, and CWD within the corresponding activity areas are included in the Current Condition section. The effects of present management actions are included in the Direct and Indirect Effects section.

The reasonably foreseeable effects of future actions on DD, TSRC, and CWD in the activity areas, in combination with past and present effects, are discussed in this section. The reasonably foreseeable effects that were considered for the analysis of DD, TSRC, and CWD are those contained in the Cumulative Effects Appendix of the EIS.

The only reasonably foreseeable future action likely to have the potential for cumulative effects on the soil resource within the activity areas as defined above is the continuation of the temporary opening of currently closed system roads for firewood access. This has been occurring on an annual basis on the West Zone of the Payette for the past two years, and is proposed to continue. Members of the public submit currently closed system roads to be considered for a six to eight week opening during the permitted firewood season. Roads are evaluated by the Zone IDT and approved or denied. This allows for additional firewood access on a temporary basis. Cumulative effects on DD and TSRC where these road corridors might intersect activity areas proposed for the Project would be minimal, if they occur at all.

Access on these roads occurs during the driest time of the year (July–August), and the potential for soil disturbance would be limited to vehicles that illegally left the existing road prism, or firewood cutters who illegally skidded logs instead of hand cutting, bucking, and piling.

The cumulative effects on CWD within activity areas proposed for this project would be variable. Firewood cutting would increase in corridors along roads for the time the roads were open and would result in lower amounts of CWD—especially in the greater than 15-inch category—as downed logs and standing material that would become CWD is used for firewood. However, given the limited number of roads open for this program each season, and the limited time period for access, the reduction of CWD where these potential future firewood roads intersect activity areas proposed for this project would likely be minimal.

The above actions describe the reasonably foreseeable future actions pertinent to the soil resource within this Project area. Assuming the implementation of any of the action alternatives (and associated project design features and mitigations) for this project and the actions described in this cumulative effects section, all Forest Plan standards related to the soil resource will be met.

3.7.4.3. Forest Plan Consistency

Alternative 1 (No Action Alternative) meets the Forest Plan standards for DD, TSRC, and CWD since trends toward the standard or desired condition are required only when management activities are implemented.

Alternatives 2, 3 and 4 (action alternatives) meet the Forest Plan standards and guidelines for DD, TSRC, and CWD since activity areas meet or trend toward the Forest Plan standard or the desired condition. Standards and guidelines are achieved by combining implementing Forest Plan direction, developing specific design features and prescriptions, and applying site-specific mitigation measures.

Detrimental Disturbance

Existing levels of DD would continue to recover naturally and DD standards would be met for all activity areas by implementing the mitigation measures described in Chapter 2 for Alternatives 2, 3, and 4 (action alternatives).

Reductions in DD would be achieved by implementing management requirements, BMPs, burning prescriptions, and specifically designed mitigation measures that restrict heavy equipment operations. These measures would provide little opportunity for additional DD to be produced. Additionally, by obliterating all skid trails and landings used with the proposed activities, as well as areas that are visually compacted or displaced from past activities, DD levels will be reduced from the current condition in all action alternatives.

Total Soil Resource Commitment

TSRC would remain at 3.1% under Alternative 1 (No Action Alternative), the Forest Plan standard for TSRC would continue to be met.

For Alternatives 2, 3, and 4 (action alternatives), the Forest Plan standard for TSRC would be met through net reductions in the amount of TSRC. The existing level of 3.1% TSRC for the Project area would be reduced to 2.2% through the net decrease of approximately 78.8 acres

in Alternative 2 and 4; to 2.1% through the net decrease of approximately 86.2 acres in Alternative 3.

Coarse Woody Debris

Alternative 1 (No Action Alternative) would retain existing quantities of CWD within activity areas in the short term while fluctuations through natural events (tree mortality, blowdown, fires) would be expected over the longer term.

Alternatives 2, 3, and 4 (action alternatives) would immediately place CWD within each activity area at (or trending toward) levels that are within the desired range for the activity area PVG(s).

See the Project Record for Applicable Forest Plan standards and guidelines for this Project.

3.7.4.4. Irreversible and Irretrievable Commitments

None of the alternatives would create irreversible commitments of soil productivity.

TSRC are considered to be irretrievable losses of soil productivity until the time when physical measures are taken to restore the productivity and hydrologic function of the soil. The obliteration of roads, landings, and skid trails are examples of restoring soil productivity and hydrologic function and reducing the amount of irretrievable loss of soil productivity.

Alternative 1 (No Action Alternative) would maintain the existing condition of 885 acres of irretrievably committed soil productivity. No additional areas would be added and no additional areas would be restored.

Alternatives 2, 3, and 4 (action alternatives) would result in a net reduction in the acreage of irretrievably committed soil productivity (TSRC)—at least 77.8 acres in Alternative 2 and 4; 86.2 acres in Alternative 3. These net reductions would be from road obliteration.

3.8. Botany and Rare Plants

3.8.1. Analysis Scale, Data Sources and Methodology

3.8.1.1. Analysis Scale

3.8.1.1.1. Direct, Indirect, and Cumulative Effects Analysis Area

The botanical and rare plant analysis area for baseline conditions and direct, indirect, and cumulative effects includes the entire Project area. Site-specific-level surveys were conducted in the Project area where habitat is present for the candidate species whitebark pine (*Pinus albicaulis*), other rare plants, or Regional Sensitive plant species.

3.8.1.1.2. Temporal Scale of Analysis

Timeframes were defined in the Forest Plan as temporary (0–3 years), short-term (3–15 years), and long-term (>15 years) (USDA Forest Service 2003a). These timeframes are used to qualitatively define the effects of management actions on botanical resources and rare plants.

3.8.1.2. Data Sources and Methodology

This section incorporates by reference the botanist specialist report in the project record. The report contains the data, methodologies, analyses, maps, references and technical documentation upon which the specialist relied to reach the conclusions in the DEIS.

3.8.1.3. Analysis Indicators

The analysis indicators for botanical resources and rare plants include the following:

- Impacts to federally-listed threatened, sensitive, proposed, and candidate species.
- Impacts to Region 4 Sensitive plant species and Forest watch species.

3.8.2. Desired Conditions

The desired condition for botanical resources identified in the Forest Plan (USDA Forest Service 2003a, p. III-32) states, “the amount, distribution, and characteristics of life-stage habitats are present to maintain or reach viable populations of native species. Habitat conditions generally contribute to survival and recovery, and prevent listing on the Region 4 Sensitive Species List.” A summary of these desired forest components is presented in Chapter 3 of the Forest Plan.

Forest-wide goals, objectives, standards, and guidelines for botanical resources are found on pages III-8, III-11, and III-32 through III-34 of the Forest Plan (USDA Forest Service 2003). Forest Plan direction specifically applicable to the Project for botanical resources is listed below (USDA Forest Service 2003):

- **TEST08—**Avoid management actions within occupied TEPC plant species habitat that would adversely affect long-term persistence of those species.

- **BTST01—**Management actions that occur within occupied sensitive plant species habitat must incorporate measures to ensure habitat is maintained where it is within desired conditions, or restored where degraded.
- **BTGU01—**For site/project-scale analysis, suitable habitat should be determined for sensitive species within or near the Project area. Conduct surveys for those species with suitable habitat to determine presence. Document the rationale for not conducting surveys for other species in the project record.
- **BTGU05—**Coordinate with Forest Botanists to consider sensitive species habitat needs when designing and implementing management activities that may affect these species or their habitats.

The Project area is in MA 3, Weiser River. Pertinent management direction for this MA includes the following objective (USDA Forest Service 2003a, p. III-132):

- **Objective 0328—**Maintain or restore known populations and occupied habitats of TEPCS plant species, including Snake River goldenweed, giant helleborine orchid, Tolmie's onion, squaw apple, dwarf gray rabbitbrush, and Mahala-mat ceanothus to contribute to the long-term viability of these species.

General overall management of botanical resources in the Forest Plan include the following goals. The management direction of Forest Plan goal BTGO01 is to:

- Provide habitat capable of:
  - supporting viable populations of native plants species within the Forest, and
  - supporting plant biodiversity to meet social needs, biological diversity, and ecological and functional integrity" (USDA Forest Service 2003, page III-32).

The management direction of Forest Plan goals BTGO02 through BTGO06 is as follows (USDA Forest Service 2003, page III-32):

- BTGO02—Emphasize conservation and recovery of Region 4 Sensitive species, Forest "watch" plants, and other species at risk where quantity and quality of habitat needed to support viability is a concern.
- BTIGO03—Maintain or restore globally-rare plants identified as Natural Heritage Program G1, G2 and G3 and/or S1 and S2 species, and provide for their continued compositional and functional integrity for those species for which we have habitat.
- BTGO04—Maintain habitats for native plants that provide nectar, floral diversity, and pollen throughout the season during which pollinator species are active, with emphasis on rare plant species.
- BTGO05—Maintain or restore unique habitats (e.g., unique assemblages of rare plant species, tall forb communities, etc.) throughout the Forest.
- BTGO06—Manage plant community habitats (e.g., riparian, wetland, and upland forest, shrub, and grassland habitats) to provide for:

a. The desired amount, quality, and distribution of habitats.
b. Reduced fragmentation within habitats.
c. Juxtaposition and connectivity to other habitats.
d. Ecosystem processes that shape habitat.

3.8.3. Affected Environment

3.8.3.1. Current Condition

Table 3-110 lists the federal, State, and Forest Service status of rare plants with potential or known habitat on the Forest. This table was generated from results of the Idaho rare plant conference sponsored by the Idaho Native Plant Society in 2014 in Boise, Idaho. Because new information about rare and sensitive plant species is continuously updated, the botanical species tracked is considered dynamic.

The analysis area contains four Regional Forester Sensitive plant species: *Allium madidum* (swamp onion); *Allium tolmiei* var. *persimile* (Tolmie's onion); *Mimulus clivicola* (bank monkeyflower); *Pinus albicaulis* (whitebark pine); and one Forest watch species—*Epipactis gigantea* (giant helleborine orchid). Whitebark pine is also a U.S. Fish and Wildlife federal candidate species for listing. Table 3-111 show the species considered in this analysis and lists their habitat requirements and global and local status ratings of vulnerability.

Table 3-110. Federal, state, and Forest Service status of rare plant species with potential or known habitat on the Payette National Forest

Species Name	Common Name	Global[a]	State[b]	Forest Service Status[c]		Global Distribution[d]
				Regional Sensitive	Forest Plan	
Allium madidum	Swamp onion	G3	S3	S	S	re
Allium tolmiei var. persimile	Tolmie's onion	G4G5T3	S3	S	S	le
Allium validum	Tall swamp onion	G4	S3	N	W	w
Allotropa virgata	Candystick	G4	S3	S	S	d
Astragalus paysonii	Payson's milkvetch	G3	S3	S	S	re
Astragalus vexilliflexus var. vexilliflexus	Bentflower milkvetch	G4T4	S1	S	S	d
Botrychium lanceolatum var. lanceolatum	Lance-leaved moonwort	G5T4	S3	N	W	cb
Botrychium lineare	Linear-leaved moonwort	G2?	SH	S	S	sd
Botrychium simplex	Least moonwort	G5	S2	S	W	cb
Buxbaumia viridis	Green bug moss	G4G5	S3	N	W	w
Calamagrostis tweedyi	Cascade reedgrass	G3	S2	S	S	re
Camassia cusickii	Cusick's camas	G4	S2	S	S	re
Carex aboriginum	Indian Valley sedge	G1	S1	N	W	le
Ceanothus prostratus ssp. *prostratus*	Mahala-mat ceanothus	G5/?	S1	N	W	d
Crepis bakeri ssp. *idahoensis.*	Idaho hawksbeard	G4T2	S2	N	W	le
Douglasia idahoensis	Idaho dwarf-primrose	G3	S3	S	S	le
Draba incerta	Yellowstone draba	G5	*S2*	N	W	re
Eatonella nivea	White eatonella	G4G5	S3	N	W	d
Epilobium palustre	Swamp Willow Weed	G5	S3	N	W	w
Epipactis gigantea	Giant helleborine orchid	G4	S3	N	W	sd
Ericameria nauseosa ssp.*nana*	Dwarf grey rabbitbrush	G5T4	S3	N	W	re
Hackelia davisii	Davis' stickseed	G3	S3	N	W	le
Halimolobos perplexa var. *perplexa*	Puzzling halimolobos	G4T3	S3	S	S	le
Helodium blandowii	Blandow's helodium	G5	S2	N	W	cb
Hierochloe odorata	Sweetgrass	G4G5	S1	N	W	w
Howellia aquatilis	Water howellia	T-G3	S1	N	W	sd
Leptodactylon pungens ssp. *hazeliae* (Linanthus)	Hazel's prickly phlox	G5T2	S2	S	S	le
Lewisia sacajaweana	Sacajawea bitteroot	G2	S2	S	S	re
Lobaria scrobiculata	Pored lungwort	G4	S1	N	W	cb

Species Name	Common Name	Global[a]	State[b]	Forest Service Status[c]		Global Distribution[d]
				Regional Sensitive	Forest Plan	
Mimulus clivicola	Bank monkeyflower	G4	S3	S	S	re
Mirabilis macfarlanei	MacFarlane's four o'clock	T-G2	S2	N	W	le
Peraphyllum ramosissimum	Wild crab apple	G4	S2	N	W	sd
Pilophorus acicularis	Nail lichen	G4	S2	N	W	sd
Pinus albicaulis	Whitebark pine	C-G3G4	S3	S	—	w
Polystichum kruckebergii	Kruckeberg's sword-fern	G4	S2	N	W	re
Pyrrocoma radiata	Snake River golden weed	G3	S3	S	S	re
Ribes sanguineum	Redflower currant	G5	S1	N	W	sd
Ribes wolfii	Wolf's current	G4	S2	N	W	d
Rubus bartonianus	Bartonberry	G2	S2	S	S	le
Sanicula graveolens	Sierra sanicle	G4G5	S2	N	W	w
Saxifraga bryophora var. *tobiasiae*	Tobias' saxifrage	G5T2	S2	S	S	le
Schistostega pennata	Luminous moss	G3G4	S1	N	W	cb
Sedum borschii	Borch's stonecrop	G4 ?	S2	N	W	sd
Sedum valens	Salmon River sedum	G1G2	S1S2	N	W	le
Silene spaldingii	Spalding's silene	T-G2	S1	N	W	re
Sphagnum platyphyllum	Sphagnum	G5	S1	N	-	sd
Spiranthes diluvialis	Ute Ladies'-tresses	T-G2G3	S1	N	W	re
Trifolium douglasii	Douglas' clover	G2	S1	N	W	re
Trifolium longipes var. *multipedunculatum*	Many stalked Clover	G4T2	S2	N	W	—
Tripterocladium leucocladulum	Naked rhizomnium moss	G3	S3	N	W	le

[a]**Global—**Global ranking as assigned by Natural Heritage Program and Idaho Native Plant Society; G1 = Critically Imperiled, G2 = Imperiled, G3 = Vulnerable, G4 = Apparently Secure, G5 = Secure, ? = Inexact Numeric Rank , **T** = Threatened, **C** = Candidate.

[b]**State—**Idaho State ranking; **SH =** State Historical Occurrence, **S1 =** State Critically Imperiled, **S2 =** State Imperiled, **S3 =** Vulnerable, **S4 =** Apparently Secure

[c]**Forest Service StatusS** = Region 4 sensitive, **W** = Forest Watch Plants, **N** = No current status.

[d]**Global Distribution —d** = disjunct, **le** = local endemic (< 100 square miles), **re** = regional endemic (distribution 100–10,000 individuals), **sd** = Sparsely distributed (isolated populations), **w** = widespread, **cb** = circumboreal, circumpolar.

Source: Based on the results of the Idaho rare plant conference sponsored by the Idaho Native Plant Society in February, 2014, Boise, Idaho – http://www.idahonativeplants.org/rpc/RarePlantList.aspx

Table 3-111. Botanical species considered in the analysis for the Project based on known habitat and populations

Species Name/Family	Habitat Requirements	Global[a]	State[b]	Forest Service Status[c]	Global Distribution[d]
				Current	
Allium madidum Swamp onion Liliaceae family		G3	S3	S	re
	Found in seasonally moist meadows, along low groundwater courses, or around vernal pools. Sites may be surrounded by coniferous forests, but seldom found under forest canopies. Sites open with flat to little gradient. Known to occur at elevations from 3,800 to 6,500 feet (NatureServe, 2014). Most populations occur on the west side of the Forest.				
Allium tolmiei var. *persimile* Tolmie's onion Liliaceae family		G4/G5	S3	S	le
	Occurs in seasonally wet soils of swales, seeps, road cuts, and intermittent water courses, which become very dry during the summer. Sites range from open sagebrush habitat to ponderosa pine, Douglas-fir, and grand fir at elevations from 3,000 to 5,500 feet (Moseley & Mancuso, 1990). Occurs predominately on the west side of the Forest.				
Epipactis gigantea Giant helleborine orchid Orchidaceae family		G4	S3	W	sd
	Occurs in wet areas along stream banks, lake margins, seeps and springs, especially thermal waters. Populations on the Payette and Boise National Forests are found near hot springs or seeps. Although it can occur at sea level, it occurs in the mountains at elevations from 5,000 to 7,400 feet. (NatureServe 2014).				
Mimulus clivicola Bank monkeyflower Scrophulariaceae family		G4	S3	S	re
	Occurs in moist microhabitats such as seeps, perched water tables, and runoff channels. Sites have southerly aspects. Soils range from moderate to deep basaltic. Found between elevations from 4,200 to 6,700 feet (NatureServe, 2014). Most populations occur on the west side of the Forest in grass/shrub communities.				
Pinus albicaulis Whitebark pine Pinaceeae family		C-G3G4	S3	S	w
	Whitebark pine occurs in subalpine and timberline zones from west-central British Columbia, east to west-central Alberta, and south to central Idaho, southwestern Wyoming, and southern California (NatureServe, 2014). Commonly occurs at elevations from 7,400 to 9,000 feet on the Forest.				

[a]**Global—**Global ranking as assigned by Natural Heritage Program and Idaho Native Plant Society. G1 = Critically Imperiled, G2 = Imperiled, G3 = Vulnerable, G4 = Apparently Secure, G5 = Secure, **T** = Threatened, **C** = Candidate.
[b]**State—**Idaho State ranking; **SH =** State Historical Occurrence, **S1 =** State Critically Imperiled, **S2** = State Imperiled.
[c]**Forest Service Status—S** = Region 4 sensitive, **W** = Forest Watch Plants, **N** = No current status.
[d]**Global Distribution—d** = disjunct, **le** = local endemic (< 100 square miles), **re** = regional endemic (distribution 100–10,000), **sd** = sparsely distributed (isolated populations), **p** = peripheral, **w** = widespread, **cb** = circumboreal, circumpolar.

Allium madidum (Swamp Onion)

Species Description: A member of the lily family (*Liliaceae*), the perennial swamp onion has a slender stem rising from an ovoid bulb. A cluster of easily detached bulblets are located at one side of the base of the mature bulb. Flowers are white to pink with green midribs.

Habitat and Management Description: Swamp onion occurs in seasonally wet meadows along low ground water courses and around vernal pools at elevations from 3,800 to 6,500 feet. Plants bloom from early May to early July. Populations on the Forest of this Region 4 sensitive plant appear stable and are not trending towards federal listing. Currently, no conservation strategy exists for the plant; none is required at this time.

***Allium tolmiei var. persimile* (Tolmie's Onion)**

Species Description: A member of the lily family (*Liliaceae*), the perennial Tolmie's onion has a slender stem, circular in cross-section, rising from an ovoid bulb. This plant has two flat, thick, falcate leaves which are about equal in length to the stem. Flowers are white to pink with darker pink midvein. Plants bloom from early May to early July.

Habitat and Management Description: Tolmie's onion occurs in seasonally wet soils of swales, seeps, road cuts and intermittent water courses, which become very dry during the summer. Sites range from open sagebrush habitat to ponderosa pine, Douglas-fir, and grand fir forest types at elevations from 3,000 to 5,500 feet.

Populations on the Forest of this Region 4 sensitive plant appear stable and are not trending towards federal listing. Currently, no conservation strategy exists for the plant; none is required at this time.

Management Efforts: In managing for this species, new road construction in or near populations is avoided. Controlled access to populations is maintained so that hydrologic patterns supporting the plant are maintained.

***Epipactis gigantea* (Giant Helleborine Orchid)**

Species Description: A member of the orchid family (*Orchidaceae*), this perennial orchid grows 1–3 feet tall. The lower leaves are ovate, but narrow higher up the stem. The flowers, which occur in sets of 3–9, are showy with greenish sepals surrounding the brown-purple petals. Plants flower from June to early July.

Habitat and Management Description: A species of open, early successional habitats, the giant helleborine orchid grows on open wet sites adjacent to mineral hot seeps or cool springs along rivers, meadows, seeps. Elevations range from about 2,500 feet at Barth Hot Springs to 4,500 near Council on the Forest. Plants flower from June to July. The plant is not on the Region 4 Sensitive list because it has a broad range from central Mexico northward throughout the western United States and into southern British Columbia. Giant Helleborine is on the Forest "watch" list because recreational use and collection cause local viability concerns. Currently no conservation strategy exists for the plant; none is required at this time.

***Mimulus clivicola* (Bank Monkeyflower)**

Species Description: A member of the Scrophulariaceae family, this small, generally single-stemmed annual plant seldom gets over 3–5 inches tall. Sticky, glandular hairs cover the entire plant and produce a strong distinct musky odor. The pink flowers are showy and large in relation to the plant's overall size. Flowering begins in late May or early June and runs through mid-July.

Habitat and Management Description: Bank monkeyflower occurs in moist microhabitats such as seeps, perched water tables, and runoff channels. Most sites have southerly aspects with basaltic-based soil. It typically is found at elevations from 2,000 to 6,700 feet. Most populations occur on the west side of the Forest in grass/shrub communities.

This plant species is a regional endemic of the interior Pacific Northwest and is on the Region 4 sensitive species list. Populations on the Forest appear stable and are not trending towards federal listing. Currently no conservation strategy exists for the plant; none is required at this time.

***Pinus albicaulis* (Whitebark Pine)**

Species Description: A member of the Pinaceae family, whitebark pine is a five-needled conifer species typically 16–60 feet tall with a rounded or irregularly spreading crown shape. The largest recorded specimen is in the Sawtooth National Recreation Area of Idaho. It is 69 feet tall with a 27.6-foot circumference and a 47-foot crown spread (Fryer 2002). Whitebark pine is the only stone pine occurring in North America. Its characteristic dark brown-to-purple seed cones are 2–3 inches long and grow at the outer ends of upper branches.

Habitat and Management Description: Whitebark pine occurs in subalpine and timberline zones from west-central British Columbia, east to west-central Alberta, and south to central Idaho, southwestern Wyoming, and southern California. In Idaho, whitebark pine occurs in association with subalpine fir (*Abies lasiocarpa*) and/or Rocky Mountain lodgepole pine (*Pinus concorta*; Fryer 2002). Typical elevation range for whitebark pine on the Forest is from 7,400 feet to timber line. Small inclusions of whitebark pine habitat and trees occur in the Project area.

Whitebark pine is a federal candidate species and a Region 4 sensitive plant. On July 18, 2011, the U.S. Fish & Wildlife Service determined that whitebark pine warrants protection under the ESA, but that adding the species to the federal list of endangered and threatened wildlife and plants is precluded by the need to address other listing actions of higher priority. Subsequently, whitebark pine was added to the list of candidate species eligible for ESA protection and annual review of its status. The species was assigned a listing priority number (LPN) of 2, meaning threats are high-magnitude and imminent.

Threats to the whitebark pine include habitat loss and mortality from white pine blister rust, mountain pine beetle, and catastrophic fire and fire suppression, environmental effects resulting from climate change as well as the inadequacy of existing regulatory mechanisms. On a landscape scale, the species appears to be in danger of extinction, potentially within as few as 2–3 generations, with generation time of whitebark pine approximating 60 years (USDI Fish and Wildlife Service 2014).

3.8.4. Environmental Effects

Alternative 1 (No Action)

Alternative 1 (No Action) does not propose any new management actions for the Project area. Natural processes and ongoing management activities such as recreation, public firewood gathering, fire suppression, and routine road and trail maintenance are expected to continue in the Project area. Additional management objectives, such as culvert replacement to improve fish passage and road decommissioning/obliteration, would not occur, leaving weed corridors, sediment sources, and overall ecosystem connectivity unchanged.

Alternatives 2 (Proposed Action), 3, and 4

The vegetation treatments, prescribed fire, and road use and decommissioning proposed in Alternatives 2, 3, and 4 would result in a temporary to short-term risk of increased sediment, weed invasion, and trampling of rare plants and habitat followed by a long-term decrease in potential erosion and weed invasion. Road decommissioning length would range from about 76–84 miles for all action alternatives and is expected to result in long-term weed risk reduction in all rare plant habitat across the Project area.

All alternatives meet the objective of maintaining unique habitats or assemblages of rare plant species and maintaining ecosystem processes by using prescribed fire to maintain open habitat and decommissioning roads that facilitate weed expansion. Alternative 3 would provide the most benefit compared to the other action alternatives because of the proposed increased watershed restoration, increased road decommissioning, and reduced plans for temporary road construction.

Direct and Indirect Effects

Adverse impacts to sensitive and other rare plants species would be avoided by identifying populations and following mitigations built into the Project design. All known rare plant sites and adjacent habitat would be avoided during ground-disturbing activities except for prescribed burns. On large-scale projects with many phases of implementation, there would always be some risk that individual plants and habitat would be impacted by casual trampling or incidental actions.

Direct effects from proposed timber treatments and prescribed fire would occur in whitebark pine habitat. Thinning and treatments of sub alpine fir to release whitebark pine could result in some direct damage to individual trees of whitebark pine but provide benefits in the long term. Timber harvest and thinning, road, and recreational related activities would not occur to the habitat for, Tolmie's onion, swamp onion, bank monkeyflower, and giant helleborine orchid. Direct effects to the habitat of these species would occur, however, where prescribed fires are planned in their habitat.

Prescribed burning and other fuel treatment activities could harm some individual plants of Tolmie's onion, swamp onion, and bank monkeyflower in areas with high fuels, but overall, impacts from burning should be minimal because this sensitive species grow in open habitats with sparse vegetation where fuel loading is low. Typically, prescribed burns result in low to medium severity burns where duff and debris are partly burned and deep roots, rhizomes, and root crowns survive and resprout. Some trampling of habitat and individual plants could occur from fire activities such as ignition, emergency fire lines, or patrols along perimeters. Both fire intensity and burn season can influence fire effects on rare and native plants. In general, the season, of burn is not the deciding factor in fire effects to native grasses and forbs but the severity of fire (Kerns et al. 2006).

Bank monkeyflower is an annual plant preferring open sites with mineral soils for germination; mild disturbance to soils and removal of overstories can enhance habitat. Typical habitat for these species is forest openings, and because their habitats are not heavily forested, effects from timber harvesting and thinning are usually mitigated by avoiding the populated sites and surrounding habitat. Forest openings resulting from proposed vegetation treatments could increase the habitat and populations of the bank monkeyflower; increases in populations are often noted following overstory removal.

Prescribed burning and other fuel treatment activities could harm some individual plants of giant helleborine orchid. However, this species prefers open early successional habitats, in mineral hot seeps or cool springs along rivers in the Project area and could therefore benefit from prescribed burns.

Little habitat for whitebark pine occurs in the Project area. While prescribed fire is not planned to manage whitebark pine in this project, adjacent burns may impact some individual trees. Historically, fire played an integral role in providing suitable regeneration habitat for whitebark pine by removing competing species, such as subalpine fir.

Risk of indirect effects from erosion and weed invasion should be minimal, because mitigation application of Project design features should help avoid impacts. Weed invasion into sensitive plant habitat could occur where exposed mineral soils are susceptible to invasion by nonnative species. The majority of the weed infestations and future risk of invasion correlate with ground disturbance activities along road and trail corridors.

Implementation of regularly-scheduled weed management plans should help contain invasion of nonnative plants and reduce the risk of invasion into surrounding areas. Noxious weeds within the Project area are managed with an Integrated Pest Management (IPM) approach using mechanical, biological, and chemical methods. Currently, nonnative weed invasion is not occurring in the known populations or immediate habitat of rare plants addressed in the Project area.

Cumulative Effects

Cumulative effects occur when existing conditions from past, present, and reasonably foreseeable future land management activities overlap in both spatial and temporal scales with the direct and indirect effects associated with the proposed alternatives. A complete list of past, present, and reasonably foreseeable future actions in the cumulative effects analysis area can be referenced in Appendix 3 of the DEIS.

Existing harvest units and roads, road maintenance, livestock grazing, and recreational activities may affect rare plant populations and their viability within the cumulative effects area and would be expected to continue to affect botanical resource values. In combination with the other activities in the cumulative effects area, the proposed Project is not expected to have any additional detectable negative cumulative effects on rare plant habitat or botanical resources. Road decommissioning planned within the cumulative effects area is expected to result in a reduction of weed corridors to rare plant populations and habitat.

When considered with past, current, and reasonably foreseeable future land management activities, this Project should not affect the long-term persistence of swamp onion, Tolmie's onion, bank monkeyflower, whitebark pine, and giant helleborine orchid. All species appear secure throughout their range of distribution, except for whitebark pine, which is suffering long-term landscape-scale changes due to habitat loss and mortality from white pine blister rust, mountain pine beetle, catastrophic fire and fire suppression, environmental effects resulting from climate change, and the inadequacy of existing regulatory mechanisms.

3.8.4.1. Determination

No federally listed threatened or endangered plant species occur within or adjacent to the Project area. Habitat and populations for the Forest sensitive and watch plants—swamp onion, Tolmie's onion, bank monkeyflower, whitebark pine, and giant helleborine orchid—occur throughout the Project area.

The determination of the Forest Service that the Middle Fork Weiser River Landscape Restoration Project may impact individuals of swamp onion, Tolmie's onion, bank monkeyflower, whitebark pine, and giant helleborine orchid, but is not likely to contribute to a trend toward federal listing. This determination would stand for all alternatives except for Alternative 1, the No Action Alternative, in which natural disturbances and current management of the Project area would continue.

Past, Ongoing and Reasonably Foreseeable Future Actions

A combination of past management actions, including vegetation treatment and timber harvest; livestock grazing; recreation improvements and development; road building and maintenance; irrigation diversion and development; and land management on private and state property for fire suppression and prescribed burns have altered the condition of plant habitat in the analysis area. Currently, the risk of weed invasion is an ongoing threat to maintaining plant habitat in the analysis area.

Reasonably foreseeable future actions in the analysis area include prescribed fire; NFS road use and maintenance; long-term closure and decommissioning of roads; recreation use; motorized OHV use; firewood cutting; livestock grazing on Forest and private lands; timber harvest on Forest and private lands; housing development on private land; agriculture practices; noxious weed management; wildfires; and fire suppression. See Appendix 3 for a detailed summary.

3.8.4.2. Irreversible and Irretrievable Commitments

The Middle Fork Weiser River Landscape Restoration Project is not expected to result in any irreversible or irretrievable commitments of habitat for ESA-listed, Regional sensitive, or desired native plant species. No ESA-listed threatened or endangered plant species are found in the Middle Fork Weiser Landscape Restoration Project.

3.8.4.3. Forest Plan Consistency

All of the proposed alternatives meet Forest Plan Standards and Guidelines.

3.9. Recreation

3.9.1. Analysis Scale, Data Sources, and Methodology

3.9.1.1. Analysis Scale

3.9.1.1.1. Direct and Indirect Effects Analysis Area

For all alternatives, the recreation analysis area is where proposed changes and improvements would occur on trails, developed and dispersed recreation areas, and the road system. The analysis area—analyzing direct and indirect effects—is the entire Project area because improvements of these items are spread throughout.

3.9.1.1.2. Cumulative Effects Analysis Area

The cumulative effects analysis area includes the entire Project area plus lands north of the Project area to NFS road 50172. These lands, and the road, were added because they influence recreational activities within, and access into, the Project area.

3.9.1.1.3. Temporal Scale of Analysis

Timeframes were defined in the Forest Plan as temporary (0–3 years), short-term (3–15 years), and long-term (>15 years).

3.9.1.2. Data Sources and Methodology

Data of recreation components of the Project were collected from a variety of sources: the INFRA database for trails and developed recreation sites inventory; physical on-the-ground information collected in 2012, 2013, and 2014 for trails and developed and dispersed recreation sites; the Forest National Visitor Use Monitoring (NVUM) data from 2003, 2008, and 2013; the Forest ROS maps; the Forest Visual Quality Opportunity (VQO) maps; and references listed in the recreation specialist report.

3.9.1.3. Analysis Indicators

The indicators below are used to compare the alternatives and to determine compliance with Project design features and the 2003 Forest Plan's standards and guidelines.

Measurements/Indicators:

- Miles of open motorized trail by vehicle class for motorized trails per MVUM, and miles of open and managed non-motorized trails
- Miles of open road
- Changes to existing dispersed recreation sites measured by changes to recreation facilities and/or resource improvements at the sites

3.9.2. Affected Environment

3.9.2.1. Current Condition

3.9.2.1.1. Developed and Dispersed Recreation Conditions and Opportunities

Developed Recreation

There is one developed fee campground within the Project area, Cabin Creek Campground, with 11 single-unit sites and a capacity of approximately 88 campers at one time. The campground has had hazardous trees removed recently and needs maintenance work, including heavy maintenance within the camp sites, to bring it to a higher standard. (Figure 3-71). A new vault restroom is needed (Figure 3-72) and a new entrance kiosk is also recommended (Figure 3-73).

Figure 3-71. Location of proposed road widening project. An increased turn radius for larger recreational vehicles is needed

Figure 3-72. Existing outhouse at Cabin Creek Campground, which needs to be replaced

Figure 3-73. Existing information kiosk at Cabin Creek Campground

The following needs have been identified for the Cabin Creek Campground:

- Placing new markers/numbers at the campsites
- Graveling the main loop road
- Building a new single vault restroom at the far end of the campground
- Widening the road and turn at the entrance so that full size RVs can turn and reenter the loop road
- Adding accessible tables

- Creating an accessible pathway to the water system
- Constructing a new entrance site sign, entrance kiosk, and fee tube

Dispersed Recreation

Dispersed recreation occurs throughout the Project area and includes, berry picking, hunting, trail use by motorized and non-motorized users, firewood cutting, sightseeing, and camping. The area's visitors come from nearby towns including Weiser, Council, Cambridge, and New Meadows, but use from residents of the Treasure Valley (Boise, Meridian Nampa, and Caldwell) is increasing. Deer and elk hunting seasons draw visitors from across the western United States.

To support recreation in the area, many dispersed campsites exist along open roads; these campsites have no facilities. Off-road dispersed camping—in which a visitor can drive up to 300 feet off the road, where it is safe to do so, for the purpose of camping—is allowed on 69 of the 71 miles of open road in the Project area. Unauthorized motorized use is occurring on annually and seasonally closed roads. Furthermore, some dispersed sites have sustained damage from unrestricted motorized use.

Horse Cabin Flat (Figure 3-74), a dispersed camping area used moderately in spring and summer and more heavily in fall, has potential for moderate development, including the establishment of 4 to 5 graveled campsites with designated parking and campfire rings. Additional improvements needed include building a vault restroom to manage sanitation issues, adding hitch rails for stock, and reconstructing the entrance road to accommodate large RVs. Damage from unauthorized motorized use in the area could be managed by the placement of barrier rock. A fee for use of the area should be considered, especially given its location near Cabin Creek Campground, which is already a fee site.

Figure 3-74. Horse Cabin Flat

A large dispersed camping area and motorized unauthorized route system located adjacent to NFS road 50591 straddles NFS and private land, making management of dispersed camping on NFS lands difficult. Use of these areas in the spring are associated with camping and bear hunting; and in the fall with deer and elk big game hunting. Dispersed camping sites desired for retention, located on NFS land could be identified for potential minor development (e.g., site graveling, minimal fire rings, and barrier rock) to better define the sites and minimize site expansion.

Jungle Creek Dispersed Camping Site, located just off the Middle Fork Weiser River needs to be hardened to accommodate stock use and minimize resource damage occurring as vehicles cross the river.

Trails

Most trails in the Project area are open to some form of OHV use but trail access onto the Forest is restricted due to private land ownership. There are approximately 28 miles of existing open designated trail in the Project area, including 3.8 miles of non-motorized trail, 21.8 miles of two-wheel motorized trail, and 2.4 miles of OHV trail accommodating vehicles up to 50 inches wide. All trails need improved signing and require maintenance as many of them have lost the tread and trail definition. Table 3-112 displays trail numbers and length of trails by type of use in the Project area.

Table 3-112. Trails by use type (miles) in the Project area

Trail number	Non-motorized	2-wheel motorized	OHV (trails 50 inches wide and less)	Total
198	2.0	3.0	0	5.0
201	0	2.2	0	2.2
203	1.8	0	0	1.8
205	0	1.9	0	1.9
210	0	3.9	0	3.9
332	0	5.4	0	5.4
213	0	0.9	0	0.9
518	0	4.5	0	4.5
209	0	0	2.4	2.4
Total	**3.8**	**21.8**	**2.4**	**28.0**

Use of trails not designated during the 2009 travel planning process is occurring. Although open in the past, NFS trail 212 was not designated as open during the travel planning process. Nevertheless, it remains an important trail for horse users in the area, who would like to see it reopened and maintained for non-motorized use.

ATVs and UTVs are creating and using unauthorized routes throughout the Project area. With the development of larger OHVs, such as Razors, there is a demand for off-road motorized trails for vehicles 70 inches wide or wider even though there is ample opportunity for riding these larger OHVs on the open road system.

NFS trail 198 leads into the Council Mountain area. As the trail passes below Council Mountain, it travels through wet meadows and becomes braided and scattered. In addition, numerous trail junctions, many created by visitors and livestock, make finding routes extremely confusing. Because of these issues, the trail needs to be made discernable throughout its length, rerouted in places, and signed to avoid confusion.

The trailhead for NFS trail 209 is located on NFS road 50186 and is open to OHVs up to 50 inches wide yet a gate crosses the trailhead, causing some OHV users to simply drive around the gate to get on the trail, as can be seen in Figure 3-75. The trailhead may need to be relocated because of private land access issues. It also needs to be accurately mapped and correctly displayed on future maps. Once the location of the trailhead is finalized, a sign marker is needed at the trailhead with additional information warning the riders that there could be cattle along the trail. Figure 3-76 shows additional unauthorized OHV trail creation along NFS road 50186.

Figure 3-75. National Forest System trail 209 trailhead

Figure 3-76. Unauthorized OHV route along National Forest System road 50186, approximately 200 feet long, cut a switchback in the road

NFS trail 205 begins on private land but, without any type of trailhead, the typical user does not know where to access the trail. To alleviate the situation, a trail easement is needed from the landowner so the trail can be promoted and used, or the trail should be rerouted to exist only on NFS lands. The trail ends at the trailhead of NFS trail 198; similar work is needed.

NFS trail 210—Granite Creek Trail—is located along NFS road 50186 and is in good condition (Figure 3-77). However, old logging roads farther up the trail make it difficult for the user to identify which direction to go (Figure 3-78). Though this trail receives low use, an opportunity exists for rerouting and/or to adding signing at these trail and road intersections.

Figure 3-77. Granite Creek trailhead and the Middle Fork Weiser River

West Mountain Road 1763, known as a "Jeep Trail," is used by 4-wheel drive vehicles, UTVs, ATVs, motorcycles, and horseback riders. Currently identified as an open road, this popular route needs repair in places where it is very rocky and steep, making it difficult to ride—even for expert riders. For its entire length, the road crosses in and out of the Project area and back and forth between the Boise and Payette National Forests along the West Mountain ridge.

Figure 3-78. Granite Creek Trail logging road crossing

A large unauthorized road enters the Forest at the junction of NFS roads 50206 and 50186. The need for access on this road should be determined. If access is not needed, the road should be decommissioned. Along NFS road 50206 to the Project boundary, both sides of the road occur on steep ground with signs of dispersed campsites. This area is likely used for firewood cutting. Warm Springs Trail (NFS trail 203) and the newer relocated Sheep Creek Trail (NFS trail 332) begin from NFS road 50186. Both trails receive low-to-moderate use.

The Project area does not currently support any outfitter guide permits. The area has recently hosted 2 annual recreation event Special Use Permits: a portion of the Cascade Gravel Grinder Challenge bike race and Donnelly Snowmobile Club's Fun Run.

Winter Trails— There are approximately 46 miles of authorized groomed over-snow trail in the Project area but because there are no formal parking areas for winter sports in the Project area, snowmobile users access the area using trailheads outside the Project boundary.

3.9.2.1.2. Recreation Desired Condition Description

Dispersed recreation is emphasized in MA3. Dispersed camping opportunities are maintained and resource protection measures are used where needed. Other types of dispersed recreation uses offer a mix of roaded and unroaded opportunities. Roads, areas, and trails are signed to notify users of motorized access restrictions.

Developed recreation sites are maintained at current or improved levels. Renovation of existing developed sites occurs when facility conditions no longer effectively serve the public.

Trail maintenance is emphasized. Trail funding is used to maintain trails at current or improved levels. The most heavily used trails and those with resource damage have maintenance priority. Trailhead signing indicates the types of trail use allowed.

Listed below (Table 3-113) are the MA3 Forest Plan recreation resource objectives and standards that pertain to the Project area:

Table 3-113. MA3 Forest Plan recreation resource objectives and standards pertaining to the Project area (USDA Forest Service 2003a)

Direction	Number	Management direction description
Objective	0346	Remove existing pit toilets and evaluate new locations for new or replacement vault toilets to reduce resource impacts from existing facilities.
Objective	0348	Evaluate developed campgrounds and upgrade as needed to provide universal access and to accommodate larger camp trailers and recreation vehicles.
Objective	0350	Develop and maintain a group camping area at Horse Cabin Flats to enhance recreational opportunities.
Objective	0352	Evaluate the need for dispersed campsites and establish sites within areas where they will have relatively low impacts to important biophysical resources.
Objective	0353	Construct parking areas and provide information signs at key trailhead locations to provide parking and information for trail users. Parking for a minimum of 2 or 3 vehicles is needed in most cases.
Objective	0354	Repair trails where erosion and water-caused resource damage is occurring. Repairs may include rehabilitating eroded trail sections, rerouting sections away from streams, and installing bridges.
Objective	0355	Seek to acquire trail easements through private lands to improve recreation access.
Objective	0357	Improve trail signing especially in areas near Council Mountain, Cuddy Mountain, and Sturgill Peak where past management activities have made trail location difficult.
Objective	0359	Achieve or maintain the following ROS strategy: SPNM – summer 1%, winter 10%; SPM – summer 11%, winter 37%; RN – summer 16%, winter 1%, RM – summer 72%, winter 52%.
Standard	0360	All new developed recreation facilities shall be located outside occupied NIDGS habitat.

3.9.3. Environmental Effects

3.9.3.1. Direct and Indirect Effects

3.9.3.1.1. Alternative 1: No Action

Recreation Improvements

Under the No Action alternative, recreation opportunities in the Project area would not change from their current condition and would be maintained to the degree discussed above. Recreational use and activities would continue as they have in the past; recreational improvements proposed for the action alternatives would not be implemented.

Developed and Dispersed Recreation

Cabin Creek Campground, the only developed fee campground within the Project area, would remain open and available as is, with no new improvements proposed. Larger RVs would continue to have difficulties driving around the loop road because of its current design. The older restroom located to the back of the campground would not comply with Forest Service standards or be fully accessible. Additionally, the rotting wooden portions of the restroom would continue to deteriorate. The fee tube at the entrance kiosk would continue to be difficult for the recreation technicians to empty; they would continue to get onto the ground to empty the fee envelopes— a safety issue when they are on patrol alone.

The dispersed campsite known as Horse Cabin Flat would continue to accommodate camping throughout the year, but would not have the needed recreation and sanitation facilities

including a toilet, fire rings, and hitch rails for stock. The site would continue to expand over time, potentially causing resource damage including the delivery of sediment into the nearby stream.

The dispersed camping site near Jungle Creek would continue to be used, with resource damage continuing without the needed site hardening and rehabilitation.

Using a motorized vehicle up to 300 feet off of roads for the purposes of dispersed camping would continue along open road corridors, where authorized on the MVUM. High-use areas would likely continue to expand and lose vegetation, as unrestricted use contributes to sparse ground cover and potentially contributes to delivery of sediment into nearby streams.

Trails

Open road and trail opportunities would remain the same and likely continue to be reduced on some trails due to lack of signing and trail maintenance, poor trail location (in many areas), and numerous user-created trails. Trail maintenance would be accomplished on the existing trail system as scheduled by the district trail crews and district recreation program managers. Existing trails and their associated opportunities would continue to be provided within the Project area. Unauthorized OHV routes would likely continue to be developed throughout the Project area and existing routes would continue to be used, continuing the resource damage caused by these unauthorized routes.

Visitors would continue to have difficulty locating and using NFS trails 198 and 205 because of the lack of signed and maintained access at both ends of these trails. This is a detriment to trail users because without proper access, the trails cannot be used to their full potential. NFS trail 198 through the Council Mountain area would continue to pass through wet areas and have numerous side braided trails, without one main trail through the area. Needed repairs to the popular West Mountain Jeep Trail would not be accomplished, making this open road difficult to ride for many OHV users. There would be no new OHV opportunities developed in the Project area under the No Action alternative.

Other Resource Management Actions

With no Project implementation, there would be no change to the existing effects to recreation from other resources.

3.9.3.1.2. Alternative 2: Proposed Action

Recreation Improvements

Recreation improvements proposed for Alternative 2 address recreation objectives. Proposed improvements for developed and dispersed recreation and trails include the following:

Developed and Dispersed Recreation

1. Cabin Creek Campground
    - Install one single-unit vault toilet to replace the existing toilet. Relocate to meet all required health and safety codes.
    - Add new site markers to individual campsites
    - Replace the existing fee tube with a more accessible and safer tube, enabling fee collections to be removed while keeping the surrounding area in view
    - Replace the existing kiosk with a new and improved kiosk and information board
    - Install accessible tables
    - Build an accessible pathway to the water system and the new toilet
    - Gravel the main campground loop road and widen the road and turn area at the entrance to accommodate the turn radius of larger RVs
2. Horse Cabin Flat Dispersed Camping Site
    - Install up to 4 hitch rails
    - Designate up to 5 camping sites by placing boulders and install fire rings and gravel each site
    - Install site signs to mark the allowed camping locations
    - Install one single-unit vault toilet
3. Jungle Creek Dispersed Camping Site
    - Harden the crossing of the Middle Fork Weiser River at the Jungle Creek dispersed camping area to accommodate stock use and to minimize resource damage.
    - Install barriers to focus motorized access to the existing bridge approximately 300 feet from the Middle Fork Weiser River crossing.
    - Make general improvements to the site (e.g. hardening and installing physical barriers) in order to minimize impacts to the adjacent Middle Fork Weiser River
4. Roads Identified for Decommissioning
    - Evaluate roads identified for decommissioning for site-specific dispersed recreation opportunities within 300 feet of NFS open or seasonally open road junctions if no resource concerns are identified.
    - Improve sites, as needed, for resource protection by surfacing or other hardening, and evaluate for barriers where stream impacts are found

Trails

1. Reroute the south portion of NFS trail 198 (4.4 miles) and the east portion of NFS trail 205 (2.0 miles)—avoiding sections currently on private land and without an easement held by the Forest Service—to provide legal access to these trails. Establish new trailheads, with parking and potentially hitch rails for stock. For NFS trail 198, the new trailhead would be established at the Cabin Creek Campground. For NFS trail 205, the new trailhead would be 0.5 miles north of Lake Creek on NFS road 186. Maps displaying the proposed reroutes (located in the Project Record) show approximate routes for this trail construction. Specific routes and design features and/or mitigations would be established in conjunction with Forest watershed, fisheries, and heritage program personnel. Stream crossings would use fords and/or trail bridges as appropriate to protect SWRA resources.
2. Change the designation of a short section (2 miles) of NFS trail 198 from non-motorized to two-wheel motorized use to accommodate continued two-wheel motorized access on the entire trail (two-wheeled motorized use is currently present and allowed within the Council Mountain IRA).
3. Perform trail maintenance (including proper signing) to bring all 28 miles of existing open designated trail to approved trail class and standards, as defined in the TMO, for specific trails within the Project area. Maintenance levels would vary from routine, to heavy, to some reconstruction, depending on trail condition and trail class. NFS trail 518 needs to be reestablished in several sections.
4. Construct and formally designate for seasonal use a new motorized OHV loop trail approximately 3 miles long and open to vehicles up to 70 inches wide using closed NFS roads 50166 and 50485. This new OHV loop would require 0.5 miles of new trail construction to complete and close the loop.
5. Sign and formally designate NFS trail 212 as open for non-motorized use; renumber it as NFS trail 212. Complete needed switchback construction to mitigate steep sections.
6. Relocate the trailhead for the NFS ATV trail 209 onto NFS lands, and construct a short section of trail (less than 0.25 miles) to meet up with the new trailhead. Correct the MVUM to coincide with actual trail location on the ground. Change the designation of the trail from “open year round” to “open seasonally” to coincide with other seasonal trail and road designations in the immediate area.
7. Reroute portions of NFS trail 198 near the base of Council Mountain to reduce resource impacts and improve sustainability. Work to reduce congestion of multiple trail junctions in this sensitive upper-elevation trail network.
8. Convert 3.4 miles of the West Mountain Jeep Road 1763 from ML 2 open road to a “trail open to all vehicles.” This change would add 3.4 miles of trail to the trail system.

Effects from Proposed Recreation Improvements

Developed and Dispersed Recreation

Recreational users' experiences at the Cabin Creek Campground would be improved by implementing the proposed changes. The new toilet, built in a manner and location compliant with health and safety codes, will be fully accessible and easier to clean and maintain. Other features of the proposed improvements at the campground include accessible tables at campsites and an upgraded pathway to the water pump.

Safety of the recreation technicians working at the Cabin Creek Campground would be improved with the addition of a new metal fee tube with easier access for removing fee collections. The existing fee tube is difficult and potentially dangerous to use. It requires the technician to lie on the ground to empty the contents, which makes the technician vulnerable to someone approaching unnoticed. A new informational kiosk—with updated information, a location map, and area highlights—would improve communication between the Forest and the campground's visitors.

Widening the existing turn radius on the Cabin Creek Campground loop road would accommodate larger RVs better by making their travel easier and safer around the loop road. This improved access may attract more recreationists with larger RVs.

Improvements proposed for the Horse Cabin Flat dispersed camping area would provide improved recreation experiences. Sanitation at the site would improve with the addition of a single-unit vault toilet and metal hitch rails for stock tie up. Designating camping sites with boulders and site identification markers would help minimize unwanted site expansion. Site designation would also facilitate motor vehicle management and lessen compaction to soils and vegetation. Adding metal fire rings would reduce the proliferation of visitor-constructed rock fire rings and help keep fires contained in a safer enclosure. Hardening the site with gravel would both improve vehicle access and lessen site erosion. There is potential for the Forest to charge a fee at this site once the improvements were completed to help offset costs associated with the maintenance of the site. Any new recreation site fee proposals would go through all required approvals and reviews.

Similar improvements regarding site hardening and control of vehicle use are proposed for the crossing at the Middle Fork Weiser River (near Jungle Creek). Similar resource improvements to those addressed above for Horse Cabin Flat would be expected. However, no fees would be considered for this site.

Future dispersed camping sites could be identified on roads selected for decommissioning that are located at intersections with NFS open or seasonally open roads. These sites would be evaluated for site-specific dispersed recreation opportunities within 300 feet of the system road junction if no resource concerns are identified. If necessary for resource protection, sites would be improved by surfacing or other hardening and evaluated for barriers where stream impacts are found. The specific number of potential sites is not known at this time but was estimated during on-site field trips by the recreation specialist to be no more than 10 sites in the Project area.

In addition to any potential new dispersed camping sites created by road decommissioning, as mentioned above, up to 10 existing dispersed camping sites throughout the Project area may need improvement through site hardening and rock barriers to better delineate sites and control access. Thus, up to 20 dispersed camping sites may receive recreation site

improvements to help mitigate soil and other resource impacts caused by existing recreational use of these areas.

Trails

Currently, no signage identifies trailhead locations from private lands on the current routes for NFS trails 198 and 205, nor does trail maintenance takes place on the private land sections. Lack of signage and maintenance makes finding and using these trails difficult. Under the Proposed Action, new trail construction would relocate the trials entirely on NFS Lands, which would make access and parking possible for recreational trail users. In addition, signing identifying the trails would be present. The combination of better access, parking and signage would increase recreational trail opportunities and enjoyment for both motorized and non-motorized users in these areas and would likely cause use to increase. Resources specialists would survey and review trail rerouting prior to construction.

By changing the 2-mile, non-motorized section of NFS trail 198 to two-wheel motorized, a continuous two-wheel motorized route along the full length of the trail—from the Middle Fork of the Weiser River Road, past Council Mountain, to Mill Creek Road—would be created. This new route would be a major benefit to those wanting the opportunity for a two-wheel motorized experience on a longer, high quality trail. It would also eliminate potential confusion created when use designation changes over the course of the trail. It is recognized that the change in designation could diminish the recreation experience for some visitors currently using the short motor-free section. Yet, because motorized use is allowed on either end of the non-motorized section, enforcement to keep motorized activity away would be difficult to manage effectively.

Associated with the two-wheel motorized designation change, a trail realignment on the section of NFS trail 198 passing below Council Mountain proper would be completed. Establishing a clear route and appropriate directional signage would benefit all trail users traveling through the area. Relocating the route from wet areas and meadows would mitigate impacts of motorized use allowed on the central portion of the trail. It would also provide stock users with a safer route through the area without the current wet spots and water seeps. Finally, it would benefit soil resources by establishing one mainline trail and rehabilitating the spur routes through the area. Signs marking the new route would give users better direction.

Completing heavy trail maintenance (e.g., installing water bars, rock crib walls, turnpikes, puncheon through wet areas, signing, reestablishment of trail tread, and reestablishing vegetation clearing limits) on 28 miles of trail within the Project area would improve recreation enjoyment for motorized and non-motorized trail users. The completion of this maintenance would likely lead to an increase in recreational use by pack and saddle stock, motorcycles, and hikers. The recreation specialist report in Project Record contains definitions and descriptions of trail terms, trail class features, and related standards.

Reopening the old NFS trail 202 (becoming NFs trail 212 after official designation) to non-motorized use presents an added opportunity to stock trail riders, hikers, and other non-motorized users, but could contribute to the current backlog of existing trail maintenance by adding miles to the open trail system. In addition, the trail would require construction of switchbacks to mitigate an otherwise excessively steep trail grade, adding cost to the trail construction budget.

Constructing and designating 3 miles of new OHV trail (open to vehicles up to 70 inches wide) using closed NFS roads 50166 and 50485 would give OHV users desiring an “off

road" experience a short loop ride with the opportunity to view scenic country without having to compete with larger, faster moving vehicles on the main open road system. Similarly, this new trail would an opportunity for younger or beginning users to ride in an environment free of larger vehicles. However, designation of this new trail could contribute to the current backlog of existing trail maintenance by adding miles to the open trail system.

Relocating the trailhead for NFS trail 209 (an ATV trail) onto NFS lands, including realignment of several hundred feet of trail to connect the new trailhead with the existing trail, and placing the new route on the trail map would help recreational users find the trail and would eliminate the chance of losing to future private land development.

Converting the 3.4-mile section of West Mountain Jeep Road 1763 within the Project area to a "trail open to all vehicles" would better prepare motorized riders using 4-wheel drive vehicles, UTVs, ATVs, and motorcycles for riding on a rough, 4-wheel drive trail that is not maintained to road standards. The road-to-trail conversion would add to the Forest's trail maintenance backlog because significant work would be required to make the trail passable by average OHV riders. This conversion would not add to the inventory of available recreation opportunities.

The trail realignments and reconstruction described above will add mileage to the existing trail system, which in turn adds future maintenance. These new trails would be built to appropriate trail standards and would be easier to maintain. In addition, these trail projects would improve resource conditions in the long term because of better erosion control structures along the trail tread and fewer erosion-prone alignments.

Effects from Other Resource Management Actions

This section addresses effects to recreation from proposed mechanical treatments, prescribed fire, watershed improvements and restoration treatments, and aquatic passage and habitat connectivity projects.

Commercial and Noncommercial Logging Treatments

During implementation of the proposed commercial and noncommercial logging treatments, recreational users in the area would be displaced to some degree, depending on the units being treated. Road maintenance, reconstruction, and use associated with Alternative 2 would also impact recreational use. Roads could be closed during blading, installing drainage features, and installing or improving water passages (culvert installation). Once the unit work is completed, recreational use of the area would return to its former condition. PDFs and mitigation measures would be in place to limit Project operations and thereby reduce impacts from logging and associated traffic on hunters during peak periods of the hunting seasons.

In general terms, effects from timber harvest would be the greatest in areas where little or no timber management has occurred. Conversely, additional timber cutting in areas showing clear evidence of past timber management activities could result in much lower levels of impacts. The latter scenario would be the case for the Project area because roads are, for the most part, already in place and there are visible signs of past logging events.

Mechanical vegetation treatments proposed for Alternative 2 would affect the general public's use of roads and trails in the Project area for the duration of harvest. Safety issues from logging truck activity on shared roads, increased amounts of dust, elevated noise levels, and temporary road closures are all potential impacts to recreational use within the Project area.

If authorized, winter logging and hauling in the Project area would affect recreational use of haul roads that are also groomed over-snow trails used by the public in the winter months. Though PDFs would be in place to minimize the effects, the snowmobile riding experience would likely decline due to a compromised snow floor quality on roads used to haul timber. Still, keeping the over-snow routes passable would allow snowmobile access to the rest of the groomed system.

Harvest-related activities (felling, yarding, loading, road building, log hauling, planting, and fuel treatments) would likely have a negative impact on the experiences of recreationists using dispersed camping sites in the immediate vicinity of harvest sites, especially for those seeking a more peaceful or primitive experience. Consequently, recreationists would likely use other areas. Logging slash left on site for firewood would increase availability to fuelwood gatherers. These impacts would be short-term (0–5 years) and seasonal in nature, primarily affecting summer and fall use.

Prescribed Burning

Prescribed burning proposed for Alternative 2 would have no long-term effect on recreational road and trail access in the Project area. However, during prescribed fire treatments, recreational use would likely be modified or eliminated, depending on the proximity of the fire to open roads.

There could be temporary road and trail closures during the implementation of the burning and slash piling for public safety, but the duration would be limited to several days during the burn period. Any trails damaged by the prescribed fire treatments enough to warrant additional trail maintenance would be repaired by the fire/fuels crews to trail standards specified in the recreation PDFs (Table 2-35).

Prescribed fire would result in temporary air visibility and quality impairment within the Project area; burned landscapes would be visible to recreationists for the short- to long-term. Prescribed fire would also create impacts to recreationists in the fall when burning windows occur during peak big game and bird hunting season. These effects would be localized and short in duration.

The prescribed fire treatments proposed for Alternative 2 would have no measurable effect on recreational use of dispersed recreation sites in the long term. Recreational camping opportunities could be temporarily disrupted during the actual burning period, altering which sites recreationist may use during the treatments. Displacement would be short-lived and only during the burn period. Smoke and ash could also be expected during the actual burn period and, depending on the areas being burned, could affect campers sensitive to smoke. Some recreational sites would have blackened trees and ground vegetation for the first year, but the groundcover would be expected to return to green grass the following season. A recreation PDF (Table 2-35) would be implemented requiring fuels staff to work with the district recreation specialist on the timing of burning and notification of the public about these burns. Trails in the Project area closed during hunting season would be a concern, as would closing any dispersed camping sites during hunting season when the sites are typically full.

Watershed Improvement and Restoration Treatments

Proposed watershed improvement and restoration treatments include decommissioning roads and trails; improving trail reroutes; improving (hardening) dispersed recreation sites; and implementing vegetation treatments designed to restore or enhance native riparian vegetation through mechanical or hand treatment, prescribed fire, and planting and seeding.

Approximately 16 miles of NFS roads and 64 miles of unauthorized routes would be decommissioned under this alternative. Of the 16 miles of NFS roads proposed for decommissioning, only 1.4 miles are open roads. Currently, approximately 73 miles of authorized roads are open year-round, and 27 miles are open seasonally, to motorized use within the Project area; a total of approximately 100 miles of open road. The reduction of 1.4 miles of open road for the driving public would not make a difference to recreational use. Decommissioning the unauthorized routes would make it clearer to OHV users that the roads are closed. Most of the unauthorized roads are currently closed under the travel plan, but because they are highly visible to OHV users, their use has continued. The proposed decommissioning would increase the likelihood that OHV users would follow the travel plan.

Three miles of new OHV trail would be developed under Alternative 2. The 3 miles of new OHV trail access would mitigate the 1.4 miles of open road access lost with the road decommissioning, as the trail would be open to all vehicles up to 70 inches wide. Approximately 100 miles of open road would continue to be available for hunting, scenic driving, berry picking, and fuelwood gathering; 27 of these miles are currently closed seasonally.

Trail reroutes designed to improve riparian conditions would also improve recreational use of the trails by placing them in better locations, getting water off the trails in the wet meadow reroutes, consolidating use onto a single pathway, and better orienting trail users to the correct trail.

There would be both positive and negative effects to existing recreational dispersed camping opportunities with implementation of the watershed treatments proposed for Alternative 2. The positive effects would be to the dispersed camping sites identified and chosen for hardening. These hardened (graveled) sites would better facilitate vehicle ingress and egress, reduce dust at the site, and allow for better use of the site during wet conditions. Some of the negative effects to dispersed recreation would be the loss of available dispersed camping spots along the 1.4 miles of NFS road that would be closed to motor vehicle use.

Use of prescribed fire for watershed improvements to riparian areas would be similar to those discussed in the prescribed burning section above.

Aquatic Organism Passage / Habitat Connectivity Projects

Aquatic organism passage / habitat connectivity projects proposed for fish would replace culverts on open FRS 50186 at the Middle Fork Weiser River near the junction with NFS road 50245 and NFS road 50186 at Big Creek. This work would delay and/or eliminate use of the roads to recreationists for scenic driving, dispersed camping using motorized vehicles, and trail access during installation. This is only expected to affect recreational use of these roads for several days during culvert installation, and thus the impact to recreationists would be temporary. Watershed and fisheries improvement actions could include construction of structures for streambank stabilization (e.g., rock gabions and rock riprap), slope stabilization, and fish habitat improvement. Some structural improvements may be visually evident and could detract from the natural landscape. Negative impacts could be mitigated through design and location options, and vegetative cover plantings, where possible. Generally, improvement structures are small and localized, and result in little or no effect on recreation settings and facilities (USDA Forest Service 2003a, p. III-734).

3.9.3.1.3. Alternative 3:

Alternative 3 proposes a greater watershed restoration effort than Alternative 2 and addresses wildlife security. This alternative emphasizes watershed restoration treatments in the Granite Creek subwatershed.

Effects from Proposed Recreation Improvements

All proposed recreation and trail components and associated effects to recreation would be the same as those described for Alternative 2, except a 3-mile OHV loop trail would not be constructed and designated under this alternative.

Alternative 3 would not provide a new opportunity for beginner-level OHV riders because no new OHV trails would be constructed. NFS trail 209 would continue to provide opportunities for OHV riders, although this trail contains sections requiring advanced riding skills.

There are no designated OHV trails in the Project area open to vehicles up to 70 inches wide. Trails are only available to vehicles 50 inches in width or less. However, there is a lengthy open road system offering many riding opportunities for OHVs of all types. As for all action alternatives, the proposed road-to-trail conversion of the West Mountain Jeep Road NFS road 51763 would continue to provide a riding trail for UTV users.

Other Resource Management Actions

Effects on recreation from proposed mechanical treatments, range improvements, prescribed fire, and watershed improvements and aquatic passage projects are similar to those described for Alternative 2.

For Alternative 3, 4.4 miles of open road would be closed and decommissioned (as opposed to 1.4 miles closed in Alternatives 2 and 4). Road closure would leave approximately 95 miles of road open to motorized use. Therefore, closure of 4.4 miles it is not expected to measurably affect access for recreational driving or firewood gathering.

3.9.3.1.4. Alternative 4:

Effects from Proposed Recreation Improvements:

The recreation-related effects of proposed recreation improvements would be the same as addressed for the Proposed Action (Alternative 2).

Other Resource Management Actions:

While the intensity level of mechanical treatment proposals and other resource activities in Alternative 4 would differ from those in Alternative 2, recreation effects from proposed mechanical treatments, range improvements, prescribed fire, and watershed improvements and aquatic passage projects would be similar to those described for Alternative 2.

3.9.3.2. Cumulative Effects

This list, though comprehensive, may contain unintended omissions due to lack of records or knowledge. The listing is intended to demonstrate that relevant past, present, and reasonable foreseeable activities are identified and considered in the analysis of cumulative effects. Past effects in the Project area addressed in this recreation discussion are:

- Past timber harvest in cumulative effects analysis area—9,816 acres of harvest on NFS lands and 8,495 acres on private lands within the Project area
- Water diversions 1939–1941
- NFS roads 1900–present
- Road and trail maintenance—past and on-going
- Fire suppression, including Grays Creek in 2007, burned 17,790 acres
- Livestock management
- Floods—impacting roads and streams in the Project area in 1997 and 2010
- WCS
- Firewood harvest
- Noxious weed treatment
- Recreational use including dispersed camping; developed camping in fee sites or sites with recreation facilities; trail use, maintenance, and construction; livestock use within recreation sites and on the trails
- Forest-wide over-snow grooming decision in 2013
- Recreation use, including camping, hunting, hiking, ATV use, fishing, horse use on trails, motorcycle use on trails, scenic driving
- Implementation of the Payette National Forest Council and New Meadows Ranger Districts Snow-free Season Travel Management Plan ROD (February 2009).

Regardless of the alternative selected in this process, recreation use is likely to increase in the years to come. At the same time, and at a national scale, access to recreation opportunities on private lands is decreasing, creating greater demand on public lands to supply recreation opportunities, especially in locations near urban areas. Both undeveloped and developed areas would be pushed closer toward their capacity limits. Conflict levels and resource impacts from recreation use are likely to continue to increase. Use restrictions resulting from attempts to resolve conflicts, and efforts to mitigate resource impacts, are also likely to increase. These effects are also likely to affect non-National Forest recreation providers to some extent as well (USDA Forest Service 2003b).

If more developed facilities are provided, the resulting change to the natural landscape would increase developed opportunities. Conversely, the change would decrease opportunities for recreationists seeking a more primitive setting and experience.

3.9.3.3. Irreversible and Irretrievable Commitments

There would be no irreversible or irretrievable commitments to the recreation resource with implementation of any of the action alternatives.

3.9.3.4. Forest Plan Consistency

All recreation-related portions of the alternatives would be consistent with Forest Plan direction. The Proposed Action (Alternative 2) would meet the Forest Plan goals/objectives of General Recreation. REGO03 (USDA Forest Service 2003a, p. III-62) which is to: "Address current and emerging recreation conflicts, while maintaining recreation opportunities when possible."

3.10. Roadless

3.10.1. Analysis Scale, Data Sources and Methodology

3.10.1.1. Analysis Scale

3.10.1.1.1. Direct and Indirect Effects Analysis Area

The Council Mountain IRA and the Poison Creek IRA are in MPC 4.1c. Management actions in this MPC must be designed and implemented in a manner consistent with the unroaded landscape.

The Council Mountain RNA is located at the peak of Council Mountain within the Council Mountain IRA in MPC 2.2. The RNA is comprised of sagebrush and subalpine meadow communities and small stringers of subalpine fir plant communities on basalt substrates.

The Poison Creek IRA is small in size, only 5243 acres, with 4854 on the Boise National Forest, and only 389 acres on the Payette National Forest. The Poison Creek area lies within the West Mountain range, west of the Cascade Reservoir. Elevations range from 5,200 feet to 7,836 feet at Lone Tree Summit. Overall, the Poison Creek roadless area is marked by dense timber at lower elevations, giving way to alpine vegetation, meadows, exposed rock outcroppings, and steep nonforested slopes.

The analysis area for direct and indirect effects on the roadless resources are the Council Mountain and Poison Creek IRAs and other uninventoried roadless lands adjacent to the IRAs within the Project Area.

This analysis analyzes the environmental consequences, including irreversible and irretrievable commitment of resources on roadless area attributes, and the effects for potential designation as wilderness under the Wilderness Act of 1964. In 2008, the 9th Circuit reaffirmed the analysis must also encompass uninventoried roadless lands. This analysis must consider the effects to the entire roadless expanse—that is, both the roadless area and the unroaded lands contiguous to the roadless area.

3.10.1.1.2. Cumulative Effects Analysis Area

The cumulative effects analysis area is the entire Project area.

3.10.1.1.3. Temporal Scale of Analysis

Time frames as defined in the Forest Plan were used for analysis of effects: temporary (0–3 years), short-term (3–15 years), and long term (15 or more years).

3.10.1.2. Data Sources and Methodology

Data sources used include the 2003 Southwest Idaho Ecogroup Land and Resource Management Plan FEIS Appendix C, Volume 3: Roadless Area Re-evaluation (USDA Forest Service 2003b) and the Idaho Roadless Rule of 2008. The purpose of the analysis on the roadless resource is to disclose potential effects to roadless and wilderness attributes and determine if or to what extent the Project might affect future consideration for wilderness recommendations. This analysis focuses on the potential effects of Project activities on

wilderness characteristics as defined in the FSH 1909.12 (72.1). The following wilderness characteristics were evaluated (FSH 1909.12 [72.1]):

- Natural—The extent to which long-term ecological processes are intact and operating.
- Undeveloped—The degree to which the impacts documented in natural integrity are apparent to most visitors.
- Outstanding opportunities for solitude or primitive unconfined recreation—Solitude is a personal, subjective value defined as the isolation from sights, sounds, and presence of others and from developments and evidence of humans. Primitive recreation is characterized by meeting nature on its own terms, without comfort and convenience of facilities.
- Special Feature and values—Unique ecological, geographical, scenic, and historical features of an area.
- Manageability—The ability to manage an area for wilderness consideration and maintain wilderness attributes.

The analysis for the effects on other roadless resource attributes, such as water resources, soils, and wildlife habitat, are found in other sections of the DEIS.

3.10.1.3. Analysis Indicators

The indicators for analysis to the roadless resource are the five wilderness characteristics described in section 3.10.1.2. The analysis indicators were used to compare the alternatives and determine compliance with Project design features, Forest Plan standards and guidelines (USDA Forest Service 2003a), and the 2008 Idaho Roadless Rule.

3.10.2. Affected Environment

3.10.2.1. Current Condition

3.10.2.1.1. Council Mountain IRA

The Council Mountain IRA is 16,567 acres in size; over half of the IRA (9,437 acres) lies within the Project area. The Council Mountain RNA is 111 acres in size; 67 acres of the RNA occur in the Project area, the rest are still within the IRA, but outside the MRWR Project Area. Recreational use of the RNA is not encouraged.

The Council Mountain IRA covers the top of Council Mountain, which is bordered on the west by Council Valley and on the east by the Middle Fork Weiser River. The Middle Fork Weiser River Road, East Fork Weiser River Road, and Cottontail Creek Road provide principal access. A few primitive trails crisscross the area. The area is surrounded by a combination of private and public lands, with the Snowbank IRA located several miles to the south (on the Boise National Forest). Cirque basins with granite intrusions and steep, grassy, basaltic slopes characterize the area.

Recreational use in the Council Mountain IRA is mainly dispersed recreation, including hunting, hiking, fishing, horseback riding, trail riding, and scenic viewing. Six NFS trails occur in the area. The IRA has approximately 14.6 miles of trail: 12.6 miles are motorized

and 2.0 miles (portion of NFS trail 198) are non-motorized. Inventoried ROS is primarily RM and SPM.

The IRA contains bull trout rearing habitat, rainbow trout, and introduced brook trout. Many terrestrial wildlife species also make their home in the IRA.

A portion of one cattle allotment covers 100% of the roadless area. No mining claims and no approved plans of operation exist within the Council Mountain IRA.

Lands Contiguous to the Roadless Areas

Numerous miles of existing open roads and heavily logged private land are located within several acres of all sides of the Council Mountain IRA boundary. This does not leave a sufficient block of additional acres, therefore, no acres of unroaded lands contiguous to the roadless area needed to be analyzed.

Capability/Wilderness Characteristics

Natural Integrity and Appearance: The natural integrity and appearance for the Council Mountain IRA are medium to high. The area is somewhat affected by grazing-related developments, such as fencing and water ponds, as well as other developments occurring near the border. An estimated 2.1 miles of unauthorized road and 0.2 miles of NFS road occur within the IRA boundary. These mentioned facilities cover only several acres, leaving thousands of acres unaffected by their presence. Upon leaving the above mentioned features, visitors experience a natural, untrammeled area.

Opportunities for Solitude and Primitive Recreation: Due to the visibility of the town of Council and easy access to the IRA, this area provides only a moderate opportunity for solitude and primitive recreation. Two-wheel motorized use is allowed, designated, and prevalent throughout the IRA. The open ridges and deep snow pack in the area make it popular for winter sports, including challenging ski mountaineering. The majority of the IRA is open to over-snow motorized use.

Special Features: As stated above, the Council Mountain RNA is within the Council Mountain IRA.

Manageability and Boundaries: The IRA has fairly irregular and complex boundaries along much of its perimeter and is less than 1.0 mile wide at one point. More manageable boundaries could be defined but would reduce acreage. Established motorized use within the roadless area, as well as on private land, along the south and southeast perimeter could complicate managing this area as wilderness.

Public interest to designate the Council Mountain IRA as wilderness has been low. No portion of the Council Mountain IRA was recommended for wilderness in the 2003 Forest Plan ROD (USDA Forest Service 2003c).

3.10.2.1.2. Poison Creek IRA

A very small portion of the Project area is in the Poison Creek IRA. The IRA is 5,243 acres, with 4,854 located on the Boise National Forest and 389 acres on the Payette National Forest. Only 75 of the 389 acres of the IRA on the Payette National Forest are within the Project boundary.

Two motorized trails occur within the roadless area; however, all trail miles are located within the Boise National Forest portion of the IRA. Trail use is low and generally occurs during the fall big-game season.

The IRA is open to over-snow travel. Inventoried ROS is primarily RM in the summer and SPM in the winter.

The ridgetop provides an important raptor migration corridor. Multiple game and nongame wildlife species occupy the IRA. No bull trout occur in any of the streams in the IRA, no fishery is located in Poison Lake, and no grazing allotments are located in the area. However, 5 mining claims occur in the IRA.

Lands Contiguous to the Roadless Areas

A main road is located directly at the southern, northern, and western boundaries of the Poison Timber IRA, preventing any contiguous unroaded lands analysis. The Boise National Forest is located to the east; since no projects are planned on that end of the IRA, the east side is not discussed in this analysis.

Capability/Wilderness Characteristics

Natural Integrity and Appearance: The Poison Creek IRA appears primarily affected by the forces of nature, with little evidence of human imprint. The natural integrity of the area is intact. Two short segments of unauthorized roads, totaling 0.35 miles, can be found within the perimeter of the IRA.

Opportunities for Solitude and Primitive Recreation: Opportunities for solitude and primitive recreation can be found due to the rugged terrain and forested cover over much of the area, but the relatively small size of the IRA diminishes the opportunities for challenge and risk. In some locations of the IRA a feeling of solitude or remoteness is diminished by the proximity of Cascade Reservoir, the adjacent rural developments, and nearby communities of Cascade and Donnelly.

Special Features: The high-elevation Poison Lake is a special water feature. Lone Tree Summit is a notable landmark feature.

Manageability and Boundaries: The ridge along the western boundary would form a logical boundary as would land ownership boundaries along the north, south, and eastern IRA boundaries.

The degree of public interest for designating Poison Creek IRA as wilderness is unknown at this time as this area is a recently delineated roadless area and has not undergone any formal scoping or public comment relative to wilderness designation. The Forest Plan did not recommend any portion of the Poison Creek IRA for wilderness (USDA Forest Service 2003a), and stated that essentially, all of the IRA would be available for low levels of development.

3.10.2.1.3. Idaho Roadless Rule

The Idaho Roadless Rule of 2008 designated a system of lands called Idaho Roadless Areas and established five MA themes for individual roadless areas. Council Mountain IRA was identified under a “Primitive” roadless management theme and Poison Creek IRA under a “Back Country/Restoration” theme. Allocation to a specific theme is not intended to mandate or direct the Forest Service to propose or implement any action; rather, the themes provide an

array of permitted and prohibited activities regarding timber cutting, sale, or removal; road construction and reconstruction; and mineral activities.

Under the "Primitive" theme, the Council Mountain IRA would be managed to remain relatively undisturbed by human management activities while allowing for limited forest health activities including preserving biological strongholds for a variety of species and protecting ecological integrity.

Under the "Back Country/Restoration" theme, the Poison Creek IRA would be managed to retain its undeveloped character, while providing a variety of recreational opportunities and allowing for limited forest health activities, including preserving biological strongholds for a variety of species and maintaining or restoring the characteristics of ecosystem composition and structure.

3.10.3. Environmental Effects

3.10.3.1. Direct and Indirect Effects to Inventoried Roadless Areas

3.10.3.1.1. Alternative 1

Under the No Action alternative, the large-scale project implementation described for the Proposed Action would not be implemented; therefore, no new impacts to the IRAs would need to be addressed. Smaller site-specific projects, including trail maintenance and improvements, would be expected over the short and long term inside and adjacent to the roadless areas. These site-specific projects are outside the scope of this analysis and will be addressed under subsequent project-specific NEPA analyses.

3.10.3.1.2. Alternatives 2, 3, and 4

Under Alternatives 2,3, and 4 the following actions are proposed within the Council Mountain and Poison Creek IRAs:

1. Sign and formally designate NFS trail 212 as open for non-motorized use. Complete needed switchback trail construction to mediate the steep sections of this 0.8-mile long trail.
2. Reroute portions of NFS trail 198 near the base of Council Mountain to reduce resource impacts and improve sustainability. Work to reduce congestion of multiple trail junctions in this sensitive upper elevation trail network.
3. Change the designation of a 2-mile section of NFS trail 198 running through the Council Mountain IRA from non-motorized to two-wheel motorized to accommodate continued two-wheel motorized access on the entire trail.
4. Fully obliterate and decommission 9 segments of unauthorized routes, totaling 0.8 miles.
5. Maintain 15 miles of trails.
6. Reroute the south portion of NFS trail 198 (4.2 miles within roadless) and the east portion of NFS trail 205 (1.7 miles within roadless) to avoid sections currently located on private land without an easement held by the Forest Service, to provide legal access to these trails. Establish new trailheads with parking and potential hitch

rails for stock near Cabin Creek Campground (NFS trail 198) and 0.5 miles north of Lake Creek on NFS road 186 (NFS trail 205).

No timber cutting, prescribed burning, fish passage projects, or hydrology projects are proposed within the Council Mountain IRA.

Projects proposed within the Poison Creek IRA are:

1. Unauthorized route decommissioning: full obliteration – 1 segment, 0.2 miles.

Section 3.10.1.2 describes the wilderness characteristics analyzed for this IRA. Implementing actions 1, 2, and 5 described above (trail signing, trail improvements, trail realignments, and trail maintenance), would not measurably change or impact the wilderness characteristics of natural, undeveloped, primitive recreation; special features; or manageability of the Council Mountain IRA. All trails exist on the ground, and trails are an acceptable feature in wilderness if this IRA were to ever be designated as such. The trail improvements could potentially increase visitor use in the area, which can impact solitude, but impacts would still be acceptable within the SPM ROS standards for visitor use numbers.

The proposed trail designation change from non-motorized to motorized listed above in item 3 for NFS trail 198 is for a 2-mile section; both ends of this section are currently designated as two-wheel motorized. The Council Mountain IRA existing condition includes primarily two-wheel motorized use on the trail system. Changing the designation of a 2.0-mile section of NFS trail 198 from non-motorized to two-wheel motorized should not measurably add to impacts from motorized use to the wilderness characteristics of the Council Mountain IRA. Additionally, the proposed designation change from non-motorized to two-wheel motorized would not likely add to noise impacts in the area, as they were already occurring, for the most part, under existing conditions.

Rerouting NFS trails 198 and 205 onto NFS lands (proposed in 6 above) would require constructing several miles of new trail in the Council Mountain IRA. However, trails are an accepted part and feature within IRAs. Both trail reroutes would occur directly adjacent to the IRA boundary so would not introduce new impacts to solitude, naturalness, or undeveloped into large undeveloped areas within the IRA.

None of the proposed recreation trail-related changes would affect the potential to manage the Council Mountain IRA for wilderness consideration. If the area were to be designated by Congress as wilderness, all trails would remain and designated use would be changed to non-motorized.

The proposed route decommissioning of unauthorized routes proposed for the Council Mountain IRA (0.8 miles) and the Poison Creek IRA (0.2 miles) would improve wilderness characteristics and attributes by making the area more natural and undeveloped.

None of the proposed activities within the Council Mountain IRA would change or alter the existing ROS, as all proposed trail activities support the continued recreation opportunities of SPM, SPNM, RN and RM.

Completing the projects listed above in the Council Mountain IRA would be within allowable improvements and activities under the Idaho Roadless Rule and meet Forest Plan standards and guidelines (USDA Forest Service 2003a) for activities within IRAs.

No road construction or reconstruction is proposed under Alternative 2. Approximately 1.0 miles of unauthorized routes are proposed for decommissioning; these routes would be obliterated. Some timber would be felled to facilitate this obliteration. Incidental timber

cutting would occur during trail rerouting, trail maintenance, and road obliteration. Trees would be submerchantable in size to small-diameter trees. These would be left on site and used for erosion control measures where needed. Timber cutting to facilitate trail maintenance would occur on all trails within the project area, including those trails within the IRA,

Idaho Roadless Rule

The "rules" within the Idaho Roadless Rule would not be violated by any actions proposed under Alternative 2. Trail maintenance and construction activities are proposed in the Council Mountain IRA, but all proposed activities meet the intent of the Idaho Roadless Rule (36 CFR 294.26(a)). Minimal timber cutting to clear the proposed trail reroutes could occur on NFS trails 212, 198, and 205; but, timber cutting would be incidental to implementing a management activity not otherwise prohibited (trail clearing). Proposed activities 1, 2, 4, 5, and 6 would include timber cutting of incidental small trees; cut timber would be left in place on the ground (36 CFR 294.24).

3.10.3.2. Cumulative Effects

Vegetative treatments, including timber harvesting and prescribed fire, are proposed on NFS, State, and private lands adjacent to the IRAs. Continued recreational trail improvements within the IRA could bring additional visitors into the IRA but are not expected to have a negative effect on the IRA wilderness character or attributes.

None of the proposed projects within the IRA would have a measurable cumulative effect to either the Council Mountain or Poison Creek IRAs wilderness capability or wilderness characteristics.

Irreversible and Irretrievable Commitments

None of the proposed projects within the Council Mountain and Poison Creek IRAs would have irreversible and/or irretrievable commitments to make the IRAs ineligible for future wilderness designation under the 1964 Wilderness Act. While there is existing motorized use within the IRAs, if the IRAs were designated as wilderness, motorized use would revert to non-motorized use on the trails, and existing motorized over-snow use would no longer be allowed.

3.11. Transportation

3.11.1. Analysis Scale, Data Sources and Methodology

3.11.1.1. Analysis Scale

3.11.1.1.1. Direct, Indirect, and Cumulative Effects Analysis Area

The analysis area for transportation is the Project area within the Middle Fork Weiser River watershed.

A TAP was prepared for this project in 2013 and a MRS recommendation identified by the IDT (USDA 2013b). The MRS identified NFS roads needed for the protection, administration, and utilization of NFS lands and the use and development of their resources.

A significant amount of mixed ownership occurs in the Project area. Much of the area is held by Potlatch Corporation, an industrial timberland owner. Access is complex and involves miles of cost-shared roads and other easements similar to cost sharing, which may limit Forest Service options for managing these roads.

Currently, 83 miles of existing easements occur on NFS lands accessing private lands in the Project area.

3.11.1.1.2. Temporal Scale of Analysis

The project is expected to occur over a 10 year period (2016-2026). The long-term impacts related to changes in the transportation system are analyzed for more than 15 years.

3.11.1.2. Analysis Process/Measurements and Indicators

The following issue was identified as affecting transportation in the Project area, and the indicator described below was used to compare alternatives.

Issue Statement:

Proposed activities to the road system (i.e. road closures and decommissioning) may reduce the amount of access to the areas identified in the Forest Plan for active management.

Indicators:

- Suited timberlands within 0.25 miles of an NFS road (includes closed roads).

3.11.1.3. Data Sources and Methodology

3.11.1.3.1. Forest Plan Direction

The Forest Plan (USDA Forest Service 2003a), contains the goals, objectives, standards and guidelines for roads (Table 2-19). Land suitable for timber harvest is also described in the Forest Plan based on a combination of PVGs (PVGs 2-10), MPCs (MPCs 4.2, 5.1, 5.2, 6.1, 6.2 and non-wild segments of 2.1), and RCA buffers (RCAs of 300 feet—perennial streams and 150 feet—intermittent streams).

3.11.1.3.2. GIS Data

The Forest Service (Payette National Forest-Specific) GIS library of roads, suited timber lands, MPC, and RCA was used to derive suitable timber lands within 0.25 miles of systems roads for the project area.

3.11.1.4. Desired Condition

The road network matches the level of management activities occurring on the Forest and supplies the transportation system needed for recreation, special uses, timber harvest, range management, minerals development, fuels reduction, and fire protection. The transportation network is managed through the use of a variety of tools to reduce degrading effects to resources. Roads needed for long-term objectives are maintained to provide for user safety and resource protection. Roads not needed for long-term objectives are decommissioned and stabilized (USDA Forest Service 2003, p. 3-58).

The Project is located completely within MA 3, Weiser River. MA 3 has additional management direction in the form of Road Guideline 0311, which states the following (USDA Forest Service 2003, p. 3-130):

Road construction or reconstruction may occur where needed:

a. To provide access related to reserved or outstanding rights;
b. To respond to statute or treaty;
c. To achieve restoration and maintenance objectives for vegetation, water quality, aquatic habitat, or terrestrial habitat;
d. To support management actions taken to reduce wildfire risks in WUI areas; or
e. To meet access and travel management objectives as described in the Forest Plan

3.11.2. Affected Environment

3.11.2.1. Current Condition

The Middle Fork Weiser River watershed road system was primarily developed for timber harvest access. The majority of the road system was constructed within the last 60 to 70 years, with most activity occurring in 1950s, 1960s, and 1970s. The main access route through the area is Middle Fork Weiser River Road (NFS road 50186). This county road is a single to one-and-a-half lane with crushed aggregate surface. The watershed contains about 385 miles of road of which 159 miles are NFS road and 164 miles of identified unauthorized

roads on NFS lands. Additional unclassified roads exist within the area but have not been mapped. NFS roads have been identified as needed for protecting, administering, and using the Forest and using and developing its resources. Unauthorized roads are defined as roads other than an NFS road or temporary road and are not included in a Forest transportation atlas (36 CFR 212.1). Most unauthorized roads in the Project area are the result of past timber harvest, primarily in the 1950s and 1960s. Currently, 36 miles of NFS road (22%) are managed as closed. Ninety-three miles (59%) of the NFS road system maintained for high clearance vehicles are open, seasonally open, and open to administrative use only. Thirty miles (19%) of NFS roads are maintained for passenger car travel.

3.11.3. Environmental Effects

3.11.3.1. Direct and Indirect Effects

3.11.3.1.1. Road Actions

All Alternatives

Table 3-114 displays road actions by alternative occurring in the Project area in support of harvesting biomass and saw timber. Routine road maintenance would occur on other roads that are not connected to the Proposed Action.

Table 3-114. Road actions in support of timber and biomass harvest

Type of Road	Road Activity	Miles by Alternative		
		Alt. 2	Alt. 3	Alt. 4
Temporary Roads	New Construction	9.7	8.1	8.3
	Use and Decommission	34.3	27.0	43.6
National Forest System Roads	Maintain or Improve	79.4	76.4	79.5
	Add to System	0	0	4.0
	Realignment	2.2	0/0	4.5
	Use and Close	21.3	17.3	21.5
	Long-Term Closure	27.3	22.9	27.4
	Convert to Trail	4.5	4.5	4.5
	Use and Decommission	12.9	19.6	12.9
	Decommission	16.1	23.3	16.1

Alternative 1 is not displayed in Table 3-114 as no Project-related road work would occur under the No Action Alternative. However, yearly road maintenance not connected to the Project would continue to occur in the project area.

Temporary roads are needed to access units for timber harvest where existing NFS road access is not available. Two types of temporary roads are identified in this project: new construction and existing non-NFS roads. Both types of temporary roads would be obliterated after harvest activities are completed for the Project. Road obliteration is a decommissioning technique used to eliminate the functional characteristics of a travel-way and reestablish the natural resource production capability. The intent is to make the corridor unusable as a road or a trail and stabilize it against soil loss, which can involve recontouring and restoring natural slopes (USDA Forest Service 2003a, GL-32). Refer to sections 3.4 through 3.7 for further information on the effects and need for road obliteration. Alternative 2 would have a modest level of harvest but, compared to the other action alternatives, would

require the most new temporary road construction to access the acres planned for harvest (Table 3-114). Alternative 4 would harvest the most timber, but the proposed addition of existing roads to the system would reduce the miles of new construction required and allow for obliterating the most miles of non-NFS travel-ways. Alternative 3 would require the same temporary road construction as Alternative 4, but would obliterate the fewest miles of existing travel-ways due to the least amount of harvest activities.

Alternative 4 proposes to add 4.0 miles of existing unclassified road to the NFS that were associated with past land exchanges as well as relocate 1.7 miles of unclassified road to connect to the existing road system. The road network in these areas has never been classified because harvest activities have not occurred since the land exchange. The opportunity to reduce road density through decommissioning unneeded roads and enhance the management opportunities for these areas by relocating portions of other roads will increase the accessible acres within the project area. The roads added to the system and relocated will be brought up to standard to haul commercial timber and remain closed to the public.

Two categories of NFS road obliteration are proposed for the Project (Table 3-114). One category would be used to obliterate existing NFS roads used for timber harvest. This is much like temporary road use and obliteration of non-NFS roads, except planned construction of the road occurred in the past in anticipation for future use. The other category would be to obliterate the road without using it. Alternative 3 would decommission the most miles of NFS road, while Alternative 4 would decommission the fewest miles. Decommissioning would remove the road from the Forest's transportation system, which could require constructing new roads or temporary roads to access those lands in the future.

The category of maintain or improve (Table 3-114) includes NFS roads that are to remain drivable after completing Project activities. Work on these roads would be classified as maintenance and would replace or improve drainage structures, remove encroaching brush, replace surfacing where needed, add drainage features such as armored dips, spot gravel, and reshape road surfaces where needed. The main gravel roads would be maintained for passenger car use, while secondary roads would be maintained for high clearance vehicle use and designed to make the road as self-maintaining as possible while reducing impacts to other resources. Alternative 3 proposes to close all NFS roads designated as administrative use only by pulling culverts and constructing barriers to prohibit vehicle use.

The category of use and close (Table 3-114) are roads currently open for administrative use only that would be used, and then put into long-term closure (ML1) status. Alternatives 2 and 4 propose the most miles of use and close roads since most of the administrative use only roads would remain on the system, whereas Alternative 3 would decommission some of those roads.

Gravel is proposed for stream crossings or where roads are within RCA buffers. Graveling would occur on roads that are to remain open to vehicle use or roads used for hauling logs. Alternatives 2 and 4 would gravel more miles than Alternative 3 since these alternatives would retain administrative use only roads and close fewer roads to public traffic.

Road-to-trail conversion is proposed under all alternatives and would move management of a 4.5-mile portion of West Mountain Jeep Trail (NFS road 51763) from NFS roads to the NFS trails. The trail would remain open to all vehicles.

3.11.3.1.2. Road Access for Management

All Alternatives

Proposed road system activities (e.g., road closures and decommissioning) could reduce the access to the areas identified in the Forest Plan for active management. Road access is needed for economical active management activities, such as timber and biomass harvest, thinning, and fuels treatments. The public has identified access as an issue to be evaluated. Refer to section 3.9 for effects of alternatives on road access for the public recreation.

Roads are needed to transport goods and services to and from the Forest. Economical harvest of saw logs and biomass requires roads within a reasonable distance for ground-based and skyline logging. Helicopter logging requires much less road but is usually uneconomical, especially for thinning and biomass removal.

Acreage of suited timberland within 0.25 miles of a NFS road was used to evaluate the level of access provided for economic harvest of saw logs and biomass. Logging systems vary by terrain. Ground-based skidding is primarily downhill on ground slopes less than 45%, with maximum skidding distances of 800– to 2,500 feet. Sometimes, skidding distances of 3,500 feet or more occur, but distances are not often this long due to terrain constraints and juxtaposition of the land. Skyline logging occurs uphill to roads, usually on slopes greater than 45%. Skyline logging depends on terrain, as it requires the slope beneath the skyline to be a concave shape to allow cable deflection. The deflection provides lift so logs can be suspended while yarding. Typical yarding distance for skyline logging on the Forest is between 800 and 1,500 feet, with some distances up to 2,500 feet.

Suitable timberlands within 0.25 miles from an existing road were used as an approximation to account for terrain variability. The Project area has an estimated 17,151 acres of land within the suited timber base. Currently, 12,455 acres (73%) is within 0.25 miles of an existing NFS road. This acreage is considered a reasonable estimate of current condition given the past intensive timber harvest in the area between the 1950s and 1980s. A decrease in acreage of suited timber base within 0.25 miles of a road would likely increase the need for new road construction or temporary road construction in order to economically manage the suited timber base.

Table 3-115 shows the changes to suited timberland proposed within 0.25 miles of an NFS road. Alternatives 2 and 3 propose decommissioning 29 and 34 roads, respectively, which would decrease the currently accessible suited timberland. Alternative 4 would add 13 existing roads to the system and decommission the same 29 roads as under Alternative 2, which would decrease the loss of accessible suited timber land.

Table 3-115. Suited timber lands within 0.25 miles of National Forest System roads (includes closed roads)

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Acres	12,455	11,567	10,933	12,218
Change in Acres	0	–888	–1,522	–237
Percent Change (%)	0.0	–7.1	–12.2	–1.9

Open road access is needed for noncommercial management activities including; thinning, fuels treatments, firewood gathering, weed control, improvement maintenance, and fire

suppression. Generally, the closer these activities occur to drivable roads, the less they cost. Roads that are put into long-term closure usually have culverts pulled and are not drivable and would require activities similar to construction prior to use. Opening roads in long-term closure would normally require installing culverts, removing barriers, and compacting the driving surface in order to access NCT, fuels reductions, controlled burning, firewood gathering, and mechanical fire suppression. Long-term road closures usually are not returned to service unless in conjunction with commercial harvest activities. The further people have to walk or be flown in, the more these management activities cost. Fire engines are usually restricted to open roads, making engine use for controlled burning and fire suppression limited to areas close to open roads. Table 3-116 displays the suited timberlands within 0.25 miles of an open NFS road. Alternative 1 (No Action) would not reduce access. Alternative 2 would reduce access by 1,061 acres (9.7%). Alternative 3 would reduce access by 1,630 acres (–14.9%), the largest access reduction of the action alternatives due to increased decommissioning and closing existing administrative use only roads. Alternative 4, with the addition of existing non-NFS roads, would only reduce access by 162 acres (1.5%).

Table 3-116. Suited timber lands within 0.25 miles of an open National Forest System road (includes administrative use only roads)

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Acres	10,972	9,911	9,342	10,810
Change in Acres	0	–1,061	–1,630	–162
Percent Change (%)	0.0	–9.7	–14.9	–1.5

Road Graveling and Gravel Pits

All Alternatives

All alternatives propose spot-graveling, where needed, on roads to be used for hauling logs or biomass. Project-related gravel placement would include 5.0 miles on Granite Creek (NFS road 50245), 2.5 miles on King Hill–Fall Creek (NFS road 50214) and 1.2 miles on little Creek (NFS road 50692). Spot-graveling would be used to stabilize soft spots and armor drivable dips and road surfaces at stream crossings. The source of gravel for the Project would be from existing and identified potential gravel pits adjacent to or in the Project area. A brief description of the gravel pits follows.

Five Corners

The Five Corners Pit site is located in the SW ¼ of the NE ¼ of Section 29, T. 17 N., R. 2 E. on diced upper basalt geology. The pit has been used for pit run and crushed aggregate in the upper Middle Fork Weiser and upper East Fork Weiser River areas. The pit is about 2.5 acres in size and is accessed by NFS road 51817.

Wolf Creek Crossing

Wolf Creek Crossing Pit is located on NFS road 50326 to the west of Wolf Creek in the Upper Little Weiser River drainage. The pit is on lower basalt geology. The legal location is the SW ¼ of the NE ¼ of Section 33, T. 15 N., R. 2 E. The pit is about 2 acres in size and has been used as a crushed rock and pit-run source. The pit would require expansion up to 2 acres for removal of additional rock.

Jungle Pit

Jungle Pit is located in the Upper Jungle Creek drainage on Forest Service lands. The site is located in T. 16 N., R.2 E., Section 23 at the end of NFS road 51796. The 0.1-acre site is a large exposure of diced lower basalt bedrock developed with the previous Middle Fork Weiser River EIS and planned for 2 acres of disturbance. Rock from this site is suitable for pit-run or crushing and will likely be used for gravel in the area.

Fall Creek Pit

Fall Creek Pit site is located in the NE ¼ of the NE ¼ of Section 23, T. 15 N., R. 2 E., along NFS road 50436. The undeveloped site is located on gently sloped lower basalt scabland; no tree removal would be necessary and about 2 acres of disturbance expected. Rock from the pit would make suitable crushed aggregate and pit-run surfacing. The pit site would likely be used for future aggregate needs within the area and was identified in the previous Middle Fork Weiser River EIS.

Warm Bar Pit

Warm Bar Pit is located north of NFS road 50186 between Warm Spring Creek and Bar Creek in the NW ¼ of the SE ¼ of Section 11, T. 15 N., R. 1 E., on lower basalt rock. The 0.5-acre pit was developed in conjunction with the 2010 ERFO repair work on the Middle Fork Weiser River and closed after the work was completed. Rock from this pit would make suitable rip-rap and possibly suitable crushed aggregate surfacing if fines are present, but would likely require blasting to reduce the rock in place. The pit would require expansion up to 1 acre for removal of additional rock.

All of the gravel pits have suitable rock for present and foreseeable future expansion needs. The pits would continue to be used for road maintenance activities. Activities in the pits would be coordinated with the Wildlife Biologist for any restrictions or constraints for protection of wildlife. Expansion of the gravel pits outside of the existing disturbed area would require additional coordination with resource specialists such as heritage, botany, and wildlife. Alternate or additional pit locations could be considered when the impacts of developing a new rock source would be less or equal to using an existing source.

3.12. Economics/Socio-Economics

3.12.1. Analysis Scale, Data Sources and Methodology

3.12.1.1. Analysis Scale

3.12.1.1.1. Direct, Indirect and Cumulative Effects Analysis Area

The Project area is located entirely within Adams County, Idaho. Although all restoration activities would occur in Adams County, there are economic linkages between the NFS lands within the Project area and neighboring communities in Idaho and Valley counties. To analyze how the proposed Project may affect the local economy, the economic study area includes all of Adams, Idaho, and Valley counties and a number of incorporated and unincorporated communities in the vicinity of the Project. Because the Project's landscape is near the LCBC Landscape Restoration Project EIS, on the New Meadows District of the Forest, significant overlap occurs between the existing conditions of the two projects. This overlap enables this Project to draw heavily from the Economics Report prepared for the LCBC Restoration Project EIS. Additional information and updates have been provided, as needed, based on information from the Forest IDT and public interests.

3.12.1.1.2. Temporal Scale of Analysis

Implementation of the project in its entirety is expected to occur between 2016 and 2026 (including pre- and post-treatment). The analysis covers annual quantitative and qualitative effects (direct, indirect, and cumulative) throughout this time period. Within the overall implementation period, the span of activities and treatments will vary between 3 and 9 years. This type of accounting applied present net value with a 4% discount rate to reflect the current value of future financial transactions for project activities.

3.12.1.2. Data Sources and Methodology

The analysis of economic effects considers market-related values in a financial efficiency analysis as well as job and labor income in an economic impact analysis. Nonmarket values, such as the value of recreation experiences and some ecosystem services, by their nature are difficult to quantify. Direction provided in 40 CFR 1502.23 and FSH 1909.15, (7/6/04) and 22.35 (01/14/05) provides for the use of qualitative analysis to evaluate the effects of these nonmarket values. The nonmarket aspects of each proposed activity will be described in other resource sections of the EIS and in specialist reports (available in the project record).

Financial efficiency is a comparison of the costs and benefits that can be quantified in terms of actual dollars spent or received in the study area over the life of the Project. As FSH 2409.18 indicates, this analysis compares anticipated costs and revenues that are part of Forest Service monetary transactions. Given the information provided, financial efficiency measures are calculated in this analysis to provide a means of comparing the financial efficiency of alternatives. This analysis offers a consistent measure for comparing alternatives. However, it should not be viewed as a complete answer, but only an examination of trade-offs between costs and benefits. The financial efficiency measures discussed below, along with social, ecological, or other nonmarket values discussed throughout the document, provide a complete comparison of the alternatives.

The alternatives are compared using a financial efficiency measure called net present value (NPV). This measure is generated using a program developed by the USDA Forest Service called Project Economic Analysis Tool (PEAT) and depends on a principle called the "time value of money." The idea is that money received now is worth more than the same amount received in the future. This concept makes sense since the money received now could be put to some advantageous use or can accrue interest until the future date. Using this concept, estimates of benefits and costs occurring in the future were collected from resource specialists through data entry worksheets in PEAT and then discounted back to represent their current value. A 4% discount rate is commonly used for evaluations of long-term investments and operations in land and resource management by the Forest Service (FSM 1971.21). This discount rate is used in the calculation of NPV.

According to Circular A-94 published by the Office of Management and Budget, NPV is the standard criterion for deciding whether a project is economically justifiable. NPV compares all monetarily valued costs and benefits and is calculated by subtracting the discounted sum of costs from the discounted sum of benefits. A positive NPV suggests the discounted sum of benefits is greater than the discounted sum of costs; a negative NPV suggests the opposite.

Management of the forest is expected to yield positive benefits but not necessarily financial ones. Costs for restoration activities are based on recent experienced costs from other projects on the Forest (e.g., prescribed burning, understory thinning) and from professional estimates provided by project resource specialists. Non-harvest related costs are included in the NPV analysis but are not included in appraised timber value.

Economic impacts, in terms of employment and labor income, are used to evaluate potential direct, indirect, and cumulative effects on the study area's economy. Economic impacts are estimated using input-output analyses. Input-output analyses are a means of examining relationships within an economy, both between businesses and between businesses and final consumers; it captures all monetary market transactions for consumption in a given time period. The resulting mathematical representation allows one to examine the effect of a change in one or several economic activities on an entire economy, all else being constant. This examination is called impact analysis and the input-output modeling tool most commonly used by the Forest Service is IMPLAN. The IMPLAN modeling system allows the user to build regional economic models of one or more counties for a particular year. The model for this analysis used the 2013 IMPLAN data. IMPLAN translates changes in final demand for goods and services into resulting changes in economic effects, such as labor income and employment of the affected area's economy.

The economic impact effects are measured by estimating the direct jobs and labor income generated by (1) the processing of the timber volume from the Project and (2) the dollars from any restoration activities of the Project going into the local economy affected by the treatments proposed. Additional indirect and induced multiplier effects (ripple effects) are generated by the direct activities. Together, the direct and multiplier effects comprise the total economic impacts to the local economy and are measured through response coefficients unique to the Project area economy.

Response coefficients estimated by IMPLAN report the impacts to jobs and income per a specified unit of a restoration treatment activity. After measuring multiplier effects in IMPLAN, local response coefficients are imported into a Microsoft Excel workbook known as Forest Economics and Analysis Spreadsheet Tool (FEAST). Developed by the Forest Service for impact analysis, FEAST serves as the interface between user data and IMPLAN. When project design data collected from resource specialists in PEAT are entered into

FEAST, FEAST uses the imported response coefficients to measure how restoration activities proposed under the Project would cause ripples through the economy, impacting employment and income levels.

The data used to estimate the direct effects from the timber harvest and processing were provided by the University of Montana's Bureau of Business and Economic Research (BBER) (Morgan et al. 2013). This national data is broken into multi-state regions and is considered more accurate than that which is available from IMPLAN. The BBER Region for Idaho and Montana is used for this analysis given the concentration of sawmills in Idaho expected to receive volume from this project. The BBER data represents the results of mill censuses that correlate production, employment, and labor income.

The discussion of potential jobs and income impacts should occur alongside consideration of nonmarket values and financial efficiency. Changes in final demand for goods and services provided by the National Forest can contribute to employment and income in the area. However, this demand could be disproportionately impacted by availability of substitute or complementary goods and services available. Therefore, it is important to consider the efficiency of using these resources alongside potential job and income generation from their use.

3.12.1.3. Analysis Indicators

The analysis indicators used are described in Table 3-117.

Table 3-117. Socioeconomic analysis indicators

Indicator	Measure	Source
Financial Efficiency (Quantitative)	Net Present Value of Treatments (Ten-Year Period)	Specialist Interviews Estimated Costs Adjusted for 4% Discount Rate Timber Revenue (based on Predicted High Bid and Yield)
Regional Economic Impact (Quantitative)	Employment Labor Income	Economic Profile System – Human Dimensions Toolkit IMPLAN modeling American Community Survey 2014
Ecosystem Services (Qualitative)	*Avoided Cost* Wildfire Suppression Property Damage Water Quality Air Quality Tourism Timber	
Environmental Justice (Qualitative)	Potential Adverse Effects	Various literature reviews (see references in text)

3.12.2. Affected Environment

3.12.2.1. Current Condition

Existing social and economic conditions are necessary to establish a baseline from which to estimate potential consequences of the Middle Fork Weiser River Landscape Restoration Project. This section analyzes the current conditions and trends related to the social and economic environment of the economic study area, including population and demographic changes, potential EJ populations, and employment and income conditions.

3.12.2.1.1. Population and Demographics

Population is an important consideration in managing natural resources. In particular, population structure (e.g., size, composition, density) and population dynamics (how the structure changes over time) are essential to describing the consequences of forest management on the social environment (Seesholtz et al. 2004). This section highlights population and demographic trends in the relevant study area.

Population Growth

Population growth can fluctuate considerably over time and across geographic regions. Table 3-118 shows historic population counts for the counties, state, and nation in 1990, 2000, and 2010, and growth rates for these regions between 1990 and 2010. Idaho's population has grown more than twice as fast as the general U.S. population during the time period. Relative to the state, the three-county study area experienced moderate growth during the 1990s and increasingly rapid growth between 2000 and 2010. In 2010 there were approximately 30,105 people living within the three-county Middle Fork Weiser River Restoration Project study area (USDC Census Bureau 2010). While the study area experienced considerable growth over the last 30 years, the rate at which communities within Adams, Idaho and Valley counties grew varied. In the 1990s, Valley County grew more rapidly (25%) than Idaho (13%) and Adams (7%) counties. By the early 2000s, growth in Idaho County tapered off to 5% while Adams and Valley counties experienced 14% and 29% growth respectively (Table 3-118; USDC Census Bureau 2010).

Changes in a region's population can be attributed partly to natural increases (births minus deaths) and in part to net migration. Amenities (the natural, cultural, and social characteristics of an area) have played an increasing role in U.S. migration. Areas characterized as having high levels of natural amenities (unique land and water features, mild temperatures, scenic quality, and recreation opportunities of a geographic region) have been shown to experience greater population growth than areas with fewer natural amenities (Rudzitis and Johansen 1991, Johnson and Beale 1994, Johnson and Beal 1998, McGranahan 1999, Hunter et al. 2005, Frentz et al. 2004). Furthermore, this growth occurs increasingly at the boundaries of public lands (Radeloff et al. 2001). In recent years, communities surrounding these National Forest lands have become increasingly attractive to many Americans because of the proximity to open spaces and natural settings which provide residents with easy access to year-round recreational opportunities. A portion of population growth in this region can be attributed to the scenic beauty and outdoor recreation supported by the Project area.

Table 3-118. Historical population counts and growth rates: 1990, 2000, and 2010

	1990	2000	Percent Growth, 1990–2000 (%)	2010	Percent Growth, 2000–2010 (%)
United States	248,709,873	281,421,906	13	308,745,538	10
Idaho	1,006,749	1,293,953	29	1,567,58	21
Study Area	**23,146**	**26,638**	**15**	**30,105**	**13**
Adams County	3,254	3,476	7	3,976	14
Idaho County	13,783	15,511	13	16,267	5
Valley County	6,109	7,651	25	9,862	29

Source: U.S. Census Bureau, 1990, 2000, and 2010

Population Density

Population density measures the number of people living per square mile within a given area. This measure can serve as a valuable indicator of the socioeconomic and living conditions of a region including urbanization, availability of open space, socioeconomic diversity, and civic infrastructure (Horne and Haynes 1999). In general, more densely populated areas are more urban, diverse, and offer more access to public infrastructure. In contrast, less densely populated areas provide greater access to open spaces and wildlands, which may offer natural amenity values to residents and visitors. Table 3-119 displays the number of people per square mile at the national, state, and county levels (USDC Census Bureau 2010).

In general, population densities across Idaho remain low relative to the nation. Although the study area experienced considerable growth over the last 30 years, communities surrounding the Payette National Forest continue to have very low population densities. In 2010, there were 2.9 people per square mile in Adams County, 2.7 in Valley County, and 1.9 in Idaho County. Low population densities suggest that the area is very rural and may have low levels of private land ownership. The majority of land in the study area's three counties is publicly owned, with 64% in Adams County, 83% in Idaho County, and 86% in Valley County under federal ownership (USDI Geological Survey, 2012). The close proximity of communities in the study area to federally owned lands makes them more susceptible to changes in resource management on public lands.

Table 3-119. Population density

Location	People per Square Mile
United States	86.6
Idaho	19.0
Adams County	2.9
Idaho County	1.9
Valley County	2.7

Source: USDC Census Bureau 2010, Table DP-1

Age

A population's age may affect community values and uses associated with Forest lands, making it relevant to Forest management decisions. From 2009 to 2013, the median age was estimated to be 37.3 years in the United States and 34.9 years in Idaho (USDC Census Bureau 2013b); making Idaho's population slightly younger than the general U.S. population.

Populations surrounding the Middle Fork Weiser River Restoration Project area tend to be considerably older than the general population at both national and state levels.

The median age of residents living in proximity to the Project area is 51.0 years in Adams County, 48.4 years in Idaho County, and 47.6 years in Valley County (Table 3-120). A high median age commonly indicates that an area has a relatively large number of retirees. Large populations of retirees may influence the relationships local communities have with forest resources in the Project area. In general, older users of the forest have a higher demand for leisurely recreational experiences that also provide access to facilities. In addition, a smaller share of their personal income comes from wages in forest-related industries. This makes communities with a high level of retirees less vulnerable to changes in resource management on the Forest.

Table 3-120. Median age

Location	Median Age
United States	37.3
Idaho	34.9
Adams County	51.0
Idaho County	48.4
Valley County	47.6

Source: USDC Census Bureau 2013b

Educational Attainment

Educational attainment measures the number of people within a region who have earned a high school diploma or bachelor's degree. Levels of education can be an important indicator of an area's social and economic opportunities and its ability to adapt to change. Table 3-121 lists the percent of the adult population 25 years or older with a high school diploma and the percent with a bachelor's degree.

Table 3-121. Educational attainment, percent of persons greater than 25 years old

Location	High School Graduate (%)	Bachelor's Degree or Higher (%)
United States	85.6	28.2
Idaho	88.5	24.6
Adams County	86.2	19.5
Idaho County	87.8	13.9
Valley County	93.5	36.8

Source: USDC Census Bureau 2010, Table DP02

The majority of adults 25 years or older in the United States have obtained at least a high school diploma and approximately 28% possess a bachelor's degree or higher. While the high school diploma attainment rate for Idaho is slightly higher than that of the nation, Idaho's attainment rate of post-secondary education degrees is lower than the national rate. Approximately 89% of the state's residents have earned a high school diploma and nearly one-quarter have earned a bachelor's degree or higher. Educational attainment within the Project study area tends to be low relative to the state, with the exception of Valley County.

In 2010, it was estimated that 86% of Adams County residents and 88% of Idaho County residents had completed high school, and only 20% and 14% of residents in these respective counties possess the equivalent of a bachelor's degree or higher. Low educational attainment in rural areas is not uncommon. Because rural communities normally offer few opportunities for educational or occupational advancement, they often struggle to attract and retain

educated and highly skilled individuals. Frequently, residents interested in pursuing advanced education move from these rural communities to more economically advanced areas that support greater educational opportunities.

Educational attainment of residents in Valley County is high relative to rates at the state and national level. In 2010, approximately 93% of adults 25 years or older held a high school diploma and nearly 37% had obtained a bachelor's degree or higher. High levels of educational attainment may be a result of increased amenity migration. Often, new migrants to rural regions do not follow traditional economic theories of migration, have higher incomes, more education, occupations that are nontraditional by rural standards, and are not seeking socioeconomic gains (Shumway and Davis 1996, Rudzitis 1999).

Economic Conditions

The previous section discussed demographics and population trends in the counties surrounding the Project area relative to the state and nation. The following section will focus on economic conditions within the study area to further develop a baseline against which potential impacts can be measured.

Unemployment

Unemployment rates measure the percent of the local work force that is jobless but actively seeking employment. Though public officials strive for full employment, structural unemployment (mismatch between labor skills and available jobs within a region) and frictional unemployment (people moving or transitioning employment) cause rates to persist even in times of economic prosperity. The existence of structural and frictional unemployment implies that there is an inherent "natural" rate of unemployment.

The natural rate of unemployment is believed to fall between 5% and 6% and allows workers to move between jobs and industries without signaling broad economic distress. Figure 3-79 shows the annual unemployment rate of the study area relative to the state and nation between 1990 and 2014.

Although the average annual unemployment rate for the state has generally mirrored that of the nation, unemployment in Adams, Idaho and Valley counties has historically been higher than that of the state and the nation. While recent trends in Idaho County's annual average unemployment rate show a gradual convergence with state and national rates, average annual unemployment in Adams and Valley counties remain high relative to other reference areas. In general, trends at the county level show greater variation in annual unemployment rates than those for the state and nation. Considerable variation in annual rates suggests that these counties may be more vulnerable to changes in social and economic conditions. It is important for Forest management to recognize the vulnerability of forest-dependent communities to changes in economic conditions, as changes in resources management on NFS lands may adversely affect the economic environment of local communities.

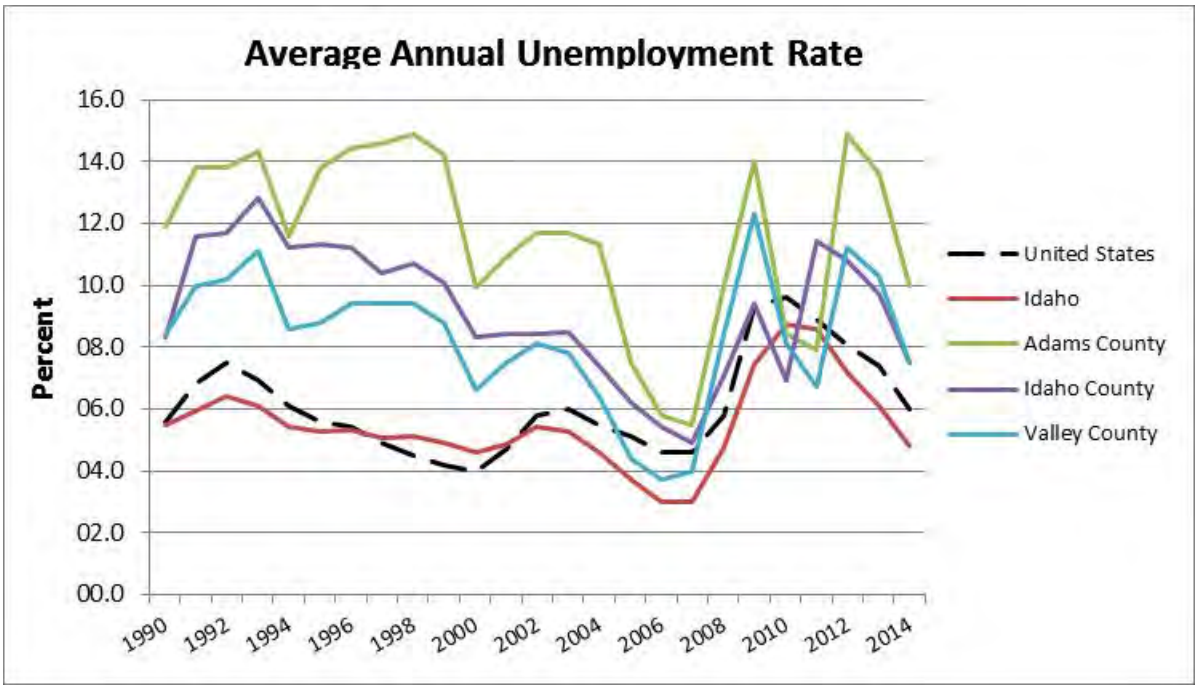


Figure 3-79. Average annual unemployment, 1990-2014 (Source: USDOL Bureau of Labor Statistics 2014). Note: Unemployment rates are not seasonally adjusted

Employment and Specialization

Employment can generally be classified as being either services related or non-services related. Services related sectors support jobs in utilities; wholesale trade; retail trade; transportation and warehousing information; finance and insurance; real estate, rental, and leasing; professional; scientific & technology; management of companies and enterprises; administrative and support services; educational services; health care and social assistance; arts, entertainment, and recreation; accommodation and food services; and other services sectors. Employment in non-services related sectors include mining, construction, manufacturing, agriculture, forestry, fishing, and hunting.

Between 1998 and 2013, total employment in the three-county study area increased from 5,583 to 6,674 jobs (USDC Census Bureau 2015). Though job creation is perceived as desirable, much of this growth can be attributed to jobs in services related industries which typically pay lower wages than those in non-services sectors. Study area jobs in service related sectors paid on annual average approximately $7,000 less than jobs in non-services related fields U.S. Department of Labor (USDOL) Bureau of Labor Statistics 2015). Between 1998 and 2013, employment in non-services related sectors increased by 1% while employment in services related sectors increased by 22%. In 1998, services related sectors supported 73% of employment in Adams, Idaho and Valley counties and grew to 77% of total employment in 2013(USDC Census Bureau 2015).

The local economy surrounding the Middle Fork Weiser River Restoration Project area is diverse and supports employment in 194 industries (IMPLAN 2013 data, available in the project record). Assessing employment by industrial sectors helps identify industries which are important to the local economy. Economies with higher levels of diversification normally offer greater employment opportunities to local residents and foster greater stability because the region's economic activity is more evenly distributed across industrial sectors.

Employment in aggregated industrial sectors as a share of total employment within Adams, Idaho and Valley counties is shown below in Figure 3-80. (IMPLAN 2013 data, available in the project record). Although employment in the study area is supported by numerous industrial sectors, approximately 25% of all local employment is supported by the government (14%) and retail trade (11%) sectors. While the government and retail trade sectors are the two largest employment sectors within the study area, the construction (9%); agriculture, forestry, fishing, and hunting (10%); and accommodation and food services (9%) sectors are also large employers within the Project study area.

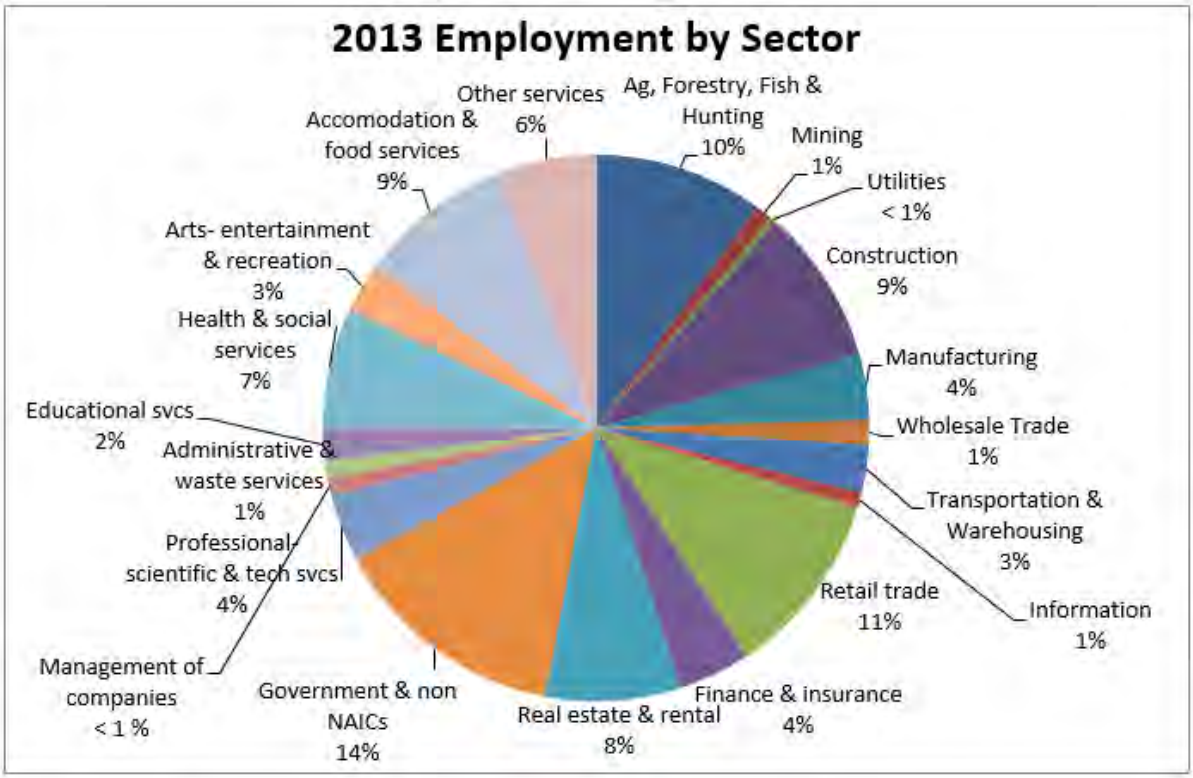


Figure 3-80. 2013 employment (Source: IMPLAN 2013 data, available in the project record)

Highly specialized economies (i.e., those that depend on a few industries for the bulk of employment and income) are more prone to cyclical fluctuations and generally support limited job opportunities. The ICBEMP identified communities with specialized employment using the ratio of the percent employment in each industry in the region of interest (Adams, Idaho and Valley counties) to the percent of employment in that industry for a larger reference region (the state of Idaho). For a given industry, when the percent employment in the analysis region is greater than in the reference region, local employment specialization exists in that industry (USDA Forest Service 1998). Applying this criterion to 2013 employment data for the Project area reveals that the region is most specialized with respect to agriculture, forestry, fishing and hunting (+6.3%), real estate and rental (+6.6%) and construction (+2.5%). While these sectors collectively support 11% of total employment across the state, these sectors support more than 26% of all jobs in Adams, Idaho, and Valley counties. Relative to the state of Idaho, the three-county local economy is less specialized with respect to health and social services, professional services, administrative and waste services, and manufacturing (Figure 3-81).

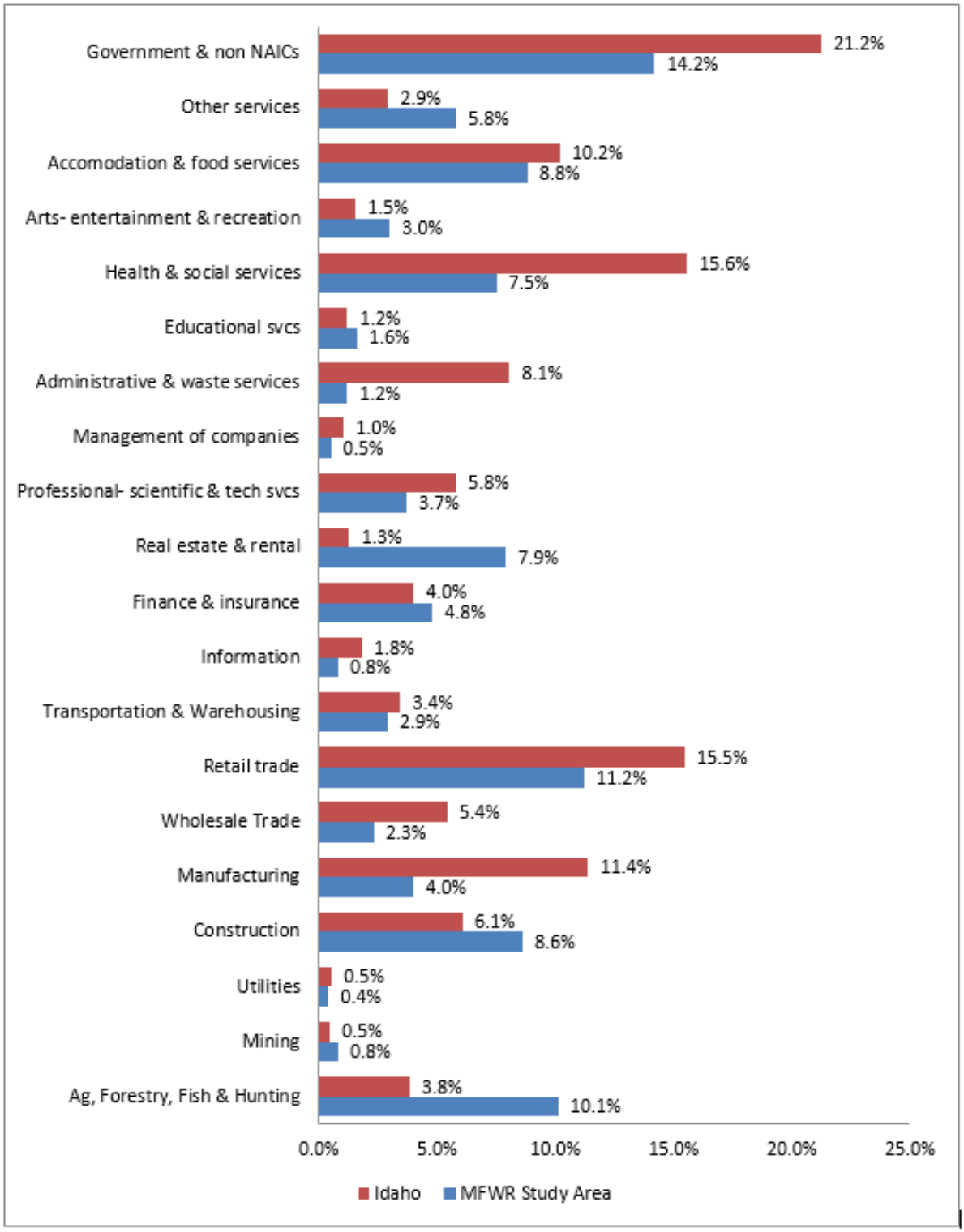


Figure 3-81. Sector employment as share of total state and county employment (Source: IMPLAN 2013 data, available in the project record)

Identifying important industries and regional specialization is of particular interest when sectors relating to current and proposed forest management actions are shown to support a large share of local employment. The largest employers within the study area are industries classified under the government and natural resources sectors (agriculture, forestry and fishing). The strong presence of these sectors highlights the importance of forest-related resources to local economic vitality. While the Project area accounts for only a small portion of the National Forest, it is likely that forest management contributes to overall employment in these sectors. For a more detailed discussion of how activities under the alternatives contribute to local employment see the Environmental Consequences discussion below.

Personal Income

Personal income is a key indicator of the economic well-being of a county and provides a measure of all sources of income within Adams, Idaho and Valley counties. High personal income may be a signal of greater job opportunities, highly skilled residents, greater economic resiliency, and well-developed infrastructure. Conversely, low personal income is often a reflection of poor economic conditions and relatively few job opportunities available within a region. Total personal income (TPI) in the study area exceeded $1 billion dollars in 2013. Between 1990 and 2013, TPI in Adams, Idaho and Valley counties grew by 71% (adjusted for inflation and reported in 2013 dollars) (USDC Census Bureau 2013).

Per capita personal income (PCPI) measures personal income per person in a region. Historically PCPI in Idaho and the Middle Fork Weiser River Restoration Project study area has been lower than PCPI nationally. As shown by Table 3-122, PCPI in the United States steadily increased between 1990 and 2013. Growth in PCPI at the state level is similar to national PCPI growth, while PCPI growth in the three-county study area is slightly higher. Between 1990 and 2013, PCPI (after being adjusted for inflation) grew by 47% in Adams County, 52% in Idaho County, and by 50% in Valley County. Though personal income in the study area has increased, average PCPI within Adams and Idaho counties remains moderately lower than that of the state and the nation (USDC Census Bureau 2015).

Table 3-122. Per capita personal income (PCPI), 1990 and 2013 (adjusted for inflation and reported in 2013 dollars)

	1990	2013	Percent change in PCPI 1990-2013 (%)
United States	$19,591	$42,453	46
Idaho	$15,962	$33,544	48
Adams County	$13,793	$29,468	47
Idaho County	$14,092	$26,848	52
Valley County	$18,006	$36,203	50

Source: USDC Bureau of Economic Analysis 2013

There are two major sources of personal income: (1) labor earnings or income earned through employment and (2) non-labor income. Labor earnings, or wages, were supported by a wide range of industrial sectors and represented approximately 50% of the study area's TPI in 2013. Although wages can fluctuate between counties and across industries, average annual wage in the Project study area remain below those of the state and the nation (Table 3-123). On average, study area jobs in services related sectors paid 16% less than jobs in non-services related fields.

Table 3-123. Average annual wages

	All Sectors	Services	Non-Services
United States	$49,808	$51,520	$58,367
Idaho	$36,839	$38,640	$45,405
Adams County	$32,309	$28,360	$35,154
Idaho County	$33,549	$30,762	$34,930
Valley County	$32,659	$29,010	$37,741

Source: U.S. Department of Labor Bureau of Labor Statistics, Quarterly Census of Employment and Wages, 2013

While the local economy surrounding the Project area supports a large share of lower paying service jobs, the unique natural and cultural amenities of the forest may provide addition benefits which help offset these low wages. Living in close proximity to NFS lands provides residents with greater access to open spaces, wildlands and a wide range of recreational opportunities. While local residents may forego higher paying jobs in areas with fewer natural amenities, they gain personal enjoyment from the outdoor experiences they have on the Payette NF. In this manner, some residents may earn a "secondary income" from local natural amenities which complements the income they earn through traditional employment. Natural amenities, often provided by public lands, have been found to influence population and employment changes in amenity-rich communities (Knapp and Graves 1989, Clark and Hunter 1992, Treyz et al. 1993, Mueser and Graves 1995, McGranahan 1999, Lewis and Plantinga 2002). Although the Project area encompasses only a small portion of the Forest, its unique natural and cultural amenities contribute to the attractiveness of local communities and increases regional well-being.

Nonlabor Income

Personal income also includes nonlabor income individuals receive from sources other than an employer. In general, there are two categories of nonlabor income: investment income (dividends, interest, and rent payments), and transfer payments from the government to individuals (retirement and disability insurance, medical payments, welfare assistance, unemployment, and veteran's benefits). Given the importance of older populations noted above (see Table 3-120 and related discussion) transfer payments are further broken down into age-related transfer payments (social security and Medicare), income maintenance (Medicaid, welfare and unemployment insurance compensation) and other transfer payments (Veterans benefits, education and training assistance and all other, including workers' compensation).

Nonlabor income's share of TPI has grown significantly in recent years. In 1970, nonlabor income accounted for nearly 26% of TPI within the study area. By 2013, nonlabor income had grown to represent approximately 52% of TPI in the three-county study area (USDC Census Bureau 2015).

Nonlabor income's increasing share of regional TPI can be attributed to increases in both investment income and transfer payments. Between 1970 and 2013, investment income as a share of TPI within the study area grew from 17% to 30%, while transfer payments increased from 9% to 23. As shown in Table 3-124, nonlabor income's share of TPI in all study area counties exceeds shares at the state and national level (USDC Census Bureau 2015).

Table 3-124. Nonlabor income

	Total Personal Income ($1000)	Non-Labor Income Share (%)	Percent of Total Personal Income		
			Percent Investment Income (%)	Percent Age Related Transfer Payments (%)	Percent Other Transfer Payments (%)
United States	$14,683,147,000	36	19	10	7
Idaho	$60,040,758	39	21	11	8
Study Area	$1,063,563	53	30	16	7
Adams County	$131,272	57	31	19	7
Idaho County	$515,698	51	25	18	8
Valley County	$416,593	54	37	12	5

As discussed earlier in the demographics section, the population surrounding the Project area is slightly older than the general population and the region's median age is likely to rise as baby-boomers age and more retirees relocate to the area. As the region's baby boom population grows, age-related transfer payments as a share of income from nonlabor sources is likely to rise. Because communities with more retired residents are typically less dependent on employment as a source of income, communities with aging populations may be more resilient to economic downturns (Allen et al. 2003).

Rural county population change, the development of rural recreation, and retirement-destination areas are all related to natural amenities (McGranahan 1999, Henderson 2005, Saint Onge 2007). As a steward of natural amenities, the Forest can be attributed with attracting a portion of retirees and age-related nonlabor income to the region. Thus, the Middle Fork Weiser River Restoration Project area plays a role in fostering a more resilient economy.

3.12.2.1.2. Environmental Justice

In 1994, President Clinton issued EO 12898. This order directs federal agencies to focus attention on the human health and environmental conditions in minority and low-income communities. The purpose of EO 12898 is to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects on minority and low-income populations.

EJ is the fair treatment and meaningful involvement of people of all races, cultures, and incomes, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. The goal of EJ is for Federal agency decision-makers to identify impacts that are disproportionately high and adverse with respect to minority and low-income populations and identify alternatives that will avoid or mitigate those impacts. According to USDA DR5600-002 (USDA Forest Service 1997), EJ, minority, minority population, low-income, and human health and environmental effects, are defined as follows:

EJ 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.

Minority means a person who is a member of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic.

Minority Population means any readily identifiable group of minority persons who live in geographic proximity to—and, if circumstances warrant, migrant farm workers and other geographically dispersed/transient persons who will be similarly affected by—USDA programs or activities.

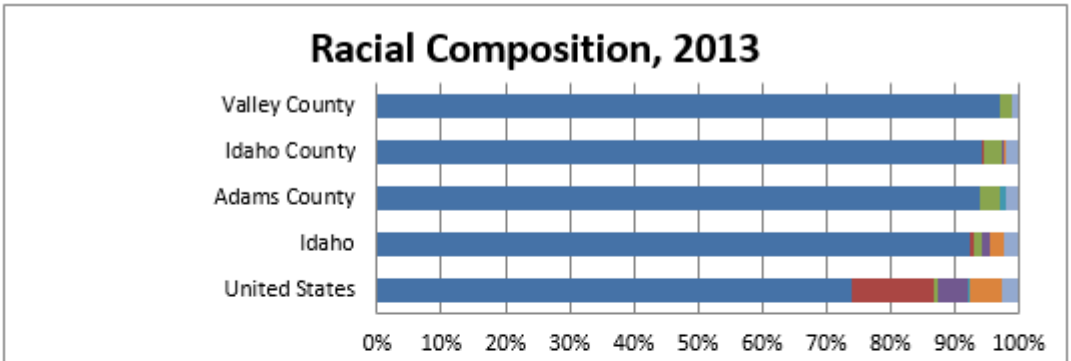
Low-Income Population means any readily identifiable group of low-income persons who live in geographic proximity to—and, if circumstances warrant, migrant farm workers and other geographically dispersed/transient persons who will be similarly affected by—USDA programs or activities. Low-income populations may be identified using data collected, maintained, and analyzed by an agency or from analytical tools such as the annual statistical poverty thresholds from the Bureau of the Census' Current Population Reports, Series P-60 on Income and Poverty.

Human Health and/or Environmental Effects as used in this Departmental Regulation include interrelated social and economic effects.

The emphasis of EJ is on health effects and/or the benefits of a healthy environment. The CEQ has interpreted health effects with a broad definition: “Such effects may include ecological, cultural, human health, economic or social impacts on minority communities, low-income communities or Indian Tribes …when those impacts are interrelated to impacts on the natural or physical environment” (United States. Office of the President of the United States. Council of Environmental Quality CEQ 1997).

Race and Ethnicity

As shown in Figure 3-82, Idaho’s population is predominately white and significantly less diverse than the general U.S. population. All three counties are even less racially diverse than the general population of the state. In 2013 the overwhelming majority of residents in Adams, Idaho and Valley counties were reported to be white alone. Although minority racial groups account for only a small portion of the study area’s total population, many local residents identify themselves as American Indian, Native Hawaiian or some other Pacific Islander, or being belonging to two or more races.



	United States	Idaho	Adams County	Idaho County	Valley County
White alone	74%	92%	95%	94%	98%
Black or African American alone	13%	1%	0%	0%	0%
American Indian alone	1%	1%	3%	3%	2%
Asian alone	5%	1%	0%	0%	0%
Native Hawaiian & Other Pacific Is	0%	0%	1%	0%	0%
Some other race alone	5%	2%	0%	0%	0%
Two or more races	3%	2%	2%	2%	1%

Figure 3-82. Racial composition, 2013 (Source: USDC Census Bureau 2013)

Many Americans identify with racial groups based on physical attributes but continue to be proud of the cultural heritage from which they descend. Although Americans may appear to look White, Black, Asian, or belonging to some other racial group, they often continue to speak the native language and follow cultural traditions of the regions from where their families originated. People identifying with the term “Hispanic” or “Latino” had less of a presence in the state (11%) and study area (3%) in 2013 than the national average (USDC Census Bureau 2013).

Poverty

Poverty is an important indicator of both economic and social well-being. Individuals with low incomes are more vulnerable to a number of hardships which may negatively affect their health, cognitive development, emotional well-being, and school achievement. It may also promote socially unacceptable behavior (Williams 1984, Patterson 1991, Haan et al. 1987, Battistich et al. 1995, Farrington 1995, Chung 2004, Hopson and Lee 2011). In general, low income individuals tend to rely more heavily on natural resources and depend more directly on NFS lands for sustenance and home heating. Since these individuals will be more vulnerable to changes in the management of local resources, it is important for Forest management to understand how these forest users may be affected by restricting forest uses. Following the Office of Management and Budget's Directive 14, the Census Bureau uses a set of income thresholds that vary by family size and composition to detect who is poor. If the total income of an individual or family falls below the relevant poverty threshold, then the individual or family is classified as being “below the poverty level.”

As illustrated by Figure 3-83, poverty rates for the state of Idaho mirror those of the general U.S. population. Between 2009 and 2013, it was estimated that approximately 15% of individuals and 11% of families in Idaho and across the U.S. fell below the poverty line. Poverty rates for individuals and families living in the three counties of interest varied. While poverty rates for Adams County are comparable to rates at the state and national level, there was greater divergence between poverty rates in Adams and Idaho counties: approximately 18% of individuals and 13% of families fell below the poverty line in Idaho County, while 9.5% of individuals and 8% of families in Valley County were reported to be living below the poverty line.

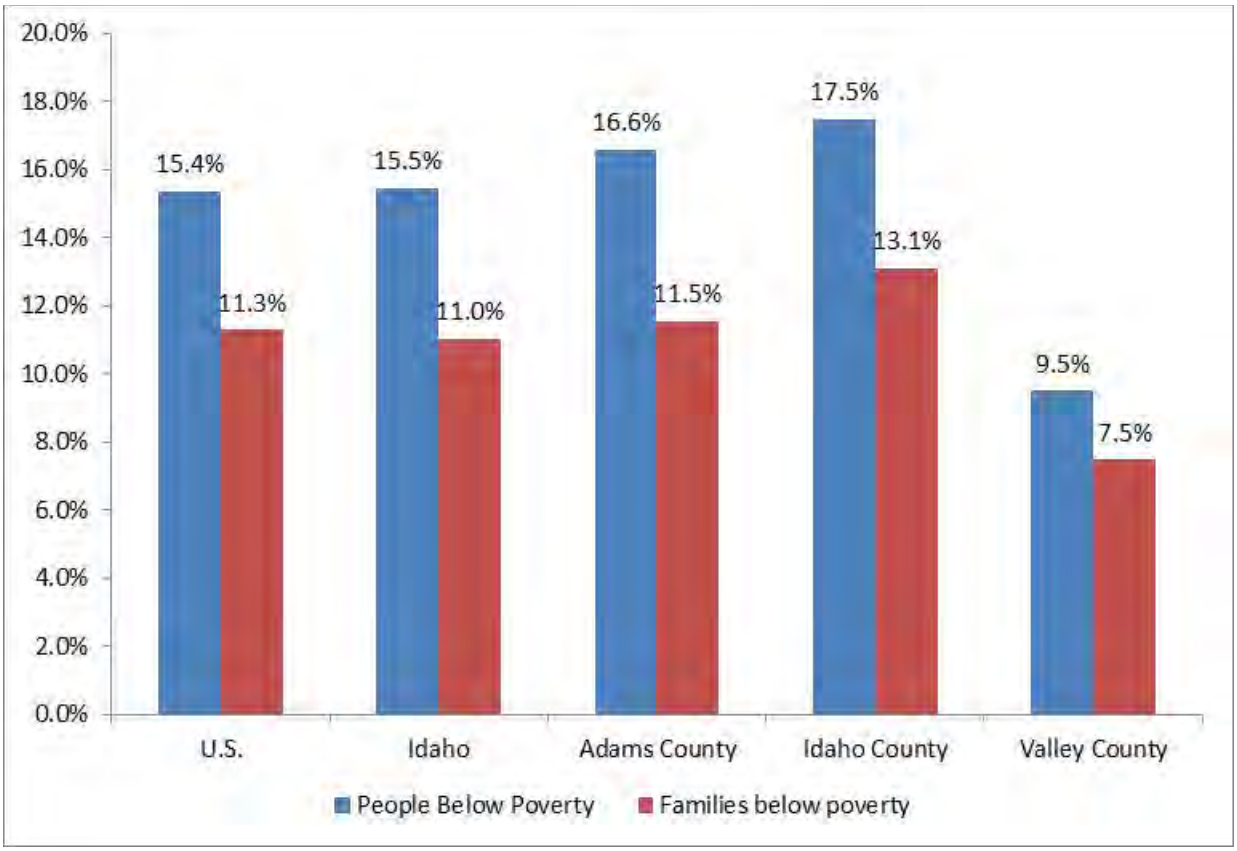


Figure 3-83. Poverty rates, between 2009 and 2013 (Source: USDC Census Bureau 2013)

Table 3-125 shows people below poverty by race and ethnicity. These statistics highlight the racial composition of low income populations living below the poverty line. Populations in Adams, Idaho, and Valley counties are predominately white and account for the overwhelming majority of individuals living below the poverty line. Although minority racial groups accounted for 5%, 6%, and 3% of the population in Adams, Idaho and Valley counties respectively (Figure 3-82), minority groups accounted for 11% of all people living in poverty in Adams County and 12% in Idaho County. Between 2009 and 2013, biracial and multiracial Americans accounted for 2% of the population and nearly 11% of all people living below the poverty line in Adams County. In Idaho County, Native Americans accounted for 3% of the population but nearly 8% of all Idaho County residents living in poverty (USDC Census Bureau 2013b). These statistics suggest that Native Americans in Idaho County and biracial/ multiracial individuals in Adams County are disproportionately poor and have the potential to experience disproportionately high and adverse effects related to changes in the management

of forest resources. To mitigate adverse impacts to EJ populations, Forest management may need to facilitate additional public outreach in these communities to ensure that EJ populations are involved in scoping and alternative development.

Table 3-125. Poverty by race and ethnicity, 2011

	U.S. (%)	Idaho (%)	Adams County (%)	Idaho County (%)	Valley County (%)
White alone	60.5	86.9	88.8	88.1	98.3
Black or African American alone	21.8	0.8	—	0.2	—
American Indian alone	1.5	2.2	—	7.9	—
Asian alone	4.0	1.6	0.8	—	0.3
Native Hawaiian & Other Pacific Island	0.2	0.2	—	0.1	—
Some other race	8.3	4.4	—	0.2	—
Two or more races	3.6	3.9	10.5	3.5	1.3
Hispanic or Latino (of any race)	26.8	20.8	7.5	3.1	4.1

Source: USDC Census Bureau 2013b

3.12.3. Environmental Effects

3.12.3.1. Effects Common to all Alternatives

3.12.3.1.1. Economic Consequences

The economic analysis of the Middle Fork Weiser River Restoration Project uses two types of analysis: (1) regional economic impact analysis and (2) financial efficiency analysis.

Regional Economic Impact

Economic impact analysis measures how activities under the Middle Fork Weiser River Restoration Project would affect employment, income, and economic activity in the regional economy. Business patterns in the regional economy create a constant flow of goods, services, and people between counties surrounding the Forest and the Project area. To analyze how restoration treatments in the Middle Fork Weiser River region of the Forest would affect the local economy, three counties adjacent to the National Forest were examined. The counties included in the study area are Adams, Idaho, and Valley.

Employment and labor income supported by Forest management actions under the action alternatives are displayed below in Table 3-126 and Table 3-127. Alternatives 2, 3, and 4 propose commercial logging and road work activities to be carried out in the project area over a 10-year treatment period (with the exception of a few recreational site updates and regeneration exams and planting, which will occur over a 20-year period). Results for Alternatives 2, 3, and 4 reflect an increase in employment and income generated by activities under the alternatives. These are not new jobs or income, but rather jobs and income that can

be attributed to this project. These activities include construction associated with recreation improvements, harvesting and processing of commercial and noncommercial forest products, other activities associated with restoration treatments, and road work.

Table 3-126. Annual employment by activity type under the alternatives

Proposed Activities	Alt 2	Alt 3	Alt 4
Commercial forest products:			
Logging and processing	33	30	36
Associated activities[a]	7	6	7
Recreation	>1	>1	>1
Restoration	9	4	7
Road work	1	1	1
Total employment contribution	49	41	50

[a]Associated logging activities include biomass removal, weed spraying, pre-commercial thinning, and marking

Table 3-127. Annual labor income by activity type under the alternatives (thousands of dollars)

Proposed Activities	Alt 2	Alt 3	Alt 4
Commercial forest products			
Logging and processing	$1,267	$1,169	$1,373
Associated activities[a]	$160	$149	$171
Recreation	$3	$3	$3
Restoration	$220	$105	$169
Road work	$18	$18	$20
Total labor income contribution	$1,667	$1,443	$1,734

[a]Biomass removal, weed spraying, pre-commercial thinning, and marking

Recreation Related Improvements

The recreation analysis is conducted at the forest level for consistency with recreation use reporting methods undertaken in the NVUM effort in 2008. The Forest is estimated to support 810,000 visits each year. Although the Project area accounts for only a small share of the forest, it is unknown what portion of these visits occurs in the Project area. And, though treatments considered under the action alternatives may negatively affect the quality of developed and dispersed recreation visits temporarily, but they are not anticipated to cause a net change to Project area visitation. In addition to restoration activities, improvements to facilities associated with outdoor recreation are proposed under alternatives 2, 3 and 4. While investments to increase the quality and quantity of recreation-related facilities are not anticipated to affect use levels in the Project area, improvements to trails, restrooms, and camp sites will increase the quality of recreational experiences. The effects to the quality of recreation experiences are discussed in the Recreation section of the EIS and recreation specialist report (project record). Economic consequences of recreation-related contracts and improvements are discussed here.

Restoration Treatments and Forest Products

Restoration treatments produce commercially-valuable forest products. Table 3-128 shows the expected forest product volumes from treatments under each alternative. These are the total volumes over the life of the restoration project. Approximately one-tenth of the volume would be harvested and processed annually.

Table 3-128. Forest product volumes, by alternative over the life of Project

	Alternative 2	Alternative 3	Alternative 4
Timber (ccf)	83,080	76,656	90,016
Biomass (tons)	2,077	1,916	2,250

3.12.3.1.2. Economic Efficiency

Economic efficiency analysis measures the ratio of economic benefits to economic costs resulting from activities under the Middle Fork Weiser River Restoration Project. Forest restoration projects are designed primarily to meet noncommodity objectives, making it difficult to monetize project benefits to fit within the NPV framework. Although forest restoration is anticipated to lead to positive outcomes, not all benefits realized through restoration treatments under the Middle Fork Weiser River Restoration Project can be monetized due to data limitations and uncertainty. Therefore, the following discussion of economic efficiency is primarily descriptive in its analysis of tradeoffs.

Table 3-129 summarizes the NPV of restoration treatments from the Forest Service perspective. The first NPV indicates the financial efficiency of the timber sale including all costs and revenues associated with the timber harvest and required design criteria. The second NPV includes all costs for the proposed action including other restoration activities. A 4% discount rate was used over a period of 10 years (2016–2026), the estimated time required for full implementation of the project. Over the 10-year treatment period, assuming a 4% discount rate, the landscape restoration project is expected to cost the Forest Service between $16.9 and $19.1 million (Table 3-129). This is the discounted cost to the government of the project. This figure can be viewed as a lower bound proxy for the economic value of restoration activities and treatments. The full economic value of restoration and logging activities far exceeds the monetary revenue provided by jobs in timber, roads, or restoration. Rather, the full disclosure of benefits to society also includes immeasurable ecosystem services resulting from cleaner water; avoided costs of wildfire; aesthetic and cultural benefits; and other nonmarket values which represent consumer surplus beyond market prices for traditional commercial, noncommercial, and recreational treatments and upgrades covered under the alternatives.

Table 3-129. Present value (PV) of Project treatments over 10-year period, 4% discount rate

	Alternative 2	Alternative 3	Alternative 4
Timber Harvest & Required Design Criteria			
PV costs	$4,797,812	$4,407,627	$4,988,129
PV revenue	$3,629,851	$1,130,179	$3,932,891
Net present value	$(1,167,961)	$(3,277,448)	$(1,055,238)
All Project Activities			
PV costs	$19,152,650	$18,206,526	$16,901,640
PV revenue	$3,629,851	$1,130,179	$3,932,891
Net present value	$(15,522,800)	$(17,076,347)	$(12,968,749)

Treatments proposed under the Middle Fork Weiser River Restoration Project are intended to restore the structure and function of forests and watersheds in the study area. Benefits of these treatments include reduced fire hazard and increased ecosystem services and wood product removal.

Central to the economic efficiency analysis of forest treatment is the relationship between treatment (prescribed burning and mechanical thinning) and wildfire risk (incidence) and hazard (severity) reduction. Mercer (2000) notes that treatment is associated with a decrease in wildfire suppression costs and a decrease in net resource damage. However, the precise relationship between treatment and wildfire cost reduction is not identified. The proceeding section analyzes direct costs and effects to health, tourism, ecosystem services, and the timber market.

Treatment Costs

Treatment is associated with a decrease in wildfire suppression costs and a decrease in net resource damage (Mercer et al. 2000). Prescribed burning is often preferred to mechanical thinning due to its lower cost. However, depending on proximity to urban centers, a full accounting of the costs of prescribed burning may reveal that mechanical thinning is more economically efficient in some circumstances. The cost of smoke exposure, for instance, is higher when prescribed burning occurs near population centers. Mechanical treatment also has costs that are not accounted for in implementation, such as soil erosion. However, the indirect consequences of prescribed burning are more easily observable, which generally make it a less publicly popular treatment option.

Fuel reduction projects can significantly reduce the risk of catastrophic wildfire (WFLC 2010). Assessing the benefit-cost ratio of fuel reduction projects is questionable without information on the degree to which treatment reduces the risk of wildfire. Furthermore, the scale and cost of prevented wildfires is uncertain and hugely variable. Anticipated reductions in the threat to human life and decreases in wildland fire related costs such as property loss, lost revenues, and suppression costs are not included in the analysis of NPV for the alternatives. Fuels treatments under these alternatives will improve fuel conditions and make the surrounding area more resistant to large scale wildfires like the 2012 Wesley Fire. While the NPV of restoration treatments appears to be negative under all alternatives, the prevention of even one fire similar in size and severity as the Wesley Fire would make the NPV of restoration activities significantly less negative.

Wildfire Costs

Suppression costs are generally only a small component of the total cost of a wildfire. The Western Forestry Leadership Coalition finds that the total cost of wildfire ranges from 2 to 30 times greater than the suppression cost (WFLC 2010). Wildfire costs are very difficult to predict because wildfires range enormously in size, terrain, and proximity to local communities. All of these factors affect the direct cost of dealing with a wildfire. The direct costs of fire suppression include only expenses associated with personnel and supplies used to administer a prescribed burn or extinguish a wildfire. While suppression costs are generally only a small component of the total cost of a wildfire, the direct cost associated with fire suppression can exceed a million dollars per acre. According to the Incident Status Summary Report for the 2012 Wesley Fire on the Payette National Forest, the U.S. Forest Service spent more than $16.2 million to fight the 16,405 acre blaze (ISSR-109).

Fire is a natural part of the landscape and unnecessary wildfire suppression leads to fuel buildup and increased fire risk and hazard. As a result, NPV benefits do not often include the additional benefits of proactive fuels treatment. A joint Forest Service-Sierra Nevada Conservancy study examined the economic analysis of impacts of a wildfire equivalent in severity of the 2013 Sierra Nevada Rim Fire (2014). It concluded that the benefits of restoration activities (with a value estimated conservatively at $126-$228 million over a 30-year period) exceeded the cost of treatment ($68 million). These benefits stem from saved structures and timber, avoided costs of fire cleanup, road repairs and sediment removal for utilities, and carbon sequestered. The study does not even include the additional impacts of wildlife habitat loss or recreation expenditures foregone. Generally, the avoided costs of water treatment from increased turbidity or erosion following wildfire near municipal water sources cannot be overstated—a statistically significant positive relationship exists between sediment or turbidity levels and drinking water treatment costs. Assuming fixed costs in capital do not vary over the short term, a 1% increase in sediment or turbidity levels would lead to a 0.07–0.30% increase in treatment costs (Gartner 2013). This estimate does not include the increased treatment costs for nutrient runoff and short-term mobilization of nitrogen and phosphorus following high-severity wildfire (Miller et al. 2013).

Health Impacts

Smoke is inevitable in the airsheds of Idaho, whether from wildfire or prescribed fire. Smoke can travel great distances and affect communities located far from the burn unit, sometimes persisting after the burn has been completed. Fires burning under historic conditions (wildfire or prescribed fire) produce behavior and effects that are low to moderate. Fires that burn under more extreme conditions (most/all fires in this category are wildfires) produce behavior and effects that are moderate to severe.

Ambient particulate matter (PM) concentrations increase substantially during a wildfire (Kochi et al. 2010). A dose-response function is an equation that estimates the health consequences of exposure to pollution. Compared to conventional PM studies (based on urban air pollution), wildfire studies are “less likely to find a significant positive mortality effect in spite of the substantial increases in PM levels during the wildfire period” (Kochi et al. 2010a). There are several probable reasons for this finding, including: (1) urban air pollution and wildfire smoke are chemically different (wildfire smoke is generally less toxic), and (2) wildfire events are more likely to promote averting behavior, such as evacuation (Kochi et al. 2010a). However, the wildfire studies did find increased hospital admissions linked to asthma and respiratory problems during wildfire events (Kochi et al. 2010a). PM studies find that the dose-response function is not linear. In other words, a doubling of PM concentration more than doubles the health consequences. Furthermore, at low-levels, an increase in PM may result in no measureable health consequences (Kochi et al. 2010).

Five key health outcomes are considered in the literature: (1) mortality, (2) restricted activity days, (3) hospital admissions, (4) respiratory symptoms, and (5) self-treatment. Kochi et al. (2010) estimate that the cost of health effects due to smoke from wildfire events range from $0.26 million to $1.2 billion depending on the scale of the fire and the health outcomes considered.

The timing of prescribed fires is predictable, the volume of smoke produced is far less than in a wildfire, and there is time to notify the public when burns will be implemented. As a result, adverse health consequences are less likely to result from prescribed fires.

Cost to Tourism

During wildfire events, tourism decreases due to evacuations, road closures, and negative publicity (Mercer et al. 2000). Depending on the size and intensity of the wildfire, impacts to tourism may be long-lasting. Recreation and tourism displacement can reduce contributions to the local economy. In addition to the costs to local businesses, individuals may have lower consumer surplus[3] values if they must recreate at a substitute site due to the presence of fire or smoke.

Knotek et al. (2008) found that local visitors are more accepting of prescribed fire than are nonlocal visitors. This finding may be due to (1) better communication between federal agencies and local residents, (2) more local familiarity with the role of fire in the landscape, and (3) more opportunities to engage in substitute behavior.

Ecosystem Services

Wildland fire is an integral natural process essential to sustaining healthy forest ecosystems. Periodic low-severity fires serve as a catalyst for plant growth and reproduction and promote biodiversity of plant and animal communities. These fires reduce understory and debris buildup along the forest floor, but rarely kill overstory trees or substantially alter forest structure (Smith 2000, Schoennagel et al. 2004). Low-severity fires open up thickly-treed areas and release nutrients locked in older vegetation. Increased nutrient cycling and exposure to sunlight after surface disturbance fires increases soil productivity and facilitates the rapid regeneration of grasses, shrubs, and newly germinated fire-dependent seeds (Debano 1991, Moench 2002). Fire, as part of a forest's natural disturbance regime, can also increase stand resiliency to destructive insects and diseases which have become endemic in many parts of the country (Parker et al. 2006).

Although large fire events are consistent with all fire regimes, the frequency and severity of wildfires in the West has risen. High-severity fires are exceedingly destructive and cause widespread mortality. Often referred to as stand-replacing fires, these fires alter forest structure, composition, and function (Smith 2000, Saab and Powell 2005). The destruction caused by high-severity fires can adversely affect a wide range of forest resources and have the potential to reduce ecosystem service values through: (1) destruction of wildlife habitat, (2) water quality and watershed impacts, (3) damage to cultural and archaeological sites, and (4) soil erosion and impacts to water quality (Morton et al. 2003).

Restoration treatments under the alternatives have been developed to improve ecological conditions of fire-prone landscapes within the Project area. Rather than eliminating wildland fire, the restoration plans have been designed to alter fire behavior conditions from high-severity crown fires to low-severity surface fires. In doing so, the Project will increase the area's resilience to catastrophic fires and increase the benefits of ecosystem services it realizes through low-severity fires.

The following ecosystem service benefits can be expected from Project treatments:

- Reduction of unnaturally large wildfires.

[3] Consumer surplus is the value that individuals receive above what is paid to consume the good or service. For instance, if an individual pays $10 to recreate at a site, but would be willing to pay $25, his/her consumer surplus is $15.

- Protection of watersheds, leading to increases in surface water and decreases in soil loss.
- Diversification of understory composition and protection of rare habitat from fire.
- Better management of wildlife habitat.
- Enhanced recreation that is aesthetically pleasing.
- Sequestering carbon in large trees and soils (Combrink et al. 2012).

Timber Market

Prescribed burning allows for measured and controlled use of fire to manage forest density and health. Wildfire events, however, are unplanned and have the potential to cause extreme destruction. Wildfires can be a substantial shock to timber markets. Following a wildfire, some of the killed timber is salvaged and brought to market. This can flood markets, temporarily decreasing the price of timber. While processing capacity is generally too low to lead to a substantial price shock, the price of timber may increase over the long run due to reduced timber inventories (Mercer et al. 2000).

3.12.3.2. Alternative 1: No Action

Under the No Action Alternative, no direct effects on the local economy would occur from the Project.

Indirect effects on local economic conditions could occur as a result of the No Action Alternative, however, estimates of these changes are not available. For example, the lack of fuels treatment could increase wildland fire-related costs such as property loss, lost revenues, and suppression costs. Fire suppression costs and risk to life and property should be less when wildland fires occur where hazardous fuels have been treated compared to areas where fuels have not been treated. It's commonly accepted that fires in nontreated area are more likely to burn hotter, have longer/higher flame length, and burn tree canopies. However, it is not possible to predict the level and costs of nonprescribed wildland fire under the No Action Alternative.

Cumulative Effects

The lack of measurable direct and indirect effects translates to a lack of measurable cumulative effects to economic conditions under the No Action Alternative.

3.12.3.2.1. Alternative 2: Proposed Action

The Payette National Forest proposes to implement restoration treatments over a 10-year period to restore the structure and function of forests and watersheds within the Middle Fork Weiser River area. This alternative includes commercial and noncommercial vegetation treatments on approximately 16,758 acres and prescribed burning on approximately 24,250 acres over the life of the project.

Financial efficiency

As discussed above, the NPV is the discounted sum of benefits minus discounted costs associated with each scenario. The financial efficiency analysis is specific to the timber harvest and ecosystem management associated with the Project (as directed in Forest Service Manual 2400-Timber Management and guidance found in the FSH 2409.18). Costs for sale

preparation, sale administration, regeneration, and ecosystem restoration are included. All costs, timing, and amounts were developed by the specialists on the project's IDT. The expected revenue is the corresponding predicted high bid of $50 per centrum cubic feet (CCF). The predicted high bid is used for the expected revenue (rather than the appraised stumpage rate) because the predicted high bid is the best estimate of the high bid resulting from the timber sale auction. The actual timber value will depend on the market when the timber is sold, and may be higher or lower than the predicted high bid. NPV was calculated using PEAT, a program for economic analysis of long term, on-the-ground resource management projects.

Table 3-129 indicates that the proposed alternative is financially inefficient for the timber harvest and required design criteria, as well as for all activities, as indicated by the negative NPV. The NPV for the proposed action is negative $1,167,961 for the timber harvest and required design criteria and negative $15.5 million for all planned activities. As discussed above, there are many indirect effects which are not captured in the analysis of financial efficiency. Fuels treatments under this alternative would contribute to fuels conditions that would have more resistance to wildland fire. Treatments proposed under this alternative could reduce the threat to human life and decrease wildland fire-related costs such as property loss, lost revenues and suppression costs. If treatments proposed under this alternative successfully prevented even one fire similar in size and severity as the Wesley Fire, the NPV of these restoration activities would be significantly less negative.

Employment & labor income impacts

Economic impacts, in terms of employment and labor income, associated with Project activities (timber harvest, restoration activities, road work, and recreation improvements) are estimated with the IMPLAN input-output model previously described. Timber production, restoration activities, road work, and recreation improvements from this project would have direct and indirect effects on local jobs and labor income.

For timber harvest, the direct employment and labor income response coefficients (e.g., jobs and labor income per million cubic feet) were derived by the University of Montana's BBER. The indirect and induced multiplier effects were estimated using the IMPLAN model for the three-county study area. For restoration, road work, and recreation improvements, the direct, indirect and induced effects were derived using IMPLAN.

Commercial forest products.

While there is potential to harvest between 64.8–84.8 million cubic feet of sawtimber and 1,400–2,200 tons of biomass under Alternative 2, it is anticipated that 83 million cubic feet of sawtimber and 2,077 tons of biomass would be harvested. The harvesting and processing of these commercial forest products would support, 33 jobs and $1.27 million in local labor income on annual average. In addition to the employment and income contributions of logging and processing, the PCT and marking as well as weed spraying and biomass removal associated with these commercial forest products would support an additional 7 jobs and $160,000 in labor income on annual average over the life of the project. This analysis assumes that 80% of the timber would be processed within the designated study area.

Recreation related improvements.

Although treatments will likely create noise, dust, and smoke, which may negatively affect the short term quality of recreational experiences during the project treatment days, proposed treatments are not anticipated to affect overall forest visitation. As section 4.6 of the NVUM surveys for the forests demonstrate, when individuals are unable to visit their preferred site, most will engage in substitute behavior that will continue to have an effect in the local economy (USDA Forest Service 2011a,b). As a result, treatments considered under Alternative 2 are not expected to measurably reduce the economic contributions of recreation within the study area.

However, Alternative 2 does propose to upgrade two camp sites, as well as make trail improvements to increase the quality of recreational experiences supported by the Project area, and will likely result in higher nonmarket values associated with Project area lands. The construction of new and improvements to existing recreation related facilities will also generate new work for private contracting. The creation improvements included in this alternative would support a portion of 1 job and approximately $3,000 in labor income in the local economy on annual average over the life of the project.

Restoration activities.

Restoration activities proposed under Alternative 2 would include postharvest vegetation treatments on approximately 5,400 acres. Treatments under this alternative include regeneration exams and planting. These activities will be implemented through a combination of Knutson-Vandenburg Act (KV) funds and private contracts (50% contributions from each are anticipated). These activities are expected to support an estimated 9 jobs and approximately $220,000 in labor income across the three-county study area on annual average over the 10-year period. Additionally, restoration vegetation treatments include an estimated 24,000 acres of prescribed burning and slashing. However, these activities are expected to be completed using existing Forest Service workforce and therefore are not accounted for in direct and indirect economic impacts (economic consequences of Forest Service workforce are considered under the Forest Plan EIS).

Road work.

While some road work will be associated with the commercial harvesting of forest products, Alternative 2 proposes additional road work to realign, improve, maintain, and decommission roads within the Project area. Additional road work associated with long term road closure, best management practices, graveling, campsite shoreline hardening, and aquatic organism passage are proposed under this alternative. Forest specialists have indicated that the majority of road work would be contracted out to firms operating within the three-county study area. Road work proposed under this alternative is estimated to support 1 job and $18,000 in labor income across Adams, Idaho and Valley counties on annual average over the life of the project.

IMPLAN estimates all activities proposed under Alternative 2 would support approximately 49 jobs and $1.7 million in local labor income (direct, indirect, and induced) on an annual average over the life of the project (Table 3-126 and Table 3-127). Since the expenditures occur over a 10-year period, the estimated impacts of jobs and labor income would be spread out over the life of the project. These are not new jobs or income, but rather jobs and income that can be attributed to activities carried out by this restoration project.

Cumulative Effects

Past and present cumulative economic activity has already been absorbed by the local economy and is represented in the affected environment section presented above. Cumulative economic effects related to past and present economic activity is discussed below. However, estimating the direct and indirect effects specific to future reasonably foreseeable projects (listed Appendix 3, Cumulative Effects) is not possible due to unavailable information. Individually, these projects would likely have a minimal impact on economic conditions. When taken cumulatively, they may substantially affect employment and income levels in the study area. The degree to which the economic environment would be impacted, as well as the distribution of effects, cannot be determined from the information available.

Neither the Project's feasibility nor financial efficiency of the Proposed Action would be affected by actions and projects listed in Appendix 3 Cumulative Effects. In addition, current feasibility and economic efficiency of other projects within the three-county study area would not be affected since past and present cumulative economic activity has already been absorbed by the local economy. Still, cumulative impacts from the Project to the feasibility and economic efficiency of reasonably foreseeable projects within the study area would occur. The degree to which the economic environment would be impacted, as well as the distribution of effects, cannot be determined from the information available.

Past and present levels of employment and labor income associated with other projects, occurring in the area listed in the Appendix 3 Cumulative Effects, have the potential to accrue alongside the employment and labor income impacts from the Project depicted in Table 3-126 and Table 3-127 above. The direct and indirect effects specific to these projects are unknown. However, past and present economic activity has already been absorbed by the local economy and is represented in the affected environment section presented above. Effects from the Project would accrue alongside other projects to the individual sectors depicted in Figure 3-81 above. The effects to these sectors, alongside past and present economic activity, are depicted in Table 3-130 below.

Table 3-130. Annual employment contributions to study area sectors for Alternative 2

Sectors	Study area totals	Commercial forest products	Recreation	Restoration	Road work	Percent of study area total
Agriculture, forestry, fishing & hunting	1,596	18.0	0.0	8.1	0.0	1.6
Mining	133	0.0	0.0	0.0	0.0	0.0
Utilities	61	0.1	0.0	0.0	0.0	0.1
Construction	1,357	0.3	0.1	0.0	0.4	0.1
Manufacturing	627	10.2	0.0	0.0	0.0	1.6
Wholesale trade	364	1.4	0.0	0.1	0.0	0.4
Transportation & warehousing	1,763	1.0	0.0	0.0	0.0	0.1
Retail trade	455	1.2	0.0	0.1	0.1	0.3
Information	126	0.2	0.0	0.0	0.0	0.1
Finance & insurance	752	0.8	0.0	0.1	0.0	0.1
Real estate & rental & leasing	1,241	0.8	0.0	0.1	0.0	0.1
Professional, scientific, & technical services	577	0.6	0.0	0.1	0.0	0.1
Management of companies	86	0.3	0.0	0.0	0.0	0.3
Administrative, waste management & removal services	184	0.3	0.0	0.0	0.0	0.2
Educational services	258	0.3	0.0	0.0	0.0	0.1
Health care & social assistance	1,179	1.3	0.0	0.2	0.0	0.1
Arts, entertainment, and recreation	477	0.3	0.0	0.0	0.0	0.1
Accommodation & food services	1,391	1.3	0.0	0.1	0.0	0.1
Other services	963	1.1	0.0	0.1	0.0	0.1
Government	2,179	0.1	0.0	0.0	0.0	0.0
Totals[a]	**15,768**	**39.4**	**0.1**	**9.1**	**0.6**	**0.3**

[a]Totals may not add due to rounding

The largest contributions, alongside other sector-specific economic activity, are experienced in the agriculture, forestry, fishing & hunting and manufacturing sectors (Table 3-130). As shown in Figure 3-81, the three-county study area is most specialized, relative to all other sectors, in the agriculture, forestry, fishing & hunting sector. While this sector is important to the economic vitality of the three-county study area, the Project's contributions represent a relatively small cumulative economic impact to past and current activities. Impacts associated with all activities under this alternative would constitute less than a half of one percent (0.3%) of employment totals in the three-county study area (Table 3-130). Consequently, actions under this EIS would have small cumulative economic impacts relative to past and present economic conditions. Cumulative employment and labor income impacts to the three-county study area from reasonably foreseeable projects would occur. The degree to which the economic environment would be impacted, as well as the distribution of effects, cannot be determined from the information available. However, the small cumulative economic impact from past and present activities indicates cumulative economic effects related to reasonably foreseeable activities are likely to be small.

3.12.3.2.2. Alternative 3

The Payette National Forest proposes to implement restoration treatments over a 10-year period to restore the structure and function of forests and watersheds within the Middle Fork Weiser River area. Alternative 3 is designed to treat PVGs 2, 5 and 6 but not Groups 7–11 and emphasizes watershed restoration treatments in the Granite Creek subwatershed. This alternative was developed in response to comments that requested more effective watershed restoration and expressed wildlife security concerns.

Financial Efficiency

As discussed above, the NPV is the discounted sum of benefits minus discounted costs associated with each scenario. The financial efficiency analysis is specific to the timber harvest and ecosystem management associated with the Project (as directed in Forest Service Manual 2400-Timber Management and guidance found in the FSH 2409.18). Costs for sale preparation, sale administration, regeneration, and ecosystem restoration are included. All costs, timing, and amounts were developed by the specialists on the Project's IDT. The expected revenue is the corresponding predicted high bid of $50 per CCF. The predicted high bid is used for the expected revenue (rather than the appraised stumpage rate) because the predicted high bid is the best estimate of the high bid resulting from the timber sale auction. The actual timber value will depend on the market when the timber is sold, and may be higher or lower than the predicted high bid. NPV was calculated using PEAT, a program for economic analysis of long term, on-the-ground resource management projects.

Table 3-129 indicates that the Alternative 3 is financially inefficient for the timber harvest and required design criteria, as well as for all activities, as indicated by the negative NPV. The NPV for the proposed action is negative $3,277,488 for the timber harvest and required design criteria and negative $17 million for all planned activities (Table 3-129). As discussed above, there are many indirect effects which are not captured in the analysis of financial efficiency. Fuel treatments under this alternative would contribute to fuels conditions that would have more resistance to wildland fire. Treatments proposed under this alternative could reduce the threat to human life and decrease wildland fire-related costs such as property loss, lost revenues and suppression costs. If treatments proposed under this alternative successfully prevented even one fire similar in size and severity as the Wesley Fire, the NPV of these activities would be significantly less negative.

Employment & Labor Income Impacts

Economic impacts, in terms of employment and labor income, associated with Project activities (timber harvest, restoration activities, road work, and recreation improvements) are estimated with the IMPLAN input-output model described above. Timber production, restoration activities, road work, and recreation improvements from this project would have direct and indirect effects on local jobs and labor income.

For timber harvest, the direct employment and labor income response coefficients (e.g., jobs and labor income per million cubic feet) were derived by the University of Montana's BBER. The indirect and induced multiplier effects were estimated using the IMPLAN model for the three-county study area. For restoration, road work, and recreation improvements, the direct, indirect and induced effects were derived using IMPLAN.

Commercial forest products.

While there is potential to harvest between 58.3–78.3 million cubic feet of sawtimber and 1,300–2,100 tons of biomass under Alternative 3, it is anticipated that 76.7 million cubic feet of sawtimber and 1,916 tons of biomass would be harvested (Table 3-128). The harvesting and processing of these commercial forest products would support 30 jobs and $1.17 million in local labor income on annual average. In addition to the employment and income contributions of logging and processing, the PCT and marking as well as weed spraying and biomass removal associated with these commercial forest products would support an additional 6 jobs and $149,000 in labor income on annual average over the life of the project. This analysis assumes that 80% of the timber would be processed within the designated study area.

Recreation related improvements.

Although treatments will likely create noise, dust, and smoke, which may negatively affect the short term quality of recreational experiences during the project treatment days, proposed treatments are not anticipated to affect overall forest visitation. As section 4.6 of the NVUM surveys for the forests demonstrate, when individuals are unable to visit their preferred site, most will engage in substitute behavior that will continue to have an effect in the local economy (USFS 2011a, USFS 2011b). As a result, treatments considered under Alternative 3 are not expected to measurably reduce the economic contributions of recreation within the study area.

However, Alternative 3 does propose to upgrade two camp sites, as well as make trail improvements to increase the quality of recreational experiences supported by the Project area, and will likely result in higher nonmarket values associated with Project area lands. The construction of new and improvement to existing recreation related facilities will also generate new work for private contracting. The creation improvements included in this alternative would support a portion of 1 job and approximately $3,000 in labor income in the local economy on annual average over the life of the project.

Restoration activities.

Restoration activities proposed under Alternative 3 would include postharvest vegetation treatments on approximately 5,400 acres. Treatments under this alternative include regeneration exams and planting. These activities will be implemented through a combination of KV funds and private contracts (50% contributions from each are

anticipated). These activities are expected to support an estimated 4 jobs and approximately $105,000 in labor income across the three-county impact area on annual average over the 10-year period. Additionally, restoration vegetation treatments include an estimated 34,000 acres of prescribed burning and slashing. However, these activities are expected to be completed using existing Forest Service workforce and therefore are not accounted for in direct and indirect economic impacts (economic consequences of Forest Service workforce are considered under the Forest Plan EIS).

Road work.

While some road work will be associated with the commercial harvesting of forest products, Alternative 3 proposes additional road work to improve, maintain, and decommission roads within the Project area. Additional road work associated with long term road closure, best management practices, graveling, campsite shoreline hardening, and aquatic organism passage are proposed under this alternative. Forest specialists have indicated that the majority of road work would be contracted out to firms operating within the three-county study area. Road work proposed under this alternative is estimated to support 1 job and $18,000 in labor income across Adams, Idaho and Valley counties on annual average over the life of the project.

IMPLAN estimates all activities proposed under Alternative 3 would support approximately 41 jobs and $1.4 million in local labor income (direct, indirect, and induced) on an annual average over the life of the project (Table 3-126 and Table 3-127). Since the expenditures occur over a 15-year period, the estimated impacts of jobs and labor income would be spread out over the life of the project. These are not new jobs or income, but rather jobs and income that can be attributed to activities carried out by this restoration project.

Cumulative Effects

Past and present cumulative economic activity has already been absorbed by the local economy and is represented in the affected environment section presented above. Cumulative economic effects related to past and present economic activity is discussed below. However, estimating the direct and indirect effects specific to future reasonably foreseeable projects (listed in Appendix 3, Cumulative Effects) is not possible due to unavailable information. Individually, these projects would likely have a minimal impact on economic conditions. When taken cumulatively, they may substantially affect employment and income levels in the study area. The degree to which the economic environment would be impacted, as well as the distribution of effects, cannot be determined from the information available.

Neither the Project's feasibility nor financial efficiency of the Proposed Action would be affected by actions and projects listed in Appendix 3 Cumulative Effects. In addition, current feasibility and economic efficiency of other projects within the three-county study area would not be affected since past and present cumulative economic activity has already been absorbed by the local economy. However, cumulative impacts from the Project to the feasibility and economic efficiency of reasonably foreseeable projects within the study area would occur. The degree to which the economic environment would be impacted, as well as the distribution of effects, cannot be determined from the information available.

Past and present levels of employment and labor income associated with other projects, occurring in the area listed in Appendix 3 Cumulative Effects, have the potential to accrue alongside the employment and labor income impacts from the Project depicted in Table 3-126 and Table 3-127 above. The direct and indirect effects specific to these projects are

unknown. However, past and present economic activity has already been absorbed by the local economy and is represented in the affected environment section presented above. Effects from the Project would accrue alongside other projects to the individual sectors depicted in Figure 3-81 above. The effects to these sectors, alongside past and present economic activity, are depicted in Table 3-131 below.

The largest contributions, alongside other sector-specific economic activity, are experienced in the agriculture, forestry, fishing and hunting and manufacturing sectors (Table 3-131). As shown in Figure 3-81, the three-county study area is most specialized, relative to all other sectors, in the agriculture, forestry, fishing and hunting sector. While this sector is important to the economic vitality of the three-county study area, the Project's contributions represent a relatively small cumulative economic impact to past and current activities. Impacts associated with all activities under this alternative would constitute less than a half of one percent (0.3%) of employment totals in the three-county study area (Table 3-131). Consequently, actions under this EIS would have small cumulative economic impacts relative to past and present economic conditions. Cumulative employment and labor income impacts to the three-county study area from reasonably foreseeable projects would occur. The degree to which the economic environment would be impacted, as well as the distribution of effects, cannot be determined from the information available. However, the small cumulative economic impact from past and present activities indicates cumulative economic effects related to reasonably foreseeable activities are likely to be small.

Table 3-131. Annual employment contributions to study area sectors for Alternative 3

Sectors	Study Area Totals	Commercial Forest Products	Recreation	Restoration	Road Work	Percent of study area total
Agriculture, forestry, fishing & hunting	1,596	16.6	0.0	3.9	0.0	1.3
Mining	133	0.0	0.0	0.0	0.0	0.0
Utilities	61	0.1	0.0	0.0	0.0	0.1
Construction	1,357	0.3	0.1	0.0	0.4	0.1
Manufacturing	627	9.4	0.0	0.0	0.0	1.5
Wholesale trade	364	1.2	0.0	0.0	0.0	0.4
Transportation & warehousing	1,763	0.9	0.0	0.0	0.0	0.1
Retail trade	455	1.1	0.0	0.1	0.1	0.3
Information	126	0.2	0.0	0.0	0.0	0.1
Finance & insurance	752	0.7	0.0	0.0	0.0	0.1
Real estate & rental & leasing	1,241	0.7	0.0	0.0	0.0	0.1
Professional, scientific, & technical services	577	0.6	0.0	0.0	0.0	0.1
Management of companies	86	0.3	0.0	0.0	0.0	0.3
Administrative, waste management & removal services	184	0.2	0.0	0.0	0.0	0.1
Educational services	258	0.2	0.0	0.0	0.0	0.1
Health care & social assistance	1,179	1.2	0.0	0.1	0.0	0.1
Arts, entertainment, and recreation	477	0.2	0.0	0.0	0.0	0.1
Accommodation & food services	1,391	1.2	0.0	0.1	0.0	0.1
Other services	963	1.1	0.0	0.1	0.0	0.1
Government	2,179	0.1	0.0	0.0	0.0	0.0
Totals[a]	**15,768**	**36.4**	**0.1**	**4.3**	**0.6**	**0.3**

[a]Totals may not add due to rounding

3.12.3.2.3. Alternative 4

The Payette National Forest proposes to implement restoration treatments over a 15-year period to restore the structure and function of forests and watersheds within the Middle Fork Weiser River area. Alternative 4 is designed to respond to comments requesting the maximum level of vegetation treatments to produce the most "economic benefit" (most jobs and financial return from commercial product revenue); and to comments relating to the intensity and benefit of treatments in managing for spruce budworm and other insects to promote diameter growth.

Financial Efficiency

As discussed above, the NPV is the discounted sum of benefits minus discounted costs associated with each scenario. The financial efficiency analysis is specific to the timber harvest and ecosystem management associated with the Project (as directed in Forest Service Manual 2400-Timber Management and guidance found in the FSH 2409.18). Costs for sale preparation, sale administration, regeneration, and ecosystem restoration are included. All costs, timing, and amounts were developed by the specialists on the Project's IDT. The expected revenue is the corresponding predicted high bid of $50 per CCF. The predicted high bid is used for the expected revenue (rather than the appraised stumpage rate) because the predicted high bid is the best estimate of the high bid resulting from the timber sale auction. The actual timber value will depend on the market when the timber is sold, and may be higher or lower than the predicted high bid. NPV was calculated using PEAT, a program for economic analysis of long term, on-the-ground resource management projects.

Table 3-129 indicates that the Alternative 4 is financially inefficient for the timber harvest and required design criteria, as well as for all activities, as indicated by the negative NPV. The NPV for the proposed action is negative $1.1 million for the timber harvest and required design criteria and negative $12.9 million for all planned activities (Table 3-129). As discussed above, there are many indirect effects which are not captured in the analysis of financial efficiency. Fuel treatments under this alternative would contribute to fuels conditions that would have more resistance to wildland fire. Treatments proposed under this alternative could reduce the threat to human life and decrease wildland fire-related costs such as property loss, lost revenues and suppression costs. If treatments proposed under this alternative successfully prevented even one fire similar in size and severity as the Wesley Fire, the NPV of these activities would be significantly less negative.

Employment & Labor Income Impacts

Economic impacts, in terms of employment and labor income, associated with the Project activities (timber harvest, restoration activities, road work, and recreation improvements) are estimated with the IMPLAN input-output model described above. Timber production, restoration activities, road work, and recreation improvements from this project would have direct and indirect effects on local jobs and labor income.

For timber harvest, the direct employment and labor income response coefficients (e.g., jobs and labor income per million cubic feet) were derived by the University of Montana's BBER. The indirect and induced multiplier effects were estimated using the IMPLAN model for the three-county study area. For restoration, road work, and recreation improvements, the direct, indirect and induced effects were derived using IMPLAN.

Commercial forest products.

While there is potential to harvest between 80.8–100.8 million cubic feet of sawtimber and 1,800–2,400 tons of biomass under Alternative, 4 it is anticipated that 90.0 million cubic feet of sawtimber and 2,240 tons of biomass would be harvested (Table 3-128). The harvesting and processing of these commercial forest products would support 36 jobs and $1.4 million in local labor income on annual average. In addition to the employment and income contributions of logging and processing, the PCT and marking as well as weed spraying and biomass removal associated with these commercial forest products would support an additional 7 jobs and $171,000 in labor income on annual average over the life of the project. This analysis assumes that 80% of the timber would be processed within the designated study area.

Recreation related improvements. Although treatments will likely create noise, dust, and smoke, which may negatively affect the short term quality of recreational experiences during the project treatment days, proposed treatments are not anticipated to affect overall forest visitation. As section 4.6 of the NVUM surveys for the forests demonstrate, when individuals are unable to visit their preferred site, most will engage in substitute behavior that will continue to have an effect in the local economy (USFS 2011a, USFS 2011b). As a result, treatments considered under Alternative 4 are not expected to measurably reduce the economic contributions of recreation within the study area.

However, Alternative 4 does propose to upgrade two camp sites, as well as make trail improvements to increase the quality of recreational experiences supported by the Project area, and will likely result in higher nonmarket values associated with Project area lands. The construction of new and improvement to existing recreation related facilities will also generate new work for private contracting. The creation improvements included in this alternative would support a portion of 1 job and approximately $3,000 in labor income in the local economy on annual average over the life of the project.

Restoration activities. Restoration activities proposed under Alternative 4 would include postharvest vegetation treatments on approximately 5,400 acres. Treatments under this alternative include regeneration exams and planting. These activities will be implemented through a combination of KV funds and private contracts (50% contributions from each are anticipated). These activities are expected to support an estimated 7 jobs and approximately $169,000 in labor income across the three-county study area on annual average over the 10-year period. Additionally, restoration vegetation treatments include an estimated 42,000 acres of prescribed burning and slashing. However, these activities are expected to be completed using existing Forest Service workforce and therefore are not accounted for in direct and indirect economic impacts (economic consequences of Forest Service workforce are considered under the Forest Plan EIS).

Road work.

While some road work will be associated with the commercial harvesting of forest products, Alternative 4 proposes additional road work to improve, maintain, and decommission roads within the Project area. Additional road work associated with realignment, long term road closure, best management practices, graveling, campsite shoreline hardening, and aquatic organism passage is proposed under this alternative. Forest specialists have indicated that the majority of road work would be contracted out to firms operating within the three-county study area. Road work proposed under this alternative is estimated to support 1 job and

$20,000 in labor income across Adams, Idaho and Valley counties on annual average over the life of the project.

IMPLAN estimates all activities proposed under Alternative 4 would support approximately 50 jobs and $1.7 million in local labor income (direct, indirect, and induced) on an annual average over the life of the project (Table 3-126 and Table 3-127). Since the expenditures occur over a 15-year period, the estimated impacts of jobs and labor income would be spread out over the life of the project. These are not new jobs or income, but rather jobs and income that can be attributed to activities carried out by this restoration project.

Cumulative Effects

Past and present cumulative economic activity has already been absorbed by the local economy and is represented in the affected environment section presented above. Cumulative economic effects related to past and present economic activity is discussed below. However, estimating the direct and indirect effects specific to future reasonably foreseeable projects (listed in Appendix 3 Cumulative Effects) is not possible due to unavailable information. Individually, these projects would likely have a minimal impact on economic conditions. When taken cumulatively, they may substantially affect employment and income levels in the study area. The degree to which the economic environment would be impacted, as well as the distribution of effects, cannot be determined from the information available.

Neither the project feasibility nor financial efficiency of the Proposed Action would be affected by actions and projects listed in Appendix 3 Cumulative Effects. In addition, current feasibility and economic efficiency of other projects within the three-county study area would not be affected since past and present cumulative economic activity has already been absorbed by the local economy. However, cumulative impacts from the Project to the feasibility and economic efficiency of reasonably foreseeable projects within the study area would occur. The degree to which the economic environment would be impacted, as well as the distribution of effects, cannot be determined from the information available.

Past and present levels of employment and labor income associated with other projects, occurring in the area listed in Appendix 3 Cumulative Effects, have the potential to accrue alongside the employment and labor income impacts from the Project depicted in Table 3-126 and Table 3-127 above. The direct and indirect effects specific to these projects are unknown. However, past and present economic activity has already been absorbed by the local economy and is represented in the affected environment section presented above. Effects from the Project would accrue alongside other projects to the individual sectors depicted in Figure 3-81 above. The effects to these sectors, alongside past and present economic activity, are depicted in Table 3-132 below.

Table 3-132. Annual employment contributions to study area sectors for Alternative 4

Sectors	Study Area Totals	Commercial Forest Products	Recreation	Restoration	Road Work	Percent of study area total
Agriculture, forestry, fishing & hunting	1,596	19.4	0.0	6.2	0.0	1.6
Mining	133	0.0	0.0	0.0	0.0	0.0
Utilities	61	0.1	0.0	0.0	0.0	0.1
Construction	1,357	0.3	0.1	0.0	0.4	0.1
Manufacturing	627	11.1	0.0	0.0	0.0	1.8
Wholesale trade	364	1.5	0.0	0.0	0.0	0.4
Transportation & warehousing	1,763	1.1	0.0	0.0	0.0	0.1
Retail trade	455	1.3	0.0	0.1	0.1	0.3
Information	126	0.2	0.0	0.0	0.0	0.2
Finance & insurance	752	0.8	0.0	0.1	0.0	0.1
Real estate & rental & leasing	1,241	0.9	0.0	0.1	0.0	0.1
Professional, scientific, & technical services	577	0.7	0.0	0.0	0.0	0.1
Management of companies	86	0.3	0.0	0.0	0.0	0.4
Administrative, waste management & removal services	184	0.3	0.0	0.0	0.0	0.2
Educational services	258	0.3	0.0	0.0	0.0	0.1
Health care & social assistance	1,179	1.4	0.0	0.1	0.0	0.1
Arts, entertainment, and recreation	477	0.3	0.0	0.0	0.0	0.1
Accommodation & food services	1,391	1.4	0.0	0.1	0.0	0.1
Other services	963	1.2	0.0	0.1	0.0	0.1
Government	2,179	0.1	0.0	0.0	0.0	0.0
Totals[a]	**15,768**	**42.6**	**0.1**	**7.0**	**0.7**	**0.3**

[a]Totals may not add due to rounding

The largest contributions, alongside other sector-specific economic activity, are experienced in the agriculture, forestry, fishing & hunting and manufacturing sectors (Table 3-132). As shown in Figure 3-81 the three-county study area is most specialized, relative to all other sectors, in the agriculture, forestry, fishing & hunting sector. While this sector is important to the economic vitality of the three-county study area, the Project's contributions represent a relatively small cumulative economic impact to past and current activities. Impacts associated with all activities under this alternative would constitute less than a half of one percent (0.3%) of employment totals in the three-county study area (Table 3-132). Consequently, actions under this EIS would have small cumulative economic impacts relative to past and present economic conditions. Cumulative employment and labor income impacts to the three-county study area from reasonably foreseeable projects would occur. The degree to which the economic environment would be impacted, as well as the distribution of effects, cannot be determined from the information available. However, the small cumulative economic impact from past and present activities indicates cumulative economic effects related to reasonably foreseeable activities are likely to be small.

3.13. Range Management and Noxious Weeds

3.13.1. Analysis Scale, Data Sources and Methodology

3.13.1.1. Analysis Scale

3.13.1.1.1. Direct, Indirect and Cumulative Effects Analysis Area

The rangeland resource may be directly, indirectly, and cumulatively affected by projects proposed within the 49,276-acre Middle Fork Weiser River Landscape Restoration Project area. Although rangelands consist of timbered areas, riparian areas, shrublands, grasslands, and rocky scablands, the analysis of direct and indirect effects to the rangeland resource focuses mainly on the condition of nontimbered grasslands (strata 60) and shrublands (strata 70) on the NFS lands within the following HUC 6 subwatersheds (United State Geological Survey [USGS] watershed boundary data set): East Fork Weiser River, Granite Creek-Middle Fork Weiser River, Jungle Creek-Middle Fork Weiser River, Mica Creek-Middle Fork Weiser River, and Little Fall Creek-Middle Fork Weiser River.

3.13.1.1.2. Temporal Scale of Analysis

Time frames as defined in the Forest Plan were used for the direct and indirect effects analysis: temporary (1–3 years), short-term (3–15 years), and long-term (15+ years) (USDA 2003). Time frames for the cumulative effects analysis are specified in the cumulative effects section. The time frames defined above are considered appropriate time scales for analysis because maintenance and future management will need to determine the appropriate objectives for managing the Project area within the 15–30 year timeframe.

3.13.1.2. Data Sources and Methodology

Data sources used for collecting information for rangeland resources and noxious weed components of the Project include the natural resource manager (NRM) system for range and noxious weeds; the Payette National Forest GIS reference layer file; physical on-the-ground observations; information collected in 2013, 2014, and 2015 for the Council and Indian Mountain C&H Allotments; Council Ranger District 2210 rangeland management planning files; and references listed in the range and noxious weeds specialist report.

3.13.2. Affected Environment

3.13.2.1. Current Condition

Natural events and human-caused disturbances have influenced the current rangeland vegetation condition in the Project area. Natural disturbance patterns such as precipitation, floods, droughts, and wildfires influence vegetation composition, quality, and quantity. Ground-disturbing management activities directly affect vegetation composition, quality, and quantity, and indirectly affect livestock movement. Past and current ground-disturbing management activities include livestock grazing, timber harvest, reforestation plantation fencing, road construction, road obliteration, and recreation uses such as camping, motorcycling, and riding ATVs.

The first livestock users in Idaho were Native Americans. Spaniards brought horses to the southwest in 1541, and by 1700, horses were widespread. Trappers and early settlers recalled seeing vast numbers of horses grazing in Council and Indian Valleys (Jones 1989).

Discovery of the excellent rangelands in Idaho led to a livestock boom beginning in the 1870s. Heavy livestock use during the early 1900s resulted in severe impacts to soils and native vegetation. Regulation of livestock grazing began with the establishment of the Weiser National Forest in 1905 when approximately 150,000 sheep and 25,000 cattle and horses grazed on NFS lands (Lafferty 1943).

The earliest records (1909) of livestock grazing on the Weiser District show most of the present allotments were grazed by sheep. In 1940, there were three cattle allotments and one sheep allotment. Today, 1,179 cow/calf pairs are permitted to graze the Council Mountain C&H Allotment from June 20 through October 15 and 1,758 cow/calf pairs are permitted to graze the Indian Mountain C&H Allotment from July 1 through October 15.

Rangelands in the Project area's subwatersheds have been used primarily for forage by livestock (cattle, sheep, and horses) and wildlife (elk, deer, and bear). Since the turn of the century, livestock grazing has affected the composition and function of the shrub/grass group. Where grazing was excessive, perennial grasses have been replaced by less desirable annual grasses, shortening the fire return interval. Conversely, fire suppression in shrub communities has increased the shrub component and decreased plant diversity. Suppression of fire has played a role in allowing the overstory of plant communities to progress to late-seral ecological status, without interference, decreasing plant diversity and productivity. Upland areas that were not heavily grazed in the past reveal that large segments of the desirable forage for livestock and wildlife, have large accumulations of dead plant material, and are progressing toward late-seral ecological status. These areas will return to a more productive, mid-seral ecological status with prescribed fire and more intensive grazing.

Fire was a common disturbance factor in rangelands prior to settlement of the area, but the historical fire return interval varied greatly due to differences in elevation, fuel flammability, and ignition sources. High elevation mountain big sagebrush communities had fire return intervals ranging from 25 to 50 years. Low elevation grasslands, often dominated by annual grasses, experienced fires every 5 to 25 years. In general, fire events in rangelands maintained herbaceous plants and limited the establishment of woody plants.

3.13.2.1.1. Current Rangeland Management

The Project area contains two grazing allotments—the Council Mountain C&H Allotment (82,980 acres) and the Indian Mountain C&H Allotment (86,725 acres). The allotments also include Idaho Department of Lands and Potlatch land ownership. Permitted cattle numbers from June 20 through October 15 include 1,179 cow/calf pairs on NFS lands and 31 cow/calf pairs on Idaho Department of Lands within the Council Mountain C&H Allotment. Permitted cattle numbers from July 1 through October 15 include 1,758 cow/calf pairs on NFS lands, 41 cow/calf pairs on Idaho Department of Lands, and 156 cow/calf pairs on Potlatch lands within the Indian Mountain C&H Allotment.

The allotments are managed under deferred grazing rotation systems, in which forage use by livestock is influenced by topography and water. The low country is ready in early June and July, but the high country is not ready until mid to late July. By the time the high country is ready, the low country forage and some water sources have dried up. The area between the low and high country is steep and dominated by trees and shrubs. Much of the allotments'

areas are receiving proper (less than or equal to the forest plan grazing standard of 45% utilization for riparian areas and early use pastures and 50% utilization for late season pastures) grazing use, though some areas receive little-to-no use.

Livestock impacts are associated mainly with trailing, stock driveways, and concentrated use areas where vegetation is removed or trampled. Concentrated use is also evident in some riparian areas where use is associated with watering, trailing, and bedding sites. Some high elevation basins have been grazed prior to range readiness of soils and vegetation in the past. These kinds of livestock grazing problems have been mitigated through construction of drift fences and water developments (USDA Forest Service 1997).

Continued maintenance and development of the water sources is very beneficial to the allotments. Use of alternate water sources, combined with salting and riding, will draw livestock and wildlife out of the creek bottoms and improve animal distribution in the uplands.

As a result of excessive livestock use from the late 1800s through the early 1900s, herbaceous plants decreased in the watershed. It is not known how much the vegetative composition was altered. Plant composition probably remained similar to historical levels but the relative abundance changed and plants that tolerate higher levels of use probably increased. The decrease in native vegetation created an opportunity for introduced species to become established. Upland sites that were grazed too heavily in the past, and too early in the year, are composed largely of early seral plant species and include annuals and undesirable forbs and grasses that have shallow root systems and do not provide stability to soils. Early seral plants provide little cover and forage for wildlife and livestock. In contrast, large areas of the allotments are not subject to enough grazing activity, and the plant community is in a late-seral status composed of decadent brush with little understory. Proper livestock grazing can help maintain brush community types in a mid-seral status that are composed of a greater variety of grasses and forbs in the understory and less ground cover by decadent brush. A mid-seral status is more productive than late-seral and provides greater habitat and forage for wildlife and livestock.

The subwatersheds located in the Project area are composed of three basic vegetation habitat types: Douglas-fir/snowberry, subalpine fir/huckleberry, and sagebrush/grass. The suitable acres for livestock grazing are primarily in the sagebrush/grass habitat types with an ecological status of late seral to Potential Natural Community (PNC), with some localized areas in early- to mid-seral status. Cattle use in these subwatershed uplands has been moderate, with many areas grazed lightly or not at all. Perennial grasses with areas of Basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*) and antelope bitterbrush (*Purshia tridentata*) dominate low-elevation grasslands. On some of the lower, drier sites, the perennial plants are more widely spaced, resulting in an abundance of introduced plants such as cheatgrass (*Bromus tectorum*), bulbous bluegrass (*Poa bulbosa*), rattlesnake chess (*Bromus brizaeformis*), and medusahead rye (*Taeniatherum caput-medusae*). Annual forbs and thistles have also become established on these sites. Mixed communities of mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), forbs, and grasses occur at mid elevations. Sod-forming perennial grasses dominate high-elevation grasslands.

While livestock numbers have decreased since the early 1900s, big game, particularly elk, have increased, resulting in more year-long grazing and increased grazing in less accessible areas. This use by wildlife is generally slight to moderate across the watersheds. Adverse impacts from deer and elk occur early in the year during spring green-up when the snow is just melting. At that time, the soils are wet and the herbaceous plants are in an early growth

stage. Also, some areas, particularly the south facing slopes near the Forest boundary, receive heavy use on browse species by wildlife during the winter and early spring months. Big game/livestock competition is usually evaluated in terms of forage use patterns and habitat overlap. Because of similar forage use patterns and habitat overlap (especially in winter/spring range), competition is most likely to exist between elk and cattle. Deer and cattle use can be complementary when combined because of differences in forage preferences; however, dry spring weather following heavy grazing may reduce available bluebunch wheatgrass (*Pseudoroegneria spicata*), leading to competition between cattle and white-tailed deer or mule deer and/or elk and deer. Winter range is characterized by elevations of up to 5,000 feet which provide winter range habitat (forage and cover in the winter) for big game. Identified big game winter range occurs in the Project area.

No existing reforestation plantation fences exist in the Project area. Grasses in reforested areas and along the associated road network are comprised mainly of perennial erosion-control grass species that were seeded in the closeout phase of the various timber sales. Intermixed on these lands are the native warm season plants with an occasional isolated cool season species. Introduced grasses (e.g., wheatgrasses, bromes, and orchard grass) have supported the majority of the grazing pressure since their introduction. While density of introduced grasses has diminished, these species have survived. On the sites adjacent to permanent water sources, continuous grazing and/or overgrazing by cattle, elk, and deer has removed the desirable vegetation, and in its place there exist annuals and/or non-palatable species. Better livestock distribution, the reintroduction of fire, and range improvement installation would help improve upland range conditions.

Drought has had an effect on species composition in the Project area. The increase in annuals, such as bulbous bluegrass and cheatgrass, is directly related to the lack of water and competition from less drought-tolerant species such as bluebunch wheatgrass and the perennial bluegrasses (*Poa* species). Livestock grazing has also had an effect on plant composition in localized areas in the uplands of the Project area allotments. The distribution of livestock on the low elevation units in the recent past has been poor due to lack of water developments and fencing to keep livestock from moving into the high units too early in the grazing season. Drought conditions have also contributed to livestock concentrating in certain areas due to the availability of water and forage in them. As a result of these factors, there are areas of concentration in the uplands that are grazed too much, yet other suitable areas that receive little-to-no use.

Noxious Weeds

Approximately 1,346 acres have been inventoried for noxious weed species in the Council Mountain C&H Allotment and 1,161 acres inventoried in the Indian Mountain C&H Allotment; this inventoried area includes the analysis area. Noxious weeds identified during these surveys include rush skeletonweed (*Chondrilla juncea*), Canada thistle (*Cirsium arvense*), yellow toadflax (*Linaria vulgaris*), dalmatian toadflax (*Linaria dalmatica*), common St. Johnswort (*Hypericum perforatum*), houndstongue (*Cynoglossum officinale*), spotted knapweed (*Centaurea stoebe*), and sulfur cinquefoil (*Potentilla recta*). A majority of the infestations observed were associated with ground disturbance activities from roads and trails.

3.13.3. Environmental effects

3.13.3.1. Direct and Indirect Effects

3.13.3.1.1. Alternative 1—No Action

Under the No Action alternative, the nonforested rangelands would be expected to show continued improvement at a slower rate than the action alternatives due to the Forest Plan standards and guidelines for livestock grazing.

Noxious weeds would continue to be controlled using an integrated management approach (USDA Forest Service 1987). Control methods include chemical, biological, cultural, or mechanical treatments, depending on the weed species present, cost of control, proximity to live water, or other elements applicable to the site. Funding for weed control would not depend on KV funds.

3.13.3.1.2. Effects Common to Action Alternatives (Alternatives 2, 3, and 4)

Timber Management

Following timber harvest activities, the areas opened up would provide vegetation that may be used as forage by big game and livestock. This vegetation would be available until the tree canopy closes again and shades out the lower growing vegetation. Unfenced harvest units would be considered transitory range as soon as the logging operations are complete. Transitory ranges would provide more forage than that occurring prior to timber harvest and more forage than under the No Action alternative; however, livestock grazing capacities are not based on transitory range.

Timber harvest has the potential to facilitate livestock access to the higher elevations, causing livestock to move to the higher elevations too soon in the summer. Higher elevation soils are too wet and the grasses are still in an early, fragile stage. This could have adverse effects on the grasses due to timing and duration of use. Higher elevation soils would be more susceptible to compaction and the streambanks more susceptible to sloughing.

Prescribed Fire

Prescribed fires are proposed to reduce the risk of wildland fire to forestland, investments, adjacent private lands, and facilities, as well as to cleanup timber slash and decadent vegetation. Known populations of noxious weeds would be monitored and treated in burned areas, as the effects of burning on each species are uncertain.

Prescribed fires generally take place in the spring or fall when conditions are conducive to slow, cool, low-intensity burns. Under these circumstances, burned vegetation should not require rest from grazing. Monitoring data collected on prescribed burns over the past 8 years indicates that rest from livestock grazing was needed only on a few occasions for one growing season.

Coordination between the Fuels Specialist, Range Specialists, and affected permittee would take place prior to burning each block to determine the objective of each burn. Each prescribed fire would be monitored and evaluated to determine the severity of the burn, and a proper livestock grazing rest period would be applied. Rest periods following prescribed fires can range from no rest to numerous growing seasons of rest depending upon the severity of

the burn. If it is determined that a prescribed fire needs to be rested from livestock grazing, several options are available to facilitate this action. The annual grazing rotation can be changed to defer grazing in the burned area. Livestock management practices, such as watering, salting, herding, and temporary fencing, would be used to keep livestock away from the burned area.

The proposed prescribed fires would cleanup dead and decadent plant material and stimulate growth of old and new plants. The use of prescribed fire would eventually lead to increased forage quality and quantity for wildlife and livestock.

Noxious Weeds

Noxious weeds would continue to be controlled using an integrated management approach. Control methods include chemical, biological, cultural, or mechanical treatments, depending on the weed species present, cost of control, proximity to live water, or other elements applicable to the site. The majority of noxious weeds in the Project area are associated with roads and trails. Therefore, it is expected that proposed new road construction and road obliteration would account for additional acres of noxious weed infestations and subsequent management. New infestations of noxious weeds could become established in the logging units, skid trails, and landings, as well as with new road construction, improvement, reconstruction, and graveling. KV dollars, if available, would be requested for treatment of noxious weeds.

Depending on funding, all roads scheduled for decommissioning through this Project would be inventoried and treated prior to obliteration. Treatment sites would be recorded and revisited, on a road by road basis as needed, after completion of the Project. Some weed infestations may persist for many years and will require follow up treatment.

The following NFS roads in the Project area are proposed for decommissioning under Alternatives 2, 3, and 4. They either have known weed infestations or provide access to weed infestations within the project area: 50186, 50219, 50233, 50258, 50277, 50517, 50521, 50538, 50701, 50706, 51305, 51517, 51541, 51896, 501861500, 501868000, 502145000, 502332000, 504911000, and 507012000.

Roads

Livestock permittees use old and new logging roads for a variety of livestock management practices including transporting salt and supplements to salting grounds; moving and distributing livestock throughout the allotment; and for access to range improvement projects for maintenance. Some of the roads currently used by the permittees for these activities are proposed for decommissioning under the action alternatives. Decommissioning these roads could have dramatic impacts on current livestock operations and management.

Continued coordination between Forest Service employees and the permittees should be taken prior to and during decommissioning to ensure permittee needs are met, where possible. The following roads proposed for decommissioning common to Alternatives 2, 3, and 4 pose livestock management concerns to the permittees and would need more discussion before decommissioning commences: 50166, 501841000, 502183000, 502187000, 50256, 50258, 50485, 504853000, 50489, 50496, 504961000, 50566, 505911000, 50677, and 51549. Additional roads proposed for decommissioning under Alternative 3 that would pose concern for livestock management include 50197, 50277, and 51547.

Cattle are creatures of habit and learn to use grazing areas based on forage preferences, time of year, ease of access, ease of movement, and repetition. If movement and distribution of livestock on the allotments is interrupted or blocked, cattle would have to be taught new access routes to areas that they previously had access too. Consequently, some areas could become overgrazed while areas previously accessible could receive little to no use. This interruption in movement and distribution could take several years to overcome, and in some cases, areas previously grazed could become unusable based on loss of access.

Decommissioned roads that have been seeded would provide vegetation that may be used as forage by big game and livestock after the first year. Depending on the location of the roads identified for each alternative, the decommissioning could draw livestock away from riparian areas by blocking or discouraging access.

The road construction identified in the action alternatives would not have a big effect on livestock grazing and movement because the roads are accessing timbered areas identified for harvest. A minimal amount of forage would be lost.

Use of roads identified to remain open would have minimal effect on livestock movement. Livestock on the allotments are used to vehicular traffic and generally will move out of the way of oncoming vehicles. The amount of traffic on these roads is not considered heavy.

3.13.3.2. Cumulative Effects

The rangeland resource may be directly, indirectly, and cumulatively affected by projects proposed in the Middle Fork Weiser River Landscape Restoration Project area. Although rangelands consist of timbered areas, riparian areas, shrublands, grasslands, and rocky scablands, the analysis of direct and indirect effects to the range resource focused on the condition of the non-timbered grasslands (strata 60) and shrublands (strata 70) on all NFS lands within the watershed. Therefore, the cumulative effects analysis also is focused on nontimbered grasslands and shrublands.

Past actions that have cumulatively affected rangeland resources in the watershed are described in section 3.13.2.1. The subwatersheds have been actively managed for timber production in the past. The cumulative effects of this management have been to provide improved access for livestock movement. However, much of the older road system was constructed within riparian areas, which could have increased the level of use within these areas by livestock. Access to high country prior to range readiness has also increased as a result of timber sale roads. The old road system has contributed to increased levels of noxious weed infestations by providing a ready seedbed on the disturbed soil and by increasing the volume of vehicular traffic, which could introduce noxious weeds through the dispersal of seeds and plant parts that become affixed to the undercarriage of vehicles.

Decommissioning of roads in riparian areas could result in a decrease in livestock use of riparian areas in the short term (3–15 years). Cumulatively, this would lead to improved vegetative and soil conditions in situations where livestock are currently adversely affecting these resources.

Effects of implementing the action alternatives, when combined with effects from other past, present, and reasonably foreseeable actions and events, would not have any major adverse impacts on the rangeland resource. The actions have indirectly been designed to improve rangeland conditions overall, whether it be by decommissioning roads in riparian areas, or harvesting timber and opening up areas for foraging and livestock movement.

3.13.3.3. Forest Plan Consistency

Impacts to uplands, meadows, or riparian areas would be consistent with Forest Plan direction for rangeland resources.

Noxious weed control treatments are designed to meet Forest Plan Standards and Guidelines by preventing new infestations and controlling existing infestations. An integrated approach, considering all methods of treatment, would be implemented.

All action alternatives would be consistent with Forest Plan management direction for rangeland resources—To provide a sustainable level of forage, consistent with other resource management direction, through the Forest Service grazing permit system.

All action alternatives would be consistent with Forest Plan management direction for nonnative plants—To primarily restrict noxious weed infestations to locations along roads, trails, river corridors, and air strips.

3.13.3.4. Irreversible and Irretrievable Commitment of Resources

Roads that are constructed would cause an irreversible and irretrievable commitment of some rangelands for forage production. The total amount of rangeland resources lost from road construction would be minimal. There would be a minimal decrease in the amount of forage available to wildlife or livestock.

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Chapter 4 — List of Preparers, References, Glossary and Acronyms

4.1. List Of Preparers

Jon Almack	Wildlife (Wildlife Biologist)
Mary Bresee	Vegetation (Silviculturist)
Andy Bumgarner	Weeds and Range (Range Conservationist)
Jane Cropp	Recreation, Roadless and Visuals (Recreation Staff Officer)
Jennifer Dobb	Economics (Economist)
Henry Eichman	Economics (Economist)
Debbie Ellis	Vegetation (Timber Management Assistant)
Jonas Epstein	Economics (Economist)
Trisha Giambra	Fish (Fisheries Biologist)
Alma Hanson	Botany and Rare Plants
Dave LaChapelle	Fuels (Fuels Management Specialist)
Stephen Penny	Team Leader (Environmental Coordinator)
Melanie Vining	Hydrology and Soils (Hydrologist)
Marti Wegner	Transportation (Engineer)
Erik Whiteman	Cultural Resources (Archaeologist)
Jason Wright	Transportation (Engineer)
Becky Wroblewski	Geographical Information Systems Data Analysis and Cartography (Resource Information Specialist)

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4.3. List of Acronyms

°C	°Celsius
°F	°Fahrenheit
ACS	Aquatic Conservation Strategy
AIRFA	American Indian Religious Freedom Act
AOI	Annual Operating Instructions
AOP	Aquatic Organism Passage
APE	Area of Potential Effects
AqS	National Aquatic Survey
ARPA	Archaeological Resources Protection Act
ASQ	Allowable Sale Quality
ATV	All-Terrain Vehicle
BA/PL	Restoration of Burned Areas/Plantations
BBER	Bureau of Business and Economic Research
BMP	Best Management Practice
CA	Core Area
CCF	Centrum Cubic-Feet
CDC	Conservation Data Center
CEQ	Council on Environmental Quality
CFLR	Collaborative Forest Landscape Restoration
CT-ASP	Conifer Removal in Aspen Stands
CT-FT	Commercial Thin-Free Thin
CT-MP	Commercial Thin / Mature Plantations
CWA	Clean Water Act
CWD	Coarse Woody Debris
DBH	Diameter at Breast Height
DD	Detrimental Soil Disturbance
DEIS	Draft Environmental Impact Statement
DFC	Desired Future Conditions
DNA	Deoxyribonucleic Acid
ECA	Equivalent Clearcut Area
eDNA	Environmental DNA

EIS	Environmental Impact Statement
EJ	Environmental Justice
EO	Executive Order
ERU	Ecological Reporting Units
*ESA	Endangered Species Act
FA	Functioning Appropriately
FEAST	Forest Economics and Analysis Spreadsheet Tool
FEIS	Final Environmental Impact Statement
FID	Fisheries Inventory Database
FR	Functioning at Risk
FRCC	Fire Regime Condition Class
FSH	Forest Service Handbook
FT-PC-MSw	Free Thin–Patch Cut-Modified Shelterwood
FUR	Functioning at Unacceptable Risk
FWS	Fish and Wildlife Service
GFSS	Grass/Forb/Shrub/Seedling
GIS	Geographic Information System
GRAIP	Geomorphic Road Analysis and Inventory Package
HRV	Historical Range of Variability
HUC	Hydrologic Unit Codes
ICB	Interior Columbia Basin
ICBEMP	Interior Columbia Basin Ecosystem Management Project
IDEQ	Idaho Department of Environmental Quality
IDFG	Idaho Department of Fish and Game
IDT	Interdisciplinary Team
IFPA	Idaho Forest Practices Act
IFWIS	Idaho Fish and Wildlife Information System
IPM	Integrated Pest Management
IRA	Inventoried Roadless Area
KEC	Key Environmental Correlates
KEF	Key Ecological Functions
KV	Knutson-Vandenburg Act
LAU	Lynx Analysis Unit

LCAS	Lynx Conservation Assessment and Strategy
LCBC	Lost Creek-Boulder Creek
LSI	Land System Inventory
LSP	Landslide Prone
LSQ	Low Site Quality
LWD	Large Woody Debris
MA	Management Area
MCCM	Mill Creek-Council Mountain
MIS	Management Indicator Species
MPC	Management Prescription Categories
MRS	Minimum Road System
MVUM	Motor Vehicle Use Map
MWMT	Maximum Weekly Maximum Temperature
NCT	Noncommercial Thinning
NEPA	National Environmental Policy Act
NFMA	National Forest Management Act
NFS	National Forest System
NFT	Nonforested Treatment
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
NIDGS	Northern Idaho Ground Squirrel
NPV	Net Present Value
NRCS	National Resources Conservation Service
NRIS	Natural Resources Inventory System
NRM	Natural Resource Manager
NVUM	National Visitor Use Monitoring
OHV	Off-Highway Vehicle
OF	Old Forest
OML	Operational Maintenance Level
PCE	Primary Constituent Elements
PCT	Pre-Commercial Thinning
PCPI	Per Capita Personal Income
PEAT	Project Economic Analysis Tool

PFA	Post-Fledging Areas for northern goshawk family units
PFC	Payette Forest Coalition
PFT	Prescribed Fire Treatments
PIBO	PACFISH/INFISH Biological Opinion
PM	Particulate Matter
PNC	Potential Natural Community
PNF	Payette National Forest
PR	Partial Retention
PVG	Potential Vegetation Group
RCA	Riparian Conservation Areas
RM	Roaded Modified
RMRS	Rocky Mountain Research Station
RN	Roaded Natural
RNA	Research National Area
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum
RUIP	Recovery Unit Implementations Plans
SA	Elk Security Area
SFB	Shaded Fuelbreak
SHPO	State Historic Preservation Office
SINMAP	Stability Index Mapping
SOPA	Schedule of Proposed Actions
SOSI	Species Of Special Interest
SPM	Semi Primitive Motorized
SPNM	Semi-Primitive Non-Motorized
SWCP	Soil Water Conservation Practices
SWRA	Soil, Water, Riparian, and Aquatic
TAP	Travel Analysis Process
TE	Threatened and Endangered
TEPC	Threatened, Endangered, Proposed, Candidate
TEPCS	Threatened, Endangered, Proposed, Candidate, Sensitive species
TES	Threatened, Endangered, Sensitive species
TMA	Timber Management Assistant

TMDL	Total Maximum Daily Load
TMO	Trail Management Objective
TPI	Total personal income
TSRC	Total Soil Resource Commitment
USDA	United States Department of Agriculture
USDI	United States Department of the Interior
USDOL	United States Department of Labor
USGS	United State Geological Survey
UTV	Utility Terrain Vehicle
VQO	Visual Quality Objectives
VSS	Vegetation Structural Stages
WARS	Watershed and Aquatic Recovery Strategy
WBD	Watershed Boundary Dataset
WCF	Watershed Condition Framework
WCI	Watershed Condition Indicators
WCS	Wildlife Conservation Strategy
WLSH	Weiser-Little Salmon Headwaters Project
WMT	Wet Meadow Treatment
WUI	Wildland-Urban Interface

4.4. Glossary

303(d)—Section of the Clean Water Act that defines standards for state water quality. States are required to submit updated lists of water bodies that do not meet section 303(d) standards to the Environmental Protection Agency every two years. States must also develop plans for improving the water quality of listed water bodies, with the goal of "delisting" them.

Action area—The area including the project area and a larger area surrounding the project area, chosen to analyze the effects of the proposed project on wildlife resources. The action area is often related to watersheds or sub-watersheds, but must include enough land to adequately account for the effects of the project on each of the wildlife species analyzed.

Activity area—The smallest logical land area where the effect that is being analyzed or monitored is expected to occur. The area may vary in size depending on the effect that is being analyzed or monitored, because some effects are quite localized and some occur across landscapes.

Activity fuel—The combustible material resulting from or altered by forestry practices such as timber harvest or thinning, as opposed to naturally created fuels.

Air quality—The composition of air with respect to quantities of pollution therein; used most frequently in connection with "standards" of maximum acceptable pollutant concentrations.

Allotment (grazing)—Area designated for the use of a certain number and kind of livestock for a prescribed period of time.

Alternative—In an Environmental Impact Statement (EIS) or Environmental Assessment (EA), one of a number of possible options for responding to the purpose and need for action.

Analysis area—One or more areas grouped for purposes of analysis based on common impacts, effects, and social or economic factors.

Aquatic Conservation Strategy (ACS)—"A long-term strategy to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within lands administered by National Forests," page B-48, Forest Plan, 2003 as amended.

Aspect -The direction a slope faces. A hillside facing east has an east aspect.

Beneficial use—An actual or potential use that may be made of the waters of the State that are protected against quality degradation. Beneficial uses contained in the State Water Quality Standards include domestic, agricultural, and industrial water supplies, recreation, aquatic life, and salmonid spawning.

Best Management Practice—Practices, techniques or measures developed, as determined by the State of Idaho Division of Environmental Quality and identified in the state water quality management plan, which are determined to be the cost-effective and practicable means of preventing or reducing the amount of pollution generated by nonpoint sources to a level compatible with water quality goals (IAC-IDEQ 2007).

Biological Assessment (BA)—A document required by the Endangered Species Act, prepared by the fisheries and wildlife biologists to determine the effects of the proposed project on federally listed fish and wildlife species, as well as species proposed for federal listing, and designated and proposed critical habitat for listed species. The fisheries and wildlife BAs are usually prepared separately. Each document provides an official determination of effects for each species. Following review by the District Ranger and the Forest fisheries or wildlife biologist, the BA is reviewed by the U.S. Fish and Wildlife Service (FWS), through a process called consultation. The FWS can suggest changes to the project, or concur with the biologists' determinations and mitigations.

Biological Evaluation (BE)—A document required by the Endangered Species Act, prepared by the fisheries and wildlife biologists to determine if there are effects to listed species. If so, then a BA is completed. The BE also is used to determine the effects of the proposed project on Region 4 sensitive species and migratory bird species habitats.

Biological Opinion (BO)—A document resulting from formal consultation that states the opinion of USDI, Forest Service or NOAA fisheries as to whether a federal action is likely to jeopardize the continued existence of listed species or their habitat.

Biomass—A renewable energy source, a biological material from living, or recently living organisms, such as wood, waste, (hydrogen) gas, and alcohol fuels. Relevant to this project, biomass includes forest product material derived from woody material, not meeting sawlog specifications that is typically chipped at landings and removed for burning in a plant that utilizes the energy produced during combustion for electricity generation. This material is typically tops of trees, branches and cull material or trees smaller in diameter than those that meet sawtimber specifications (see Sawtimber).

Board foot—A measurement of wood equivalent to a board 1-foot square and 1 inch thick. Usually expressed in terms of thousand board feet (MBF) or million board feet (MMBF).

Broadcast burning—Burning forest fuels as they are, with no piling or windrowing.

Candidate species—Plant and animal species being considered for listing as endangered or threatened, under the Endangered Species Act, in the opinion of the U.S. Fish and Wildlife Service (FWS) or the National Marine Fisheries Service (NMFS). Category 1 candidate species are groups for which the FWS or NMFS has sufficient information to support listing proposals; category 2 candidate species are those for which available information indicates a possible problem, but that need further study to determine the need for listing.

Canopy—The more-or-less continuous cover of branches and foliage formed collectively by the crown of adjacent trees and other woody growth.

Canopy closure—Canopy closure represents the total non-overlapping crown closure of all trees in a stand, excluding the seedling tree size class. Trees in the seedling tree size class are used to estimate canopy closure class only when they represent the only structural layer present. Canopy closure classes are based on the following:

- Low = 10–39% canopy closure
- Moderate = 40–69% canopy closure
- High = 70% or more canopy closure

(USDA Forest Service 2003)

Canopy cover—For the purposes of this document, canopy cover is used interchangeably with canopy closure.

Cavity—The hollow excavated in trees by birds or other natural phenomena; used for roosting and reproduction by many birds and mammals.

Channel stability—The ability of a stream channel to resist the effects of natural and human caused disturbance.

Chain—a measurement of distance equivalent to 66 feet.

Climax conditions—The highest ecological development of a plant community capable of perpetuation under the prevailing climactic conditions.

Coarse woody debris (CWD)—Pieces of woody material having a diameter of at least 3 inches and a length greater than 6 feet (also referred to as large woody debris, or LWD).

Cold water biota—Animal and plant life that grow best in water temperatures below 18 °C.

Commercial thin—Any type of thinning that produces merchantable material at least equal to the value of the direct cost of harvesting.

Condition class—The degree of departure from historical fire regimes and vegetation characteristics. Condition Classes are a method to quantify the amount of area that has uncharacteristic or undesirable fire risk. Condition Class 1 shows no departure from historical fire regimes, Condition Class 2 shows moderate alterations, and Condition Class 3 shows the greatest amount of departure.

Corridor (landscape)—Landscape element that connects similar patches of habitat through an area with different characteristics. For example, streamside vegetation may create a corridor of willows and hardwoods between meadows or through a conifer forest.

Cover type—The current or existing vegetation of an area, described by the dominant vegetation.

Critical Habitat—Endangered Species Act—Designated by the FWS or NMFS, specific areas, within a geographical area occupied by a threatened or endangered species, on which are found physical or biological features essential to conservation of the species. These areas may require special management consideration or protection, and can also include specific areas outside the occupied area that are deemed essential for conservation.

Cultural resource - An object or definite location of human activity, occupation, or use identifiable through field survey, historical documentation, or oral evidence. Cultural resources are prehistoric, historic, archaeological, or architectural sites, structures, places, or objects and traditional cultural properties. Cultural resources include the entire spectrum of resources for which the Heritage Program is responsible from artifacts to cultural landscapes without regard to eligibility for listing on the National Register of Historic Places (FSH 2309.12 (05)).

Cumulative effects—Impacts on the environment that result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

Current condition- The present condition of a resource or resource area.

Cut slope—that portion of the slope that is excavated for road construction, trails, landings, or skidtrails.

DBH (diameter at breast height)—Diameter at breast height. The diameter of a tree measured 4 feet 6 inches above the ground, uphill side.

Decommission—see Road Decommissioning.

Degrade—To degrade is to measurably change a resource condition for the worse within an identified scale and time frame. Where existing conditions are within the range of desired conditions, “degrade” means to move the existing condition outside of the desired range. Where existing conditions are already outside the range of desired conditions, “degrade” means to change the existing condition to anything measurably worse. The term “degrade” can apply to any condition or condition indicator at any scale of size or time, but those scales need to be identified. This definition of “degrade” is not intended to define degradation for the State of Idaho as it applies to their Antidegradation Policy (IDAPA 16.01.02.051).

Demographic—Related to the vital statistics of human populations (size, density, growth, distribution, etc.).

Denning habitat or sites—Habitat and locations used by mammals during reproduction and rearing of their young, when the young are highly dependent on adults for survival.

Desired Condition (DC)—Also called Desired Future Condition, a portrayal of the land, resource, or social and economic conditions that are expected in 50-100 years if management goals and objectives are achieved. A vision of the long-term conditions of the land.

Detrimental soil disturbance(DD)—The alteration of natural soil characteristics that results in immediate or prolonged loss of soil productivity and soil-hydrologic conditions. Detrimental disturbance can occur from soil that has been displaced, compacted, puddled or severely burned.

Disturbance—Any event, such as wildfire or a timber, sale that alters the structure, composition, or function of an ecosystem.

Ecosystem—A naturally occurring, self-maintained system of living and non-living interacting parts that are organized into biophysical and human dimension components.

Ecosystem health—A condition where the components and functions of an ecosystem are sustained over time and where the system's capacity for self-repair is maintained, such that goals for ecosystem uses, values, and services are met.

Effective cover- (in Forest Plan glossary, listed as "effective ground cover")—Vegetation, litter, and rock fragments larger than ¾" in diameter. Expressed as the percentage of material, other than bare ground, covering the land surface. May include live vegetation, standing dead vegetation, litter, cobble, gravel, stones, and bedrock. This cover contributes to preventing soil erosion.

Endangered species—Designated by the FWS or NOAA Fisheries, in accordance with the Endangered Species Act, an animal or plant species, or critical habitat, that has been given federal protection status, because it is in danger of extinction throughout all or a significant portion of its natural range.

Endemic—A plant or animal native to the local area.

Environmental Impact Statement (EIS)—A document required of federal agencies by the National Environmental Policy Act for major projects or legislative proposals significantly affecting the environment. A tool for decision making, it describes the positive and negative effects of the undertaking and cites alternative actions.

Ephemeral stream—A stream or portion of a stream that flows only in direct response to precipitation or run-off events, and that receives little or no continuous water from springs, snow, or other sources. Unlike intermittent streams, an ephemeral usually does not have a defined stream channel or banks, and its channel is at all times above the water table.

Erosion—This includes processes of weathering, solution, corrosion, and transportation of earth and rock materials. Forces involved may be water, ice, wind, and gravity.

Executive Order (EO)—Executive orders are official documents, numbered consecutively, through which the President of the United States manages the operations of the federal government.

Family—A collection of focal species that share similarities in source habitats, with the similarities arranged along major vegetative themes.

Fill—Earth or rock moved during road construction and used to build up portions of the roadway.

Fill slope—The sloping earth surface on the downhill side of a road resulting from roadway excavation.

Fine fuels—Cured grasses, leaves, needles, twigs, and small branches that ignite easily and carry fire rapidly.

Firefighter effectiveness—The ease at which firefighters are able to suppress a fire, based on the flame lengths and rates of spread, which are dependent on the fuel loading and horizontal and vertical continuity of the fuels.

Fire regimes—The characteristics of fire in a given ecosystem, including factors such as frequency, intensity, severity, and patch size. The terms used for the different fire regimes are: Nonlethal, Mixed1, Mixed2, and Lethal. See table below for description.

Fire Regime	Fire Interval	Fire Intensity	Vegetation Patterns (Agee 1998)
Nonlethal	5–25 years	Low—10% mortality or less	Relatively homogenous with small patches generally <1.0 acre of different seral stages, densities, and compositions created from mortality
Mixed1	5–70 years	Low to moderate—10–50% mortality	Relatively homogenous with patches created from mortality ranging in size from <1.0 to 600 acres of different seral stages, densities, and compositions
Mixed2	70–300 years	Moderate to high—50–90% mortality	Relatively diverse with patches created by mixes of mortality and unburned or underburned areas ranging in size from <1 to 25,000 acres of different seral stages, densities, and compositions
Lethal	100–400 years	High—over 90% mortality	Relatively homogenous with patches sometimes >25,000 acres of similar seral stages, densities, and compositions. Small inclusions of different seral stages, densities, and compositions often result from unburned or underburned areas.

Fire intensity—The effects of fire on the above-ground vegetation generally described in terms of mortality.

Fire return interval—The average time between wildfires in a given ecosystem.

FRID—Fire Return Interval Departure (FRID) is defined as the based on the historical fire return interval (the historical interval between fires, in years) for the vegetation type of interest and the years that have elapsed since the last fire. From maps of where and when past fires have occurred, average fire return intervals for each vegetation type class can be determined. Average fire return intervals combined with years that have elapsed since the last fire can be used to derive an index to calculate the departure of an area from its average fire return interval. (The University of Arizona 2005, Fire Return Interval Departure.)

Fire scar—A healing or healed over injury caused or aggravated by fire, on a woody plant.

Fire severity—Fire effects at and below the ground surface. Describes the impacts to organic material on the ground surface, changes to soils, and mortality of below-ground vegetative buds, roots, rhizomes, and other organisms.

Focal species—Species that represent the varying characteristics of a landscape's attributes that must be represented in the landscape.

Forage—Plant material (usually grasses, forbs, and brush) that is available for animal consumption.

Forbs—Broadleaf ground vegetation with little or no woody material.

Forest plan—In this document, the Payette National Forest Land and Resource Management Plan (2003).

Forest Road—As defined in Title 23, Section 101 of the United States code, any road wholly or partly within, or adjacent to, that serves the NFS and that is necessary for the protection, administration, and utilization of the NFS and the use and development of its resources (Forest Plan page GL-15).

Forest Vegetation Simulator (FVS)- A model used to compare changes in stand growth, tree mortality, and average diameters over time.

Fragmentation—The splitting or isolation of habitat into smaller patches because of human actions. Habitat can be fragmented by management activities such as timber harvest and road construction, and changes such as agricultural development, major road systems, and reservoir impoundments.

Fuel—Any substance or composite mixture susceptible to ignition and combustion.

Fuel loading—The weight per unit area of downed woody material (Brown et al. 1982).

Fuels Management Analyst (FMA) Plus—A computer modeling program used to predict and model fire behavior. Inputs include weather conditions, stand data, and fuel models.

Fuel model—A set of numerical values that describe a fuel type for the mathematical model that predicts spread rate and intensity. The parameters that can be varied in a fuel model are: loading, surface area-to-volume ratio, fuel bed depth, and heat content of fuel and moisture of extinction.

Fuel moisture—The amount of moisture in the fuel. Dead fuels can absorb or lose moisture from the air. Small diameter fuels can change in moisture content rapidly, because they have large surface area compared to their volume.

Fuel profile—The properties that describe wildland fuel including chemistry, compaction, continuity, loading, moisture content, and size. The fuel profile consists of aerial fuels as well as surface and ground fuels.

Fuel treatment—The rearrangement or disposal of natural or activity fuels to reduce the fire hazard. Fuels are defined as both living and dead vegetative materials consumable by fire.

Fuelbreak—Areas manipulated for the common purpose of altering surface fuels, decreasing ladder fuels, and reducing tree densities (opening the tree canopy) to reduce the risk of uncharacteristic wildfire and the potential for crown fire (adapted from Agee et al. 2000).

Geographic Information System (GIS)—A computer system that stores and uses spatial (mapable) data.

Goal—As Forest Plan management direction, a goal is a concise statement that helps describe a desired condition, or how to achieve that condition. Goals are typically expressed in broad, general terms that are timeless, in that there are no specific dates by which the goals are to be achieved. Goal statements form the basis from which objectives are developed.

Granitics—Soils derived from granite. Pertaining to relatively coarse grained, light colored rocks.

Ground cover—All vegetative material within 3 feet of the exposed soil surface as well as any additional litter, rock, and rock fragments that are in contact with the soil surface.

Ground fire—A fire that burns the organic material in the upper soil layer (DeBano et al. 1998).

Guideline—As Forest Plan management direction, a guideline is a preferred or advisable course of action generally expected to be carried out. Deviation from compliance does not require a Forest Plan amendment (as with a standard), but rationale for deviation must be documented in the project decision document.

Habitat—A place that provides seasonal or year-round food, water, shelter, and other environmental conditions for an organism, community, or population of plants or animals.

Habitat family—See family.

Habitat security—The protection inherent in any situation that allows big game to remain in a defined area despite an increase in stress or disturbance associated with the hunting season or other human activity. The components of security may include, but are not limited to: vegetation, topography, road density, general accessibility, hunting season timing and duration, and land ownership. Habitat security is area specific, while hiding cover (see definition below) is site specific.

Habitat type—The aggregate of all areas that support or can support the same primary vegetation at climax.

Harvest—Removal of timber (or a portion of an animal population) to achieve a desired condition.

Herbaceous- Referring to grasses and small annual and perennial plants.

Heritage Program. The comprehensive Forest Service program of responsibilities related to historic preservation. The purpose of the Heritage Program is to manage prehistoric and historic cultural resources for the benefit of the public through preservation, public use, and research. (FSM 2360.5)

Hiding cover—vegetation capable of hiding 90% of a standing adult ungulate (deer, elk, moose) from the view of a human at a distance equal to or less than 200 feet; generally, any vegetation used by ungulates for security or to escape from danger.

Historic Properties. 36 CFR 800.16 defines historic properties as “any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria.” (FSM2360.5)

Historical Range of Variability (HRV)—The natural fluctuation of healthy ecosystem components over time. In this document, HRV refers to the range of conditions and processes that likely occurred prior to settlement of the area by people of European descent (around the mid 1800s), and that would have varied within certain limits over time.

Home range—The area that an animal habitually uses during nesting, resting, bathing, foraging, and roosting.

Hydrologic—Refers to the properties, distribution, and effects of water. “Hydrology” is the study of water; its occurrence, circulation, distribution, properties, and reactions with the environment.

Hydrologic Unit Code (HUC)—A hierarchal coding system developed by the U.S. Geological Service to map geographic boundaries of watersheds of various sizes.

IDT (Interdisciplinary Team)—A team of individuals with skills from different disciplines that focus on the same task or project.

Idaho Batholith—A great mass of intruded igneous rock that is primarily granite and covers much of central Idaho.

Indicator—In effects analysis, a way or device for measuring effects from management alternatives on a particular resource or issue.

Indirect effects—Impacts caused by an action but occurring later in time or farther removed in distance.

Insignificant effect—An insignificant effect is one that cannot by detected, measured, or evaluated in any meaningful way.

Intermittent stream—A stream or portion of a stream that flows only in direct response to precipitation or seasonal run-off, and that receives little or no water from springs or other permanent sources. Unlike ephemeral streams, an intermittent has well-defined channel and banks, and it may seasonally be below the water table.

Irretrievable commitments—Losses of production or use for a period of time. An example is suited timberland being used for a skid trail. Timber growth on the land is irretrievably lost while the land is a skid trail, but the timber resource is not irreversibly lost because the land could grow trees again in the near future.

Irreversible commitments—Permanent or essentially permanent resource uses or losses that cannot be reversed, except in the extreme long term. Examples include minerals that have been extracted or soil productivity that has been lost.

Issue—A public or agency concern about a specific action or area that is addressed in the NEPA process.

Juxtaposition—The position of being side by side or close together. Relative position of forage, cover, and other important habitat components for big game.

Key Ecological Functions (KEF)—KEF are the set of ecological roles performed by a species in its ecosystem. These ecological roles are the main ways organisms use, influence, and alter their biotic and abiotic environments.

Key Environmental Correlates (KEC)—KEC are biotic or abiotic habitat elements that species use on the landscape to survive and reproduce.

Knutson-Vandenburg Act (KV)—In 1930, Congress passed the Knutson-Vandenburg Act (KV Act) to authorize collection of funds (KV Funds) for reforestation and timber stand improvement on areas cut over following a timber sale. Funds are to be used to protect and improve the future productivity of renewable resources on timber sale areas.

Ladder fuels—Continuous vertical vegetation that connects surface fuels to the crown fuels of overstory trees, forming a ladder by which a fire can spread into tree or shrub crowns (DeBano et al. 1998).

Landform—A natural feature of the land surface such as a mountain, valley, or ridge.

Landing—A location (usually cleared and level) where logs are stored or loaded onto logging trucks for transport.

Landslide prone—Land that has a probability of mass movement greater than or equal to 10% during a period of 100 years.

Landtype—A portion of the landscape resulting from geomorphic and climatic processes with defined characteristics having predictable soil, hydrologic, engineering, productivity, and other behavior patterns.

Landtype associations—A grouping of landtypes similar in general surface configuration and origin.

Level I Maintenance—These are roads that have been placed in storage between intermittent uses. The period of storage must exceed 1 year. Basic custodial maintenance is performed to prevent damage to adjacent resources and to perpetuate the road for future resource management needs. Emphasis is normally given to maintaining drainage facilities and runoff patterns. Planned road deterioration may occur at this level. Appropriate traffic management strategies are "prohibit" and "eliminate" all traffic. These roads are not shown on motor vehicle use maps. Roads receiving level 1 maintenance may be of any type, class, or construction standard, and may be managed at any other maintenance level during the time they are open for traffic. However, while being maintained at level 1, they are closed to vehicular traffic but may be available and suitable for non-motorized uses (FSH 7709.59).

Long-term—For environmental effects, greater than 15 years. See short-term and temporary.

Long-term road closure—Roads placed in maintenance level 1 and receiving treatments to keep damage to adjacent resources to an acceptable level, and to perpetuate the road to facilitate future management activities. These roads were identified as not needed for project use for more than 15 years. Closure activities could include removing man-made drainage structures, restoring stream channel and banks, providing for drainage (waterbars), scarifying, seeding, and fertilizing.

Lop and scatter—When branches are cut from fallen trees and scattered over the area rather than piled for burning. This allows the slash to lie close to the ground to reduce the fire hazard and accelerate decomposition.

Maintain—When used in a management goal or objective for biological and physical resources, "maintain" means to stay within the range of desired conditions.
The context is that resource conditions are already within their desired range, and the expectation is that management actions to achieve goals or objectives maintain resource conditions within their desired range in the planning period.
When used in a standard or guideline for biological and physical resources, "maintain" means that current conditions are neither restored or degraded, but remain essentially the same. The context is that resource conditions may or may not be in their desired range, and the expectation is that maintenance management actions do not degrade or restore current conditions.
This is an important distinction because most goal or objective management actions cannot be designed to achieve desired conditions for all resources. Specific actions are designed to achieve desired conditions for specific resources, but may simultaneously have effects on those or other resources. The intent behind "maintain" when used in a standard or guideline is to keep those effects from degrading resource conditions; i.e., moving conditions from functioning properly to functioning at risk, or making conditions measurably worse when they are currently functioning at risk or not functioning properly. See definitions for "degrade" and "restore" in this Glossary.
For Recreation, Scenic Environment, Heritage, Lands, Special Uses, and Wilderness resources, "maintain" means to continue a current or existing practice, activity, management strategy, resource condition, or level of use.
For physical improvements managed under the Roads and Facilities programs, "maintain" means to keep the road or facility in a usable condition.
For resource inventories, databases, plans, maps, or other documents related to all resources, "maintain" means to periodically update these items to reflect current conditions and/or status.

Management Area—A land area with similar management goals and a common prescription, as described in the Forest Plan.

Management direction—Activities that must be carried out to meet the goals of agency management.

Management Indicator Species (MIS)—Representative species whose habitat conditions or population changes are used to assess the impacts of management activities on similar species in a particular area. MIS are generally presumed to be sensitive to habitat changes.

Management Prescription Category (MPC)—Management prescriptions are defined as, "Management practices and intensity selected and scheduled for application on a specific area to attain multiple use and other goals and objectives" (36 CFR 219.3). MPCs are broad categories of management prescriptions that indicate the general management emphasis prescribed for a given area. They are based on Forest Service definitions developed at the national level, and represent management emphasis themes, ranging from Wilderness (1.0) to Concentrated Development (8.0). The national MPCs have been customized during Forest Plan revision to better fit the needs and issues of the Southwest Idaho Ecogroup Forests.

Market value—The price that timber and wood products would bring if sold today.

MBF and MMBF—One thousand board feet, and one million board feet, respectively.

Merchantable (timber)—Trees or stands of size and quality suitable for marketing and utilization.

Mitigation—Actions to avoid, minimize, reduce, eliminate, or rectify the impact of a management practice.

Mixed conifer—Stands on the Payette composed primarily of ponderosa pine, Douglas-fir, and grand fir.

Monitoring—The process of collecting information to evaluate if objectives and anticipated results of a management plan are being realized, or if implementation is proceeding as planned.

Mortality (stand)—The number or volume of trees that died because of fire, insects, disease, climatic factors, or competition from other trees or vegetation.

National Environmental Policy Act (NEPA)—The National Environmental Policy Act of 1969 requires environmental analysis and public disclosure of federal actions.

National Fire Plan (NFP)—Strategic and implementation goals, budget requests and appropriations, and agency action plans to address severe wildland fires, reduce fire impacts on rural communities, and ensure effective firefighting capability in the future.

National Forest Management Act (NFMA)—A law passed in 1976 as an amendment to the Forest and Rangeland Renewable Resources Planning Act requiring the preparation of Regional Guides and Forest Plans and the preparation of regulations to guide that development.

National Register of Historic Places (NRHP)—A list of cultural resources that have local, state, or national significance maintained by the Secretary of the Interior.

Native species—Animals or plants that originated in the area in which they live. Species that normally live and thrive in a particular ecosystem.

Natural fuel—The combustible material resulting from natural processes and not directly generated or altered by land management practices.

New road construction—Activity that results in the addition of forest classified or temporary road miles (36 CFR 212.1). This is the definition included in the Forest Plan, however this CFR has been superceded.

Non-point pollution—Pollution that emanates from diffuse and intermittent sources.

Noxious weed—A state-designated plant species that causes negative ecological and economic impacts to both agricultural and other lands within the state.

Objective—As Forest Plan management direction, an objective is a concise time-specific statement of actions or results designed to help achieve goals. Objectives form the basis for project-level actions or proposals to help achieve Forest goals. The time frame for accomplishing objectives, unless otherwise stated, is generally considered to be the planning period, or the next 10 to 15 years. More specific dates are not typically used because achievement can be delayed by funding, litigation, environmental changes, and other influences beyond the Forest's control.

Open road density—Miles of open road per square mile.

Opening (created) -Related to vegetation management, openings are created only by planned, even-aged, regeneration timber harvesting. Only those even-aged timber harvest practices that reduce stocking levels to less than 10% create openings. Canopy closure will normally be used to determine stocking levels. Residual stands of mature trees will generally have less than 10% stocking when fewer than 10 to 15 trees per acre remain following harvest.

Overstory That portion of the trees, in a Forest of more than one story, forming the upper or uppermost canopy.

Overstory removal—Removal of most or all of the trees forming the uppermost canopy in a two or multi storied stand. The remaining trees are of good quality and will be managed as the next crop of trees on the site.

Perennial stream—A stream that typically maintains year-round surface flow, except possibly during extreme periods of drought. A perennial stream receives its water from springs or other permanent sources, and the water table usually stands at a higher level than the floor of the stream.

Potential Vegetation Group (PVG)—Potential vegetation types grouped on the basis of a similar general moisture or temperature environment.

Prescribed fire—Any fire ignited by management actions to meet specific objectives.

Private Road—A road located on private land within the National Forest boundary.

Project area—The area bounding all management activities associated with a project. This area is greater than the total acres treated; some analysis of effects to resources may be appropriate at this scale and others may occur at the activity area level and not include the entire project area.

Proposed action—A proposal made by the Forest Service or other federal agency to authorize, recommend, or implement an action to meet a specific purpose and need.

Proposed species—Species that are proposed to the USDI Fish and Wildlife Service for threatened or candidate status.

Proposed endangered—Taxa proposed to be listed as endangered.

Proposed threatened—Taxa proposed to be listed as threatened.

Recontour—Reestablish the natural slope of the land where a road has been located. This may involve pulling the fill material up onto the road surface and/or bringing in material to replace that, which was removed to build the road.

Recreation Opportunity Spectrum (ROS)—A framework for stratifying and defining classes of outdoor recreation environments, activities, and experience opportunities. The settings, activities, and opportunities for obtaining experiences are arranged along a continuum or spectrum divided into six classes--primitive, semiprimitive nonmotorized, semiprimitive motorized, roaded natural, rural, and urban.

Reforestation—The natural or artificial restocking of an area with Forest trees.

Regeneration—The renewal of a tree crop, whether by natural or artificial means. Also, the young crop itself, which commonly is referred to as reproduction.

Restore—For biological and physical resources, restore means to repair, re-establish, or recover ecosystem functions, processes, or components so that they are moving toward or within their range of desired conditions. For the Recreation, Scenic Environment, Heritage, Lands, Special Uses, Wilderness, Roads and Facilities resources, restore means to use management actions to re-establish desired resource conditions.

Revegetation—The re establishment of plant cover, either naturally or by manually seeding.

Riparian—Relating to the banks of natural watercourses such as rivers or streams.

Riparian Conservation Areas (RCAs)—Portions of watersheds where riparian-dependant resources receive primary emphasis, and management activities are subject to specific goals, objectives, standards, and guidelines. RCAs include traditional riparian corridors, perennial and intermittent streams, wetlands, lakes, springs, reservoirs, and other areas where proper riparian functions and ecological processes are crucial to maintenance of the area's water, sediment, woody debris, nutrient delivery system, and associated biotic communities and habitat.

Ripping—Breaking up a compacted surface to a depth of at least 16 inches.

Road -A motor vehicle travelway over 50 inches wide, unless designated and managed as a trail. A road may be classified, unclassified, or temporary.

Road construction— see New road construction.

Road decommissioning—Activities that result in the stabilization and restoration of unneeded roads to a more natural state (36 CFR 212.1, FSM 7703). All decommissioning in this project is full road obliteration and includes the following:

- Reestablishing former drainage patterns, stabilizing slopes, and restoring vegetation;
- Removing culverts, reestablishing drainages, removing unstable fills, pulling back road shoulders, and scattering slash on the roadbed;
- Completely eliminating the roadbed by restoring natural contours and slopes

Road maintenance—The ongoing upkeep of a road necessary to retain or restore the road to the approved road management objective.

Road reconstruction—Activity that results in improvement or realignment of an existing classified road as defined below:

Road improvement Activity that results in an increase of an existing road's traffic service level expansion of its capacity, or a change in its original design function.

Road realignment—Activity that results in a new location of an existing road or portions of an existing road and treatment of the old roadway.

Road Obliteration—See Road Decommissioning. For this project the terms are used synonymously.

Sawtimber—Trees containing at least one 8-foot sawlog with a top diameter of 6-inches and meeting regional specifications for freedom from defect.

Scale—Defined in this framework as geographic extent; for example, region, sub-regional, or landscape scale.

Scarification—Exposing or roughing mineral soil surface for better seed germination.

Scoping—The process the Forest Service uses to determine, through public involvement, the range of issues that the planning process should address.

Seasonally open road—Roads open to motorized use on a seasonal basis (e.g., closed during hunting season).

Section 106 review- A review required by the National Historic Preservation Act to determine effects of a federal action on cultural resources.

Section 7 Consultation—Consultation required by the Endangered Species Act with the appropriate jurisdictional agency for a listed species.

Sediment—Any solid material (mineral and organic) that has been moved to a water body and is being transported or has been deposited.

Sensitive species—A Forest Service or BLM designation, sensitive plant and animal species are selected by the Regional Forester or the BLM State Director because population viability may be a concern, as evidenced by a current or predicted downward trend in population numbers or density, or a current or predicted downward trend in habitat capability that would reduce a species' existing distribution. Sensitive species are not addressed in or covered by the Endangered Species Act.

Seral—The unique characteristics of a biotic community that is a developmental, transitory stage in an orderly ecological succession involving changes in species, structure, and community processes with time.

Short term—For environmental effects, greater than 3 to 15 years. See temporary and long term.

Short-term road closure—Roads placed in maintenance level 1 and closed to vehicular traffic for greater than one year. Basic custodial maintenance is performed to keep damage to adjacent resources to an acceptable level, and to perpetuate the road to facilitate future management activities. Emphasis is normally given to maintaining drainage facilities and runoff patterns.

Silvicultural prescription—The method selected to manage a forest stand. Silvicultural prescriptions are broken into broad types, including even aged and uneven aged. Even aged prescriptions include clearcut, seed tree, and shelterwood. Uneven aged prescriptions include individual tree selection and group selection. Other non regeneration prescriptions include thinning and sanitation/salvage cuttings.

Silviculture –The care and tending of stands of trees to meet specific objectives.

Site potential tree height—For delineating RCAs, a site potential tree height is the height that a dominant or co-dominant tree within a stand is expected to attain at an age of 200 years. Outside of RCAs, a site potential tree height is the average height that the dominant or co-dominant tree within a stand will attain within 100 years.

Site preparation—A general term for removing unwanted vegetation, slash, roots, and stones from a site before reforestation.

Skid trail—A route used by loggers to drag logs from stump to landing.

Skidding—A loose term for hauling trees by sliding, not on wheels, from stump to roadside, deck, skidway, or other landing.

Skyline logging—A logging system using steel cable, a tower, and a powered winch to elevate logs from their position in the woods and carry them suspended to a point where they can be loaded on to trucks.

Slash—The residue left on the ground after timber cutting and/or accumulation as a result of storm, fire, or other damage. It includes logs, uprooted stumps, broken or uprooted stems, branches, twigs, leaves, bark, and chips.

Slash filter windrow-- Woody debris placed along a slope to trap and hold sediment coming off a hill or road above.

Snag—standing dead tree.

Soil compaction—Where one or more of the following conditions occurs in relation to natural: a 50% reduction in macropore space; less than 15% macropore space, total; 15% increase in soil bulk density; or a 40% reduction in hydraulic conductivity.

Soil erosion—Soil erosion is the detachment and transport of soil particles or aggregates by wind, water, or gravity. Management practices may increase soil erosion hazard when they remove ground cover and detach soil particles. .

Soil productivity—Soil productivity includes the inherent capacity of a soil under management to support the growth of specified plants, plant communities, or a sequence of plant communities. Soil productivity may be expressed in terms of volume or weight/unit area/year, percent plant cover, or other measures of biomass accumulation.

Source Habitat—Source habitats are those characteristics of macrovegetation (i.e., cover types and structural stages) that contribute to stationary or positive population growth for a species in a specified area and time (Wisdom et al. 2000).

Species composition—The different tree species within a stand, usually expressed as a percentage within each age class.

Stand—An aggregation of trees or other vegetation occupying a specific area and sufficiently uniform in composition (species), age arrangement, and condition as to be distinguishable from the Forest or other vegetation of land cover on adjoining areas.

Stand density—A measure of how crowded a stand is. Measures of density include: trees per acre, square feet of basal area, stand density index (SDI), and percent of maximum SDI.

Stand initiation—A stage of stand development following a disturbance when new individuals and species continue to appear for several years (Oliver and Larson 1996).

Stand structure—The different sizes and ages of trees within a stand.

Standard—As Forest Plan management direction, a standard is a binding limitation placed on management actions. It must be within the authority and ability of the Forest Service to enforce. A project or action that varies from a relevant standard may not be authorized unless the Forest Plan is amended to modify, remove, or waive application of the standard.

State Historic Preservation Officer (SHPO)—A person appointed by a state's Governor to administer the State Historic Preservation Program.

Strata—Groups of stands that are relatively homogeneous in age, productivity, and density.

Structure—The size and arrangement, both vertically and horizontally, of vegetation.

Stumpage—Value of timber as it stands uncut in the woods

Substrate—The composition of a streambed, including mineral and organic materials.

Subwatershed—An area of land that drains to a common point. A subwatershed is smaller subdivision of a watershed but is larger than a drainage or site. Subwatersheds are often synonymous with sixth-field hydrologic units, which are nested within larger watersheds (fifth-field units), and are comprised of smaller drainages, sites, and stream reaches.

Succession—The replacement in time of one plant community with another. The prior plant community (or successional stage) creates conditions that are favorable for the establishment of the next stage. These changes often occur in a predictable order. More specifically, the gradual and natural progression in composition and structure of an ecosystem toward a climax condition or stage.

Successional stage—A stage or recognizable condition of a plant community that occurs during its development from bare ground to climax.

Summer range—The area essential for big game to carry out their reproductive cycles.

Surface erosion—The wearing away of the land surface by running water or wind.

Surface fire—A fire that burns only surface fuels (DeBano et al. 1998).

Sustainability-- The ability to maintain a desired condition or flow of benefits over time.

System roads—(also termed classified roads) Roads wholly or partially within or adjacent to National Forest System lands that are determined to be needed for long-term motor vehicle access. System roads can include state roads, county roads, privately owned roads, NFS roads, and other roads authorized by the Forest Service.

Temporary—For environmental effects, 0 to 3 years. See short-term and long-term.

Temporary road—Roads authorized by contract, permit, lease, other written authorization, or emergency operation, that are not intended to be a part of the forest transportation system, that are not necessary for long-term resource management, and that is not a forest road or a forest trail and that is not included in a forest transportation atlas (36 CFR 212.1).

Thinning—A cultural treatment made to reduce stand density of trees primarily to improve growth, enhance forest health, or recover potential mortality (Helms 1998). Types of thinning include the following: Crown thinning—the removal of trees from the dominant and codominant crown classes in order to favor the best trees of those same crown classes- synonym thinning from above. Free thinning—The removal of trees to control stand spacing and favor desired trees, using a combination of thinning criteria without regard to crown position. Low thinning—The removal of trees from the lower crown classes to favor those in the upper crown classes—synonym thinning from below.

Threatened species—Designated by the FWS or NOAA Fisheries, in accordance with the Endangered Species Act; a plant or animal species, or critical habitat, given federal protection, because it is likely to become endangered throughout all or a significant portion of its range within the foreseeable future.

Timber sale contract—The binding document between the Forest Service and timber purchaser that states, among other things, how the sale will be logged.

Timber Stand Improvement (TSI)—An intermediate treatment made to improve the composition, structure, condition, health, and growth of even or uneven aged stands.

Total Maximum Daily Load (TMDL)—TMDL is the sum of waste load allocations for point sources, non-point sources, natural background, and a margin of safety. A TMDL specifies the amount of a pollutant that needs to be reduced to meet water quality standards set by the state. TMDL is used in a process to attain water quality standards that (1) identifies water quality problems and contributing pollutant sources, (2) allocates pollution control responsibilities among sources in the watershed, and (3) provides a basis for taking actions needed to restore a water body.

Total Soil Resource Commitment (TSRC)—A measure of how much land in a project area is converted to a non-productive condition (less than 40% of natural productivity rates) for 50 years or more. Examples are permanent skid trails, landings, roads, campgrounds, administrative sites, and recreational trails.

Tractor logging—Any logging method, which uses a tractor as the motive power for transporting logs from the stumps to a collecting point—whether by dragging or carrying the logs.

Unauthorized Road or Trail—Roads on NFS lands that are not managed as part of the forest transportation system, such as unplanned roads, abandoned travelways, and off-road vehicle tracks that have not been designated and managed as trails. Non-system roads also include those roads that were once under permit or other authorization and were not decommissioned upon the termination of the authorization (36 CFR 212.1).

Uncharacteristic wildfire—a wildland fire that causes fire behavior and/or effects that are not within the historical fire regime for a given area. This may include fire intensity, severity, size, and landscape patterns.

Underburn—A light broadcast burn under an existing forest canopy. A fire prescribed to reduce fuels without damaging existing trees.

Undesirable wildland fire—an unwanted wildland fire. This type of fire differs from an uncharacteristic fire in that it may or may not be within its natural fire regime, but due to social or political reasons, it is not desired in a given area at a given time under certain circumstances.

Understory—The trees and other woody species growing under a more-or-less continuous cover of branches and foliage formed collectively by the upper portion of adjacent trees and other woody growth.

Viability- The ability of wildlife or plant populations to maintain a sufficient size so that it persists over time in spite of normal fluctuations in numbers. Viability is usually expressed as a probability of maintaining a specific population for a specified period.

Viable population—A population that is regarded as having the estimated numbers and distribution of reproductive individuals to ensure that it will continue to exist over time and will be well distributed within a given area.

Visual Quality Objective (VQO)—Categories of acceptable landscape alteration measured in degrees of deviation from the natural-appearing landscape. The categories include Preservation, Retention, Partial Retention, Modification, and Maximum Modification.

Water quality—Refers to the chemical, physical, or biological characteristics that describe the conditions of a river, stream, or lake.

Water Quality Limited Segment (WQLS)—A stretch or area of surface water where technology-based controls are not sufficient to prevent violations of water-quality standards. In such cases, new permit limitations are based on ambient-water-quality considerations.

Waterbar—An earthen barrier across a road or skid trail used to divert water and reduce erosion. It is usually designed to allow limited vehicle passage.

Watershed—The entire land area that contributes water to a drainage system or stream.

Watershed Condition Indicator (WCI)—WCIs are an integrated suite of aquatic (including biophysical components), riparian (including riparian –associated vegetation species), and hydrologic (including uplands) condition measures that are intended to be used at a variety of watershed scales. They assist in determining the current condition of a watershed and should be used to help design appropriate management actions, or to alter or mitigate proposed and or ongoing actions, to move watersheds toward desired conditions. WCIs represent a diagnostic means to determine factors of current condition and assist in determining future conditions associated with implementing management actions or natural restoration over time.

West Zone (of the Payette National Forest) —Council and Weiser Ranger Districts, Payette National Forest, Idaho.

Wet Meadow- A type of marsh that commonly occurs in poorly drained soils. These wetlands, which often resemble grasslands, are typically drier than other marshes except during periods of seasonal high water. For most of the year wet meadows are without standing water, though the high water table allows the soil to remain saturated. A variety of water-loving grasses, sedges, rushes, and wetland wildflowers proliferate in the highly fertile soil of wet meadows.

Whole-tree yarding—Method of tree harvest where felled trees are yarded or skidded to landing locations with top and limbs intact. Trees are then deli bed, topped, and bucked at the landing and associated slash is then treated at the landing.

Wildland fire or wildfire—Any fire not involving a home or other structure, other than prescribed fire, that occurs in the wildland.

Wildland/Urban Interface (WUI)—For at risk communities that have not yet designated their WUI as part of a community wildfire protection plan, the HFRA has a default definition of WUI (section 101 (16)(B(ii). It is an area extending ½ mile from the boundary of an at-risk community. The line, area, or zone where structures and other human developments meet or intermingle with undeveloped wildland or vegetative fuel.

Yarding—The operation of hauling timber from the stump to a collecting point.

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