



# Pierre Lake Fuels Reduction Environmental Assessment

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## **Introduction to the Proposed Project**

The Bureau of Land Management (BLM) Spokane District is proposing to conduct a fuels treatment project on 672 acres of forested land in northeast Washington using a combination of commercial and non-commercial harvesting techniques. The project would be located approximately 3-7 miles northeast of Orient, in Stevens County and in the Northeast Management Area of the Spokane District's Border Field Office (BLM 1985). The BLM lands proposed for treatment consist of six isolated parcels that are separated by private, Washington Department of Natural Resources (DNR), and National Forest lands (see Attachment 1; a legal description of all properties affected is included on Attachment 1).

## **Background**

No vegetation, fuels reduction, or fire hazard management activities have occurred within the proposed project area. However, multiple timber sales consisting of single tree selection were located within in the Hidden Treasure Unit of the project area in the period 1951 - 1968.

Historical evidence indicates that, prior to fire exclusion, this area experienced low to mixed severity fires every 6 to 15 years. Past fires acted as a thinning agent to maintain early-seral species with open understories of predominantly grasses and forbs. These forests may have been deprived of 10 or more natural fire cycles (Brown et al. 2004). The absence of wildfires in the area for many decades has resulted in stands that are unnaturally dense with understory trees. As a result, the severity and size of wildland fires have increased in the region over the last 100 years, and particularly so within the last 20 years. These changes have altered tree species composition and age classes, with uniform stands of middle-aged trees predominating at present, in contrast to historic conditions that included predominantly large and older age class trees.

The current age distribution and stand structure present an increased fire hazard because the small understory trees and brush provide fuel ladders to the overstory creating the potential for a wildfire that could result in complete stand mortality. "Lightning is the primary cause of wildland fires in the western United States, and fire starts coincide more closely with available fuels than with the number or charge of lightning strikes," (Rorig et al. 1999).

Residential development has occurred in this area over the last several decades. Many homes are located within or adjacent to areas that are at high risk of wildfire due to topography and heavy fuel loading.

In 2003, Congress passed the Healthy Forest Restoration Act (HFRA). The HFRA is intended is to reduce wildfire risk to communities, municipal water supplies, and other at-risk Federal lands through a collaborative process of planning, prioritizing, and implementing hazardous fuel reduction projects. It was also intended to facilitate efforts to protect forests from the threat of stand-replacing wildfire.

### *Coordination Efforts and Other Relevant Activities in the Area*

The project area has been a fire protection focus area for several different agencies and homeowner groups over the past several years. The DNR and the U.S. Forest Service (USFS) are in the process of conducting fuels reduction treatments in the vicinity; this project would be located adjacent to those treatments and has been designed to complement those projects' objectives. The project area has been identified by the Stevens County Community Wildfire Protection Plan (CWPP) to be within the Lower Kettle River Strategic Planning Area #2.

### **Purpose and Need**

Efficient fire suppression efforts over the past 100 years have resulted in excessive forest floor fuel loads and excessive vegetation growth. Dry summer climatic conditions, as well as insect and disease infestations, have also contributed to dangerous fuel levels and an elevated risk of severe wildfires locally. Trees growing in these very dense conditions are also at greater risk of mortality due to inter-tree competition for nutrients, water and sunlight. Disease stressed trees, insect killed trees and forest floor fuels create continuous fuel ladders which connect ground fires to the tree crowns. This scenario creates conditions which can completely destroy the entire forest stand in the event of a wildfire. The proposed fuels management project is needed to abate or reverse these trends of disease and heavy fuel loading in the project area.

Additionally, the BLM's proposed project has been developed in response to the DNR request to implement fuels projects adjacent to private, DNR, and USFS lands.

The BLM's purpose for this proposed action is to:

- enhance identified escape routes in the event of a wildfire
- reduce the risk to homes, structures and infrastructure from wildfires
- reduce the risk of uncharacteristic wildfire on forest ecosystems
- improve the ability of forest stands to withstand frequent fires, and
- increase fire managability and contribute to firefighter/public safety during wildfires.

### **Public Involvement**

Prior to the official public scoping period and meeting, the BLM posted notification signs near mailbox clusters and along primary travel routes in the project area. The BLM mailed information postcards to all adjacent landowners and to all parties who had previously indicated interest in similar BLM projects. The BLM also mailed scoping letters and maps to anyone who requested more information about the project. Additionally, the BLM provided information about the project on the Spokane District website.

The BLM held a public meeting on Tuesday, October 20, 2009 at the Barstow Fire Training Center, 25266 Hwy. 395 N., Kettle Falls, Washington, 99141. Nine community members (that signed in) attended this meeting. Public comment and feedback from the meeting was generally supportive of the project.

## Issues Identified for Further Consideration

The BLM received four comment letters and emails during the public scoping period. Additionally, resource issues and concerns were identified by a project Interdisciplinary Team (ID Team) during internal scoping. The BLM used all scoping comments received to further develop the proposed action and to focus the effects analysis. The concerns and topics of interest expressed in the comments are summarized below:

1. Confirmation and support for the BLM's purpose and need to improve forest health on BLM lands and to enhance fire safety for the residences of the adjacent property landowners.
2. Use and maintenance of all private roads to access project areas.
3. Timing of thinning and piling and utilization of biomass to limit bark beetle infestation.
4. Adoption of a more generous range of basal area targets to reflect natural variances from one biophysical environment to another.
5. Retention of large diameter at breast height (dbh) trees (18 – 20 inches) and natural clumps.
6. Identification of patches to remain untreated throughout harvest units.
7. Protection of riparian areas.
8. Scenic impacts and visual integrity in the riparian area along the Kettle River.
9. Short-term economic benefits from the project.
10. The project area provides suitable habitat for the sensitive plant black snakeroot (*Sanicula marilandica*).
11. The project area provides suitable habitat for special status species, including Townsend's big-eared bat (*Corynorhinus townsendii*) and Bald eagle (*Haliaeetus leucocephalus*).
12. Protection or discovery of Cultural Resources would require protection and notification of the proper authority.
13. Firefighter and public safety in the vicinity of abandoned mines and abandoned mine lands (AML).

## **Issues Eliminated from Further Consideration**

### *Effects to Mining Operations and/or Energy Development*

Existing mine openings, while a safety consideration for the fuels reduction crews, will not be affected by the proposed treatments or operations. Overall, there is no potential to affect minerals or energy development potential in the project area. This issue will not be considered further in this analysis.

## **Compliance with Land Use Plan**

The project area is located within the Northeast Management Area of the Spokane District's Border Field Office. The Spokane District Resource Management Plan (RMP) Amendment (1992) specifies that Forest Management, Wildlife Habitat, Recreation, and Livestock Grazing are programs of emphasis for this management area. The proposed action is in compliance with the Spokane RMP Record of Decision (RMP/ROD) (1987) and the Spokane RMP Amendment ROD (1992).

## **Alternatives**

Consistent with the 2003 HFRA, two alternatives have been developed to respond to the Purpose and Need and the issues identified during scoping: Alternative 1 (Proposed Action) and Alternative 2 (No Action).

### **ALTERNATIVE 1 (PROPOSED ACTION)**

#### *Overview*

The BLM would treat 672 acres of forest vegetation and fuels over multiple years using prescribed fire, commercial harvest, and precommercial thinning. Four treatment units have been defined based on BLM parcel boundaries:

- Kettle River
- Rock Cut
- Mining Camp
- Hidden Treasure (also commonly referred to as First Thought Mine)

In general, all treatments would focus on large tree retention and all treatments would retain natural clumps and untreated areas throughout the project area. The following treatment specifications and restrictions would be applied, in addition to the Project Design Features described below.

### *Diameter Specifications*

These specifications apply to the entire project area.

- No trees larger than 23” dbh would be removed.
- In general, trees larger than 18” dbh would be retained. Trees larger than 18” dbh may be removed if the tree bole or canopy is in competition with other trees of similar size.
- No western red cedar larger than 8” dbh would be removed, unless necessary for road construction.
- No Engelmann spruce larger than 8” dbh would be removed, unless necessary for road construction.

### *Riparian Zone Activity Specifications*

These specifications apply to areas within 0-75 feet of the Kettle River.

- Equipment would not be allowed to operate within 75 feet of the high water mark of the Kettle River, with the exception of on existing roads.
- Prescribed fire use and precommercial thinning (hand thinning and piling) are the only treatment types that would be used within 50 feet of the Kettle River. (Commercial tree harvesting would not occur within 50 feet of the high water mark of the Kettle River.)
- Beyond 50 feet from the high water mark of the Kettle River, selective harvesting/commercial timber is proposed with emphasis on smaller diameter trees, consistent with the diameter specifications identified above.

### *Treatment Specifications*

The following three treatment types are proposed to reduce hazardous fuels and severe wildfire potential across the project area:

- **Prescribed fire** - Prescribed fire would be used to deliberately burn wildland fuels to reduce hazardous fuel accumulation, promote and enhance regeneration (grasses, forbs, shrubs, slash and trees), and reintroduce fire into fire-dependent ecosystems.
- **Pre-commercial thinning** - Pre-commercial thinning would occur on trees less than 9” DBH throughout the entire project area. Pre-commercial thinning is intended to target small diameter ladder fuels in the understory and to reduce stocking and concentrate growth on the more desirable trees.
- **Commercial thinning/harvest** - Commercial thinning/harvest would occur on trees less than 23” DBH, producing merchantable material at least equal to the value of the direct costs of harvesting. In general, trees larger than 18” dbh would be retained.

Commercial harvest would occur on approximately 414 acres (see Attachment 2). Harvests would occur with an average leave tree spacing of 30 feet which results in an average of approximately 52.5 square feet of basal area per acre. Commercial harvest treatments would be

conducted in conjunction with pre-commercial thinning and the removal of biomass across the entire project area (see Attachment 3).

All landing sites and hand piles would be either chipped for biomass or burned on site. Where feasible, thinning would be followed with broadcast burning and would be used in the future to maintain the forest ecosystems and reduced fuel loads.

Equipment and personnel access would occur via existing BLM roads (open as well as abandoned roads), state and county roads, existing easements, road use agreements, and temporary skid and haul roads. Landing locations would be located within existing road rights-of-way and would be designated by the BLM immediately prior to implementation. Access routes and landing locations may require some vegetation clearing or removal of downed trees and debris.

In the Kettle River and Rock Cut units, commercial treatments would only occur in during the winter months during periods of snow/frozen ground. To minimize the potential for soil compaction, a combined minimum of 10” of frozen ground and compacted snow and/or a combination of snow and slash would be required prior to harvest activities. Frozen ground means the ground remains hard and frozen after the equipment has passed and does not break-up. If this requirement is not being met, or if resource damage is occurring, the sale administrator would shut down potential ground disturbing operations until such time as the required conditions are met. There are no seasonal restrictions on treatment activities within the Mining Camp or Hidden Treasure units.

Selected mine hazards are being considered for closure. The intent of these closures is to improve firefighter/public safety in the event of future wildland fires. These closures would be completed with fencing, buried culverts, and bat gates, where necessary.

## PROJECT DESIGN FEATURES

The following environmental protection measures would be implemented prior to and during treatment activities to avoid or reduce potential impacts to resources as a result of the project. The following measures are fundamental components of the Proposed Action Alternative.

### *Fuels Management*

- Prior to conducting prescribed burns in the project area, a burn plan will be prepared to address burning objectives and operational concerns. The plan would identify mitigation measures necessary to protect site-specific resource values, notification procedures for local area residents, and potential fire behavior and precautions.

### *Cultural Resources*

- Cultural resources will be protected, to the extent possible, from impacts of the proposed project. This will be accomplished by project redesign to avoid impacting sites that have been identified within the project area. If the site cannot be avoided, consultation will be conducted with the Department of Archaeology and Historic Preservation and appropriate

tribal governments and historical societies and if necessary, the Advisory Council on Historic Preservation. If important cultural properties are encountered during project implementation, the disturbing activity will be halted, the authorized BLM official will be contacted, and the resource protected until a BLM archaeologist has assessed the historic significance of the resource.

- The Marcus-Grand Prairie Road requires protection from ground disturbing activities. Skidding and heavy log truck traffic would only be permissible on 12” or more of snow.
- Sites that could be impacted from project activities will be flagged with high visibility tape prior to project implementation. The size of the areas flagged for protection will vary, depending on the type of resource (e.g., combustible, fragile) and other site conditions such as terrain and fuel loading. Small open pit prospects, waste rock piles, and similar sites have low potential to be impacted by project activities. These sites will not be flagged.

### *Soils*

- Seeding of grasses or other non-invasive cover plants will be required where soil is disturbed by harvest, fuel disposal, or road activities (typically including tractor skid trails, cut-to-length trails where the slash has failed to mitigate erosion, landings, and road cut and fill slopes).
- Following prescribed burns, seed large barren areas, particularly areas with a high potential for sediment delivery to streams. The goal is to provide long-term soil cover and reduce the risk of weed infestations. Native plant materials are the first choice in re-vegetation, but non-native, non-invasive plant species may also be used.
- When available, use existing roads, landings, and unauthorized roads instead of building new road templates and landings. Tractor fireline and skid trails should be coordinated to minimize the overall impact. The goal is to minimize the creation of new detrimentally impacted areas. This practice applies to all units and new and temporary road construction.

### *Special Status Plants*

- All known special status plant species occurrences will be flagged prior to project implementation. Project activities will avoid all flagged occurrences.

### *Wildlife*

- Townsend’s big-eared bat: To maintain mine microsite characteristics, no removal of overstory or emergent trees will be allowed within 250’ of identified priority sites.
- Townsend’s big-eared bat: No burning would be allowed in the vicinity of priority mine features during the periods October 15 – April 15 and June 1– August 30.
- Bats, in general: All mine features will be evaluated on a case by case basis for closure. Sites that possibly provide habitat for bats that present a risk to public safety will be closed with

bat-compatible closures.

- Bald eagle winter roost: If bald eagles are observed within 400' of the project area during the winter roosting season (November 15-March 15), all operations within 400' of the roost site will be suspended until after March 15.
- Bald eagle winter roost: Precautions should be taken to avoid burning or disturbing suitable roost trees.
- Eagle (bald or golden): If active or inactive eagle nests are found during treatments, no activities will occur within 660' or 330', respectively, during the period February 1 –July 31.
- Eagle (bald or golden): Precautions should be taken to avoid burning or disturbing suitable nest trees.
- Goshawk: If an active goshawk nest is found during harvesting, road building, or other project-related activities, a minimum of 30 acres of the most suitable habitat surrounding the nest will be excluded from the sale. If an active nest is located, sale activities within one mile of the nest will be restricted from April 1 to August 30 minimize disturbance during the bonding and nesting period.
- Wherever possible, slash piles will not be constructed on logs, stumps, talus slopes, or within 25 feet of wildlife trees with nest structures.
- Wherever possible, piles will not be located within 10 feet of reserved trees or snags.
- An average of 2.3 large (>21" dbh) snags will be retained per acre in the project area. If adequate numbers of snags greater than 21" dbh are not available, then a mix of the largest snags available shall be substituted (USDA FS and USDI BLM 2000b). Snags removed for worker safety will be high-topped at 10-15', if possible.
- Temporary and reopened roads will be closed and/or rehabilitated as necessary.
- Biologist Notification - During any project activities including, but not limited to, layout, marking, harvest operations, thinning, burning, and post-harvest activities, if raptor nests or threatened or endangered wildlife species are observed, a BLM biologist will be notified and project activities will cease until a biological evaluation is completed.

### *Recreation / Visual Resources*

- Visual Resources along Kettle River - Commercial tree harvesting will not occur within 50 feet of the high water mark of the Kettle River. Equipment will not be allowed to operate within 75 feet of the high water mark, with the exception of along existing roads.
- Trees that constitute the "front wall" (first 50 feet measured from the high water mark) on the Kettle River area will be retained for visual integrity.

- The thinning of commercial trees will be “feathered” to soften the edges of cut patches. Additionally, variable density thinning will be used to prevent a “tree farm” appearance following harvest activities.

### *Monitoring and Evaluation*

- Monitoring and evaluation of the treatment activities would be conducted consistent with BLM Instruction Memorandum OR-2009-028, *Monitoring Fuels Treatments* (or, latest revision) and the Healthy Forest Restoration Act of 2003.

## ALTERNATIVE 2 (NO ACTION)

No fuels reduction or safety enhancement activities would occur under this alternative. This alternative would continue current forest and wildfire management practices as defined in the 1987 and 1992 RODs for the RMP and RMP Amendment.

## Affected Environment & Environmental Consequences

### SOILS

#### *Affected Environment*

Thirteen soil map units occur within the project area. The primary characteristics, typical slope ranges, and key considerations relative to the proposed project are displayed in Table 1.

The main limitation for commercial harvest on most of the soil types present in the project area is steepness of slope (NRCS 1982). Steep slopes restrict the use of equipment with wheels or tracks in skidding operations. Standard equipment with wheels or tracks can cause rutting and compaction when the soil is moist and/or displacement of the surface layer when soil is dry. Yarding paths, skid trails, firebreaks, and other surface disturbances are subject to rilling and gullyng. Cable yarding systems generally are safer to use and cause less displacement of the soil.

Soil compaction can be increased in areas where yarding paths and skid trails are forced to converge to avoid large outcrops of rock or dangerously steep terrain (NRCS 1982).

Runoff rates and water erosion hazards vary by soil type, steepness of slope, and rock to soil ratios. In the project area, the full range of runoff rates, from slow to very rapid, and water erosion hazard, from slight to very high, are present.

Table 1. Soil Characteristics within the Project Area.

Soil Series	Soil Characteristics / Soil Formation	Typical Slope Range	Treatment Units Affected	Acreage within Project Area	Hazard Considerations
Aits	Very deep, well drained soils on toe slopes, foot slopes, and side slopes of foothills / Formed in glacial till and are mantled with volcanic ash and loess	0 to 65%	<ul style="list-style-type: none"> <li>• Mining Camp</li> <li>• Hidden Treasure</li> </ul>	76 acres	Runoff: Medium to rapid  Water erosion: Moderate to high
Bisbee	Very deep, somewhat excessively drained soils on undulating, dunelike terraces and terrace escarpments / Formed in wind worked, mixed sandy outwash material	0 to 45%	<ul style="list-style-type: none"> <li>• Rock Cut</li> </ul>	67 acres	Runoff: Medium to rapid  Water erosion: Moderate to high  Wind erosion: High
Bonner	Very deep, well drained soils on terraces and terrace escarpments / Glacial outwash and are mantled with volcanic ash and loess	0 to 65%	<ul style="list-style-type: none"> <li>• Kettle River</li> <li>• Rock Cut</li> </ul>	19 acres	Runoff: Slow to rapid  Water erosion: Moderate to high
Hagen	Very deep, somewhat excessively drained soils on terraces and terrace escarpments / Formed in mixed, sandy glacial outwash material	0 to 40%	<ul style="list-style-type: none"> <li>• Kettle River</li> <li>• Rock Cut</li> </ul>	32 acres	Runoff: Slow to medium  Water erosion: Slight to moderate  Wind erosion: High
Inkler	Very deep, well drained soils on toe slopes, foot slopes, and side slopes of foothills / Formed in glacial till, colluvium, and residuum, with an admixture of volcanic ash in the upper part	0 to 65%	<ul style="list-style-type: none"> <li>• Hidden Treasure</li> </ul>	25 acres	Runoff: Medium to very rapid  Water erosion: Moderate to very high
Rock-Outcrop Donavan	Very deep, well drained soils on toe slopes, foot slopes, and side slopes of foothills / Formed in mixed glacial till, with an admixture of loess and volcanic ash	0 to 65%	<ul style="list-style-type: none"> <li>• Kettle River</li> <li>• Rock Cut</li> </ul>	55 acres	Runoff: Very rapid  Water erosion: Very high
Merkel	Very deep, well drained soils on toe slopes, foot slopes, and side slopes of foothills / Formed in glacial till derived mainly from granite, with an admixture of volcanic ash in the upper part	0 to 65%	<ul style="list-style-type: none"> <li>• Kettle River</li> </ul>	8 acres	Runoff: Very rapid  Water erosion: Very high
Rufus	Shallow, well drained soils on side slopes and ridgetops of mountains / Formed in residuum and colluvium derived from shale, with an admixture of volcanic ash and loess	30 to 65%	<ul style="list-style-type: none"> <li>• Kettle River</li> <li>• Mining Camp</li> </ul>	52 acres	Runoff: Very rapid  Water erosion: Very high
Scoop	Very deep, well drained soils on	5 to	<ul style="list-style-type: none"> <li>• Hidden Treasure</li> </ul>	133 acres	Runoff: Medium to

Soil Series	Soil Characteristics / Soil Formation	Typical Slope Range	Treatment Units Affected	Acreage within Project Area	Hazard Considerations
	toe slopes, foot slopes, and side slopes of foothills / Formed in glacial till and colluvium, with an admixture of loess and volcanic ash	65%			rapid Water erosion: Moderate to high
Spens	Very deep, somewhat excessively drained soils on terrace escarpments of major drainageways / Formed in mixed glacial outwash and colluvial material	25 to 65%	• Rock Cut	8 acres	Runoff: Rapid Water erosion: High
Springdale	Very deep, somewhat excessively drained soils on terraces / Formed in glacial outwash, with an admixture of volcanic ash and loess	0 to 15%	• Rock Cut	7 acres	Runoff: Slow to medium Water erosion: Slight to moderate Wind erosion: High
Stevens	Very deep, well drained soils on toe slopes, foot slopes, side slopes, and ridgetops of foothills / Formed in mixed glacial till, with an admixture of loess and volcanic ash	0 to 65%	• Hidden Treasure	139 acres	Runoff: Slow to very rapid Water erosion: Moderate to high
Thout	Moderately deep, well drained soils on toe slopes, foot slopes, side slopes, and ridgetops of foothills / Formed in residuum, colluvium, and glacial till, with an admixture of volcanic ash	8 to 65%	• Hidden Treasure	47 acres	Runoff: Very rapid Water erosion: Very high

Source: NRCS 1982.

## ***Environmental Consequences***

### *a) Alternative 1 (Proposed Action)*

#### a. Direct and Indirect Effects

The project activities or mechanisms that would directly affect soil resources in the project area include: roads (both existing and temporary), project implementation actions (e.g., hand lines), prescribed fire, and the removal of vegetation.

As shown in Table 1, the majority of the project area is comprised of soil types with moderate or higher runoff and water erosion susceptibility.

Some soil erosion is expected on roads, skid trails and firelines in the Hidden Treasure and Mining Camp units. Soil erosion, compaction, or other effects would be negligible in the Kettle River and Rock Cut units due to the winter operating season. Soils would be frozen during

treatment activities and therefore potential impacts would be minimized.

Prescribed fire handlines and draglines typically remove litter and topsoil down to mineral soil along fuel breaks and holding features. Exposing the mineral soil would increase erosion susceptibility during precipitation events occurring during project implementation. Erosion control structures and revegetation efforts would minimize any long-term soil disturbance effects.

Low to moderate intensity prescribed fire would consume vegetation and litter down to the mineral soil. At these intensity levels, prescribed fire would preserve the existing root systems and would not cause excessive runoff or the creation of hydrophobic (water-repellant) soil conditions. The resulting soil erosion acceleration would be minor and localized; buffer vegetation would trap most sediment before entering intermittent and perennial streams.

Overall, the effects of prescribed fire treatments on soil resources are anticipated to be short-term and minor.

#### b. Cumulative Effects

The combined effects of this project and other projects on nearby or adjacent lands would result in a lower risk for high intensity, stand-replacing fire and would reduce the chance that large sediment loads would enter streams and rivers downstream, such as the Kettle River. When combined with the effects of other past and ongoing projects, Alternative 1 would ultimately result in more diverse forest conditions, mixed age stands, and a healthier understory that would likely better protect topsoil from mass losses and provide a better buffer against water quality effects. Future naturally ignited fires would likely be less intense and vegetation would recover faster, thereby protecting water quality and soil resources from loss. Overall, Alternative 1 would have beneficial cumulative effects to water quality and topsoil loss.

#### *b) Alternative 2 (No Action)*

##### a. Direct and Indirect Effects

Alternative 2 would perpetuate heavy ladder fuels, understory growth, and the accumulation of down and dead materials. In the short-term, understory vegetation and down and dead materials would minimize the erosion effect from precipitation events, and would disrupt runoff to prevent extensive sediment transport into waterways.

However, in the long-term, hazardous fuels would continue to accumulate under Alternative 2 and the potential for a large stand-replacing wildfire would continue to increase. A catastrophic wildfire could greatly reduce soil productivity and increase soil erosion rates in the future.

The resource damage and disturbances that would occur during large wildfire suppression activities include emergency fireline construction, and constructed safety zones and roads. If a wildfire started, it would be increasingly difficult to extinguish and intensities would be much

greater than were found historically, likely causing detrimental soil conditions at greater, highly variable rates than those expected by controlled treatments.

b. Cumulative Effects

Given that no direct effects are anticipated and that indirect effects would be largely offset by the fuels reduction efforts of adjacent land managers, Alternative 1 is not anticipated to contribute to cumulative effects to soil resources in the project area or “Wedge”.

## WATER, RIPARIAN AND FISHERIES

### *Affected Environment*

Sand Creek, which runs through the Rock Cut treatment unit, is a perennial fish-bearing stream that is a tributary to the Kettle River. The Kettle River, which is adjacent to two of the proposed treatment units, is a medium-size perennial river. Its headwaters are in Canada; the river flows south to the confluence with the Columbia River and Lake Roosevelt at Kettle Falls. Both Sand Creek and the Kettle River are outside the range of anadromous fish. There are no known bull trout populations in the Kettle River, although several straying bull trout individuals have been identified in the Kettle River. Both Sand Creek and the Kettle River contain rainbow trout, mountain white fish, dace, red side shiners, and sculpin.

Under the 1987 Spokane RMP, the BLM has committed to protection of riparian values on all fish bearing streams. The wet riparian regime along the Kettle River which supports cedar trees also provides habitat for Douglas fir trees (Pers. Comm. Karen Honeycutt, Fisheries Biologist, Colville N.F.; Pamela Camp, Botanist, Wenatchee Field Office; Dr. John Lehmkuhle, Forestry Science Lab, Wenatchee, Washington).

### *Environmental Consequences*

a) *Alternative 1 (Proposed Action)*

a. Direct and Indirect Effects

The Proposed Action Alternative would be consistent with the restrictions listed above (see alternative description and Project Design Features) and would have an overall beneficial effect on the long term health of the riparian zone. By reducing the small diameter and overstocked species as well as reducing ladder fuels leading into the canopy of larger trees, the fuels reduction objectives of Alternative 1 would improve the long term health of the riparian zone and help protect it from future stand altering fire events.

Removing ladder fuels from the bases of larger diameter leave trees would reduce the possibility of future severe fire and loss of larger diameter trees to fire in the future. The Proposed Action Alternative would help to preserve existing large diameter trees as well as promoting diameter growth of medium sized trees. The retention of larger shade producing trees within the 75-foot buffer would help to lower stream temperatures as well as provide for large woody debris

(LWD) recruitment in the riparian zone.

b. Cumulative Effects

Collectively, the proposed and current USFS, DNR, BLM, and private fuels reduction and small diameter thinning activities would result in a larger tree canopy of Douglas fir, cedar, ponderosa pine, and black cottonwood for shade in the riparian zone. If the other projects are conducted with similar size prescriptions and restrictions on cross-country travel in the riparian zone, the cumulative effect of these treatments would be beneficial to riparian zone conditions. These treatments would cumulatively promote large tree growth, reduce competition, and reduce the likelihood of detrimental wildfires in the riparian zone.

a) *Alternative 2 (No Action)*

a. Direct and Indirect Effects

The No Action Alternative would not result in any direct effects to water or riparian resources in the project area. However, without thinning or the removal of ladder fuels, forested riparian areas adjacent to Sand Creek and the Kettle River would remain susceptible to future severe wildfires which may ultimately reduce shading and LWD recruitment potential in the riparian zone. Additionally, in the event of a severe wildfire in the future, the removal of mature forest canopy in the riparian zone would result in the loss of shade along the river and could potentially increase stream temperatures.

b. Cumulative Effects

Fuels reduction and small diameter thinning activities would likely continue to occur on adjacent and nearby USFS, DNR, and private lands. However, the effects of No Action on BLM managed lands in the project area would be limited to the immediate project area and are not anticipated to contribute to cumulative effects to water or riparian zone conditions.

## FOREST VEGETATION

### *Affected Environment*

The Pierre Lake project area has a biophysical environment (BE) (grouping of plant associations that have similar historic patterns of natural disturbance) of warm, dry, Douglas-fir/shrub (95%) and cool, mesic western red cedar/western hemlock forb-shrub (5%).

The warm, dry Douglas-fir/shrub BE is dominated by an overstory of fire resistant conifer species like ponderosa pine, western larch, and Douglas-fir trees. In the understory, ninebark is a common associate (Williams et al. 1995). It typically occurs in warm and dry environments; many on south and west facing slopes, and other droughty locations.

The cool, mesic, western redcedar-western hemlock/forb-shrub BE is confined to the wettest

forested portions of the project area. They typically occur in valley bottoms and as stringers along creeks. The understory of this BE is typically very sparse due to the dense canopy and may support only young redcedar, Engelmann spruce, and western hemlock.

There are many large diameter trees scattered through all community types, some as large as 28.5 inches in diameter. Three large trees were cored to determine age: ages were 134 years (28.5" dbh Douglas-fir), 145 years (27.3" dbh Ponderosa pine), and 243 years (28.6" dbh Ponderosa pine). Although these parcels have trees that exhibit old growth characteristics, these stands are not classified as old growth (BLM 1985).

The forest vegetation has changed over time due to fire exclusion and other human activities such as logging, grazing and mining. The forests we see today have denser tree spacing, a composition dominated by fire intolerant species, and more ladder and ground fuels. The extent and impact of this change can be correlated to the fire regime itself; an area that historically experienced frequent fires (Fire Regime I) would be more greatly affected and altered than a biophysical environment that experienced fire once every few centuries (Fire Regime V).

A series of Fire Regime Condition Classes (FRCC) have been developed to describe the extent to which the current fire regime has deviated from normal (historic) for any given biophysical environment. These are based on changes in the species composition, structure, age, and density of a stand and are used to quantify the condition of the landscape resulting from fire exclusion and other influences (timber harvesting, grazing, insects, disease, and the introduction and establishment of non-native species) (Hann et al. 2004). The three Condition Class categories are defined as follows:

- **Condition Class 1:** Fire regimes in this condition class are within their natural (historical) ranges. Vegetation composition and structure are intact. The risk of losing key ecosystem components from the occurrence of fire is relatively low. Where appropriate, maintenance management such as prescribed fire and hand treatments can prevent these stands from becoming degraded.
- **Condition Class 2:** Fire regimes in this condition class have been moderately altered from their historical range. Fire frequencies have departed by either increasing or decreasing from historical frequencies by one or more return interval resulting in moderate changes to one or more of the following: fire size, frequency, intensity, severity, or landscape patterns. A moderate risk of losing key ecosystem components has been identified on these lands. To restore the historical fire regime, these lands may need moderate levels of restoration treatments such as prescribed fire and hand or mechanical treatments.

Forests may exhibit moderate increases in density, encroachment of shade tolerant species, or moderate loss of shade intolerant trees caused by fire exclusion, logging, or insects and disease. Surface shrub/grass may be replaced with woody fuels and litter.

- **Condition Class 3:** Fire regimes in this condition class have been largely altered

from their historical range. Fire frequencies have departed from historical frequencies by multiple return intervals resulting in dramatic changes to one or more of the following: fire size, frequency, intensity, severity, or landscape patterns. Vegetation condition, structure, and diversity have been highly altered. A high risk of losing key ecosystem components has been identified. To restore the historical fire regimes these lands may require high levels of restoration treatments such as hand mechanical before prescribed fire can be utilized. Forests may exhibit high increases in density, encroachment of shade tolerant tree species, or loss of shade intolerant tree species caused by fire exclusion, logging, insects, or disease. Surface shrub/grass may be replaced with woody fuels and litter.

An assessment of the overall landscape condition class in the Pierre Lake project area reveals a FRCC of 2; it has been moderately altered from historic conditions. Assessment at the stand level indicates that about 90 percent of stands surveyed (and proposed for treatment) were identified as having an FRCC of 2 or 3. Vegetation conditions warrant fuels reduction activities to reduce the risk of losing key ecosystem components. Proposed fuel reduction treatments would contribute to moving stands toward an FRCC of 1, within historic conditions.

Weeds occurring in the project area include diffuse knapweed, St. John's wort, bull thistle, and hound's-tongue. Weed infestations are most common along roads and in disturbed sites and are widespread.

### *Environmental Consequences*

#### *a) Alternative 1 (Proposed Action)*

##### a. Direct and Indirect Effects

Under Alternative 1 the direct impact to plant communities that are in treatment units would be the removal of trees and the creation of openings in areas where the canopy was closed, allowing more light into the understory. As a result of opening the canopy, conditions would be improved for understory grasses, forbs, and some shrubs that require more light. Controlled burning in the treatment units after thinning would impact the plant communities by causing the top growth of most understory plants to die back. Most of the species are adapted to fire and would re-sprout after low intensity burning, and some of the species would respond to fire by regenerating from fire adapted seeds in the soil seed bank.

Implementation of the Proposed Action Alternative would reduce the density of understory vegetation in stands of both the warm, dry Douglas-fir/shrub and cool, mesic, western redcedar-western hemlock/forb-shrub biophysical environments. Woody shrub species and conifer densities, particularly Douglas-fir, would be reduced. Competition for limited resources, especially moisture, among residual understory trees would be reduced and moisture stress on existing overstory trees would be decreased by thinning and reducing the density of understory vegetation.

Understory thinning and subsequent maintenance prescribed burning would encourage native ponderosa pine regeneration in stands that are presently dominated by more shade-tolerant species such as Douglas-fir. This would help maintain stand health in both biophysical environments.

Under the Proposed Action Alternative, the BLM would thin conifer stands from below, cutting and piling conifer trees up to 8 inches DBH. The overstory canopy would be thinned as well to break up canopy fuels. Treatment of the non-commercial sized material in the proposed treatment units would reduce surface and ladder fuels. The proposed fuels reduction treatments would reduce fire behavior such as flame length, rate of spread, and fire duration. With the reduction of flame length and fire duration, the chance of a crown fire initiating in these stands would be reduced. The reduction in fire behavior would lessen the potential damage from a wildfire initiated within or adjacent to the project area and would increase tactical opportunities for firefighters to limit fire spread and damage to residential homes during a wildfire.

The Proposed Action Alternative could increase fire resiliency of vegetation within the project area. A forest that is fire-resilient has characteristics that allow it to readily recover from a fire event. A forest's resiliency to fire can be increased by managing surface fuels to limit the flame length, removing ladder fuels to keep flames from burning into tree crowns where trees have no defense against fire, and retaining larger diameter trees that are more fire resistant (Agee and Skinner 2005; Agee 1996; Agee 1993).

The Proposed Action Alternative would slow and potentially reverse the departure from the historic fire regime within the project area. Within treatment areas, the condition class would shift from condition class 2 towards condition class 1. This trend would not be reversed instantly and could take several treatment entries to achieve condition class 1. Periodic maintenance treatment via prescribed fire or thinning by hand would be necessary to maintain the desired condition class in treated areas.

Some temporary disturbance of soil in the treatment areas would occur, but project plans include planting of grasses in these areas. Invasive weeds may increase in response to disturbance and increased vehicle traffic.

#### b. Cumulative Effects

Treatments within the WUI would have a positive cumulative effect if:

- Private landowners continue to conduct fuels reduction work around structures and property boundaries.
- WUI treatments are maintained overtime. Maintenance activities in the form of underburning or ladder fuel reduction are likely necessary every one to two decades to maintain or lower the treatment unit's condition class ratings.

There is the expectation that the treatments will have a positive cumulative effect by improving the ability of fire resistant species to be competitive and survive. Over time, the stand will become more fire resistant. Fuels reduction treatments are not expected to cause any irreversible effects to the environment. Climate change may influence distribution of biophysical

environments and their fire regimes, though how this would affect the project area is hard to predict.

Past forest practices across the region, including selective logging of large trees and fire suppression, have contributed to the current condition of the forested lands within the project area. The BLM has conducted several past forestry projects that have resulted in the removal of commercial timber (Table 2). Adjacent landowners have also been implementing forestry projects that remove commercial and non-commercial timber. These projects include BLM funded National Fire Plan Grant – WA DNR, Rock Cut timber sale – WA DNR, American Recovery and Reinvestment Act (ARRA) funded grant – Wedge Fuels Reduction – WA DNR, Summit Pierre Fuels Reduction Project – U.S. Forest Service, and private timber companies. Generally the practices of private timber companies have been more aggressive (fewer and smaller trees DBH leave trees) and profit motivated.

Table 2. Past BLM Forestry Projects in the Project Area.

Unit	Date of Activity	Acres	Harvested Timber	Comments
Kettle River Unit	N/A	0	NONE	
Mining Camp Unit	N/A	0	NONE	
Rock Cut Unit	N/A	0	NONE	No previous entries on record, however there are numerous stumps across the unit associated with some sort of timber activity. The stumps probably date back to the early 1900's when there was mining activity in this area.
Hidden Treasure Unit	12-4-54	42.1	55 MBF	
	11-5-51	35	213 MBF	Timber Trespass
	3-5-52	52.8	440 MBF	
	4-13-68	272	1199 MBF	

Adjacent USFS and WA DNR lands are in similar condition, and both agencies are developing and implementing fuels reduction projects. The combination of the Proposed Action Alternative and other agencies' fuels reduction efforts is anticipated to decrease risk of severe or stand-replacing fires in the project area and vicinity.

Noxious weeds would not likely be eliminated as a result of the activities and efforts proposed for this project, nor by the continued BLM noxious weed treatment program.

*a) Alternative 2 (No Action)*

a. Direct and Indirect Effects

The No Action Alternative would have little or no effect on vegetation conditions in the project area. Reproduction would be limited to shade-tolerant species until a stand-replacing wildfire occurs. The probability (depends on climate and number of ignitions) of stand-replacing wildfire is greater than under Alternative 1, because of the large quantity of fuels present and the multi-layered structure providing ladder fuels.

Weed infestations could increase substantially if an intense fire occurred. High intensity fire

would likely result in increased exposure of bare ground, destruction of underground structures of native plants (i.e., root masses), or depletion of seed banks thereby limiting the recovery of native grasses and shrubs.

#### b. Cumulative Effects

The cumulative effects of taking of no action depend in part on climatic trends and activities surrounding the project area. There would be fewer risks to private property in the WUI in private land owners reduce fuels around their own structures and property boundaries.

The current condition of forests in the project area is a consequence of past logging and fire suppression practices. If no action is taken, the project area would continue to be susceptible to wildfire and consequent changes in species composition; however, the spread of wildfire beyond the project area may be somewhat limited by the fuels reduction projects being implemented on adjacent lands.

### SPECIAL STATUS SPECIES – PLANTS

#### *Affected Environment*

A portion of the project area was surveyed for special status plants through a land exchange botany contract conducted in 1998; the remainder of the area was surveyed through the Northeast Lands Data Project (NLDP) in 2003.

No federally listed or candidate plant species are known to occur within the project area. One Washington Sensitive and Bureau Sensitive species, black snakeroot (*Sanicula marilandica*), is reported from the project area in T39N, R37E, section 18, in a quaking aspen grove within a lowland draw. This species grows in shaded, somewhat moist forested habitats. The species is not addressed in the Fire Effects Information System database (USFS 2010). However, it is likely that fire effects on this species vary with fire intensity. A low intensity fire that burns quickly across the ground surface would likely destroy aboveground parts and reduce or eliminate seed production for the year. Underground parts such as roots and caudex might survive a low intensity fire, but would probably not survive a high intensity fire that burned below the surface of the soil. Because this species is shade-dependent, removal of the tree canopy at the plants' location could have an adverse effect on individual plants of black snakeroot at that site (K. Ahlenslager, Colville NF Botanist, personal communication).

#### *Environmental Consequences*

##### a) *Alternative 1 (Proposed Action)*

##### a. Direct and Indirect Effects

The Proposed Action Alternative is not expected to affect the population of black snakeroot, because the plants' location would be flagged prior to project implementation. Project activities

would avoid this location. The Proposed Action Alternative would not jeopardize the existence of black snakeroot nor cause the need for it to be listed.

b. Cumulative Effects

Given that there is no potential for direct or indirect effects under the Proposed Action Alternative, there is no potential for cumulative impacts to special status plant species as a result of Alternative 1.

b) *Alternative 2 (No Action)*

a. Direct and Indirect Effects

The No Action Alternative would have no direct effects on the black snakeroot population. However, under this alternative, stand-replacing wildfires would be more likely to occur. A light burn that does not remove the overstory and does not burn down to mineral soil might not damage the plants, particularly if it occurred while the plants were dormant. However, the population could be lost if the aspen grove experienced a severe burn, which could remove canopy shade and possibly damage underground structures of the plants, as noted above.

b. Cumulative Effects

Given that there is no potential for direct effects to special status plant species as a result of the No Action Alternative and the potential for indirect effects is largely unknown (i.e., chance of stand-replacing wildfire in the future), no cumulative effects are anticipated as a result of this alternative.

## WILDLIFE

### *Affected Environment*

The project area is predominated by drier slopes facing west and southwest; there are very few moist north-facing slopes. Elevations range from approximately 1,400 feet along the Kettle River to approximately 3,480 feet in the northwest corner of the Hidden Treasure unit. The project area includes three predominant habitat types: dry coniferous forest, cliffs/talus, and riparian/wetland. A description of each habitat type follows:

*Dry Coniferous Forest:* This habitat type is comprised of several species of coniferous trees, predominantly Douglas-fir, ponderosa pine, and larch; an understory of woody species including aspen, snowberry, ninebark, and twinberry; and an herbaceous layer including bluebunch wheatgrass, pinegrass, and Oregon grape. This habitat represents the majority of the project area and occurs in varying age classes and densities depending upon site potential and history. While areas with older trees (>150 years) occur in parts of the project area (particularly in the Kettle River and Mining Camp units and in cedar groves in riparian areas), typically these trees are scattered among younger trees and do not form a closed canopy. Areas where there are closed

canopies of older trees are typically small in area (<1 acre). The Mining Camp and Hidden Treasure units were included in the NLDP surveys (NLDP 2003) and the Rock Cut and Kettle River units were surveyed for the Proposed Columbia Basin Shrub-Steppe Land Exchange (BLM files 2002). No areas of old growth habitat were identified in any of these units during these surveys.

Washington's Comprehensive Conservation Strategy describes the overall history for this habitat type as follows:

This habitat has been affected by timber harvesting and fire suppression. Timber harvesting has focused on shade-intolerant species in mid- and late-seral forests, leaving shade-tolerant species. Fire suppression enforces those logging priorities by promoting less fire-resistant, shade tolerant trees. The resultant stands at all seral stages tend to lack snags, have high density, and are composed of smaller and more shade-tolerant trees. Mid-seral forest structure is currently 70 percent more abundant than in historical, native systems. Late seral forests of shade-intolerant species are now essentially absent. Early-seral forest abundance is similar to that found historically but lacks snags and other legacy features. (WDFW 2005)

This habitat type supports 220 wildlife species, including 12 amphibian, 11 reptile, 116 bird, and 81 mammal species (WDFW 2005). Common species in this habitat include deer, elk, black bear, bobcat, squirrels, chipmunks, black-capped chickadees, red-breasted nuthatches, flicker, pileated woodpecker, ruffed grouse, and wild turkey. This habitat includes approximately 418 acres of white-tailed deer winter range and 84 acres of mule deer winter range (WDFW 2008).

The project area provides year-round habitat for mule deer, white-tailed deer, and some elk. Within the project vicinity, white-tailed deer are the most abundant, though historically, mule deer were most common. This reflects a change in habitat conditions from open forest to closed forest favoring white-tailed deer over mule deer (USFS 2009). The project area also provides approximately 418 acres of white-tailed deer winter range and 84 acres of mule deer winter range (WDFW 2008).

*Cliffs and Talus:* Most of the cliffs and talus in the project area occur on the west-facing slopes of the Kettle River unit. These cliffs are approximately 40 feet high with crevices and possibly nesting ledges for falcons, although none are known to nest in the project area. Bats, woodrats, and swallows use this habitat.

*Riparian:* Riparian habitat in the project area consists of a 263 meter portion of Sand Creek; a perennial stream and tributary to the Kettle River; approximately 1 mile along the east bank of the Kettle River; and several ephemeral or intermittent drainages. Riparian vegetation includes western red cedar, snowberry, rose, aspen, and Oregon grape. Woody vegetation in the drainages provides nesting habitat for songbirds and browse and hiding cover for deer and elk. Most of the vegetation along the Kettle River is located above the river floodplain and is indistinguishable from the adjacent upland vegetation. Large trees along the Kettle River could provide nesting sites for osprey or bald eagle, although none are known at this time. These trees could provide winter roost habitat for bald eagles (WDFW 2008).

## *Environmental Consequences*

### *a) Alternative 1 (Proposed Action)*

#### a. Direct and Indirect Effects

ELK, WHITE-TAILED DEER, MULE DEER: The project would result in temporary disturbance impacts to each of these three species. Public use of temporary project roads could result in long-term disturbance impacts to elk and deer. However, the closure and rehabilitation of any temporary roads used by the project would mitigate these long-term disturbance impacts. In general, prescriptions that ultimately open stands would benefit mule deer to the detriment of white-tailed deer. The project would allow additional light to reach the forest floor, which should stimulate growth of forbs and, most importantly, shrubs that provide both lateral hiding cover and forage in winter. None of the treatments are designed to remove the larger overstory trees that create good cover in winter and which help to intercept snow and keep the areas around the boles snow-free, so though the project would result in some loss of cover, it would not create large openings in winter range. Sufficient large trees would be retained as overstory cover to maintain the area's effectiveness as winter range.

#### b. Cumulative Effects

ELK, WHITE-TAILED DEER, MULE DEER: Historical fire suppression, firewood collection and timber practices have created forest habitats in northeastern Washington characterized by stands at all seral stages that are composed of high densities of smaller trees. Mid-seral forest structure is much more abundant and late-seral forests are much less abundant than what was found historically (WDFW 2005). Current forest stand characteristics favor white-tailed deer more than mule deer. Both the Proposed Action Alternative and the Summit Pierre Fuels Reduction Project on adjacent Colville National Forest lands would ameliorate the effects of these historical practices. Both projects would create forest openings while retaining large live trees and snags. Areas of shrubs will be retained in the Forest Service project, and burning will be used to stimulate regrowth of shrubs in both federal projects. Both projects would increase mule deer habitat and decrease white-tailed deer habitat. The Wedge CWPP Fuels Reduction Project and the National Fire Plan Grant Pierre Lake Fuels Reduction project will result in extensive brush removal (at least in the short term). These projects would cumulatively increase mule deer habitat and decrease white-tailed deer habitat.

The Rockcut Timber Sale does not target brush removal. The Rockcut Timber Sale area will retain large leaf trees while continuing to provide brushy habitat while the brush habitat in the proposed project, Summit Pierre Fuels Reduction Project, the Wedge CWPP Fuels Reduction Project, and the National Fire Plan Grant Pierre Lake Fuels Reduction project areas is reduced.

b) *Alternative 2 (No Action)*

a. Direct and Indirect Effects

ELK, WHITE-TAILED DEER, MULE DEER: In the short-term, the No Action Alternative would benefit these species by maintaining winter and hiding cover and existing levels of forage. In the long-term, however, the effects may be negative due to the increasing decadence of browse species. The habitat would continue to favor white-tailed deer over mule deer.

b. Cumulative Effects

ELK, WHITE-TAILED DEER, MULE DEER: Historical fire suppression, firewood collection and timber practices have created forest habitats in northeastern Washington characterized by stands at all seral stages that are composed of high densities of smaller trees. Mid-seral forest structure is much more abundant and late-seral forest structure is much less abundant than what was found historically (WDFW 2005). Current forest stand characteristics favor white-tailed deer more than mule deer. Under the No Action Alternative, the BLM lands in the project area (672 acres) would continue to favor white-tailed deer over mule deer. The No Action Alternative is therefore not anticipated to contribute to cumulative effects in the project area.

**SPECIAL STATUS SPECIES – WILDLIFE**

***Affected Environment***

a) *Federally Listed Species*

Federally listed wildlife species with the potential occur in the project area are listed in Table 3.

Table 3. Threatened and Endangered Species with Potential to Occur in the Project Area

Species	Scientific Name	Federal Status	State Status
Gray wolf	<i>Canis lupus</i>	FE	SE
Canada lynx	<i>Lynx canadensis</i>	FT	ST
Grizzly bear	<i>Ursus arctos</i>	FT	SE

FE=Federally Endangered

FT=Federally Threatened

SE=State Endangered

ST=State Threatened

GRAY WOLF: The nearest individual wolf occurrence was recorded 12 miles from the project area in 1992 (WDFW 2008). Wolfpacks have started to den in the Cascade Mountains again in Washington in 2008 and in the Pend Oreille Valley in 2009, but none have denned within 50 miles of the project area (Pers. Comm. Dana Base, District Wildlife Biologist, WDFW). Howling surveys were performed by the USFS on adjacent lands in the Colville National Forest in March 2009. No responses were elicited by these surveys (USFS 2009). Because the project area does not contain critical habitat or wolf recovery areas (USDI FWS 1987) and the species is not known to occur in the immediate project area, the project is not expected to affect this species and it will not be addressed further in this document (Pers. comm. Carrie Cordova, USFWS; Pers. comm. Dana Base WDFW).

CANADA LYNX: The nearest lynx occurrence was recorded 5.5 miles away from the project area in 1987 (WDFW 2008). The most recent occurrence (in 2004) was documented 8 miles away. The project area is not within a Lynx Analysis Unit and does not contain lynx habitat (NLDP 2003, BLM files 2002). Suitable habitat is not available on adjacent National Forest lands (USFS 2009). Therefore, no effects to lynx are expected and this species will not be addressed further in this document.

GRIZZLY BEAR: Grizzly habitat is characterized by large areas of secluded land that provide security from human depredation and other uses such as logging, road building, and recreation (USDI FWS 1993). Because of their sensitivity to human disturbance, core security areas (>1 mile from roads) are a priority for managing for viable grizzly bear populations (Singleton et al 2002).

The project area does not provide any core habitat – the entire project area is within 1 mile of active roads, rendering it unsuitable for grizzlies. This is supported by the fact that there are no records of grizzly bears occurring in the project area (WDFW 2008). Grizzly bears have not been observed in the Wedge (the area in northwest Stevens County bounded by the Columbia River to the east and the Kettle River to the west) for over 50 years (Pers. comm. Chris Loggers, USFS). The nearest grizzly bear occurrences are in Canada approximately 13 miles from the project area (Pers. comm. Chris Loggers, USFS). Although physically capable of long-distance movements, bears do not appear to be behaviorally inclined to make such movements, particularly in the fragmented habitats characteristic of the northwestern United States (Singleton et al. 2002).

The project area lies within a Management Situation #5 (“Grizzlies do not occur, or only occur rarely in the area”), as defined by the Grizzly Bear Recovery Plan (USDI FWS 1993). Lands within Management Situation #5 areas are not managed primarily as grizzly bear habitat and maintenance of grizzly habitat is optional (USDI FWS 1993). The Selkirk Recovery Zone is 36 miles to the east; the North Cascades Recovery Zone is over 50 miles to the west. Because the project area does not contain critical habitat or grizzly recovery areas, and the species is not known to occur in the area, no effects to grizzly bears are expected from the project and it will not be addressed further in this document.

*b) Other Special Status Species*

Other Special Status Species potentially occurring in the project area are listed in Table 4. These include BLM Sensitive species, migratory Bird Species of Conservation Concern identified for the Northern Rockies (protected by the Migratory Bird Treaty Act), and eagles protected by the Bald and Golden Eagle Protection Act.

Table 4. Other Special Status Species with Potential to Occur in the Project Area

Species	Scientific Name	Federal Status	State Status
Bald eagle	<i>Haliaeetus leucocephalus</i>	SEN, BSC, EA	SS
Peregrine falcon	<i>Falco peregrinus</i>	SEN, BSC	SS
Great gray owl	<i>Strix nebulosa</i>	SEN	SM
White-headed woodpecker	<i>Picoides albolarvatus</i>	SEN, BSC	SC
Cedar waxwing	<i>Bombycilla cedrorum</i>	SEN	none
Pygmy shrew	<i>Sorex hoyi</i>	SEN	SM
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	SEN	SC
Fisher	<i>Martes pennanti</i>	SEN	SE
Wolverine	<i>Gulo gulo</i>	SEN	SC
Moose	<i>Alces americanus</i>	SEN	none
Flammulated owl	<i>Otus flammeolus</i>	BSC	SC
Lewis' woodpecker	<i>Melanerpes lewis</i>	BSC	SC
Williamson's sapsucker	<i>Sphyrapicus thyroideus</i>	BSC	none
Calliope hummingbird	<i>Stellula calliope</i>	BSC	none
Olive-sided flycatcher	<i>Contopus cooperi</i>	BSC	none
Willow flycatcher	<i>Empidonax traillii</i>	BSC	none
Cassin's finch	<i>Carpodacus cassinii</i>	BSC	none
Golden eagle	<i>Aquila chrysaetos</i>	EA	SC

SEN=BLM Sensitive  
 BSC=Bird Species of Conservation Concern  
 Northern Rockies, Migratory Bird Treaty Act  
 EA=Bald and Golden Eagle Protection Act  
 SC=State Candidate  
 SS=State Sensitive  
 SM=State Monitor

**BALD EAGLE:** While no bald eagle nests or roosts are known to occur in the project area, suitable habitat for this species is present in the project area. Large trees along the Kettle River could provide nest sites and/or winter roosting sites. The nearest known nest is approximately 6.5 miles from the project area (WDFW 2008). The Kettle River is identified in the Natural Heritage Database as providing winter roosting habitat (WDFW 2008).

**PEREGRINE FALCON:** There are no known nest sites in the project area. The tallest cliffs available in the project area provide marginal habitat due to their short stature (approximately 40' tall). There are no known occurrences of this species in the project area (WDFW 2008) (NLDP 2003). Due to lack of habitat in the project area, no effects to this species are expected and it will not be addressed further in this document.

**GREAT GRAY OWL:** Great gray owls use mature conifer stands of Douglas-fir, larch, and ponderosa pine adjacent to foraging areas in forest openings and meadows (Wahl et al. 2005). During general wildlife surveys in the project area in 2003, no great gray owls, nests, sign, or nesting habitat was observed (NLDP 2003). Likewise, during general wildlife habitat surveys on adjacent Colville National Forest lands in 2007 and 2008 no great gray owls, nests, or sign was observed (USFS 2009). Because the species has not been observed in the project area and it lacks suitable nesting habitat, no effects to this species are expected and it will not be addressed further in this document.

**WHITE-HEADED WOODPECKER:** White-headed woodpeckers are primarily associated with more open stands of mature and old ponderosa pine trees and mixed conifers including the dry Douglas-fir biophysical environment. They require large, decayed snags for nesting and roosting while they forage primarily in the bark of large live ponderosa pines (Lewis and Rodrick 2002).

The population of white-headed woodpeckers in the region is considered low, with a declining trend (WDFW 2005). There are no known occurrences of this species in the project area (WDFW 2008) (NLDP 2003). During surveys on adjacent Colville National Forest lands, crews did not observe white-headed woodpeckers (USFS 2009). The closest known occurrence is 19 miles away (WDFW 2008).

**CEDAR WAXWING:** This species may use open coniferous forest habitat and forest edge in the project area (Wahl et al. 2005). During general wildlife surveys in the project area in 2003, no cedar waxwings were observed (NLDP 2003). While this species is declining west of the Cascades, there appears to be little change on the east side of the range (Wahl et al. 2005).

**PYGMY SHREW:** The project area is on the edge of the species' range (Long 1974). This species occurs in a wide variety of habitats, including dry coniferous forest (Johnson and Cassidy 1997). In Washington, pygmy shrews have been trapped mostly in second growth, dry to mesic, closed coniferous forest at mid-elevations. There are no known records for the project area; however, GAP analysis data predict that core and peripheral habitat are available in the project area (Johnson and Cassidy 1997).

**TOWNSEND'S BIG-EARED BAT:** This species uses caves, mines, and buildings in a variety of habitat types for maternity colonies and winter hibernacula, and forage in upland habitats more than over water, unlike most bats. The species is very sensitive to disturbance in hibernacula and maternity colonies (Johnson and Cassidy 1997). There are numerous mine adits in the project area that may provide habitat for this species.

Three Townsend's big-eared bats were observed in early November roosting in the project area. Internal mine surveys of several adits in the project area during May 2010 found evidence of bat use in all of the adits surveyed; habitat quality varied from marginal to excellent (Corbett 2010). The First Thought mine, on private land adjacent to BLM land in the Hidden Treasure unit, was found to provide excellent bat habitat (Corbett 2010). The largest winter hibernaculum in northeast Washington is located on adjacent Colville National Forest lands (USFS 2009). There are no records of maternity colonies in the project area (however, these have not been surveyed during the maternity season) or on adjacent Colville National Forest lands (limited surveys). However, there are BLM records of a Townsend's big-eared bat maternity colony in similar habitat in Lincoln County, so the possibility cannot be dismissed.

**FISHER:** Fishers use forests with a high percentage of canopy closure, abundant large woody debris, large snags and cavity trees, and understory vegetation (Lewis 2006). There is little to no habitat of this type in the project area. There are no known occurrences of this species in the project area (WDFW 2008) (NLDP 2003). In addition, the species is believed to be extirpated from the state (Lewis 2006) (WDFW 2005), and current reintroduction efforts are concentrating on the Olympic Peninsula. Therefore, no effects to fisher are expected and it will not be addressed further in this document.

**WOLVERINE:** Wolverine are rare in northeastern Washington and are generally most common in the alpine or subalpine zones. GAP analysis (Johnson and Cassidy 1997) considered ponderosa pine habitat as peripheral. Because nearly no seclusion habitat or high-elevation habitat exists,

the project area provides fairly poor wolverine habitat (USFS 2009). During general wildlife surveys in the project area in 2003, no wolverine or sign were observed (NLDP 2003). The nearest known occurrence was recorded 15 miles away from the project area in 2005 (WDFW 2008).

**MOOSE:** Generally, moose prefer forested habitat where lakes, marshes, and other wetlands provide them with aquatic vegetation and willows. In less wet areas, like northeast Washington, they also eat the woody browse in early stages of regrowth following disturbances like fires, logging, and clearing. Moose adapt to a variety of available forage (WDFW 2000). With the exception of some peripheral habitat along the Kettle River, the project area does not provide suitable wetlands. Woody browse is available in the project area, although most of it is more mature than the early regrowth preferred by the moose. Although there are no records for the project area (WDFW 2008) (NLDP 2003), the skeletal remains of a moose were found in the Rock Cut unit in the summer of 2009.

**FLAMMULATED OWL:** Flammulated owls are typically found in mid-elevation coniferous forests containing mature to old, open canopy ponderosa pine and Jeffrey pine, Douglas-fir, and grand fir. This species nests in snag cavities excavated by flickers, sapsuckers, and woodpeckers, specifically pileated woodpeckers. Areas with brushy understory vegetation may provide insect prey and feeding cover when flammulated owls forage near the ground (Hays and Rodrick 2003). The population of flammulated owls in the region is considered low; population trends are unknown (WDFW 2005). The relatively low density of snags in much of the project area may be limiting the habitat for this species. However, a flammulated owl was heard in the Hidden Treasure unit in May 2003.

**LEWIS' WOODPECKER:** The Lewis' woodpecker prefers a forested habitat with an open canopy and a shrubby understory which supports a prey base of insects, with large snags available for nest sites and hawking perches (Lewis et al 2002). The population of Lewis' woodpeckers in the region is considered low, with a declining trend (WDFW 2005). The relatively low density of snags in much of the project area may be limiting the habitat for this species. There are no records of this species in the project area (WDFW 2008) (NLDP 2003), although habitat was identified in the Hidden Treasure unit in 2003 (NLDP 2003). The species is considered uncommon in the project vicinity (USFS 2009).

**WILLIAMSON'S SAPSUCKER:** This species uses open coniferous and mixed coniferous forests (Wahl et al 2005) and is considered rare in the project vicinity (USFS 2009). This species is dependent upon snags for nest sites (Dobbs et al 1997). There are no records of this species in the project area (WDFW 2008) (NLDP 2003). This may be due to the limited availability of snag habitat.

**CALLIOPE HUMMINGBIRD:** This species uses open montane forest, mountain meadows, and riparian thickets of aspen, willow and alder in all forested zones below the subalpine fire zone, sometimes in shrubby habitats in low to medium elevations (Wahl et al. 2005). Although there are no records for the project area (WDFW 2008) (NLDP 2003), calliope hummingbirds are considered fairly common in the project vicinity (USFS 2009).

OLIVE-SIDED FLYCATCHER: This species uses open mature stands of conifers or forest stands with high perches in tall trees and snags along the edges of clearings, around lakes, wetlands, avalanche chutes, talus fields, burns, clear-cuts, and windthrown forest patches (Wahl et al 2005). Although there are no records for the project area (WDFW 2008) (NLDP 2003), olive-sided flycatchers are considered fairly common in the project vicinity (USFS 2009).

WILLOW FLYCATCHER: This species uses moist habitats with dense deciduous thickets, riparian areas, wetlands, and swamps with thick growth of alder, willow, dogwood or wild rose. Recent clear-cuts with thick brush can also have high breeding densities (Wahl et al 2005). Although there are no records for the project area (WDFW 2008) (NLDP 2003), willow flycatchers are considered fairly common in the project vicinity (USFS 2009).

CASSIN'S FINCH: This species uses dry coniferous forests, especially in the ponderosa pine zone, during the breeding season and winters at lower elevation sites, including forest edge habitats (Wahl et al. 2005). This species was observed in the Mining Camp and Hidden Treasure units during general wildlife surveys conducted in 2003 (NLDP 2003) and is considered fairly common in the project vicinity (USFS 2009).

GOLDEN EAGLE: This species is found mostly in dry open forests and in high elevation alpine zones. Golden eagles are associated with steep terrain; most nests east of the Cascades are located on cliffs (Wahl et al. 2005). The population of golden eagles in the region is considered low; regional population trends are unknown (WDFW 2005). Although this species was not observed during general wildlife surveys conducted in 2003, suitable habitat was identified in the Mining Camp and Hidden Treasure units (NLDP 2003). The nearest recorded occurrence is 2.2 miles away.

### *Environmental Consequences*

#### *a) Alternative 1 (Proposed Action)*

##### a. Direct and Indirect Effects

BALD EAGLE: No effects to bald eagles are expected to result from the project. No commercial volume would be removed within 50' of the Kettle River; all trees >23" dbh would be retained; and any nest trees that may be discovered over the life of the project would be protected from cutting and prescribed burning, therefore, no reduction in roosting or nesting habitat is expected. Operations would be suspended within 400' of any winter roosting eagles (November 15 – March 15) or within 660' of an active nest or 330' of an inactive nest during the breeding season (1 February – 31 July); therefore, noise and activity disturbances to this species are not expected to occur (USFWS 2007) (Watson and Rodrick 2000).

WHITE-HEADED WOODPECKER: The thinning of small trees and retention of large live trees and snags would improve habitat conditions for the white-headed woodpecker, which prefers open large live tree habitat. Project activities during breeding season could cause the loss of a clutch by affected pairs. However, this is unlikely to affect the species beyond the project area scale, particularly in light of the expected long-term improvements to habitat.

CEDAR WAXWING: The project would improve habitat for this species by creating more open stands of conifers. Project activities during breeding season could cause the loss of a clutch by affected pairs. However, this is unlikely to affect the species beyond the project area scale, particularly in light of the expected long-term improvements to habitat and the stability of the species population east of the Cascades (Wahl et al. 2005).

PYGMY SHREW: Because of this species' ability to use a wide variety of habitat types (including coniferous forest, clear cuts, parklands, and brushy areas), the project is not expected to affect this species.

TOWNSEND'S BIG-EARED BAT: External surveys were used to evaluate mine features with regard to their potential for providing Townsend's big-eared bat habitat. Features with any of following characteristics were considered primary sites for mitigation: bats, guano, and adit length exceeding 50', sideworkings or internal shafts, and air movement (Tuttle and Taylor 1998).

Eight sites were identified for the following mitigation: no removal of overstory or emergent trees within 250' of the feature (USDA FS and USDI BLM 2000a); no burning such that smoke could enter the mine feature during the winter or breeding season. Seven of these sites are in the Hidden Treasure unit; one is in the Kettle River unit.

The retention of large trees and snags and the creation of openings in the forest that can be used by foraging bats would also improve habitat for the Townsend's big-eared bat in the project area. Any new roads created would be closed and rehabilitated to prevent increased exposure of mine sites to the public.

Because it is not possible to definitively rule out bat use of a mine feature based on one or two daytime external visits, it is possible that some of the mine features in the project area that were not identified for mitigation do provide habitat for Townsend's big-eared bats. These sites may be subject to temporary noise disturbances due to project activities; smoke from burning activities being drawn into the mine; and changes in mine microclimate due to removal of adjacent vegetation.

WOLVERINE: The project area provides marginal habitat for wolverine because of its lack of high elevation and seclusion habitats. Therefore, no effects are expected to this species.

MOOSE: The project would improve habitat for moose by stimulating regrowth of woody browse species and by retaining the large trees that provide winter cover.

FLAMMULATED OWL, LEWIS' WOODPECKER, WILLIAMSON'S SAPSUCKER: In the short-term, the project may negatively affect these species by reducing the total number of snags and brushy foraging habitat. In the long-term, snag foraging and nesting habitat would remain unaffected. Although initially some snags would be removed for worker safety, in the long-term, the proposed project would result in larger diameter trees and therefore larger snags. The longevity of existing snags would be improved because smaller trees would be cleared from around the larger snags. The smaller trees shade the snags, keeping the snags cooler and retaining moisture.

The cooler, moister conditions cause snags to decay more rapidly than if they were exposed to drying (USFS 2009). In addition, any large snags felled for safety reasons would be high-topped at 10-15' and remain on site to provide foraging habitat.

There would be an initial decrease in brushy foraging habitat for flammulated owls and Lewis' woodpeckers; however, some brush areas would remain unaffected where location or microsite conditions at the time of prescribed burning are not conducive to the burning of the brush. Resprouting of fire adapted shrubs would result in younger stands of brush species.

CALLIOPE HUMMINGBIRD, OLIVE-SIDED FLYCATCHER, AND CASSIN'S FINCH: These species are fairly common in the project vicinity or in northeastern Washington and would benefit from the project. Calliope hummingbirds use edges and forest openings and respond positively in the short-term to logging (USFS 2009). Olive-sided flycatchers often use areas that have been logged, which are superficially similar to post-fire stands. Their greatest declines have occurred in the eastern U.S. Cassin's finches prefer open forests and they use selectively logged forests and small-scale clear-cuts (USFS 2009).

WILLOW FLYCATCHER: The project may have a slight short-term negative effect to this species due to the loss of woody plants in the riparian corridor. Subsequent regrowth of woody riparian shrubs and trees would provide for willow flycatcher habitat in the long-term.

GOLDEN EAGLE: The only anticipated effects to golden eagles are short-term reductions in prey base. The removal of brush would cause a short-term loss of habitat for prey species (such as snowshoe hare). Operations would be suspended within 660' of an active nest or 330' of an inactive nest during the breeding season (1 February – 31 July) (USFWS 2007); therefore, noise and activity disturbances to this species are not expected to occur. Overall, no effects to this species are expected.

#### b. Cumulative Effects

WHITE-HEADED WOODPECKER: The area considered for cumulative effects analysis consists of the Wedge between the Kettle and Columbia rivers. Historic fire suppression activities in the Wedge have created forest habitats with high densities of fire intolerant tree species and brush. The Proposed Action Alternative (672 acres), as well as the Summit Pierre Fuels Reduction Project (~7,000 acres) on adjacent Colville National Forest lands, and the Wedge CWPP Fuels Reduction Project (200 acres), and the National Fire Plan Grant Pierre Lake Fuels Reduction project (400 acres), and the Rockcut Timber Sale (365 acres) would enhance habitat for the white-headed woodpecker by creating more open forests while retaining large trees and snags.

CEDAR WAXWING: The area considered for cumulative effects analysis consists of the Wedge between the Kettle and Columbia rivers. Historic fire suppression activities in the Wedge have created forest habitats with high densities of fire intolerant tree species and brush. The Summit Pierre Fuels Reduction Project on adjacent Colville National Forest lands, and the Rockcut Timber Sale will enhance habitat for the cedar waxwing by creating more open forests while retaining fruit-bearing shrubs (refer to the white-headed woodpecker cumulative effects analysis for acreages). The proposed project, the Wedge CWPP Fuels Reduction Project and the National

Fire Plan Grant Pierre Lake Fuels Reduction project would remove brush species, possibly reducing foraging habitat in the short-term

**TOWNSEND'S BIG-EARED BAT:** The area considered for cumulative effects analysis consists of the Wedge between the Kettle and Columbia rivers. The Proposed Action Alternative would not negatively contribute to cumulative effects because of the buffer zones around priority sites and the restrictions on burning at these sites. Potential impacts to the species due to project effects to unbuffered low-priority mine features are negligible due to the marginal habitat these features provide. Illegal use of historical structures that support Townsend's big-eared bats would potentially cause disturbance of roost sites and maternity sites during summer and hibernacula during late autumn and winter, although few recreationists or miners explore mines during winter. The eventual closing of mine features using bat compatible gates would minimize disturbance by eliminating most illegal use. No effects are expected from the Summit Pierre Fuels Reduction Project on adjacent lands of the Colville National Forest because of buffers and seasonal restrictions for this species. Planned projects and treatments on other ownerships within the project area could, when combined with the effects of the Proposed Action Alternative, contribute to cumulative effects to Townsend's big-eared bats because private landowners are not required to manage for these bats and old buildings can be modified or destroyed. However, the overall cumulative effect is anticipated to be negligible to minor.

**MOOSE:** Historic fire suppression activities in the northeastern Washington have created forest habitats with high densities of fire intolerant tree species and brush. The Proposed Action Alternative and the Summit Pierre Fuels Reduction Project on adjacent Colville National Forest lands would enhance habitat for the moose by creating more open forests while retaining large trees for winter habitat and rejuvenating woody browse species. The Rockcut Timber Sale does not target brush removal. Brush reduction is incidental to the Proposed Action Alternative, which is designed to commercially thin trees. The Rockcut Timber Sale area would continue to provide brushy habitat while the brush habitat in the proposed project, Summit Pierre Fuels Reduction Project, the Wedge CWPP Fuels Reduction Project, and the National Fire Plan Grant Pierre Lake Fuels Reduction project areas is reduced.

**LEWIS' WOODPECKER, FLAMMULATED OWL, WILLIAMSON'S SAPSUCKER:** The area considered for cumulative effects analysis consists of the Wedge between the Kettle and Columbia rivers. Existing large snags throughout the cumulative effects area were created primarily through major insect and disease in the past decade and reduced primarily by firewood harvest rather than timber harvest. Throughout the area, snags have developed and continue to develop primarily through root rot diseases, insect outbreaks and fire and post-fire mortality and be reduced by timber harvest. The tree damage created during the winter storms of 1996-1997 created some standing, broken, live trees. These trees will become extremely valuable as time passes because they will begin to decay and to attract insects, yet will remain standing. Additionally, because they are live, and not considered snags under OSHA guidelines, many more of these can remain in a stand during salvage logging activities.

The Summit Pierre Fuels Reduction Project, affecting ~7,000 acres on adjacent lands on the Colville National Forest, is expected to add little to the cumulative negative effects of reduced snag levels because most large snags and logs will remain on site, temporary roads would be

closed after harvest activities (so although many of the snags within 200 feet of the roads will probably be removed by the public for firewood while the roads are open, the suppression of snag levels will not be continual because the roads will be closed), green trees would remain on site to develop into snags in the future, and snags will be created in units that fall below standards in the Forest Plan (USFS 2009). Likewise, the proposed project (affecting ~672 acres on BLM) would have little net effect on snag densities in the region because although there may be an initial loss of snags due to removal for worker safety, in the long-term, larger, longer-lasting snags would be created. The Rockcut Timber sale includes provisions for retaining leave trees and specifies that snags not felled for safety reasons may be left standing, and would be expected to have a negligible effect on snag and log densities in the area. Shrubs are not targeted for removal at all in the Rockcut Timber sale. The Wedge CWPP Fuels Reduction Project and the National Fire Plan Grant Pierre Lake Fuels Reduction project remove most of the brush in the project areas, diminishing the foraging habitat for the flammulated owl and Lewis' woodpecker. The proposed project would also diminish brushy habitats in the short term, although fire-adapted shrubs would resprout and produce young stands of brush.

**CALLIOPE HUMMINGBIRD, OLIVE-SIDED FLYCATCHER, AND CASSIN'S FINCH:** Historical fire suppression, firewood collection and timber practices have created forest habitats in northeastern Washington characterized by stands at all seral stages that are composed of high densities of smaller trees. Mid-seral forest structure is much more abundant and late-seral forests are much less abundant than what was found historically (WDFW 2005).

Collectively, the Proposed Action Alternative, the Summit Pierre Fuels Reduction Project on adjacent Colville National Forest lands, and the Rockcut Timber Sale would help to ameliorate the negative effects of these historical practices. All of these projects would create forest openings while retaining large live trees. Areas of shrubs would be retained in the Forest Service project, and burning would stimulate the regrowth of fire-adapted shrubs in both federal projects. Shrubs are not targeted for removal at all in the Rockcut Timber sale. The Wedge CWPP Fuels Reduction Project and the National Fire Plan Grant Pierre Lake Fuels Reduction project would thin overstory trees but would also remove most of the brush in the project areas, diminishing the value for migratory birds.

**WILLOW FLYCATCHER:** Willow flycatchers in Washington experienced significant declines from 1966 to 1979. During the period between 1980 and 2000, the species still suffered a decline, but to a lesser degree, indicating that there may be a reversal of the trend, or at least stabilization, in the years to come. Despite their decline, willow flycatchers are still very common in western Washington. They are less common and more locally distributed east of the Cascades. River-corridor channelization, overgrazing, dam construction, and urbanization all degrade willow flycatcher habitat. With the listing of many northwest salmon populations under the Endangered Species Act, many rivers are undergoing restoration to improve the habitat for salmon, which should also improve habitat for willow flycatchers and other riparian species (BirdWeb 2008). The Summit Pierre Fuels Reduction Project (affecting ~7,000 acres on the Colville National forest) will enhance willow flycatcher habitat (USFS 2009). Shrubs are not targeted for removal at all in the Rockcut Timber sale. The Wedge CWPP Fuels Reduction Project and the National Fire Plan Grant Pierre Lake Fuels Reduction project remove most of the brush in the project areas, diminishing the value for the willow flycatcher.

The proposed project would affect ~672 acres of land. This represents a small fraction of habitat for the willow flycatcher in the Wedge. Given the small area affected, and the foreseeable improvements to willow flycatcher habitat both on the adjacent forest lands and regionally, any adverse cumulative effects to willow flycatcher habitat caused by the proposed project would be negligible.

*b) Alternative 2 (No Action)*

a. Direct and Indirect Effects

**BALD EAGLE:** The No Action Alternative would result in an increased risk of stand-replacing wildfire which could, in the long-term, diminish potential bald eagle habitat in the project area by destroying large trees that could provide nesting or roosting habitat.

**WHITE-HEADED WOODPECKER:** The No Action Alternative would result in an increased risk of wildfire which could benefit this species by creating more open stands of large trees. Fire that removes large trees would eliminate white-headed woodpecker habitat in the affected area and could destroy nests or kill nestlings if it occurred during the breeding season.

**CEDAR WAXWING:** The No Action Alternative would result in an increased risk of wildfire which could benefit this species by creating more open stands of conifers. Fire that removes large trees would eliminate cedar waxwing habitat in the affected area and could destroy nests or kill nestlings if it occurred during the breeding season.

**PYGMY SHREW:** No effects expected.

**TOWNSEND'S BIG-EARED BAT:** The No Action Alternative would result in an increased risk of stand-replacing wildfire, which could diminish Townsend's big-eared bat habitat in the project area by destroying vegetation around mine openings. The removal of vegetation from the vicinity of mine openings would affect the microclimate of the mine and, ultimately, negatively affect the species, if present. Additionally, smoke from wildfires could be drawn into the mine and cause bats to abandon the site.

**WOLVERINE:** The project area provides marginal habitat for wolverine because of its lack of high elevation and seclusion habitats. Therefore, no effects are expected to this species.

**MOOSE:** In the short-term, the No Action Alternative would benefit moose by maintaining winter cover and browse for moose. In the long-term, however, browse species would grow decadent and provide less available forage. Increasing densities of coniferous trees would reduce suitability of moose habitat in some areas. High-intensity wildfire could remove browse and winter cover, eliminating moose habitat in the project area in the short-term; eventual revegetation of the area would result in rejuvenated shrubs and improved forage.

**FLAMMULATED OWL, LEWIS' WOODPECKER, WILLIAMSON'S SAPSUCKER:** The No Action Alternative would result in an increased risk of stand-replacing wildfire which could diminish

potential habitat for these species in the project area by destroying large snags that provide nesting sites and shrubs that provide foraging habitat.

CALLIOPE HUMMINGBIRD, OLIVE-SIDED FLYCATCHER , AND CASSIN'S FINCH: The No Action Alternative would result in an increased risk of stand-replacing wildfire which could diminish potential habitat for these species in the project area by destroying large trees that provide nesting sites and shrubs that provide foraging habitat.

WILLOW FLYCATCHER: The No Action Alternative would result in an increased risk of stand-replacing wildfire which could diminish potential habitat for the willow flycatcher in the project area by destroying brushy habitat that provides potential nesting sites and foraging habitat.

GOLDEN EAGLE: The No Action Alternative would result in an increased risk of stand-replacing wildfire which could diminish potential habitat for the golden eagle in the project area by destroying large trees that provide nesting sites and shrubs that provide habitat for prey species such as snowshoe hares.

#### b. Cumulative Effects

BALD EAGLE, WHITE-HEADED WOODPECKER, CEDAR WAXWING, TOWNSEND'S BIG-EARED BAT, FLAMMULATED OWL, LEWIS' WOODPECKER, WILLIAMSON'S SAPSUCKER, WILLOW FLYCATCHER, GOLDEN EAGLE: While the No Action Alternative would result in an increased risk of habitat loss due to stand-replacing wildfire on BLM lands, fuels reduction projects on adjacent properties (Summit Pierre Fuels Reduction, 7,000 acres; National Fire Plan Grant Pierre Lake Fuels Reduction, 400 acres; and the Rockcut Timber Sale, 365 acres) would reduce the overall risk in the region. The No Action Alternative is, therefore, not anticipated to have any measurable contribution to cumulative effects in the region.

MOOSE: Historical fire suppression, firewood collection and timber practices have created forest habitats in northeastern Washington characterized by stands at all seral stages that are composed of high densities of smaller trees. Mid-seral forest structure is much more abundant and late-seral forest structure is much less abundant than what was found historically (WDFW 2005). Under the No Action Alternative, the BLM lands in the project area (672 acres) would continue to support habitat comprised of smaller dense trees and aging shrubs. Eventually, habitat quality for moose would be reduced as shrub species become more decadent and inaccessible and as conifer stands grow denser. The Summit Pierre Fuels Reduction Project on adjacent Colville National Forest lands (~7,000 acres) would ameliorate the effects of these historical practices. This project would create forest openings while retaining large live trees and snags. Areas of shrubs would be retained and burning would be used to stimulate regrowth of shrubs. The Wedge CWPP Fuels Reduction Project and the National Fire Plan Grant Pierre Lake Fuels Reduction project would result in extensive brush removal (at least in the short term). These projects would retain some overstory trees for winter cover but would remove forage plants. The Rockcut Timber Sale does not target brush removal. The Rockcut Timber Sale area would retain large leaf trees while continuing to provide brushy habitat while the brush habitat in the proposed project, Summit Pierre Fuels Reduction Project, the Wedge CWPP Fuels Reduction Project, and the National Fire Plan Grant Pierre Lake Fuels Reduction project areas is reduced.

## RECREATION AND VISUAL RESOURCES

### *Affected Environment*

The area along the Kettle River is used primarily for dispersed on-water recreational activities such as rafting, swimming, and fishing. Upland areas in the project area are also used by recreationists for hunting, camping, bird watching, riding ATVs, and firewood gathering. There are no developed recreational facilities in the project area. Recreational use occurs primarily in the spring, summer, and fall months. Recreation visitation estimates have not been established.

The river corridor is characterized by forests, gentle slopes, and a gradually descending river. No Visual Resource Inventory Classes or Visual Resource Management Classes have been established for this area.

### *Environmental Consequences*

#### *a) Alternative 1 (Proposed Action)*

##### *a. Direct and Indirect Effects*

Recreational use of the area would remain open to the public during treatments, except in the immediate vicinity of logging operations.

In the short-term, land-based recreation activities and visitors may be displaced as a result of treatment activities, presence of harvest personnel, noise, or operation of equipment. This effect is anticipated to be minor and limited to the duration of active treatments.

The proposed 50-foot buffer zone at the high-water mark (see Project Design Features) would minimize the potential for effects to water-based recreation activities and aesthetics of the river corridor. As such, effects to water-based recreation activities and aesthetics are anticipated to be short-term and only minimally adverse.

The proposed treatment activities would have no direct effect on river access points. In the long-term, the removal of understory vegetation would enhance both land- and water-based recreational opportunities by creating a more park-like landscape that allows easier cross-country hiking access, more camping opportunities, and improved opportunities for wildlife viewing. The removal of understory vegetation may improve portage access for hand-carried boats. It would also improve hunting in the area by thinning out the smaller diameter trees and leaving the larger trees, while still providing adequate cover and improving big game grazing habitat and browse cover. The closing of mine openings throughout the project area would result in minor beneficial effects for public safety.

The scenic view from the river would be temporarily impacted by logging operations and other forest treatment activities until slash is removed or disposed of and vegetation reestablishes.

b. Cumulative Effects

The geographic scope of the recreation cumulative effects analysis is limited to the immediate project area and river corridor. Past private logging operations have resulted in slightly diminished aesthetics on adjacent lands. However, these historic operations have not fundamentally altered the recreational uses or opportunities available in the project area. No other current or future activities have been identified in the immediate vicinity. Given that the short- and long-term direct and indirect effects of this alternative are anticipated to be negligible overall, there is limited potential for these effects to measurably contribute to cumulative effects to recreation and/or visual resources in this area.

*b) Alternative 2 (No Action)*

a. Direct and Indirect Effects

The No Action Alternative would have no direct effect on recreation uses or visual resources in the project area. However, under this alternative, the potential for a stand-replacing wildfire in the future is increased. A stand-replacing wildfire would greatly affect available recreation opportunities, potentially reduce the quality of remaining recreational experiences, and diminish visual resources until sufficient vegetative cover has reestablished.

b. Cumulative Effects

Given that there is no potential for direct effects to recreation and visual resources as a result of the No Action Alternative and the potential for indirect effects is largely unknown (i.e., chance of stand-replacing wildfire in the future), no cumulative effects are anticipated as a result of this alternative.

## CULTURAL/PALEONTOLOGICAL RESOURCES

### *Affected Environment*

The project area is located in the traditional territory of the Lakes and the Colville people. Teit (1930) and Ray (1936) place the southern boundary of the *sngaytskst* or “Lakes” people - one of the twelve tribes and bands that today make up the Confederated Tribes of the Colville Reservation - near Kettle Falls, Washington. After Fort Colville was established near Kettle Falls in 1825, the Lakes people began moving south, often wintering in the Kettle Falls area (Bouchard and Kennedy 1985, 1998). This movement south was also very likely influenced by the establishment of the Colville Indian Reservation south of the Canadian border in 1872 where many *sngaytskstx* people were allotted land (Bouchard and Kennedy 1985:15).

Along the Kettle River, Native American uses likely included fishing, hunting, and food gathering. Because travel routes often parallel rivers, there were also likely trails roughly following the old Marcus-Grand Prairie Road on the east side of the river. Peeled cedar trees (culturally modified trees) are present in part of the project area, indicating that, perhaps, Native Americans continue to use the area for plant and resource gathering.

The project area is located within the Orient Mining District of northern Stevens County, Washington. Mineral survey maps dating to the early 1900’s refer to this area as the Pierre Lake Mining District. It was formed in 1902 as a result of significant discoveries at the First Thought and Napoleon mines. Gold, silver, copper and lead were the chief ore deposits which the miners sought. The First Thought Mine, located within the District and the project area, became one of the largest producers of gold in the state (Fulkerson & Kingston 1958:5). Although the main First Thought discovery “glory hole” and associated adits and tunnels are located on private land, portions of the aerial tramway cross BLM lands.

As a result of the potential for rich ore deposits, most of the project area experienced some level of prospecting and/or full mine development prior to 1950. Many of the productive mining claims were patented in the early 1900s, but many were left in the public domain. In the First Thought Treatment Unit, hundreds of prospect pits, waste rock piles, open adits, tunnels and shafts surround the private inholding which is where the First Thought Mine is located. Most of the prospects are shallow but some of the larger mine workings consist of deep shafts – some filled with water – and open or partially collapsed adits. Accompanying the mine sites are often other developments including roads, short rail systems, aerial tramways, log and timber framed structures, and refuse scatters.

The entire project area was surveyed between 2000 and 2004 to Class III standards as part of two separate data inventories – the proposed Shrub Steppe Land Exchange and the North East Lands Data Project (NELDP). A total of 44 sites and isolates have been recorded in the project area (28 from the NELDP survey, 10 from the Shrub Steppe Inventory, and 6 from 2009 field reviews). Four sites are interpreted to be prehistoric or ethnohistoric. The remainder are primarily related to historic mining activity (e.g., mines, collapsed structures). Four sites have been determined ineligible for the National Register of Historic Places and one – the Marcus-Grand Prairie Road in the Kettle River Unit – has been determined eligible. No eligibility

determinations have been conducted for the remaining sites so, for the purposes of analysis, they will be treated as potentially eligible unless it has been determined that they could not be impacted by the Proposed Action Alternative due to the nature of the cultural resource (e.g., prospect pits).

Consultation for this project was initiated with the Washington State Department of Archaeology and Historic Preservation (DAHP), the Confederated Tribes of the Colville Reservation and the Stevens County Historical Society on September 17, 2009. The DAHP concurred with the area of potential effects on September 25, 2009. No comments were received from the Confederated Tribes of the Colville Reservation or the Stevens County Historical Society. After field review and submittal of a final report with recommendations for site protection, the SHPO concurred with the BLM recommendation of no historic properties affected by this project on 11/18/09.

There are no known paleontological resources in the project area.

### *Environmental Consequences*

#### *a) Alternative 1 (Proposed Action)*

##### a. Direct and Indirect Effects

The Proposed Action Alternative could result in ground disturbance through a variety of actions including landing and temporary road construction, tree felling, skidding, and broadcast/pile burning. However, because all vulnerable sites would be protected from ground disturbing activities, no direct and indirect impacts to cultural resources as a result of the proposed activities are anticipated.

Given that the Marcus-Grand Prairie Road requires special protection from ground disturbing activities (no skidding or heavy log truck traffic without a minimum of 12” of snow cover), adverse impacts to this resource are not anticipated.

The culturally modified cedars would not be affected because they would not be harvested, thinned or underburned. Proposed fencing around hazardous mines would not affect the cultural values of the site.

The installation of bat gates or culverts would occur only on sites where there is proven or highly suspected habitat for the Townsend’s Big-eared bat, a BLM Sensitive species. Historic data review and field review of these sites indicates that installation of the bat gates would not affect the cultural values or National Register eligibility of sites. The State Historic Preservation Officer concurred with this finding of no historic properties affected for the mine closures and the fuels reduction project on 11/18/09.

b. Cumulative Effects

Given that there is no potential for direct or indirect effects under the Proposed Action Alternative, there is no potential for cumulative impacts to cultural resources as a result of Alternative 1.

a) *Alternative 2 (No Action)*

a. Direct and Indirect Effects

The No Action Alternative would have no direct effects on cultural sites in the project area. However, the No Action Alternative may increase the likelihood of stand-replacing wildfire in the project area. If a stand-replacing wildfire event occurred, fire susceptible cultural sites (i.e., wooden structures) would be adversely affected. Furthermore, a stand-replacing wildfire event may also increase soil erosion which could affect the stability of cultural resources.

b. Cumulative Effects

Given that there is no potential for direct effects to cultural resources as a result of the No Action Alternative and the potential for indirect effects is largely unknown (i.e., chance of stand-replacing wildfire in the future), no cumulative effects are anticipated as a result of this alternative.

## AIR QUALITY

### *Affected Environment*

The U.S. Environmental Protection Agency (EPA) and the Washington DNR regulate air quality in Washington through implementation of the Federal Clean Air Act (CAA) (42 U.S.C. §§ 7401-7671q). The CAA is a Federal air quality law, which is intended to protect human health and the environment by reducing emissions of specified pollutants at their source.

The CAA outlines three types of airshed classification areas: Class I, II, and III. Class I areas include wilderness areas designated as of August 7, 1977 that are 5,000 acres or greater in size, and also include all National Parks over 6,000 acres. These areas have the most stringent degree of protection from current and future air quality degradation. Class I Airsheds include restrictions on prescribed burning during weekends from July 1 through Labor Day. The nearest Class I Airsheds to the project area are the Salmo-Priest Wilderness on the Washington-Idaho border approximately 50 miles to the east and the Pasayten Wilderness in the Okanogan National Forest approximately 130 miles to the west. Since no prescribed burns would take place during the restricted time periods, Class I Airsheds will not be analyzed further.

The CAA requires the adoption of national ambient air quality standards (NAAQS) to protect the public health and welfare from the effects of air pollution. The CAA defines NAAQS as levels of pollutant above which detrimental effects on human health and welfare could occur. Standards

are provided for sulfur dioxide (SO<sub>2</sub>), carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), particulate matter less than 10 microns (PM<sub>10</sub>), particulate matter less than 2.5 microns (PM<sub>2.5</sub>), and lead (Pb), which are known as the criteria pollutants (see Appendix B) (EPA 2008a). The EPA has identified PM<sub>10</sub> particle sizes as the standard for evaluating emissions and its effect on human health. PM<sub>10</sub> particles are those particles in smoke less than 10 microns in size. These particles are too small to be filtered out by the human respiratory system. These small particulates can cause respiratory problems, especially to smoke sensitive portions of the population.

A state or region is given the status of “attainment” if the NAAQS thresholds have not been exceeded for any criteria pollutant, or “nonattainment” for a specific pollutant if the NAAQS thresholds have been exceeded for that pollutant. An area designated as nonattainment may request redesignation if it can be shown that the area has not exceeded the NAAQS for a period of three years. Redesignation requires the appropriate agency with jurisdiction over the area to prepare a maintenance plan and demonstrate compliance with NAAQS for 10 years.

The closest non-attainment area to the project area is the City of Spokane. However, smoke from prescribed burning in the Pierre Lake project area is not anticipated to disperse that far. Therefore, non-attainment areas will not be addressed further in this Environmental Assessment.

Both prescribed fires and wildfires are potential sources of air pollutant emissions. The amount of emissions depends on the size and intensity of the fire (determined by meteorological conditions such as temperatures and wind speed and direction); the fuel type and fuel moisture content (including age class, size, and mixture of vegetation types); and the available fuel loading (the total mass of combustible fuels).

### *Environmental Consequences*

#### *a) Alternative 1 (Proposed Action)*

##### *a. Direct and Indirect Effects*

Under the Proposed Action Alternative, prescribed fire activities would result in adverse short-term minor effects in the immediate vicinity of the project area. Prescribed fire treatments would be conducted in compliance with an approved burn plan and state-issued burn permit. These two documents would establish criteria for burning activities, such as meteorological conditions, season, and treatment acreages, such that treatment activities would have only short-term minor adverse effects to local air quality. Burn plans and smoke permits would not be approved or allowed if the proposed treatments were expected to result in major effects to smoke sensitive areas, effects to nonattainment areas, or any exceedances of NAAQS.

Adverse smoke effects from the burning of slash piles would be short-term and minor. Adverse smoke effects from broadcast burning activities would be variable, but still within the permissible PM<sub>10</sub> criteria. Smoke effects would be of short duration (2-5 days) and have only temporary effects. Smoke is expected to remain at nuisance or negligible levels rather than at levels that could impair human health.

Impaired visibility in the immediate area of burning is possible. The BLM and prescribed fire managers would coordinate directly with nearby residents to ensure that they are aware of the proposed fire treatments and potential hazards. It is not expected that visibility would be reduced such that driving safety would be impaired.

The proposed fuels reduction treatments would, in the long term, result in a beneficial reduction of potential emissions during natural wildfire events in the project area by reducing the availability of fuels for future, unplanned wildland fires. In the long term, reduced fuel loads throughout the project area would have a minor beneficial effect on severity and extent of air quality effects as a result of future wildland fires.

In addition to potential smoke effects from fire treatments, the operation of heavy equipment and vehicles under Alternative 1 would generate low levels of particulate emissions (road and travelway dust) and exhaust emissions. Air quality effects as a result of these emissions would be short term adverse and negligible, and would be localized to active treatment units. Road dust would result in short-term adverse minor effects to the private inholding. However, these effects would be limited primarily to the summer and early fall months when soil (i.e., road surface) moisture is low.

#### b. Cumulative Effects

Considering the increasing susceptibility of forests to high severity wildfires throughout the west, the proposed fuels treatments would result in minor long-term beneficial cumulative effects to air quality in the project area. The proposed treatments would ultimately delay, diminish, or altogether impede the effects of reasonably foreseeable future stand-replacing wildland fires and the subsequent high-volume PM<sub>10</sub> emissions in the project area, thereby preserving local air quality conditions in the long term. On a regional scale, however, the Proposed Action Alternative would have no cumulative effect on air quality, as the project area is largely insignificant compared to the burnable area in proximity to population centers or smoke sensitive areas.

#### a) *Alternative 2 (No Action)*

##### a. Direct and Indirect Effects

The No Action Alternative would have no direct effect on local or regional air quality. Alternative 2 would indirectly perpetuate hazardous fuel accumulation and increase the potential for high severity wildland fires in the project area.

## b. Cumulative Effects

Given that no direct effects are anticipated, the potential for indirect effects are largely unknown (e.g., future wildland fire), and the relatively small size of the project area, it is unlikely that this alternative's effects, when combined with the effects of other projects, would contribute to cumulative adverse effects to air quality.

## CLIMATE CHANGE

### Affected Environment

The movement of carbon between the earth and its atmosphere controls the concentration of carbon dioxide (CO<sub>2</sub>) in the air. CO<sub>2</sub> is important because it is a greenhouse gas and traps heat radiation given off when the sun warms the earth. Higher concentrations of greenhouse gases in the atmosphere cause the earth to warm. As more CO<sub>2</sub> is added to the air, temperatures will continue to increase and the warmer earth will have an impact on the earth's climate, climate variability, and ecosystems (Ryan et al. 2010, p. 2). Although, it is known that green house gases have an effect on climate change, it cannot be directly determined what that affect is.

Current global emissions of carbon dioxide total 25 billion metric tons of carbon dioxide (Denman et al. 2007), and current U.S. emissions of carbon dioxide total 6 billion metric tons (EPA 2009, p. 2-3). In its recent report, Climate Change Indicators in the United States (EPA 2010), the EPA determined that carbon dioxide accounts for most of the nation's emissions of greenhouse gases, and most of the increase in emissions in recent decades. The report also identifies electricity generation as the largest source of greenhouse gases in the U.S., followed by transportation.

Average annual fire emissions in the continental U.S. were estimated as 213 million metric tons of carbon dioxide (213 Tg CO<sub>2</sub> yr<sup>-1</sup>) from 2002 – 2006. While relatively small when compared with average annual fossil fuel-based emissions in the U.S., the potential emissions contribution of wildfires is substantial and presents a risk to forest carbon offset projects (Wiedinmyer 2010, p. 1926)

In the dry, fire prone forests of the western U.S., wildfire size and severity have been increasing as a result of changing climatic conditions and past management activities (Wiedinmyer 2010, p. 1930-1931). Also, the proportion of fuel combusted during a fire event tends to increase with increasing burn severity (degree to which a site has been altered or disrupted by fire). Prescribed fires are typically less severe than wildfires since they are implemented when atmospheric conditions are stable and fuel moisture is high enough to maintain flame length, combustion, and spread rates within prescription, combusting less than 50% of the available fuel.

Forests store large amounts of carbon in live and dead wood and soil and play an active role in controlling the concentration of CO<sub>2</sub> in the atmosphere. In the U.S. in 2003, carbon removed from the atmosphere by forest growth or stored in harvested wood products offset 12-19% of U.S. fossil fuel emissions (the 19% includes a very uncertain estimate of carbon storage rate in

forest soil) (Ryan et al. 2010, p. 2).

### *Environmental Consequences*

#### a) Alternative 1 (Proposed Action)

##### a) Direct and Indirect Effects

The BLM's Proposed Action Alternative would result in direct effects on greenhouse gas levels by emitting CO<sub>2</sub> emissions as a result of commercial thinning, site preparation, pile burning, and broadcast burning, after which forest growth would result in storage of carbon.

The Proposed Action Alternative would harvest approximately 3,000 Measured Board Feet (MBF) of timber, which contains a total of 3,978 metric tons of carbon. However, some of this carbon is stored in the wood product (preventing its immediate release to the atmosphere) and some is available for use as biomass energy thereby displacing fossil fuel use.

Pile burning to dispose of slash after commercial and precommercial thinning, which is not used for biomass energy, would result in the consumption of 7 tons of biomass per acre and 4,755 tons of biomass for the entire project area. This is equivalent to 3.2 metric tons of carbon emissions per acre or 2,161 metric tons of carbon emissions for the project area (BLM Timber Harvest Carbon Calculator).

Assumptions for broadcast burning across the entire project area include; 100% consumption of the fuels on the ground, 5% consumption of the canopy, and that fire will burn across 100% of the project area. The project area currently has approximately 9 tons per acre of biomass consisting of timber slash, shrubs, grasses, downed wood, litter and duff. The Proposed Action Alternative would result in consumption of approximately 5,487 tons of biomass over the project. The biomass consumed by the proposed prescribed fire would result in the direct emission of 3.71 metric tons per acre of carbon emissions or 2,494 metric tons of carbon emissions for the project area (BLM Timber Harvest Carbon Calculator).

The BLM Proposed Action Alternative may cause indirect effects on greenhouse gas levels by making changes in vegetation that promote healthy large diameter timber that decreases the probability of sustained crown fires. Continued forest growth following harvest would result in an annual increase in stand volume across entire project area. After time regenerated forests will eventually recover all of the carbon lost so that a complete cycle is carbon neutral regarding storage if the recovery is long enough (Ryan et al. 2010, p. 3-4).

The total approximated combined carbon emissions for all treatments in the project area, not including carbon neutral offsets (carbon sequestration from the forest) is 8,633 metric tons of CO<sub>2</sub>. Overall, this is a negligible effect at both the regional and global scales.

##### b) Cumulative Effects

Changes in land use patterns and forestry projects, such as commercial thinning, nationally

results in a net sink of carbon dioxide of 1 billion metric tons (EPA 2009, p. 2-3); the emissions from the Proposed Action Alternative and similar actions in the area would represent 0.0001% of this net sink.

Greenhouse gas emissions resulting from continued prescribed fires across the U.S. have the potential to reduce the overall CO<sub>2</sub> emissions produced from wildfires (Wiedinmyer 2010, p. 1931). Although, in the short term continued prescribed fires will contribute to the overall local CO<sub>2</sub> emissions in the region.

Biomass energy that is produced from forestry activities as seen in present and reasonably foreseeable projects help to reduce the amount of CO<sub>2</sub> emitted into the atmosphere. In addition wood and bark that are burned to run a mill or heat houses, or made into liquid biofuel, lower emissions from fossil fuel use (Ryan et al. 2010, p. 5).

Electricity generation followed by transportation will continue to account for most of the nation's greenhouse gas emission (EPA 2010).

*a) Alternative 2 (No Action)*

a. Direct and Indirect Effects

Forest vegetation would continue to grow and sequester carbon, but would be more susceptible to forest insect/disease and severe wildfire outbreaks. The level of greenhouse gas emissions would depend on the severity, intensity and extent of the outbreak.

Live tree mortality rates from wildfire are typically greater than from prescribed fire resulting in fewer trees remaining to sequester carbon (Wiedinmyer 2010, p. 1931) and there is evidence that not treating fuels increases the fuel availability.

In the event of a severe wildfire, the mortality of living trees and the amount of forest biomass consumed would be increased compared to a prescribed fire. The impacts resulting from a wildfire would be comparable to that of the Proposed Action Alternative in comparison to the total global CO<sub>2</sub> emissions. Except that the forest products (lumber and bio-fuel) would not be placed in long term storage. This would cause the breakdown and release of CO<sub>2</sub> back into the atmosphere at an accelerated rate compared to the Proposed Action Alternative.

Overall, the direct and indirect effects of the No Action Alternative on greenhouse gas emissions are anticipated to be negligible.

b. Cumulative Effects

Given that the likely direct and indirect effects of the No Action Alternative are anticipated to be negligible, the No Action Alternative is not anticipated to have any measurable cumulative effect on greenhouse gas emissions.

## OTHER RESOURCE ELEMENTS ANALYZED

The following discussion has been excerpted directly from the U.S. Forest Service's Summit Pierre Fuels Reduction Project Environmental Assessment (September 2009). The Summit Pierre project is located adjacent to the Pierre Lake project area. The U.S. Forest Service analysis is applicable to the Pierre Lake project. All project references have been changed to reflect the BLM's proposed project.

### *Effects on Consumers, Civil Rights, Minority Groups and Women (Includes Environmental Justice Analysis)*

The Proposed Action Alternative would benefit consumers, but only in a limited capacity. It would provide wood products to one or more area sawmills, thus contributing raw materials that would become available to consumers.

All contracts and employment offered by the BLM contain Equal Employment Opportunity requirements. Therefore, no adverse or discriminatory effects to Civil Rights, Minority Groups or Women are expected with regards to access to federal contracts or jobs.

Environmental Justice means that, to the greatest extent practicable and permitted by law, all populations are provided the opportunity to comment before decisions are rendered on, are allowed to share in the benefits of, are not excluded from, and are not affected in a disproportionately high and adverse manner by, government programs and activities affecting human health or the environment. In examining the proposed project, there is one potential "population" that may be affected: low-income residents of Stevens County.

In 2002, the per capita personal income in Stevens County was \$20,610 or about 67% of the national average. In 2005, Stevens County's per capita income was ranked 35th of 40 Washington counties. In 2007, 11.4% of Stevens County families were ranked below poverty level, compared to national rate of 9.8% (U.S. Census Bureau 2009).

Changes in the availability of firewood would likely affect low-income residents more than others because alternate sources of heat are more costly. The proposed project would provide short-term firewood-gathering opportunities.

## **Coordination and Consultation**

This Environmental Assessment was prepared by an interdisciplinary team of BLM resource specialists representing various resource values, including soils, hydrology (water), wildlife habitat, cultural values, forestry, fuels, and fire, with public collaboration consistent with the 2006 10-Year Strategy Implementation Plan.

The BLM collaborated with the following organizations during planning of this project: Washington State DNR, USFS, Joint Fire Protection District Ferry 3 - Stevens 8, Friends of Sand Creek Homeowners, surrounding communities, adjacent landowners, and Conservation Northwest.

The BLM initiated consultation for this project with the Washington State Department of Archaeology and Historic Preservation (DAHP), the Confederated Tribes of the Colville Reservation and the Stevens County Historical Society on September 17, 2009. All interested parties were requested to provide input to the Proposed Action Alternative and to identify any concerns with the project. A 30-day comment period on the Proposed Action Alternative was requested. The DAHP concurred with the area of potential effect on September 25, 2009. No comments were received from the Confederated Tribes of the Colville Reservation or the Stevens County Historical Society. The BLM finding of no effect to cultural properties was given to the DAHP on November 11, 2009. DAHP concurrence with this finding was received on November 18, 2009.

The BLM will notify project partners, stakeholders, and the general public when a decision is made on the proposed project. Public notification will be disseminated through a press release and/or public notices in local newspapers or other media outlets.

## Literature Cited

- Agee, J.K. 1993. Fire Ecology of Pacific Northwest Forests. Island Press, Washington D.C.
- Agee, JK. 1996. The influence of forest structure on fire behavior. In: *Proceedings of the 17<sup>th</sup> Forest Vegetation Management Conference, January 16-18, 1996, Redding, CA.* p. 52-68.
- Agee, JK and CN Skinner. 2005. Basic principles of forest fuel reduction treatments. *Forest Ecology and Management* 211(1-2):83-96.
- BirdWeb, 2008. Seattle Audubon.
- BLM. 1985. Spokane Resource Management Plan/EIS. US Department of the Interior, Bureau of Land Management, Spokane District, Spokane, WA. 202 pp.
- Brown, Richard, T., Agee, James, K., Franklin, Jerry, F. 2004. Forest Restoration and Fire: Principles in the Context of Place Division of Ecosystem Sciences, College of Forest Resources, University of Washington, Seattle.
- Calder, William A. and Lorene L. Calder. 1994. Calliope Hummingbird (*Stellula calliope*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/135>  
[doi:10.2173/bna.135](https://doi.org/10.2173/bna.135)
- Corbett, J. 2010. Report on evaluation of select abandoned mine features of the Colville area, Spokane Field Office, Spokane, Washington.
- Denman, K. L., Brasseur, G., Chidthaisong, A., Ciais, P., Cox, P. M., Dickinson R. E., Hauglustaine, D., Heinze, C., Holland, E., Jacob, D., Lohman, U., Ramachandran, S., da Silva Dias, P.L., Wofsy, S.C. and Zhang, X. (2007) Couplings between changes in the climate system and biogeochemistry. In: *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change.* Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.) Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
- Dobbs, R. C., T. E. Martin and C. J. Conway. 1997. Williamson's Sapsucker (*Sphyrapicus thyroideus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/285>
- EPA (U.S. Environmental Protection Agency). 2010. Climate Change Indicators in the United States. Available on the internet at <http://www.epa.gov/climatechange/indicators.html>. Accessed on August 18, 2010.

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EPA 2009. Environmental Protection Agency. 2009. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2007. U.S. EPA, Washington, D.C.

Hann et al. 2008. Interagency and The Nature Conservancy Fire Regime Condition Class website. U.S. Department of Agriculture, Forest Service, U.S. Department of the Interior, The Nature Conservancy, and Systems for Environmental Management [www.frcc.gov].

Hays, DW and EA Rodrick. 2003. Flammulated Owl (*Otus flammeolus*) In: Priority Habitats and Species Management Recommendations Vol IV: Birds. Online: [http://wdfw.wa.gov/hab/phs/vol4/flammulated\\_owl.pdf](http://wdfw.wa.gov/hab/phs/vol4/flammulated_owl.pdf)

Johnson, RE, and KM Cassidy. 1997. Terrestrial Mammals of Washington State: Location Data and Predicted Distributions. Volume 3 in Washington State GAP Analysis – Final Report (KM Cassidy, CE Grue, MR Smith, and KM Dvornich, eds.). Washington Cooperative Fish and Wildlife Research Unit, University of Washington, Seattle, WA, 302 pp.

Lewis, JC. 2006. Implementation Plan for Reintroducing Fishers to Olympic National Park. Washington Department of Fish and Wildlife. Olympia. 31+ vii pp.

Lewis, JC, and EA Rodrick. 2002. White-headed Woodpecker (*Picoides albolarvatus*) In: Priority Habitats and Species Management Recommendations Vol IV: Birds. Online: [http://wdfw.wa.gov/hab/phs/vol4/white\\_woodpker.pdf](http://wdfw.wa.gov/hab/phs/vol4/white_woodpker.pdf)

Lewis, JC, M Whalen, and EA Rodrick. 2002. Lewis' Woodpecker (*Melanerpes lewis*) In: Priority Habitats and Species Management Recommendations Vol IV: Birds. Online: [http://wdfw.wa.gov/hab/phs/vol4/lewis\\_woodpker.pdf](http://wdfw.wa.gov/hab/phs/vol4/lewis_woodpker.pdf)

Long, CA. 1974. *Microsorex hoyi* and *Microsorex thompsoni*. Mammalian Species No. 33, pp 1-4.

NatureServe. 2009. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: November 13, 2009).

NLDP. 2003. Northeast Lands Data Project. USDI, Bureau of Land Management, Spokane, WA.

NRCS. 1982. Soil Survey of Stevens County, Washington. Norman C. Donaldson and Joseph T. DeFrancesco of Soil Conservation Service and Don W. Barron, Washington State Department of Natural Resources.

Rorig, Miriam, L., Ferguson, Sue, A., 1999. Characteristics of Lightning and Wildland Fire Ignition in the Pacific Northwest Pacific Northwest Research Station, USDA Forest Service, Seattle, Washington.

EPA 2009. Environmental Protection Agency. 2009. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2007. U.S. EPA, Washington, D.C.

Hann et al. 2008. Interagency and The Nature Conservancy Fire Regime Condition Class website. U.S. Department of Agriculture, Forest Service, U.S. Department of the Interior, The Nature Conservancy, and Systems for Environmental Management [www.frcc.gov].

Hays, DW and EA Rodrick. 2003. Flammulated Owl (*Otus flammeolus*) In: Priority Habitats and Species Management Recommendations Vol IV: Birds. Online: [http://wdfw.wa.gov/hab/phs/vol4/flammulated\\_owl.pdf](http://wdfw.wa.gov/hab/phs/vol4/flammulated_owl.pdf)

Johnson, RE, and KM Cassidy. 1997. Terrestrial Mammals of Washington State: Location Data and Predicted Distributions. Volume 3 in Washington State GAP Analysis – Final Report (KM Cassidy, CE Grue, MR Smith, and KM Dvornich, eds.). Washington Cooperative Fish and Wildlife Research Unit, University of Washington, Seattle, WA, 302 pp.

Lewis, JC. 2006. Implementation Plan for Reintroducing Fishers to Olympic National Park. Washington Department of Fish and Wildlife. Olympia. 31+ vii pp.

Lewis, JC, and EA Rodrick. 2002. White-headed Woodpecker (*Picoides albolarvatus*) In: Priority Habitats and Species Management Recommendations Vol IV: Birds. Online: [http://wdfw.wa.gov/hab/phs/vol4/white\\_woodpker.pdf](http://wdfw.wa.gov/hab/phs/vol4/white_woodpker.pdf)

Lewis, JC, M Whalen, and EA Rodrick. 2002. Lewis' Woodpecker (*Melanerpes lewis*) In: Priority Habitats and Species Management Recommendations Vol IV: Birds. Online: [http://wdfw.wa.gov/hab/phs/vol4/lewis\\_woodpker.pdf](http://wdfw.wa.gov/hab/phs/vol4/lewis_woodpker.pdf)

Long, CA. 1974. *Microsorex hoyi* and *Microsorex thompsoni*. Mammalian Species No. 33, pp 1-4.

NatureServe. 2009. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: November 13, 2009).

NLDP. 2003. Northeast Lands Data Project. USDI, Bureau of Land Management, Spokane, WA.

NRCS. 1982. Soil Survey of Stevens County, Washington. Norman C. Donaldson and Joseph T. DeFrancesco of Soil Conservation Service and Don W. Barron, Washington State Department of Natural Resources.

Rorig, Miriam, L., Ferguson, Sue, A., 1999. Characteristics of Lightning and Wildland Fire Ignition in the Pacific Northwest Pacific Northwest Research Station, USDA Forest Service, Seattle, Washington.

Ryan et al. 2010. A Synthesis of the Science on Forests and Carbon for U.S. Forests. Issues in Ecology, Ecological Society of America. 16pp

Tuttle, MD and DAR Taylor. 1998. Bats and Mines. Bat Conservation International, Inc. Resource Publication No. 3, 41 pp.

USDA Forest Service and USDI Bureau of Land Management. 2000a. Final Supplemental Environmental Impact Statement For Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines.

USDA Forest Service and USDI Bureau of Land Management. 2000b. Interior Columbia Basin Supplemental Draft Environmental Impact Statement, Volume 2 – Appendices. BLM/OR/WA/Pt-00/019+1792 Walla Walla, Washington: Interior Columbia Basin Ecosystem Management Project.

U.S. Department of the Interior, Fish and Wildlife Service. 1993a. Grizzly bear recovery plan. U.S. Fish and Wildlife Service, Missoula, MT. 181 p.

U.S. Department of the Interior, Fish and Wildlife Service. 1987. Northern Rocky Mountain wolf recovery plan. U.S. Fish and Wildlife Service, Denver, Colorado. 119 p.

U.S. Fish and Wildlife Service. 2008. Birds of Conservation Concern 2008. United States Department of Interior, Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, Virginia. 85 pp. [Online version available at <<http://www.fws.gov/migratorybirds/>>]

U.S. Fish and Wildlife Service. 2007. National Bald Eagle Management Guidelines.

USFS. 2009. Environmental Assessment Summit Pierre Fuels Reduction Project. Three Rivers Ranger District, Colville National Forest, Stevens County, Washington.

Wahl, TR, B Tweit, and SG Mlodinow. 2005. Birds of Washington: Status and Distribution. Oregon State University Press, Corvallis, OR. 436 pp.

Washington Department of Fish and Wildlife (WDFW). 2008. Priority Habitats and Species database. Washington Department of Fish and Wildlife, Olympia, WA.

Washington Department of Fish and Wildlife (WDFW). 2005. Washington's Comprehensive Conservation Strategy. Washington Department of Fish and Wildlife, Olympia, WA.

Washington Department of Fish and Wildlife (WDFW). 2000. Moose *from* Living With Wildlife. <http://wdfw.wa.gov/wlm/diversty/living/moose.htm>

Watson, JW, and EA Rodrick. 2000. Bald Eagle (*Haliaeetus leucacephalus*) In: Priority Habitats and Species Management Recommendations Vol IV: Birds. Online: [http://wdfw.wa.gov/hab/phs/vol4/bald\\_eagle.pdf](http://wdfw.wa.gov/hab/phs/vol4/bald_eagle.pdf)

Wiedinmyer, Christine and Hurteau , Mathew D., 2010. Prescribed Fire As a means of Reducing Forest Carbon Emissions in the Western United States, Environ. Sci. Technol., National Center for Atmospheric Research. 1926-1932pp.

Williams, D.K., B.F. Kelley, B.G. Smith, and T.R. Lillybridge. 1995. Forested plant associations of the Colville National Forest. General Technical Report PNWGTR-360. Portland, OR. US Department of Agriculture Forest Service, Pacific Northwest Research Station. 375 p.

## **Attachments**

Attachment #1 – Project Overview Map

Attachment #2 – Commercial Harvest Map

Attachment #3 – Pre-commercial Harvest Map