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Forest Service
Pacific Northwest
Region

ENVIRONMENTAL ASSESSMENT

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WILDCAT FUELS REDUCTION AND VEGETATION MANAGEMENT PROJECT

Umatilla National Forest
Heppner Ranger District

Grant and Morrow Counties, Oregon

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Chapter 1

Introduction

This environmental assessment (EA) documents the analysis and discloses the potential site-specific effects of the proposed Wildcat project. This environmental analysis is tiered to and supplements the analysis in the final environmental impact statement prepared for the Umatilla National Forest Land and Resource Management Plan (1990), hereafter referred to as the Forest Plan. The Forest Plan guides management of the Umatilla National Forest.

Project Area

The Wildcat project area is located in the eastern portion of the Heppner Ranger District in Morrow and Grant counties, Oregon, about 15 miles south of the town of Heppner. You can access the project area from Highway 207 at Anson Wright Memorial Park by County Road 670/Forest Road 22 and County Road 847/Forest Road 21 or from Cutsforth Park on County Road 678/Forest Road 53 onto Forest Road 21. A legal description of the area is T.5S., R.27E., Sections 13, 22-28, 33-36; T.5S., R.28E., Sections 18-20, 28-32; T.6S., R.27E., Sections 1-4, 8-17, 21-27, 35-36; and T.6S., R.28E., Sections 5-9, 16-21, Willamette Meridian (Figure 1-1).

The project area comprises about 25,450 acres within the National Forest boundary in the Little Wall Creek-Skookum Creek and Swale Creek subwatersheds (170702020803 and 170702020801) located within the Wall Creek Watershed which drains into the North Fork John Day River. The topography is generally a south aspect with 10 to 20% slopes. The elevation ranges between 3600 feet and 5280 feet. There is 4,150 acres of the Monument Big Game Winter Range in the southern portion of the project area. There are no inventoried roadless areas, no wilderness areas and no wild and scenic rivers within the project area.

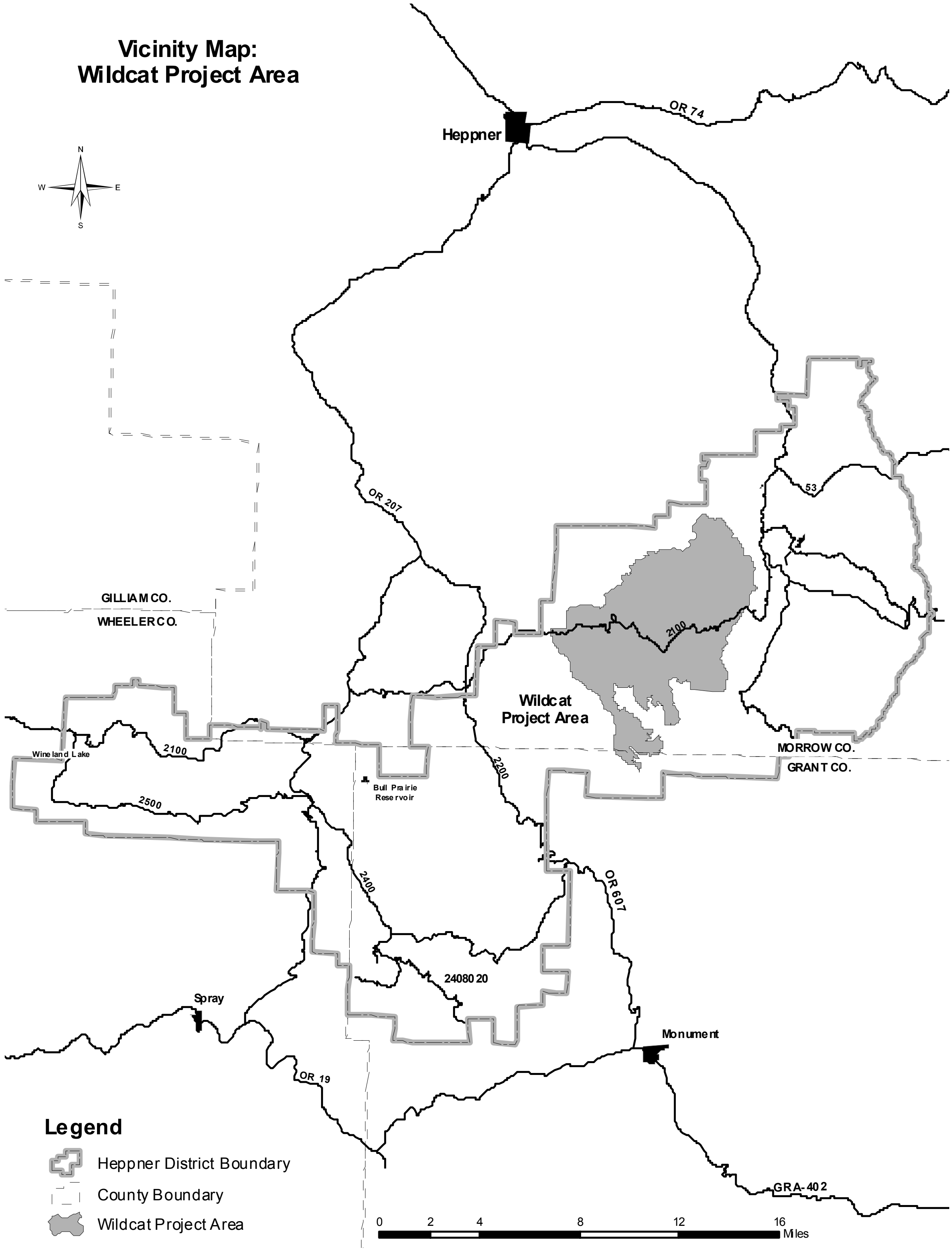

Figure 1-1: Location of the Wildcat Fuels Reduction and Vegetation Management Project Area

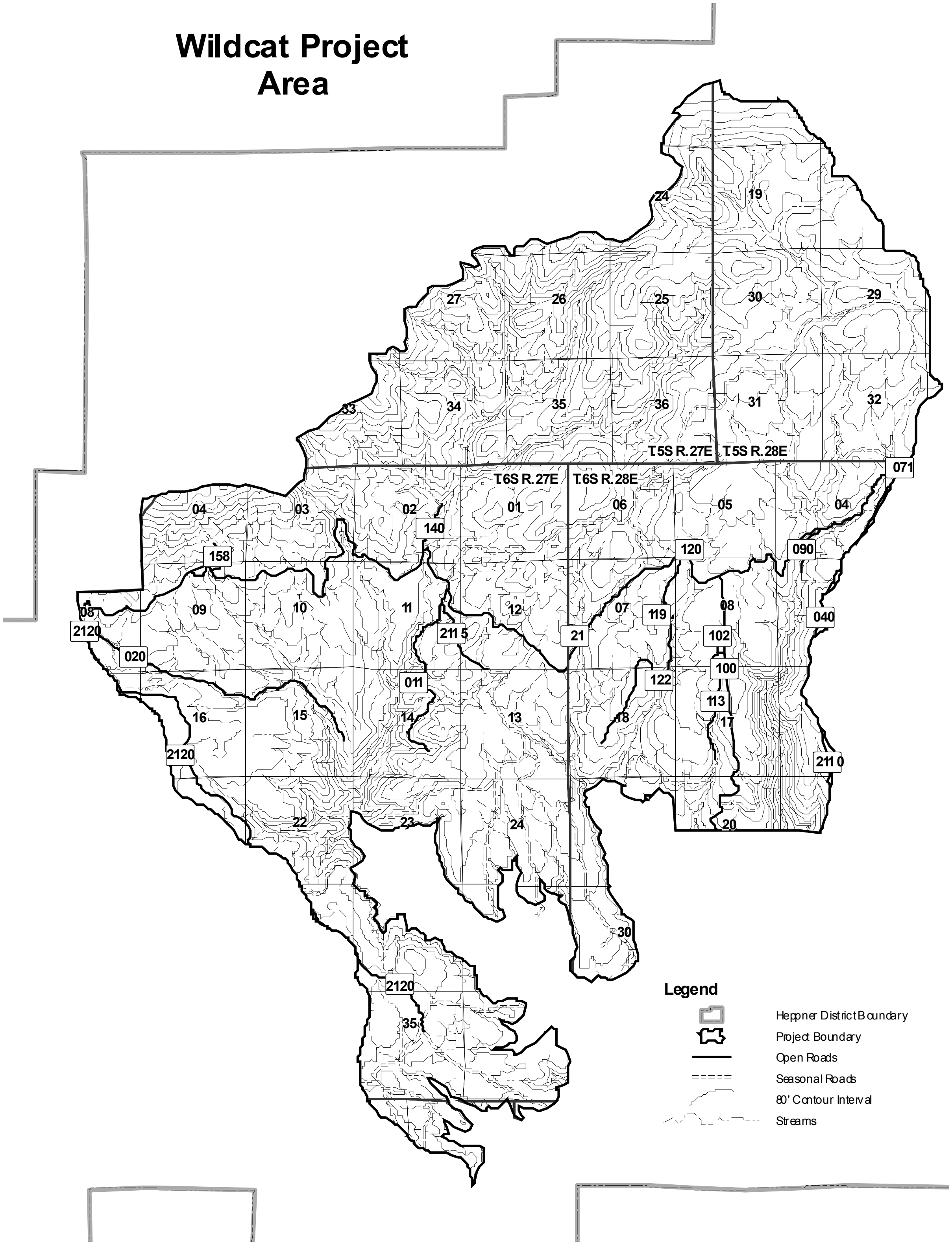

Figure 1-2: Wildcat Fuels Reduction and Vegetation Management Project

Background

The project area has been altered from historical conditions due to fire suppression, insect and disease, and past forest management practices. These three circumstances have changed stand density, stand structure, species composition, and fire regime condition class at both the stand level and the subwatershed level.

The northern portion of the project area is comprised mostly of cold and moist upland forest. Spruce budworm caused widespread mortality in Douglas-fir and grand fir species in the late 1980s and early 1990s resulting in abundant snags, dead topped trees, and down woody material up to 70 tons/acre. A result of this insect outbreak was a change in the tree structure.

Historically, timber harvest has been a disturbance agent in the area. In the cold and moist uplands there has been salvage sales connected with the spruce budworm epidemic to remove dead and dying trees, along with regeneration harvests resulting from the mountain pine beetle epidemic in the early 1970s. In the dry upland forest on the south half of the watershed, larger trees were harvested leaving a residual understory comprised mostly of small-diameter Douglas-fir trees along with incidental amounts of large overstory ponderosa pine.

Fire, and subsequent suppression by humans, has also influenced the analysis area as a whole and is primarily responsible for the current forest stands in most of the area. Suppression of fire in these areas has resulted in the stand composition and structure that is now present. In the dry upland forest, stands once dominated by open park-like stands of ponderosa pine have closed in with shade tolerant species such as Douglas-fir and grand fir. In the cold and moist upland forest, suppression of fire lead to an over stocked condition that resulted in a mountain pine epidemic in the early 1970s and later by a spruce budworm epidemic in the late 1980s and early 1990s. The *Wall Ecosystem Analysis* states that these stands will remain in this condition until they burn or are treated.

The Monument Complex Fire occurred within a portion of the Wildcat Analysis area in July 2007. The Monument Complex Fire was an early season event that was predominately a low to moderate severity fire that had a minor effect on stand structure, species composition, and stand density. The areas affected within the Wildcat project area received a low to moderate underburn that consumed ground vegetation. The fire also killed a large portion of the understory seedling and saplings, but very few of the overstory trees were affected.

Today, the dry upland forests are comprised of dense multi layered canopies of shade tolerant/fire intolerant species, which are not characteristic of historic conditions. The cold and moist upland forest areas are an open structure with a low to moderate overstory density and abundant reproduction in the understory. Bark beetles and root rot are continuing to cause mortality in ponderosa pine and lodgepole pine. Dwarf mistletoe is prevalent in both western larch and Douglas-fir and is infecting the reproduction coming in underneath the overstory.

Purpose and Need for Action

The purpose and need is derived from evaluating current planning direction identified in the Forest Plan's desired future conditions described as forest wide and management area goals, objectives, standards, and guidelines. These desired future conditions are compared against current conditions in the environment. In addition, the *Wall Ecosystem Analysis* identified vegetation and fuel conditions, desired conditions, and opportunities to move toward desired future conditions. Because of the emphasis in reducing the risk of stand loss due to stand density coupled with the increased risk of stand replacement fire events, two areas have been identified as needing corrective measures: vegetation and fuels. There is a need to reduce stand densities, develop specific stand structures, alter species composition and reduce fuel loadings in order to reduce conditions favorable to insect and disease outbreaks and wildfire damage. An additional purpose and need is to provide for production and sustained yield of wood fiber and insofar as possible meet projected production levels consistent with various resource objectives, standards and guidelines, and cost efficiency (Forest Plan p. 4-2) while providing jobs to area residents. The following describes in more detail the elements needing change.

Vegetation

There is a need to move the seral and structural conditions of forest stands toward their historic ranges of variability through: increasing the amount of old forest single strata in the dry upland forest in the short and long term, increasing the resistance of forest stands to large scale insect and disease through species and stocking density control, and decrease the risk to resources from large scale wildfires through reduction of vertical and horizontal fuels.

- Move structural conditions toward the historic range of variability.
- Reduce stocking in stands dominated by trees less than 21 inches in diameter at breast height to promote growth and development of large trees.
- Restore historic amount of stands dominated by large trees.
- Reduce the levels of mortality of existing large diameter trees within the late and old structured stands by reducing understory competition.
- Protect and enhance the vegetative conditions of aspen by increasing the vigor of existing stands.
- Reduce insect and disease susceptibility and mortality in forested stands by reducing competition between trees.

Current historical range of variability analysis within the dry upland forest type demonstrates that there is an over representation of multi-layer old forest and stem exclusion closed canopy. These structural classes reveal an increase in multi-layer closed canopy structural stages that have changed from what occurred in this forest type historically. We attribute this change to fire suppression, selective harvest of large overstory trees with no further management to direct the development of the stand, and the increased area affected from insect and disease outbreaks and resulting tree mortality.

The *Wall Ecosystem Analysis* describes historical conditions within the watershed and the project area that were dominated by multi-aged ponderosa pine open park-like stands (with a component of western larch on the moister sites) that were maintained by ground fires. This analysis identified a need for actions in the Wildcat project area as a high concern for vegetation sustainability and recommends actions to improve sustainability. Specifically, portions of the subwatershed were recommended as high priorities for treatment to move middle structure classes toward late/old structure classes.

An Assessment of Ecosystem Components in the Interior Columbia Basin and Portions of the Klamath and Great Basin (Interior Columbia Basin Ecosystem Management Project) made similar findings in dry upland forests. This analysis found a decline in old forest single story structure by 15% while old forest multi-story structure has increased 4 % from historical conditions of the 1850 to 1900 (Quigley et al., 1997).

A major factor of the overall health of the forest is the vigor of the trees and other forest vegetation. If the majority of the trees in a given area have densities that result in stagnated stands, they become vulnerable to insects and disease. Competition from intermediate and suppressed trees in ponderosa pine stands reduces growth of dominant and codominate trees (Cochran 1993). This is important given the existing low number of large trees and the time and growth needed to develop large structure. Many of the dry upland forested stands contain two to three times the basal area and stands in the cold and moist upland forest are near the upper end of the stocking level recommended in the Suggested Stocking Levels for Forest Stands in Northeastern Oregon and Southeastern Washington: An Implementation Guide for the Umatilla National Forest (Powell, 1999).

The dry upland forest sites have progressed along the successional spectrum due to changes in the natural disturbance regime and are now dominated by shade tolerant climax species like grand fir. Stands that were once dominated by open ponderosa pine are now multi-storied stands with grand fir and Douglas-fir in both the understory and overstory. Aspen stands were historically maintained through periodic fire. In recent years: fire suppression, grazing and browsing, and conifer encroachment has altered aspen habitat.

Fire Regime Condition Class

There is a need to reduce the forest's susceptibility to moderate and high severity fires and bring the area's fuels closer to levels expected under natural fire disturbance regimes by lowering stand densities, increasing the relative abundance of fire tolerant species, treating existing fuels, and re-introducing fire into the watershed.

- Reduce ladder fuels to reduce risk of fire spread into the upper canopy.
- Reduce ground fuel that would contribute to wildfire intensity and resource damage.
- Reduce fuel densities to allow for the reintroduction of prescribed fire on a historical occurrence level.

Due to past management activities, dry and moist upland forests within fire regimes 1 & 3[1] show the highest degree of departure in condition class and will be affected the most from wildfires. These areas have missed several fire return intervals and are now composed of multilayered, overstocked, fire intolerant species which create ladder fuels that carry fire into the dominant desired overstory. Today, fires in the dry and moist forests would have moderate to severe effects characterized by high fire severity and intensity on landscapes that historically displayed low to moderate severity. The risk of losing key ecosystem components would be high. Ignitions today would not function as a natural disturbance process within their historical range of variability pertaining to fire size, frequency, intensity, severity, or landscape patterns.

Without treatment, the Wildcat project area will continue to transition toward a Condition Class 3, where the risk of losing key ecosystem components will increase[2]. There is a need to maintain or shift forest

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[1] Fire Regime 1: 0-35 years, Low severity - Typical climax plant communities include ponderosa pine, eastside/dry Douglas-fir, pine-oak woodlands, Jeffery pine on serpentine soils, oak woodlands, and very dry white fir. Large stand-replacing fire can occur under certain weather conditions, but are rare events (i.e. every 200+ years).

Fire Regime 3: 35-100+ years, Mixed severity - This regime usually results in heterogeneous landscapes. Large, high severity fires may occur but are usually rare events. Such high severity fires may "reset" large areas (10,000-100,000 acres) but subsequent mixed severity fires are important for creating the landscape heterogeneity. Within these landscapes a mix of stand ages and size classes are important characteristics; generally the landscape is not dominated by one or two age classes.

[2] Condition classes (fire regime condition class) measure the degree of departure from reference conditions, resulting in changes to key ecosystem components, such as vegetation characteristics (composition, structure, age distribution, canopy closure, or degree of mosaic), fuel composition, fire frequency, severity and pattern, and other associated disturbances (insect, disease, and windthrow).

structures toward a Condition Class 1.

Forest Plan Amendments

Habitat Effectiveness Index

A Forest Plan Amendment to change the Habitat Effectiveness Index from the Forest Plan standard of 70 to the existing HEI of 68 is required for individual projects within the C3 Management Area for those action alternatives that convert satisfactory or marginal cover to lower quality cover or forage habitat.

The existing habitat effectiveness index for the Monument winter range is 68. Implementation of the Wildcat proposed action or alternative actions would result in a habitat effectiveness index of 68 across the winter range. The Forest Plan (page 4-152) currently reads:

> "Elk habitat will be managed on designated big game winter ranges to achieve a habitat effectiveness index of no less than 70, including discounts for open roads to motorized vehicular traffic, as described in Wildlife Habitats in Managed Forests (Thomas and others 1979). The habitat effectiveness standard will be measured on an individual winter range basis".

The method prescribed for the calculation of Habitat Effectiveness Indices is described in Appendix C of the Forest Plan.

Although there is no anticipated change in habitat effectiveness index, an index of no less than 70 would not be achieved as described for the C3-Big Game Winter Range management area (Forest Plan, page 4-152).

21 Inch Conifer Removal in Aspen Stands

A Forest Plan amendment would be needed for those action alternatives that propose to remove conifers larger than 21 inch diameter at breast height within designated aspen stands for the duration of the project. The Forest Plan (Eastside Screens, Appendix B, page 10) currently reads:

> "Scenario A: Outside of LOS, many types of timber sale activities are allowed. Intent is still to maintain and/or enhance LOS components in stands subject to timber harvest such as possible, by adhering to the following standards: a) Maintain all remnant late and old seral and/or structural live trees >21 inches dbh that currently exist within stands proposed for harvest activities."

Conifer encroachment and overstory conifers continue to remove water, minerals, and light needed for aspen survival within enclaves of aspen in the Wildcat project area. Continued competition between conifers and aspen will result in the further decline and loss of aspen habitat in the project area.

Summary of Purpose and Need

There is a need to shift dry upland forests to a more historic species composition as identified in Potential Natural Vegetation of the Umatilla National Forest (Powell 1998), and Potential Vegetation, Disturbance, Plant Succession, and Other Aspects of Forest Ecology (Powell 2000).

There is a need to reduce species competition within aspen stands in order to restore aspen habitat.

There is a need to increase the amount of old forest with a predominance of large trees in a single story structure.

There is a need to reduce stand densities in dry upland forest to levels established in Suggested Stocking

Levels for Forest Stands in Northeastern Oregon and Southeastern Washington: an Implementation Guide for the Umatilla National Forest (Powell 1999) to reduce the potential for large-scale insect and disease outbreaks and reduce the potential of damage from an unwanted wildfire.

There is a need to modify current stand structures to maintain or move the landscape toward a Fire Regime Condition Class 1 thus reducing the threat of key ecosystem components being lost in the event of a wildfire.

There is a need to reduce fuel levels in the moist and cold upland forests to levels that will lessen the likelihood of severe and intense fire behavior.

To fully address the site-specific purpose and needs as stated above for the project and to implement the proposed action or alternative actions, two amendments are needed to bring the actions into consistency with the Umatilla National Forest Land and Resource Management Plan (Forest Plan).

Proposed Action

In response to the purpose and need, the Heppner Ranger District proposes vegetation and fuels management on about 13,900 acres to improve the health, and vigor of the upland forest, and reduce the potential for future fires of uncharacteristic effects in upland forests through the reduction of hazardous fuels and reduction of ladder fuels. Vegetation management treatments include commercial thinning of about 2,218 acres, mechanical fuels treatment of 2,113 acres of standing dead and downed woody material and reduction of conifer regeneration resulting from the late 1980s and early 1990s spruce budworm outbreak, noncommercial thinning of about 3,289 acres and treatment of surface fuels on about 10,288 acres. Maintenance of existing roads (39 miles of open and 41 miles closed), construction of a new system road for 2.2 miles, and construction of about 3.6 miles of temporary road would be required for access and haul purposes. The proposed action would also obliterate 2.4 miles of closed road located within riparian areas.

The proposed action would require an amendment to the Forest Plan to change the Habitat Effectiveness Index standard in the C3 Management Area for the duration of the project. The amendment would change the HEI from 70 to the existing habitat effectiveness index of 68 only in the Monument winter range for the site-specific project called Wildcat.

The proposed action would require an amendment to the Forest Plan to allow removal of conifer trees greater than 21 inches diameter at breast height only within the identified aspen stands for this project.

The proposed action would be implemented as early as the fall of 2009 with the duration of the project extending for approximately 5 to 7 years.

A detailed description of the proposed action and alternative actions can be found in Chapter 2.

Decision Framework

Some material in this Environmental Assessment (EA) tiers to or incorporates by reference information from other existing documents, in order to avoid redundancy and to decrease the size of this document.

This EA documents the site-specific implementation of the Forest Plan. As a result, it is tiered to:

- The *Umatilla National Forest Land and Resource Management Plan Final Environmental Impact Statement, Record of Decision*, and the accompanying *Land and Resource Management Plan* (USDA 1990), dated June 11, 1990 (Forest Plan). The Forest Plan provides programmatic direction for the Forest, including the Wildcat project area. The Forest Plan does this by allocating parts of the Forest to different resource emphasis or "management areas", and prescribing the type and intensity of management that may occur within each allocation. Relevant portions of the Forest Plan are summarized below and compliance with applicable Standards and Guidelines will be discussed in Chapter 3.

Forest Plan Amendment #2, Continuation of Interim Management Direction Establishing Riparian, Ecosystem, and Wildlife Standards for Timber Sales (Eastside Screens) dated 1995. The Eastside Screens established additional management direction regarding area buffers, structural diversity, connectivity of late/old structure, retention of snags and downed wood, and goshawk nest-sites.

Forest Plan Amendment #10, The Interim Strategies for Managing Anadromous Fish-Producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California (PACFISH) dated February 24, 1995. PACFISH provided further protection for fish habitat, particularly regarding activities within riparian areas.

The Managing Competing and Unwanted Vegetation FEIS and its Mediated Agreement and Record of Decision (ROD) dated October 8, 1988. This EIS provides direction for implementation, mitigation, and monitoring of projects that propose to manage competing and/or unwanted vegetation through the use of herbicides, mechanical methods, or prescribed fire.

- *R6 FEIS: Pacific Northwest Region Invasive Plant Program Final Environmental Impact Statement, 2005*. Publication R6-NR-FHP-PR-02-05, USDA Forest Service, Pacific Northwest Region, Portland, Oregon. This EIS amended the *Umatilla National Forest Land and Resource Management Pan* by adding management direction relative to invasive plants. This project is intended to comply with the new management direction.

This EA also incorporates by reference the following:

- Umatilla National Forest Interim Snag Guidance letter dated April, 1993 (which provides direction on the number and distribution of snags to retain in harvest units);
- *Environmental Assessment for the Management of Noxious Weeds* and its *Decision Notice* dated May 24, 1995 (which identifies prevention and appropriate treatment methods for known noxious weed populations);
- *Environmental Assessment for the Motorized Access and Travel Management Plan, Heppner Ranger District*, dated July 1992 (which provides District-wide direction on the management of roads and off highway vehicle trails, both open and closed);
- *Wall Ecosystem Analysis* dated September 1995 (which is a watershed-level ecosystem analysis of current and reference conditions, along with recommendations for restoration);
- The Biological Assessment for Mid-Columbia steelhead trout and Steelhead trout critical habitat has been prepared and submitted to the regulatory agency (NOAA Fisheries). The consultation process will be completed before the project decision is finalized.
- National Fire Plan (August 2000) (developed with the intent of responding to severe wildland fires and their impacts to communities while addressing five key points: Firefighting, Rehabilitation, Hazardous Fuels Reduction, Community Assistance, and Accountability);
- Other sources of information cited in this EA and its analysis file, such as specialist reports, published studies, and books. The analysis file is available for review at the Heppner Ranger

District, 117 S. Main, Heppner, Oregon, 97836.

Management Direction

Analysis and documentation has been done according to direction contained in the National Forest Management Act (NFMA), the National Environmental Policy Act (NEPA), the Council on Environmental Quality Regulations, Clean Water Act, Clean Air Act, National Historic Preservation Act, and the Endangered Species Act.

Umatilla National Forest Land and Resource Management Plan

The Umatilla National Forest Land and Resource Management Plan (Forest Plan) provides programmatic direction for the Forest, including the Wildcat Project Area. The Forest Plan does this by allocating parts of the Forest to different resource emphasis areas or management areas, and prescribing the type and intensity of management that may occur within each of the 25 management areas. The Management Areas for the Wildcat Project Area are shown on Figure 2-1, Chapter 2. Compliance with goals and desired future conditions are discussed in the forest plan consistency section in Chapter 3 of this document. Compliance with Forest Plan standards and guidelines will be discussed in the specific resource sections, as applicable, in Chapter 3.

Table 1-1 shows the management areas that occur within the National Forest portion of the Wildcat Project Area. The proposed action would occur within all nine management areas (see Chapter 2 Treatment by Management Area tables for specific information.)

Table 1-1. Management Areas in the Wildcat project.

Forest Plan Management Areas	Area (Acres)
A4 – Viewshed 2	417 acres
C1 – Designated Old Growth	588 acres
C2 – Managed Old Growth	83 acres
C3 – Big Game Winter Range	3,747 acres
C4 – Wildlife Habitat	8,199 acres
C5 – Riparian (Fish and Wildlife)	1,210 acres
C8 – Grass-Tree Mosaic	402 acres
E1 – Timber and Forage	7,230 acres
E2 – Timber and Big Game	3,574 acres
Total Acres	25,450

The Proposed Action follows Forest Plan direction as amended by PACFISH (USDA/USDI 1995a). PACFISH (Interim Strategies for Managing Anadromous Fish-Producing Watersheds in Eastern Oregon and Washington, Idaho and Portions of California) is ecosystem-based, aquatic habitat and riparian-area management strategies aimed at protecting and restoring Pacific salmon, steelhead, and bull trout populations.

As required by the Forest Plan (PACFISH amendment), riparian habitat conservation areas (RHCA's) would be delineated on the ground; no timber harvest activities would occur within riparian habitat conservation areas unless silvicultural practices are done to assure Riparian Management Objectives are met.

Goals and Desired Future Conditions

A4 – Viewshed 2

(Forest Plan, pages 4-105 through 4-110): the goal is to: manage the areas seen from a travel route….where some forest visitors have a major concern for the scenic qualities (Sensitivity Level 2) as a natural appearing to slightly altered landscape.

Desired future condition: Management activities will be done with sensitivity to people's concern for scenic quality (Level 2), with vegetative manipulation conducted so that forest management activities remain visually subordinate in foregrounds of selected travel routes and sites. Management activities will be obvious in the middleground and background viewing area, but designed to compliment their surroundings. Forest stands will occasionally be logged in order to maintain long-term health and vigor, and to encourage a park-like, near natural appearance with big trees in the immediate foreground. Recreation opportunities will be mostly road oriented.

C1 – Dedicated Old-Growth

(Forest Plan, pages 4-144 through 4-146): the goal is to provide and protect sufficient suitable habitat for wildlife species dependent upon mature and/or overmature forest stands, and promote a diversity of vegetative conditions for such species.

Desired future condition: Old-growth areas will be characterized by stands of naturally appearing overmature trees. Stands of mature trees may be included in the old growth category to provide a better distribution of this habitat type throughout the forest. Trees in these stands are relatively large (with many trees greater than 21 inches dbh); past the point of rapid growth, and some have visible evidence of decay and decline including mycorrhizal fungi and other microorganisms. Stands will be dispersed in quantities and sizes which meet the needs of dependant wildlife. These stands will contribute toward the forest diversity and aesthetic values.

C2 – Managed Old-Growth

(Forest Plan, pages 4-147 through 4-150): the goal is to provide and protect sufficient suitable habitat for wildlife species dependent upon mature and/or overmature forest stands, and promote a diversity of vegetative conditions for such species.

Desired future condition: Old-growth areas will be characterized by stands of naturally appearing overmature trees. Stands of mature trees may be included in the old growth category to provide a better distribution of this habitat type throughout the forest. Trees in these stands are relatively large (with many trees greater than 21 inches dbh); past the point of rapid growth, and some have visible evidence of decay and decline including mycorrhizal fungi and other microorganisms. Stands will be dispersed in quantities and sizes which meet the needs of dependant wildlife. These stands will contribute toward the forest diversity and aesthetic values.

C3 – Big Game Winter Range

(Forest Plan, pages 4-151 through 4-154): The goal is to: "Manage big game winter range to provide high levels of potential habitat effectiveness and high quality forage for big game species.

Desired future condition: Big game winter ranges will appear as a mosaic of managed forests, brush patches, and large grasslands. Forested areas will contain a mix of harvested even-aged, uneven-aged, and natural stands, creating patterns of cover patches and forage areas for big game. Areas of early spring green-up and other forage changes due to prescribed fires and other means will occur in a mosaic pattern over the winter ranges; quality forage will be abundant because of management.

C4 – Wildlife Habitat

(Forest Plan, pages 4-158 through 4-162): The goal is to provide high levels of potential habitat effectiveness for big game and other wildlife species with emphasis on size and distribution of habitat components (forage and cover for elk, and snags and dead and down materials for all cavity users). Unique wildlife habitats and key use areas will be retained or protected.

Desired future condition: The forest will be a mosaic of even-aged and uneven-aged stands dispersed in a manner to create a pattern of forage, and marginal and satisfactory cover for big game.

C5 – Riparian (Fish and Wildlife)

(Forest Plan, pages 4-163 through 4-166): the goal is to maintain or enhance water quality and produce a high level of potential habitat capability for all species of fish and wildlife within the designated riparian habitat areas while providing for a high level of habitat effectiveness for big game.

Desired future condition: A near natural setting will predominate adjacent to the stream, with a wide variety of plant communities of various species, sizes, and age classes. In forested riparian zones, a continuous high tree canopy layer will be present and the forest will appear denser than in the surrounding land. Upper and mid-level conifer and hardwood canopy structure and lower shrub level will provide desired levels of stream surface shading, streambank stability, and satisfactory cover for big game.

C8 – Grass-Tree Mosaic

(Forest Plan, pages 4-171 through 4-174): The goal is to provide high levels of potential habitat effectiveness, high quality forage for big game wildlife species, visual diversity, and protect erosive soils.

Desired future condition: Generally remain natural appearing with the predominant view being made up of patches of stringers of timber. Many forest stands will appear as mature timber with some having multi-layered canopies. Some stands will be more open as the result of management activities designed to improve big game habitat.

E1 – Timber and Forage

(Forest Plan, pages 4-178 through 4-181): The goal is to manage forest lands to emphasize production of wood fiber (timber) and encourage production of forage.

Desired future condition: Intensive management of forest for timber production and other commodity products will be apparent. The forest will primarily be a diverse mosaic of even-aged stands of many age classes, with trees somewhat uniformly spaced and well stocked. Regenerated stands will generally range from 20-40 acres. Stands managed using uneven-aged principles will also be apparent, particularly in the ponderosa pine types. A diversity of species will be present in plantations, but seral, more pest free species such as ponderosa pine, western larch, and lodgepole pine will be most evident. Accumulated fuels will generally be light, and large destructive fire will seldom occur; prescribed fire will be an important management tool.

E2 – Timber and Big Game

Forest Plan, pages 4-182 through 4-186): The goal is to manage forest lands to emphasize production of wood fiber (timber) and encourage forage production, and maintain a moderate level of big game and other wildlife.

Desired future condition: Management of forests for timber production, domestic livestock, big game and other wildlife habitat will be apparent. Horizontal and vertical diversity will be apparent; tree species will be diverse, but seral, more pest-free species such as ponderosa pine, western larch, and lodgepole pine will predominate. Accumulated fuels will be light, and large destructive fires will seldom occur.

Scoping

Scoping is the process the Forest Service uses to identify potential concerns associated with the proposed action, develop alternatives to the proposed action, and determine the extent of environmental analysis necessary for reaching an informed decision. Scoping was initiated when the project was listed in the Winter 2007 quarterly edition of the Umatilla National Forest Schedule of Proposed Activities (SOPA).

Scoping letters were sent on March 2, 2007 to two local tribal agencies and their representatives and 108 interested organizations, individuals, and other agencies that had indicated an interest in this type of project. Comment letters were received from 3 individuals, 3 organizations and 1 State Agency: Oregon Wild; Sierra Club/League of Wilderness Defenders - Blue Mountains Biodiversity Project; and Oregon Department of Fish and Wildlife. A field trip to the project area to discuss project design was held on May 24, 2007. This field trip was attended by two organization representatives, one business representative, a private individual and eight members of the interdisciplinary team. A newsletter containing information on the project status was mailed on July 13, 2007 to nine individuals who had shown interest in this specific project. A complete record of all scoping and the Forest Service's responses to scoping feedback are documented in the project record and the Wildcat analysis.

Treaty Rights

The Forest Service, through the Secretary of Agriculture, is vested with statutory authority and responsibility for managing resources of the National Forests. No sharing of administrative or management decision-making power is held with any other entity. However, commensurate with the authority and responsibility to manage is the obligation to consult, cooperate, and coordinate with Indian Tribes in developing and planning management decisions regarding resources on National Forest System land that may affect tribal rights.

In 1855, two treaties that affect the Umatilla National Forest were signed between the United States government and several Indian tribes. The treaty with the Walla Walla, Cayuse, and Umatilla tribes and bands of Indians in Washington and Oregon Territories (today referred to as the Confederated Tribes of the Umatilla Indian Reservation) was signed on June 9, 1855. On June 26, 1855, a treaty was signed with the Tribes of Middle Oregon (these groups are now known as the Confederated Tribes of the Warm Springs Indian Reservation).

The Wildcat Environmental Assessment project area lies within the area ceded to the United States by the Tribes as a result of the 1855 Treaty. The treaty was subsequently ratified by Congress and proclaimed by the President in 1859. As a result of the treaty, elements of the Tribes' culture, such as tribal welfare, land and resources were entrusted to the United States government. Trust responsibilities resulting from the Treaty dictate, in part, that the United States government facilitates the execution of treaty rights and traditional cultural practices of the Tribes by working with them on a government to government basis in a manner that attempts a reasonable accommodation of their needs, without compromising the legal positions of the Tribes or the Federal Government.

Although no written comments were received from the Tribes, the effects of the proposed action and alternatives were evaluated according to past statements of tribal interest that expressed concerns regarding similar projects and outlined Treaty Rights resources that could be affected by the project. These concerns have included:

- Potential impacts to fish habitat and population
- Implementation of adequate measures to protect the fishery resource and production in the John Day Basin
- Potential impacts of the proposed projects on salmonid species listed as threatened and endangered under the Endangered Species Act
- Impacts of the proposed projects on PACFISH and water quality standards, and measures the Forest Service will implement to adhere to those standards
- Impacts to wildlife in the usual and accustomed use areas
- Project impacts on archaeological sites and Traditional Cultural Properties
- Access to traditional use areas for tribal members

Because tribal trust activities often occur in common with the public, the Umatilla National Forest will strive to manage tribal ceded land in favor of the concerns of the tribes, as far as practicable, while still providing goods and services to all people.

Issues

The Forest Service encourages public involvement in the identification of issues and development of alternatives through a process called 'scoping'. During scoping, a description of this project's purpose and need and proposed action was distributed to the public through letters, personal contact, and the Forest's Schedule of Proposed Actions. The public was invited to comment on the potential conflicts posed by the proposed actions. These comments were then used to identify issues, alternatives to the proposed action, and the extent of environmental analysis necessary for making an informed decision.

In addition to issues identified through public response, the Interdisciplinary Team considered potential issues not identified by the public. This was done by first identifying all the activities connected to accomplishing the proposed action. Then the team identified potential cause/effect relationships associated with each type of action that could result in resource conflicts, relying in part on public comments from previous, similar projects. The Interdisciplinary Team considered these potential conflicts or issues, together with those identified during scoping, to determine whether it required development of an alternative to the proposed action, needed mitigation measures, or whether it was beyond the scope of this project. Issues are discussed below. Comments were received from three individuals, three organizations and one State Agency. Two issues were considered to be major or relevant to the development of alternatives to the proposed action. Relevant issues are defined as "unresolved conflicts between alternative uses of available resources" [NEPA § 102(2)(E)]. A summary of these effects is presented at the end of Chapter 2, with a more detailed discussion in Chapter 3, Environmental Consequences.

Major Issues

Big Game Habitat

- Winter Range

Comments received during scoping expressed concerns about recent projects on the Heppner Ranger District that have amended the Forest Plan in order to treat vegetation within the Monument Winter Range. The Forest Plan sets a standard of habitat effectiveness (HEI) at 70 within the C3 management area. The Monument winter range is currently below Forest Plan standards for elk habitat effectiveness (HEI). Although the project would maintain HEI and satisfactory cover at the current level, the proposed action would reduce marginal cover.

- Summer Range

Comments received during scoping expressed concerns about treatment within summer range habitat on the Heppner Ranger District. Some of these concerns include increased vulnerability along open forest roads and reduction in cover. Treatment of marginal cover within the C4 and E2 management areas has the potential to impact HEI and the quality of elk habitat. Although the proposed action would not treat satisfactory cover the treatment of marginal cover would modify the development of future satisfactory cover.

Indicators: HEI (Road density, % total cover, % forage, % satisfactory cover, % marginal cover)

Sedimentation

There are three streams within the project area that are listed on the State of Oregon's 303(d) list for sediment. Without mitigation the proposed activities may lead to direct and cumulative effects of sediment reaching one or more of these streams. Forwarding and use of roads in Riparian Habitat Conservation Areas, landscape burning, and forwarding across intermittent or ephemeral stream channels has the potential to increase sediment amounts in streams.

Indicators: Road density and riparian road density

Other Issues

Issues that were not considered major, but which relate to existing regulations or which help to better understand the consequences of the proposed activities were considered other issues and will be tracked throughout this document. These other issues are generally of high interest or concern to the public or are necessary to understand the full extent of the alternatives.

Recreation

This area is a popular hunting ground for big game. User conflict may increase in areas where harvest and burning activities overlap during increased recreation use, in particular big game hunting season.

Roadless Areas and Areas without Roads

A concern was expressed about thinning and mechanical treatment units that were partially in roadless areas or undeveloped areas. No thinning or prescribed burning is proposed in this project within the Inventoried Roadless Areas. Thinning and burning are planned throughout the project area, including areas identified by Oregon Wild as unroaded areas.

Dead Wood Habitat: Snags

Proposed treatment activities would affect snags and downed wood density in mechanical fuels reduction units, affecting primary cavity excavator habitat. The primary concern is ensuring that an adequate level of dead standing wood is available into the future to provide downed wood and standing dead wood in varying stages of decay and densities for the range of species requiring these habitat features.

Late and Old Structure Habitat

Treatment of late and old structure stands has the potential to affect habitat quantity and quality for a number of wildlife species associated with mature forest stands.

Neotropical Migratory Birds

The proposed activities, including harvest, fuels treatments, and landscape underburning could directly or indirectly affect neotropical migratory birds and their habitat. Of particular interest is the Dry Forest habitat type.

Stream Temperature

There are two streams within the project area that are listed on the State of Oregon's 303(d) list for temperature. Existing shade is below Pacfish riparian management objectives on several streams. Proposed thinning and burning activities may impact shade on these streams.

Fish Habitat

Forwarding and use of roads in Riparian Habitat Conservation Areas, landscape burning, and forwarding across intermittent or ephemeral stream channels will likely increase sediment amounts in stream impacting fish habitat and spawning.

Air Quality

Local residents have expressed concerns about prescribed burning contributing to short term degradation to air quality and visibility. The Clean Air Act and Oregon Smoke Management Program establish the standard for smoke emissions that may be released during a prescribed burn that can affect air quality and visibility to local communities and the surrounding area.

Soils

Soil disturbance would occur with the proposed activities that require ground based equipment, particularly where mechanical fuels treatment follows mechanical thinning. Disturbance could include compaction, displacement, rutting, and exposure of the mineral surface to erosion due to removal of ground cover.

Noxious and Invasive Plants

Soil exposure from project activities may provide habitat for noxious and invasive plants. There is the potential for the spreading of existing noxious and invasive plant sites by harvest equipment.

Viability of Timber Harvest

The viability of timber harvest can vary from one alternative to another based upon the costs and revenues associated with the alternative. For example, a requirement to use a more expensive logging system or a prescription that harvests a lower volume of timber per acre can reduce the viability of a harvest proposal. Conversely, a less expensive logging system or a higher harvest volume per acre can increase the viability of a harvest proposal.

Financial Efficiency

Financial efficiency of the alternatives will vary depending on the relative differences in revenues produced by the alternatives and the costs associated with generating the revenues.

Permits and Licenses

None Required

Project Record

A Project Record will be maintained at the Heppner Ranger District. Items contained in the Project Record include: Scoping letters sent to Tribes, other Governmental Organizations, public mailing lists; letters received during the Scoping process from concerned citizens; emails from concerned citizens and Forest Service IDT members; minutes of meetings; Wildcat Public Participation Plan; the project initiation letter and specialist reports. This Project Record may be reviewed at the Heppner Ranger District, 117 S. Main, Heppner, Oregon 97836.

Decisions to be Made

The Umatilla National Forest Supervisor or the Heppner District Ranger will serve as the deciding official for this project. The deciding official will decide whether to implement the proposed action, another action alternative, or the no action alternative, and his decision will be based on the following criteria:

Forest stand stocking levels: How well does the alternative achieve the desired species composition, forest structure, and stocking levels identified for dry upland forests?

Short-term and long-term risks: How well does the alternative balance short-term risk of resource impacts from thinning, reducing fuels mechanically, burning, and road decommissioning with the long-term risk of resource impacts from doing nothing?

Which alternative(s) decrease fuel loads to the point of lessening the risk of uncharacteristic wildfire?

Depending on the alternative chosen, the Deciding Official will also determine:

Whether a Forest Plan Amendment is necessary.

What, if any, measures are needed to mitigate potential undesired effects.

What monitoring requirements are needed to assure the selected alternative and mitigation are implemented as designed and effective.

Preview of Remaining Chapters

Chapter 2 – Alternatives

This chapter describes and compares the alternatives considered for the Wildcat project, and provides a basis for choice among options by the decision-maker and the public. Some of the information is based upon the design of the alternative and some of the information is based upon the environmental, social, and economic effects of implementing each alternative.

Chapter 3 – Environmental Consequences

This chapter summarizes the physical, biological, social, and economic environments of the affected project area and the potential changes to those environments due to the implementation of the alternatives discussed in Chapter 2. It also presents the scientific and analytical basis for the comparison of alternatives presented.

Chapter 4 – Consultation and Coordination

This chapter lists the scoping letters that were sent out to what organizations or concerned citizens and responses received. It also lists the members of the Interdisciplinary Team and other consultants that prepared this environmental assessment.

Bibliography

List of reference material cited by each specialist in writing their reports and this environmental assessment.

Appendices

This section contains description of best management practices, unit data, Forest Plan SCREENS compliance, roads analysis, soils data by unit, descriptions of past present and reasonably foreseeable future projects considered in cumulative effects analysis, and definitions and descriptions used in analysis.

Chapter 2

Alternatives

Chapter 2

Introduction

Chapter 2 describes and compares the No Action, Proposed Action, and 2 alternative ways to manage forest vegetation in the Wildcat Project Area. These alternatives were designed to address or resolve the relevant issue identified through public involvement and cause/effect analysis. A team of resource specialists (Interdisciplinary Team) developed these alternatives within the framework of the Forest Plan and applicable laws. This chapter is divided into the following sections:

- Alternative Development Process which includes a description of each alternative considered.
- Potential Knutsen-Vandenburg (KV) Projects
- Comparison of Alternatives

Range of Alternatives

The alternatives for this project were designed to express a range of possible actions. The interdisciplinary team developed the range of alternatives and mitigation measures presented in this chapter, based on the Purpose and Need and the major issues described in Chapter 1.

An adequate range of alternatives is one that fully meets the Purpose and Need and addresses the major issues. An alternative to the Proposed Action must: (1) address one or more major issues; and (2) meet the Purpose and Need. An action alternative that does not meet both criteria may be eliminated from detailed study.

Other influences on the development of alternatives included: Forest Plan goals and objectives, Forest Plan standards and guidelines, consultation requirements under the Endangered Species Act, and other federal and state laws and regulations. Considering these influences, the interdisciplinary team developed alternatives that address a range of treatments, management requirements, mitigations, and effects on resources.

Alternatives Considered in Detail

Alternative 1:

Objectives

Alternative 1 is a No Action alternative that would allow previously approved (on-going) activities to proceed, but none of the proposed treatments included in the Wildcat Proposed Action would be implemented. Alternative 1 would allow natural processes to continue, with the associated risks and benefits and provide a baseline for comparison with other alternatives.

Description

Current biological and ecosystem functions would continue at their present rate. Existing management direction, including activities such as livestock grazing, fire suppression, firewood cutting, recreation, monitoring, and road maintenance would continue at their present levels.

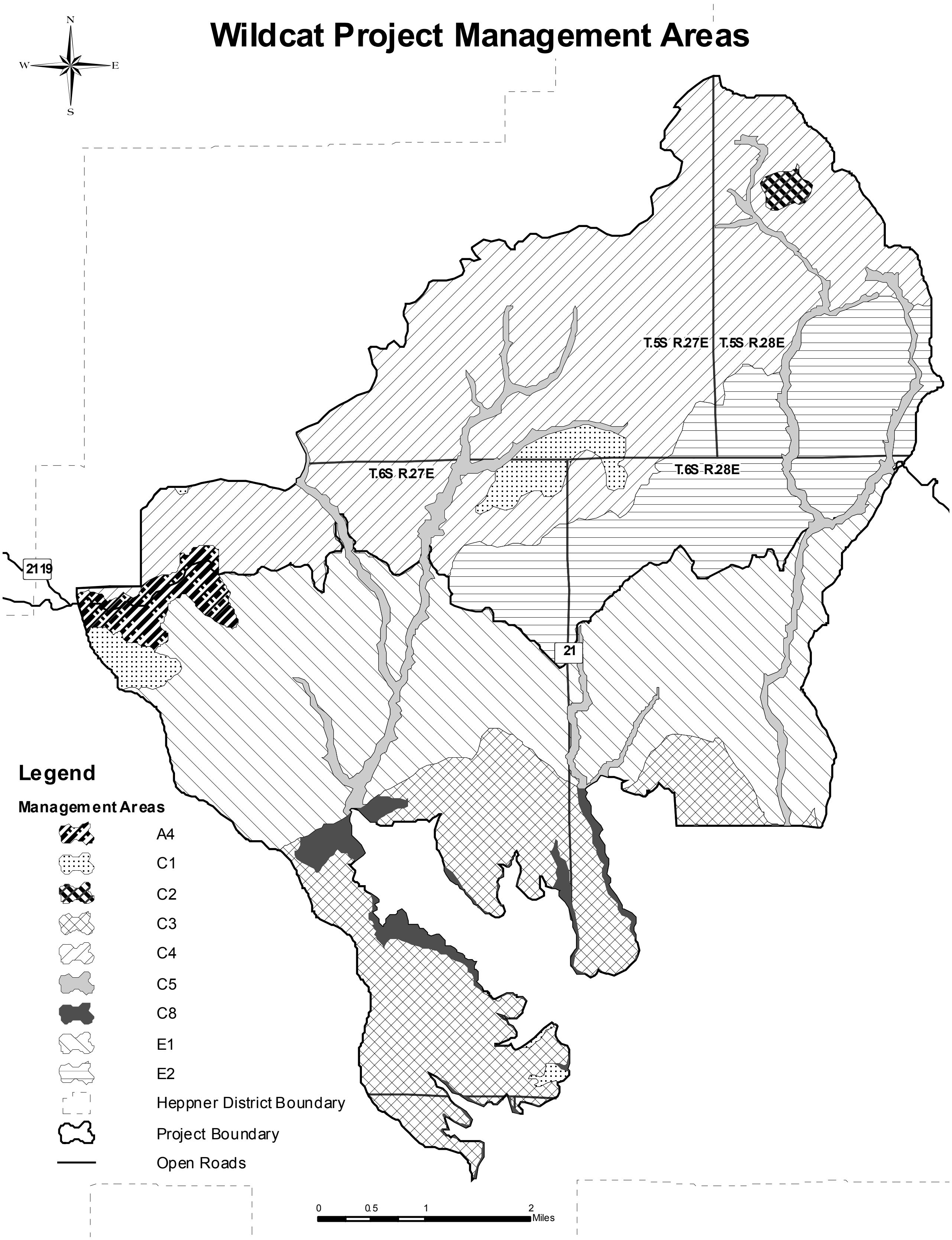


Figure 2-1. Wildcat Management Area Designation

Alternative 2:

Objectives

The treatments in Alternative 2, the Proposed Action, respond to the Purpose and Need for the Wildcat project. They are designed to accomplish the following objectives:

Modify upland-forest stands to a species composition and structure compatible with the historical range of variability. Thinning treatments are used to reduce forest density, modify species composition, and transform some of the multi-layered old forest structure into single-layer old forest structure.

Reduce fuel loading and forest density to a level that facilitates future reintroduction of low-intensity surface fire, while also reducing density-dependent tree mortality caused by insects and disease.

Reduce the dead and down fuel load that is the result of the spruce budworm outbreak of the 1980s and 1990s in strategic locations within the two subwatersheds to reduce the spread of future wildfire.

Alter species composition, structural stage, canopy closure, and dead and down fuel loads to shift Fire Regime Condition Class[1] 2 or 3 toward Condition Class 1. Maintain Condition Class 1 through the use of prescribed fire.

Description

This alternative proposes a variety of management treatments for upland forest sites, as described below: (Refer to Appendix B – Unit Data Sheet, for specific units)

Commercial Thinning

Commercial thinning would occur on approximately 2,218 acres. Commercial thinning would reduce tree density to recommended stocking levels for each plant association. In the dry upland forest; silvicultural prescriptions would favor retention of early-seral species such as ponderosa pine and western larch. Diseased and suppressed trees would be preferentially removed in order to improve forest health. Commercial thin treatments would leave a fully stocked stand and no live trees over 21 inches dbh would be removed from those stands where the dominant species type is conifer. Snags and down wood would be retained at levels specified in the Wildcat Wildlife Report. Thinned material that is merchantable (i.e. sawlogs, chips, or hog fuel) would be sold, producing an estimated volume of 12,000 hundred cubic feet (Ccf).

Timber harvest using skidders would occur on approximately 739 acres; ground-based systems using harvesters and forwarders would occur on approximately 1,386 acres, and skyline systems would occur on 93 acres.

Connected Actions to Commercial Thinning

Activity fuel reduction on 1,386 acres would be treated either mechanically or by prescribed fire. These 1,386 acres are areas within the harvester forwarder system units where much of the processing occurs at the stump and not at the landing resulting in increased fuel bed depths throughout the unit. The remaining

[1] Fire Regime Condition Class (condition class) measure the degree of departure from reference conditions, resulting in changes to key ecosystem components, such as vegetation characteristics (composition, structure, age distribution, canopy closure, or degree of mosaic), fuel composition, fire frequency, severity and pattern, and other associated disturbances (insect, disease, and windthrow).

832 acres of commercially thinned stands would treat activity fuels within the landscape burning portion of this project or with pile burning at the landings.

Burn control lines would be constructed along 15.6 miles of thinning unit boundaries on the 1,386 acres. After the activity burning is complete these lines would be rehabilitated as necessary.

Roads used for access and haul of forest products from commercial thinned stands would include 19 miles of closed road to be temporarily reopened, 1.2 miles of temporary roads constructed, and 39 miles of open road maintained. Additional road miles are connected actions for the mechanical fuels treatment units. Closed roads re-opened for temporary access would be re-closed after haul is completed. Temporary roads would be obliterated after haul is completed.

Aspen Restoration

Four stands would include treatment for aspen restoration (40 acres). This would involve removing competing conifers and constructing ungulate proof fencing around the aspen clones. Conifer removal would be limited to the area where the aspen are growing or sprouting plus one and one half tree heights. Cut to length systems (forwarder) would be used to remove merchantable material. Conifers over 21 inches would be removed in unit 77 and unit 82 to favor quaking aspen. Aspen stands in units 83 and 84 would also remove the majority of conifer, but would not remove any conifers greater than 21 inches. A portion of the conifer component would be retained for biodiversity.

Noncommercial Thinning

Non-commercial thinning would occur on approximately 3,286 acres: 956 acres outside harvest units, 230 acres within harvest units and 2,113 acres within mechanical fuels treatment units. Conifer saplings, generally up to 7 inches in diameter at breast height (dbh), and juniper trees less than 14 inches diameter would be thinned to promote tree vigor, improve insect and disease resistance, restore or maintain a sustainable species composition, and decrease fire hazard by reducing ladder fuels. Noncommercial thinning units would be either cut by hand using chainsaws or by mechanical means. Stands would remain fully stocked and no reforestation would be required based on stand density. Created slash would either be limbed and bucked to within 18 inches of the ground or mechanically treated (grapple piling, chipping or slash busting).

Trees non-commercially thinned may have commercial value dependent upon tree diameter and size limitations of equipment or processing. Generally, trees that are 7 inches dbh or smaller are considered not to have commercial value, though in recent years smaller diameters have been used for chips, hog fuel, and non-sawtimber products. The market for small diameter trees is undependable, so it is unknown whether vegetation treated under the noncommercial thinning would constitute a saleable product. If a commercial value can be received from this product it will be sold.

Mechanical Fuels Treatments

Mechanical fuels treatment would occur on 2,113 acres. This treatment would involve the removal of dead and down material and ladder fuels that predominately resulted from the spruce budworm outbreak in the late 1980s and early 1990s. Mechanical treatment would use both mechanical and hand methods to remove, masticate in place, and/or pile and burn this material. Possible methods would include: using mobile masticators where chipping and grinding of material would take place on site, using mechanical equipment such as a forwarder or skyline system to move material out of units onto landings, using mechanical equipment to pile material on site, or using chainsaws and hand piling methods. Overstory trees that are diseased may be removed in order to improve existing and future stand health.

Based on the forest products market any of these treatment methods could result in the removal of forest products as biomass and/or the burning of material on site. With current markets merchantable material would produce an estimated volume of 2,100 hundred cubic feet (Ccf).

Connected Actions to Mechanical Fuels Treatment

In areas where the understory regeneration is not composed of the recommended species composition or density for the site a non-commercial thinning would occur to alter that composition. Reforestation may occur within the mechanical fuels treatment units in areas where regeneration is lacking. Approximately 942 acres within these mechanical fuels treatment units would be planted with the appropriate tree species for the site. A mixture of ponderosa pine, western larch, and Douglas-fir seedlings would be used. Damage to planted seedlings by animals would be controlled using Vexar® tubing and gopher trapping.

A portion of the 2107-040, all of 2107-042 and all of the 2107-043, totaling 2.4 miles, would be obliterated and decommissioned to improve water quality in Alder Creek. A specified road would be constructed outside of riparian areas to obtain access to the mechanical fuels treatment units to the north of this area. The road would be opened only for the implementation and administration of the project area. The road would be classified as a closed road and follow all access strategy direction for summer range critical use period as described in the Motorized Access and Travel Management Plan for the Heppner Ranger District. The road will be a native surface road for a total of 2.2 miles. To treat the remaining mechanical fuels reduction units, an additional 2.4 miles of temporary road would be constructed and obliterated after project completion and 22 miles of closed roads reopened only for the life of the project. Total miles of open roads used are included in the commercial harvest section and is not separated out in the mechanical fuels treatment section.

Landscape Burning

Approximately 10,288 acres would be landscape burned to reduce surface fuels. This would include burning within activity units on the 1,386 acres where commercial thinning would occur and 8,900 additional acres of the project. Underburning would reduce small tree density and accumulated ground fuels while reintroducing fire into the ecosystem.

Connected Actions to Landscape Burning

Burn control lines would be constructed along 9.6 miles of thinning units and 6.3 miles of hand or wet line would be constructed along precommercial thin units. These burn control lines create fuel breaks to aid in control of fire within specific burn blocks. These burn control lines would be rehabilitated as necessary.

Forest Plan Amendment (HEI)

This alternative would require the Forest Supervisor to amend the Umatilla National Forest Land and Resource Management Plan with a Forest Plan Amendment to reduce the Forest Plan's habitat effectiveness index standard for this project from 70 to the existing habitat effectiveness index of 68. The standard reads:

> "Elk habitat will be managed on designated big game winter ranges to achieve a habitat effectiveness index of no less than 70, including discounts for open roads to motorized vehicular traffic, as described in Wildlife Habitats in Managed Forests (Thomas and others 1979). The habitat effectiveness standard will be measured on an individual winter range basis" (Forest Plan page 4-152).

The method prescribed for the calculation of Habitat Effectiveness Indices is described in Appendix C of the Forest Plan. The habitat effectiveness index for a given area depends upon three habitat characteristics: (1) potential elk use in response to cover for the land type (distribution of cover and forage), (2) road density, and (3) the quality of cover, defined as either satisfactory or marginal cover. The habitat effectiveness index is based upon quantitative analysis of each of these three components.

The habitat effectiveness analysis for this project showed that the proposed project would not change the habitat effectiveness index within the affected winter range. The existing habitat effectiveness index is 68, and would remain at 68, below the Forest Plan standard of 70, after the project. However, analysis showed that alternative 2 would affect the quality of cover, changing some of the marginal cover to forage. This represents a decrease in habitat quality. Because the proposed change reduces the quality component of the habitat effectiveness index, the proposed project is not in conformance with Forest Plan Standards and Guidelines. In order to proceed with the proposed project, the Forest Supervisor proposes to amend the Forest Plan following procedures described in Forest Service Handbook 1909.12, Chapter 5, Forest Plan Implementation and Amendment Process. The reduction of this standard would apply only to the Monument winter range and the site-specific project called Wildcat Fuels and Vegetation Management Project.

Forest Plan Amendment (SCREENS)

This alternative would also require the Forest Supervisor to amend the Umatilla National Forest Land and Resource Management Plan with a Forest Plan Amendment to remove conifers of any size from two existing quaking aspen stands. The Forest Plan (Eastside Screens, Appendix B, page 10) currently reads:

> "Scenario A: Outside of LOS, many types of timber sale activities are allowed. Intent is still to maintain and/or enhance LOS components in stands subject to timber harvest such as possible, by adhering to the following standards: a) Maintain all remnant late and old seral and/or structural live trees ≥21 inches dbh that currently exist within stands proposed for harvest activities."

Alternative 2 proposes to remove conifers within the aspen stands based on the greatest benefit to aspen survival and not based on diameter of the conifer. The removal of conifers from the aspen stands would result in the loss of 4 to 5 acres of conifer dominated aspen habitat. These areas would be converted to aspen dominated stands with a conifer component. Because the alternative would remove trees greater than 21 inches diameter at breast height, the proposed project is not in conformance with Forest Plan Standards and Guidelines. In order to proceed with the proposed project, the Forest Supervisor proposes to amend the Forest Plan following procedures described in Forest Service Handbook 1909.12, Chapter 5, Forest Plan Implementation and Amendment Process. The exclusion of this standard would apply only to the two aspen stands identified as unit 77 and unit 82 within the site-specific project called Wildcat Fuels and Vegetation Management Project.

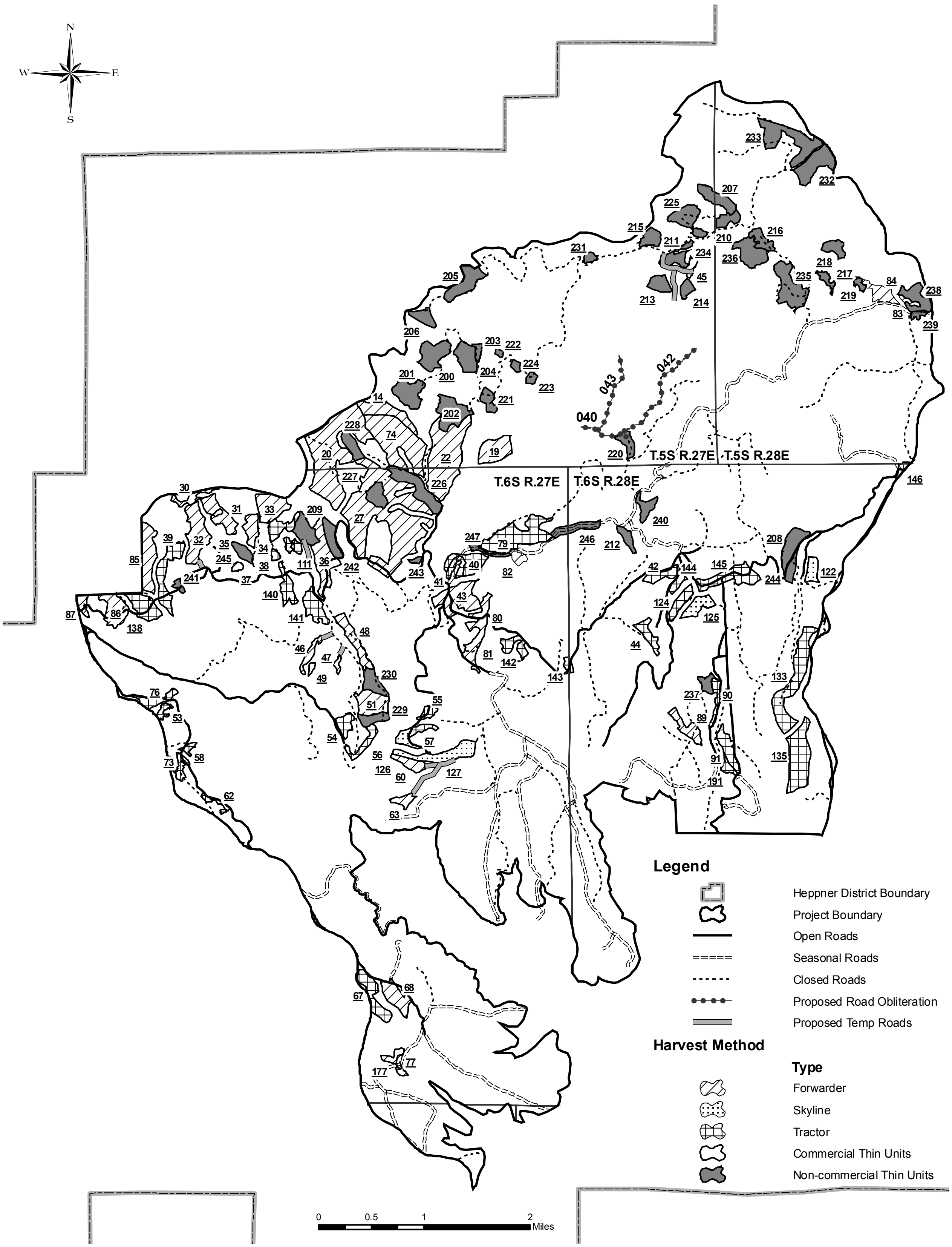


Figure 2-2. Alternative 2 – Proposed Action, Commercial and Noncommercial Thinning

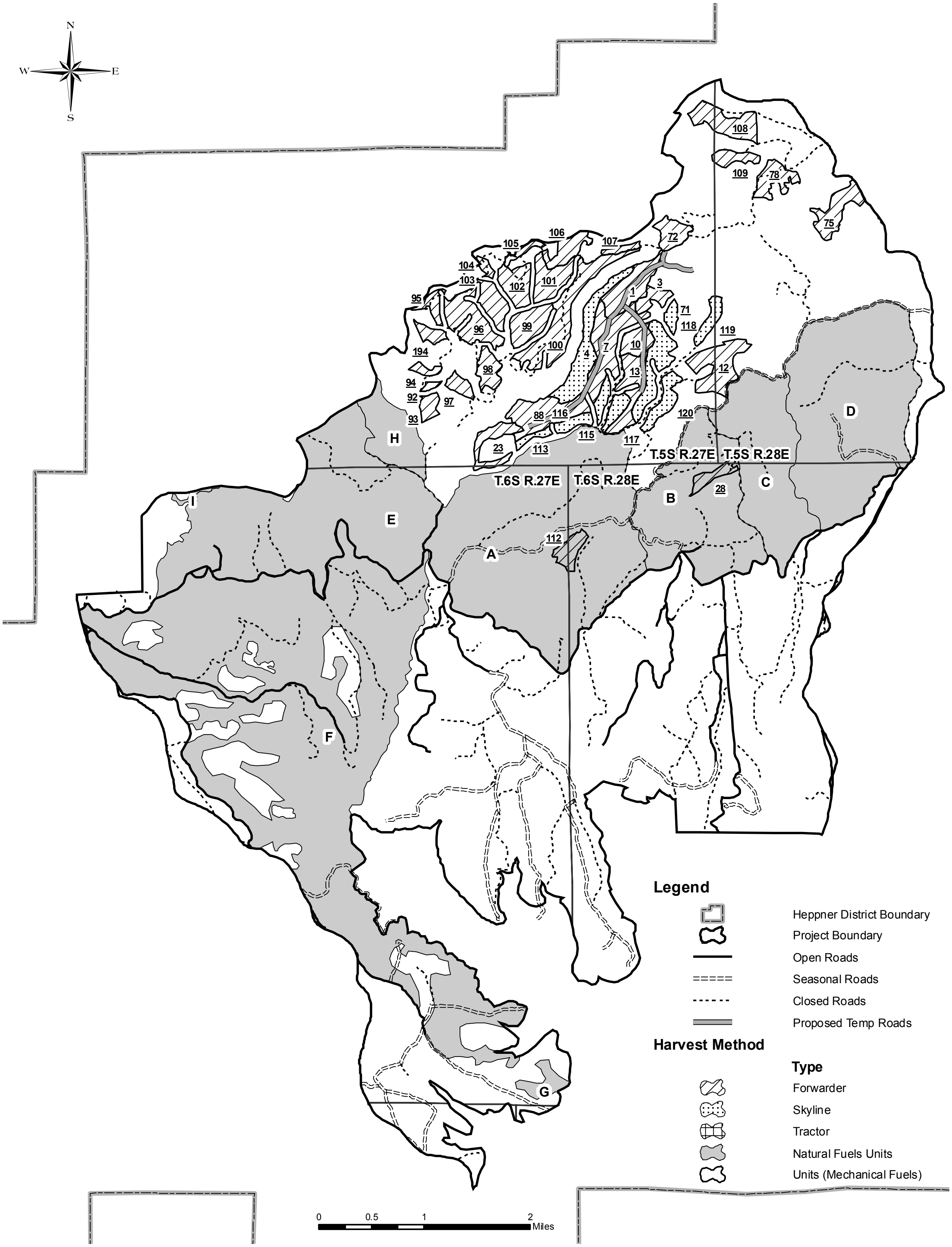


Figure 2-3. Alternative 2 – Proposed Action, Mechanical Fuels Treatment and Fuels Reduction

Alternative 3

Objective

The objective of this alternative is to achieve the vegetation and fuels objectives of the purpose and need while maintaining blocks of existing big game cover and wildlife habitat throughout the project area.

This alternative is designed to:

- Maintain marginal wildlife cover at existing levels within the C3 management area (winter range).
- Reduce vulnerability, as compared to Alternative 2, adjacent to roads open during hunting season, while maintaining areas of existing hiding cover in the short term, and providing future hiding cover throughout the project area
- Retain blocks of cover within treatment areas in the C4 and E2 management areas (summer range) to provide cover during the elk calving season.
- Reduce fragmentation of habitat and disturbance resulting from the construction and continued administrative use of the specified road in the northern portion of the project area.

Proposed treatments included in Alternative 3 respond to land and resource management objectives established for the Wildcat project, and to a lesser extent, meet the objectives previously described for Alternative 2.

Description

Variable density thin units 39, 85, 111, the east half of unit 43, and the south west finger of unit 27. Variability density thinning would decrease vulnerability by providing hiding cover patches ranging is size of ¼ to ½ acre.

No commercial thin in the winter range in units 63, 67, 68, 177, and 191 to maintain marginal cover within the C3 management area and no commercial thin in the summer range in units 14, 30, 32, 33, and 74 to maintain hiding cover in areas where a large block of vegetative treatments would occur north of FS Road 21.

No noncommercial thin in mechanical fuels treatment units 1, 10, 94, 99, 101, 117, and noncommercial only treatment units 222, 225, and 227 to maintain existing hiding cover in the northern portion of the project area.

This alternative has no new specified road construction but features more temporary road construction than Alternative 2. Alternative 3 includes all of the management practices and activities stated in Alternative 2, with differences noted below:

Commercial Thinning

Commercial Thinning would occur on approximately 1,866 acres. Thinned material that is merchantable (i.e. sawlogs, chips, or hog fuel) would be sold, producing an estimated volume of 10,000 hundred cubic feet (Ccf).

Timber harvest using skidders would occur on approximately 698 acres; ground-based systems using harvesters and forwarders would occur on approximately 1,075 acres; and skyline harvest systems would occur on 93 acres.

Connected Actions to Commercial Thinning

Activity fuel reduction on 1,075 acres would be treated either mechanically or by prescribed fire. The remaining 791 acres of commercially thinned stands would treat activity fuels within the landscape burning portion of this project.

Burn control lines would be constructed along 8.5 miles of thinning unit boundaries. After the activity burning is complete these lines would be rehabilitated as necessary.

Roads used for access and haul of forest products would include 19 miles of closed road to be temporarily reopened, 0.7 miles of temporary roads constructed, 41 miles of open road maintained. Closed roads re-opened for temporary access would be re-closed after haul is completed. Temporary roads would be obliterated after haul is completed.

Aspen Restoration

Aspen restoration would be the same as Alternative 2.

Noncommercial Thinning

Noncommercial thinning would occur on approximately 2,878 acres; 863 acres outside harvest units, 230 acres within harvest units, and 1,785 acres within the mechanical fuels treatment units.

Mechanical Fuels Treatments

Mechanical fuels treatment would be the same as Alternative 2 with an exception to the new access road to the units.

To obtain access to the mechanical fuels treatment units 4.6 miles of temporary road would be constructed. Temporary roads would be decommissioned after the implementation of the project. A system road would not be constructed. The 2.4 miles of road obliteration would occur as in Alternative 2.

Landscape Burning

Approximately 10,079 acres would be landscape burned to reduce surface fuels. This would include burning of the activity fuels on the remaining 791 acres where commercial thinning would occur and 9,288 additional acres of the project area.

Connected Actions to Landscape Burning

Approximately 6.2 miles of burn control lines would be constructed using hand or wet line along precommercial thin units that are adjacent to a burn block. These lines would be rehabilitated as necessary.

Forest Plan Amendment (HEI)

No amendment to the forest plan standard for HEI would be required under this alternative because existing satisfactory and marginal wildlife cover would be maintained within the C3 winter range management area. Treatment would occur in cover stands; however, cover would not be converted from satisfactory cover to marginal cover or from marginal cover to forage resulting in no change to HEI.

Forest Plan Amendment (SCREENS)

This alternative would also require the Forest Supervisor to amend the Umatilla National Forest Land and Resource Management Plan with a Forest Plan Amendment to remove conifers of any size from two existing quaking aspen stands.

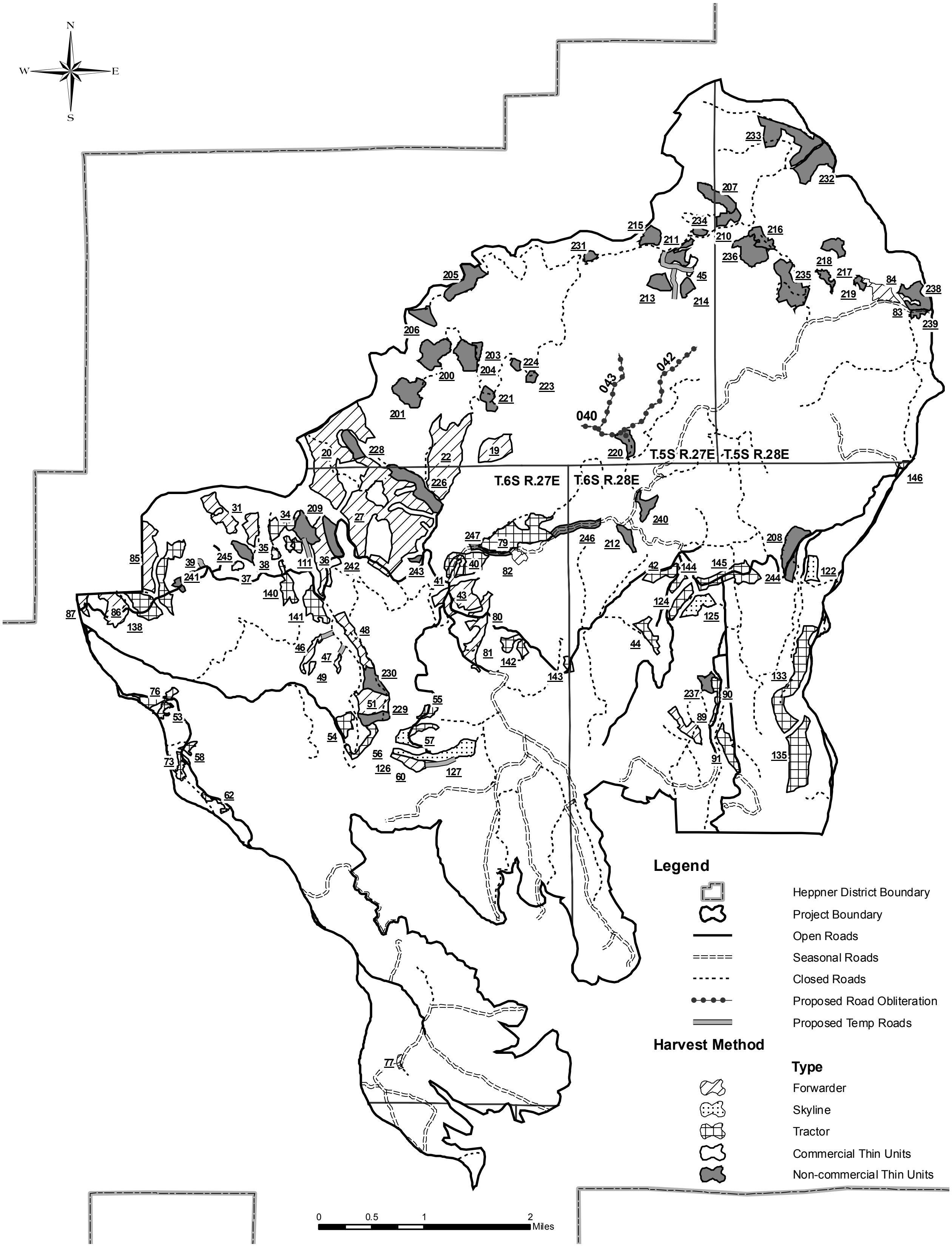


Figure 2-4. Alternative 3 – Commercial and Noncommercial Thinning

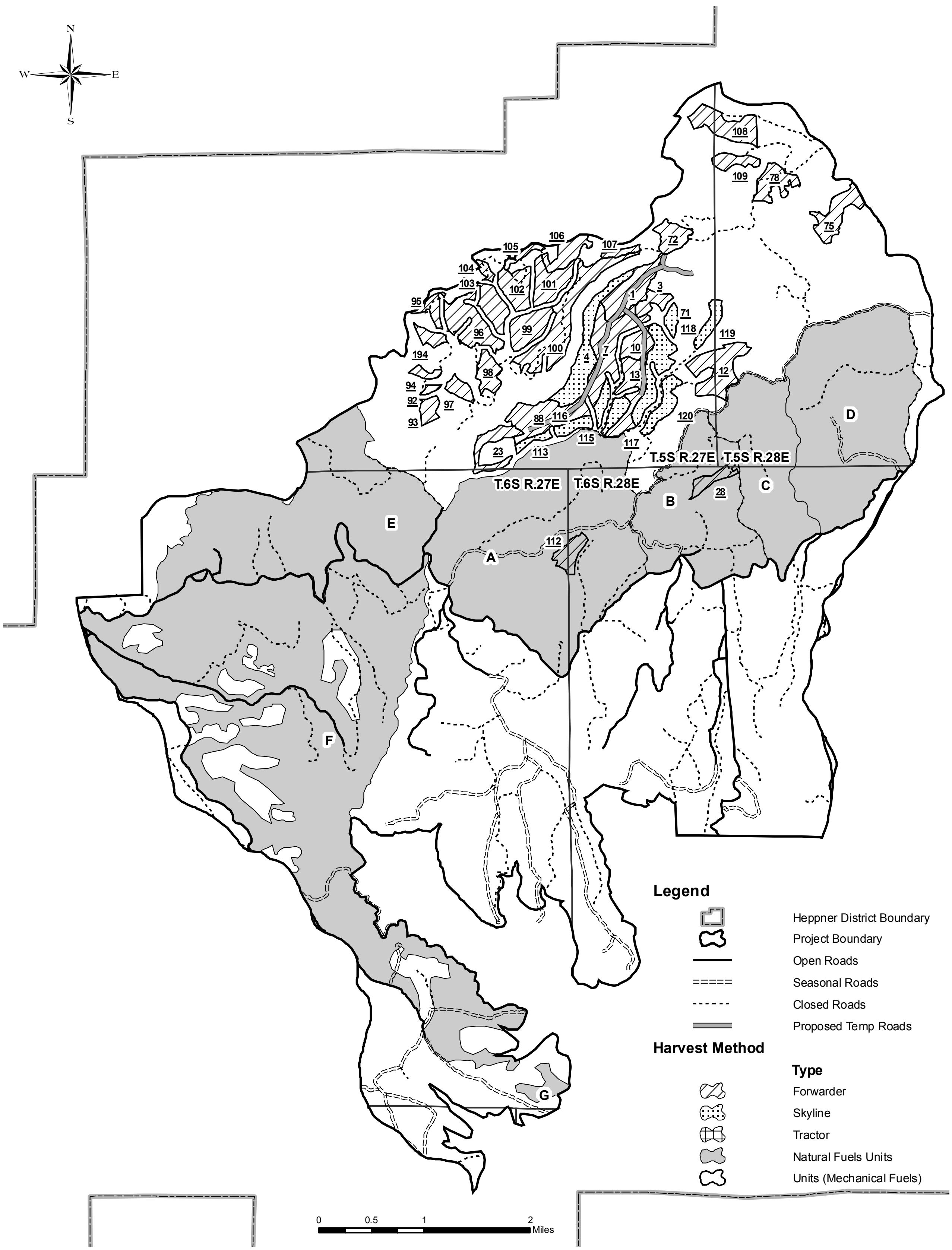


Figure 2-5. Alternative 3 – Mechanical Fuels Treatment and Fuels Reduction

Alternative 4

Objectives

The objective of this alternative is to achieve the vegetation and fuels objectives of the purpose and need while reducing the potential of immediate and long term impacts to soil and water. This alternative would reduce the total area where soil productivity would be impacted. Eliminating the construction of the system road and reduction of temporary roads results in additional soil left in production. In addition, the risk of new sediment reaching streams due to exposure of soil from harvest system activity and temporary or system road construction would be reduced. The risk of sediment reaching streams from project activities would be avoided with the following changes to the proposed action as described below.

Avoiding construction of temporary or system roads to access mechanical fuel treatment units would reduce the amount of exposed soil and potential for future erosion. Changing harvest systems to forwarder only would reduce the potential of soil exposure and compaction.

Description

No mechanical fuels treatment in units: 4, 7, 10, 13, 23, 71, 88, 113, 115, 116, 117, 118, 119. Not treating these units would reduce overall road construction. The specified road and temporary spurs that would access those units listed above would not be constructed. Elimination of the specified road would also eliminate road access to unit 19; therefore there would be no thinning treatment to unit 19. No additional specified roads would be constructed.

Change harvest systems from tractor to forwarder on units: 34, 36, 38, 39, 40, 42, 41, 44, 53, 54, 55, 56, 57, 58, 59, 62, 67, 73, 76, 79, 90, 91, 138, 139, 140, 141, 142, 143, 144, 145, 146 and change skyline to forwarder harvest system on portions where slopes generally less than 35 percent on units: 120, 122, 125, 126, 127, 133, and 135, do not treat the remaining portions of these units.

Proposed treatments included in Alternative 4 respond to land and resource management objectives established for the Wildcat project, and to a lesser extent, meet the objectives previously described for Alternative 2.

Commercial Thinning

Commercial Thinning would occur on approximately 2,179 acres using ground based systems such as harvester forwarders. Thinned material that is merchantable (i.e. sawlogs, chips, or hog fuel) would be sold, producing an estimated volume of 12,000 hundred cubic feet (Ccf).

Connected Actions to Commercial Thinning

Activity fuel reduction on 2,179 acres would be treated either mechanically or by prescribed fire. These 2,179 acres increased from alternative 2 because units where forwarder systems are used leave residual slash through out the unit rather than at landings. This residual slash would require treatment prior to the introduction of the landscape scale underburning.

About 10.8 miles of mechanical and 4.8 miles of hand or wet line would be constructed along thinning unit boundaries. After activity burning is complete these lines would be rehabilitated as necessary.

Roads used for access and haul of forest products would include 19 miles of closed road to be temporarily reopened, 1.2 miles of temporary roads constructed, and 39 miles of open road maintained. Closed roads re-opened for temporary access would be re-closed after haul is completed. Temporary roads would be obliterated after haul is completed.

Aspen Restoration

Aspen restoration would be the same as Alternative 2.

Noncommercial thinning

Noncommercial thinning would occur on approximately 2,544 acres; 956 acres outside harvest units, 230 acres within harvest units, and 1,358 acres within mechanical fuels treatment units.

Mechanical Fuels Treatments

Mechanical fuels treatment would occur on 1,358 acres.

Based on the forest products market any of these treatment methods could result in the removal of forest products as biomass and/or the burning of material on site. With current markets merchantable material would produce an estimated volume of 1,600 hundred cubic feet (Ccf).

Connected Actions to Mechanical Fuels Treatment

No specified road would be constructed. To treat the remaining mechanical fuels reduction units, 1.2 miles of temporary road would be constructed to access mechanical fuels treatment units in the far north east area. Temporary roads would be obliterated after project completion. Twenty-two miles of closed roads would be reopened only for the implementation of the project. Road obliteration would be the same as in Alternative 2.

Landscape Burning

Approximately 10,288 acres would be landscape burned to reduce surface fuels. This would include burning of 2,179 acres where commercial thinning would occur and 8,109 additional acres of the project area.

Connected Actions to Landscape Burning

Burn control lines would be constructed along 9.6 miles of thinning units along the outer boundary of a burn block and 6.3 miles of hand or wet line would be constructed along precommercial thin units that are adjacent to burn blocks. These burn control lines create fuel breaks to aid in control of fire within specific burn blocks. These lines would be rehabilitated as necessary.

Amendment to the Forest Plan (HEI)

This alternative would require the Forest Supervisor to amend the Umatilla National Forest Land and Resource Management Plan with a Forest Plan Amendment to reduce the Forest Plan's habitat effectiveness index standard for this project from 70 to the existing habitat effectiveness index of 68.

Amendment to the Forest Plan (SCREENS)

This alternative would also require the Forest Supervisor to amend the Umatilla National Forest Land and Resource Management Plan with a Forest Plan Amendment to remove conifers of any size from two existing quaking aspen stands.

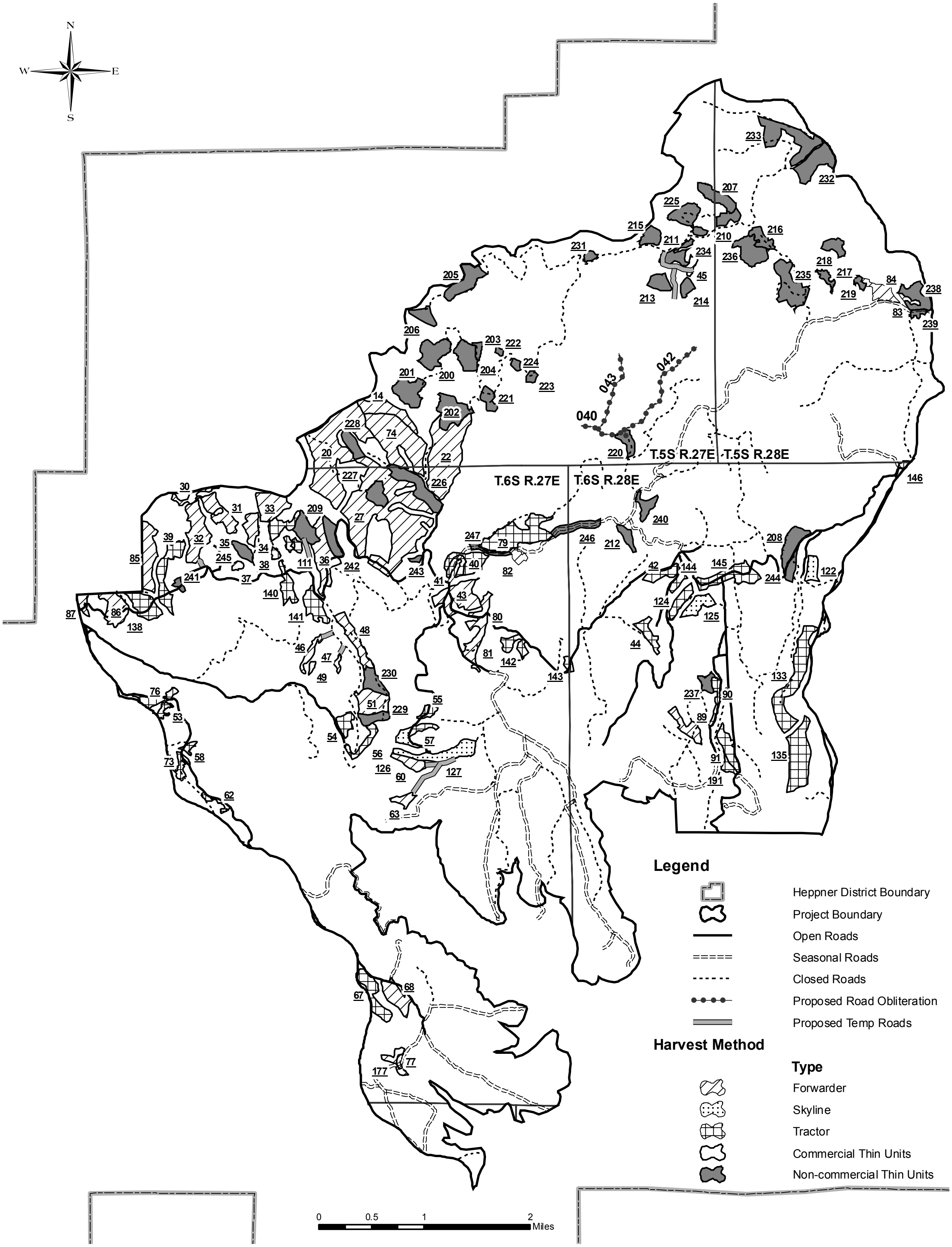


Figure 2-6 - Alternative 4 - Commercial and Noncommercial Thinning

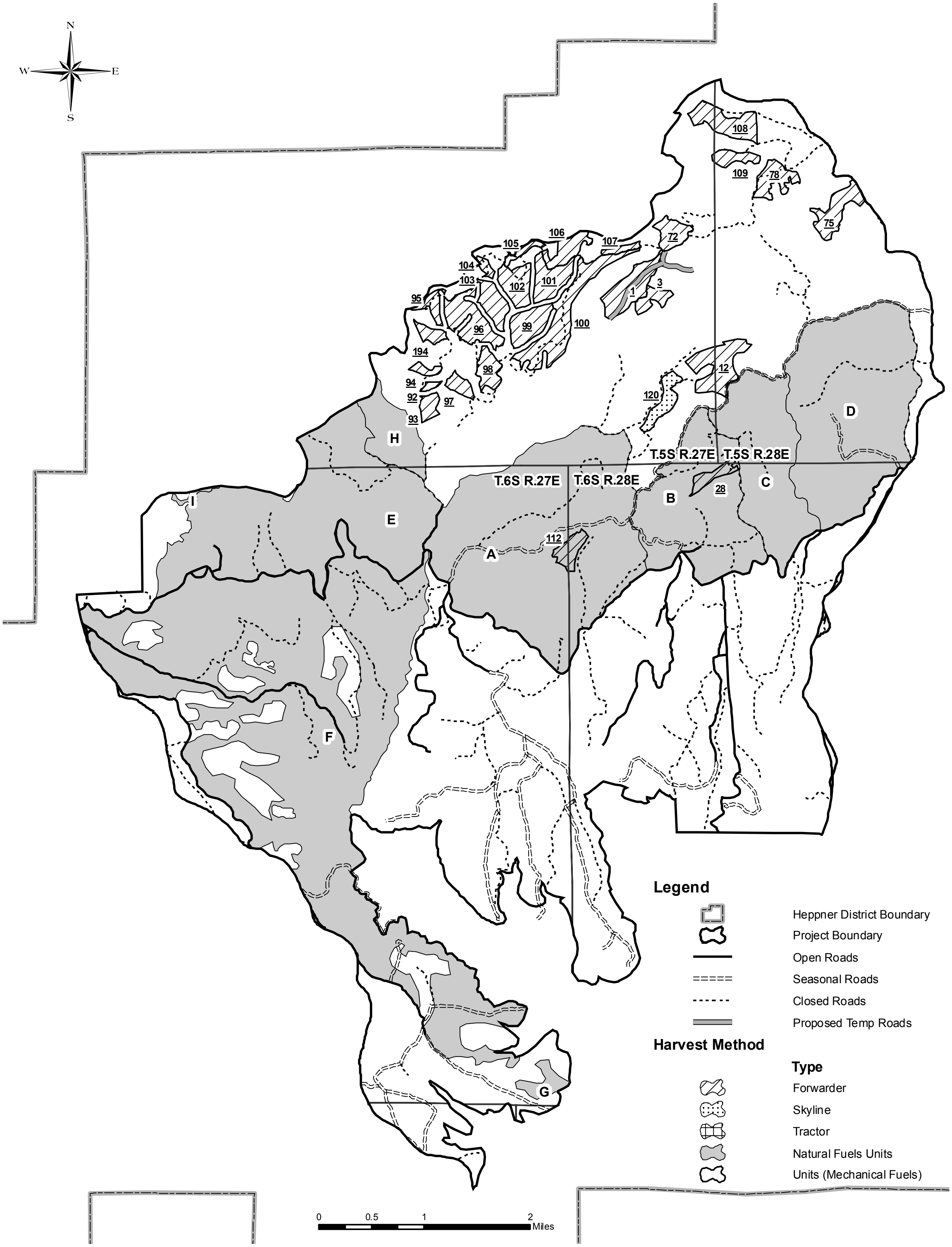


Figure 2-7. Alternative 4 – Mechanical Fuels Treatment and Fuels Reduction

Alternatives Considered but Eliminated from Detailed Study

No New or Temporary Roads

A suggested alternative during scoping was to refrain from creating any new or temporary roads for the removal of timber products within the project area.

Alternatives to achieve this would include selecting an alternative harvest removal method that would not require roads for access or haul purposes or to eliminate all units that would be accessed by a temporary road.

An alternative to extract logs via helicopter could eliminate the need for new or temporary road construction. This alternative was considered and determined not feasible based on the limited volume and value of product that would be removed. In areas where only light thinning is indicated in the silvicultural prescriptions operability is limited by economics. In addition, the use of helicopters for harvest would create a higher potential for snag loss.

In response to the request for no new or temporary roads Alternative 4 eliminates the 2.2 miles of new road construction located in the northern portion of the project area (this road is also identified as 2.2 miles of temporary road in Alternative 3). See the environmental effects section of Chapter 3 for information on the effects of new road construction, temporary road construction and no new or temporary road.

The interdisciplinary team considered the location of each temporary road, the affects that road would have on resources, and the expected duration of use before determining whether to build an alternative eliminating all temporary roads. In this project temporary roads would be used to, and within, some units to allow for harvest activities. No temporary roads would be located within riparian areas.

After a temporary road has served the purpose, the purchaser would give notice to the Forest Service and would remove culverts, eliminate ditches, outslope roadbeds, remove ruts and berms, effectively block the road to normal vehicular traffic, subsoil and/or build cross ditches and water bars, as determined by the Forest Service. When culverts are removed, associated fills shall also be removed to the extent necessary to permit normal maximum flow of water. Temporary roads are used only for the life of the project and rehabilitation often begins before the purchaser leaves the area. The temporary roads used in this project would be used only in areas where environmental effects are expected to be consistent with the Forest Plan. Project design and rehabilitation measures would be used to alleviate the potential for environmental effects. After considering the potential effects of each temporary road in this project it was determined that there is no major issue to drive the development of this alternative.

Methods of Natural Fuels Reduction

An alternative suggested during scoping was against employing helicopters or other airborne methods of implementing controlled burns.

This alternative was dropped from further consideration for the following reasons:

Controlled burning takes place under prescribed conditions where the application of fire will meet the resource objectives. Ignition pattern and the timing in which fire is applied determine the effects of the prescribed fire. The tool used in applying fire does not determine effects. Eliminating the use of helicopters for aerial ignition would reduce the options available to meet prescription objectives.

Another alternative considered was to design a fuels treatment by creating a fuel break along the 5350 road and eliminating the mechanical fuels treatment units to the north of the area.

This alternative was dropped from further consideration for the following reasons:

There is a need to restore the health and vigor of these areas and address the potential risk for uncharacteristic fire effects. Focusing our fuels treatment along the 5350 road does not serve the purpose and need of the Wildcat project area and will leave the proposed mechanical fuels treatment area (2,113 acres) susceptible to uncharacteristically intense wildfire. Wildfire in this area has the potential to spot across the 5350 and continue burning to the north and west due to topographical, weather, and fuel characteristics. Fuel breaks along this road will be difficult to defend in the occurrence of a wind driven event and have the potential to put firefighters at increased risk if the proposed down slope treatment is foregone.

Designing a fuel break along 5350 and allowing acres proposed for fuel treatments to burn in a wildfire would put up to 7 miles of designated critical habitat for steelhead (including Alder and East Fork Alder creeks) at risk of a high intensity wildfire that would likely remove most if not all riparian vegetation from these creeks. Loss of shade providing trees adjacent to streams would directly increase stream temperatures. A large wildfire could also potentially remove all fish from a burned over stream as documented in the Bull, Tower, and Summit fires (1996), Meadow Fire (2001), and Bull Springs Fire (2003) which occurred in similar stand conditions. Steelhead that remain would have to survive in a habitat degraded by loss of shade, increased sediment from ash and unprotected soil, loss of future large wood, etc. In such an event, spawning and rearing success of steelhead would be reduced.

In addition, Alder Creek is already listed for sediment on the State of Oregon’s 303d list for water quality impaired streams. Allowing the area around Alder Creek to burn in a wildfire would only increase the amount of sediment entering Alder Creek through a loss of most if not all riparian vegetation.

Thinning Prescription

There were several comments received that focused on alternative thinning treatments from setting diameter limits, eliminate diameter limits, using fire as a thinning tool and eliminating any harvest, and to use variable density thinning across the entire project area.

One respondent suggested that trees larger than 12 inches DBH should not be removed.

This alternative was dropped from further consideration for the following reasons:

Establishing an upper diameter limit of 12 inches would not reduce stand densities enough to meet the stand densities suggested in the Umatilla National Forest stocking guidelines, thereby not meeting the purpose and need to increase the resistance of forest stands to large scale insect and disease outbreaks or to reduce the risk of fire spread into the upper canopy through the ladder fuels. Fuel load and crown density are determining factors of fire risk, not specific diameter limits. This project will first remove trees from the lower crown class favoring trees in the upper crown class in order to meet these stocking guidelines. Tree selection based on diameter limit rather than on stand characteristics would not always meet many components of the stated purpose and need.

Another suggested that based on current densities and fuel loads the goals of the project could not be met without the ability to cut larger trees and that a forest plan amendment to log trees [greater than 21 inches] would be needed to improve conditions.

This alternative was dropped from further consideration for the following reasons:

Harvesting trees over 21 inches would not be necessary to bring stands to stocking densities suggested in the Umatilla National Forest stocking guidelines. Removing trees over 21 inches would not meet the purpose and need to move the structural conditions of forest stands toward their historic ranges of variability through: increasing the amount of old forest single strata in the dry upland forest in the short and long term.

Another respondent stated "(we support variable density thinning) This means that thinning should be done in a way that creates ¼ to ½ acre gaps, dense patches, lightly thinned, moderately thinned, and heavily thinned patches in every stand." An alternative was considered to use variable density thinning across the entire project area.

This alternative was dropped from further consideration for the following reasons:

Variable density thinning would not produce the desired stand structure or species composition for the project area. The dry upland forest historically was large open-park like stands primarily of ponderosa pine and Douglas-fir with grand fir to a much lesser extent. Small patches or openings did occur throughout the landscape but not at the scale that the project area covers. Variable density thinning would reduce overall density in a stand but would not alter overall species composition or structural stages. Therefore variable density thinning across the entire project area would not fully meet the components of the purpose and need. Alternative 3 does include variable density thinning on 244 acres. These acres were located in areas where they would most likely benefit big game.

It is suggested that prescribed fire could be used to reduce stocking densities instead of commercial thinning.

Prescribed burning would remove fine flashy fuels; however, it would not be selective with regard to desired tree species composition, stocking density, or spatial distribution of trees. Given the amount and distribution of fuel, prescribed fire could not be implemented as a thinning tool. The objective of the project is to create a stand structure that would allow fire to be returned to the system. Once stocking densities are reduced to desired ranges prescribed fire would be used to reduce fuel loads, control species composition, and maintain preferred stocking densities.

Treatment Locations within the Project Area

A request was made to eliminate all treatment within the C3 – Big Game Winter Range

This alternative was dropped from further consideration for the following reasons:

The interdisciplinary team considered an alternative that avoided all treatments within the C3 – Big Game Winter Range area to avoid reducing habitat quality for elk in this area. This alternative was dropped from further consideration because it would not meet the purpose and need. Similar to no action, this portion of the project area would continue to move away from historical ranges and result in a higher risk of uncharacteristic wildfire effects.

The interdisciplinary team did develop an alternative to address big game habitat. Alternative 3 was developed specifically to address big game habitat quality by eliminating harvest treatment in areas identified as marginal cover within the C3 management area. This resulted in eliminating about 94 acres of commercial thinning, no change of marginal cover, and no requirement for a site specific forest plan amendment to implement the project. Prescribed fire would still be included in Alternative 3 in order to either move or maintain those acres to fire regime condition class 1, part of the purpose and need.

Another alternative suggested during scoping involved eliminating commercial thinning and mechanical fuels reduction in areas identified by Oregon Wild as non-inventoried.

The areas identified by Oregon Wild include 9,480 acres within the project area boundary. The Forest Service has re-inventoried and identified areas that meet the criteria for wilderness potential as defined in FSH 1909.12, Chapter 70 for the project area. Of the areas identified by Oregon Wild: 2,114 acres meet the criteria for areas with wilderness potential and 7,366 acres do not meet the criteria for areas with wilderness potential. Areas that meet the criteria for wilderness potential are not proposed for commercial thinning, mechanical fuels treatment, noncommercial thinning, or road construction in the Wildcat project. This alternative was not developed further because the areas identified by Oregon Wild did not meet the criteria for wilderness potential, are not inventoried roadless areas, and are consistent with the intent of the land allocation decisions in the Forest Plan.

Potential Knutsen-Vandenburg Projects

The following projects and opportunities have been identified as possible candidates to receive funding under the Knutsen-Vandenburg Act. These are commonly referred to as KV funds and are collected from the sale of timber. If harvest occurs, KV funds might not be generated for all enhancement projects. If KV funds are limited, other funding sources would be necessary, or the unfunded project would not be implemented.

Sale area enhancement opportunities associated with the action alternatives include:

- Noncommercial thinning
- Noxious weed control
- Treatment of debris created by noncommercial thinning
- Underburning ponderosa pine stands to maintain structure
- Road obliteration
- Installing fencing around aspen stands.

KV Projects Requiring Separate Analysis

These are opportunities that may be pursued in the future and are not currently proposed under the action alternatives. These projects may be reasonably foreseeable future projects. If these projects are initiated, additional NEPA analysis would be required:

- Range improvement fence construction and reconstruction.
- Replacement and/or removal of fish barriers (culverts).
- Decommissioning roads no longer needed (as identified in the Roads Analysis for this project).
- Installing guardrails/gates on other closed roads in the area to improve closure effectiveness.
- Planting hardwoods in riparian areas and aspen stands.
- Maintaining instream structures.
- Reconstruction of water sources.

Management Requirements and Project Design Elements

The Umatilla National Forest uses two general types of mitigation: management requirements and project design elements. Management requirements are standards that are established to protect forest resources, and are implemented during or after the projects to meet Forest Plan and other direction. Project design elements are actions designed for a specific project to reduce or prevent undesirable effects from proposed activities. Project design elements can include avoiding the effect, minimizing the effect by limiting the action, rectifying the effect, reducing the effect through maintenance, or compensating for the effect. The action alternatives include the following management requirements and project design elements. Unless noted otherwise in the decision document, these management requirements and project design elements would be incorporated into each of the action alternatives for implementation.

Management Requirements and Project Design Elements

The management requirements would be implemented to meet the stated objectives. These requirements represent standard operating procedure for the protection of forest resources. The source for the requirements is the Forest Plan guidelines and provisions developed by the Umatilla National Forest.

Project design elements are practices that the interdisciplinary team developed during this analysis to address site-specific environmental concerns that were not sufficiently addressed by existing management requirements.

1. Whole tree yarding will only occur where ash soils can be protected. To protect soils, no whole tree yarding will occur in units with volcanic ash soils. These units will be harvested with a forwarder (or other low-impact logging system that would result in effects similar to that experienced under a harvester/forwarder system) to achieve full suspension of logs. Debris created by the harvester will be placed in front of the harvester in the travel routes to minimize soil disturbance and compaction.
2. Use of heavy equipment will be suspended when soil is too wet to support heavy equipment without detrimental resource damage as described in the Forest Plan.
3. No ground-based equipment will operate in areas where the average slope is greater than 35 percent in order to reduce the potential for soil movement. Skid trails, forwarder trails, and other log transportation routes will be controlled by the Forest Service to meet the Best Management Practices and applicable management requirements during timber sale contract administration.
4. A list of the USDA Forest Service Pacific Northwest Region General Water Quality Best Management Practices (USDA Forest Service 1988) specific to harvest in this area is included in Appendix A of this document. The intent of these Best Management Practices is to meet Clean Water Act requirements and to protect streams and adjacent areas to maintain aquatic resources.
5. All riparian areas would be protected from harvest activities during layout using PACFISH and Best Management Practice Guidelines. No commercial thinning will occur within PACFISH Riparian Habitat Conservation Areas (300 feet on each side of class 1 and 2 [fish-bearing streams], 150 feet for Class 3 streams [non-fish bearing perennial streams], and 100 feet for Class 4 [intermittent] streams and springs, seeps, ponds, and bogs less than one acre.) If a tree is felled into a Riparian Habitat Conservation Area or unique habitat buffer, the portion inside the protected area will be left in place. In the event that trees are inadvertently damaged within a riparian area, those damaged trees that are determined to be a safety hazard will be cut and left. The intent is to avoid disturbance to the riparian area. The exception to this is the treatment of aspen stands located in units 77, 82, 83, 84, and 240. Conifers may be removed from these units in the Riparian Habitat Conservation Area within the extent of the aspen stand. In addition non-commercial thinning will occur in several units and thinning in these units will include RHCAs where it has been identified that riparian conditions would improve with thinning treatments. Noncommercial thinning in these RHCAs will occur by hand only.
6. Where conditions and safety permit, trees will be felled away from riparian areas, residual conifers, large broken or hollow top snags, dispersed campsites, fences, landlines, research plots (ecology plot center markers and condition and trend transect markers) and improvements (fences, stock ponds, section corner monuments).
7. Equipment crossing Class 4 streams will be confined to crossings approved by an Aquatic Specialist, and may not otherwise operate within the draw, in order to minimize soil disturbance and compaction. Debris will be placed into the crossings to reduce soil disturbance and compaction and removed from class 4 channels following use. Soil control measures will be used at class 4 crossings as needed. Skidding up and down ephemeral draws will be prohibited. Equipment crossing class 3 or greater streams will be prohibited except on existing roads.
8. All temporary roads, skid trails, forwarder trails, and landings will be rehabilitated as necessary to reduce soil erosion and compaction. This may include planting, seeding, and protection of plants;

earthwork; and cultivation practices following procedures described in the noxious weeds section of these design elements.

9. Logging haul routes will be maintained before and after use as needed.
10. The source location, quantity, and timing of water use for dust abatement will be approved by the Forest Service before a sale, in order to protect the water and fisheries resources during times of low water. Under no circumstances would more than 10 percent of a stream's flow be pumped for dust abatement.
11. Hauling will not occur across open water fords unless the channel is dry.
12. Any Snowplowing done to facilitate winter harvest will be done following standard snow plowing guidelines.
    - Snowplowing will occur in a way that prevents erosion damage to roads and streams.
    - There will be no side casting of snow into streams.
    - No snowplowing will occur during breakup conditions.
    - Equipment is of the size and type commonly used to remove snow and will not cause damage to the road.
    - The use of dozers to remove snow requires written Forest Service approval. All equipment shall be equipped with shoes or runners to keep the dozer blade a minimum of two inches above the road surface unless agreed otherwise.
    - Berms shall be opened to prevent the accumulation of runoff during melt off.
    - Surface trenches in snow surface may be required to direct high runoff flows into areas, which will allow spreading and absorption of water.
13. Existing regeneration will be maintained in RHCAs to the extent possible given thinning and prescribed burning constraints. Maintain existing shade on perennial streams (class 1, 2, and 3) during non-commercial thinning (units 204, 207, 216, and 217) and prescribed burning where shade standards are currently not being met. The exception to this will be in aspen stands where conifers may be removed as aspen will quickly replace lost shade.
14. Prescribed fire would be ignited in Riparian Habitat Conservation Areas when needed to keep fire intensity low and to utilize terrain features for fire control. Fire would also be allowed to back into Riparian Habitat Conservation Areas. Exposure of mineral soil would not exceed 10 percent within Riparian Habitat Conservation Areas.
15. Width of fire control lines would not exceed 18 inches of mineral soil: adjacent to Riparian Habitat Conservation Areas, on slopes exceeding 35 percent, and on other sensitive areas where soil disturbance is of concern. Fire line will be rehabilitated after the burn by constructing waterbars and seeding as necessary.
16. In skyline units, where possible, select areas for skylines where existing vegetation is limited in Riparian Habitat Conservation Areas to reduce impacts to stream shade.
17. Unique habitats (such as talus, rocky outcroppings, scab habitats, cliff faces, and meadows) would be protected from logging activities. Meadows would be buffered using Pacfish standards to protect these habitats; measures to protect other unique habitats will be determined by the district wildlife biologist.
18. Where available, a 15 to 20 foot wide strip of small diameter conifers would be retained outside the

road prism along all non-commercial thin units (including those stands that are commercially harvested first or mechanically thinned and then non-commercially thinned) along open roads. These leave strips would be left to reduce the visibility of elk and deer along these routes.

19. Leave wildlife habitat clumps of uncut regeneration (small diameter) conifers ranging in size from ¼ acre up to 1 acre in size in non-commercial thin and mechanical fuels units (including those stands that are commercially harvested first and then non-commercially harvested). Clumps of uncut small diameter conifers would total approximately 2 acres for every 30 acres of treatment.
20. Within commercial thin units, retain at least one unburned small diameter slash pile for every two acres of treatment for wildlife cover. If hand or grapple piling does not occur in these units, retain existing clumps or piles of slash, small diameter downed wood, and litter for wildlife at the above rate.
21. In noncommercial thin and mechanical fuels treatment units, retain at least one unburned slash pile per acre for hiding cover for wildlife. If hand or grapple piling does not occur in these units, retain existing clumps or piles of slash, small diameter downed wood, and litter for wildlife at the above rate.
22. If a goshawk nest site is located during goshawk surveys or sale preparation, the site would be protected by eliminating harvest on 30 acres of the most suitable nesting habitat around the site and identifying a post fledging area. The 400 acre post fledging area would be designated around this core nest area. This post fledging area would meet guidelines for structural composition as described in Reynolds et al. 1992. Treatment could occur in this post fledging area if treatments retain late and old structure or move young stands toward a late old structure condition.
23. Prescribed fire would be allowed within the northern goshawk territory associated with nesting areas; however, during the spring nesting season no lighting would occur within the 30 acres immediately surrounding a nest to reduce the risk of nest abandonment and impacts to developing chicks.
24. If raptor nest sites are encountered during layout or implementation, they will be protected. The level of protection will vary by species, and will be determined by the District Wildlife Biologist. The nest tree will be protected from all management activities.
25. Maintain snag densities at levels identified in the Wildlife Specialist Report for each potential vegetation group.
26. Where possible snags will be retained in clumps and small groups.
27. Downed wood would not be removed in commercial and non-commercial thinning units. Units 14 and 30 are identified as commercial thin units but would allow for the removal of downed wood to levels identified in Table 2-1. Downed wood would be removed from mechanical fuels units. Downed wood would be retained according to levels displayed in Table 2-1.

Table 2-1: Forest Plan standards for downed wood (pieces per acre) by Forest Plan working group and Plant Community Type.

Working Group/Plant Community Type	Pieces per Acre	Diameter at Small End (inches)	Length per Piece (feet)	Total Length per Acre (feet)
Ponderosa Pine/Ponderosa Pine	3-6	12	6	18-36
South Associated/Mixed Conifer	15-20	12	6	90-120
North Associated/Grand Fir	15-20	12	6	90-120
Lodgepole Pine/Lodgepole Pine	15-20	8	8	120-180

28. Where possible, the largest pieces of dead wood in varying states of decay will be retained in mechanical fuels units and units 14 and 30. Where possible, leave downed wood in localized clumps (not piles) with scattered single pieces.
29. Burn prescriptions would be designed to produce low fire intensities. Where heavy fuel accumulations exist (identified old growth areas and late and old structure habitat) adjust timing of burning or exclude these areas from landscape underburns to ensure that late and old structure habitat features are not adversely impacted.
30. Winter logging and snowplowing to access treatment units in winter range habitat could occur if the following occurs: inform Oregon Department of Fish and Wildlife of location and timing of winter logging and snowplowing, and Forest Service monitoring of general area for use by elk during implementation.
31. In order to protect big game within the summer range during calving season (May 1 through June 30) no logging activities would occur during this period.
32. Within mechanical fuels treatment units, broken top and spike (dead) top green trees will be retained at a rate of 1 per acre larger than 15 inches dbh, where they are available, to maintain potential raptor nesting and roosting habitat in the fuels treatment area.
33. Approximately 10 percent of the proposed mechanical fuels treatment acres will not be treated to provide undisturbed habitat for primary cavity excavating bird and other wildlife. These leave areas would be those with an overstory with little or no evidence of disease (such as dwarf mistletoe), generally in a healthy condition. The result would be a mosaic of treated stands intermixed with undisturbed areas with locally high deadwood densities.
34. Noncommercial thinning debris will be limbed and bucked, mulched, piled, or removed as biomass to within levels compliant with the forest plan standard for any specific management area.
35. Harvest prescriptions would retain late and old structure consistent with the Forest Plan.
36. The State of Oregon's Smoke Management Implementation plan would be followed for all prescribed burning.
37. Fences, gates, and cattle-guards would be maintained in their existing condition during harvest activity to prevent cattle from passing between allotments or pastures.
38. Purchaser/contractor shall employ whatever cleaning methods are necessary to ensure that off-road equipment is free of soil, seeds, vegetation matter or other debris that could contain or hold seeds prior to coming onto National Forest lands.
39. Any seeding will use certified weed-free seed provided by the Forest Service. Native grass and forb seed will be used as available, otherwise non-persistent exotic species will be provided. Hay and straw used for mulch or erosion control will also be weed-free.
40. Gravel, fill, sand stockpiles, quarry sites, and borrow material, will be inspected for invasive plants before use and transport. Treat or require treatment of infested sources before any use of pit material. Use only gravel fill, sand, and rock that is judged to be weed free by District or Forest weed specialists.
41. Conduct road blading, brushing, and ditch cleaning in areas with high concentrations of invasive plants in consultation with "District or forest –level invasive plant specialists; incorporate invasive plant prevention practices as appropriate.
42. A copy of known noxious weed infestations and identification material would be included in the timber sale contract package. Known infestation would be treated by the Forest Service prior to implementation of activities according to the Umatilla National Forest Environmental Assessment for

the Management of Noxious Weeds (1995) and standards outlined in the Pacific Northwest Regions final Environmental Impact Statement for the Invasive Plant Program (2005).

43. To reduce user conflict with management activities the access and travel management restrictions for timber sale contracts will be applicable during critical use periods. In summer range the critical use period is from October 20 through November 30, and May 1 through June 30.
44. Where possible, dispersed camp sites will be buffered from thinning activities to protect the recreational experience of the site user. Roads and areas near dispersed sites will be posted at least one week in advance of initiating prescribed burning activities.
45. All known cultural resource sites would be protected. Field crews will consult with the project archaeologist prior to implementation. Any new cultural resource sites discovered during layout or implementation would be protected until an archaeologist can assess them and determine appropriate actions.

Monitoring and Evaluation

Monitoring for both implementation (whether the project was implemented as planned) and effectiveness (whether overall management objectives were met) would occur. Forest Service personnel would conduct monitoring in areas that have the highest probability of showing effects.

Forest Plan Monitoring

During project lay-out, units would be spot checked by Forest Service personnel to assure that riparian protection, as delineated by PACFISH requirements and Best Management Practices is implemented as stated. Boundaries that do not meet requirements would be adjusted accordingly.

Number, size, and distribution of snags and down logs within a sample of units would be field checked by Forest Service personnel.

The Forest Service contract representative would monitor during and after activities to ensure sediment and soil compaction objectives are met. If objectives are not met, Forest Service personnel would identify and implement corrective action and document modifications to be used in future projects.

The District noxious weed coordinator or crew would conduct noxious weed species surveys prior to initiation of harvest or other ground disturbing activities within the project area.

Forest Service personnel would spot check activities during implementation to determine whether noxious weed mitigation measures are implemented. Deviations would be corrected immediately.

For five years after activities are completed, the District noxious weed coordinator or crew would conduct an annual inventory of the treatment area and access routes to determine if existing noxious weed populations have spread or if new sites have occurred.

After prescribed fire treatments, Forest Service personnel would field check a sample of burn units to determine whether the prescription and mitigation (i.e. mortality, mineral soil exposure, fuel load reductions, etc.) have been met. If objectives or mitigation have not been met, additional burning may be delayed or the fire prescription and procedures adapted to ensure the mitigation is achieved.

Comparison of Alternatives

This section provides a summary of the effects of implementing each alternative. Information in the table is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

Table 2-2: Summary of Wildcat Alternatives

	Alternative			
	1	2	3	4
Commercial Harvest				
Conventional Commercial Thin (acres)	0	2,218	1,622	2,179
Variable Density Thin (acres)	0	0	244	0
Forwarder (acres)	0	1,387	1,075	2,179
Skidder (acres)	0	739	698	0
Sky line (acres)	0	93	93	0
Volume Harvested - Bd. Ft.	0	6.0 MBF	5.0 MBF	6.0 MBF
Volume Harvested - Ccf	0	12,000 Ccf	10,000 Ccf	12,000 Ccf
Activity fuel reduction – mechanical or burn	0	1,387	1,075	2,179
Mechanical Line - miles	0	10.8	8.5	10.8
Hand Line - miles	0	4.8	4.6	4.8
Pile Burning (acres)	0	10.4	10	10.4
Forest Plan Amendment - HEI	-	Yes	No	Yes
Forest Plan Amendment - Aspen	-	Yes	Yes	Yes
Noncommercial Thinning				
Within commercial units (acres)	0	230	230	230
Within mechanical fuel units (acres)	0	2,113	1,785	1,358
Outside above treatment units (acres)	0	956	863	956
Mechanical Fuels Treatment				
Mechanical Fuels Treatment Units (acres)	0	2,113	2,113	1,358
Number of Mechanical Fuel Units	0	41	41	27
Forwarder (acres)	0	1,725	1,725	1,358
Sky line (acres)	0	388	388	0
Volume Harvested - Bd. Ft.	0	1.05 MBF	1.05 MBF	0.8 MBF
Volume Harvested - Ccf	0	2,100 Ccf	2,100 Ccf	1,600 Ccf
Pile burning (acres)	0	26.5	26.5	17.0
Planting (acres)	0	942	942	942
Road Work Associated with the Project				
New System Roads	0	2.2	0	0
Temporary Road (miles)	0	3.6	5.3	2.4
Closed roads opened for haul (miles)	0	41	41	41
Open roads maintained for haul (miles)	0	39	39	39
Road Obliteration (miles)	0	2.4	2.4	2.4
Landscape Burning				
Total landscape burning acres	0	10,288	10,079	10,288
Mechanical line	0	9.6	8.6	9.6
Wet or Hand line	0	6.3	6.2	6.3
Total of Project Area Treated with One or More Activities				
Acres	0	13,927	13,554	13,138

Table 2-3. Thinning Treatments (Commercial and Noncommercial) by Management Area

Management Area	*Alternative 1 (Acres)*	*Alternative 2 (Acres)*	*Alternative 3 (Acres)*	*Alternative 4 (Acres)*
A4 – Viewshed 2	0	83	79	83
C1 – Dedicated Old Growth	0	0	0	0
C2 – Managed Old Growth	0	1	1	1
C3 – Big Game Winter Range	0	97	3	97
C4 – Wildlife Habitat	0	1,991	1,645	1,952
C5 – Riparian (Fish and Wildlife)	0	30	30	30
C8 – Grass-Tree Mosaic	0	0	0	0
E1 – Timber and Forage	0	787	786	787
E2 – Timber and Big Game	0	185	185	185
TOTAL	0	3,174	2,730	3,135

Table 2-4. Mechanical Fuel Treatments by Management Area

Management Area	*Alternative 1 (Acres)*	*Alternative 2 (Acres)*	*Alternative 3 (Acres)*	*Alternative 4 (Acres)*
A4 – Viewshed 2	0	0	0	0
C1 – Dedicated Old Growth	0	0	0	0
C2 – Managed Old Growth	0	20	20	20
C3 – Big Game Winter Range	0	0	0	0
C4 – Wildlife Habitat	0	2,014	2,014	1,265
C5 – Riparian (Fish and Wildlife)	0	9	9	3
C8 – Grass-Tree Mosaic	0	0	0	0
E1 – Timber and Forage	0	0	0	0
E2 – Timber and Big Game	0	71	71	71
TOTAL	0	2,113	2,113	1,358

Table 2-5. Prescribed Fire by Management Area

Management Area	*Alternative 1 (Acres)*	*Alternative 2 (Acres)*	*Alternative 3 (Acres)*	*Alternative 4 (Acres)*
A4 – Viewshed 2	0	315	315	315
C1 – Dedicated Old Growth	0	568	568	568
C2 – Managed Old Growth	0	0	0	0
C3 – Big Game Winter Range	0	628	628	628

C4 – Wildlife Habitat	0	2,219	2,010	2,010
C5 – Riparian (Fish and Wildlife)	0	535	535	535
C8 – Grass-Tree Mosaic	0	220	220	220
E1 – Timber and Forage	0	2,358	2,358	2,358
E2 – Timber and Big Game	0	3445	3,445	3,445
TOTAL	0	10,288	10,078	10,288

Table 2-6. Comparison Response to Purpose and Need by Alternative

Purpose and Need	Alternative 1 – No Action	Alternative 2- Proposed Action (5,287[2])(10,288[3])	Alternative 3 (4,843)(10,078)	Alternative 4 (4,493)(10,288)
Forest Structure (Based on 18,113 acres of dry upland forest) Increase the amount of OFSS and SEOC in the dry upland forest	OFSS – 662 SEOC – 1,555	OFSS – 1,055 SEOC – 2,315	OFSS – 1,004 SEOC – 2,156	OFSS – 1,055 SEOC – 2,307
Forest Density Moved stand density from high density to moderate or low density in order to reduce understory competition, promote growth and development of large trees	Cold Upland Forest – 0 acres Moist Upland Forest – 0 acres Dry Upland Forest – 0 acres	Cold Upland Forest – 487 acres Moist Upland Forest – 1,088 ac Dry Upland Forest – 2,315 ac	Cold Upland Forest – 446 acres Moist Upland Forest – 977 ac Dry Upland Forest – 2,076 ac	Cold Upland Forest – 331 acres Moist Upland Forest – 906 ac Dry Upland Forest – 2,037 ac
Aspen Improve conditions of aspen habitat to favor aspen regeneration and survival	Conifer competition continues	40 acres of aspen habitat treated to reduce conifer competition	Same as Alternative 2	Same as Alternative 2
Fire Regime Condition Class (Based on 27,780 Acres) Reduce the risk of losing key ecosystem component in the event of a wildfire	Condition Class 1 – 16,425 Condition Class 2 – 5,646 Condition Class 3 – 5,709	Condition Class 1 – 22,327 Condition Class 2 – 3,431 Condition Class 3 – 2,021	Condition Class 1 – 22,099 Condition Class 2 – 3,476 Condition Class 3 – 2,204	Condition Class 1 – 22,019 Condition Class 2 – 3,649 Condition Class 3 – 2,111

[2] Total acres of commercial, noncommercial and mechanical fuels treatment

[3] Acres of prescribed fire

Table 2-7. Comparison of Effects to Resources by Alternative

Resource	Alternative 1 – No Action	Alternative 2- Proposed Action (5,287)(10,288)	Alternative 3 (4,843)(10,078)	Alternative 4 (4,493)(10,288)
Fuels				
Stand Replacement Potential Reduce vertical and horizontal fuels, fire intolerant species, increase canopy base height, and decrease crown bulk density to reduce stand replacement fire potential.	High – 12,407 Moderate – 2,960 Low – 12,400	High – 5,095 Moderate – 2,357 Low – 20,313	High – 5,285 Moderate – 2,470 Low – 20,013	High – 5,573 Moderate – 2,299 Low – 19,896
Crown Fire Potential Reduce probability that crown fires will either initiate or spread through the forest (acres)	Extreme – 216 Very high – 4,703 High – 7,497 Medium – 8,033 Low – 7,330	Extreme – 139 Very high – 1,932 High – 3,029 Medium – 4,235 Low – 18,444	Extreme – 139 Very high – 2,078 High – 3,068 Medium – 4,402 Low – 18,082	Extreme – 178 Very high – 2,152 High – 3,253 Medium – 4,385 Low – 17,811

Resource	Alternative 1 – No Action	Alternative 2- Proposed Action (5,287)(10,288)	Alternative 3 (4,843)(10,078)	Alternative 4 (4,493)(10,288)
Soils				
Acres of Estimated Detrimental Disturbance in Units	110	397	369	363
New System Roads	0	2.2 miles (5.3 acres)	0	0
Temporary Roads	0	3.6 miles (8.7 acres)	5.3 miles (12.8 acres)	2.4 miles (5.8 acres)

Resource	Alternative 1 – No Action	Alternative 2- Proposed Action (5,287)(10,288)	Alternative 3 (4,843)(10,078)	Alternative 4 (4,493)(10,288)
Hydrology				
Road Obliteration	0	2.4 miles	2.4 miles	2.4 miles
Roads Crossing Streams	200	197	197	197
Acres treated in riparian areas: reduced shade in the first 1 to 10 years followed by shade increase due to increased vegetation growth	Non-commercial thinning – 0 Aspen treatment – 0 Mechanical Fuels – 0 Riparian Rx Burning – 0	Non-commercial thinning – 119 Aspen treatment – 4 Mechanical Fuels – 5.5 Riparian Rx Burning – 2,132	Non-commercial thinning – 113 Aspen treatment – 4 Mechanical Fuels – 5.5 Riparian Rx Burning – 2,132	Non-commercial thinning – 119 Aspen treatment – 4 Mechanical Fuels – 5.5 Riparian Rx Burning – 2,132

Resource	Alternative 1 – No Action	Alternative 2- Proposed Action (5,287)(10,288)	Alternative 3 (4,843)(10,078)	Alternative 4 (4,493)(10,288)
Aquatic Resources and Fish				
Mid-Columbia Steelhead and Redband Trout	Continued Risk of wildfire and large scale insect and disease resulting in loss of stream shade or increase in sediment to streams	Greatest reduction in risk of future impacts from wildfire and insect and disease. Finding: Not Likely to Adversely Affect (NLAA)	Finding: NLAA	Least reduction of risk Finding: NLAA
Designated Critical habitat and Essential Fish Habitat	Continued chronic sources of sediment from closed roads, loss of growth potential in RHCAs	Road obliteration (2.4 miles) would allow recovery of the riparian areas reducing sediment in the long term	Same as Alternative 2	Same as Alternative 2
Future Large Wood	Continued reduction in the production of large wood due to overstocking in Riparian Habitat Conservation Areas	Increase future large wood through noncommercial thinning in RHCAs – 143 acres	Increase future large wood through noncommercial thinning in RHCAs – 137 acres	Same as Alternative 2

Resource	Alternative 1 – No Action	Alternative 2- Proposed Action (5,287)(10,288)	Alternative 3 (4,843)(10,078)	Alternative 4 (4,493)(10,288)
Terrestrial Wildlife				
Late Old Structure	No treatment of C1 or C2 old growth or late and old structure habitat.	Approx. 393 acre increase in dry upland forest OFSS habitat (from 4% to 6% in HRV analysis area).	Approx. 342 acre increase in dry upland forest OFSS habitat (from 4% to 6% in HRV analysis area).	Approx. 393 acre increase in dry upland forest OFSS habitat (from 4% to 6% in HRV analysis area).
Dead Wood Habitat	No impact on snags and downed wood habitat	Impact on snags would be the greatest under this alternative.	Intermediate level of impact on snags.	Least impact on snags
Management Indicator Species	**Rocky Mountain elk** – No direct change in cover **Primary cavity excavators** – No impact on snags and downed wood habitat **Pileated woodpecker** – nesting and foraging habitat not treated **Three-towed woodpecker** – foraging habitat not treated **Pine Marten** – Commercial thinning would not reduce habitat	**Rocky Mountain elk** – Reduction in satisfactory cover in E1, reduction of marginal cover in C3. Vulnerability would increase the most under this alternative **Primary cavity excavators** – All action alternatives would maintain suitability and improve the long term resilience and health of habitat **Pileated woodpecker** – 73 acres of nesting and 625 acres of foraging habitat treated **Three-towed woodpecker** – 313 acres foraging habitat treated **Pine Marten** – 92 acres of reproductive habitat treated, 146 acres of forage habitat treated	**Rocky Mountain elk** – Reduction in satisfactory cover in E1, no reduction of marginal cover in C3. Vulnerability would increase the least under this alternative **Primary cavity excavators** – same as 2 **Pileated woodpecker** – 69 acres of nesting and 585 acres of foraging habitat treated **Three-towed woodpecker** – 297 acres foraging habitat treated **Pine Marten** – 85 acres of reproductive habitat treated, 139 acres of forage habitat treated	**Rocky Mountain elk** – Reduction in satisfactory cover in E1, reduction of marginal cover in C3. Impact on vulnerability less under this alternative that Alternative 2 **Primary cavity excavators** – same as 2 **Pileated woodpecker** – 73 acres of nesting and 507 acres of foraging habitat treated **Three-towed woodpecker** – 259 acres foraging habitat treated **Pine Marten** – 91 acres of reproductive habitat treated, 137 acres of forage habitat treated
Endangered and Sensitive Species	**Gray wolf** – no effect **California wolverine –** no impact	**Gray wolf** – no effect **California wolverine –** no impact	**Gray wolf** – no effect **California wolverine –** no impact	**Gray wolf** – no effect **California wolverine –** no impact

	white-headed woodpecker – No new habitat created or restored, **Lewis' woodpecker** – no effect **Columbia spotted frog** and **inland tailed frog** – no effect	**white-headed woodpecker** - Approx 393 acres of old forest single stratum habitat created or restored , **Lewis' woodpecker** – Approx 809 acres of suitable habitat treated **Columbia spotted frog** and **inland tailed frog** – 2.4 miles of road obliteration has the potential to injure or kill an individual	**white-headed woodpecker** - Approx 342 acres of old forest single stratum habitat created or restored , **Lewis' woodpecker** – Approx 739 acres of suitable habitat treated **Columbia spotted frog** and **inland tailed frog** – 2.4 miles of road obliteration has the potential to injure or kill an individual	**white-headed woodpecker** - Approx 393 acres of old forest single stratum habitat created or restored , **Lewis' woodpecker** – Approx 646 acres of suitable habitat treated **Columbia spotted frog** and **inland tailed frog** – 2.4 miles of road obliteration has the potential to injure or kill an individual
Species of Interest	**Northern Goshawk** – no foraging habitat or suitable nesting habitat treated **Olive-sided flycatcher** – no affect **Bats of interest** – no affect	**Northern Goshawk** – Approx 4,273 acres of suitable foraging habitat and 47 acres of suitable nesting habitat treated **Olive-sided flycatcher** – treatments would be negligible **Bats of interest** – reduction of roost snags	**Northern Goshawk** – Approx 3,928 acres of suitable foraging habitat and 44 acres of suitable nesting habitat treated **Olive-sided flycatcher** – same as alt 2 **Bats of interest** – same as alt 2	**Northern Goshawk** – Approx 3,479 acres of suitable foraging habitat and 47 acres of suitable nesting habitat treated **Olive-sided flycatcher** – same as alt 2 **Bats of interest** – less roost sang reduction than alt 2
Neo-Tropical Migratory Birds	**Dry Forest** – no beneficial changes in habitat for white-headed woodpecker and flammulated owl. **Mesic Mixed Conifer** – no change **Subalpine Forest** – no change **Aspen** – no beneficial change in habitat for red-naped sapsucker **Steppe Shrubland** – no change in habitat **Riparian Shrub** – No change in habitat	**Dry Forest** – 2,368 acres treated resulting in benefit habitat changes for white-headed woodpecker and flammulated owl. **Mesic Mixed Conifer** – 1,626 acres of habitat treated, minor effects to habitat **Subalpine Forest** – 521 acres of cold upland habitat treated, short term impact **Aspen** – four stands treated resulting in habitat benefit for red-naped sapsucker **Steppe Shrubland** – Burning	**Dry Forest** – 2,140 acres treated resulting in benefit habitat changes for white-headed woodpecker and flammulated owl. **Mesic Mixed Conifer** – 1,502 acres of habitat treated, minor effects to habitat **Subalpine Forest** – 521 acres of cold upland habitat treated, short term impact **Aspen** – four stands treated resulting in habitat benefit for red-naped sapsucker **Steppe Shrubland** – Burning	**Dry Forest** – 2,068 acres treated resulting in benefit habitat changes for white-headed woodpecker and flammulated owl. **Mesic Mixed Conifer** – 1,336 acres of habitat treated, minor effects to habitat **Subalpine Forest** – 329 acres of cold upland habitat treated, short term impact **Aspen** – four stands treated resulting in habitat benefit for red-naped sapsucker **Steppe Shrubland** – Burning

		result in minor habitat effects **Riparian Shrub** – No impact	result in minor habitat effects. Fewer acres treated than alternatives 2 or 4. **Riparian Shrub** – No impact	result in minor habitat effects **Riparian Shrub** – No impact

Resource	Alternative 1 – No Action (Ac. Thinning)(Ac. Burning)	Alternative 2- Proposed Action (5,287)(10,288)	Alternative 3 (4,843)(10,078)	Alternative 4 (4,493)(10,288)
Air Quality				
Total Emission (PM 10 + PM 2.5)	10,940 tons (PM) over a 2 week period in the event of a wildfire	3,089 tons (PM) over a 5 year period	2,903 tons (PM) over a 5 year period	3,423 tons (PM) over a 5 year period

Resource	Alternative 1 – No Action	Alternative 2- Proposed Action	Alternative 3	Alternative 4
Recreation				
Dispersed campsites within or near treatment units	0	42	36	42

Resource	Alternative 1 – No Action	Alternative 2- Proposed Action	Alternative 3	Alternative 4
Economics				
Present Net Value	0	$383,179	$279,127	$400,960

Chapter 3

Environmental Consequences

Chapter 3

INTRODUCTION

This chapter discloses the potential effects of each of the alternatives described in Chapter 2, including the scientific and analytical basis for the comparison of the alternatives. The effects discussions are organized by Specialists Reports and are as follows:

Effects are shown as being direct (occurring at the same time and place as the triggering action), indirect (separate in time and space from the action that caused them), or cumulative (the incremental effect of the project when added to effects from other past, present, and reasonably foreseeable actions). Appendix F contains a list of past, present and reasonably foreseeable future projects that may occur in or near the project area. Each resource specialist considered and included activities relevant to the individual resource in the cumulative effects analysis. Direct, indirect and cumulative effects are described in terms of increases or decreases, intensity, duration, and timing. The discussion of these effects also provides a comparison of the trade-offs associated with each alternative. The scale of the analysis area may be different for each resource. The chapter ends with a discussion of compliance with the Forest Plan, various laws, and executive orders.

FOREST VEGETATION

This section incorporates by reference the Wildcat Forest Vegetation Report contained in the project analysis file at the Heppner Ranger District. Specific information on the methodologies, assumptions, and limitations of analysis and other details are contained in the report. A summary of the current conditions of the affected environment and the predicted effects of the Proposed Action and its alternatives are discussed in this section.

Scope of Analysis

All effects analysis was accomplished at the sub-watershed area scale (Little Wall Creek – Skookum Creek– 170702020803; Swale Creek – 170702020801) on National Forest lands consisting of 33,650 acres. The Historical Range of Variability (HRV) can be greatly influenced by scale, both spatially and temporarily. It is recommended that the Historical Range of Variability analysis be conducted on land areas no smaller than 15,000 acres (Blackwood 1998).

Species Composition

Existing Condition

Cover Types

Tree species occur in either pure or mixed stands called cover types. Cover types are classified using existing tree composition. Forest cover types are based on a predominance of stocking and are seldom pure. For example, the grand fir type has a majority (50% or more) of grand fir trees but may also contain Douglas-fir or other tree species. Table V-1 summarizes the area of existing cover types for the Wildcat analysis area. It shows that the predominant forest cover types is ponderosa pine (37% of the analysis area has ponderosa pine as the plurality or majority species), followed by Douglas-fir (22%), and grand fir (17%). (Table V-1)

Table V-1. Existing cover types in the Wildcat analysis area.

Code	Cover Type Description	Acres	Percent
ABGR	Forest with grand fir as the majority species	4584	13.6
mix-ABGR	Mixed forest with grand fir as the plurality species	973	2.9
PIPO	Forest with ponderosa pine as the majority species	12034	35.8
mix-PIPO	Mixed forest with ponderosa pine as the plurality species	469	1.4
PSME	Forest with interior Douglas-fir as the majority species	6560	19.5
mix-PSME	Mixed forest with interior Douglas-fir as the plurality species	715	2.1
LAOC	Forest with western larch as the majority species	1692	5.0
mix-LAOC	Mixed forest with western larch as the plurality species	33	0.1
PICO	Forest with lodgepole pine as the majority species	117	0.3
PIEN	Forest with Engelmann spruce as the majority species	395	1.2
mix-PIEN	Mixed forest with Engelmann spruce as the plurality species	78	0.2
Grass	Nonforest cover types dominated by grass communities	5104	15.2
Shrub	Nonforest cover types dominated by shrub communities	665	2.0

Sources/Notes: Summarized from the vegetation database (see Powell 2001c). Forest cover types where one tree species comprises a majority (e.g., it has 50% or more of the stocking) are named for that species (Eyre 1980). For polygons where no single species predominates, the cover type is named for the plurality species preceded by "mix" to designate a mixed-species composition. Total of 33,650 acres surveyed. 96 acres of meadow, 116 acres of Other, and 16 acres of mixed-other are not included.

About 17% of the analysis area supports nonforest vegetation, most of which is grass. Dry meadows and bunchgrass communities (dominated by fescues and bluebunch wheatgrass) are common nonforest types. Often, the nonforest vegetation occurs side by side with forest vegetation and is referred to as grass-tree mosaic. In general, grass tree mosaic consists of forested stringers alternating with nonforest communities (grasslands and shrublands). The southern half of the Wildcat analysis area fits this description.

Potential Cover Types

Recent bioregional assessments concluded that dry-forest areas have vegetation conditions that are out-of-balance when compared with the historical (presettlement) situation (Caraher et al. 1992, Hessburg et al. 1999, Lehmkuhl et al. 1994, Quigley and Arbelbide 1997). Because management has suppressed fires over several return intervals (fire cycles), dry sites that were historically dominated by ponderosa pine have changed more than any other forest type over the past 90 years.

Eighty-three percent of national forest system lands in the Wildcat analysis area are forested. When classified using potential vegetation groups; fifty-four percent of National Forest system lands are dry uplands; twenty-two percent are moist uplands; and seven percent are cold uplands (Table V-2).

Table V-2. Potential vegetation groups (PVG) of the Wildcat analysis area.

Code	PVG Description	Acres	Percent
Dry UF	Dry Upland Forest	18,113	53.7
Dry UH	Dry Upland Herbland	5,080	15.1
Dry US	Dry Upland Shrubland	39	0.1
Mod SM RH	Moderate Soil Moisture Riparian Herbland	96	0.3
Moist UF	Moist Upland Forest	7,335	21.8
Moist UH	Moist Upland Herbland	24	0.1
Moist US	Moist Upland Woodland	626	1.9
Cold UF	Cold Upland Forest	2,333	7.1

Sources/Notes: Powell (1998) describes how plant associations and plant community types were assigned to potential vegetation groups. Total acres surveyed 33,650. Only National Forest System land included.

An historical range of variability analysis for vegetative cover was conducted comparing present cover type (derived from stand exams and INFORMS Most Similar Neighbor modeling interpolation) to historical ranges derived from Morgan and Parsons (2000) (Table 3.3). The Morgan and Parsons ranges are based on multiple 1200-year simulations representing landscapes in a “dynamic equilibrium” with their disturbance regime. It is important to note that cover type is an indicator of overstory or dominate species within a stand and may not accurately characterize understory species in developing stands.

The results of this analysis indicate that in dry upland forest grand fir and Douglas-fir cover types are more abundant on the landscape than historically. Grand fir cover is at 8 percent of the dry forest landscape where historically it was 1-5 percent of the landscape. Douglas-fir is greater than 20 percent more abundant on the landscape than historically. In the past Douglas-fir may have composed only 5-15 percent of the dry forest cover where today it composes 35 percent of the dry forest cover.

In moist upland forest grand fir cover is over 20 percent more abundant on the landscape than it was historically. It currently makes up 50 percent of the forest cover in moist sites where historically it made up only 5-30 percent of the forest cover. The other species that are outside HRV in moist upland forest are Douglas-fir and lodgepole pine. Douglas-fir is a less abundant cover type than it has been historically with current levels at 9 percent cover where historically it would have been 15-30 percent of the cover type. Lodgepole pine is also outside HRV at 3 percent of cover where historically it was 5-30 percent of cover.

The cold upland forest HRV results show that grand fir, western larch, and ponderosa pine are all more abundant than would be found historically. It also indicates that Englemann spruce/mixed fir cover is much less than would be found historically. These results warrant further discussion because the HRV for each cover type in cold upland forest is not necessarily applicable to this project area. Morgan and Pearsons provide ranges of variability for cold upland forest that include 20-40 percent of cover dominated by spruce and high elevation fir mix. In the Wildcat analysis simply does not have the high elevation habitat described by Morgan and Pearsons. Therefore, while the moist and dry HRV for species are relatively accurate, the HRV for cold upland forest are not applicable to the Wildcat project area because it does not contain high elevation spruce/fir dominated stands and there is no indication that they existed historically.

Table V-3. Historical range of variability based on cover type by PVG. Black cells indicate that cover type (ie ABGR and mix-ABGR) is at least 3 or more percentage points above HRV. Cells with dotted line boarder indicate that cover type is below HRV by at least 3 percentage points.* See above discussion on applicability of HRV for cold forest to the Wildcat project area.

Table V-3. Existing Cover Types by PVG for the Wildcat analysis area.

	Cold Upland Forest			Moist Upland Forest			Dry Upland Forest		
Cover Type	Cold UF acres	% Cover in Cold UF	HRV*	Moist UF acres	% Cover in Moist UF	HRV	Dry UF acres	% Cover in Dry UF	HRV
ABGR mix-ABGR	418	18	0-10*	3,708	50	5-30	1,431	8	1-5
LAOC mix-LAOC	646	27	0-15*	1,080	15	10-30		0	0-10
PIEN mix-PIEN		0	20-40*	473	6	0-15		0	0
PIPO mix-PIPO	1,031	44	0-5*	1,206	17	5-15	10,266	57	50-90
PSME mix-PSME	240	10	0-15*	619	9	15-30	6,415	35	5-15
OTHER				116	2				
PICO				117	2	5-30		0	0-5
Grand Total	2,333			7,335			18,113		

Recommended treatments would shift species composition in dry upland forest to favor ponderosa pine and western larch within their HRV and reduce Douglas-fir and grand fir cover to within their HRV. In moist upland forest treatments would aim to reduce grand fir cover while increasing Douglas-fir cover. Western larch, ponderosa pine, and lodgepole pine, and Englemann spruce would also be favored in the moist upland forest.

Species selection in silviculture treatments is a combination of moving species composition toward HRV and promotion of insect, disease, and fire resistant stands. Although HRV will be a guide for species selection it is by no means the only reason species are selected for or against. Each stand and micro-site will be considered for species selection based on HRV, disease threat, species composition, and fire resistance of each species.

Direct and Indirect Effects

Alternative 1

This alternative would allow the areas identified for treatment at this time to progress through natural successional patterns at their own rate with no outside manipulation. Current biological and ecosystem functions would continue as they are in the present condition. On-going management direction and activities such as grazing, fire protection, monitoring, and road maintenance would continue.

Taking no action in the Wildcat analysis area would result in species compositions that remain out of balance with historical conditions. In the dry upland forests, species mixes in ponderosa pine communities would continue to be dominated by Douglas-fir. This lessens the chance of pine regeneration more as time passes, and would make it difficult for the species to maintain a presence or dominance in stands where it historically has been the primary species. In the absence of regular fire cycles and periodic insect-caused mortality, Douglas-fir and grand fir in-growth will continue, moving the stands even further away from their historical range of variability.

The lack of reproduction in the dry upland forests in the Wildcat analysis area, especially ponderosa pine reproduction, is a direct result of the dense canopies of the Douglas-fir in-growth.

In the cold and moist upland forests, where the stands have experienced mortality from insects and disease, there would be no chance to shift species composition to dilute the effects of the agents causing the damage and mortality. For example, trees infected with mistletoe are infecting the understory trees coming in underneath the overstory and are perpetuating the problem. In areas of decreased stocking due to dense fuels and grass, no action foregoes the chance to re-establish these stands due to poor stocking with early seral species that are more resistant to insect and disease.

Alternative 2, 3, and 4

The silvicultural prescriptions in all action alternatives include some form of thinning or other harvest cuts that would have a direct effect on the species makeup of each stand. In all cases early seral species such as ponderosa pine, western larch and lodgepole pine would be favored, making them the preferred species to leave when considering trees to be thinned. Douglas-fir and grand fir would be more likely to be selected for removal.

This shift would bring species compositions across the landscape more in line with what occurred historically, improving overall stand health in the long term. On an individual stand basis, selecting against certain tree species would create stands of trees species mix that reflects early seral conditions. Although shade tolerant species would still be present in the stands, they would play a minor role in stand development.

In areas that would be planted, ponderosa pine and western larch would be the primary species planted, with mixes of other species as appropriate to the site. Ponderosa pine and western larch are early seral species for plant associations in both the cold, moist as well as the dry upland forest. At the end of all the activity, the overall effect in the stands would be a shift toward more ponderosa pine and western larch, with all the other species intermixed.

The implementation of the proposed commercial thinning, noncommercial thinning, and planting a portion of the project area would be moved toward the species composition more representative of the historical makeup of the area. Table V-4 identifies acres that would be affected by each of the three treatments.

Table V-4. Acres Moved Toward Historic Species Composition by Alternative

	Treatment			
Alternative	Commercial Thin	Noncommercial Thinning	Planting	Total acres moved
No Action	0	0	0	0
Alternative 2	2,218	3,299	942	5,287
Alternative 3	1,622	2,878	942	4,842
Alternative 4	2,179	2,544	942	4,493

Alternative 2

Alternative 2 includes noncommercial thinning on 3,299 acres; 956 acres outside harvest units and 230 acres within harvest units and 2,113 acres in the mechanical fuels treatment units. Commercial thinning completed on 2178 acres, and commercial thinning related to aspen on 40 acres with a total treatment area of 3,174 acres. Planting would occur on up to 942 acres. All activities would help move species composition toward a more insect and disease resistant forest.

Table V-4 illustrates that Alternative 2 would have the greatest effect on species composition moving 5,287 acres toward a more historic species composition. Considering there are 27,782 acres of upland forest in the Wildcat analysis area, Alternative 2 would change 19% of the upland forest to a more historical species composition.

Alternative 3

Under Alternative 3, noncommercial thinning would occur on 2,878 acres; 863 acres outside harvest units, 230 acres within harvest units and 1,785 acres within the mechanical fuels treatment units. Commercial thinning would be completed on 1,622 acres, and planting on approximately 942 acres. All activities would help move species composition toward a more insect and disease resistant forest.

Table V-4 illustrates that Alternative 3 would have a moderate effect on species composition moving 4,842 acres toward a more historic species composition. Considering there are 27,782 acres of upland forest in the Wildcat analysis area, Alternative 3 would change 17% of the upland forest to a more historical species composition.

Alternative 4

Alternative 4 includes noncommercial thinning on 2,544 acres; 956 acres outside harvest units, 230 acres within harvest units, and 1,358 acres within the mechanical fuels treatment areas. Commercial thinning completed on 2,179 acres, and planting on approximately 942 acres for a total treatment area of 4,493 acres.

Table V-4 illustrates that Alternative 4 would have the least effect on species composition moving 4,493 acres toward a more historic species composition. Considering there are 27,782 acres of upland forest in the Wildcat analysis area, Alternative 4 would change 16% of the upland forest to a more historical species composition.

Cumulative Effects

Cumulative effects are the results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions. Past activities such as fire suppression and even-aged and uneven-aged timber harvest helped create the conditions observed in current stands within the analysis area. There are no other proposed actions that would selectively effect species composition. The intent of the proposed thinnings for all action alternatives would be to thin the stands to the recommended basal area and species composition for each plant association, which when considered with past trends, would begin to move the landscape to more resilient conditions when fire, insect or disease occur.

Structure

Current Condition

Table V-5 summarizes the area of forest structural classes by Potential Vegetation Groups for the cold, moist, and dry upland forest, using the 7-class system described by O'Hara et al. (1996), for the Wildcat analysis area. It shows that the predominant structural stages are understory reinitiation and stem exclusion closed canopy; followed by the old forest multi strata; and stem exclusion open canopy structural stage. Stand initiation and young forest multi strata are relatively uncommon structural classes – each of them occupies four percent or less of the Wildcat analysis area.

Table V-5. Existing forest structural classes by Potential Vegetation Groups.

	Existing Potential Vegetation Group			
Structure Code	Cold UF	Moist UF	Dry UF	Total Ac
OFMS	826	276	4620	5722
OFSS	0	0	662	662
SECC	0	449	7105	7554
SEOC	544	1945	1555	4043
SI	131	843	315	1290
UR	833	3823	2797	7452
YFMS	0	0	1060	1060
Total Acres	2333	7335	18113	27782

Code	Forest Structural Class Description	Stage
OFMS	Old Forest Multi Strata structural class	Late/old
OFSS	Old Forest Single Stratum structural class	Late/old
SECC	Stem Exclusion Closed Canopy structural class	Middle
SEOC	Stem Exclusion Open Canopy structural class	Middle
SI	Stand Initiation structural class	Early
UR	Understory Reinitiation structural class	Middle
YFMS	Young Forest Multi Strata structural class	Mid/Early
Nonforest	Forbland, grassland, and shrubland cover types	Very Early

Sources/Notes: Forest structural classes are described in O'Hara et al. (1996) and in Powell (2000).
See Appendix G for description of forest structural classes.

Historic Range of Variability (HRV) Analysis

An HRV analysis was completed to measure the change from the existing condition. A historical range of variability analysis was used to evaluate structural classes for the Wildcat analysis area for the existing conditions; results are provided in Table V-6. It summarizes the percentage of each structural class, by potential vegetation group; the historical ranges for each of the structural classes are also shown.

The Historical Range of Variability results in Table V-6 shows a deficit in the amount of Old Forest Single Stratum acres in dry upland forest along with an excess of acres in the Old Forest Multi strata and Stem Exclusion Closed Canopy Potential Vegetation Groups (PVG). It also indicates that due to the spruce budworm outbreak in the early 1980s there is a considerable amount of acres in Stand Initiation and Understory Reinitiation in the cold and moist upland forests. The result of this is that there is a deficit of Old Forest Multi Strata in the moist upland forest (Appendix c – Eastside Screens Consistency).

Table V-6 Current historical range of variability (HRV) analysis for the forest structural classes in the Wildcat analysis area.

		OFMS	OFSS	SECC	SEOC	SI	UR	YFMS
Historical Ranges								
Cold UF	%	10-40	0-5	5-20	0-5	1-20	5-25	10-40
Moist UF	%	10-30	0-5	5-25	0-5	1-10	5-25	40-60
Dry UF	%	5-20	15-55	1-10	5-20	5-15	1-10	5-25
Existing Condition								
Cold UF	Ac.	826	0	0	544	131	833	0
	%*	35	0	0	23	6	36	0
Moist UF	Ac.	276	0	449	1,945	843	3,823	0
	%*	4	0	6	27	11	52	0
Dry UF	Ac.	4,620	662	7,105	1,555	315	2,797	1,060
	%*	26	4	38	9	2	15	6
Sources/Notes: Upland forest potential vegetation groups (PVG) are described in Powell (1998). Historical percentages (H%) were derived form Hall (1993), and USDA Forest Service (1995), and are summarized in Blackwood (1998). Current percentages (C%) were based on NFS lands. Structural class codes are described in Table 3.5. Gray cells show instances where the current percentages (C%) is above the historical percentage (H%) for a structural class. Black cells show instances where the current percentage is below the historical percentage.								

Direct and Indirect Effects

Effects Common to All Action Alternatives

All action alternatives would be focused primarily upon increasing Old Forest Single Stratum in dry upland forest, which is well below its historic range of variability in the Wildcat analysis area. Thinning from below removing the smaller trees and leaving the larger trees would be the primary means of achieving this goal, especially in the stem exclusion closed canopy and old forest multi strata. Thinning the stands would reduce the number of trees, allowing the remaining trees to grow larger more quickly. The effect of this treatment would be to shift their current structure of stem exclusion closed canopy to a more open condition resembling old forest single stratum. Thinning in stem exclusion open canopy would not alter the current structural stage, but it would enhance growing conditions for individual trees within the stands so that they may obtain old forest single strata quicker.

In the cold and moist upland forest, thinning in stand initiation, understory reinitiation, old forest multi strata, and young forest multi strata does not change the structural stage, however it does lessen the risk of insect, disease and stand replacement fires. Also, thinning in these stages will move them to an old growth multi strata stage more quickly than if left untreated. Old Forest Single Strata (OFSS) structural stage in the cold and moist upland forests is a rare structural stage due to environmental conditions.

Alternative 1

Continuation of existing management direction, including fire suppression, would allow a multi-layered structure to increase. The level of shade-tolerant species would continue to increase as the numbers of ponderosa pine would continue to decline in numbers and become less of a presence across the landscape.

With the current conditions of understory reinitiation (UR) in the cold and moist upland forests and the stem exclusion closed canopy (SECC) in the dry upland forest, it is unlikely that given the current conditions and continued fire suppression that the forest structure would recover its historical range in the Wildcat analysis area without some sort of intervention. In other words, these two structure classes would become stagnated and never achieve old forest conditions.

Leaving the analysis area in its current condition (taking no action), would do little to achieve the goals and desired future condition as stated in the Forest Plan which are 1) species composition and stocking level control emphasizing seral species, and 2) animal, insect, and disease protection (Forest Plan, pg. 4-9). Not meeting the desired future condition and achieving these goals would most likely allow conditions to further decline.

Alternative 2

Structural classes would be changed through commercial and noncommercial thinning. In the dry upland forests, post structure Old Forest Single Stratum (OFSS) would increase from the existing condition. Stem Exclusion Open Canopy (SEOC) would increase and Stem Exclusion Closed Canopy (SECC) would decrease. Stem Exclusion Open Canopy mimics Old Forest Single Stratum in that it creates the park-like stands, but is made up of smaller diameter trees.

In the cold and moist upland forests, there would be little change to the structure.

	Potential Vegetation Group		
Structure	Cold UF (acres)	Moist UF (acres)	Dry UF (acres)
OFMS	-14	0	-318
OFSS	+11	0	+393
SECC	0	-74	-863
SEOC	0	+4	+760
SI	+3	-11	-3
UR	0	+80	+29
YFMS	0	+3	+1

Alternative 3

Changes in the structural classes in alternative 3 would be similar to alternative 2 with fewer acres moved toward the desired structures of Old Forest Single Story and Stem Exclusion Open Canopy for the potential vegetation groups in the Dry Upland Forest.

	Potential Vegetation Group		
Structure	Cold UF (acres)	Moist UF (acres)	Dry UF (acres)
OFMS	-14	0	-258
OFSS	+11	0	+342
SECC	0	-71	-712
SEOC	+41	+4	+601
SI	-38	-61	-4
UR	0	+83	+29
YFMS	0	+3	+1

Alternative 4

Alternative 4 would be very similar to Alternative 2 in structural class changes. Alternative 4 would result in 9 less acres moving from stem exclusion closed canopy to stem exclusion open canopy in the dry upland forest as compared to Alternative 2.

	Structural Changes within Potential Vegetation Group		
Structure	Cold UF (acres)	Moist UF (acres)	Dry UF (acres)
OFMS	-14	0	-318
OFSS	+11	0	+393
SECC	0	-74	-854
SEOC	0	+1	+752
SI	+3	-10	-4
UR	0	+80	+29
YFMS	0	+3	+1

Cumulative Effects

Past activities such as fire suppression and even-aged and uneven-aged timber harvest helped create the conditions observed in current stands within the analysis area. There are no other present or foreseeable future projects that would affect density in the project area. The proposed thinnings would counteract effects of these past activities and start moving these stands towards a more open forests and increasing vigor of individual trees producing larger trees and increase old forest single story structure throughout the project area.

Alternative 2

Alternative 2 would influence the structure in the Wildcat analysis area. In the dry upland forests, post structure Old Forest Single Stratum (OFSS) would increase by 2% (increases from 4% to 6%) from the existing condition. Stem Exclusion Open Canopy (SEOC) would increase 4% from the existing 9% to 13% and Stem Exclusion Closed Canopy (SECC) would decrease 4% from the existing 38% to 34%. Stem Exclusion Open Canopy mimics Old Forest Single Stratum in that it creates the park-like stands, but is made up of smaller diameter trees. All of these changes would move the dry upland forest closer to the historical range of variability.

In the cold and moist upland forests, there would be little change to the structure.

Alternative 2								
		OFMS	OFSS	SECC	SEOC	SI	UR	YFMS
Cold UF	Ac.	812	11	0	544	134	833	0
	%*	35	0.5	0	23	6	36	0
Moist UF	Ac.	276	0	375	1,949	832	3,903	3
	%*	4	0	5	27	11	53	0
Dry UF	Ac.	4,302	1,055	6,242	2,315	312	2,826	1,061
	%*	24	6	34	13	2	15	6

Alternative 3

Alternative 3 would also have an impact on the existing conditions for the wildcat analysis area. In the dry upland forests, Old Forest Single Strata (OFSS) would increase by 2% (increases from 4% to 6%) from the existing condition. Alternative 3 would not have as great an impact on Stem Exclusion Closed Canopy as Alternative 2 would. Alternative 3 would reduce Stem Exclusion Closed Canopy by 3% from the existing condition to 35% and increase Stem Exclusion Open Canopy by 3% from the existing condition to 12%.

In the cold and moist upland forests, there would be little change to the structure.

Alternative 3								
		OFMS	OFSS	SECC	SEOC	SI	UR	YFMS
Cold UF	Ac.	812	11	0	585	93	833	0
	%*	35	0.5	0	25	4	36	0
Moist UF	Ac.	276	0	378	1949	782	3950	3
	%*	4	0	5	27	11	53	0
Dry UF	Ac.	4362	1004	6393	2156	311	2826	1061
	%*	23	6	35	12	2	16	6

Alternative 4

Alternative 4 would have the same impact on the existing conditions as Alternative 2 for the Wildcat analysis area. In the dry upland forests, Old Forest Single Strata (OFSS) would increase by 2% (increases from 4% to 6%) from the existing condition. Stem Exclusion Open Canopy (SEOC) would increase 4% from the existing 9% to 13% and Stem Exclusion Closed Canopy (SECC) would decrease 4% from the existing 38% to 34%.

In the cold and moist upland forests, there would be little change to the structure.

Alternative 4								
		OFMS	OFSS	SECC	SEOC	SI	UR	YFMS
Cold UF	Ac.	812	11	0	544	134	833	0
	%*	35	0.5	0	23	6	36	0
Moist UF	Ac.	276	0	375	1,946	832	3,903	3
	%*	4	0	5	27	11	53	0
Dry UF	Ac.	4,302	1,055	6,251	2,307	311	2,826	1,061
	%*	24	6	34	13	2	15	6

Density

Current Condition

A forest density analysis was completed because it can help identify opportunities to use thinning and other density management treatments to address forest health issues in the Wildcat analysis area. The density analysis was based on a process described in Powell (2001b). Results of the forest density analysis were used to identify individual stands that were overstocked. These stands were considered for treatment under the Wildcat Environmental Analysis (EA). Results of the forest density analysis are summarized below. It shows that a high percentage of forestland in the Wildcat analysis area is overstocked (84 percent).

The upper stand density (stocking) for the Wildcat project area currently averages about 130 square feet of basal area per acre, although some areas have tree density in excess of 180 square feet of basal area per acre. This means the overstocked stands in the project area have forest density levels that exceed recommended stocking by a factor of two or three times (Powell 1999).

Table V-7: Forest density analysis for the Wildcat analysis area – Existing conditions

Potential Vegetation Group	Total Acres	Overstocked Acres	Overstocked Percent
Cold Upland Forest	2,333	1,232	53
Moist Upland Forest	7,334	4,256	58
Dry Upland Forest	18,114	17,901	99
Total Upland Forest	27,781	23,389	84

An historical analysis was also conducted for the Wildcat analysis area. Historical levels are based on personal communication with the forest silviculturist and represent mid-points of ranges. Tables V-8, V-9, and V-10 illustrate density ratings of Low, Moderate and High within the specific PVGs in the Wildcat Project area. The Cold Upland Forest shows slight deviation from the historical density where Moist Upland forest shows a much greater deviation in the moderate and high ratings for density. The greatest deviation in historical density ratings can be seen in the Dry Upland Forest with stands having high density over 90 percent of the area when historically these stand where on about 10 percent of the area.

Table V-8. Density analysis for the Cold Upland Forest

Density Rating	Acres	Percent	Historical %	Historical Ac
Low	898	38.4	20	467
Moderate	203	8.7	30	700
High	1,232	52.8	50	1166
Total	2,333			2,333

Table V-9. Density analysis for the Moist Upland Forest

Density Rating	Acres	Percent	Historical %	Historical Ac
Low	1,197	16.3	20	1,467
Moderate	1,881	25.7	50	3,668
High	4,256	58.0	30	2,200
Total	7,334			7,334

Table V-10. Density analysis for the Dry Upland Forest

Density Rating	Acres	Percent	Historical %	Historical Ac
Low	212	1.2	60	10,868
Moderate	1,223	6.7	30	5,434
High	16,678	92.1	10	1,811
Total	18,113			18,113

Direct and Indirect Effects

Alternative 1

Eighty four percent of the upland forests in the Wildcat analysis area are considered overstocked. Overstocked stands are susceptible to insect and disease outbreaks, crown fire, and other disturbance processes affecting dense tree stands. In the absence of disturbance, stands would become stagnated and would enter the self-thinning zone where density related competition would result in individual tree mortality, low growth rates, and susceptibility to damaging agents.

Alternative 2

All action alternatives would reduce stocking (density) in the treatment units. This density reduction would be accomplished through noncommercial and commercial thinning. Prescriptions for all action alternatives would be designed to begin bringing stand densities back to historical conditions. Removing some of the trees in the treatment units would allow the remaining trees more access to sunlight, nutrients, water, and growing space, which would improve the overall health of the remaining affected stands. Maintaining or improving healthy tree stands cold reduce damage and mortality from insects and disease, and create a more long-lived and resilient stand.

Tables V-11, V-12, and V-13 illustrate density rating changes of Low, Moderate, and High within the specific PVGs in the Wildcat Project area following the thinning and noncommercial thinning activities under alternative 2.

Table V-11: Density analysis for the Cold Upland Forest for Alternative 2

Density Rating	Changed Acres	Total Percent	Historical %	Total Acres	Historical Ac
Low	+49	40	20	947	467
Moderate	+438	28	30	641	700
High	-487	32	50	745	1,166

Table V-12: Density analysis for the Moist Upland Forest for Alternative 2

Density Rating	Changed Acres	Total Percent	Historical %	Total Acres	Historical Ac
Low	+567	24	20	1,764	1,467
Moderate	+521	33	50	2,402	3,667
High	-1,088	43	30	3,168	2,200

Table V-13: Density analysis for the Dry Upland Forest for Alternative 2

Density Rating	Changed Acres	Total Percent	Historical %	Total Acres	Historical Ac
Low	+161	2	60	373	10,868
Moderate	+2,155	19	30	3,378	5,434
High	-2,315	79	10	14,363	1,811

Alternative 3

Tables V-14, V-15, and V-16 illustrate density rating changes of Low, Moderate, and High within the specific PVGs in the Wildcat Project area following the thinning and noncommercial thinning activities under alternative 2.

Table V-14. Density analysis for the Cold Upland Forest for Alternative 3

Density Rating	Changed Acres	Total Percent	Historical %	Total Acres	Historical Ac
Low	+49	40	20	947	467
Moderate	+397	27	30	600	700
High	-446	33	50	786	1,166

Table V-15. Density analysis for the Moist Upland Forest for Alternative 3

Density Rating	Changed Acres	Total Percent	Historical %	Total Acres	Historical Ac
Low	+536	23	20	1,733	1,467
Moderate	+445	33	50	2,326	3,667
High	-977	44	30	3,275	2,200

Table V-16. Density analysis for the Dry Upland Forest for Alternative 3

Density Rating	Changed Acres	Total Percent	Historical %	Total Acres	Historical Ac
Low	+161	2	60	373	10,868
Moderate	+605	18	30	3,138	5,435
High	-2,076	80	10	14,602	1,811

Alternative 4

Tables V-17, V-18, and V-19 illustrate density rating changes of Low, Moderate, and High within the specific PVGs in the Wildcat Project area following the thinning and noncommercial thinning activities under alternative 2.

Table V-17. Density analysis for the Cold Upland Forest for Alternative 4

Density Rating	Changed Acres	Total Percent	Historical %	Total Acres	Historical Ac
Low	+49	40	20	947	467
Moderate	+282	21	30	485	700
High	-331	39	50	901	1,166

Table V-18. Density analysis for the Moist Upland Forest for Alternative 4

Density Rating	Changed Acres	Total Percent	Historical %	Total Acres	Historical Ac
Low	+469	23	20	1,666	1,467
Moderate	+437	32	50	2,318	3,667
High	-906	46	30	3,350	2,200

Table V-19. Density analysis for the Dry Upland Forest for Alternative 4

Density Rating	Changed Acres	Total Percent	Historical %	Total Acres	Historical Ac
Low	+134	2	60	346	10,868
Moderate	+1,904	17	30	3,127	5,435
High	-2,037	81	10	14,641	1,811

Cumulative Effects

Past activities such as fire suppression and selective timber harvest helped create the stocking density in the current stands identified in the analysis area. There are no other present or foreseeable future projects that would affect density in the project area. The proposed thinnings would counteract effects of these past activities and start moving these stands toward a more resilient landscape.

Alternative 2

Alternative 2 would reduce overstocked stands from 84% to 78% after harvest activities and non-commercial thinning.

Table V-20. Forest density analysis for Alternative 2 for the Wildcat analysis area

Potential Vegetation Group	Total Acres	Overstocked Acres	Overstocked Percent
Cold Upland Forest	2,333	745	32
Moist Upland Forest	7,334	3,168	43
Dry Upland Forest	18,114	17,741	98
Total Upland Forest	27,781	21,654	78

Alternative 3

Alternative 3 would reduce overstocked stands from 84% to 78% after harvest activities and non-commercial thinning.

Table V-21. Forest density analysis for Alternative 3 for the Wildcat analysis area

Potential Vegetation Group	Total Acres	Overstocked Acres	Overstocked Percent
Cold Upland Forest	2,333	786	34
Moist Upland Forest	7,334	3,275	45
Dry Upland Forest	18,114	17,740	98
Total Upland Forest	27,781	21,801	78

Alternative 4

Alternative 4 would reduce overstocked stands from 84% to 78% after harvest activities and non-commercial thinning.

Table V-22. Forest density analysis for Alternative 4 for the Wildcat analysis area

Potential Vegetation Group	Total Acres	Overstocked Acres	Overstocked Percent
Cold Upland Forest	2,333	901	39
Moist Upland Forest	7,334	3,350	46
Dry Upland Forest	18,114	17,768	98
Total Upland Forest	27,781	22,019	79

Quaking aspen

Current Condition

Quaking aspen *(Populus tremulodies)* is a deciduous hardwood tree that is generally found in areas of relatively high soil moisture. In the Blue Mountains, this species is considered at the western edge of aspen's North American range (Shirley and Erickson 2001), and forms "small groves that can be thought of as a *keystone cover type*—one that has more significant effects on species diversity and ecological processes than would be expected considering the comparatively small amount of land area that it occupies (Knight 2001)." Aspen reproduction is almost exclusively due to vegetative or clonal reproduction and this species is well known for its longevity. Many clones are thought to be thousands of years old although aspen trees have an average lifespan of between 100 and 150 years in the Rocky Mountains, stands occasionally survive beyond 200 years (Burns and Hondkala 1990; Jones and Schier 1985). If the same holds true for aspen in the Blue Mountains, most of our aspen overstories are approaching the end of their natural life cycles. Aspen is also a very shade intolerant tree species. On the Heppner Ranger District, virtually every other tree species has more tolerance than aspen, making aspen vulnerable to suppression and clonal death (Baler 1949, Powell 2008).

Aspen across the western United States are in decline including in the Blue Mountains and the Heppner Ranger District. It is hypothesized that the decline is due to a combination of factors including fire suppression, vegetation structural changes, browsing, and disease among other proximate and ultimate causes. On the Umatilla National Forest and specifically the Heppner Ranger District fire suppression and pressure from both wild and domestic ungulates have contributed to declining aspen stands (Shirley and Erickson, 2001). This is especially true because our district has characteristically small clones where herbivory can be concentrated (Guyon 2006).

Aspen on Heppner Ranger District are in danger of clonal death and local extinction. "Once aspen is gone from a site, it is gone- there is no slumbering root system underground, just waiting for the next wildfire to awaken it! (Powell 2008)."

Unit 77 (Cottonwood Springs) has an aspen component consisting of scattered decadent and declining trees and saplings with large amounts of stem damage. Stem damage may be a result of ungulate feeding, or canker disease. The stand has limited amounts of aspen suckering. Suckering that is occurring is in close proximity to living aspen trees and in areas where the overstory has died. A heavy dead and downed aspen component is present in the stand, indicating that the aspen clone was more vigorous and widespread in the past. There are moderate to high amounts of conifer presence in the aspen stand. Ponderosa pine comprises the majority of conifer stocking in the Cottonwood Springs stand. Scattered

Douglas-fir is also present in the overstory. Overstory ponderosa pine are highly infected with dwarf mistletoe.

Unit 82 consists of two disconnected aspen stands. Overall, this aspen stand has fewer overstory aspen than does stand 77, but more dense suckering. Douglas-fir, ponderosa pine, and grand fir compose the overstory. Small diameter conifer regeneration is found throughout the stand.

Unit 83 is located adjacent to the riparian meadow along Dry Swale Creek north of the 2107 road. This stand consists of a few larger diameter aspen and numerous suckers. Suckering is heaviest near the edge of the meadow and relatively sparse further east, where understory and overstory conifers are more abundant. Some suckers near the meadow edge have grown above the browse zone of ungulates; however, overall regeneration is poor.

Unit 84 contains several disconnected aspen stands. Unit 84 is located north of the 2107 road adjacent to a riparian meadow along upper Dry Swale Creek. The northern-most portion of the aspen in this unit consists of a mix of larger mature aspen and sapling-pole sized aspen. Large overstory and understory conifers (larch, spruce, lodgepole pine, and grand fir) are present throughout the stand. Suckering is extensive but suppressed; this stand appears to be more vigorous than both stands 77 and 82. The aspen stand at the southern end of the unit consists of several decadent, dying aspen trees and sparse regeneration. Suckering occurs both north and south of the 2107 road, primarily below small diameter lodgepole pine and a few western larch.

Direct and Indirect Effects

Alternative 1

Aspen stands would continue to decline as conifer encroachment and browsing further reduce their ability to reproduce effectively. The small remnant clones currently in the project area are likely to die and this unique habitat could be lost from the Wildcat project area indefinitely.

Alternative 2, 3, 4, and 5

In all action alternatives, the treatment of aspen stands would include removing the majority of conifers to reduce canopy cover to less than 25 percent in and around the current aspen stand up to one and one half tree heights beyond the current extent of the aspen root system as recommended by Schier and Campbell (1980), Bartos and Campbell (1998), and Powell (2008). In addition, a fence would be installed to encompass the treated area to mitigate herbivory of aspen suckers (Shirley and Erickson, 2001). If, after these activities are implemented, monitoring suggests desired future conditions are not being met (aspen sprouting of 500 stems per acre or more), a mix of aspen and black cotton wood seedlings could be planted to augment natural aspen suckering as recommended by Powell (2008).

This project would affect aspen clones in five ways. Overstory conifer removal would allow sunlight to reach the soil surface, promoting aspen suckering and stem development. Refer to Powell (2008) for a detailed discussion of sprouting physiology. Overall conifer reduction near aspen clones would help restore the historical water table and increase water availability to aspen. Prescribed fire across the landscape would also have a beneficial effect on aspen stimulation and regeneration. Fence construction around the aspen clone would exclude ungulates from browsing on sprouting aspen induced by increased sunlight and water availability.

The removal of conifers from degraded aspen stands has proven to be an effective treatment for aspen restoration across the western United States. Jones et al. (2005) tested the effects of conifer removal and found a significant increase in aspen regeneration in stands treated with conifer removal via traditional harvesting methods and pre-commercial thinning similar to the treatment proposed in the Wildcat project. Root stimulation was attributed to conifer removal and, in some part, to mild root disturbance from logging operations. Kilpatrick (2003), Shepperd (2001), and Benedict (2001) have all found similar results in their respective conifer removal experiments. Using these studies and the condition of stands where conifer removal and fencing has occurred on the Heppner Ranger District as evidence we conclude that conifer removal is an effective method for stimulating declining aspen clones.

Cumulative Effects

Past activities including fire suppression, wildlife management and domestic grazing have contributed to the present condition of aspen stands observed in the analysis area. Following project implementation current and future grazing and wildlife impacts to aspen stands would be greatly reduced. Prescribed fire or grazing have the potential to result in failure of fencing designed to reduce browsing of aspen. If fencing fails aspen sprouts would continue to be grazed by both cattle and wildlife causing declines in aspen viability. Aspen fences would need to be monitored for soundness on a regular basis or following prescribed fire to ensure reconstruction or repair occurs as need.

FUELS

This section incorporates by reference the Wildcat Fuels Report contained in the project analysis file at the Heppner Ranger District. Specific information on the methodologies, assumptions, and limitations of analysis and other details are contained in the report. A summary of the current conditions of the affected environment and the predicted effects of the Proposed Action and its alternatives are discussed in this section.

Scope of Analysis

The scale for this analysis includes the upland forest portion composing 27,779 acres of two sub-watersheds within the Heppner Ranger District forest boundary: Little Wall Creek – Skookum Creek and Swale Creek. This scale was chosen because the effects from the proposed actions are limited to forested settings and would not be distinguishable at a larger scale.

Fire Regime Condition Class: Only Upland forest potential vegetation groups (dry, cold, moist) were analyzed because there would be no significant changes within the non-forest portions of the Wildcat Analysis Area.

Fire Regime Condition Class

A natural fire regime is a general classification of the role fire would play across a landscape in the absence of modern human mechanical intervention, but including the influence of aboriginal burning (Agee 1993, Brown 1995). Fire Regime Condition Class describes the deviation from natural fire regimes in terms of fire return interval (length between subsequent fires) and vegetative change from historical composition and density. There are three condition classes numbered 1 – 3 with a condition class 1 being representative of historical condition and condition class 3 showing the greatest deviation from historical fire regime and vegetative structure.

Current Condition

Current condition class ratings for the Wildcat analysis area are not representative of historic percentages in the upland forest. 27,779 acres of the Wildcat analysis area were analyzed to determine condition class rating by fire regime and potential vegetation group (PVG). Within the project area 41% of the upland forest acres are in condition classes 2 and 3 and 59% of upland forest acres are within Condition Class 1. Table F-1 shows current condition classes for the upland forest within the Wildcat analysis area. These acres are further broken down into the potential vegetation groups. Three forested PVG's exist within the analysis area; they are cold upland forest, moist upland forest and dry upland forest. Fire regimes can be associated with PVG's and are part of the condition class analysis in determining the degree of departure from reference conditions. Reference conditions for Condition Class rating by potential vegetation group are shown below in Table F-2.

Table F-1: Current Condition Class by Potential Vegetation Group (PVG) and Fire Regime.

Current PVG	CC1	CC2	CC3	Total Acres
Dry Upland Forest				
Fire Regime 1	10,871--60%	3,555—20%	3,685—20%	18,110
Moist Upland Forest.				
Fire Regime 3	4,073— 56%	1,667—23%	1,595—21%	7,335
Cold Upland Forest				
Fire Regime 4	1,480—63%	425—18%	429—19%	2,334
Total Acres	16,424	5,645	5,709	27,779
Percent of Analysis area	59%	20%	21%	100%

** Acres analyzed represent only upland forest within the analysis area. Areas of grasslands, meadows, and upland herb acres were excluded and make up the difference between condition class acres and analysis acres.*

Table F-2: Historic Condition Class by Potential Vegetation Group (PVG) and Fire Regime. (Source: Umatilla FRCC lookup table by David Swanson)

Historic PVG	CC1	CC2	CC3	Total Acres/% Fire Regime
Dry Upland Forest				
Fire Regime 1	13,553--75%	3,614—20%	903—5%	18,070
Moist Upland Forest.				
Fire Regime 3	2,934— 40%	2934—40%	1,467—20%	7,335
Cold Upland Forest				
Fire Regime 4	1,634—70%	155—6%	545—24%	2334
Total Acres	18,121	6,703	2,915	27,739
Percent of Analysis area	65%	24%	11%	100%

Due to past management activities, dry and moist upland forests within fire regimes 1 & 3 show the highest degree of departure in condition class and will be affected the most from wildfires. These areas have missed several fire return intervals and are now composed of multilayered, overstocked, fire intolerant species which create ladder fuels that carry fire into the dominant desired overstory. Today, fires in the dry and moist forests would have moderate to severe effects characterized by high fire severity and intensity on landscapes that historically displayed low to moderate severity. The risk of losing key ecosystem components would be high. Ignitions today would not function as a natural disturbance process within their historical range of variability pertaining to fire size, frequency, intensity, severity, or landscape patterns.

Direct and Indirect Effects

Table F-3: Comparison of alternatives and the desired condition for upland forest fire regime condition class.

	Alternative 1		Alternative 2		Alternative 3		Alternative 4	
Condition Class 1	16,424	59%	22,327	80%	22,099	80%	22,019	79%

Condition Class 2	5,646	20%	3,431	12%	3,476	12%	3,649	13%
Condition Class 3	5,709	21%	2,021	7%	2,204	8%	2,111	8%

Alternative 1

Under alternative 1, the Wildcat analysis area would continue under its current management activities. No harvest or fuel treatment activities would occur under the direction of this environmental assessment. The Wildcat area would continue on its present trends. Species composition, density and structure would continue to be altered from historic ranges. Uncharacteristic high fuel loads would continue to put the Wildcat analysis area at risk of large scale severe fires. Fire suppression would continue increasing the number of fire return intervals missed.

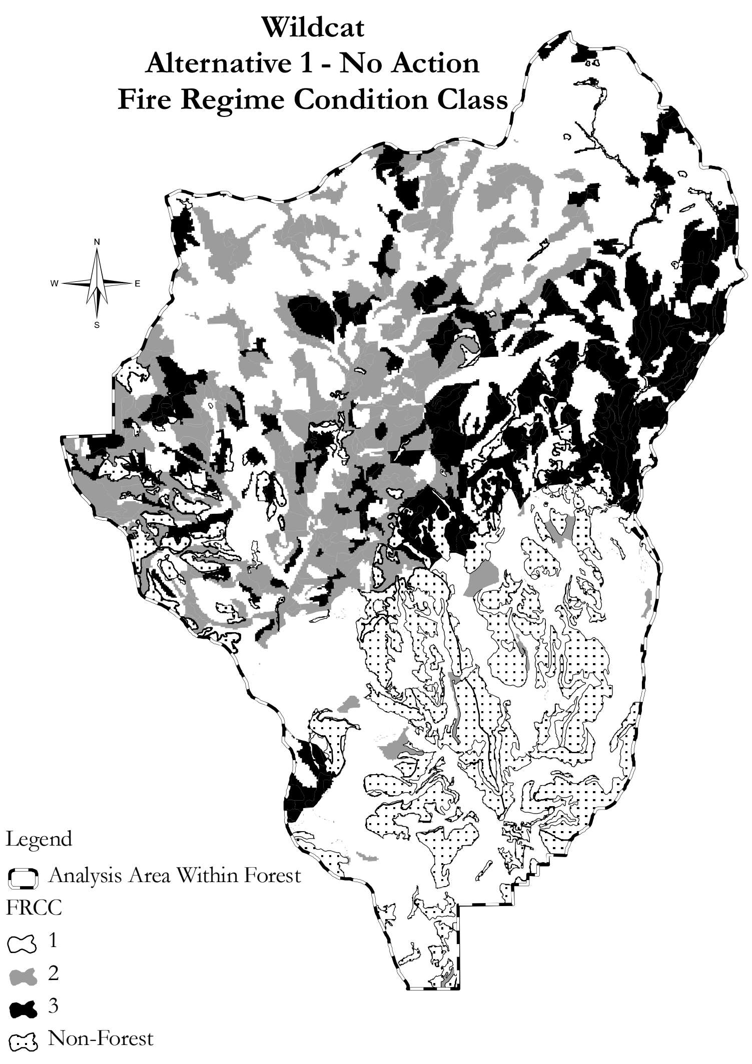


Figure 3.1: Fire Regime Condition Class under Alternative 1.

Condition classes would continue to be altered from their historic ranges. The risk of losing key ecosystem components should a wildfire occur would remain moderate to high. Vegetative attributes would continue to be altered from their historic ranges in terms of species composition, structure, and density, contributing to an increase in vertical fuel loadings and ladder fuels. Due to ongoing fire suppression fire frequencies will continue to depart from historic ranges increasing the number of missed return intervals. This condition will result in uncharacteristic changes in fire size, frequency, intensity, and severity. Fire behavior will increase over time through increased flame lengths and intensities uncharacteristic of the historic role fire played in these dry sites. Table F-1 shows current condition class acres by potential vegetation group. Figure 3.1 displays condition class placement throughout the analysis area.

Alternative 2

Alternative 2 addresses the need to shift acres in the Wildcat Analysis Area from condition classes 2 and 3 towards condition class 1 and maintain upland forest at Condition Class 1. Prescribed burning of the landscape will occur to reduce fuel loading and maintain Condition Class 1 acres. 6,156 acres of Upland forest will be maintained at Condition Class 1. Fire regime condition class 3 will be moved toward condition classes 1 and 2 by reducing small diameter, fire intolerant species, and accumulated hazardous ground fuels. The proposed thinning treatments and prescribed underburns would help move current fire regime condition classes closer to historical composition and structure.

Specifically the proposed action will change 3,598 acres of condition class 2 to 1, and 2,354 acres of condition class 3 dry upland forest to 1. Additionally this proposed action will shift 1,334 acres of condition class 3 cold and moist upland forest to condition class 2. This will be accomplished through mechanical treatment of fuels, commercial and pre-commercial thinning, and prescribed burning. See Table F-3 for the comparison of Alternative 2 acres and their relative percent abundance in the landscape. Figure 3.2 shows the condition class acreage of the proposed action in the analysis area.

This proposed action would bring the Wildcat area closer to its historic range of variability returning the treated acres to characteristic or desired composition, structure, and density. Fire attributes such as size, frequency, intensity, and severity would be characteristic of historic patterns across the landscape.

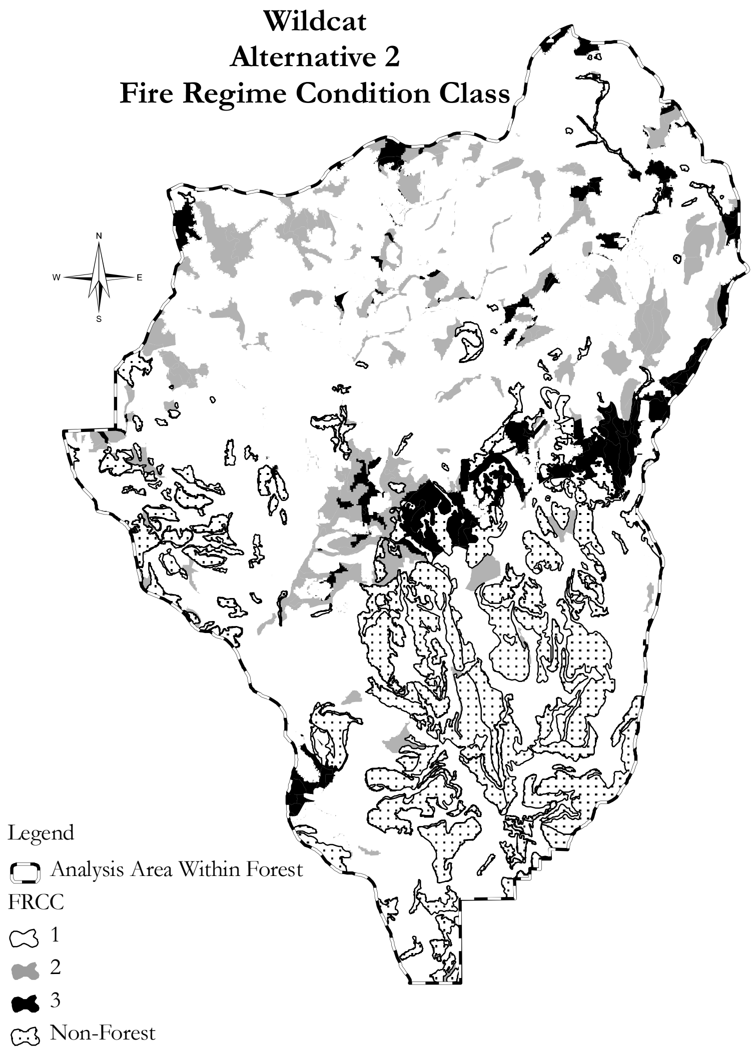


Figure 3.2: Fire Regime Condition Class under Alternative 2.

Alternative 3

Alternative 3 addresses the need to shift acres in the Wildcat Analysis Area from condition classes 2 and 3 towards condition class 1. Under this alternative 6,041 acres of Upland forest will be maintained at Condition Class 1. Fire regime condition class 3 will be moved toward condition classes 1 and 2 by reducing small diameter fire intolerant species and accumulated hazardous ground fuels. Stands would move toward historical species composition, density, size, and structure. The proposed thinning treatments and prescribed underburns would help move current fire regime condition classes closer to historical composition and structure.

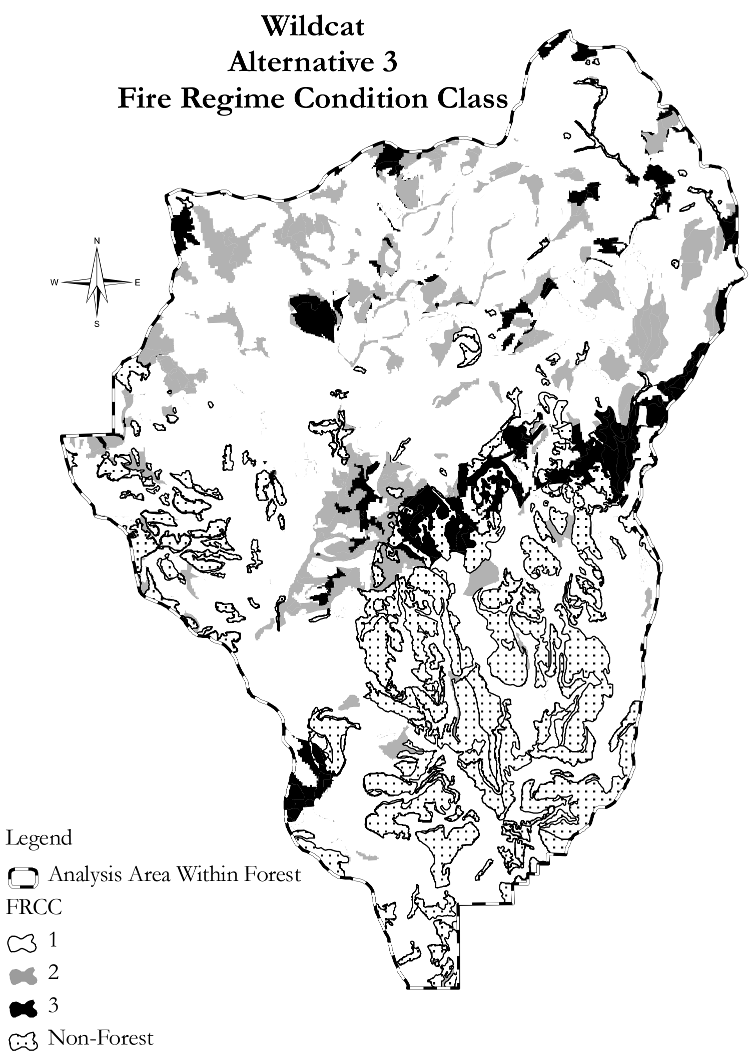


Figure 3.3: Fire Regime Condition Class under Alternative 3.

Specifically the proposed action will change 3,475 acres of condition class 2 to 1, and 2,200 acres of dry upland forest condition class 3 to 1. Additionally this proposed action will shift 1,305 acres of condition class 3 cold and moist upland forest to condition class 2. This will be accomplished through mechanical treatment of fuels, commercial and pre-commercial thinning, and prescribed burning. See Table F-3 for the comparison of Alternative 3 acres and their relative percent abundance in the landscape. Figure 3.3 shows the condition class acreage of the proposed action in the analysis area.

Alternative 3 would bring the Wildcat area closer to its historic range of variability returning the treated acres to characteristic or desired composition, structure, and density. Fire attributes such as size, frequency, intensity, and severity would be characteristic of historic patterns across the landscape.

Alternative 4

Prescribed burning of the landscape will occur to reduce fuel loading and maintain Condition Class 1 acres. Under this alternative 5,180 acres of Upland forest will be maintained at Condition Class 1. Fire regime condition class 3 will be moved toward condition classes 1 and 2 by reducing small diameter fire intolerant species and accumulated ground fuels. Stands would move toward historical species composition, density, size, and structure. The proposed thinning treatments and prescribed underburns would help move current fire regime condition classes closer to historical composition and structure.

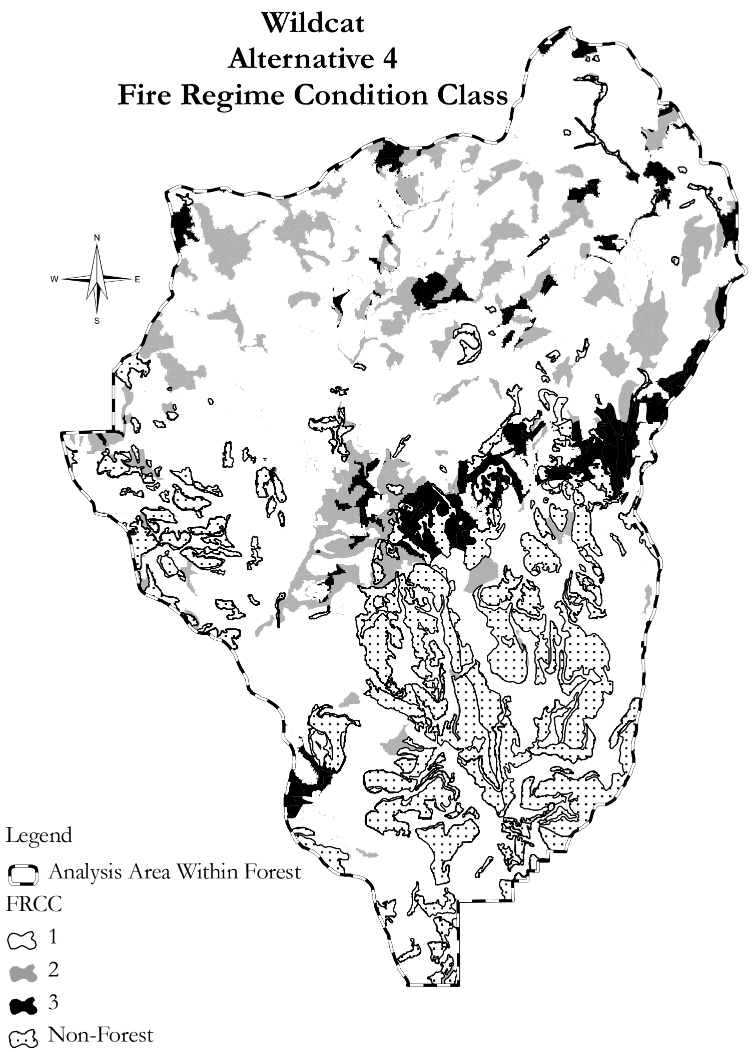


Figure 3.4: Fire Regime Condition Class under Alternative 4.

Specifically the proposed action will change 3,307 acres of condition class 2 to 1, and 2,334 acres of dry upland forest condition class 3 to 1. Additionally this proposed action will shift 1,265 acres of condition class 3 cold and moist upland forest to condition class 2. This will be accomplished through mechanical treatment of fuels, commercial and pre-commercial thinning, and prescribed burning. See Table F-3 for the comparison of Alternative 4 acres and their relative percent abundance in the landscape. Figure 3.4 shows the condition class acreage of the proposed action in the analysis area.

Cumulative Effects

The degree of departure in vegetation composition and natural fire regime correlates to the FRCC categorization (FRCC Guidebook, 2008). The larger the departure from reference conditions and historic range of variability in structure, density, and missed fire return intervals results in increased fire behavior. Past activities affecting FRCC include fire suppression, harvest, grazing, public use firewood collection, and hazardous fuels treatments.

Past fire suppression and large tree harvest has increased FRCC rating within the Wildcat Analysis Area by promoting a change in species composition and surface and vertical fuel load. This change can be characterized by an increase in available fuel and understory tree density which correlate to increased fire behavior and effects in the event of a wildfire - especially in Fire Regime 1 ecosystems (Brown, 2000, Agee, J.K. 1991).

Grazing may facilitate an alteration of fuel abundance and structure where grass is the primary carrier of fire. The removal of this fuel and its redistribution as animal waste alters fuel continuity where grazing is prevalent. It has been suggested that grazing can serve as a fuel reduction treatment (Nader et al., 2007) and thus reduce wildfire size and/or behavior. Others suggest that the benefits of grazing on fire behavior and size is evident only at small spatial scales and landscape effects are negligible (Williams et al., 2006). Grazing and continued fire exclusion results in further departure from natural fire regimes and buildup of woody fuels in forested settings thereby altering FRCC ratings.

Collection of firewood within 300 lateral slope feet of open roads within the Wildcat area has generally reduced the amount of available dead fuel within this corridor. Trees that are removed have a stump height (1 foot from base) diameter limit of 24 inches. Only dead snags and downed logs are allowed to be removed. All species are available for collection with the exception of ponderosa pine. This removal of fuel and snags alters the fuel profile and does little to affect the FRCC rating.

The degree of departure from historic conditions has been lessened and FRCC ratings improved through fuel treatment. Hazardous fuel treatments are aimed at mimicking natural fire behavior and function within an ecosystem. Fuels treatment is accomplished through mechanical thinning, removal of fuel, prescribed fire, or a combination of the three. Treatments are designed to alter FRCC through manipulation of species composition, removal of fire intolerant understory species, and reduction of available fuel.

Present activity within the analysis area includes fire suppression, public use firewood collection and grazing. Fire suppression may increase the amount of fuel accumulating within the analysis area. It also allows shade tolerant species to continue to develop in the understory and create ladder fuels that increase the potential for crown and stand replacement fire events. The continuation of fire suppression activities and the resultant increase in missed fire return intervals will facilitate further decline in FRCC throughout the analysis area.

Fire suppression, grazing, and public use firewood collection are the three reasonably foreseeable actions that will affect fuel loading and composition in the analysis area. This will allow fuels buildup and sustain conditions previously described in above section.

Fire Behavior (Stand Replacement Potential)

Current Condition

The Wildcat project area has been drastically altered as a result of 90+ years of fire suppression and past forest management practices, which had an effect on stand density, stand structure, and species composition. Current stands are comprised of dense, multi layered canopies of fire intolerant species, which are not characteristic of historic conditions. An accumulation of dead and down fuel from insect infestation in the late 1980s to early 90s has created a situation where the risk of effects from wildfire in this area is higher than in historic times. The *Wall Watershed Analysis* describes the Little Wall Creek - Skookum Creek and Swale Creek subwatersheds as being impacted the most from spruce budworm outbreaks. "Fire spread rates are significantly higher in these stands than they were when the stand had a closed canopy (Wall watershed analysis 1995)."

Many dry forests in the analysis area have now missed 7 to 10 fire-return intervals, compared to their historical fire regimes. With heavy ground fuels and high tree densities, these dry forests are now much more likely to have severe fires than in the past (PNW Science Update Issue #2 September 2002 pg. 5).

Current fuel loads caused by fire suppression and recent tree mortality have resulted in a change in the range of fuel models for the Wall watershed (Wall watershed analysis 1995).

Direct and Indirect Effects

Alternative 1

The expected fire behavior in the northern end of the wildcat analysis area will be intense with severe effects due to the heavy dead and down fuel loadings caused by insects and absence of treatment under this alternative. These areas have missed several fire return intervals and are now multilayered, overstocked, and contain fire intolerant species which create ladder fuels that carry fire into the overstory. Ladder fuels and increased dead and down fuel loading create potential for stand replacement fire events. Fires today in the dry and moist upland forests would have atypical effects characterized by moderate to severe fire severity and intensities in landscapes that historically would have low to moderate fire severity. The risk of losing key ecosystem components would be high. Ignitions today would not function as natural disturbance processes within their range of variability considering fire size, frequency, intensity, severity, or landscape patterns.

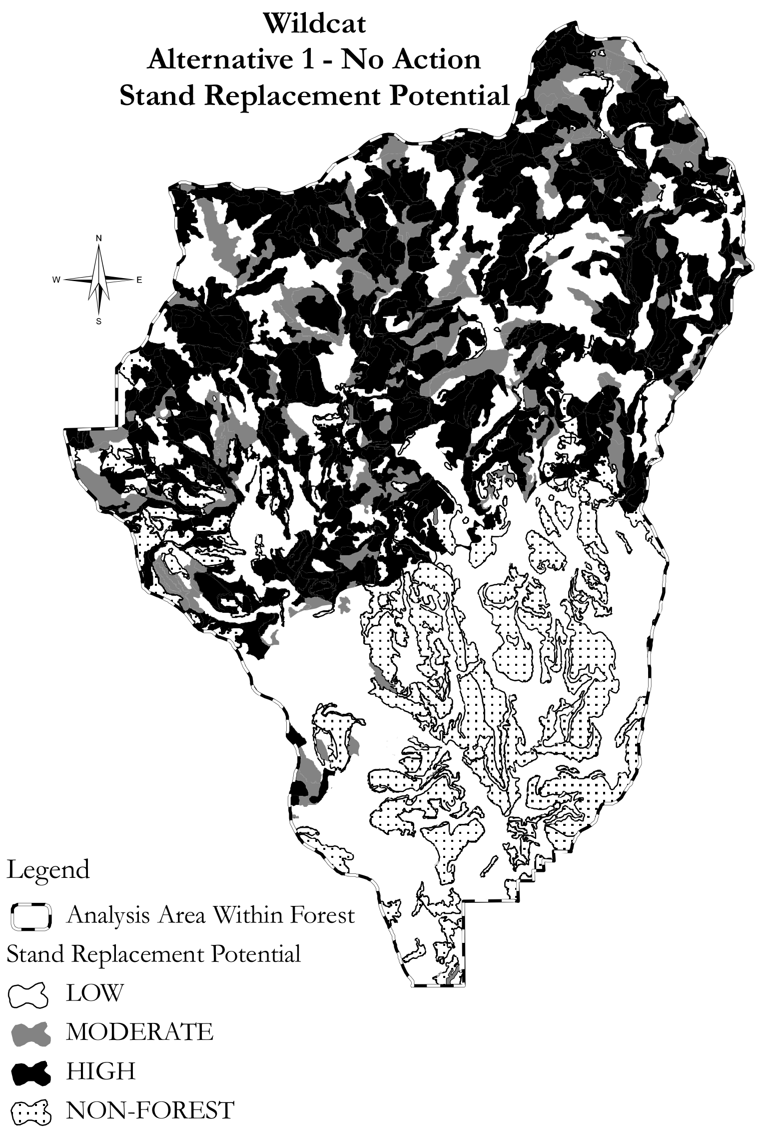


Figure 3.5: Stand Replacement Potential

Figure 3.5 illustrates the relative location of stand replacement potential classification in the analysis area.

Alternative 2

Alternative 2 proposes to treat 10,288 acres with prescribed fire. Of these, 4,164 acres of are maintenance burns occurring primarily in grass, timber litter, and timber slash fuel types. The proposed action would reduce the amount of dead and down woody material, fire intolerant species, and vertical (ladder) fuels. There will be an increase in canopy base height and a decrease in crown bulk density. The treatments in this proposed action are designed to alter the current fuel conditions by reducing surface fuels, ladder fuels, and crown density while keeping large trees. This treatment will enable fire to function as a natural disturbance factor in the ecosystem.

Figure 3.6 illustrates the reduction of acres at risk to stand replacing fire events post treatment when compared to pre-treatment conditions (figure 3.5). The northern portion of the analysis area displays the most significant improvement due to treatment of insect killed fire intolerant species. Table F-4 shows the shift in stand replacement fire potential due to treatment under Alternative 2.

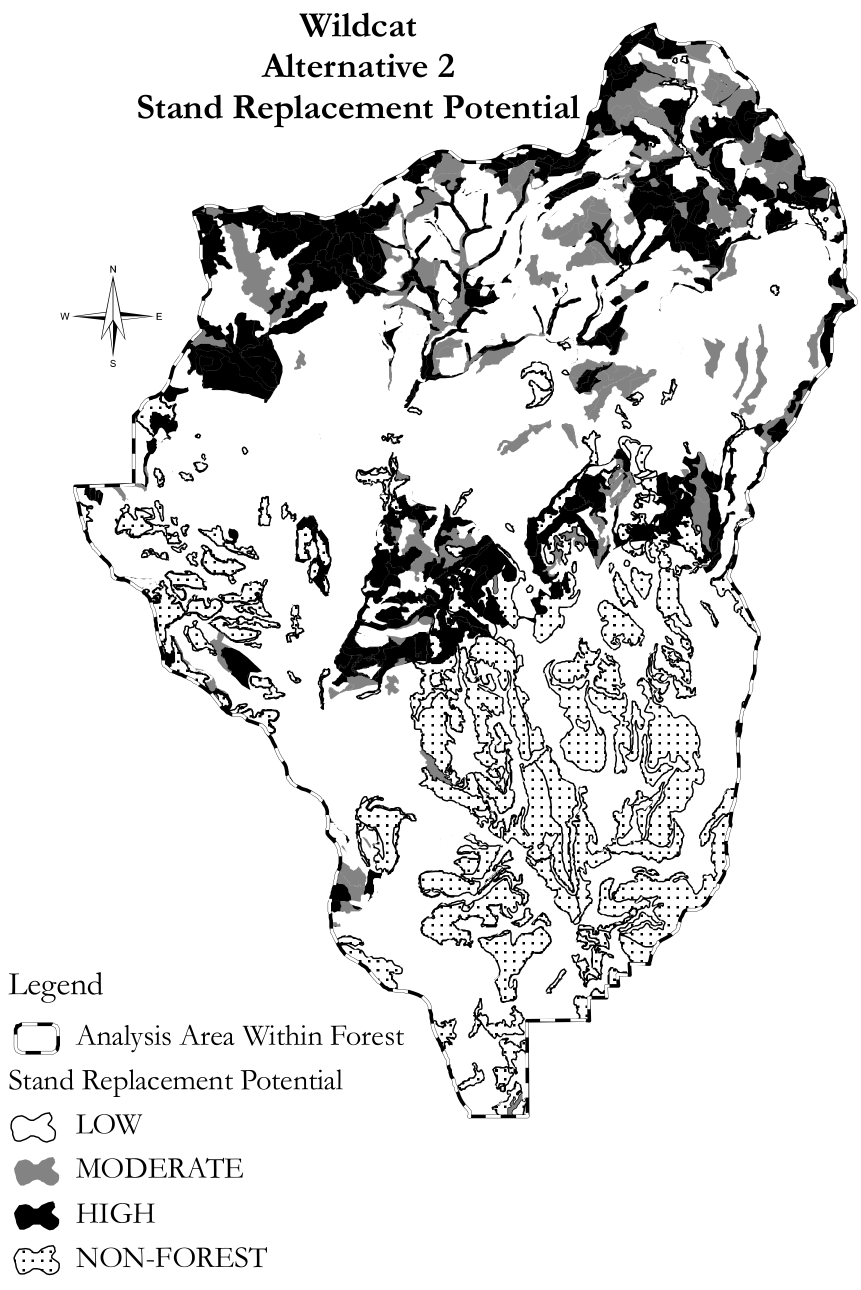


Figure 3.6: Stand Replacement Potential, Alternative 2

Table F-4: Shift in stand replacement fire potential acres pre and post treatment.

Stand Replacement Potential	Alternative 1	Alternative 2	Change
High	12,407	5,095	-7,311
Moderate	2,960	2,357	-602
Low	12,400	20,313	7,913
Non-Forest	5,882	5,882	0

Alternative 3

Alternative 3 proposes to treat 10,079 acres with prescribed fire, of those, 8,095 acres are maintenance burns occurring primarily in grass, timber litter, and timber slash fuel types. The management action would reduce the amount of dead and down woody material, fire intolerant species, and vertical (ladder) fuels. There will be an increase in canopy base height and a decrease in crown bulk density. The treatments in this proposed action are designed to alter the current fuel conditions by reducing surface fuels, ladder fuels, and crown density while keeping large trees. This treatment will enable fire to function as a natural disturbance factor in the ecosystem.

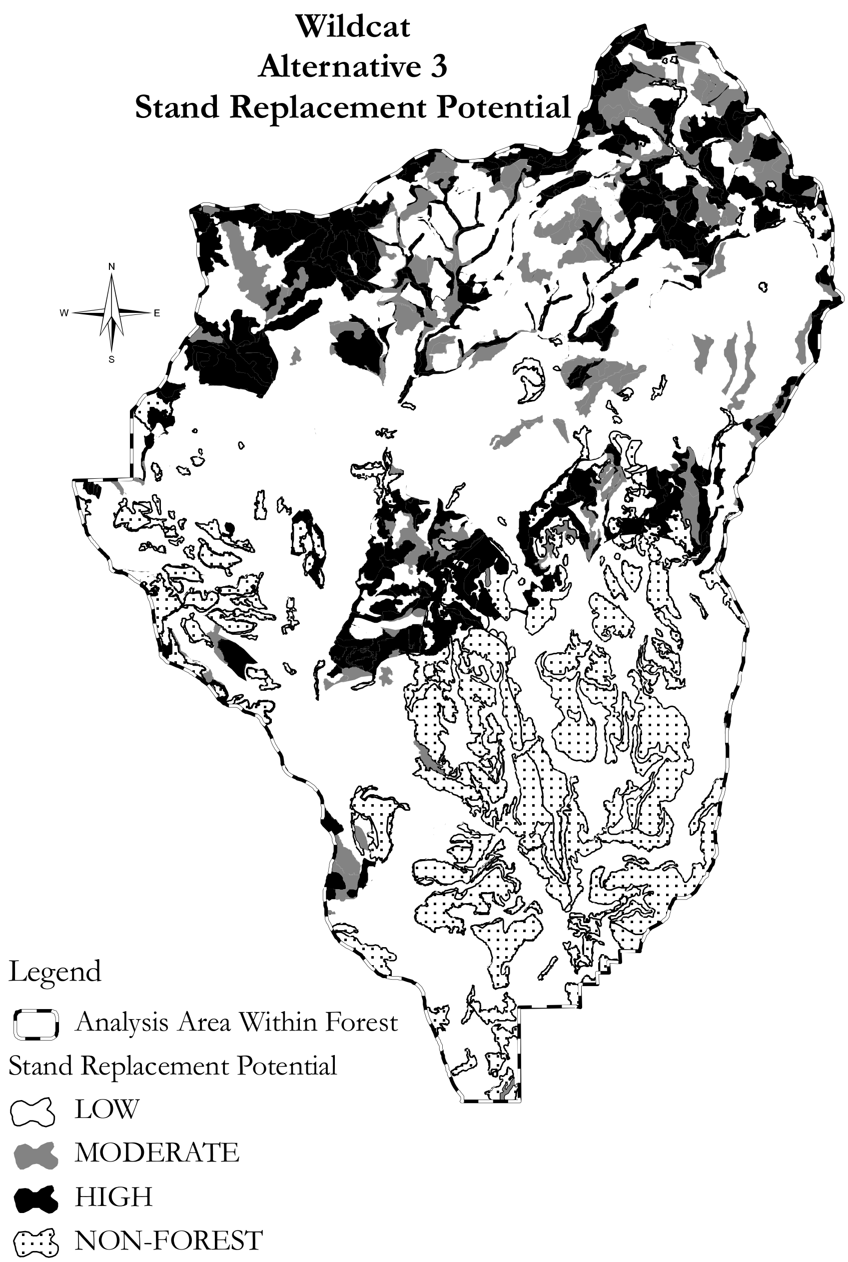


Figure 3.7: Stand Replacement Potential, Alternative 3

Figure 3.7 illustrates the reduction of acres at risk to stand replacing fire events post treatment when compared to pre-treatment conditions (figure 3.5). Table F-5 shows the difference in stand replacement potential acres. The northern portion of the analysis area displays the most significant improvement due to treatment of insect killed fire intolerant species.

Table F-5: Shift in stand replacement fire potential acres pre and post treatment.

Stand Replacement Potential	Alternative 1	Alternative 3	Difference
High	12,407	5,285	-7,122
Moderate	2,960	2,470	-490
Low	12,400	20,013	7,613
Non-Forest	5,882	5,882	0

Alternative 4

Alternative 4 proposes to treat 10,288 acres with prescribed fire, of those, 3,823 acres of are maintenance burns occurring primarily in grass, timber litter, and timber slash fuel types. The management action would reduce the amount of dead and down woody material, fire intolerant species, and vertical (ladder) fuels. There will be an increase in canopy base height and a decrease in crown bulk density. The treatments in this proposed action are designed to alter the current fuel conditions by reducing surface fuels, ladder fuels, and crown density while keeping large trees. This treatment will enable fire to function as a natural disturbance factor in the ecosystem.

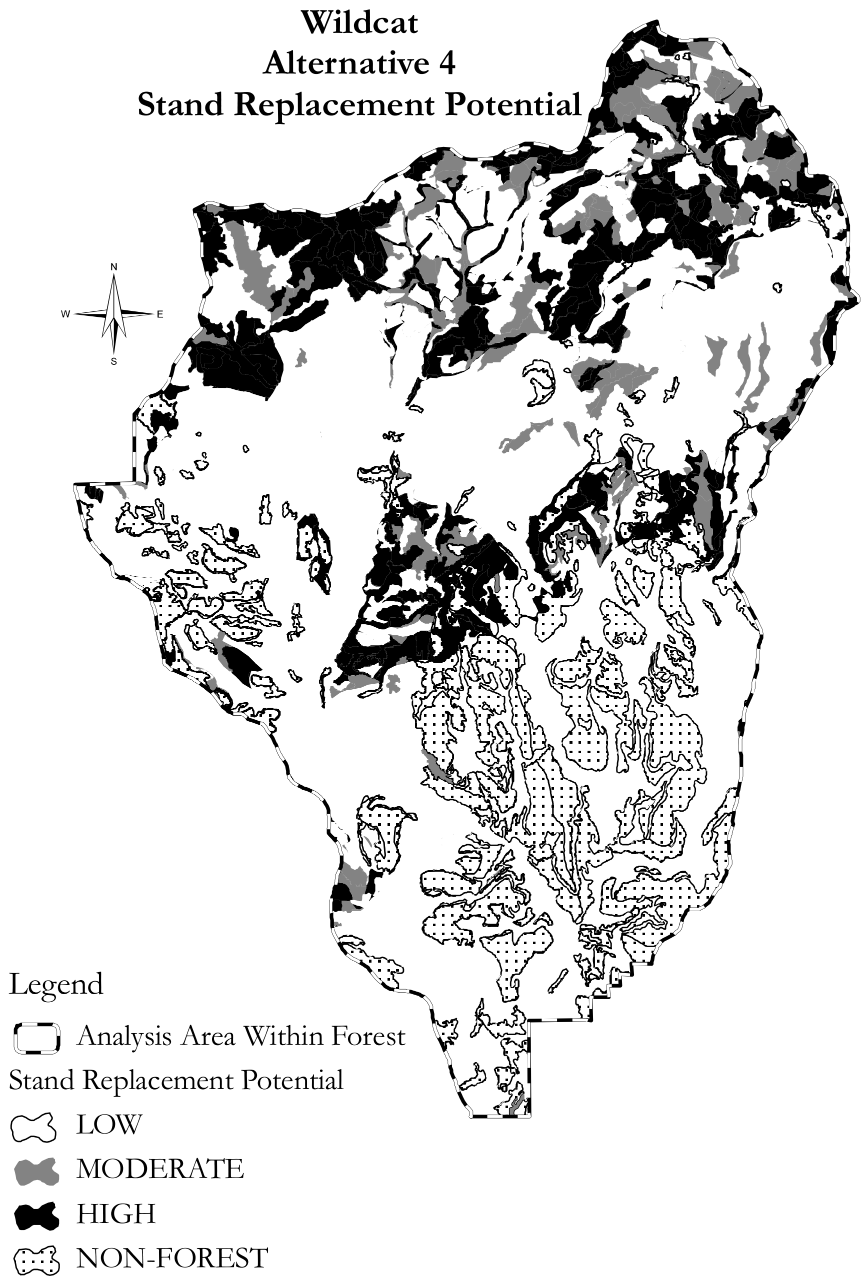


Figure 3.8: Stand Replacement Potential, Alternative 4

Figure 3.8 illustrates the reduction of acres at risk to stand replacing fire events post treatment when compared to pre-treatment conditions (figure 5). Table F-6 shows the difference in stand replacement potential acres. The northern portion of the analysis area displays the most significant improvement due to treatment of insect killed fire intolerant species.

Table F-6: Shift in stand replacement fire potential acres pre and post treatment.

Stand Replacement Potential	Alternative 1	Alternative 4	Difference
High	12,406	5,573	-6,833
Moderate	2,959	2,299	-660
Low	12,403	19,896	7,493
Non-Forest	5,882	5,882	0

Cumulative Effects

Stand replacement potential due to wildfire is based on the energy released during a surface and/or crown fire. If there is sufficient heat released into the crown or around the base of a tree it is likely the tree will suffer mortality. Stand replacement is defined as overstory mortality of 75% or more (FRCC Guidebook). Past activities that have affected the stand replacement potential within the Wildcat analysis area are fire suppression, harvest, hazardous fuel reductions, and possibly grazing.

Past fire suppression and large tree harvest activities have increased the potential of stand replacing fire events in the Wildcat Analysis Area. Many of the same factors and reasoning that affect crown fire initiation likewise affect stand replacement potential. Fire suppression and past large tree harvest have increased both surface and aerial fuels in the analysis area. Sufficient fuel loads are present to release enough heat in the occurrence of a wildfire to cause a stand replacement event in many stands of the Wildcat Analysis Area.

Hazardous fuel reduction treatments have been implemented to reduce both surface and aerial fuels. A reduction of fuels translates to a lower intensity wildfire with less energy released during combustion. This increases the likelihood that fire tolerant overstory tree species will survive a wildfire event. Additionally, surface fuel removal decreases the residency time of a fire in a stand thereby allowing the area to more effectively survive a wildfire.

Grazing may have a dual role in stand replacement potential. The first role is an overall removal of fine, and digestible, fuel in the forested environment. These fuels are mainly grass type flashy fuels that carry a fire quickly through a stand with little residence time. As grazing occurs in forested areas fire frequency is decreased leading to a reciprocal buildup of woody debris and understory regeneration. This buildup of fuel has the potential to increase residence time of the fire in the stand enabling it to release enough heat energy to cause significant overstory mortality. The dual role of grazing in stand replacement potential can be characterized by the initial reduction of fine fire carrying fuels which can effectively “suppress” fire activity (Nader, 2007) and the reciprocal buildup of larger fuels that release more heat energy in the event of a wildfire.

Crown Fire Potential

Current Condition

Current conditions within the Wildcat project area have the ability to support wildfires with the potential to allow crown fire initiation. Currently 80% of the analysis area has the characteristics needed (density, structure and increased fuel loadings) to support crown fires. Non forest accounts for 5,881 acres which is 17 percent of the analysis area. Table F-7 shows acres of crown fire potential.

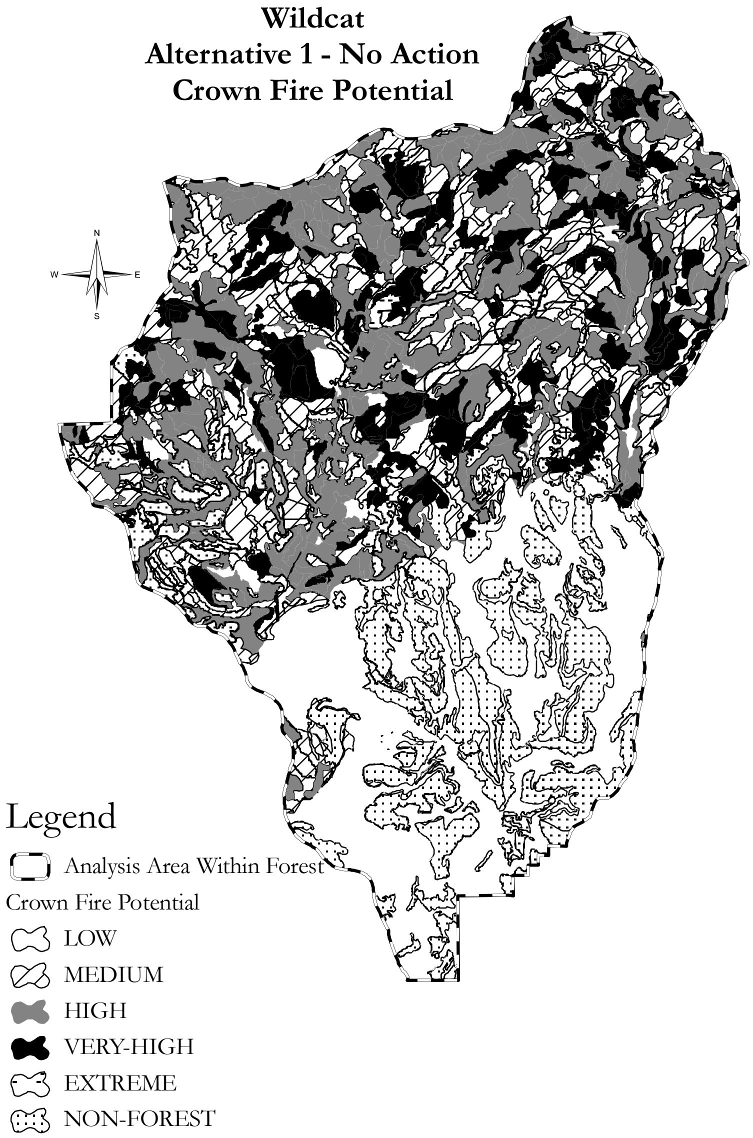
Table F-7: Acres of crown fire potential divided into 5 relative measures of severity.

Crown Fire Potential	Acres	Percentage of Analysis area
EXTREME	216	< 1%
VERY-HIGH	4703	17%
HIGH	7497	27%
MEDIUM	8033	29%
LOW	7330	26%

The desired condition is to have a forest that is receptive to natural disturbances that shaped and continue to play a role in shaping the forest structure. Fire-safe forests are not fireproof, but will have: “Surface fuel conditions that limit surface fireline intensity; forest stands that are comprised of fire-tolerant species, described in terms of species, sizes, and structures; a low probability that crown fires will either initiate or spread through the forest." (Agee,1996).

Direct and Indirect Effects

Alternative 1



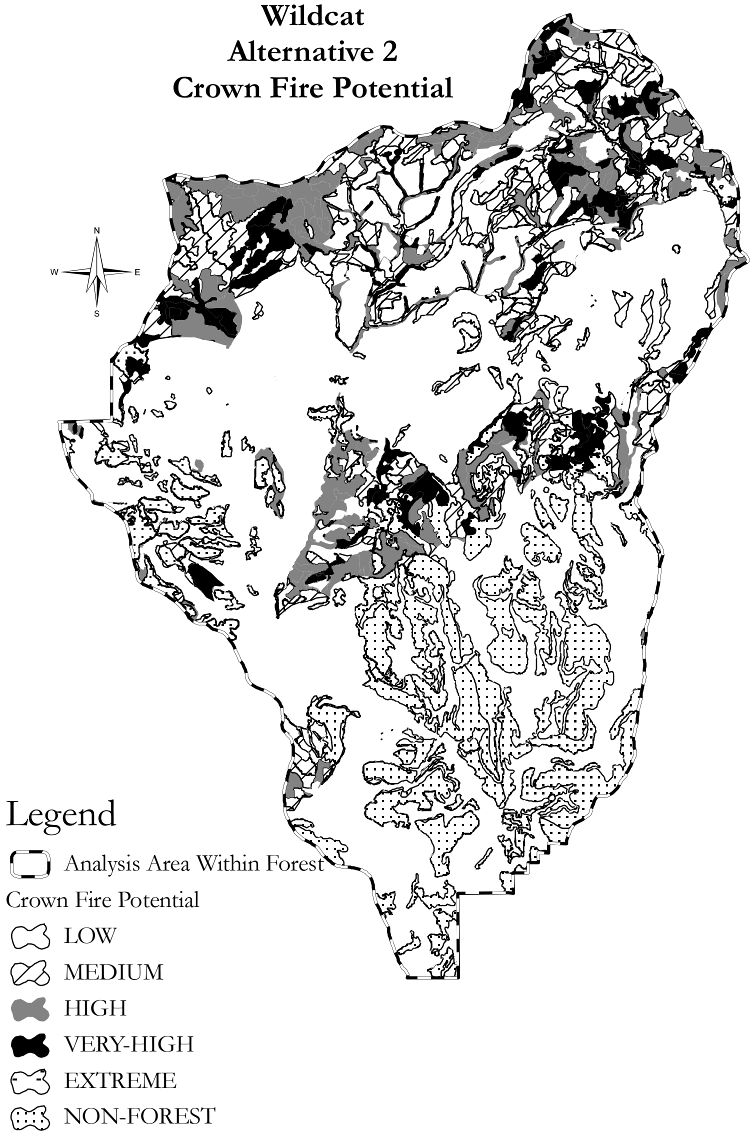
The potential for crown fires in the Wildcat analysis area will continue to be moderate to high based on no treatment of the dense stands. Stand characteristics such as canopy base height and canopy bulk density will continue to be at levels that will allow a surface fire to transition vertically into the crowns of trees.

Current conditions within the Wildcat project area have the ability to support uncharacteristic wildfires with the potential to allow crown fire initiation. 80% of the analysis area has the characteristics needed (density, structure, and increased fuel loadings) to support crown fires. Non forest accounts for 5,881 acres which is 17 percent of the analysis area. Table F-8 shows acres of crown fire potential, and Figure 6 shows their distribution within the Wildcat analysis area.

Table F-8: Acres of crown fire potential by severity rating.

Crown Fire Potential	Acres	Percentage of Analysis area
EXTREME	216	< 1%
VERY-HIGH	4,703	17%
HIGH	7,497	27%
MEDIUM	8,033	29%
LOW	7,330	26%

Alternative 2



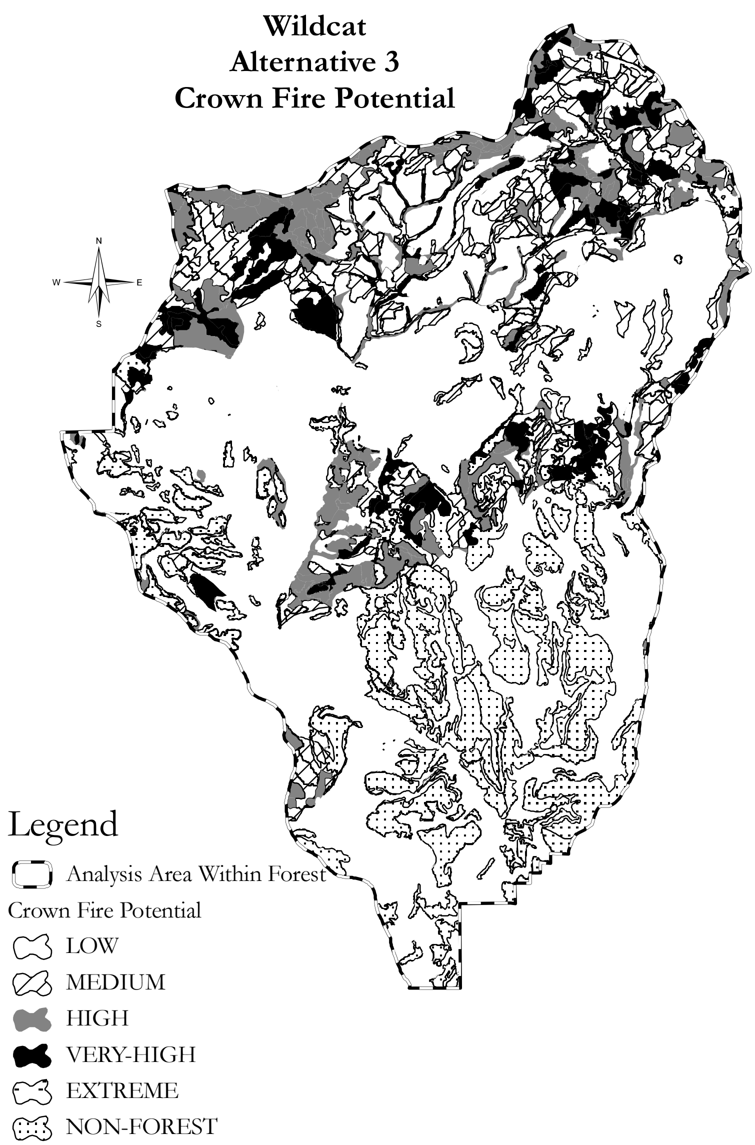
The potential for crown fires in the Wildcat analysis area under alternative 2 will decrease due to reduction from treatment of dead and down debris, fire intolerant species, and vertical (ladder) fuels. The proposed treatments work to reduce stocking, fuel loading levels, and crown bulk density as well as increasing crown base height. The treatment of these attributes reduces both fireline intensity and flame length thus minimizing the potential for crown fires within the treated area.

Through treatment there would be a reduction of acres with crown fire initiation potential ratings of extreme, very-high, high, and medium by 77, 2,771, 4,468, and 3,798 acres respectively. There would also be an increase of low rated crown initiation potential by 11,114 acres within the analysis area. Table F-9 shows the change in crown fire potential by rating and acres. Figure 3.10 illustrates the relative abundance of each crown fire potential rating within the analysis area (only upland forest acres considered).

Table F-9: Change in acres of crown fire potential post treatment

Crown Fire Potential	Pre Treatment Acres	Post Treatment Acres	Percentage of Analysis area	Percentage Post Treatment
EXTREME	216	139	< 1%	<1%
VERY-HIGH	4703	1932	17%	7%
HIGH	7497	3029	27%	11%
MEDIUM	8033	4235	29%	15%
LOW	7330	18444	26%	66%

Alternative 3



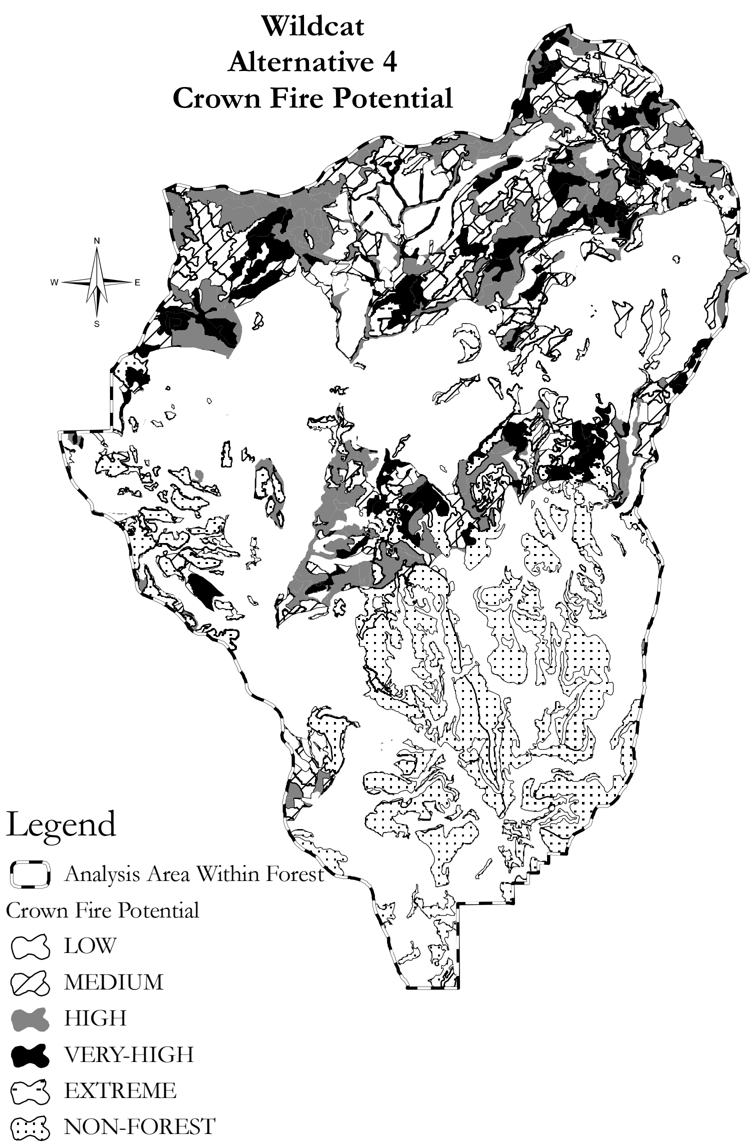
The potential for crown fires in the Wildcat analysis area under alternative 3 will decrease due to reduction from treatment of dead and down debris, fire intolerant species, and vertical (ladder) fuels. The proposed treatments work to reduce stocking, fuel loading levels, and crown bulk density as well as increasing crown base height. The treatment of these attributes reduces both fireline intensity and flame length thus minimizing the potential for crown fires within the treated area.

Through treatment there would be a reduction of acres with crown fire initiation potential ratings of extreme, very-high, high, and medium by 77, 2,625, 4,429, and 3,631 acres respectively. There would also be an increase of low rated crown initiation potential by 10,752 acres within the analysis area. Table F-10 shows the change in crown fire potential by rating and acres. Figure 3.11 illustrates the relative abundance of each crown fire potential rating within the analysis area (only upland forest acres considered).

Table F-10: Change in acres of crown fire potential post treatment

Crown Fire Potential	Alternative 1	Alternative 3	Percentage of Analysis area	Percentage Post Treatment
EXTREME	216	139	< 1%	<1%
VERY-HIGH	4,703	2,078	17%	7%
HIGH	7,497	3,068	27%	11%
MEDIUM	8,033	4,402	29%	16%
LOW	7,330	18,082	26%	65%

Alternative 4



The potential for crown fires in the Wildcat analysis area under alternative 3 will decrease due to reduction from treatment of dead and down debris, fire intolerant species, and vertical (ladder) fuels. The proposed treatments work to reduce stocking, fuel loading levels, and crown bulk density as well as increasing crown base height. The treatment of these attributes reduces both fireline intensity and flame length thus minimizing the potential for crown fires within the treated area.

Through treatment there would be a reduction of acres with crown fire initiation potential ratings of extreme, very-high, high, and medium by 38, 2,551, 4,244, and 3,648 acres respectively. There would also be an increase of low rated crown initiation potential by 10,481 acres within the analysis area. Table F- 11 shows the change in crown fire potential by rating and acres. Figure 3-12 illustrates the relative abundance of each crown fire potential rating within the analysis area (only upland forest acres considered).

Table F-11: Change in acres of crown fire potential post treatment.

Crown Fire Potential	Alternative 1	Alternative 4	Percentage of Analysis area	Percentage Post Treatment
EXTREME	216	178	<1%	<1%
VERY-HIGH	4,703	2,152	17%	8%
HIGH	7,497	3,253	27%	12%
MEDIUM	8,033	4,385	29%	16%
LOW	7,330	17,811	26%	64%

Cumulative Effects

Crown fire initiation models utilize crown bulk density, crown base height, fuel moisture, and the assumption of sustained energetic surface fire to determine the likelihood of initiating and sustaining a crown fire (Watcharapong et al., 2006 and others). Past activities affecting crown fire initiation include fire suppression, harvest, hazardous fuel treatments, and to a certain extent grazing.

Past fire suppression activity and large tree harvest has increased the likelihood of crown fire initiation. Fire suppression and large tree harvest activities have altered the amount and orientation of surface and aerial fuels that are important to initiating and sustaining crown fire. Overall these management activities have allowed an increase in understory regeneration and surface fuel accumulation (Brown, 2000). Surface fire drives half of the crown fire equation and thus surface fuel accumulation is an important factor for crown fire initiation. The overall increase of understory regeneration, or ladder fuels, has allowed a pathway for an active surface fire to transition to a crown fire. In the absence of periodic fire understory trees grow into the canopy thereby increasing crown bulk density while simultaneously reducing crown base height. This creates a continuous vertical fuel complex that has the potential to sustain crown fire (Bonnicksen et al., 1982).

There are two trains of thought surrounding the effect of grazing on wildfire behavior. The first suggests that grazing is an appropriate activity to reduce fire severity and size through manipulation of fuel (Nader, 2007), the second suggests that there is no significant difference between grazed and un-grazed fire and any reduction effect is strictly limited to isolated occurrences (Williams, 2006). If the first idea prevails then we must look at the indirect effects of reduction of fire size and severity to the surrounding forested land. In the absence of fire – through grazing or suppression – fuel accumulation through litter fall and understory regeneration occur. Both of these results can increase the likelihood of crown fire initiation due to presence of ladder fuels (understory trees) and sufficient surface fuel accumulation. If the second idea proves true there will be no noticeable effect on a landscape scale and grazing's effect on crown fire is negligible.

Hazardous fuel treatments are designed to reduce the presence of ladder fuels, reduce crown bulk density, raise canopy base height, and reduce surface fuel accumulation through mechanical treatment or prescribed fire. Fuel treatment activities serve to reduce the risk of crown fire initiation across the landscape.

SOILS

This section incorporates by reference the Wildcat Soils Report contained in the project analysis file at the Heppner Ranger District. Specific information on the methodologies, assumptions, and limitations of analysis and other details are contained in the report. A summary of the current conditions of the affected environment and the predicted effects of the Proposed Action and its alternatives are discussed in this section.

Scope of Analysis

The area of analysis is primarily by activity unit or on an analysis area for items such as temporary road construction. The analysis considered: soil types and existing conditions of the soil resource, proposed actions and alternatives with chosen operational systems and mitigation, and contractual and operational controls of land disturbing activities.

Detrimental Soil Conditions

Current Condition

The soils in the area generally have high infiltration capacity but are susceptible to erosion when highly disturbed in continuous areas on steeper slopes. All but the shallowest soils have volcanic ash or have influence of volcanic ash in their surface and subsoil layers. They are non-cohesive when dry and are susceptible to 'dusting out' when very dry and driven over repeatedly with machinery sufficient to remove surface organics and churn the soils with tires or tracks.

No units (exclusive of the road system) were observed to have bare soil exceeding Forest Plan guidelines or accelerated erosion from prior management activity requiring rehabilitation or erosion control measures.

Much of the area in the upper portions of the analysis area, particularly in the Skookum drainage, have dead wood levels considerably above recommended levels (Brown et al 2003 ; Graham et al 1994). While not a concern from a productivity viewpoint the amount of wood in places constitutes a threat from high fire severity. Long (flame) retention times and heat release increases the severity of impacts to the soil.

Field visits determined units are within guidelines for detrimental soil condition (see Appendix E for unit specific soil data). The area contains old access trails that can either be reused for the proposed action or left as is due to current stability and recovery of more desirable soil characteristics (surface organics and compaction level).

The Monument Fire (summer 2007) affected portions of the Wildcat Analysis area, primarily in the southern end of the project area. The portions of the Wildcat area that were affected by the Monument Fire had downed wood consumed by the fire. Fire severity was generally low and scattered (Busskohl BAER assessment) with limited areas of severe fire where large amounts of wood was consumed. Proposed units within the Wildcat area had generally light consumption of downed wood and downed wood levels are within ranges of desired condition for the ecological types. The Monument Fire consumed surface duff layers in some units within the Wildcat Analysis area. Fire suppression effects are taken into account when assessing detrimental soil conditions or other soil disturbance conditions. Fire effects are taken into account when analyzing effects of proposed actions as site conditions in burned areas can change how the proposed activities impact soils.

Direct and Indirect Effects

Alternative 1

Conditions in the project area will remain much the same as now. Slow accumulation of woody material, including smaller branches and duff, will continue unless interrupted by wildfire. Organic material buildup on the surface would increase productive capacity somewhat but increase the risk of widespread, high severity wildfire that could remove large amounts of this material at once over large areas. Road conditions would remain much the same except road maintenance would not occur on utilized closed road sections, and temporary road construction would not occur. No added soil disturbance, detrimental or otherwise, would occur with this alternative.

Alternative 2

Table S-1 below summarizes acres of soils affected by Alternative by select measures, including Detrimental Soil Condition (DSC) per Forest Plan criteria. Details on a unit basis may be found in Appendix E. Table S-1.

Table S-1. Summary Comparison of Soil Effects by Alternative

ACTIVITY MEASURE	ALTERNATIVE 1	2	3	4
Total Gross Activity Acres	0	13,927	13,554	13,138
Net Acres Estimated Detrimental Disturbance in Units	110	397	369	363
New System Roads in Acres[1]	0	5.3	0	0
New Temporary Road in Acres	0	8.7	12.8	5.8
Units Exceeding Plan Standards for DSC	0	0	0	0

Commercial Thinning and Mechanical Fuels Treatment

Monitoring of other harvest activity on the Umatilla indicates cut-to-length processors and full-suspension forwarders result in detrimental soil impacts (per Plan definition) dominantly in the 2 to 4 % range with lesser compaction (in particular) on the shallower soil types. The residual soils, and those with thin volcanic ash mantles (less than 7 inches), have high strength in dry conditions and do not compact easily. They are still susceptible to surface displacement. The deeper soils, most with high ash content in the Wildcat area, are still susceptible to compaction even when dry, as soil strength does not increase in ash soils to the same degree as in other parent materials. The results with the in-woods processors (including the cut-to-length systems using forwarders) have been quite favorable. The slash mats spread compressive forces while little to no displacement occurs as there is minimal turning forces or dragging of trees to move surface soil. Landings often overlap existing roads thereby limiting additional impacts to unaffected soil areas.

Units identified as skidder logging systems generally use whole tree yarding to remove the entire tree including the needles and small branches where the majority of nutrients in the aboveground tree biomass reside. This is then typically burned in a larger pile at the landing where much of the nutrient content is volatilized and lost from the site. Very large burn-pile sites are often severely burned (Forest Plan definition) due to the intense heat generated from the large amount of slash involved. Monitoring of prior use of this system elsewhere on the Heppner and Pomeroy districts has shown detrimental soil impacts to be within Forest Plan guidelines, generally in the 4-8 % range. However, close attention to skid trail spacing, soil conditions, and erosion control measures as described in project design elements would minimize adverse soil impacts.

Skyline yarded units in these soil types and vegetative conditions (Forest monitoring) typically have DSC in the range of 0-3%.

Alternative 2 would utilize ground-based and skyline harvest systems. Alternative 2 would use a mechanical cut-to-length system (1,387 acres more or less) with a processor leaving tops and branches in the unit. Skidder-based yarding would be utilized on the remainder of the harvest acres (588 acres more or less).

Normal operating season contract provisions provide for machinery to operate on soils sufficiently dry to

[1] Conversion of road miles to acres assumes a twenty foot width for calculations.

withstand forces that might otherwise create puddling (or rutting) and compaction. Shallow and mixed ash and residual soils in the area have high soil strength when dry. Volcanic ash soils are more susceptible to compaction impacts even when quite dry, and can be at risk of displacement due to ‘dusting-up’ if highly disturbed.

Use of mechanical systems such as cut-to-length (harvester/forwarder) systems has been found (Umatilla Forest monitoring experience and (other) Blue Mountain trials, see Blue Mountain Natural Resources Institute Tech Notes citation in vegetation report) to substantially eliminate displacement impacts, exposed soil, and, where sufficient slash mat or downed wood is created or already in place, reduce compaction effects considerably. Nearly all of the smaller branches and needles are all left on site, and even if later jackpot or underburned, will allow nutrient retention in the unit. No landings would be constructed as logs can be decked along the length of adjacent haul roads.

Whole-tree yarding, using a tracked or rubber-tired skidder (referred to as Skidder yarding in this project), removes the entire tree to a landing area where the tree is processed into logs. Slash is piled onto the landing areas and burned in place. This normally creates larger landings than with cut-to-length systems and can create areas of severely burned soils under the burn piles due to their size. Also, most of the skid trails with multiple passes will have the surface duff removed and considerable displacement of the surface soils due to the tractor operation and dragging of trees the length of the skids. Erosion risk is created with the exposure of bare mineral soil. Overall disturbance (and disturbance that would be considered detrimental per Forest Plan criteria) from this system is reduced by use of a systematic skid trail system where skid trail spacing averages about 100 feet. Contract administration, project design elements, and Best Management Practices (BMPs) address erosion hazard risk while still addressing fuel loading concerns.

Units yarded via skyline systems would have relatively little soil disturbance within the units, with most soil disturbance occurring at landings. Measurable soil disturbance is limited to yarding corridors where logs are yarded upslope (typically) and may drag one end along the soil surface. This may create long, narrow bare soil areas with risk of erosion should an intense rain storm occur before erosion control measures are installed (part of Best Management Practices).

The new system and temporary road construction would adversely affect the productive capacity to that section of ground (approximately 14 acres). Rehabilitation of temporary roads returns the affected sites to productive capability, although reduced in the short-term. Full obliteration would most fully return productive capacity over the long term. Closed roads reopened for use can benefit from surface treatment (ripping or other tillage activity) which can improve infiltration, reduce or eliminate erosion hazard, and improve seed bed condition upon completion.

Noncommercial Thinning and Planting

Hand thinning operations have virtually no adverse impacts to soils. Thinning slash, whether left in place or hand-piled, remains largely within the units. Burning, if prescribed, often occurs from 1 to 3 years later allowing for needles to fall from branches and reduce fire threat to residual trees. Piles in residual stands are normally small enough that fire intensity from pile burning rarely gets hot enough to produce severe burning impacts on the soil.

Machine thinning and piling activity can be expected to add incrementally to detrimental soil conditions in the activity units. Use of machinery for thinning activity can produce compaction and displacement effects, although detrimental levels of soil disturbance is typically very limited, less than 2% on a unit basis. While the total acreage involved with the proposal is large, the degree of effects to soils would be low.

Use of the low soil impact techniques for thinning is the appropriate choice and provides mitigation for potential compaction in the deeper ash soils in the area. Selection of equipment such as the ASV masticator, and/or light-bodied excavator-based units keeps soil disturbance, especially compaction, limited to small areas where no surface wood exists, or where turning in deep to moderately deep ash soils occurs. Mastication will allow the processed material to stay onsite, retaining organic matter in areas which may be reduced from the prior operations. In areas where fuel loadings require piling, there will still be sufficient wood retention to continue ecological site (soil and vegetation) appropriate dead and down amounts.

Planting has virtually no direct adverse effect on the soil resource, as impacts are limited to walking and planting using a shovel or similar instrument to make a planting site for the seedlings. Indirect effects would be those related to transportation to and from the sites (road use) and associated effects from crews moving through the area.

Activity Fuels Treatment

Grapple-piling equipment would be considered in portions of the area in thinning or harvest units to reduce thinning and existing slash. These are usually grapple heads mounted on small-body excavator bodies with wide tracks. As such they have relatively low ground-pressure and can work on top of downed logs and existing or created slash. They none-the-less can produce additional compaction and some displacement while turning. Operation on downed slash and other woody material and use of existing trails keeps additional compaction and displacement effects very low. Monitoring of grapple-piling operations on the Umatilla indicates detrimental soil impacts in the 0-2% range.

Underburning

Effects of concern from prescribed fire activity would be related to areas of severe fire intensity and total exposed soil surface subject to potential erosion hazard. The prescription for underburning and pattern of heavy fuel concentrations are prime determining factors affecting the extent of high severity burn areas. Contemporary prescriptions for underburning rarely create extensive severe burn conditions. The total area of severely burned soils is expected to be small. Areas of exposed mineral soil typically can be expected to be about 2 to 10 percent of treatment areas.

Road use

Use of the road system for all activities would have indirect effects to soils. Effects could include sediment generation if used during wet conditions and dust production during dry conditions. These impacts are readily mitigated through project design elements. Road maintenance intended to improve road conditions as a result of the increased use will normally provide an opportunity to improve drainage and reduce potential for sediment production, which might occur if log haul were to occur in wet conditions. Short-term increases may occur with the increased truck traffic and there is potential for fines to move from the road surface during any concurrent heavy rain events.

Additional discussion of effects to soils or erosion risk from the action proposals may be found in the hydrologic effects discussion.

Organic Matter

Remaining wood is expected to be sufficient to continue ecological processes. Amounts in excess of guidelines by ecological type in untreated areas allow for an increased risk of more extensive high severity fire.

Prescribed fire would create a mosaic of burn severity with small areas of higher severity in size and extent (<10-15%). Burn severity of piled slash is typically high although the area covered is limited and the piles widely scattered limiting erosion hazard and allowing recolonization of soils by biological organisms. Landings in whole-tree yarding operations can create areas of high burn severity, up to one-half acre in some past operations on the Forest. Total area of severely burned soil is included in estimates for detrimental soil conditions.

Tree bole removal would remove a long-term source of organic matter, while reducing the risk of severe fire effects in the future by reducing fuel loading above levels considered optimal (Graham et al 1994).

Harvest activities would increase ground cover by placing logging slash on the ground before post-harvest slash treatment. In some cases fine woody debris (slash) would increase from activities where treatments did not reduce all of the increase in material. This is typically considered a positive for soil organics and nutrient treatments with a short-term potential for increased fire spread and severity before decomposition reduces that risk after a few years.

Effective Ground Cover

The Forest Plan includes standards and guidelines for effective ground cover remaining after ground disturbing activity based on erosion hazard. Operational techniques for harvest and fuels treatments are designed to keep exposed mineral soil within acceptable levels to reduce or minimize erosion hazard. Forest Plan standards would be met.

Stability

Land stability is not of particular concern for this project. The area is quite stable with the only area of mapped slump/slide outside and west of the project area. Proposed actions would not be expected to trigger a landslide or mass movement action in an area that is otherwise stable.

Alternative 3

This alternative would treat fewer acres for vegetative and fuels objectives but would require a slight increase in temporary road construction compared to the other two action alternatives. The reduction of treated acres would reduce the area of total and detrimental soil disturbance. Temporary road construction would increase to about 5.3 miles, or approximately 13 acres. Alternative 3 would produce about 7% less detrimental soil conditions than Alternative 2. Table S-1 compares Detrimental Soil Conditions by alternative.

Alternative 4

This alternative provides for a harvester/forwarder harvest system only for ground-based units, dropping of skyline units, and a reduction in mechanical fuels treatment acres. Temporary road construction would be limited to about 2.4 miles (approximately 6 acres or about 2/3 of the Proposed Action, Alternative 2). Use of the harvester/forwarder system only would reduce the likelihood of exposed mineral soil and the area of detrimentally affected soil as observed on other similar operations on the Forest. Potential loss of surface soil due to ‘dusting up’ (dust production from skidding and trafficking on bare mineral soil) is reduced without the dragging of trees. Mechanical fuels treatment acres would also be reduced to about 1,358 acres with subsequent reduction in soil exposure to machinery and affects to soils, in both total and detrimental levels of disturbance.

Quantifiable differences in effects between the action alternatives – that otherwise have the same operations- are proportional to the amounts of acres involved with the activities. Changes in operational systems and units involved in Alternative 4 would reduce the area of total and detrimental soil disturbance. Alternative 4 would have about 9% less detrimental soil conditions than Alternative 2. Total acres of the various activities may be found in Chapter 2.

Cumulative Effects

Previous management activities over the past several decades have compounded to produce the existing condition. Activities include road building, timber harvest, site preparation, livestock grazing, fire suppression activities and prescribed fire. A primary concern is additional impacts to the soil resources resulting from proposed activities, and whether any portions are identified that might benefit from some rehabilitation treatments. The best available science indicates disturbance standards could benefit from site-specific tailoring adjusted for the soils inherent properties (Craigg and Howes 2005).

Prior tractor skidding on the proposed units is well recovered. After cessation of activity with this proposal, several years of relative inactivity from ground-disturbing operations will be desirable to allow natural processes to stabilize the area further. Prescribed fire and thinning activities would be suitable if it is not possible to complete (all) desired treatments in this entry.

The proposed harvest systems and/or operating conditions have been developed in response to concern over soil impacts. Use of harvester/forwarder equipment, and designated skidding routes if non-suspended yarding is utilized, minimizes additional displacement and compaction effects. In conjunction with use of existing trails or landings, when feasible, proposed activities can be expected to stay well within Plan guidelines for detrimental soil conditions including residual consideration of effects from prior activities.

Areas of prescribed burns may add incrementally to the total area of severely burned soils from the Monument Complex Fire.

Suppression actions resulting from the Monument Complex affected some units remaining in the Wildcat project area. These have been rehabilitated with erosion control treatments and are not expected to add measurably to accelerated erosion or erosion hazard currently in the project area.

HYDROLOGY

This section incorporates by reference the Wildcat Hydrology Report contained in the project analysis file at the Heppner Ranger District. Specific information on the methodologies, assumptions, and limitations of analysis and other details are contained in the report. A summary of the current conditions of the affected environment and the predicted effects of the Proposed Action and its alternatives are discussed in this section.

Scope of Analysis

The scope of this analysis is the Little Wall Creek-Skookum Creek sub-watershed, (HUC 170702020803), and the Swale Creek sub-watershed, (170702020801), which are part of the Wall Creek Watershed. The analysis area is 38,837 acres, of which 33,663 acres are managed by the Heppner Ranger District. Analysis of cumulative effects will include past, present and future foreseeable activities within the analysis area that are believed to be currently affecting either hydrologic function or water quality. Projections of cumulative effects are made for 16 years into the future. Because road systems have the largest potential to affect stream systems on a watershed basis, road density and number of stream crossings will be used as indicators in this analysis for evaluating the effects of actions proposed for this project. Measures to determine effects to hydrologic function and water quality include:

Water Quality:

Sedimentation

- Erosion and sediment as indicated by overall road density
- Acres of soil disturbance in RHCAs

Water temperature: (as measured by changes in stream side shade and potential changes to stream temperatures)

Hydrologic Function:

- Water yield and peak flows analyzed using the Equivalent Clearcut Area (ECA) model

Sedimentation

Current Condition

Increases in erosion rates occur episodically and generally in response to climatic conditions and disturbance. High intensity precipitation and wildfire are the two primary natural disturbance processes that influence erosion, sediment transport in stream and river systems, and the physical and biological conditions in those stream and river systems.

Human activities related to resource management also have a major influence. The effect of the road system (and skid trails) in a watershed on erosion, sediment transport, and physical and biological conditions in stream systems often exceeds that of all other activities combined, especially in forested mountainous areas. The road system connects directly to the stream system at road crossings. Crossings are often the places where eroded soil enters the water. There are 200 stream crossings (on Forest Service and county roads) in the analysis area, and there are 2.2 miles of road per square mile of watershed area on the Forest Service portion of the analysis area. The riparian road density is 2.8 miles of road per square mile of Forest Service managed riparian area. Exclusive of roads, the Soil Report found no eroding bare soil areas in proposed units.

Monument Complex Fire rehabilitation has occurred on 8 miles of mechanical fire line and 7 miles of existing roads to prevent sedimentation.

Direct and Indirect Effects

Alternative 1

The existing sediment regime in the streams of the analysis area would continue. Past harvest related erosion and sediment transport would continue to recover. Surface runoff would largely be determined by the intensity of precipitation events and their duration. The existing 134 miles of roads would continue to erode and cause sedimentation in the vicinity of the 200 crossings. Hill slope erosion would continue to enter the drainage ditches of the road system, reducing their effectiveness. No change in road use would occur including no decommissioning or obliteration of existing roads.

Alternative 2

This alternative proposes to construct 2.2 miles of new system road and 5.8 miles of temporary road in upland areas. In addition, 41 miles of closed roads will be reopened to facilitate haul. Thirty nine miles of open roads would be maintained as a part of this project. The new system road and the temporary roads are not in riparian areas, and are not expected to affect sedimentation. In the short term, some of the existing road maintenance (both closed and open) may expose soil and cause small scale, localized, increases in stream sediment, particularly at existing stream crossings. Sediment transport to streams would be minimized by the use of best management practices. In the mid-term this work is likely to reduce background sedimentation for 5 to 10 years, until the roads return to the current level of deterioration.

Alternative 2 also proposes to obliterate 2.4 miles of riparian roads with three associated stream crossing structures. Obliteration of these roads would expose soil, potentially leading to sediment transport to nearby streams. This erosion would be small, localized sedimentation, such as a sediment plume up to 300 feet long, lasting up to 6 hours or until precipitation stopped. The risk would be mitigated by doing the work during the dry season, by mulching when rain threatens, by buffering sediment sources with straw bales, and by prompt seeding when the work was done. Obliteration of these roads will reduce stream sedimentation in 3-5 years by stabilizing stream banks, road cuts, and removing road fills and culverts. This activity would improve water quality.

This alternative also proposes 5.5 acres of mechanical fuel treatments in riparian areas, 119 acres of non-commercial thinning in riparian areas, and approximately 4 acres of commercial thinning in riparian aspen stands. All activities in riparian habitat conservation areas, except aspen treatment, would be done by hand and are not expected to expose soil or lead to sedimentation. Commercial sized conifers will be removed from four aspen stands in this project using a forwarder. Aspen stand treatments within RHCAs may expose soil. Project Design Element measures would minimize soil disturbance and keep it far enough away from streams so potential sediment from these sources would not impact streams. One aspen stand will require a forwarder trail across a class IV stream. This crossing is located on a class IV stream above an instream pond. It is not likely that this will result in any sediment transport to streams below this pond. It is not expected that these activities would cause measurable increases in sedimentation.

Additional activities under this alternative that would lead to soil exposure include timber harvest, mechanical fuel treatments, and non-commercial harvest. The activities would cause a limited amount of soil exposure with the potential to erode. However, because of the short duration of time before vegetation is reestablished, the presence of logging slash, the use of Best Management Practices, and the use of riparian buffers, it is not expected that eroded soil from these activities would reach any stream. Associated with commercial thinning, five forwarder trails will cross Class IV streams. These will be at designated crossings and will be chosen where no vegetation removal is required. There will be no constructed roadbed at these locations so little soil exposure is expected.

Prescribed burning will be done on a little over 10,000 acres. Of these acres, 687 are in class 1 riparian areas, 173 acres in class 3 riparian areas, and 1,272 acres of class 4 riparian areas. Burning in riparian areas would be done under controlled conditions so vegetation loss near streams is unlikely. Prescribed burning may also result in soil exposure within riparian habitat conservation areas. Burn intensities would be expected to be low and localized, and re-sprouting of vegetation could occur within two weeks of soil exposure (Agee 1993). Project design elements were established to control sediment, so there would not be a measurable increase in sedimentation.

Table H-1 shows a comparison of indicators used to distinguish sediment impacts between the different alternatives.

Table H-1: Sedimentation indicators by alternative.

	alt 1	alt 2	alt 3	alt 4
Road density	2.22	2.22	2.22	2.22
Road obliteration miles	0	2.4	2.4	2.4
Riparian road density	2.76	2.61	2.61	2.61
Road maintenance miles	11	85	85	85

Riparian road crossings	200	197	197	197

Alternative 3

The potential effects to water quality and project design elements would be similar to those described in Alternative 2. The same amount of road obliteration would occur under this alternative and the only road construction would be temporary roads constructed outside of Riparian Habitat Conservation Areas. Temporary roads would not be expected to affect sedimentation. Six fewer acres of non-commercial thinning would occur in class IV RHCAs under this alternative. It was not likely that sediment would enter streams as a result of this activity so effects would be the same as discussed under alternative 2. The same amount of aspen acres, mechanical fuel treatments in RHCAs, forwarder trails, and prescribed burn in RHCAs is proposed under this alternative so effects of these activities would be the same.

Alternative 4

The potential effects to water quality and project design elements would be similar to those described in Alternative 2. The same amount of road obliteration would occur under this alternative and the only road construction would be temporary roads constructed outside of RHCAs. Temporary roads would not be expected to affect sedimentation. The same amount of noncommercial thinning acres, aspen acres, mechanical fuels treatment in RHCAs, forwarder trails, and prescribed burning in RHCAs is proposed under this alternative so effects of these activities would be the same as Alternative 2.

Cumulative Effects – Alternatives 2, 3, and 4

Some past activities, including thinning in riparian areas, road construction and maintenance, grazing, wildfires and suppression, fencing riparian areas, construction of upland water sources, and aspen stand restoration have all likely affected sediment transport to analysis area streams.

Past harvest activities exposed soil in Riparian Habitat Conservation Areas. Road construction along or crossing creeks removed all riparian vegetation along the roadbed exposed soil and created some chronic sediment sources. Grazing of riparian areas in the past has cause unstable banks leading to inputs of sediment into streams and increases in sediment through bank trampling. Grazing has been modified since this time and most past effects to stream banks are recovering. Previous wildfires were also indiscriminant about burning riparian vegetation, leaving some areas with exposed soil. In July, 2007, the Monument Complex Fires burned 15,862 acres in the Wildcat Analysis Area (Little Wall Creek – Skookum Creek and Swale Creek sub-watersheds). This fire lead to exposed soil and the potential for sediment transport mostly in the southern half of the analysis area.

Other past activities have decreased the amount of sediment reaching streams. Riparian exclosure fencing has allowed riparian vegetation and bank stability to recover reducing the amount of sediment entering streams. In addition, the construction of upland ponds and development of springs for cattle has diverted cattle from streams reducing the impact to the riparian vegetation and stream banks. Restoration of aspen stands in the past has lead to a greater percentage of bank stability along several streams within these stands.

Present activities that can contribute to an increase in sediment reaching streams is grazing and roads. The remaining unfenced portions of stream within the cattle allotments in the analysis area continue to be impacted by grazing with a reduction in riparian vegetation and stream bank stability at these locations. Existing roads that cross creeks will continue to supply sediment to area streams. A present activity that will lead to a reduction in sediment reaching streams is road maintenance.

Future foreseeable activities proposed for this watershed that would affect sediment include grazing and riparian planting along streams within the analysis area. The remaining unfenced portions of stream within the cattle allotments in the analysis area will continue to be impacted by grazing with a reduction in riparian vegetation and stream bank stability at these locations.

Currently much of the past stream bank damage and other sources of sediment are recovering or will continue to recover in the future. Overall there would still be some roads that would contribute sediment to streams. Grazing would still impact riparian vegetation and stream banks on some streams, but with current management little impact to stream banks should be seen. Activities proposed in this project could cumulatively increase the amount of sediment entering streams in the short term. However in general, with the 2.4 miles of roads that will be obliterated, there will be a net reduction in the amount of sediment entering streams in the long term.

Temperature

Current Condition

The analysis area is in a semi-arid climate zone which has high summer temperatures and low summer precipitation. The low precipitation results in low stream flows during the summer. Because of the low stream flows and high air temperatures, stream temperatures tend to increase in the summer. Skookum below reach 5, Upper Swale, Dry Swale, East Fork Alder and Upper Alder creeks stand out as having low shade percentages. Skookum and Swale creek are on the State's 303d list for temperature within the Wildcat analysis area.

Table H-2: Base line percent shade by stream reach from stream surveys, 1992-2001.

Stream	Reach	Shade %	Method*
Alder	1	74.5	sp
	2	48.3	sp
	3	61.6	sp
	4	44	sp
East Fk Alder	1	38	sp
Bear	1	66	sp
Little Bear	1	55	sp
Dry Swale	1	35	sp
Hog	1	67	sp
	2	53	sp
	3	58	sp
Skookum	1	20-30	d
	2	20-30	d
	3	31-60	d
	4	0-19	d
	5	>60	d
Swale	1	66	sp
	2	27	sp
	3	41	sp
Two Springs	1	70	sp

**Shade was measured by Solar Pathfinder (sp) or densiometer (d).*

The Monument Complex Fire burned approximately 41 percent of the analysis area in July, 2007. It is likely that stream temperatures will be affected by the Monument Fire due to a loss of stream shade on some of the streams within the analysis area.

Direct and Indirect Effects

Alternative 1

The reduced riparian canopy would continue to allow more sunlight to reach area streams. Passive restoration would eventually increase the amount of shade on area streams. However, such a canopy would be deficient in key species, and would not provide as much shade as the potential vegetation within the foreseeable future (D. Swanson, personal communication, 2008).

Common to Alternative 2, 3, and 4

The riparian canopy would not be affected by harvest, non-commercial thinning, or mechanical fuel treatments that occur outside of riparian areas; except that such fuel treatments would reduce the threat of fire spreading into riparian areas. Harvest in aspen stands, noncommercial thinning, and mechanical fuel treatments are proposed in riparian areas. Harvesting conifers in aspen stands would reduce stream shade for approximately 8-12 years, until the existing aspen clone had re-sprouted enough to occupy the space. The aspen stands are located on class 4 tributaries of Alder and Skookum creeks. Because of the relatively small area of the aspen stand, compared to the drainage areas of the streams, and because of the relatively early de-watering of the stream, it is not expected that the temperatures would be affected in the short term. Over the long term, the aspen stand is expected to rejuvenate and expand into the surrounding area and eventually increase stream shade.

There are between 113 and 119 acres of non-commercial thinning proposed in riparian areas of class I-IV streams by alternative. This thinning is designed to increase the rate of conifer development, so that the growth of the stand is concentrated on fewer stems. In the short term, there would be a slight reduction in riparian shade along class IV streams. No trees currently providing shade on perennial streams would be removed. It is expected that the reduction in shade along class IV streams would be unmeasurable. After approximately 5 to 10 years, there would be more shade than without this treatment. It is expected that the faster growing trees would provide more shade on the class 4 streams than without this treatment (M. Burns, USDA, personal communication, 2007).

Approximately 5 acres of mechanical fuel treatments are proposed in riparian areas of class IV streams. These treatments would reduce the risk of high intensity fires which would have the potential to reduce the riparian canopy. They would be limited to removal of downed material and snags in excess of those needed to meet PACFISH and wildlife requirements. No shade providing green trees would be removed.

Prescribed fires would not be ignited in riparian areas, but would be allowed to back into them. This is unlikely to affect the canopy and its ability to shade streams. Mechanical fire lines may occasionally enter riparian areas (2005 Forest Plan Monitoring Report), but are not likely to affect the percent of canopy cover.

Re-opening closed roads, road maintenance and road reconstruction would cut small trees and shrubs growing in the rights-of-way. This would slow the passive recovery of vegetation growing in riparian areas. However, the reduction in vegetation would not measurably change the percent of existing canopy cover, which in turn would not measurably affect temperature.

The riparian road obliteration would result in the removal of several hundred sapling and pole sized trees in riparian areas. These are mostly on the north sides of streams, and would have minimal effects on the shade casting portion of the existing canopy. These downed trees would be laid across the road prisms as part of the decommissioning process. Conifers and hardwoods would be planted and protected along the road prisms and in adjacent un-vegetated areas during the following year. In approximately 5 to 10 years, the planted trees on both sides of the streams would be expected to begin producing shade.

Cumulative Effects

Alternative 2, 3, and 4

In the Wildcat Analysis Area, the riparian canopy has been diminished in area and in diversity by past harvest, road construction, grazing by cattle and wildlife, and wildfire. In 2007, the Monument Complex Fire is likely to impact riparian shade and stream temperatures in the southern part of the two sub-watersheds. The effects are likely to be measurable, but are not expected to affect 303 (d) listing status.

On-going activities such as recreation, personal firewood gathering, grazing, and harvest of minor forest products are not expected to have any measurable effects on stream shade or temperature. Other on-going activities in the Wall Creek Watershed, which includes the two sub-watersheds that contain the Wildcat Project are the Rimrock, Ant, Wildhorse, Sunflower-Bacon, Tupper, and Southern Roadside Hazard Timber Sales. These projects were designed in the last 5 years, following the same Forest Plan Standards and Guidelines as this project. They are expected to have very minimal effects to the riparian canopy through the cutting of small trees and shrubs during road maintenance and temporary road construction. These effects are expected to be unmeasurable and would not affect stream temperatures. Aspen restoration connected with these sales is expected to cause increases in riparian shade over small areas.

The Monument Salvage is a past project. This sale salvaged less than 190 acres of fire killed timber, and construct less than 0.5 miles of temporary roads. It occurred in 2008, and is not expected to have any effect on the riparian canopy, which is mostly burned up in the sale area. Two other reasonably foreseeable projects which would affect stream temperatures are the Heppner Riparian Road Restoration project and the South Zone Umatilla Riparian Re-vegetation project. The Road Restoration Project would restore roads and stream crossings. The Riparian Re-vegetation Project would plant 600 hardwoods along named streams and tributaries and protect them with 40 cages in the Wildcat Analysis Area. Re-vegetation like this is a long term project. Observations on similar projects suggest that stream shade would begin to increase in 10 to 20 years, and that the hardwoods would begin to reproduce in 15 to 30 years.

Hydrologic Function

Current Conditions

The overall condition of the analysis area was examined with the Equivalent Clearcut Area (ECA) model. It uses past harvest data to model the current condition, and the extent of the proposed harvest. Results were pro-rated to account for recovery over time and are expressed in acres which have not recovered hydrologically from past treatments. The existing condition Equivalent Clearcut Area for Wildcat is 10.8 percent, or approximately 3,056 acres. It is expected that this project would increase ECA to 15.4 percent or 4,369 acres in the first year.

Measurable changes in hydrologic parameters such as peak flow which would result from past or present harvest, wildfires, insect infestations, or roads are unlikely at the current levels of Equivalent Clearcut Area or at the expected levels caused by this project. By comparison, results from the heavily instrumented High Ridge Evaluation area, located approximately 70 miles to the northeast in the headwaters of the Umatilla River, did not show detectable increases in water yield or peak flows until 60 to 100 percent of the catchments were in a clear-cut condition (Helvey and Fowler, 1996). The High Ridge study area is located in a higher elevation, more snow-dominated zone, and is less responsive than the Little Wall Creek -

Skookum Creek and Swale Creek sub-watersheds. The numerous studies of harvest and water yield generally show a range of responses occurring when 20 or more percent of the study area is harvested (Sherer, 2000, and Stednick, 1996).

Direct and Indirect Effects

Alternative 1

No activities would occur to change the equivalent clearcut acres.

Alternative 2

The Equivalent Clearcut Area model would increase from 10.8 to 15.4 percent with this alternative. The model exaggerates the percentage, because it assumes all activities would take place in the first year, rather than spread out over 3 to 5 years. Even so, at the 15.4 percent level, it is not expected that there would be any effects to peak flows.

Because the existing and proposed harvest and roaded part of the analysis area, is approximately 15.4 percent Equivalent Clearcut Area and because effects to hydrologic parameters are not documented at less than 20 percent, it is assumed that this project would not measurably affect peak flows.

Alternative 3

The Equivalent Clearcut Area model would increase from 10.8 to 15.0 percent with this alternative. The model exaggerates the percentage, because it assumes all activities would take place in the first year, rather than spread out over 3 to 5 years. Even so, at the 15.0 percent level, it is not expected that there would be any effects to peak flows.

Alternative 4

The Equivalent Clearcut Area model would increase from 10.8 to 14.5 percent with this alternative. The model exaggerates the percentage, because it assumes all activities would take place in the first year, rather than spread out over 3 to 5 years. Even so, at the 14.5 percent level, it is not expected that there would be any effects to peak flows.

Cumulative Effects – All Alternatives

Though the equivalent clearcut area percentages change by alternative there would be no effect to peak flows under any alternative so there would be no cumulative effects to peak flow within the analysis area.

AQUATIC HABITAT AND FISH

This section incorporates by reference the Wildcat Aquatic and Fish Report contained in the project analysis file at the Heppner Ranger District. Specific information on the methodologies, assumptions, and limitations of analysis and other details are contained in the report. A summary of the current conditions of the affected environment and the predicted effects of the Proposed Action and its alternatives are discussed in this section.

Scope of Analysis

The scale used for analysis includes two sub-watersheds (Little Wall Creek –Skookum Creek – 170702020803 and Swale Creek - 170702020801). These two subwatersheds cover about 38,816 acres, of which 33,650 acres are within the National Forest boundary. Named streams within these subwatersheds include Skookum, Alder, Hog, East Fork Alder, Swale, Bear and Two Springs creeks. All of these streams have been surveyed.

Sediment/Substrate

Current Condition

During surveys in 1991 - 2001 Wolman pebble count data was collected. Each reported value represents 2 pebble counts averaged. The values are as follows:

Stream	Reach	Percent fines <2mm
Alder	1	18
	2	50
	3	54
	4	84
EF Alder	1	53
Hog Creek	1	5
	2	4
	3	18
Skookum	1	12
	2	19
	3	22
Swale	1	12
	2	18.5
	3	22
Little Bear	1	11
Bear	1	9
Dry Swale	1	12
Two Springs	1	16

High levels of sediment loading (>35% embeddedness or >20% fines[2]) within the stream can lead to reduced quality of spawning substrate, the smothering of incubating fish eggs and can indirectly affect eggs and fry by reducing water flow through stream gravels leading to high levels of mortality (Hartman et al. 1997).

Direct and Indirect Effects

Alternative 1

The existing condition of high percent of fine sediment in streams will continue. No activities would occur under this alternative that would increase the amount of sediments. Riparian road decommissioning would also not occur so these roads would continue to contribute fine sediments to East Fork Alder Creek.

Alternative 2

Harvest, mechanical fuels treatment, 5.8 miles of road construction both system and temporary, and mechanical fire lines associated with prescribed burning outside of RHCAs could result in some soil exposure. Mitigation measures would minimize soil disturbance and keep it far enough away from streams

[2] Fines are defined as particles <2mm in diameter.

so potential sediment from these sources not impact streams and not increase embeddedness. In general, filter strips on the order of 200 to 300 feet in width are effective in controlling sediment that is not channelized (Belt et al. 1992). Non commercial thinning, aspen stand treatments and prescribed burning with associated hand or wet lines within RHCAs may also expose soil. Prescribed burning will be done on a little over 10,000 acres. Of these acres 687 are in class 1 riparian areas, 173 acres in class 3 riparian areas, and 1,272 acres of class 4 riparian areas. Burn intensities would be expected to be low and localized, and re-sprouting of vegetation could occur within two weeks of soil exposure (Agee 1993). Project design criteria where established to control sediment so that is not expected to be a measurable increase in sedimentation (Hydrology report) and would also not likely lead to an increase in embeddedness.

Reopening 41 miles of currently closed roads would pose some risk to increased sediment runoff. Some of the closed roads re-opened and maintained, and the open road maintenance is in riparian areas. In the short term, re-opening closed roads in riparian areas may expose soil and cause small scale, localized, increases in stream sediment (Hydrology report). This may also lead to localized increases in embeddedness but this increase would only last until high flows returned.

Approximately 2.4 miles of riparian roads are proposed to be decommissioned under this alternative. Sediment produced from decommissioning activities could result in sediment plumes instream lasting several hours. This may lead to localized increases in embeddedness immediately downstream of the project area where crossings are removed or where road fill is removed immediately adjacent to streams. This increase in embeddedness is expected to persist until high flows return to these streams in the spring when the majority of this sediment would be flushed out of the system. Decommissioning these roads would lead to an overall reduction in substrate embeddedness as it will reduce long-term chronic sediment inputs from these roads.

Alternative 3

All activities are similar to Alternative 2 though there will be six fewer acres of RHCAs included in the noncommercial thinning, and three fewer miles of road construction (temporary). These activities were not expected to lead to a measurable increase in substrate embeddedness so the effects to substrate embeddedness would be similar to those described in Alternative 2.

Alternative 4

All activities are similar to Alternative 2 though there will be approximately a half acre less of mechanical fuels treatments in riparian areas. These activities were not expected to lead to an increase in substrate embeddedness so the effects to substrate embeddedness would be similar to those described in Alternative 2.

Cumulative Effects

Alternative 2, 3, and 4

The activities contributing sediment to streams, if left as is, would continue to impact aquatic habitats. Actions were taken in an attempt to reduce the amount of sediment into streams in the past by obliterating roads and fencing streams. Today only grazing on small sections of stream and existing roads are still contributing sediment to streams. Future road decommissioning will help to further reduce this sediment input. Most activities, while they may cumulatively contribute to sediment mobilization, will not cumulatively add to the amount of sediment in streams due to riparian buffers and several mitigation measures designed to keep sediment from reaching streams. Though the road decommissioning and road maintenance may contribute to additional sediment input in the short term, these projects will in the long term lead to a reduction in the amount of sediment entering streams.

Both the Swale Creek and Little Wall Creek – Skookum Creek subwatersheds could have experienced an increase in sediment load due to past management activities including road construction, timber harvest, prescribed fire, grazing, and failure of instream fish structures. Road construction increased the drainage area with 163 stream crossings that allow sediment to be transported directly to the streams from roads. Grazing in the past caused bank destabilization, which contributed sediment to streams. A total of 164 instream structures were constructed in the 1980's and 1990's in Skookum, Alder, and Swale creeks. Fifty four of these structures have been identified as needing work and some are causing bank erosion contributing sediment to the streams. Past activities that have reduced sediment input into streams include aspen stand restoration, which tends to increase bank stability within these stands. Fencing of RHCAs in cattle allotments has allowed riparian vegetation to recover providing more structure for increased bank stability and less trampling of the bank. In addition the construction of upland water sources for cattle has diverted cattle from streams reducing the impact to stream banks on unfenced stretches of stream. Road obliteration and decommissioning has also occurred in the analysis area. Vegetation has recovered on some of these roads near streams or at crossings reducing the amount of sediment that enters streams.

Present activities that are contributing to an increase in sediment transport to streams include grazing and existing roads. There are still some unfenced areas of stream in cattle allotments that are impacted by grazing. Continued grazing is still causing bank destabilization at some of these locations. Several roads in riparian areas are chronic sediment sources for area streams. Other activities that are impacting sediment input into streams include aspen stand restoration. The restoration and fencing of aspen stands are helping to increase bank stability reducing the amount of sediment entering streams.

Future foreseeable activities are proposed for this subwatershed that would affect sediment load including road decommissioning, grazing, riparian planting and caging, aspen stand restoration and removal of instream fish passage barriers. Road decommissioning in the short term may increase the amount of sediment transported directly to streams due to the loosening of the soil. However these roads will be revegetated and in the long term this activity will lead to an overall reduction in the amount of sediment reaching streams. Road decommissioning in the short term may increase the amount of sediment transported directly to streams due to the loosening of the soil and disturbance of stream banks at the crossing. However once the barrier is removed and stream banks revegetated sediment input will be reduced. Grazing would continue in the analysis area and though minimized would continue to input sediment at isolated locations. Riparian planting and caging will help to stabilize stream banks and restore floodplain function so more sediment can be filtered out of streams during high flows. The restoration and fencing of aspen stands in the future will also help to increase bank stability reducing the amount of sediment entering streams.

Large Woody Debris

Current Condition

Large woody debris (LWD) data, collected during stream surveys, is summarized below:

Stream	Reach	LWD/mile
Alder	1	37
	2	28
	3	32
	4	22

East Fork Alder	1	63
Hog Creek	1	14
	2	13
	3	10
Skookum	1	6.1
	2	10.4
	3	17.5
Swale	1	26.1
	2	8.9
	3	41.4
Little Bear	1	42.1
Bear	1	38
Dry Swale	1	13.5
Two Springs	1	21.1

Of the surveyed streams, all reaches in Alder and East Fork Alder exceeded PacFish standards[3] for large woody debris (20 pieces per mile). The lack of wood along Skookum Creek, Hog Creek, Swale Creek reach 2 and Dry Swale Creek suggests that channel complexity and habitat quality is lower in these streams. This, in turn, limits the amount of habitat available for fish and, consequently, population sizes. The lack of large wood can indirectly lead to a reduced food supply, since large wood serves as a foundation for macroinvertebrates, the primary food source for fish.

Direct and Indirect Effects

Alternative 1

Because fuels would remain untreated under this alternative, the amount of large wood may increase in the short term due to fire mortality but may decrease in the long term as future potential large wood becomes lost to wildfire.

Alternative 2

The majority of the activities would occur outside of Riparian Habitat Conservation Areas and so would not impact large wood. Mechanical fuel treatments that occur in RHCAs would not be removing any wood that is already instream and will leave sufficient amounts to provide large wood in the future.

Non-commercial thinning in RHCAs, treatment of aspen stands, and prescribed burning could impact the recruitment of large wood. Conifers will be removed from aspen stands within RHCAs reducing the amount of large wood that may potentially fall into the creek. Opening up aspen stands so that young trees can grow would help increase large wood recruitment in the future. In addition, non commercial thinning within RHCAs will release the remaining small trees so that they can grow quicker and will provide for future large wood sooner than if treatment was not done. However, because the streams affected do not contain fish, there would be no impact to instream fish habitat.

Prescribed burning would be done on a little over 10,000 acres. Of these acres, 687 are in class 1 riparian areas, 173 acres in class 3 riparian areas, and 1,272 acres of class 4 riparian areas. Prescribed burning may lead to an increase in recruitment of large wood and may also result in the increased production of future large wood by releasing small trees by thinning out existing stands of young trees. It is not likely that prescribed burning will result in the loss of existing large wood as it will be done under controlled conditions

[3] The component of large wood was not represented in ICBEMP summary values.

and will result in a low intensity burn in RHCAs.

Alternative 3

All activities are similar to Alternative 2 though there will be six fewer acres of RHCAs included in the noncommercial thinning. Because there is less treatment within RHCAs there will be slightly less of an affect to large wood under this alternative.

Alternative 4

All activities are similar to Alternative 2 though there will be approximately a half acre less of mechanical fuels treatments in riparian areas. This activity was not expected to affect large wood so the effects of this alternative would be similar to those described in Alternative 2.

Cumulative Effects

Alternative 2, 3, and 4

Some past activities, grazing, road construction in riparian areas, harvest in RHCAs, restoration of aspen stands, and thinning in riparian areas have all likely affected large woody debris in the streams. The contribution to cumulative effects of activities under all action alternatives would be a short term loss of potential large wood in aspen stands with the removal of conifers. The remaining aspen would continue to grow eventually replacing this loss of large wood. In addition, increased production of future large wood will occur in stands where non-commercial thinning occurs in RHCAs.

Past activities that have affected large wood include commercial harvest in RHCAs and road construction. Commercial harvest in the past in RHCAs has lead to and overall reduction in potential large wood that can fall into creeks. Road construction along creeks also lead to a loss of potential large wood all along the roadbed located within RHCAs. Non-commercial thinning in RHCAs in the past has allowed for the growth of larger trees that will become large wood in the future.

Present activities that have affected large wood include cutting of danger trees and aspen stand restoration. Cutting of danger trees along roads in RHCAs in some cases leads to an increase in instream large wood where the tree is felled towards the creek. Aspen stand restoration can lead to a short term loss of potential large wood with the removal of conifers. The remaining aspen continue to grow eventually replacing this loss of large wood.

Future activities that can impact large wood include road decommissioning and fuels treatments. Road decommissioning will reverse the affects of loss of potential large wood. Fuels treatments in the analysis area in the future will function much the same as non-commercial thinning as it will generally remove the understory allowing the remaining trees to grow larger increasing the potential large wood.

Pool Frequency and Quality

Current Condition

Pool frequency data was collected during stream surveys within the analysis area and is displayed below. Pool densities in this table are compared to the median pool density of unmanaged streams in the Blue Mountain province. The residual pool depths displayed in the table below indicate that streams in the analysis area have habitat available for fish during the low flow period. The proportion of pools having at least one piece of large woody debris is unknown.

Stream	Reach	Pools/mile	Standard
Alder	1	38.8	16.1
	2	28.3	24.6
	3	26.3	39*
	4	10.4	39*
EF Alder	1	9.5	39*
Hog Creek	1	3.8	15.6
	2	4.0	17.8
	3	11.8	18.2
Skookum	1	16.6	13.5
	2	19	15.4
	3	29.2	39*
Swale	1	4.2	17.4
	2	0.7	28.4
	3	0.0	39*
Little Bear	1	1.5	39*
Bear	1	0	39*
Dry Swale	1	1.0	39*
Two Springs	1	1.5	39*

* This is the USFWS standard for streams 0-5 feet wide. Calculations using the ICBEMP numbers do not work with small stream widths

Pool frequency is an indication of habitat quantity where pool depth can be good indicator of habitat quality. The only reaches to have a sufficient number of pools to meet standards were reach 1 and 2 of Alder Creek and reach 1 and 2 in Skookum Creek; all others were below standards. Since the number and quality of pools can determine the habitat availability for fish species; this data indicates limited habitat for resident fish.

Direct and Indirect Effects

Alternative 1

As discussed in the Sediment/Substrate section, the risk of a large severe wildfire is greater due to untreated fuel loads and sediment deposition in streams could increase due to a loss of ground cover and increased water run-off rates. If an excessive amount of sediment were transported to streams, the sediment could settle in pools and there could be a loss of pool frequency or at least a reduction in pool quality.

Alternative 2, 3, and 4

The only activities that could affect pool frequency are the aspen treatments and prescribed burning and these are the same for all action alternatives. The aspen stands are located along Class 4 stream channels that are dry following spring runoff. Though felling of conifers into the creek bed could increase pool formation, this would only occur in the spring. These streams do not contain fish, so there would be no impact to instream fish habitat. Prescribed burning may increase large wood production, which could indirectly increase pool formation. It is not likely though that there will be a sufficient increase in the amount of large wood along fish bearing streams as a result of prescribed burning to measurably increase the number of pools.

Cumulative Effects

Alternative 2, 3, and 4

Some past activities including grazing, restoration of aspen stands, fencing riparian areas, road construction, harvest in riparian areas, and installation of instream structures have all likely affected pool frequency. The contribution to cumulative effects of activities under all action alternatives would be a short-term (5-10 years) loss of potential large wood that could lead to a delay in additional pool formation. However, since the streams that will be affected do not run water during the summer months there will be no cumulative effect fish habitat during these months.

Past activities that have affected pool frequency include commercial harvest in RHCAs, road construction, grazing, and installation of instream structures. Commercial harvest in the past in RHCAs lead to and overall reduction in potential large wood that could fall into creeks. Because large wood is one of the main contributing factors to pool formation the loss of this potential large wood also led to the loss of potential pools in these creeks. Road construction along creeks or crossing creeks can also lead to a loss of potential large wood, which leads indirectly to a loss in pool formation. Grazing of RHCAs has led to bank destabilization which can in turn input large amounts of sediment into streams causing pools to fill and reducing overall pool quality. Other activities have attempted to increase the number of pools in streams including the installation of instream structures. While these did increase the number of pools per mile over the short term approximately a third of these structures have been identified as needing work and some are no longer functioning as pools. Non-commercial thinning in RHCAs in the past has allowed for the growth of larger trees that will become large wood in the future. This activity increased the likelihood of natural pool formation by increasing potential large wood along streams.

Decommissioning riparian roads and cutting danger trees are the only current activities that could affect pools. Restoration of flood plains along decommissioned riparian roads will lead to future large wood that could in turn provide for natural pool formation. Cutting hazards along roads near streams may increase the amount of large wood instream if the tree lands within the stream channel.

Future activities that can impact pool and pool quality include road decommissioning. Road decommissioning will reverse the affects of loss of potential large wood and in the long term may increase the chance of natural pool formation by reestablishing potential large wood.

Wetted Width/Maximum Depth Ratio

Current Condition

Width to depth ratio data, collected during stream surveys, is summarized below. The ratios calculated are bankfull width to depth ratio in riffles. Actual calculations for wetted width to maximum depth of scour pools is not available. The bankfull width to depth ratios for stream reaches in this subwatershed are as follows:

Stream	Reach	Width to Depth Ratio
Alder	1	12
	2	8.7
	3	4.5
	4	3.9
EF Alder	1	5.6
Hog Creek	1	20
	2	ND
	3	3.5
Skookum	1	15.1

	2	13.9
	3	6.5
Swale	1	3.6
	2	2.1
	3	n/a
Little Bear	1	6.6
Bear	1	n/a
Dry Swale	1	9.3
Two Springs	1	5.0

Direct and Indirect Effects

Alternative 1

Because fuels would remain untreated under this alternative, there could be indirect increases in sediment due to a loss of ground cover and increased water run-off rates. If there is an excessive amount of sediment that is transported to streams, pools could be filled in and there could be a loss of pools or at least a reduction in pool quality. The amount of large wood could decrease along with potential large wood. Width to depth ratios could increase due to excessive amounts of sediment entering the stream.

Alternative 2, 3, and 4

Though there may be an increase in the amount of sediment entering streams due to road work (including road decommissioning) this amount of sediment is not likely of sufficient quantity to increase width to depth ratios at any location. This activity is the same for all action alternatives so effects will be similar.

Cumulative Effects

Alternative 2, 3, and 4

While some past activities, primarily grazing and road construction have likely affected width-to-depth ratios, no cumulative effects would occur from the activities proposed under any of the action alternatives.

Aquatic Species

Current Condition

Mid-Columbia River Steelhead/ Interior Redband trout (Oncorhynchus mykiss gairdneri) and Designated Critical Habitat for Steelhead– Mid-Columbia Steelhead were listed as Threatened by the National Marine Fisheries Service under authority of the Endangered Species Act (ESA) in 1999. Interior redband trout had previously been listed as Sensitive by the Forest Service in Region 6 and are on the State Sensitive/Critical list in Oregon. Steelhead and redband trout are also Management Indicator Species under the Umatilla Land and Resource Management Plan. For practical purposes, juvenile resident redband trout cannot be distinguished from the anadromous form (steelhead) where the two occur together and so no distinction will be made here. This means that the more restrictive ESA "Threatened" classification would apply. Steelhead are known to be present throughout Little Wall, Skookum, Alder, East Fork Alder, Hog, Swale, Bear, and lower Two Springs creeks. Approximately 42 miles of steelhead designated critical habitat are included in the analysis area for this project. Skookum, Alder, East Fork Alder, Hog, Swale, Bear, Lower Little Bear, and lower Two Springs creeks have been designated as critical habitat for steelhead.

Essential Fish Habitat for Chinook salmon – All perennial streams below long-standing natural fish passage barriers in the John Day River system have been designated as essential fish habitat for spring Chinook salmon. This would include all perennial fish bearing streams within the project area.

No other sensitive aquatic species have been found within the project area. Sensitive Chinook salmon are located downstream of the project area in the North Fork John Day River. There is also an aquatic spring snail that may be listed as a sensitive species in the future. Surveys were conducted for this snail and it was not found in this area.

Direct and Indirect Effects

Alternative 1

This alternative would not directly affect fish species (redband trout and steelhead) in the analysis area. However, the potential for a large, high severity fire would increase as woody fuels continue to increase (Fuels report). A large wildfire could potentially remove all fish from a burned over stream as documented in the Bull, Tower, and Summit fires (1996), Meadow Fire (2001), and Bull Springs Fire (2003) which occurred in similar stand conditions. Fish that remain would have to survive in a habitat degraded by loss of shade, increased sediment from ash and unprotected soil, loss of future large wood, etc. In such an event, spawning and rearing success would be reduced.

Alternative 2, 3, and 4

Because most activities would occur outside of Riparian Habitat Conservation Areas, there would be little impact to aquatic habitat and the fish populations these habitats support. It was not likely that there would be an increase in water temperatures under any alternative (Hydrology report) so this will not affect fish species. The analysis of aquatic habitat discussed above indicated that the only habitat parameters that may be affected are substrate embeddedness and large wood. Increases in fine sediments from road decommissioning could decrease reproductive success of fish by filling interstitial spaces between spawning gravel. This effect is likely short term and additional fines added to spawning gravels will be flushed from the stream in the following spring high flows prior to spawning. Road decommissioning may also lead to stream temperature reductions in the future (Hydrology report) in addition to an overall reduction in the amount of chronic sediment entering streams. The largest source of sediment was expected from road decommissioning and this activity is the same in all alternatives so similar effects are expected in all action alternatives.

An increase in large wood may provide a short term increase in hiding cover, shade and substrate for food sources. It may also indirectly lead to an increase in pool formation which would also increase hiding cover and may increase areas of thermal refuge. Effects to large wood were also similar between action alternatives and so will have similar affects to fish populations for all action alternatives.

Cumulative Effects

Alternative 2, 3, and 4

Threatened and Endangered species in the analysis area include Mid-Columbia Steelhead and Management Indicator Species include redband trout and steelhead. Most activities discussed under cumulative effects for aquatic habitat have affected fish populations in these streams. Increases in temperature can lead to increased stress to fish and reduction in spawning and rearing success. An increase in sediment yields could potentially add to degradation of aquatic habitat and fish populations by:

a) Increasing suspended sediment, which can have detrimental effects on fish health;

b) filling interstitial spaces, which reduces escape and hiding cover for fish;

c) increasing width/depth ratios, which can increase solar heating of water and also decrease fish hiding and escape cover and fish mobility;

d) decreasing the quality of spawning substrate, which reduces reproductive success;

e) reducing pool volumes, which decreases the amount of hiding, escape and resting habitat available and makes fish more vulnerable to predators.

Increases in sediment can increase stress on fish reducing spawning success, although whether the changes would be biologically significant would depend on many factors, including the amount and particle size of sediment produced, the size of the stream, amount of available refuge, including side channels and tributaries, and the conditions in the stream before the introduction of additional sediment. Fish in streams in good condition could tolerate more such changes than fish already stressed by poor habitat conditions. The contribution to cumulative effects of all action alternatives would be an increase of stress to redband trout and steelhead due to the potential for sediment to be mobilized into creeks and increase substrate embeddedness at isolated locations.

Biological Evaluation Determination of Effects and Rationale

Mid-Columbia steelhead: The Wildcat project may affect but is not likely to adversely affect mid-Columbia Steelhead.

Rationale:

Road decommissioning in the short term may generate sediment that would affect substrate embeddedness. In the long term however decommissioning roads would lead to recovery of these riparian areas and eliminate several chronic sources of sediment. Any sediment generated from activities in this project would be localized small amounts within the immediate project area. Increases in substrate embeddedness are only expected to last until the next high flow which will occur before spawning the following spring. Large wood may increase under all action alternatives and may lead to an increase in pool formation. These are both beneficial affects. No other activities under this project would affect steelhead.

Designated Critical Habitat and Essential Fish Habitat: The Wildcat project may affect but is not likely to adversely affect Designated Critical Habitat for steelhead or Essential Fish Habitat for Chinook salmon.

Rationale:

Road decommissioning in the short term may generate sediment that would affect substrate embeddedness. In the long term however decommissioning roads would lead to recovery of these riparian areas and eliminate several chronic sources of sediment. Any sediment generated from activities in this project would be localized small amounts within the immediate project area. Increases in substrate embeddedness are only expected to last until the next high flow which will occur before spawning the following spring. Large wood may increase under all action alternatives and may lead to an increase in pool formation. These are both beneficial affects. There would be no effect to other habitat parameters associated with this project.

Redband trout: The Wildcat project May Impact individuals or habitat for redband trout, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Rationale:

Any sediment generated from activities in this project would be localized small amounts within the immediate project area. Increases in substrate embeddedness are only expected to last until the next high flow which will occur before spawning the following spring. These effects would be short lived and there would not be a large enough quantity of sediment to change any habitat parameters at the reach level. There would be no other effect to habitat parameters associated with this project.

Consultation with NOAA Fisheries will occur for Threatened mid-Columbia steelhead and its critical habitat. The Magnuson-Stevens Fishery Conservation and Management Act as amended (1996) also applies for this project though Chinook salmon are not present within the analysis area. Streams in the analysis area have been designated essential fish habitat for Chinook salmon.

TERRESTRIAL WILDLIFE

This section incorporates by reference the Wildcat Wildlife Report contained in the project analysis file at the Heppner Ranger District. Specific information on the methodologies, assumptions, and limitations of analysis and other details are contained in the report. A summary of the current conditions of the affected environment and the predicted effects of the Proposed Action and its alternatives are discussed in this section.

Scope of Analysis

The scale of the analysis differs based on the species and habitats being considered. For this evaluation and analysis, the "analysis area" refers to Forest Service Lands within the Little Wall Creek - Skookum Creek and Swale Creek subwatersheds (Wildcat analysis area). "Project Area" refers to all the affected areas where the proposed project would occur on the landscape. "Affected area" is the stand or portion of a stand (unit) where a specific action or activity will occur. The scale of analysis for those wildlife species and habitats considered in the Wildcat Wildlife Report will be as follows:

- Late and old structure, old growth habitat, and habitat connectivity will be assessed at the scale of the two subwatersheds that make up the analysis area, with consideration given to the connectivity of late and old structure habitat and old growth to habitats outside the boundaries of the analysis area.
- Snags and downed wood will be assessed at the scale of the Wall Creek watershed for the dry upland, moist upland, and cold upland forest Potential Vegetation Groups (PVGs). These features will also be assessed at the project area scale (individual treatment units). Green tree replacements will be assessed at the scale of the project area (individual treatment units).
- The scale of analysis for the Rocky Mountain elk varies depending on standards and direction given by the Forest Plan. In the C4, E2, and E1 Management Areas, the scale of analysis will be that portion of the Management Area that lies within the analysis area. For the C3 Management Area (Big Game Winter Range), the scale of analysis extends outside the analysis area to the entire winter range area (Monument winter range).
- Primary cavity excavator species will be assessed at the scale of the two subwatersheds that make up the analysis area; effects to these habitats are contained in the Dead Wood section of this report.
- Pileated woodpecker, American marten, and northern three-toed woodpecker were all assessed at

the scale of suitable/potential habitat within the analysis area

- The scale of analysis for Endangered, Threatened, and Sensitive species, including the California wolverine, Columbia spotted frog, inland tailed frog, Lewis' woodpecker, white-headed woodpecker, and gray wolf will be suitable/potential habitat in the analysis area.
- The scale of analysis for Species of Interest, including the northern goshawk, olive-sided flycatcher, and forest dwelling bats will be suitable/potential habitat for these species within the analysis area.
- Neotropical Migratory Birds will be assessed at the scale of the analysis area; specific habitat types and features will be addressed at this scale.

Suitable habitat was identified using the vegetation database within the Corporate GIS database for the Heppner Ranger District. Vegetation data was queried based on habitat requirements and preferences of selected species. Suitable habitat queried from GIS was then intersected with proposed treatment units in the Wildcat analysis area. Queries used to identify potential wildlife habitats are available in Appendix A of the Wildlife Report. For the purposes of this report, the short term would include immediate impacts and those that last up to 5 years from implementation. The mid term would include impacts lasting from 5 to 15 years; the long term would apply to impacts that occur or changes that develop in 15 years or longer.

LATE AND OLD STRUCTURE: Dedicated Old Growth Habitat

Current Condition

Old growth (OG) habitats are distributed across the Forest so that there is one old growth habitat unit for every 12,000 to 13,000 acres of capable habitat. Unit size and distribution are variable and depend on the vegetation type and management indicator species (USDA 1990) for which the unit was designated. Old Growth units are identified in the Forest Plan as Management Area C1 (Dedicated Old Growth) and Management Area C2 (Managed Old Growth). Old growth units were initially classified as suitable and/or capable habitat for a selected Forest indicator species (pileated woodpecker or pine marten in the case of C1; northern three-toed woodpecker for C2). Units are to be maintained as old growth tree habitat for appropriate wildlife species (USDA 1990). Units can occur in smaller (50 acre minimum) blocks no more than ¼ mile apart.

The analysis area contains one C2 (Managed Old Growth) area; it is located in the northeastern corner of the analysis area. Additionally, there is all or part of six C1 (Dedicated Old Growth) stands within the analysis area. These are identified as Dedicated Old Growth units 1611, 1621, 1711, 1781, 1792, and 1931 in the Forest GIS layer that identifies old growth habitat. Table W-01 shows C1 and C2 stands, their location, size, and the old growth dependent management indicator species designated for each unit.

Table W-01. Dedicated Old Growth habitat within the Wildcat analysis area.

Stand	Location	Acres within analysis area	Management Indicator Species
C1 – Dedicated Old Growth			
1611	Headwaters of Skookum Creek	10	Pileated Woodpecker
1621	Headwaters of Alder/Swale Creeks	51	Pileated Woodpecker
1711	Lower East Fork Alder Creek	356	Pileated Woodpecker
1781	Lower Swale/middle Skookum Creeks	439	Pileated Woodpecker
1792	Upper Hog Creek	189	Pileated Woodpecker
1931	Headwaters of Hog/Skookum Creeks	19	Pileated Woodpecker

	Total	1,052	Pileated Woodpecker
C2 – Managed Old Growth			
1958	Headwaters of Swale Creek	83	Northern three-toed woodpecker
	Total	83	

Portions of four of these old growth stands (1611, 1621, 1792, and 1931) lie outside the analysis area. These stands range in size from 377 acres to 1,062 acres and are within or connected to designated roadless areas within and outside the analysis area. All of the C1 old growth management stands were designated to provide habitat for the pileated woodpecker. These are also providing habitat for the pine marten.

Dedicated and managed old growth stands are not well distributed across the Wall watershed; old growth stands are clumped together in the northern portion of the analysis area. Multiple potential vegetation groups and biophysical environments are represented by these stands.

The C1 old growth units within the analysis area would not be affected by the proposed activities because no treatments are proposed within the C1 management area allocation. None of the proposed treatment units are situated in Designated Old Growth habitat. Two proposed commercial thin units (units 30 and 76) abut Dedicated Old Growth habitat. Treatment of these units would not alter the structure or composition of the adjacent old growth habitat. Treatment (commercial thinning) within these units would maintain or promote the development of late and old structure habitat adjacent to Dedicated Old Growth stands; connectivity would also be maintained adjacent to these stands. Because there would be no treatment within Dedicated Old Growth habitat, the current composition, structure, and function of C1 old growth units would be maintained under all of the proposed alternatives. Therefore, no further analysis of the environmental effects would occur for the C1 management area.

Proposed treatment unit 78 lies within Managed Old Growth (C2) unit #1958. The impacts of proposed treatment within this C2 management unit will be assessed below.

Direct and Indirect Effects

Alternative 1

Under the no action alternative, Managed Old Growth habitat would continue to develop along existing successional pathways. Within old growth unit #1958, vegetation would continue to recover from past insect damage. Understory vegetation (primarily small diameter lodgepole pine) would grow where openings were created by tree mortality resulting from insect damage. Larger trees within this stand would continue to be vulnerable to insects and disease damage and wildfire, and could be lost to these agents in the future.

Alternative 2, 3, and 4

Under all of the action alternatives, there would be approximately 20 acres of mechanical fuels treatment/sanitation harvest within old growth unit #1958. The proposed treatment would reduce the risk of fire by removing a portion of downed woody material and snags from the unit. Removal of snags and downed wood would reduce potential foraging and nesting habitat for primary cavity excavators like the northern three-toed woodpecker. Forest Plan standards for downed wood and snags would be met or exceeded on treated acres following treatment. Based on examination of existing snag densities in the cold and moist upland forest habitat types and historic snag density distribution data for these habitat types obtained from the DecAID advisor tool, a target snag density of 6 snags per acre over 10 inches dbh (with a preference for larger diameter snags) would be retained within this unit. Treatment would also remove diseased trees that have a potential to infect the remainder of the overstory; in the short term, foraging habitat for primary cavity excavators would be reduced through reduced naturally occurring (disease and insect mortality) snags and reduced insect densities in these stands. Untreated portions of the mechanical fuels treatment area (totaling 10%) would provide for locally high levels of insects and disease and relatively high snag and downed wood densities. In the long term, primary cavity excavators would benefit by improving the health of the residual overstory in this old growth unit and producing larger diameter trees faster (through reduced competition and stress associated with insects and disease) than untreated stands. Treatment would also improve the health of understory regeneration of lodgepole pine and true fir; in the long term, multiple canopy layers composed of a variety of species would be produced in this stand.

This old growth unit currently does not exhibit old growth habitat features due to a lack of large diameter trees (lodgepole pine) and multiple canopy layers. The Forest Plan states that harvest is allowed in these stands where it enhances wildlife habitat; the proposed activities would improve stand health and resiliency, and increase growth rates of overstory trees through reduced competition and stress from insects and disease. Elevated snag retention rates would reduce short term impacts to primary cavity excavators; the number and distribution of these snags would continue to promote the conservation of old growth associated primary cavity excavating species. Proposed treatment would maintain older trees (and overall stand health) within the old growth unit; in the long term, this stand would meet or move toward the desired future condition of a mixture of habitat in the 0 to 60 and 60 to 120 year old age classes.

Cumulative Effects

Alternative 2, 3, and 4

Past activities that affected the availability and quality of late and old structure lodgepole pine (managed old growth) habitat include timber harvest and disease and insect mortality. Timber harvest activities affected the structure and composition of lodgepole pine stands in the analysis area; typically, these stands were regeneration harvested or clearcut. This activity reduced the abundance of large diameter lodgepole pine in the northern portion of the analysis area. Insects and disease have also impacted the quality and availability of medium and large diameter lodgepole pine. Post disturbance stands provided high snag densities for primary cavity excavators like the black-backed woodpecker. High quality habitat for these species has declined due to loss of snags through decay over time. These past activities, actions, and events have combined to create the existing condition of late and old structure lodgepole pine in the analysis area.

There are no ongoing or future activities proposed in the analysis area with a potential to impact this habitat type.

When combined with the residual impacts of past activities, actions, and events in the analysis area, the activities proposed under all of the action alternatives would result in short term reductions in snags (potential nesting, roosting, and foraging habitat) in a portion of old growth unit #1958. This would contribute to past reductions in snags. Conversely, treatment activities would improve the health and resiliency of treated acres to disturbance agents like disease and insects, maintaining these stands and promoting the growth of large diameter lodgepole pine. The proposed activities would not adversely impact habitat quality or species that require these habitats. In the long term, the quality of old growth unit #1958 would improve through treatment; it would provide structural diversity (a mix of mature lodgepole pine and young stands), vertical diversity (a mix of canopy layers), and move toward the desired future condition of Managed Old Growth habitat identified in the Forest Plan.

LATE AND OLD STRUCTURE: Old Forest Structural Stages

Current Condition

The wildlife standards in the Regional Forester's Forest Plan Amendment #2 (USDA 1995) require the evaluation of late and old structural stages relative to the quantity of late and old structural stages within or outside the historical range of variability. For the purpose of this standard, late and old structural stages include old forest multi-strata and old forest single-stratum stands. A number of species present on the Umatilla National Forest require late and old structure habitat. These species include pileated woodpecker, white-headed woodpecker, Lewis' woodpecker, pine marten, northern goshawk, Cooper's hawk, sharp-shinned hawk, flammulated owl, great gray owl, Vaux's swift, Townsend's warbler, Hammond's flycatcher, and others.

The historical range of variability (HRV) and existing old forest habitat in each potential vegetation group (PVG) in the Wildcat analysis area is shown on Table W-02. When compared to the historical range of variability (HRV), old forest multi-strata habitat is within the historic range in the cold upland forest potential vegetation group, below HRV in the moist upland PVG, and above HRV in the dry upland PVG. In the old forest single-stratum habitat type, the current condition is below the historic range of variability in the dry upland forest PVG.

Table W-02. Historic range of variability (HRV) analysis for late and old forest structural classes in the Wildcat analysis area.

Potential Vegetation Group		Old Forest Multi Strata		Old Forest Single Stratum		NFS Acres (Total)
		Historic Range	Current	Historic Range	Current	
Cold	Percent	10-40%	35%	0-5%	0%	2,333
Moist	Percent	10-30%	4%	0-5%	0%	7,335
Dry	Percent	5-20%	26%	15-55%	4%	18,113

The Regional Forester's Forest Plan Amendment #2 states that harvest is allowed in late and old structural (LOS) stages that are above or within HRV in order to maintain or enhance late and old structure habitat within a particular biophysical environment or to move one type of LOS habitat into an LOS stage that is deficit (below HRV). Currently, there are approximately 6,384 acres of late and old structure habitat within the analysis area (Table W-03).

Table W-03. Existing condition of late and old structure habitat in the Wildcat analysis area.

LOS Structure Type	Existing Habitat	
	Acres	Percent [1]
Old Forest Single Stratum	662	10%
Old Forest Multi-Strata	5,722	90%
TOTAL LOS HABITAT	6,384	100%

1 Percent of total habitat in habitat type.

These acres were queried from the GIS database using stand structure (old forest single structure and old forest multi-strata) to classify LOS. The Monument Complex Fire affected late and old structure habitats to varying degrees. Approximately 526 acres of late and old structure habitat (453 acres OFMS and 73 acres OFSS) was burned at moderate severity by the fire; another 4 acres of OFMS burned at high severity. Overstory mortality in these stands ranges 10 percent to as high as 100 percent. A portion of these stands no longer provide green late and old structure habitat; these habitats are providing burned late and old structure habitat that will be used by a number of wildlife species (black-backed woodpecker, Lewis' woodpecker, hairy woodpecker, etc.). The vast majority of these acres lie within the Skookum Roadless

Area in the extreme southern portion of the analysis area.

Direct and Indirect Effects

Alternative 1

In the short term, late and old structure habitat would maintain its current quality and extent in the analysis area. As a result, single-layer old forest would remain below the historical range of variability in the dry upland PVG, within HRV in the cold and moist upland forest PVGs. Old Forest Multi-Strata stands would continue to be below the historical range of variability in the moist upland PVG, within the HRV in the cold upland forest PVG and above HRV in the dry upland forest PVG. Indirectly, the amount of late and old structure would change over time. With the existing management direction, including fire suppression, late and old structure stands (multi- and single-stratum) in the project area would continue to grow into a multistory structure. As understory trees that would normally be thinned by fire grow, they would create a multi-strata canopy where open, single-stratum forest once existed, further reducing single stratum old forest habitat in the dry upland forest PVG. This would increase stand density and fuel loading, stressing trees, and making stands increasingly susceptible to insect and disease outbreaks and high-severity wildfire. A major disturbance on the landscape (i.e. fire) would change the composition and structure of late and old structure habitat by converting these stands to early seral, stand initiation-structural stages. This would result in reduced quantity and connectivity of late and old structure habitats in the analysis area. Old forest single-stratum and old forest multi-strata would likely both be below the historical range of variability in the dry upland PVG after such an event. The same would be true of old forest multi-strata habitat in the moist upland and cold upland forest potential vegetation groups as well.

Common to Alternatives 2, 3, and 4

Under all of the action alternatives late and old structure habitat would be commercially thinned or treated to reduce disease and fuel loading. No trees over 21 inches dbh (even those afflicted by disease) would be removed in commercial, non-commercial, or mechanical fuels reduction treatments. Commercial thinning of LOS stands would generally occur in dry forest old forest multi-strata (OFMS) stands. This activity would promote or enhance late and old structure habitat features in the short and long term. The largest trees in these stands would be retained; smaller competing understory and overstory trees and those uncharacteristic of the potential vegetation group would be removed. Canopy closure would be reduced to some degree in treated LOS stands. Treatment would promote increased growth rates in residual trees by reducing competition for resources. Treatment of dry upland forest late and old structure habitat would promote the creation of single-layered old forest and change species compositions from mixed conifer types to those dominated by ponderosa pine and western larch.

In moist upland and cold upland forest types, mechanical fuels treatments would remove diseased trees (mistletoe, root rot, etc.) and reduce downed and standing dead fuel loading. The removal of green trees would be incidental to fuels reduction activities; removal of diseased trees would promote a healthy residual stand. Mechanical fuels treatment activities would not measurably alter the structure or composition of late and old structure habitats. Insect and disease agents that create snags and downed wood, a habitat feature valued by a number of old growth associated wildlife, would be reduced by the proposed activities. By meeting (and in most cases exceeding) Forest Plan snag and downed wood standards, treated units would provide sufficient post-treatment downed and standing dead wood (in the present and over time) for old-growth associated wildlife species. Mechanical fuels treatment would promote the resilience of moist and cold upland stands to fire, maintaining these habitats in the long term for associated wildlife species.

Species adapted to late and old structure, single-strata ponderosa pine stands (white-headed woodpecker, flammulated owl, Lewis' woodpecker, etc.) would benefit in the mid and long term through the restoration of appropriate structural stages and species compositions. In the short term, disturbance associated with treatment activities may result in these species moving elsewhere during implementation. Treatment of mixed conifer (multi-strata) stands in the dry upland forest PVG would reduce habitat for multi-strata adapted species using these habitats.

Burning would occur within LOS under all three action alternatives. A total of 2,004 acres of late and old structure habitat would be burned in natural fuels reduction units under all action alternatives. Burning would reduce fuels created from harvest activities on approximately 373 (Alternative 3) to 422 (Alternative 2 and 4) acres of treated LOS. This action would not change the overstory tree composition or structure because prescribed fire would be low intensity and would not impact overstory vegetation.

Burning would generally be restricted to the dry upland PVG, where fire was historically the most important contributor to the structure and composition of habitat in the dry upland PVG. This action would not change the overstory tree composition or structure in harvest units because prescribed fire would be low intensity and would not impact overstory vegetation. Because burning would be low intensity, fire effects on snags and downed wood are expected to be minimal. Forest Plan standards for snags and downed wood would be met in all treated LOS habitat after vegetation and fuels treatments.

Under all action alternatives, approximately 15 acres of aspen within 4 units would be treated. Conifers would be removed from these stands to reduce competition for resources and increase the vigor of remnant aspen stands. Within stands 77 and 82, a portion of all conifers, including those greater than 21 inches in diameter, would be removed. A Forest Plan amendment would be needed under all action alternatives to allow the cutting of green trees over 21 inches in diameter. While some large diameter trees (those over 21 inches dbh) would be removed, these trees are not located within potential vegetation groups/structural stages that are currently below the historical range of variability. The structure of these old forest stands would change in response to treatment; old forest multi-strata habitat would be changed to an old forest single-strata structure on approximately 5 acres in the dry upland forest potential vegetation group. There would be no net loss of old growth habitat under any of the action alternatives. Treatment in these stands and other dry forest multi-stratum old forest stands would increase old forest single-strata habitat within the HRV analysis area by 2 percent (from 4 to 6 percent) under all action alternatives.

Cumulative Effects

Past activities, actions, and events in the Wildcat analysis area that affected the quality, amount, and distribution of late and old structure habitat include commercial timber harvest (including salvage, seed tree, shelterwood, overstory removals, commercial thinning, etc.), wildfire , disease and insect infestations, and firewood cutting. Past commercial and regeneration harvest (16,309 acres) affected the structure and composition and distribution of late and old structure stands in the analysis area. Acres of LOS affected by past timber harvest could not be queried from the GIS database because stand data prior to harvest is not available. Within harvested LOS, large trees were targeted for removal; snags and downed wood (density and average size) were also reduced in these stands. Commercial and regeneration harvest reduced connectivity of late and old structure habitats, causing fragmentation of late and old structure wildlife habitat that was historically large and relatively homogeneous. Salvage harvest (2,048 acres) reduced high density snag and downed wood areas in late and old structure habitats affected by insects and disease. Although the composition and structure of these habitats was altered by these agents, large diameter snags and downed wood would have been used by a number of wildlife species associated with old growth habitat. Wildfire has also affected late and old structure habitat to a small degree. The Monument Complex Fire burned approximately 526 acres at moderate and high severity; overstory mortality is quite variable on these acres. A portion of these acres no longer provide a structure and composition suitable for late and old structure associated wildlife that require high stand densities and multiple canopy layers. Disease and insect infestations have impacted late and old structure habitat in the analysis area, reducing acres and increasing fragmentation. Spruce budworm infestations, and more recently tussock moth damage has affected late and old structure and residual large diameter trees in the analysis area. Firewood cutting also reduced the standing dead wood component in late and old structure stands. This activity occurs adjacent to open forest roads within the analysis area. Snag densities adjacent to open roads have been reduced through this activity. These activities and events have contributed to the existing condition of late and old structure habitat in the allotment.

Present and reasonably foreseeable future activities, actions, and events that affect late and old structure habitat include hazard tree felling/removal and firewood cutting. Hazard tree felling and removal would occur along approximately 80 miles of existing road within the analysis area. Many of the roads included in this figure have already had hazard trees removed to provide for public safety; new hazards that develop prior to implementation will be affected by this activity. This activity would remove dead and live trees that pose an imminent and likely danger of falling onto roads used by the public, generally out to a distance of 150 feet from the road. These activities would remove habitat desired by wildlife dependent on late and old structure habitats; defects such as heart rot, broken tops, mistletoe brooms, and snags in mid- and later stages of decay would be those most likely to be removed. Firewood cutting would have the same effects as those described under the past activities section.

When the expected effects of this alternative are combined with the residual and expected effects of past, present, and reasonably foreseeable future activities, actions, and events in the analysis area, there would be no cumulative reduction of late and old structure habitat within the analysis area. Approximately 6 acres of OFMS habitat in aspen stands would be converted to an old forest single-stratum structure with larger diameter ponderosa pine dominating the overstory. Habitat features associated with late and old structure stands would be reduced by the proposed activities, and would contribute to past impacts, particularly in the case of snags and downed wood. Due to the fact that Forest Plan standards for snags and downed wood would be met or exceeded there would be no adverse impact on species associated with these habitats. Treatment would promote the maintenance or enhancement of late and old structure habitat features and move stands toward late and old structural stages that are currently below HRV.

Alternative 2

The effects of late and old structure habitat treatment would be the same as those described for All Action Alternatives; however, the extent (acres treated) would differ between each of the Action Alternatives. Treatment of all LOS stands would promote or enhance late and old structure habitat features in the short and long term. Under this alternative, there would be no net loss of late and old structure habitat. No late and old structure habitat that is currently below HRV would be treated under this or any other alternative; if late and old structure habitat that is below HRV in a particular potential vegetation group is encountered in treatment units during layout, these acres would be excluded from the unit. Approximately 927 acres of late and old structure habitat would be commercially thinned or mechanically treated to reduce fuels and disease. See Table W-04 for acres of LOS treated by treatment type.

Table W-04. LOS acres* by treatment type under the Proposed Action.

Treatment type	Treatment	
	Acres	Percent [1]
Commercial thinning (HITH)	475	51%
Mechanical Fuels	453	49%
TOTAL LOS	928	100%

1 Percent of total habitat in treatment type.

Cumulative Effects

The cumulative effects under this alternative would be similar to those described under All Action Alternatives. When the expected effects of this alternative are combined with the residual and expected effects of past, present, and reasonably foreseeable future activities, actions, and events in the analysis area, there would be no cumulative reduction of late and old structure habitat within the analysis area. Treatment would promote the maintenance or enhancement of late and old structure habitat features and move stands toward late and old structural stages that are currently below HRV.

Alternative 3

The effects of late and old structure habitat treatment would be the same as those described for All Action Alternatives; however, the extent (acres treated) would differ between each of the Action Alternatives. Treatment of all LOS stands would promote or enhance late and old structure habitat features in the short and long term. Under this alternative, there would be no net loss of late and old structure habitat. No late and old structure habitat that is currently below HRV would be treated under this or any other alternative; if late and old structure habitat that is below HRV in a particular potential vegetation group is encountered in treatment units during layout, these acres would be excluded from the unit. Approximately 857 acres of late and old structure habitat would be commercially thinned or mechanically treated to reduce fuels and disease. See Table W-05 for acres of LOS treated by treatment type.

Commercial thinning and mechanical fuels treatment activities are proposed for late and old structure habitat under this alternative. Table W-05 shows treatment acres by prescription type.

Table W-05. LOS acres* by treatment type under Alternative 3.

Treatment type	Treatment	
	Acres	Percent [1]
Commercial thinning (HITH)	405	47%
Mech. Fuels	452	53%
TOTAL LOS	857	100%

1 Percent of total habitat in treatment type.

Cumulative Effects

The cumulative effects under this alternative would be similar to those described under all action alternatives. When the expected effects of this alternative are combined with the residual and expected effects of past, present, and reasonably foreseeable future activities, actions, and events in the analysis area, there would be no cumulative reduction of late and old structure habitat within the analysis area.

Alternative 4

The effects of late and old structure habitat treatment would be the same as those described for all action alternatives; however, the extent (acres treated) would differ between each of the action alternatives.

Treatment of all LOS stands would promote or enhance late and old structure habitat features in the short and long term. Under this alternative, there would be no net loss of late and old structure habitat. No late and old structure habitat that is currently below HRV would be treated under this or any other alternative; if late and old structure habitat that is below HRV in a particular potential vegetation group is encountered in treatment units during layout, these acres would be excluded from the unit. Approximately 752 acres of late and old structure habitat would be commercially thinned or mechanically treated to reduce fuels and disease. See Table W-06 for acres of LOS treated by treatment type.

Commercial thinning and mechanical fuels treatment activities are proposed for late and old structure habitat under this alternative. Table W-06 shows treatment acres by prescription type.

Table W-06. LOS acres by treatment type under Alternative 4.

Treatment type	Treatment	
	Acres	Percent [1]
Commercial thinning (HITH)	475	63%
Mech. Fuels	277	37%
TOTAL LOS	752	100%

1 Percent of total habitat in treatment type.

Cumulative Effects

The cumulative effects under this alternative would be similar to those described under all action alternatives. When the expected effects of this alternative are combined with the residual and expected effects of past, present, and reasonably foreseeable future activities, actions, and events in the analysis area, there would be no cumulative reduction of late and old structure habitat within the analysis area.

LATE AND OLD STRUCTURE: Connectivity

Current Condition

Wildlife standards in the Regional Forester's Forest Plan Amendment #2 (USDA 1995) require late and old structural stands and designated old growth areas to be connected to each other across the landscape. For this standard, connective habitat does not necessarily need to meet the same description of suitable habitat for a particular species, but provide "free movement" between late and old structural stands and old growth areas, for various wildlife species associated with the late and old structural condition.

For the majority of the watershed, late and old structural stands and old growth areas are connected to each other with medium to large trees, stands with variable widths greater than 400 feet, and attached with 2 or more different connections. The least connected areas generally include stands where recent (< 15 years) insect and disease outbreaks and wildfire have occurred, reducing the density of trees in those areas. Stands affected by these agents have less value as connectivity habitat. That portion of the analysis area north of Forest Road 21 experienced heavy spruce budworm damage in the late 1980s and early 1990s. Portions of this area are marginally effective connectivity habitat. Portions of the analysis area, particularly at mid and lower elevations of the analysis area are composed of grasslands and shrublands, including contiguous grasslands, grasslands interspersed with timber, juniper/shrub woodland, grassy stringers associated with draws, and other non-forest habitat features. As a result, portions of the analysis area have a naturally low potential to provide connectivity to adjacent or distant stands due to grass-dominated habitats lying between timbered stands. Connectivity habitat was identified using the Forest GIS database. Stands with the highest canopy closure and later successional stages were queried to create a connectivity map that could be displayed with treatment units to assess effects on connectivity habitat. The actions proposed under each of the action alternatives would treat connectivity habitat to some degree.

The Regional Forester's Amendment #2 allows for treatment within connectivity habitat as long as certain conditions are met. These conditions include: stands maintain medium and larger trees are common, canopy closures are within the upper 1/3 of site potential, connections are at least 400 feet wide (where available), and old growth/LOS are connected in at least two directions. Currently, late and old structure and old growth connectivity in the Wildcat analysis area meets Forest Plan standards, as amended by the Eastside Screens (1995).

Direct and Indirect Effects

Alternative 1

In the short term, late and old structure stands and old growth stands would remain connected across the landscape and within the project area with dense stands composed of medium to large trees, corridor widths greater than 400 feet, and by two or more corridors. Indirectly, connectivity habitat would change over time. With the existing management direction including fire suppression, stands in the project area would continue to grow into dense multi-layered stands. This condition would increase the susceptibility to wildfire and insect and disease outbreaks. A major disturbance on the landscape would change the composition and structure of connectivity habitat. As a result, late and old structure and old growth stands could be disconnected from other late and old structure stands in the analysis area. This would limit "free movement" between late and old structure and old growth stands within and outside the analysis area for wildlife species associated with these habitats.

Alternative 2, 3, and 4

Commercial thinning would occur in stands considered connectivity habitat between late and old structure habitats and designated C1 and C2 old growth areas. Proposed commercial harvest within connectivity habitat would maintain or encourage the development of late and old structure habitat. After harvest, all treated connectivity habitat will meet the Regional Forester's Forest Plan Amendment #2 (1995) standards for connectivity habitat following treatment. Commercially thinned connectivity habitat would maintain canopy closure in the upper 1/3 of the site potential. Sufficient connectivity habitat is present to maintain at least two connections (with canopy closure above the upper 1/3 of site potential) between late and old structure and old growth habitats. Connectivity corridors would be at least 400 feet wide and have medium and large trees.

Mechanical fuels treatment would occur in connectivity habitat in the northern portion of the analysis area. Mechanical fuels treatment would affect understory and overstory vegetation, as well as dead standing and downed wood. Approximately 10% of the mechanical fuels treatment units in the northern portion of the analysis area would not be treated; existing downed wood, snags, and understory vegetation would persist on these acres, contributing to connectivity of late and old structure and old growth habitats. Mechanical fuels treatments would impact overstory vegetation through the removal of diseased trees (mistletoe, root rot) and other structurally defective trees. Overstory structure would not be significantly altered by the light sanitation treatment that is proposed. Overstory canopy closure would be minimally affected and Forest Plan standards for snags and downed wood would be met or exceeded following treatment; therefore, these treatment activities would not affect the suitability of connectivity habitat.

Non-commercial thinning would have no impact on the quality of connectivity habitat because overstory composition and structure would not be affected. Patches of understory vegetation (reprod) would be maintained in non-commercially thinned units to provide hiding cover for wildlife.

Activity fuels would be treated within harvest units. Burning (primarily pile burning and some landscape underburning) would not change overstory composition or structure in connectivity habitat or the late and old structure these stands are providing connections between. See Table W-7 for a summary of burning by alternative. Burning would reduce a portion of understory vegetation in connectivity habitat; however, patches of unburned understory would be maintained due to the low intensity of underburning. Downed wood and snags used by late and old structure-associated species would be minimally affected by vegetative treatment and burning; Forest Plan standards for downed wood and snags would be met or exceeded in connectivity stands after these treatments. Burning activities would reduce the susceptibility of treated stands to high-intensity wildfires and insect or disease outbreaks, maintaining or improving connectivity corridors in the future.

Table W-7. Acres of burning under the Proposed Action, and Alternatives 3 and 4.

	Proposed Action	Alternative 3	Alternative 4
Acres of Burning	10,288	10,079	10,288

Roads used for harvest would not change the composition or structure of connective habitat in the project area. Maintenance and reconstruction of some roads may require the removal of some vegetation; this activity would not affect overstory composition or structure.

Cumulative Effects

Past activities, actions, and events in the Wildcat analysis area that affected connectivity of late and old structure and old growth include timber harvest and salvage (18,357 acres), road construction, insect and disease outbreaks, and wildfire (738 acres). Past harvest and salvage activities have affected the structure and composition of late and old structure and connectivity habitat through the removal of medium and large trees, reductions in canopy closure, creation of openings, and the fragmentation of large-continuous blocks of forested habitat. Road construction associated with timber harvest has increased road densities within the analysis area affecting connectivity habitat. Insect and disease infestations altered structure and composition of connectivity habitat and caused fragmentation of late and old structure habitats. Wildfire has reduced connectivity and increased fragmentation of late and old structure habitat. Fire suppression has also changed the character of connectivity habitat in the southern and central portions of the analysis area. Historically, forested habitats in these areas were much more open; connectivity habitat was for late and old structure associated species in these habitats was also much more open as a result. These past activities and events have resulted in the existing condition of connectivity habitat in the analysis area.

There are no present or reasonably foreseeable future activities, actions, or events in the analysis area that would impact the quantity or quality of connectivity habitat in the analysis area.

Although connectivity habitat would be treated (and the quality of these habitats reduced as a result), it would continue to meet the Forest Plan standards under these alternatives, allowing for the free movement of wildlife between late and old structure and old growth habitats. In dry upland forest habitat, late and old structure habitat would be enhanced by proposed commercial thinning activities; treated connectivity habitat in these areas would also be more characteristic of what occurred in this portion of the analysis area historically.

DEAD WOOD HABITAT: Snags

Current Condition

The snag analysis area for this project includes Forest Service land within the Wall Creek watershed, an area of approximately 95,190 acres. Snags occur as scattered singles, clumps, and/or patches resulting in variable densities (including stands with zero snags) across the landscape. The Forest Plan established standards for snag density based on the population requirements of species associated with snags. The plan was amended in 1995 by the Regional Forester's Forest Plan Amendment #2 (USDA 1995), also known as the "Eastside Screens." Based on amended direction, "new" snag requirements were developed for four working groups (vegetation types) on the Forest and documented in the memo, "Interim Snag Guidance for Salvage Operations" (USDA 1993). These standards and existing dead standing tree (snag) densities for the Wall watershed are found in Table W-08.

Table W-08. Existing Conditions and Forest Plan Standards for Snag Density in the Wall Creek Watershed.

Umatilla Forest Plan Standards			Wall Creek Watershed		
Working Group	Diameter Class Groups (Inches DBH)	Snag Density (#/acre)	Potential Vegetation Group	Diameter Class Groups (Inches DBH)	Snag Density [1] (#/acre)
Ponderosa Pine	> 10	2.25	Dry Upland Forest	> 10	6.8
	> 20	0.14		> 20	1.6
Mixed Conifer (South Associated)	> 10	2.25	Moist Upland Forest	> 10	64.7
	> 20	0.14		> 20	10.2
Lodgepole Pine/Subalpine Zone	> 10	1.80	Cold Upland Forest	> 10	11.7
	> 20	No standard		> 20	1.9

1 Existing snag densities take into account the cumulative impact of past projects (including the Sunflower Bacon Project) on snag densities.

Based on Current Vegetation Surveys (CVS) data in the snag analysis area (Wall Creek watershed), snag densities exceed Forest Plan standards in all diameter classes for the dry, moist, and cold upland forest potential vegetation groups (Table W-11). This indicates that adequate habitat is present to maintain viable populations of primary cavity excavating bird species in the analysis area.

The Monument Complex Fire occurred in the summer of 2007. Current Vegetation Survey plots in the Wall watershed were last measured prior to the fire. Snag densities displayed in Table W-11 for the dry upland forest potential vegetation group are underestimated due to increased snag densities as a result of the wildfire.

Decayed Wood Advisor (DecAID)

Since 2003, the Decayed Wood Advisor (DecAID, Mellen et al. 2006) has become available for deadwood analysis. DecAID provides information and guidance to land managers in evaluating effects of forest conditions for existing or proposed management activities on organisms that use dead standing (snags), downwood, and other wood decay elements. DecAID is a statistical summary of empirical data from published research on wildlife and deadwood. Data provided in DecAID allows the user to relate the abundance of deadwood habitat for both snags and down logs to the frequency of occurrence of selected wildlife species that require deadwood habitat for some part of their life cycle. This data is presented at 30 percent, 50 percent, and 80 percent "tolerance levels." Tolerance levels are not indicators of population viability or potential populations. Tolerance levels are estimates of all individuals in the population that value a particular parameter (e.g., snag density, snag diameter, downwood density, etc. (Mellen et al. 2006)). Tolerance levels are equivalent to the potential (percent) for individuals to occur in an area that has certain deadwood characteristics. Tolerance levels are also equivalent to the percent of individuals in a population. In both cases, the lower the tolerance level, the fewer individuals would use the area (landscape, watershed, etc.) relative to the habitat characteristic. DecAID tolerance levels may also be interpreted as three levels of "assurance": low (30 percent tolerance level), moderate (50 percent tolerance level), and high (80 percent tolerance level) (Mellen et al. 2006). The higher the tolerance level, the higher the "assurance" habitat (snags/downed wood) is provided. Tolerance levels are not indicators of population viability, "thresholds", or potential populations. DecAID evaluations are best performed at the landscape, watershed, or larger scale. In this analysis, inventory and wildlife data contained in DecAID will be compared to current data for the Wall Creek watershed.

DecAID was used to assist with the analysis of effects on snag dependent wildlife species by providing a thorough review of published literature and other available data on wildlife use of decayed wood elements, a statistical synthesis of data showing levels of use by individual wildlife species of decayed wood elements (tolerance levels), a summary of the patterns of use of decayed wood elements by wildlife species in Oregon and Washington, and an approximation of historic snag density distribution in various habitat types. DecAID was not used as a wildlife population simulator or to analyze population viability. Nor was it used as a substitute for making decisions based on professional experience.

There are limitations to information contained in the DecAID Advisor. These limitations are summarized in the *Caveats and Cautions* link on the DecAID website (Mellen et al. 2006). This document is available in the project file.

Three of the DecAID wildlife habitat types occur in the Wildcat analysis area. They include Lodgepole Pine forest, Eastside Mixed-Conifer forest (Blue Mountains), and Ponderosa Pine/Douglas-fir forest. The dominant vegetative coverage in the watershed is ponderosa pine (dry upland potential vegetation group). All structural condition classes occur in the watershed, but the most prevalent structure is the small/medium class.

Dry Upland Forest

For the DecAID evaluation, relative to Wall Creek watershed, the ponderosa pine/Douglas-fir forest wildlife habitat type (Mellen et al. 2007) is the dominant forest type in the project area and watershed. The small/medium structural condition class (Mellen et al. 2007) was selected for the DecAID analysis because it represents the structural stages that would be affected by the proposed action and because there is no difference in the cumulative species curves for snag density between the structural stages provided by DecAID. The pileated woodpecker and the white-headed woodpecker are the only two species identified on the cumulative species curve for snag density in the ponderosa pine/Douglas-fir habitat type. The white-headed woodpecker will be used for the comparison because it is a better representative of the dry forest type than the pileated woodpecker.

Snag densities were derived from current vegetation survey data for the dry upland forest potential vegetation group and compared to the white-headed woodpecker cumulative species curves for snag density in DecAID for the Wall Creek watershed. Estimates for snag densities exceed the 80 percent tolerance level for the white-headed woodpecker in the >10-inch (9.85 inch) diameter group, when compared with the snag density cumulative species curves in DecAID. For the >20-inch (19.7 inch) diameter group, snag density in the watershed occur between the 30 percent and 50 percent tolerance levels for the white-headed woodpecker (Table W-09).

Table W-09. DecAID Tolerance Levels for the White-headed Woodpecker in the Ponderosa Pine/Douglas-fir Forest[1]

Diameter Group (Inches DBH)	Snag Density (#/acre)			
	DecAID Tolerance Levels			CVS Data
	30%	50%	80%	Wall Creek

> 10	0.3	1.7	3.7	6.8
> 20	0.5	1.8	3.8	1.6

1 For the small/medium trees structural condition class and snag density data from current vegetation survey inventories in the Wall Creek watershed

The distribution of snags in unharvested plots for the Ponderosa pine/Douglas-fir forest type in DecAID (Mellen et al. 2007) is used as a surrogate to represent the potential "historic" distribution of snags in the analysis area. This reference condition will be compared with the current distribution of snags for the Dry Upland Forest type (Ponderosa pine/Douglas-fir) in the Wall Creek watershed. Figure W-01 compares the current distribution of snags in the watershed with the unharvested (reference) distribution of snags. For snags >10-inches dbh, about 10 percent more area currently has zero snags than the reference condition (unharvested plots). A notable reduction in area occurs for snags in the 0-4 snags/acre group (-25%). This indicates that there is a shortage of dry upland forest stands with 0-4 snags >10-inches dbh under the existing condition. Snag density groups noticeably above the reference condition in the watershed include the greater than 36 snags/acre group (+6%). This data also indicates that approximately 8% of the watershed currently has snag densities (28-32, 32-34, and >36 density groups) that are greater than anything observed in the reference condition (unharvested plots). The remaining snag density groups in the watershed (4-8, 8-12, 12-16, 16-20, 20-24, 24-28, 28-32, and 32-36) are currently within 1 to 3 percent (+/-) of the reference condition.

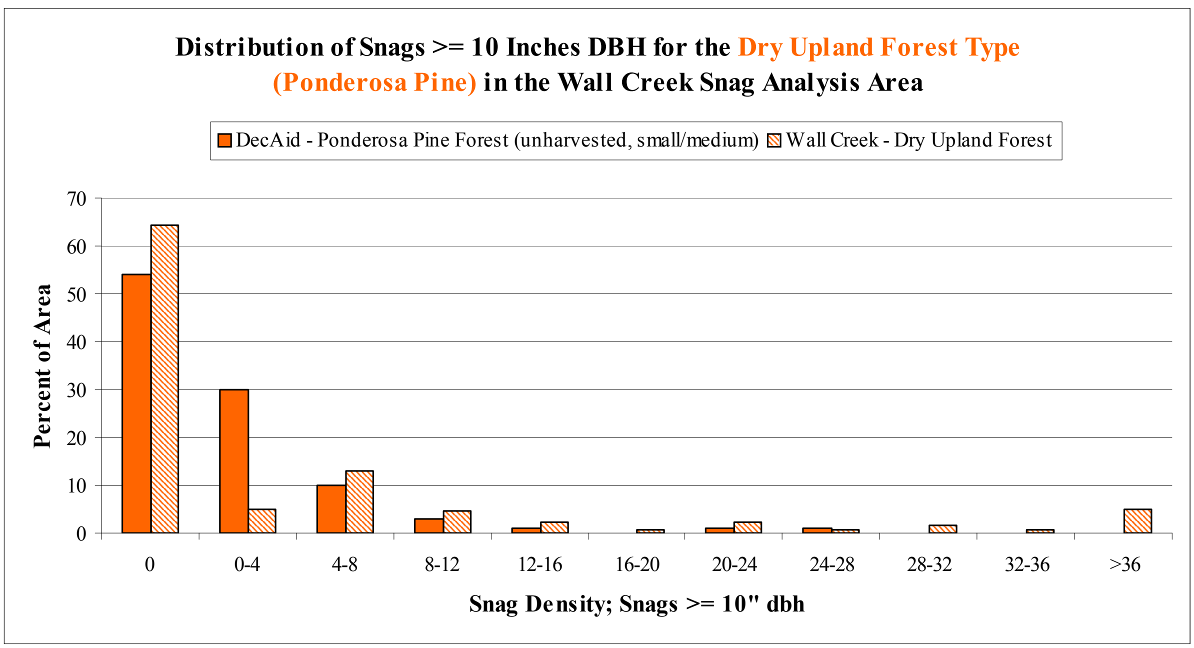


Figure W-01. Distribution of snags >10 inches dbh in the Wall Creek watershed for the Dry Upland Forest type (Ponderosa pine/Douglas-fir).

Based on the current distribution of snags >10 inches dbh in the watershed (Figure W-01), approximately 35 percent of the dry upland forest type provides snag densities for the white-headed woodpecker at the 30% tolerance level or greater (Table W-12; > 0-4 snags/acre group) and 30 percent of the area provides snag densities at the 80% tolerance level or greater (Table W-12; > 4-8 snag/acre group). When compared to the reference condition, the current condition in the watershed provides 10% less area for white-headed woodpecker at the 30% tolerance level or greater. As mentioned previously, most of this deficiency occurs in the 0-4 snags/acre group. When compared to the 80% tolerance level, the current condition provides 15% more area than the reference condition.

Figure W-02 compares the current distribution of snags in the watershed with the unharvested (reference) distribution of snags $\geq$20-inch dbh. For the dry upland forest type, there is currently about 9 percent more area without snags (0) than the reference condition (unharvested plots). Notable decreases in area occur for snags in the 0-2 (-21%) snags/acre group in the watershed. This indicates that there is a shortage of dry upland forest stands with 0-2 snags $\geq$20-inch dbh under the existing condition. Snag density groups noticeably above the reference condition include the 4-6 snags/acre group (+8%). The remaining snag density groups in the watershed (2-4, 6-8, 8-10, 10-12, 12-14, 14-16, 16-18, and >18) are currently within 1 to 3 percent (+/-) of the reference condition. This data also indicates that there is currently 8% of the watershed with snag densities greater than anything observed in the reference condition (unharvested plots).

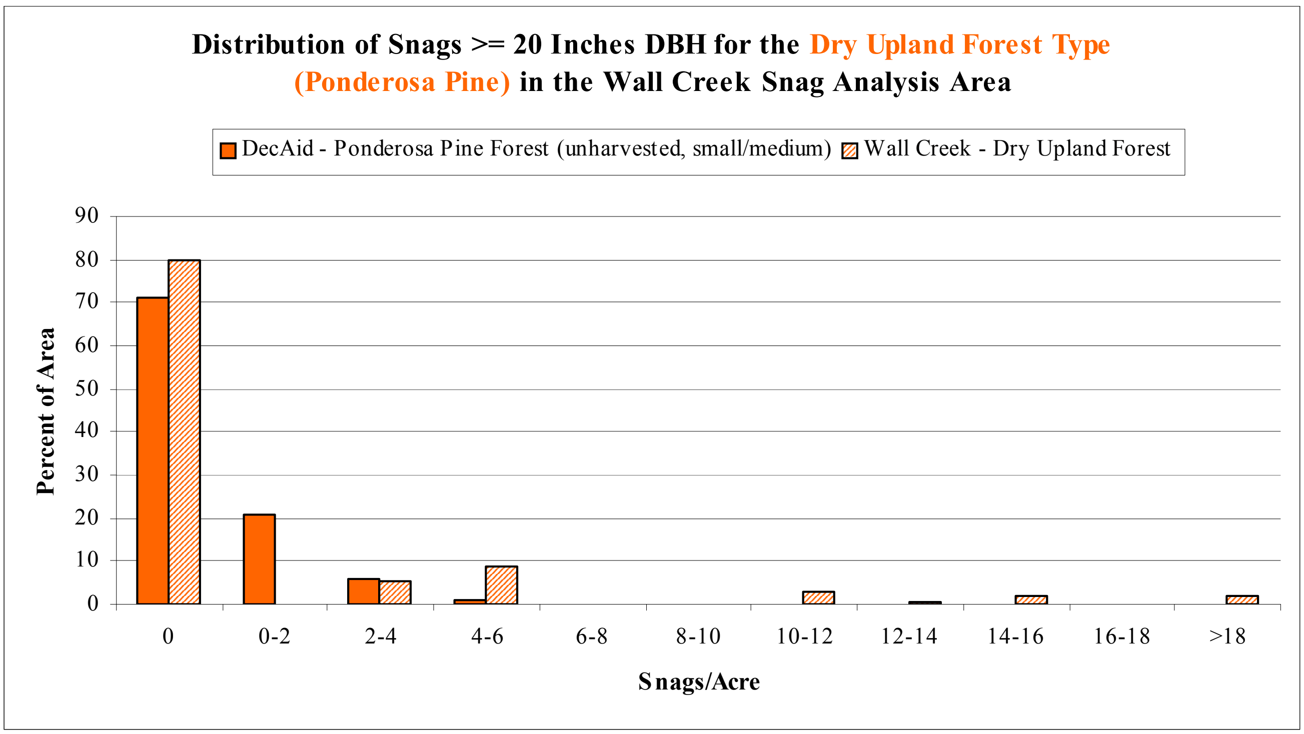


Figure W-02. Distribution of snags, $\geq$20 inches dbh, in the Wall Creek watershed for the Dry Upland Forest type (Ponderosa pine/Douglas-fir).

Based on the current distribution of snags $\geq$20 inches dbh in the watershed (Figure W-02), approximately 20 percent of the dry upland forest type provides snag densities for the white-headed woodpecker at the 30% tolerance level or greater (Table W-12; $\geq$ 0-2 snags/acre group) and 15 percent of the area provides snag densities at the 80% tolerance level or greater (Table W-12; $\geq$ 4-6 snag/acre group). When compared to the reference condition, the current condition in the watershed provides 9% less area for white-headed woodpecker at the 30% tolerance level or greater. As mentioned previously, most of this deficiency occurs in 0-2 snags/acre group. When compared to the 80% tolerance level, the current condition provides 6% more area than the reference condition. This additional area occurs primarily in the 4-6 snags/acre group.

Moist Upland Forest

The moist upland forest potential vegetation group occurs on approximately 22% of the analysis area. This potential vegetation group can be found throughout the analysis area; however, the greatest concentration of these habitats is in the central and northern portion of the analysis area. For the DecAID evaluation, relative to Wall Creek watershed, the Eastside Mixed Conifer habitat type (Mellen et al. 2007) was selected because it most accurately represents the moist upland forest potential vegetation group. The small/medium structural condition class (Mellen et al. 2007) was selected for the DecAID analysis because it represents the variety of structural stages affected in the proposed action. In addition, there is no difference in the cumulative species curves for snag density between the three structural stages. The pileated woodpecker cumulative species curve for snag density was selected for the analysis in these habitats because it is associated with moist mixed conifer habitats.

Table W-10. DecAID Tolerance Levels for the Pileated Woodpecker in the Eastside Mixed Conifer Forest[1]

Diameter Group (Inches DBH)	Snag Density (#/acre)			
	DecAID Tolerance Levels			CVS Data Wall Creek
	30%	50%	80%	
> 10	-	30.4	-	64.7
> 20	-	7.32	-	10.2

1 For the small/medium trees structural condition class and snag density data from current vegetation survey inventories in the Wall Creek watershed.

Snag densities were derived from current vegetation survey data for the moist upland forest potential vegetation group and compared to the pileated woodpecker cumulative species curves for snag density in DecAID for the Wall Creek watershed. DecAID did not provide estimates for snag densities at either the 30% or 80% tolerance levels. Estimates for snag densities exceeded the 50 percent tolerance level for the pileated woodpecker in the >10-inch (9.85 inch) and >20-inch (19.7 inch) diameter groups, when compared with the cumulative species curves in DecAID (Table W-10).

The distribution of snags in unharvested plots for the Eastside Mixed Conifer forest type in DecAID (Mellen et al. 2007) is used as a surrogate to represent the potential “historic” distribution of snags. This reference condition will be compared with the current distribution of snags for the Moist Upland Forest type (mixed conifer) in the Wall Creek watershed. Figure W-03 compares the current distribution of snags in the watershed with the unharvested (reference) distribution of snags. For snags >10-inches dbh, there is currently 15 percent more area with no snags than the reference condition (unharvested plots). Under the existing condition, notable decreases in area occur for snags in the 0-6 snags/acre group (-11%) and 12-18 snags/acre group (-10%). This indicates that there is a shortage of moist upland forest stands with 0-6 and 12-18 snags >10-inch dbh under the existing condition. Snag density groups currently noticeably above the reference condition in the watershed include the greater than 60 snags/acre group (+4%). The remaining snag density groups in the watershed (6-12, 18-24, 24-30, 30-36, 36-42, 42-48, 48-54, and 54-60) are currently within 1 to 3 percent (+/-) of the reference condition.

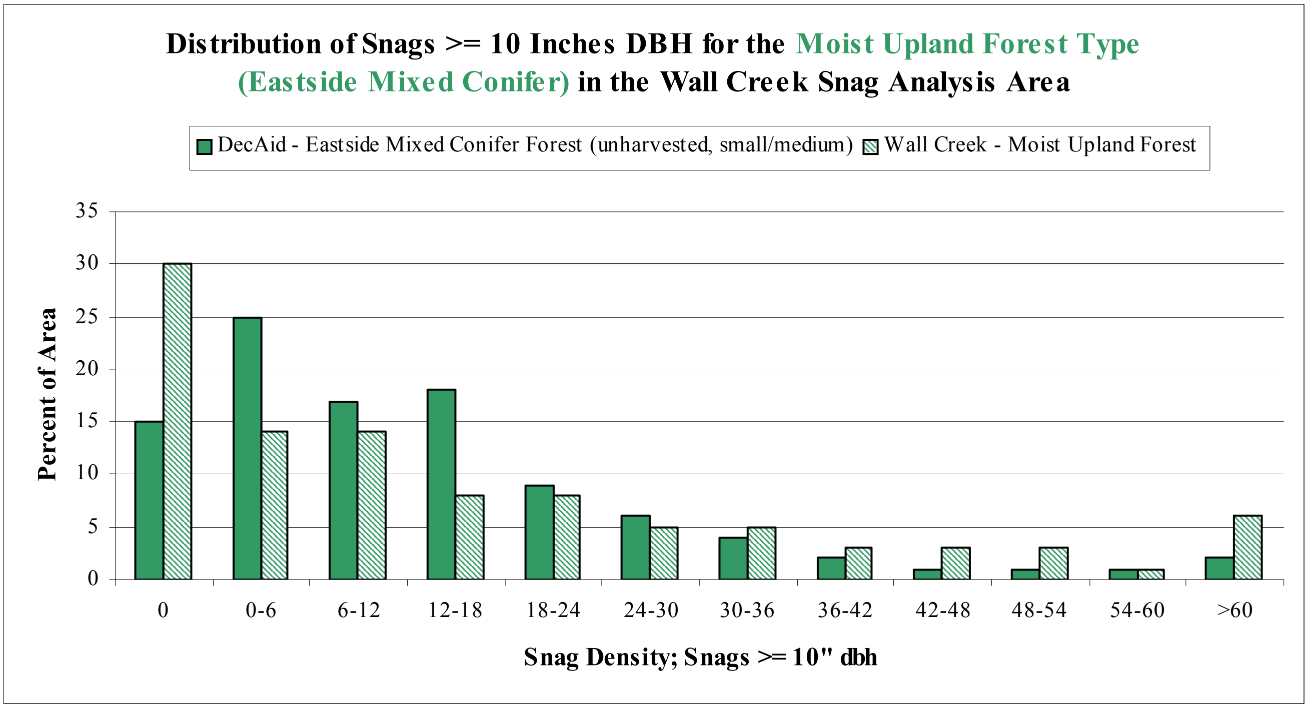


Figure W-03. Distribution of snags >10 inches dbh in the Wall Creek watershed for the Moist Upland Forest type (Mixed Conifer).

Based on the current distribution of snags >10 inches dbh in the watershed (Figure W-03), approximately 21 percent of the moist upland forest type provides snag densities for the pileated woodpecker at the 50% tolerance level or greater (Table W-13; > 30-36 snags/acre group). When compared to the reference condition, the current condition in the moist upland forest potential vegetation group provides 4% more area for pileated woodpecker at the 50% tolerance level or greater. As mentioned previously, most of this additional area occurs in the >60 snags/acre group.

Figure W-04 compares the current distribution of snags in the watershed with the unharvested (reference) distribution of snags >20-inch dbh. Currently, there is about 14 percent more moist upland forest without snags (0) than the reference condition (unharvested plots). Notable decreases from the reference condition have occurred in the 0-2 (-18%), 2-4 (-13%), and 8-10 (-5%) snags/acre groups under the existing condition in the watershed. This indicates that there is a shortage of moist upland forest stands with 0-2 and 2-4 snags >20-inch dbh under the existing condition. Snag density groups noticeably above the reference condition include the 4-6 (+9%) and >18 (+4%) snags/acre groups. The remaining snag density groups in the watershed (6-8, 10-12, 12-14, 14-16, and 16-18) are currently within 1 to 3 percent (+/-) of the reference condition.

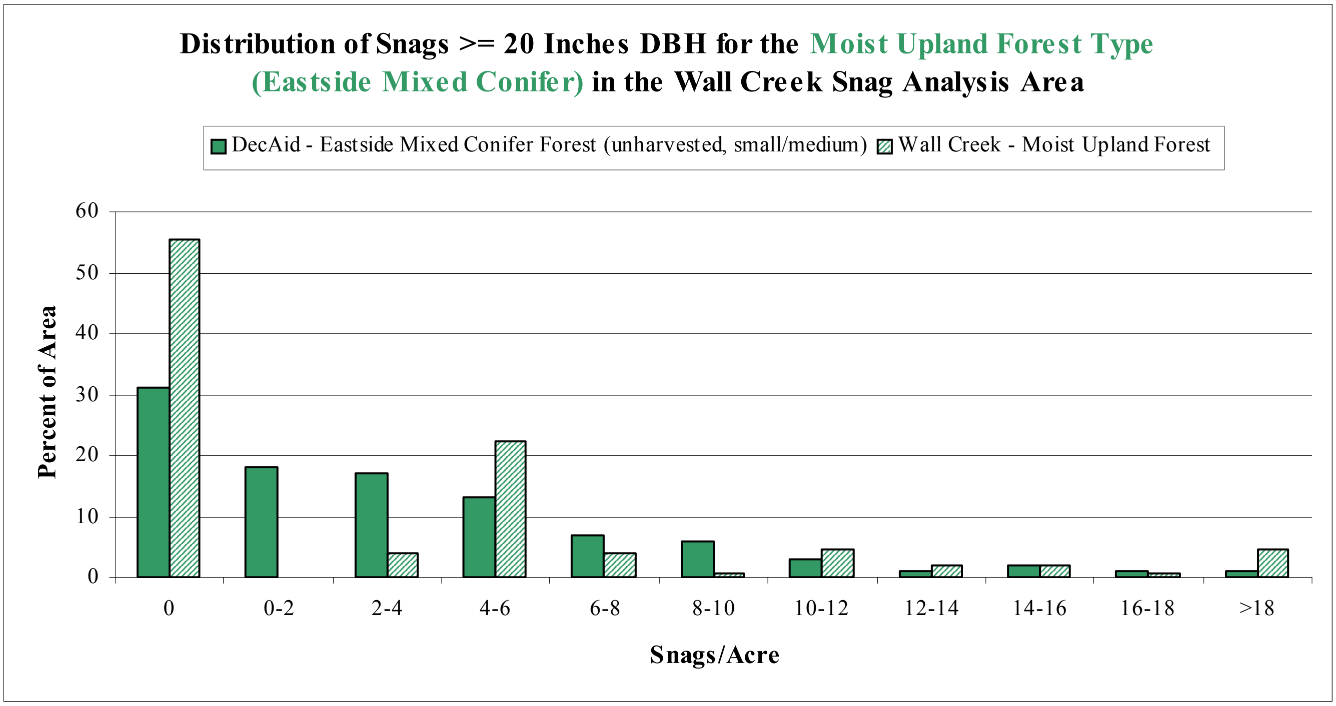


Figure W-04. Distribution of snags, >20 inches dbh, in the Wall Creek watershed for the Moist Upland Forest type (Mixed Conifer).

Based on the current distribution of snags >20 inches dbh in the watershed (Figure W-04), approximately 16 percent of the dry upland forest type provides snag densities for the pileated woodpecker at the 50% tolerance level or greater (Table W-13; > 8-10 snags/acre group). When compared to the reference condition, the current condition in the moist upland forest potential vegetation group provides 2% more area for pileated woodpecker at the 50% tolerance level or greater. As mentioned previously, most of this additional area occurs in the >18 snags/acre group.

Cold Upland Forest

The cold upland forest potential vegetation group occurs on approximately 7% of the analysis area. This potential vegetation group is found at the highest elevations in the analysis area and where cold pockets exist interspersed with moist and dry forest habitats. For the DecAID evaluation, relative to Wall watershed, the Lodgepole Pine habitat type (Mellen et al. 2007) was selected because it most accurately represents the cold upland forest potential vegetation group. The small/medium structural condition class (Mellen et al. 2007) was selected for the DecAID analysis because it represents the variety of structural stages affected in the proposed action. The American marten cumulative species curve for snag density was selected for the analysis in these habitats because it is associated with cold, high elevation forest types.

Table W-11. DecAID Tolerance Levels for the American Marten in the Lodgepole Pine Forest[1] Type

Diameter Group (Inches DBH)	Snag Density (#/acre)			
	DecAID Tolerance Levels			CVS Data Wall Creek
	30%	50%	80%	
> 10	11.8	12.8	14.4	11.7
> 20	3.7	4.0	4.5	1.9

1 For the small/medium trees structural condition class and snag density data from current vegetation survey inventories in the Desolation Creek watershed.

Snag densities were derived from current vegetation survey data for the cold upland forest potential vegetation group and compared to the American marten cumulative species curves for snag density in DecAID for the Wall watershed. When compared with the snag density cumulative species curves in DecAID (Table W-11), estimates for snag densities in the watershed fall below the 30% tolerance level for the marten in the >10-inch (9.85 inch) and the >20-inch (19.7 inch) diameter groups.

The distribution of snags in unharvested plots for the Lodgepole Pine forest type in DecAID (Mellen et al. 2007) is used as a surrogate to represent the potential "historic" distribution of snags on the landscape. This reference condition will be compared with the current distribution of snags for the Cold Upland Forest type in the Wall watershed. Figure W-05 compares the current distribution of snags in the watershed with the unharvested (reference) distribution of snags. Due to the small sample size of CVS plots used to create Figures W-05 and W-06, the data contained in these figures is highly suspect. Considering this, comparison of the existing snag density distribution (based on a small sample size) with historic data should be examined with caution. For snags >10-inches dbh, there is currently 24 percent more area with no snags in the watershed than the reference condition (unharvested plots). Snag density groups currently noticeably above the reference condition in the watershed include the 12-18 and 24-30 snags/acre group (+6% and +25%, respectively). The remaining snag density groups are underrepresented in the existing condition in the Wall watershed. Again, this is likely in part due to a low sample size in the cold upland forest potential vegetation group.

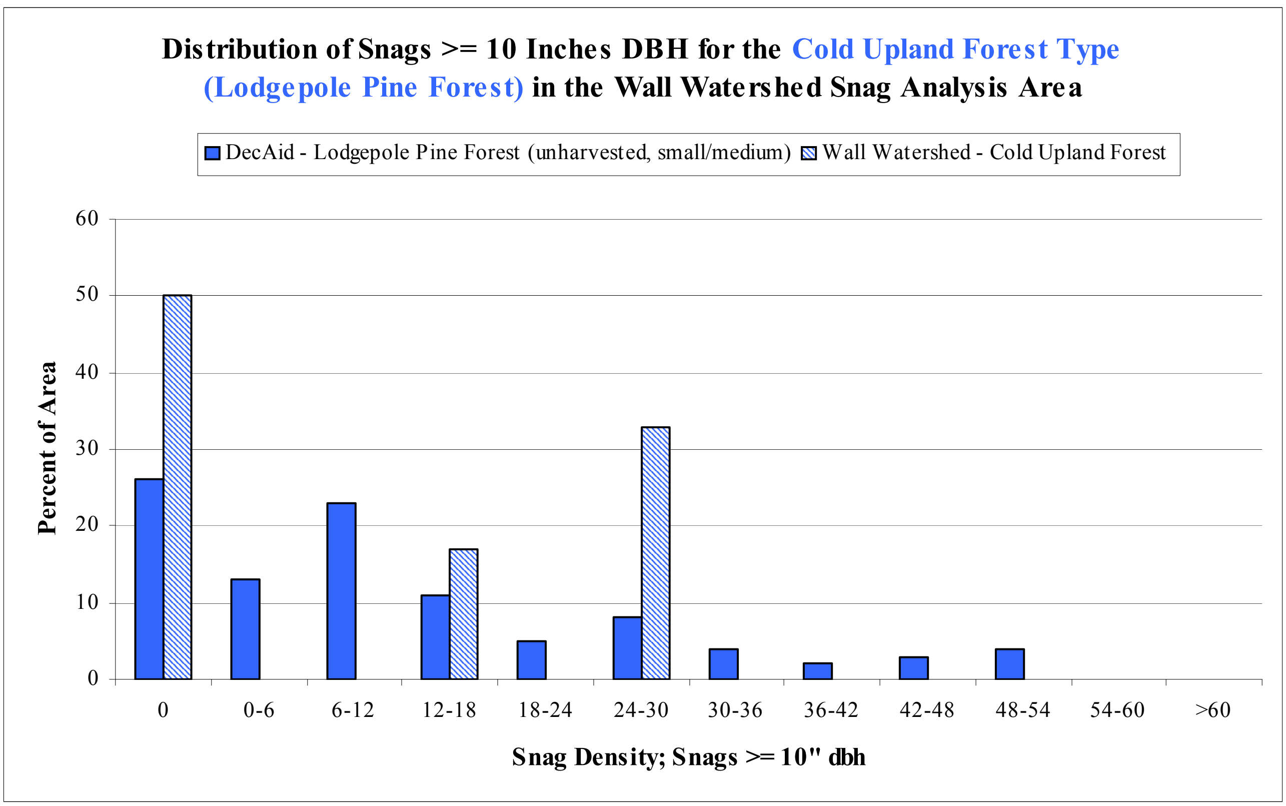


Figure W-05. Distribution of snags, >10 inches dbh, in the Wall Creek watershed for the Cold Upland Forest type (Lodgepole Pine).

Because the sample size in the cold upland forest type is so small, no inferences can be made concerning existing marten habitat and how this compares to DecAID tolerance levels for this species and habitat type.

Figure W-06 compares the current distribution of snags in the watershed with the unharvested (reference) distribution of snags >20-inch dbh. The existing amount of cold upland forest habitat with no snags is approximately the same as the reference condition. Notable increases from the reference condition occur in the 2-4 (+7%) and 8-10 (+16%) snags/acre groups under the existing condition in the watershed. The remaining snag density groups are underrepresented in the existing condition in the Wall watershed. Again, this is likely in part due to a low sample size in the cold upland forest potential vegetation group.

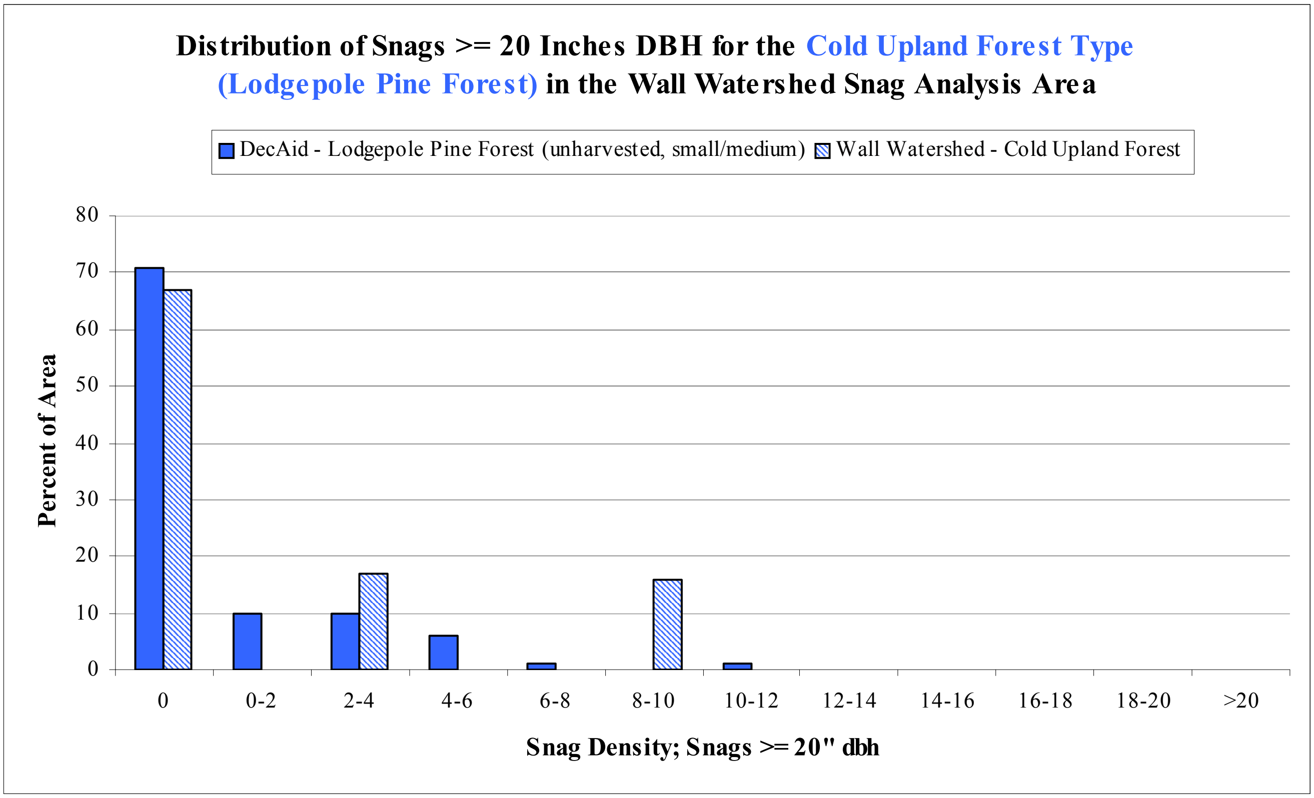


Figure W-06. Distribution of snags, >20 inches dbh, in the Wall Creek watershed for the Cold Upland Forest type (Lodgepole Pine).

Snag Retention Levels Specific to the Wildcat Project

The data presented in the previous sections indicate that the analysis area is currently underrepresented in some snag density groups in the dry, moist, and cold upland forest potential vegetation groups, when compared to the historical condition in these habitat types. The most current information available for a number of the snag-dependent species indicates that the existing Forest Plan standards may be lower than what is preferred by some species, including the pileated, hairy, and black-backed woodpeckers. To account for these factors, snag retention guidelines in the Wildcat analysis area would be elevated when compared to the current Forest Plan standard. The objective of these adjustments are to bring the distribution of snag density groups in the watershed more in line with what occurred on the landscape historically, provide high quality and well distributed foraging, nesting, and roosting habitat for primary cavity excavators and other wildlife in the C4 management area and elsewhere in the analysis area, and provide a future source of dead wood in those areas where proposed treatment (mechanical fuels/sanitation harvest) would impact these features. The goal of the C4 management area is to provide high habitat effectiveness for big game and other wildlife (primarily cavity nesting bird species) with an emphasis on the size and distribution of habitat components (i.e. dead wood habitat for all cavity excavators). The adjusted snag densities are not in response to DecAID tolerance levels; they were developed based on the historical distribution of snag density classes (#/acres) in those potential vegetation types present in the project area. They are intended to move the analysis area closer to what occurred historically by moving areas at risk of burning at high severity due to fuel loading into snag density classes currently underrepresented in the existing condition. Refer to Table W-12 for adjusted snag density standards for the Wildcat project.

Table W-12. Adjusted snag densities for the Wildcat analysis area

Potential Vegetation Group	Diameter Class (inches dbh)	Snag Density (snags/acre)
Dry Upland	>10	4
	> 20	1
Moist Upland	>10	6
	> 20	2
Cold Upland	>10	6
	> 20	2

The snag densities described here are general standards for those potential vegetation groups that occur within proposed commercial thinning and mechanical fuels treatment units. Within the mechanical fuels treatment area, the vast majority of habitat (generally moist and cold stands) would have a prescribed snag density of 6 snags per acre (greater than 10 inches dbh) on all treatment acres. Untreated portions of proposed mechanical fuels treatment units (10% of the total acreage) would have variable snag densities, but in general would be expected to be greater than 6 snags per acre. In dry upland forest stands or stands dominated by this habitat type, 4 snags per acre over 10 inches dbh would be retained. Retention of larger snags and those that provide unique habitats (broken tops, hollow, witches brooms) will be emphasized.

Direct and Indirect Effects

Alternative 1

Within the next three years, dead standing trees (snags) would continue to occupy the project area at current densities and size classes (in the absence of large scale disturbance). When compared to the cumulative species curves in DecAID, snag densities would continue to exceed the 80 percent tolerance level for the white-headed woodpecker in the greater than 10-inch group and remain between the 30 percent and 50 percent tolerance levels for the greater than 20-inch group. When compared to the pileated woodpecker cumulative species curves in DecAID, snag densities in the analysis area would remain above the 50 percent tolerance level in the greater than 10-inch and greater than 20-inch group. In the short term, the distribution of snags across the watershed is expected to remain the same as described in the affected environment section.

In the mid and long term (5 to 15+ years), existing snags would decay and fall to the ground, increasing downed wood in the analysis area. In the mid and long term, snag densities have the potential to increase in the analysis area through naturally occurring (background) mortality and mortality caused by insect and disease outbreaks and wildfire. Mortality caused by insects and disease would be patchy, creating small to moderately sized “islands” with high densities of snags in the early stages of decay. These islands would provide habitat for primary cavity excavators (black-backed woodpecker, Lewis' woodpecker, etc.) and other wildlife that require pulses of high density snags. High severity wildfire would affect a much larger and more contiguous area than insect and disease outbreaks. Initially, snag densities would increase due to fire-caused mortality; ultimately, snags resulting from this event would fall and snags would be relatively scarce until the regenerating stand becomes old enough to produce large trees, a time period ranging from 60 to 100 years.

A potential increase in snag density in the watershed could increase and maintain snag densities above the 80 percent tolerance level for the white-headed woodpecker in the greater than 10-inch and greater than 20-inch group. Snag densities would also approach or exceed the 80 percent tolerance level for the pileated woodpecker in the greater than 10-inch and greater than 20-inch groups following a disturbance of this type. Primary cavity excavators requiring high densities of snags and post-fire environments would find ample habitat in the 10 to 15 years following a high severity wildfire. Eventually, snags would fall to the ground, reducing snag densities in the watershed. Eventually, snag densities would fall below pre-fire conditions, and remain low until the regenerating stand is able to produce green trees and snags large enough to be used by cavity excavators and other wildlife. This could take as long as 100 years, or longer if a series of disturbance events occurs.

Common to all Action Alternatives

Proposed commercial harvest and mechanical fuels treatment/sanitation thinning under all of the action alternatives would have the same effects; the extent (number of acres affected) would vary by alternative. Under all action alternatives, proposed commercial thinning activities would target green trees for removal. Snags may be felled in these stands if they are in excess of adjusted Forest Plan standards. Any felling of snags within commercial and non-commercial thinning units would be incidental to green-tree harvest activities. It is also expected that some snags would be felled within commercial harvest units and along haul routes to provide for the safety of workers (to meet OSHA and operational requirements) in the project area. Potential primary cavity excavator roosting and nesting habitat would be lost to provide for safety within treatment units and along roads used for haul. Because Forest Plan standards for snags would be met or exceeded (see adjusted snag retention standards), the expected impacts on primary cavity excavators would be minor.

Within mechanical fuels units, insects and disease have caused heavy overstory mortality. In order to create a healthy green stand and to make the moist and cold upland forest habitats more resilient to wildland fire, diseased green trees (mistletoe, root rot, etc.), downed wood, and standing dead trees (snags) would be removed. In these units, hazard trees that are felled would be removed from treatment units if downed wood standards are being met. Snag retention levels would vary between 4 and 6 snags per acre greater than 10 inches dbh and 1 to 2 snags per acre greater than 20 inches dbh, depending on the potential vegetation within the treatment unit. Untreated patches within fuels treatment units (10% of the proposed treatment acres) would maintain existing snag densities, downed wood, and overstory vegetation for primary cavity excavators and other species that require high snag densities. Snag densities would meet Forest Plan standards (see adjusted standard for the Wildcat area) in all mechanical fuels treatment units following treatment and would therefore continue to contribute toward the conservation of wildlife dependent on this habitat feature.

Non-commercial thinning would not affect dead standing trees in treated stands; snag densities would not be affected by this activity.

Proposed vegetative treatment activities would have variable impacts on primary cavity excavating species within the analysis area. Generally, reductions in snags would result in reduced nesting and foraging substrate for these species. Trees with existing nest cavities generally would not be affected unless they are considered a hazard to workers. Snag retention levels would exceed Forest Plan standards (see adjusted standards); therefore these habitats would occur in sufficient amounts to provide potential nesting, roosting, and foraging habitat for these species. Untreated areas adjacent to treated stands would provide excellent snag and downed wood habitat for these species, complementing dead wood in treated stands. On a landscape level, post-treatment snag habitat in affected stands would continue to contribute toward the conservation of wildlife dependent on this habitat feature.

Use of the road system (open and closed) also has the potential to affect snags. Snags that represent a danger to operations would be felled to provide for safety. This activity would reduce snag densities along open and closed system roads. Felled snags may be removed if downed wood standards are being met. Under all three action alternatives, approximately 41 miles of closed roads would be used for haul or other treatment-related activities. An additional 39 miles of open road would be maintained (including danger tree felling) for haul under all three action alternatives. Temporary road construction would also impact snags to some degree. Snags within the prism of the proposed temporary roads and those that pose a danger to activities occurring on or along the temporary road would be felled. It is expected that the impact of this activity on snags will be very small under all action alternatives due to the narrow, linear nature of these openings.

Burning of activity fuels within harvest units is not expected to directly affect the density of snags retained after harvest. Pile and landscape burning would reduce fuels created by harvest and thinning activities. The potential loss of dead standing trees from underburning is expected to be minimal because broadcast burns would be low in intensity and occur in biophysical environments adapted to fire occurrence; in general, moist and cold upland forest habitats would not be broadcast burned. Where large accumulations of debris are located at the base or near large snags, these snags may be lost during burning. Burning also has the potential to create snags through direct and delayed fire mortality; this would compensate for those snags that are lost during burning activities. Pile burning generally would not impact or create snags; piles would be located away from snags or residual green trees, unless there is a wildlife need to create snags. Snag densities in all underburned and pile-burned stands would remain above Forest Plan standards after treatment.

Effects to snag densities in the dry upland forest PVG would be the same under all alternatives. Snag densities in the ≥10-inch diameter group would decrease by 0.1 snags per acre when compared to the current condition. Snag densities in the ≥20-inch diameter group would not be affected by proposed treatments. When compared to the DecAID cumulative species curves, densities would continue to exceed the 80 percent tolerance level for the white-headed woodpecker in the ≥10-inch group and be between the 30% and 50% tolerance levels for the ≥20-inch group. Although impacts to snag densities in the moist and cold upland forest PVGs would vary by alternative, snag densities would continue to exceed the 50 percent tolerance level in the >10-inch and >20-inch diameter groups for the pileated woodpecker and continue to be below the 30% tolerance level in the >10-inch group and >20-inch diameter groups for the American marten.

Cumulative Effects

Past activities, actions, and events in the analysis area (Wall Watershed) that have helped shape snag densities include timber harvest and salvage (approximately 63,000 acres), prescribed fire, wildfire (including the Monument Complex Fire), insect and disease outbreaks, hazard tree removal, and firewood cutting. Past harvest and salvage activities throughout the analysis area have directly affected snag density through the removal of dead standing trees ≥10 inches dbh. These activities also reduced potential recruitment of snags by removing green trees; typically, the largest trees in treatment units were harvested. Past wildfire (including the Monument Complex Fire) created snags through direct and delayed fire mortality in portions of the fire that burned at high and moderate intensities. Excellent high density snag patches and areas with little overstory mortality are available within the fire area. The vast majority of fires in the analysis area have been small and have had no impact on snag densities. Prescribed underburning generally has had little impact on snags. Smaller snags and those in later stages of decay were likely affected by prescribed burning in the analysis area. The low intensity of underburning (resulting from high fuel moisture levels) resulted in relatively few snags being consumed during these burns. Burning may also have created snags through fire-caused mortality. Insect and disease outbreaks (spruce budworm and tussock moth) have had significant impacts on snag densities in the analysis area, particularly north of Forest Road 21. These agents caused heavy overstory mortality, creating high density patches of snags in affected areas. According to historic data, snag densities in some of these stands exceed what occurred on the landscape historically. In that portion of the analysis area north of Forest Road 21, the majority of large snags created by these agents have fallen, or are in later stages of decay. Past firewood cutting removed snags adjacent to open roads within the analysis area, reducing the density of snags in these areas. Hazard tree felling affected snags in a similar fashion as firewood cutting; snag densities adjacent to open roads were reduced by this activity. These activities have combined to create the existing condition of snag habitat in the analysis area and watershed.

Present and reasonably foreseeable future activities, actions, and events in the analysis area that affect snags include personal use woodcutting, hazard tree felling, and the Monument Fire Salvage. Firewood cutting and hazard tree felling would have similar impacts; these activities would reduce snag densities along roads. Hazard tree felling would also remove defective trees (broken tops, frost cracks, diseased, etc) that would be recruited as snags in the near future. The Monument Fire Salvage removed dead and dying trees from areas experiencing overstory mortality during the Monument Complex Fire. Approximately 234 acres would be affected by this activity. Although snag densities would be reduced in localized areas, high density snag areas (high and moderate intensity portions of the fire area) would be maintained elsewhere in the fire area. This project would impact 6% of the high and moderate severity portions of the fire on National Forest System lands. The remaining 94% of the high and moderate intensity portions of the fire (those with high snag densities) on Forest Service land and high and moderate severity patches elsewhere on BLM and private land will not be impacted by this activity. Forest Plan standards for snags would be met or exceeded in salvage sale units.

When the expected effects of the action alternatives are combined with the residual and expected effects of past, present, and reasonably foreseeable future actions in the analysis area, they would all add to past reductions in snag densities throughout the watershed. At the stand scale, habitat (nesting, foraging, and roosting) for primary cavity excavating birds would be reduced; however, snag densities would continue to meet Forest Plan standards in all treated stands following treatment. By meeting these standards, sufficient habitat for snag-dependent species would be maintained within treatment units to promote the conservation of these species. Snag densities at the watershed scale would continue to exceed Forest Plan standards and continue to contribute to the conservation of primary cavity excavating birds and other snag-dependent wildlife in the analysis area and watershed. At the watershed scale, the distribution of snag density groups would become more in line with what occurred on the landscape historically.

Alternative 2

Proposed commercial and mechanical fuels treatment activities under this alternative would have the same effects as those described under All Action Alternatives. A total of 4,280 acres would be commercially thinned and mechanically treated for fuels under the Proposed Action. Because this alternative would treat the most acres of any of the action alternatives, it would also have the greatest impact on snags within the analysis area. At the scale of individual treatment units, snag densities would meet or exceed Forest Plan standards following implementation (see adjusted snag densities for the Wildcat area).

Under this alternative, snag densities at the watershed scale in the Dry, Moist, and Cold Upland Forest PVGs would continue to meet Forest Plan standards after treatment. At the watershed scale, Alternative 2 is expected to reduce the snag density in moist upland forest habitat in the ≥10-inch group and the ≥20-inch group by 12.9 snags per acre and 2.1 snags per acre, respectively, when compared to the current condition. In the cold upland forest PVG, Alternative 2 would reduce the snag density in the ≥10-inch group by 1.4 snags per acre when compared to the current condition. Snag densities in the ≥20-inch group would be reduced 0.2 snags per acre at the watershed scale under this alternative.

Burning and mechanical fuels treatments would have the same effects as those described in the Common to All Action Alternatives section. Approximately 10,288 acres would be broadcast (landscape) burned under this alternative. This activity is expected to have minor impacts on snags due to the timing and intensity of planned underburns. Under this alternative, 2.2 miles of new system road would be constructed to access treatment units. These roads would permanently (for the life of the road) remove the affected areas from production of vegetation (and snags). Due to the size of the area that would be impacted (approximately 5 acres), the effects to snags and species dependent on them is considered minor. Snags would also be felled adjacent to temporary roads; approximately 9 acres would be affected by temporary roads, with additional snag felling to allow for safety along these routes. Due to the size and linear nature of the affected area, impacts to snags associated with this activity will be minor.

Impacts on primary cavity excavating species under this alternative would be the same as those described in the Common to All Alternatives section. This alternative would impact the most acres of potential primary cavity excavator nesting, foraging, and roosting habitat (snags) when compared to the other alternatives. Because snag densities in excess of the Forest Plan standard would be maintained in commercial thin and fuels units, and untreated habitat would be well distributed across the landscape (and in portions of treatment units), the impacts to primary cavity excavators is expected to be minor.

Cumulative Effects

The cumulative effects under this alternative would be the same as those described under All Action Alternatives. Because this alternative would harvest and mechanically treat the most acres of all of the action alternatives, it would also have the greatest impact on snag densities at the watershed scale. Snag densities would continue to meet Forest Plan standards at the watershed and stand scale following treatment.

Alternative 3

Proposed commercial and mechanical fuels treatment activities under this alternative would have the same effects as those described under All Action Alternatives. A total of 4,184 acres would be commercially thinned and mechanically treated for fuels under Alternative 3. This alternative would treat slightly fewer acres than Alternative 2. At the scale of individual treatment units, snag densities would meet Forest Plan standards following implementation.

Under Alternative 3, snag densities at the watershed scale in the Dry, Moist, and Cold Upland Forest PVGs would continue to meet Forest Plan standards after treatment. At the watershed scale, Alternative 3 would reduce the snag density in moist upland forest habitat in the ≥10-inch group and the ≥20-inch group by 11.7 snags per acre and 1.9 snags per acre, respectively, when compared to the current condition. At the watershed scale, Alternative 3 would have the same impact on snags in the cold upland forest potential vegetation group as Alternative 2 because the same number of acres would be treated under each of these alternatives.

Burning and mechanical fuels treatments would have the same effects as those described in the Common to All Action Alternatives section. Approximately 10,079 acres would be broadcast (landscape) burned under this alternative, the least when compared to the other action alternatives. This activity is expected to have minor impacts on snags due to the timing and intensity of planned underburns.

Under this alternative, there would be no construction of new system roads. Approximately 5.3 miles of temporary road would be constructed under this alternative. Snags would be felled along these routes; approximately 13 acres would be affected by temporary roads. Additional snag felling would occur along these routes to allow for safety. Due to the size and linear nature of the affected area, impacts to snags associated with this activity will be minor.

Impacts on primary cavity excavating species under this alternative would be the same as those described in the Common to All Alternatives section. This alternative would impact snags on approximately 352 fewer acres than Alternative 2. In addition, 244 acres would be variable-density thinned. This prescription would maintain a mosaic of more open and dense pockets within treatment units. These patchy stands would provide habitat for both open and closed canopy-associated cavity nesters. Because snag densities in excess of the Forest Plan standard would be maintained in commercial thin and fuels units, and untreated habitat would be well distributed across the landscape (and in portions of treatment units), the impacts to primary cavity excavators is expected to be minor.

Cumulative Effects

The cumulative effects under this alternative would be the same as those described under all action alternatives. The expected impact on snags under this alternative would be less than that of Alternative 2. Fewer acres of commercial thinning would occur under this alternative when compared to the Proposed Action (Alternative 2). Snag densities would continue to meet Forest Plan standards at the watershed and stand scale following treatment.

Alternative 4

Proposed commercial and mechanical fuels treatment activities under this alternative would have the same effects as those described under All Action Alternatives. A total of 3,485 acres would be commercially thinned and mechanically treated for fuels under Alternative 4. Because this alternative would treat the fewest acres of any of the action alternatives, it would also have the least impact on snags within the analysis area. At the scale of individual treatment units, snag densities would meet Forest Plan standards following implementation.

Under this alternative, snag densities at the watershed scale in the Dry, Moist, and Cold Upland Forest PVGs would continue to meet Forest Plan standards after treatment. Alternative 4 would reduce the snag density in moist upland forest habitat in the ≥10-inch group and the ≥20-inch group by 11.0 snags per acre and 1.7 snags per acre, respectively, when compared to the current condition. At the watershed scale, Alternative 4 would reduce the snag density in cold upland forest habitat in the ≥10-inch group by 0.9 snags per acre when compared to the current condition. Snag densities in the ≥20-inch group would be reduced 0.1 snags per acre at the watershed scale under this alternative.

Burning and mechanical fuels treatments would have the same effects as those described in the Common to All Action Alternatives section. Approximately 10,288 acres would be broadcast (landscape) burned under this alternative, the same as Alternative 2. This activity is expected to have minor impacts on snags due to the timing and intensity of planned underburns.

Under this alternative, there would be no construction of new system roads. Approximately 2.4 miles of temporary road would be constructed under this alternative. Snags would be felled along these routes; approximately 6 acres would be affected by temporary roads. Additional snag felling would occur along these routes to allow for safety. Due to the size and linear nature of the affected area, impacts to snags associated with this activity will be minor.

Impacts on primary cavity excavating species under this alternative would be the same as those described in the Common to All Alternatives section. This alternative would impact the fewest acres of potential cavity excavator habitat. Because snag densities in excess of the Forest Plan standard would be maintained in commercial thin and fuels units, and untreated habitat would be well distributed across the landscape (and in portions of treatment units), the impacts to primary cavity excavators is expected to be minor.

Cumulative Effects

The cumulative effects under this alternative would be the same as those described under all action alternatives. This alternative would have the least impact on snags when compared to the other action alternatives; it would mechanically treat (fuels and commercial thinning) the fewest acres of all of the action alternatives. Snag densities would continue to meet Forest Plan standards at the watershed and stand scale following treatment.

DEAD WOOD HABITAT: Snag Replacement Trees

Current Condition

Snag replacement trees were analyzed to determine the potential for recruitment of dead tree habitat over time across the landscape. Current Forest Plan direction for green replacement tree (GRT) densities are based on the Regional Forester's Forest Plan Amendment #2 (USDA 1995). Currently, all of the stands proposed for commercial thinning meet Forest Plan (as amended) green tree replacement objectives for density and size of replacements by potential vegetation group.

Portions of the analysis area were heavily impacted by spruce budworm infestation during the 1980s and early 1990s. There are relatively few green tree replacements in some stands impacted by insects.

Direct and Indirect Effects

Alternative 1

Within the next five years, snag replacement trees (live/green) would continue to occupy the project area at or near current densities and size classes. In the mid and long term (5 to 15+ years), green tree replacements would decrease in response to disease and insect outbreaks in proposed commercial thinning stands. In the absence of fire, disease and insect outbreaks would affect dense multi-strata stands. Although green tree replacements may decrease in the future due to mortality, it is unlikely that green tree replacement levels would fall below Forest Plan objectives. In stands already affected by disease and insects (those where mechanical fuels treatment activities are proposed), green tree replacements could be reduced below objectives by further disease and insect activity. In the long term, mortality of overstory trees would increase standing and downed fuel loads, increasing the risk of high severity wildfire. Wildfire of this type would change the composition and structure of forested stands in the analysis area. Depending on the intensity and severity of the fire, this would reduce or even eliminate green replacement trees currently occupying the site. After a severe fire event, it would take in excess of

80-100 years to regain sufficient quantities of replacement trees, in all size classes, to meet the Forest Plan objectives.

Alternative 2, 3, and 4

Proposed harvest activities (commercial and non-commercial thinning) would directly and indirectly affect green trees in the project area. Commercial and non-commercial thinning would reduce the density of green trees in treatment units; however, all treated stands would be fully stocked after treatment. Green tree objectives would be met following harvest according to objectives contained in the Forest Plan. Mechanical fuels treatment activities would occur in stands that have been or that are currently being affected by disease agents and insects. These agents have resulted in reduced levels of green tree replacements in these stands. Mechanical fuels treatment activities would remove diseased green trees in these stands to promote the health of the residual stand. Replacement objectives would be met or not reduced further (if currently below objectives) in all treatment stands following treatment.

Low intensity landscape burning and pile burning would reduce fuels (slash) created from harvest and thinning activities, and reduce understory vegetation. Prescribed fire could cause mortality of small diameter conifers; however, overstory composition would be unaffected by low intensity underburning. Green tree replacements would remain above objectives after landscape and activity fuels burning.

Cumulative Effects

Past activities, actions, and events in the Wildcat analysis area that affected green replacement trees include timber harvest (16,309 acres), wildfire, and reforestation (2,300 acres). Harvest reduced the number of green trees in treatment units; at times, silvicultural practices left few if any green tree replacements. In general, areas with deficient green tree replacement have sufficient regeneration. Past harvest also targeted large diameter trees; this has led to a high proportion of green trees less than 20 inches and a lower proportion of trees greater than 20 inches in harvested stands. The Monument Complex Fire burned a portion of the analysis area during the summer of 2007. Approximately 7,525 acres of National Forest System lands burned at high and moderate intensity within the analysis area, reducing green tree replacements. Although the fire created snags, these will fall relatively quickly (0 to 20 years) and the high and moderate intensity portions of the fire will be left with relatively few snags due to the lack of green trees that survived the fire. In high and a portion of moderate severity burn areas, 100 percent mortality of green trees occurred, resulting in a shortage of green tree replacements in the future in these stands. Other small wildfires in the analysis area have had little impact on green tree replacements. Reforestation activities following harvest activities re-established a green tree component in treated stands, allowing for green tree replacements in the future. These activities and events have combined to create the existing condition of green tree replacements in the analysis area.

Present and reasonably foreseeable future activities, actions, or events that have the potential to affect green tree replacements include hazard tree felling and removal and aspen restoration activities. Both of these activities would impact green tree densities. Aspen restoration activities would include the felling, and potential removal of conifers within aspen stands. Because all conifers (less than 21 inches) would be potentially removed from these stands, aspen would provide green tree replacements in these stands.

When the expected effects of these alternatives are combined with the residual effects of past activities, actions, and events, there would be no cumulative increase in acres below Forest Plan green tree replacement objectives. By meeting green tree replacement objectives in treated stands, sufficient trees would be available to provide future snag habitat at levels consistent with the Forest Plan.

DEAD WOOD HABITAT: Downed Wood

Current Condition

Dead downwood is dependent on disturbances creating snags and snags subsequently falling to the ground. Downwood will remain on site until it decomposes, is burned up in a wildfire, or is physically or mechanically removed. These actions may result in a reduction of downwood, until snag fall occurs again on the site. Generally, downwood occurs as scattered pieces, clusters, and/or piles of logs and/or limbs within the affected area. For this analysis current vegetation survey (CVS) data was used to provide information on downwood in the Wall Creek watershed.

Current Forest Plan direction for downwood densities is based on the Forest Plan (USDA 1990) and direction given in the Eastside Screens (USDA 1995). Snag retention standards are designed to meet future down wood needs.

The Forest's amended guidelines for downwood densities for the Wildcat analysis area are found in Table W-13.

Table W-13. Existing downwood density in the Wildcat analysis area.

Forest Plan Standards (amended)		Downwood/Log Criteria	Existing Condition Wall Creek Watershed (CVS Data)	
Species	Density		Potential Vegetation Group	Density
Ponderosa pine/Douglas-fir	3-6 pcs/ac	Small end dia. >12 inches Piece length >6 feet Total length 20-40 feet	Dry Upland Forest	16.3 pcs/ac
Mixed conifer/grand fir	15-20 pcs/ac	Small end dia. >12 inches Piece length >6 feet Total length 100-140 feet	Moist Upland Forest	48.3 pcs/ac
Lodgepole pine	15-20 pcs/ac	Small end dia. >8 inches Piece length >8 feet Total length 120-160 feet	Cold Upland Forest	9.7 pcs/ac

When compared to Forest Plan standards for downed wood density, current estimates exceed the Forest Plan standard for the dry and moist upland forest potential vegetation groups by 10.3 to 13.3 pieces per acre and 33.3 to 38.3 pieces per acre, respectively. Available data indicate that downed wood density in the cold upland forest potential vegetation group is currently below Forest Plan standards. The small sample size of CVS plots (6) in the cold upland forest PVG is likely responsible for this; observations of cold upland forest in the project area indicate that Forest Plan standards are being met in these stands.

Direct and Indirect Effects

Alternative 1

Over the next five years, dead downed wood would continue to occupy the watershed at or near the current density in the dry upland, moist upland, and cold upland forest potential vegetation groups. Over the next 5 to 15 years, falling snags would be the primary factor contributing to the recruitment of downed wood habitat, potentially increasing downed wood densities across the watershed. Downed wood densities in the dry upland and moist upland forest PVG would increase even further above Forest Plan standards; densities in the cold upland forest PVG would approach or exceed Forest Plan standards as disease, insects, drought, and other factors increase mortality in these stands. In the long term, stands would continue to develop multi-layered conditions, resulting in competition for resources and stress. Potential increases in the incidence of insects and disease would cause mortality in these stands, increasing potential standing and downed wood. Increases in downed wood density would increase fuel loading and the risk of wildfire (see Fuels section). Large scale, high severity wildfire would reduce downed wood densities by consuming downed wood. A fire of this type could reduce downed wood densities below Forest Plan standards immediately following the fire. Downed wood would eventually increase as snags created by a fire of this type begin to fall. After a series of continued disturbances on the site, downed wood densities would likely fall below the Forest Plan standard because of the diminished source of green trees and snags. Replacing the downed wood component after a series of disturbance events could take up to 80 years to develop replacement trees greater than 12 inches dbh.

Common to Alternatives 2, 3, and 4

Downed wood densities would continue to exceed Forest Plan standards in the dry upland and moist upland forest PVGs and be very near or above standards for the cold upland PVG within treatment units under all of the action alternatives. Although CVS data indicate that this PVG is currently below standards for downed wood, observations of dead wood in the project area indicate that Forest Plan standards are currently being met or exceeded in cold upland forest in the analysis area

Proposed commercial and non-commercial thinning would not directly affect downed wood because downed wood would not be harvested or removed from treatment units. Indirectly, dead wood may be affected by harvest operations (skidding, skid trails, landings, etc.), where existing down logs may be moved, cut into pieces, or broken apart. However, commercial and non-commercial thinning would not be expected to reduce downed wood densities in the affected area. Pieces of downed wood meeting these standards (>12” small end diameter and >6 feet long) would remain on site as singles, groups, or piles.

Mechanical fuels treatment activities would impact downed wood within treatment units. A portion of the existing downed wood in these units would be piled and burned or removed from the unit in order to reduce fuel loading. Downed wood densities would be reduced to the Forest Plan standards in these proposed treatment units. The largest downed wood in treatment units would be retained where it is available. Approximately 10 percent of the proposed fuels treatment area would be retained in its existing condition; downed wood would not be affected on these acres. Untreated patches would vary in size and be distributed throughout the mechanical fuels treatment area; they would provide locally high densities of downed wood for wildlife that require this feature for foraging and denning (i.e. pileated woodpecker, northern flicker, American marten). These patches would be distributed across the landscape. When these patches are combined with other untreated areas (riparian areas, stands with a healthy overstory, etc), and stands where fuels and diseased vegetation would be treated, the fuels treatment area would provide downed wood at densities and with a distribution that contributes toward the conservation of wildlife requiring this habitat feature.

Activity fuels treatment would affect downed wood retained after treatment occurs. Burning treatments would not occur in mechanical fuels treatment units; therefore, there would be no additional reduction in downed wood in these units, and standards would continue to be met. Activity fuels reduction would occur in commercial harvest units where post-harvest fuel loading exceeds Forest Plan standards. Broadcast burning of activity fuels would occur in the spring or fall, depending on burn windows associated with weather and fuel moisture. Fuel moisture and weather would be used to create a low intensity underburn within these units. Existing downed wood would be minimally impacted by activity fuels treatment. Fuel moisture during burning would be at a level that minimizes potential consumption of large diameter wood; smaller, drier fuels would be consumed, while larger, wetter fuels would be untouched or lightly charred by burning. It is expected that Forest Plan standards for downed wood would be met in these treatment units following burning. Underburns would also be expected to create snags within the burn area. Snags created by burning would compensate for downed wood that may be consumed during this activity.

Landscape underburning would have similar impacts as those described for activity fuels burning. See Table W-14 for a summary of mechanical fuels treatment and burning acres (activity and landscape burning) by alternative. Fuel conditions and weather would minimize impacts to larger diameter (>12 inches) downed woody material. Although some downed wood (primarily small diameter material) would be consumed by landscape underburning activities, snags (future downed wood) would also be created by burning. Forest Plan standards for downed wood would be met in landscape underburn units following burning.

Table W-14. Acres of mechanical fuels treatment and burning under the Proposed Action, Alternative 3, and Alternative 4.

	Proposed Action	Alternative 3	Alternative 4
Mechanical Fuels Treatment (acres)	2,114	2,114	1,358
Activity Fuels Burning (acres)	1,334	1,035	2,127
Landscape Burning (acres)	10,288	10,079	10,288

Tractor fire lines used to contain underburns would likely displace downed wood, and may result in it being broken apart. This occurrence would not reduce downed wood densities.

The proposed treatment activities would reduce stocking levels, which would in turn reduce stress and resulting mortality factors such as disease and insects. Reductions in these agents would reduce mortality in treated stands, ultimately reducing snag recruitment and downed wood levels in these stands. Within the mechanical fuels treatment portion of the project, approximately 10% of the proposed mechanical fuels treatment acres would not be treated; these acres would be distributed throughout the project area. High snag and downed wood densities (and the agents that cause these) would be maintained in these areas. Elevated snag retention standards (see snag section of this report) would also contribute to downed woody material in the future.

Cumulative Effects

Past activities and events in the Wildcat analysis area that have affected downed wood include Insect and disease outbreaks, timber harvest and salvage (18,357 acres) and associated burning, wildfire, personal-use firewood collection, and prescribed underburning (20,405 acres). Insect outbreaks in the late 1980s, early 1990s, and 2002 have contributed to downed wood densities in the analysis area. Overstory vegetation in large portions of the analysis area was killed by spruce budworm and tussock moth during these periods. Downed wood densities well in excess of the Forest Plan standards are available in the analysis area. Past harvest activities affected downed wood densities by removing or piling and burning dead wood within treatment units prior to the existence of forest plan standards. Associated activity fuels burning after harvest also reduced downed wood densities. Salvage harvest of dead and dying trees reduced future downed wood recruitment. Wildfire (including the Monument Complex Fire in 2007) generally consumed downed wood within affected areas, especially small diameter material. Generally, downed wood was completely consumed in high and moderate intensity portions of the fire; downed wood was generally charred or relatively untouched in low intensity and underburned portion of the Monument Complex Fire. Personal use firewood cutting has reduced snag and downed wood densities adjacent to open roads in the analysis area. Reductions in snags adjacent to open roads reducing future downed wood recruitment. Areas away from open roads or in inaccessible areas have not been affected by this activity. Prescribed underburns have affected approximately 20,405 acres in the analysis area. These burns occurred in areas where fire burned periodically at low intensities; generally, these burns had a minor impact on downed wood. These underburns burned at low intensity when fuel moistures were high, reducing the level of impact (consumption) on downed wood. Past activities, actions, and events have combined to create the existing condition of downed wood habitat in the analysis area.

Present and reasonably foreseeable future activities that affect downed wood include firewood cutting and hazard tree felling and removal. These activities reduce future recruitment of downed wood by removing standing dead trees and defective trees along roadways. When the expected effects of these alternatives are combined with the residual and expected effects of past, present, and future actions, activities, and events in the analysis area, there would be a cumulative reduction in downed wood. This reduction in downed wood densities would not adversely impact wildlife species requiring this habitat feature. The impacts on downed wood are expected to be minor at the watershed scale. Downed wood is expected to remain at or near existing densities at the watershed scale following treatment. Although downed wood densities would be reduced by the proposed activities (particularly mechanical fuels treatment units), Forest Plan standards for downed wood would continue to be met.

Alternative 2

Environmental effects in commercial thinning and mechanical fuels treatment units under this alternative would be the same as those described in the Common to All Action Alternatives section. This alternative and Alternative 3 would mechanically treat fuels on the same number of acres, approximately 756 more acres than would be treated under Alternative 4. Downed wood densities would continue to exceed Forest Plan standards in the dry upland and moist upland forest PVGs and be near or above standards in the cold upland PVG.

Cumulative Effects

The cumulative effects under this alternative would be similar to those described under all action alternatives. When the expected effects of this alternative are combined with the residual and expected effects of past, present, and future actions, activities, and events in the analysis area, there would be a cumulative reduction in downed wood within the watershed; however, Forest Plan standards would continue to be met or exceeded and there would be no adverse impacts on wildlife species requiring this habitat feature. Downed wood is expected to remain at or near existing densities in the analysis area following treatment. The distribution of downed wood across the landscape would also be maintained through non-treatment areas, untreated portions of mechanical fuels units, and retention of downed wood at densities that meet or exceed Forest Plan standards in all treatment units.

Alternative 3

Environmental effects in commercial thinning and mechanical fuels treatment units under this alternative would be the same as those described in the Common to All Action Alternatives section. This alternative would commercially thin the fewest acres of all the action alternatives. This alternative and Alternative 2 would mechanically treat fuels on the same number of acres. Downed wood densities would continue to exceed Forest Plan standards in the dry upland and moist upland forest PVGs and be near or above standards in the cold upland PVG.

Cumulative Effects

The cumulative effects under this alternative would be similar to those described under all action alternatives. When the expected effects of this alternative are combined with the residual and expected effects of past, present, and future actions, activities, and events in the analysis area, there would be a cumulative reduction in downed wood within the watershed; however, Forest Plan standards would continue to be met or exceeded and there would be no adverse impacts on wildlife species requiring this habitat feature. Downed wood is expected to remain at or near existing densities in the analysis area following treatment. The distribution of downed wood across the landscape would also be maintained through non-treatment areas, untreated portions of mechanical fuels units, and retention of downed wood at densities that meet or exceed Forest Plan standards in all treatment units.

Alternative 4

Environmental effects in commercial thinning and mechanical fuels treatment units under this alternative would be the same as those described in the Common to All Action Alternatives section. This alternative would mechanically treat fuels on approximately 756 fewer acres than Alternatives 2 and 3. Downed wood densities would continue to exceed Forest Plan standards in the dry upland and moist upland forest PVGs and be near or above standards in the cold upland PVG.

Cumulative Effects

The cumulative effects under this alternative would be similar to those described under all action alternatives. When the expected effects of this alternative are combined with the residual and expected effects of past, present, and future actions, activities, and events in the analysis area, there would be a cumulative reduction in downed wood within the watershed; however, Forest Plan standards would continue to be met or exceeded and there would be no adverse impacts on wildlife species requiring this habitat feature. Downed wood is expected to remain at or near existing densities in the analysis area following treatment. The distribution of downed wood across the landscape would also be maintained through non-treatment areas, untreated portions of mechanical fuels units, and retention of downed wood at densities that meet or exceed Forest Plan standards in all treatment units.

MANAGEMENT INDICATOR SPECIES: Rocky Mountain Elk

Current Condition

Preferred habitat for elk consists of a mixture of forest and non-forest habitat types and a variety of forest structure to provide cover and forage for summer or winter usage (Thomas et al. 1979, USDA 1990). Summer and winter range habitat is present in the analysis area.   Approximately 14 percent of the analysis area is designated as big game winter range (Management Area C3; 5,435 acres). Portions of other Forest Plan Management Areas, including C8 and E1 lie within the Monument big game winter range; although not designated as winter range in the Forest Plan, these acres are utilized the same as designated winter range habitat. The Forest Plan establishes standards and guidelines for elk habitat for many of the management areas on the Forest. The analysis area includes portions of 4 Forest Plan Management Areas that have standards for big game habitat: C3 (Winter Range), C4 (Wildlife Habitat), E1 (Timber and Forage), and E2 (Timber and Big Game). The Monument Winter Range is the largest winter range (approximately 61,000 acres) on the Forest. It spans nearly the entire southern boundary zone of the Heppner Ranger District to the furthest west extent of the North Fork John Day Ranger District. C4 Wildlife Habitat is generally restricted to the northern portion of the analysis area, while the E1 management area allocation is situated between the C3 and C4 areas. The E2 management area is restricted to the eastern portion of the analysis area. Table W-15 compares the Forest Plan standards with the current condition of elk habitat in the analysis area.

The State of Oregon manages a herd of several hundred elk that winter in the Wildcat analysis area. The Wildcat analysis area lies entirely within the Heppner Wildlife Management Unit (WMU). The elk in the analysis area are highly mobile and tend to move in and out of the analysis area throughout the winter depending on weather conditions. The northern portion of the analysis area is critical summer range habitat for elk. Open road densities in this portion of the analysis area are low indicating that disturbance of elk is also low. Summer and winter foraging habitat for the elk consists of a variety of grasses and shrubs. Ground cover concealment, often in the form of shrubs, downed wood, or broken terrain, is important for elk calving. Calving occurs in areas where open forage areas are adjacent to good escape cover. This type of habitat is located throughout the middle and upper portions of the analysis area.

Currently, the elk population is slightly below management objectives set by the State of Oregon for the Heppner Wildlife Management Unit (WMU). The bull to cow ratio in the Heppner unit (5 bulls per 100 cows in March 2007) is also below management objectives for the unit. It is likely that the actual bull to cow ratio in the Heppner unit is higher than 5 bulls per 100 cows due to a low sample size of bulls (especially bachelor groups of bulls) during spring counts (Steve Cherry, ODFW, personal communication). Currently, post winter estimates (2007) for calf ratios indicate there are 15 calves per 100 cows in the Heppner unit. In 2006, there were 18 calves per 100 cows.

Recent declines in the elk population and calf-cow ratios are becoming a management concern in northeast Oregon. Decreases are widely thought to be the result of increasing populations of cougars and subsequent increases in predation on calves. Additional concerns include changes in habitat conditions that affect winter survival of calves and pregnant cows.

Table W-15. A comparison of standards and existing conditions for Rocky Mountain elk habitat in the Wildcat analysis area.

Management Area	Forest Plan Standards			Wildcat HEI Analysis			
	HEI	Satisfactory Cover	Total Cover	HEI	Satisfactory Cover	Total Cover	Open Road Density
C3	70	10% (Minimum) 15-20% (Desirable)	30%	68	9.5%	43%	0.5 mi/sq mi
C4	60	15% (Minimum) 20% (Desirable)	30%	64	3.3%	52.1%	0.9 mi/sq mi
E1	30	No Standard	No Standard	62	14.1%	54%	1.6 mi/sq mi
E2	45	10% (Minimum) 15-20% (Desirable)	30%	67	7.2%	65.6%	0.4 mi/sq mi

Overall, standards for total cover are exceeded in all four management areas evaluated. The Forest Plan standard for satisfactory cover is currently being met in only the E1 management area. Low satisfactory cover levels in the C3 winter range are a result of the limited capability of the hot dry and warm dry biophysical environments (those generally lying within the winter range) to produce and sustain satisfactory cover, large tracts of grassland habitat, past management activities, and recent wildfire (2007 Monument Complex Fire). The existing habitat effectiveness in the winter range is not consistent with the Forest Plan standard which states "Elk habitat will be managed on designated big game winter ranges to achieve a habitat effectiveness index of no less than 70, including discounts for roads open to motorized vehicular traffic as described in Thomas (1979). HEI is currently below Forest Plan standards for the same reasons that satisfactory cover is below standards in this management area.

Low satisfactory cover levels in the C4 and E2 management areas are largely the result of past management activities and large scale insect infestations (spruce budworm) that occurred in the 1980s and early 1990s. Thousands of acres of satisfactory cover were converted to forage and marginal cover habitat by infestations in the area north of Forest Road 21.

Direct and Indirect Effects

Alternative 1

In the short term, elk habitat would remain unchanged. The amount of satisfactory and total cover and HEI value in the C3, C4, E1, and E2 management areas would remain the same. In the mid and long term, stands would continue to grow, recover from past insect defoliation, and develop a multistory structure, increasing the amount of total cover in the C3, C4, E1, and E2 management areas. Satisfactory cover levels in the E2 management area would approach and likely exceed Forest Plan standards in the long term as stands regenerate from past insect attacks. Satisfactory cover levels in the C4 management area would require a longer period to approach and exceed Forest Plan standards. In the mid and long term, HEI in the C3, C4, E1, and E2 management areas would likely remain the same or increase as cover stands recover from past wildfire and insect defoliation and marginal cover grows into satisfactory cover. HEI would be negatively impacted by large scale wildfire or insect damage that could potentially occur in overstocked, stressed stands in the analysis area.

An increase in cover and multi-layer condition would increase the risk of high severity wildland fires and insect or disease outbreaks in the analysis area. A disturbance event similar to the Wheeler Point Fire (1996) or Monument Complex Fire (2007) is possible given that the Wildcat analysis area has similar vegetative conditions. A fire of this type would result in a reduction of total cover and satisfactory cover in the analysis area, and a marked increase in foraging habitat. If a fire of this type occurred in the C3, C4, E1, or E2 management areas, HEI would decrease due to an increased abundance of forage habitat and the lack of cover habitat.

Open road densities during the winter and spring use period are not expected to change in the short or long term.

Common to All Action Alternatives

Cover habitat would be treated by all three of the Action Alternatives. In the E1 management area, all cover (satisfactory and total) and HEI standards would be met after treatment under all of the action alternatives. Although satisfactory cover levels in the C3, C4, and E2 management areas would continue to be below standards, there would be no change in satisfactory cover levels from the existing condition under all of the action alternatives. Total cover standards would also continue to be met in these 3 management area allocations following treatment. HEI would continue to be below standards in the winter range; however, there would be no reduction in HEI in the C3 management area under any of the action alternatives. See Table W-16 for post-harvest HEI and cover levels for the C3, C4, E1, and E2 management areas.

Table W-16. Post harvest condition of Rocky Mountain elk habitat in the Wildcat analysis area.

	Alternative 2			Alternative 3			Alternative 4		
Management Area	HEI	Satisfactory Cover	Total Cover	HEI	Satisfactory Cover	Total Cover	HEI	Satisfactory Cover	Total Cover
C3	68	9.5%	43%	68	9.5%	43%	68	9.5%	43%
C4	67	3.3%	43.9%	66	3.3%	45.9%	66	3.3%	44.7%
E1	63	12.7%	50.1%	63	12.7%	50.1%	63	12.7%	50.1%
E2	67	7.2%	63.7%	67	7.2%	63.7%	67	7.2%	63.7%

In meeting the total cover standards for elk in the C3, C4, E1, and E2 management areas, elk habitat on National Forest System lands will continue to provide sufficient cover habitat (total, satisfactory, and marginal) for the elk population as well as continue to contribute to the elk population management objectives of the State of Oregon. As such, it follows that recreational hunting opportunities (State issued permits) will continue in the Monument winter range and general forest lands in the analysis area. By reducing the risk of insects, disease, and wildfire, and improving growing conditions for retained overstory and understory trees through thinning, stands would be more resilient to disturbance and provide dense cover habitat in the long term.

Treatment of forested stands under all action alternatives would affect the quality of these stands for elk. See Table W-17 for an accounting of commercial harvest, non-commercial harvest, and mechanical fuels treatment acres by alternative. Elk may avoid work areas while activities are occurring at these sites. Movements away from work areas would be short in distance and temporary; once activities ceased (at night or the completion of harvest), elk would return to the treated stands to forage on lichens and other residue made available by treatment activities. Commercial thinning would reduce stand densities, increasing sight distances in treated units. Due to the low open road densities in the majority of the analysis area (C3, C4, and E2 management areas) impacts on elk vulnerability would be negligible. Where open road densities are higher (E1 management area), elk would be more visible from roads; however, there would be no measurable impact on populations as a result. Aspen habitat treatments would increase the vigor of remnant aspen stands by reducing competition with conifers for limited resources and produce satisfactory cover and forage in the mid and long term.

Table W-17. Vegetative Treatment by Alternative

Treatment Type	Alternative 2	Alternative 3	Alternative 4
Commercial Thinning	2,166	2,070 (incl. 244 ac. variable density thin)	2,127
Non-Commercial Thinning	956	863	956
Mechanical Fuels	2,114	2,114	1,358

Non-commercial thinning and mechanical fuels treatments also have the potential to affect elk habitat. Non-commercial thinning would reduce understory tree densities, increasing sight distances in treated stands. Hiding cover for elk would be reduced as a result. Maintenance of small-diameter screening vegetation along open roads and untreated islands of regenerating conifers within non-commercially thinned stands would reduce potential vulnerability of elk. Removal of a portion of the small diameter trees in these stands would stimulate grass and forb growth where overstory canopy closure allows, improving forage for elk.

Mechanical fuels treatment would reduce downed wood densities, improving accessibility of some stands that elk currently have difficulty accessing due to the abundance of downed wood. Removal of a portion of the downed wood in these stands, non-commercial understory thinning, and removal of diseased trees would improve forage conditions in the short and mid term, and provide for healthy marginal and satisfactory cover habitat in the long term. These activities have the potential to affect elk calving habitat through the removal or disturbance of downed wood and understory vegetation used for cover during calving season. It is not expected that treatment activities would impact calving or result in reductions in calf survival. Treatment activities would not occur during or immediately following the calving season. Calving habitat in riparian corridors and untreated areas within mechanical fuels units (totaling 10% of the proposed mechanical fuels treatment acres) would not be affected.

Burning proposed in all action alternatives would have neutral or beneficial effects on elk habitat. See Table W-10 for an accounting of burning acres by alternative. Low intensity underburning (activity fuels treatment and landscape underburning) would consume accumulated small diameter litter and downed wood, dead vegetation and grass, and logging slash. Burning would occur in blocks ranging form less than 100 acres to several thousand acres in size. A low intensity underburn would generally not consume root crowns of perennial grasses or sterilize soil; growth of grasses and forbs would be stimulated by burning. Forage would improve for several years following burning. Adjacent burn blocks would not be burned in the same year in order to ensure that fall and winter forage for big game is available and well distributed through the analysis area. Torching of single trees and small patches of dense vegetation could occur; however, cover habitat (satisfactory, marginal, and hiding cover) would be minimally affected by burning.

Use of the road system, particularly closed roads (41 miles under all action alternatives) would increase road-related disturbance through increased traffic volumes. Elk would likely avoid these roads in favor of areas with less disturbance during implementation. They would return to these areas when activities cease (at night and when implementation is complete). Decommissioning of 2.4 miles of road along East Alder Creek would discourage illegal use by OHVs, increase forage, and improve potential calving habitat along this stream.

Cumulative Effects

Past activities and events in the analysis area and the entire Monument Winter Range that affected elk habitat in the analysis area include timber harvest (16,309 acres), road construction, road closures (Access and Travel Management), private land harvest within the winter range, the Rimrock Ecosystem Restoration Project (2,052 acres harvest and thinning), Bologna Basin (approx 1,000 acres of salvage and thinning), prescribed fire (20,405 acres), wildfire, and livestock grazing. Timber harvest has affected forest structure and composition, reducing the amount of cover habitat in the analysis area. Timber harvest has also fragmented habitat, creating a mosaic of forested stands and man-made openings. Conversely, the amount of foraging habitat for big game has increased in response to past harvest. Road construction associated with timber harvest increased road densities and disturbance within the analysis area. Increased open road densities make elk more vulnerable; research has found that they tend to select for habitats further away from open roads. More recently, road closures associated with access and travel management activities on the south end of the Umatilla National Forest have reduced open road densities. The road density in the Monument winter range is currently quite low (0.47 miles/sq. mile).

An unknown amount of private land harvest activity has occurred in the past within the Monument winter range. Private land harvesting has fragmented habitat, creating foraging habitat for big game where cover habitat once existed. The Rimrock Project reduced cover for big game species within the winter range to a small degree. Prescribed fire within the analysis area has improved forage habitat quality and quantity by reducing encroachment of conifers into foraging habitat and invigorating forage. Generally, prescribed fire had no impact on cover habitat for elk. Wildfire within the analysis area (and the Monument winter range) has impacted elk habitat. Large wildfires like the Monument Complex Fire of 2007 burned at high intensity in portions of the analysis area, reducing cover habitat for elk. Within the Monument winter range, the fire consumed cover patches, decreasing satisfactory cover below Forest Plan standards. Historic livestock grazing (sheep and cattle) negatively impacted range condition. Grazing altered the structure and composition of habitat through repeated overgrazing of rangelands. Past activities have resulted in the current condition of elk habitat in the analysis area and the entire Monument winter range.

Present activities, actions, and events that affect elk and elk habitat include cattle grazing and the Sunflower Bacon Vegetation Management Project. Current grazing in the allotment is not adversely affecting rangeland condition or adversely affecting wild ungulate (deer and elk) populations. Changes in grazing systems, season of use, stocking, and species grazed (cattle) have accounted for improved range condition. Livestock grazing still has the potential to compete with big game for forage habitat, particularly when forage is scarce (late summer/early fall). Current allotment management plans balance livestock utilization with big game management objectives, resulting in a shared utilization of the forage resource. The Sunflower Bacon Project would occur, in part, in the Monument winter range. This project would commercially harvest 2,057 acres, with the majority lying within the Monument winter range. This project would reduce marginal elk cover (requiring a Forest Plan amendment for the Monument winter range), but would maintain all existing satisfactory elk cover, a total cover level above the Forest Plan standard, and a high level of habitat effectiveness in the Monument winter range.

Reasonably foreseeable future activities, actions, and events that have the potential to affect elk and elk habitat include cattle grazing. Cattle grazing would have the same effects as those discussed in the present activities section.

When the expected effects of these alternatives are combined with the residual and expected effects of past, present, and future actions, activities, and events in the analysis area, there would be no cumulative reduction in satisfactory cover in the C3, C4, and E2 management areas. Total cover would be cumulatively reduced in the C4, E1, and E2 management areas; however, Forest Plan standards for these parameters would continue to be met under all of the action alternatives. HEI would remain the same (as the existing condition) in the C3 and E2 management areas; it would increase in the C4 and E1 management areas under all action alternatives. It is not believed that these impacts or increased vulnerability associated with more open stands would adversely impact elk or elk habitat within the analysis area under any of the action alternatives (2, 3, and 4).

Alternative 2

The effects of this alternative on elk and elk habitat would be the same as those described under Common to All Action Alternatives. This alternative would commercially, non-commercially, and mechanically treat fuels on the most acres when compared to the other action alternatives. Although satisfactory, total cover, and HEI in the C3 management area would not decrease under this alternative, the variables used to calculate HEI would be affected. Marginal cover would be converted to forage habitat, and the distribution of this cover across the landscape would be affected by this alternative. Because this management area is currently below standards for HEI, and the component variables of the HEI equation would be affected, a Forest Plan amendment would be required to treat these acres. This alternative would maintain a high level (HEI=68) of HEI in the winter range. Achieving a habitat effectiveness index of no less than 70 was not a purpose and need for action for this specific project. In addition, future projects that are intended to improve habitat effectiveness index are not precluded, nor is the attainment of an HEI value of 70 prevented. The direct and indirect effect of the amendment is that elk habitat would remain essentially unchanged from current conditions at the winter range scale.

This alternative would construct 3.6 miles of temporary road to access proposed treatment units. Temporary roads would generally follow existing trails, skidder roads or openings. Cover habitat would not be impacted by temporary road construction. Elk are anticipated to avoid the area during construction and use of these roads. These roads would be decommissioned following completion of treatment activities. Decommissioning may include resloping, subsoiling, placement of woody material, and seeding. These temporary roadbeds would provide forage for elk following decommissioning. This alternative would also construct 2.2 miles of system road. These roads would be closed using gates or barricades following completion of activities, therefore there would be no change in existing open road densities under this alternative. Construction and use of this road would disturb elk; they would move to areas with minimal disturbance while these activities are occurring. After the completion of activities, elk would return to the area. The road is not expected to be a barrier to elk movement or contribute to disturbance due to the fact that it will be closed to vehicle traffic during all times of the year. The proposed system road would provide easier foot-access to the treatment area. It is not expected that more open stands resulting from treatment activities, when combined with access provided by the road would impact elk distribution or population levels in the area.

Cumulative Effects

The cumulative effects under this alternative would be the same as those described under All Action Alternatives. When the expected effects of this alternative are combined with the residual and expected effects of past, present, and future actions, activities, and events in the analysis area, there would be no adverse impact on elk or elk habitat. Treatment activities would maintain a high level of big game habitat effectiveness in the analysis area under this alternative. Although new road construction would occur under this alternative, this road would be effectively closed following treatment activities. There would be no cumulative increase in open road miles under this alternative.

Alternative 3

The effects of this alternative on elk and elk habitat would be similar to those described under Common to All Action Alternatives. This alternative would commercially and non-commercially thin the least acres when compared to the other action alternatives. Under this alternative, there would be no reduction in satisfactory or marginal cover or HEI in the C3 management area. Because there would be no change in the variables used to calculate HEI, there would be no need to amend the Forest Plan to allow proposed treatment activities to occur in the winter range. This alternative would maintain a high level (HEI=68) of HEI in the winter range. Achieving a habitat effectiveness index of no less than 70 was not a purpose and need for action for this specific project. In addition, future projects that are intended to improve habitat effectiveness index are not precluded, nor is the attainment of an HEI value of 70 prevented.

To address concerns over the availability and distribution of marginal cover and the long term distribution of satisfactory cover in the C4 management area, approximately 352 acres of marginal cover habitat would be dropped. Those commercial thinning acres dropped under this alternative are all north of Forest Road 21. By dropping these acres, contiguous blocks of marginal cover would be maintained, providing hiding cover for elk. In the mid and long term, these stands would grow into a satisfactory cover condition (based on structure and composition of these stands), providing high quality hiding and security cover and improving the distribution of satisfactory cover on the landscape. While commercially thinned marginal cover would remain marginal cover following implementation, these stands would generally be low quality cover areas for elk, and would require many years to develop into satisfactory cover stands.

In order to address elk vulnerability concerns adjacent to Forest Road 21, approximately 244 acres would be treated with a variable-density thin prescription under this alternative. Variable density thinning would create a mosaic of stand structures (densities) within treatment units. Stands would be thinned at varying densities, retaining patches with higher densities ranging from ¼ to ½ an acre in size. These patches would retain a portion of the cover that currently exists in these stands and maintain screening vegetation to aid in obscuring elk when viewed from open roads. Overall, these acres would be converted to forage habitat, although more dense patches of forest would be present within variable density thinning units. Non-commercial thinning in 6 mechanical fuels treatment units totaling 309 acres and 4 non-commercial thinning units totaling 93 acres would be dropped in this alternative to maintain well-distributed high-density patches of understory vegetation. Dropping non-commercial thinning in these cold and moist stands will maintain hiding cover for elk and develop marginal cover and multi-strata stand structure. These units are distributed throughout the north-central portion of the analysis area where the majority of mechanical fuels treatments will occur. By dropping this activity in these stands, hiding cover, and ultimately marginal and satisfactory cover, will be provided for elk in the short and long term adjacent to marginal cover and foraging areas treated with mechanical fuels reduction. These stands would also provide dense understory structure needed to conceal elk calves in the spring.

This alternative would construct 5.3 miles of temporary road to access proposed treatment units. Temporary roads would generally follow existing trails, skidder roads or openings. Cover habitat would not be impacted by temporary road construction. Elk are anticipated to avoid the area during construction and use of these roads. These roads would be decommissioned following completion of treatment activities. Decommissioning may include resloping, subsoiling, placement of woody material, and seeding. These temporary roadbeds would provide forage for elk following decommissioning. This alternative would construct no new system roads.

Cumulative Effects

The cumulative effects under this alternative would be the same as those described under all action alternatives. When the expected effects of this alternative are combined with the residual and expected effects of past, present, and future actions, activities, and events in the analysis area, there would be a cumulative reduction in total cover (marginal cover) in the C4, E1, and E2 management area. Although this parameter would decrease due to treatment, it would continue to meet Forest Plan standards following treatment. This alternative would reduce marginal cover in the C4 management area the least of all of the action alternatives. HEI would remain the same or increase in these management areas following treatment. Because the fewest acres of commercial thinning, and the incorporation of variable density thinning in some treatment units, the cumulative increase in elk vulnerability would be least under this alternative.

Alternative 4

The effects of this alternative on elk and elk habitat would be the same as those described under Common to All Action Alternatives. Although satisfactory, total cover, and HEI in the C3 management area would not decrease under this alternative, the variables used to calculate HEI would be affected. Marginal cover would be converted to forage habitat, and the distribution of this cover across the landscape would be affected by this alternative. Because this management area is currently below standards for HEI, and the component variables of the HEI equation would be affected, a Forest Plan amendment would be required to treat these acres. This alternative would maintain a high level (HEI=68) of HEI in the winter range. Achieving a habitat effectiveness index of no less than 70 was not a purpose and need for action for this specific project. In addition, future projects that are intended to improve habitat effectiveness index are not precluded, nor is the attainment of an HEI value of 70 prevented. The direct and indirect effect of the amendment is that elk habitat would remain essentially unchanged from current conditions at the winter range scale.

This alternative would construct 2.4 miles of temporary road to access proposed treatment units. Temporary roads would generally follow existing trails, skidder roads or openings. Cover habitat would not be impacted by temporary road construction. Elk are anticipated to avoid the area during construction and use of these roads. These roads would be decommissioned following completion of treatment activities. Decommissioning may include resloping, subsoiling, placement of woody material, and seeding. These roadbeds would provide forage for elk following decommissioning. Mechanical fuels treatment would not occur on the southern portion of the ridge that separates Alder Creek from East Alder Creek. As a result, disturbance would be reduced, and the least acres of mechanical fuels treatment and fewest miles of temporary road construction would occur under this alternative.

Cumulative Effects

The cumulative effects under this alternative would be the same as those described under all action alternatives.

MANAGEMENT INDICATOR SPECIES: Primary Cavity Excavators

Current Condition

Primary cavity excavators (PCE) include bird species that create holes for nesting or roosting in live, dead, or decaying trees. They also provide secondary cavity users such as owls, bluebirds, and flying squirrels habitat for denning, roosting and/or nesting. Primary cavity excavators with the potential to occur on the Umatilla National Forest are listed in Table W-18 along with their preferred habitat type.

Table W-18. Primary cavity excavators and their habitats in the Wildcat analysis area.

Common Name	Habitat Community [1]	Nest Tree Size[1]
Lewis' woodpecker	Ponderosa pine, riparian cottonwood, oak woodland and burned stands.	13"-43" dbh.
Red-naped sapsucker	Riparian cottonwood, aspen, conifer forest. Mid – high elevations.	11" dbh, Avg.
Williamson's sapsucker	Mid – high elevation, mature or old conifer forests (ponderosa pine, fir, lodgepole pine, etc. with large dead trees present.	27" dbh. Avg.
Downy woodpecker	Riparian cottonwood, willow, aspen, mixed-deciduous, and mixed-conifer.	8" dbh. Min.
Hairy woodpecker	Mixed-conifer, ponderosa pine, and adjacent deciduous, stands.	17" dbh. Avg.
White-headed woodpecker	Open ponderosa pine or mixed conifer, dominated by ponderosa pine.	26" dbh. Avg.
Three-toed woodpecker	Coniferous, mixed conifer-deciduous forests. Prefer burned tracts and montane spruce or aspen.	12" dbh. Min.
Black-backed woodpecker	Coniferous forests especially burn over stands.	12" dbh. Min
Northern flicker	All forest types with older open forest and edges adjacent to open country.	22" dbh. Avg.
Pileated woodpecker	Mature coniferous, deciduous, and mixed forests.	20" dbh.

Common Name	Habitat Community [1]	Nest Tree Size[1]
		Min.
Black-capped chickadee	Mixed woodland, deciduous and coniferous forests.	4" dbh. Min.
Mountain chickadee	Open canopy, ponderosa pine, lodgepole pine, and other conifer forests.	4" dbh. Min.
Chestnut-backed chickadee	Prefers low elevation, mesic coniferous forest of pine.	4" dbh. Min.
Red-breasted nuthatch	Coniferous forests with mid to late seral stages.	12" dbh. Min.
White-breasted nuthatch	Mature ponderosa pine and mixed-conifer forests. Oak woodlands	12" dbh. Min.
Pygmy nuthatch	Mature to old ponderosa pine or mixed conifer with ponderosa pine dominant.	12" dbh. Min.

1 Marshall et al. 2003 and Thomas 1979.

In general, habitat for primary cavity excavators consists of dead and/or dying trees and downed wood in various size classes and stages of decay. Habitat can occur in a variety of vegetative communities with various structural conditions (Thomas 1979). In general, existing and potential habitat can be found throughout the analysis area, except for non-forest areas and forest stands in the process of regeneration (stand initiation, and stem exclusion). Habitat for primary cavity excavators will be evaluated in the Dead Wood Habitat (snag) section.

Direct and Indirect Effects

The environmental consequences on primary cavity excavator habitat are described in the Dead Wood Habitat section earlier in this EA. Refer to the sections DEADWOOD: Snags, DEAD WOOD: Green Replacement Snags, and DEAD WOOD: Downwood for information on the direct, indirect and cumulative effects of all alternatives for Primary Cavity Excavators and their habitat.

MANAGEMENT INDICATOR SPECIES: Pileated Woodpecker

The environmental consequences of the No Action Alternative, Proposed Action (Alternative 2), Alternative 3, and Alternative 4 on the pileated woodpecker and its habitat will be assessed here and in the Dead Wood Habitat section of this report.

Current Condition

Preferred habitat (foraging and nesting) for the pileated woodpecker includes dense moist forest types (mixed conifer) in late seral stages with a high density of dead/downed wood habitat (Marshall et al. 2003, USDA 1990). Stands generally include large diameter (>21" dbh) snags and downed wood (USDA 1990 and Bull and Holthausen 1993). In general, this habitat occurs in the mid and upper elevations of the analysis area, generally north of Forest Road 21. Small patches of suitable habitat are scattered south of the 21 road. The analysis area primarily consists of dry forest types dominated by ponderosa pine and Douglas-fir (see Silviculture Existing Conditions Report). These dry upland forest habitats account for approximately 54 percent of the analysis area. Dry forest types typically are xeric, open stands with relatively low densities of dead standing and downed wood. Dry forest types are generally not considered "suitable" habitat for the pileated woodpecker. The moist and cold upland forest potential vegetation groups are considered potential habitat for this species; they occur on approximately 22 percent and 7 percent of the analysis area, respectively.

Table W-19 shows the current condition of pileated woodpecker habitat in the analysis area. Overall, habitat is widely scattered across the analysis area, and occurs as small to moderate size blocks. The largest patch of suitable reproductive (nesting) habitat in the analysis area is 92 acres in size. Reproductive habitat is scattered throughout the analysis area, including dry upland forest habitat. Relatively little reproductive habitat is present in the extreme northern portion of the analysis area; this is largely due to spruce budworm mortality during the 1980s and early 1990s. Insect infestations caused heavy overstory mortality and reduced canopy closure below levels preferred by this species for nesting. Foraging habitat is also scattered throughout the analysis area; the largest blocks and highest concentrations of foraging habitat occur in the northern portion of the analysis area where snag and downed wood densities (resulting from insect mortality) are highest.

Table W-19. Existing condition of suitable pileated woodpecker habitat in the Wildcat analysis area.

Pileated Woodpecker Habitat	Existing Habitat	
	Acres	Percent [1]
Reproductive	1,012	26%
Foraging	2,879	74%
TOTAL HABITAT	3,891	100%

1 Percent of total habitat in habitat type.

Direct and Indirect Effects

Alternative 1

In the short term, suitable pileated woodpecker habitat would maintain its current quality and extent in the analysis area. In the mid and long term (5 to 15+ years), the structure and composition of pileated woodpecker habitat would change. In this time frame, multi-strata conditions in suitable pileated woodpecker habitat would continue to develop; stand densities would increase, and locally high concentrations of insects and disease would provide foraging and nesting habitat by creating snags. Young stands in an unsuitable condition for pileated woodpecker foraging or nesting would also develop multi-strata characteristics in the mid and long term, increasing the amount of suitable habitat in the analysis area and improving its distribution. Higher stand densities and increased standing and downed fuel loads would increase the risk of wildfire in these stands. A high-severity wildfire would change the composition and structure of suitable pileated habitat to an open shrubland/grassland with little or no tree cover and cause fragmentation of existing habitat. Pileated would be unlikely to use these habitats due to their structure and composition. Other woodpecker species would utilize these post-fire stands. This condition would last for as long as 80-100 years as stands reseeded themselves, and grew into a structural stage and size class where snags are large enough to provide potential nesting and foraging sites for pileated woodpecker.

Common to All Action Alternatives

Overstory canopy densities would be reduced by commercial thinning in suitable nesting and foraging habitat. Snag densities generally would not be affected in these treatment units except where individual snags pose a hazard to workers. Because snag densities would be maintained in these habitats, it is expected that pileated woodpecker would continue to use treated foraging habitat after harvest. See the Dead Wood Habitat section for a full discussion of the impacts of the alternatives on snag densities. Refer to Table W-20 for acres of treatment within suitable pileated habitat by treatment type.

Table W-20. Expected effects on pileated woodpecker habitat by habitat type and treatment type.

Habitat Type	Alternative	Acres Treated	Treatment Type		
			Commercial Thinning	Non-Commercial Thinning	Mechanical Fuels
Nesting	Alternative 2	73	**59 (-6%)**	14	0
	Alternative 3	69	**55 (-5%)**	14	0
	Alternative 4	73	**59 (-6%)**	14	0
Foraging	Alternative 2	625	321	56	248
	Alternative 3	585	303	35	247
	Alternative 4	507	284	56	167

**Bold indicates a reduction in habitat acres as a result of the proposed treatment.*

Research has shown that overstory canopy density is likely the primary factor that determines occupancy of potential nesting habitat by pileated woodpecker. It is likely that commercially thinned stands would not be used for nesting after treatment (in the short and mid-term) due to reductions in canopy density. Reductions in suitable nesting habitat would range from 5 percent to 6 percent, depending on which alternative is implemented. These habitats would be used for foraging due to the fact that snag densities would largely be maintained in these areas. In the long term, canopy density would increase in treated stands; larger trees and snags and downed wood would be available in these stands. Pileated woodpecker would use these stands for nesting in the long term after canopy closure increases.

Non-commercial thinning would not impact overstory structure or composition or impact snag and downed wood densities; therefore, non-commercial thinning would not impact potential pileated woodpecker habitat.

Mechanical fuels treatment activities would impact a few diseased (root rot, mistletoe, etc) green trees within treatment units. Green tree removal within these units would not impact stand structure or appreciably reduce canopy closure in these units; therefore the vegetative component of mechanical fuels/sanitation treatment would not impact this species. Snag and downed wood densities would be reduced by mechanical fuels treatment activities. Research indicates that mechanical fuels treatment activities reduce the abundance of foraging and nesting habitat for the pileated woodpecker and reduce potential prey (mainly ants) abundance as well (Bull et al. 2005). Pileated woodpecker would continue to forage in treated units at reduced levels following treatment. Untreated pileated woodpecker foraging habitat would continue to be well distributed through the northern and central portion of the analysis area. Snag densities within the analysis area would be adjusted to maintain moderate and high density snag densities in pileated woodpecker and other wildlife habitat. These snag densities would range from 4 to 6 snags per acre over 10 inches dbh, with 1 to 2 snags over 20 inches, where available. Elevated snag densities would provide pileated woodpecker habitat with a diversity of snag densities across the landscape. In addition, approximately 10% of the proposed mechanical fuels treatment acres would not be treated in order to provide a diversity of habitat with snag and downed wood densities at levels preferred by the pileated woodpecker. Where these areas occur in existing unsuitable habitat, they will provide nesting and roosting habitat in the long term, and will contribute to the connectivity of suitable habitat patches. Mechanical fuels treatment activities would improve stand health and resiliency to high severity wildfire, providing or maintaining suitable forested habitat for the pileated woodpecker in the long term.

Underburns would be designed to minimize impacts on large (>12 inches) downed wood in treatment units and in the landscape underburn portion of the analysis area. There is a potential that downed wood and snags used by this species would be consumed by proposed burning; however, snag densities would exceed Forest Plan standards following burning, ensuring that foraging and nesting habitat is maintained. Charring or downed wood and snags would reduce the abundance of ants utilizing these structural elements, reducing potential forage for this species. Due to the fact that burning would generally only blacken 50% of the underburn area, unaffected foraging habitat would be maintained for the pileated woodpecker.

Temporary road construction would not measurably impact the pileated woodpecker or its habitat. Temporary roads would generally follow existing openings. Hazard tree felling along and adjacent to these routes would impact snags and green trees. Snags and defective live trees deemed imminent or likely to fall with a potential failure zone that intersects roads used during implementation and haul routes would be felled. This activity would reduce potential nesting and foraging sites adjacent to these roads. This impact would be minor due to the fact that openings would be linear and temporary. The footprint of temporary roads would exist for a number of years; in the long term, these areas would be re-seeded by trees and shrubs, filling in openings. Openings created by temporary roads would not measurably increase the risk of predation on pileated woodpecker by aerial predators like northern goshawk due to the width of proposed temporary roads.

Cumulative Effects

Past activities, actions, and events that have affected pileated woodpecker habitat include timber harvest and salvage, wildfire, and firewood cutting. Timber harvest has occurred on approximately 18,357 acres in the analysis area. Timber harvest has altered the structure and composition of stands, created openings, and fragmented habitat. These activities reduced habitat for this species by removing large trees, impacting late and old structure characteristics, and reducing stand densities below levels preferred by this species. Wildfire has had variable impacts on pileated woodpecker and their habitat in the analysis area. Low and moderate intensity wildfire created potential foraging and nesting habitat by creating snags while maintaining stand structure and composition. High and moderate intensity wildfire that caused heavy overstory mortality reduced potential pileated habitat by altering stand structure, reducing canopy closure, and reducing stand complexity. The Monument Complex Fire consumed or heavily thinned several old growth management areas (along Skookum and Big Wall Creeks) that were considered suitable habitat for the pileated woodpecker prior to the fire. Firewood cutting has reduced snag densities adjacent to open roads. Areas away from open roads or in inaccessible areas adjacent to roads have not been affected by this activity. Snags potentially used as foraging or nesting habitat were removed by this activity.

Present and reasonably foreseeable future activities, actions, and events that have affected pileated woodpecker habitat include hazard tree felling and removal and firewood cutting. Firewood cutting will have similar effects as those discussed in the past activities section. Hazard tree felling along roads within the analysis area would remove snags and defective trees that are a danger to individuals that use roads. The snags and green trees that would be removed are those that are most likely to be used by this species: those in moderate and later stages of decay, those having diseases (such as heart rots) that make excavation easier, and those that support populations of potential prey (primarily carpenter ants).

When the expected effects of these alternatives are combined with the residual and expected effects of past, present, and future actions, activities, and events in the analysis area, there would be a cumulative reduction in nesting habitat and potential nesting, foraging, and roosting habitat for this species. All of the Action Alternatives would contribute to past reductions in pileated woodpecker habitat by reducing potential nesting habitat through commercial thinning and mechanical fuels treatment activities. By meeting Forest Plan standards for snags, providing for high and moderate snag densities in moist and cold upland forest, maintaining untreated areas within mechanical fuels treatment units, and by providing for connectivity of late and old structure and old growth habitat, there would be no adverse it impact on the pileated woodpecker. Habitat within the analysis area (including treated and untreated stands and C1 old growth areas) would continue to contribute towards the conservation of this species in the long term.

Alternative 2

The effects of this alternative would be the same as those described under Common to All Action Alternatives. This alternative would commercially thin and mechanically treat fuels on the most acres of potential pileated woodpecker foraging and nesting habitat when compared to the other action alternatives. While this alternative would reduce the risk of loss to severe wildfire on the most acres, this alternative would also impact the most suitable and potentially suitable pileated woodpecker habitat in the short term.

Construction of new system roads (2.2 miles) would result in permanent fragmentation of potential pileated woodpecker habitat. While many of the areas treated in the mechanical fuels treatment area are not currently pileated woodpecker habitat, they would grow into these habitats in the future. The fragmentation caused by new road construction would be less than that resulting from clearcutting or regeneration harvest due to the relatively narrow, linear nature of the created opening. Daily movement and dispersal between habitat blocks separated by the proposed system roads would not be impacted by the proposed road. Hazard tree felling along the road to provide for safe administrative use of the road would result in reduced snag densities along the road; reduced snag densities would persist for the life of the road.

Cumulative Effects

The cumulative effects under this alternative would be similar to those described under all action alternatives. When the expected effects of this alternative are combined with the residual and expected effects of past, present, and future actions, activities, and events in the analysis area, there would be a cumulative reduction in suitable nesting habitat and a reduction in snags potentially used for nesting, roosting, and foraging. The Proposed Action (Alternative 2) would contribute to past reductions in pileated woodpecker habitat by reducing potential nesting habitat by 6% through commercial thinning and mechanical fuels treatment activities.

Alternative 3

The effects of this alternative would be the same as those described under Common to All Action Alternatives. This alternative would commercially thin the fewest acres of nesting habitat (55 acres) when compared to the other alternatives. The difference in commercial thinning acres in suitable nesting habitat between this alternative and the other two action alternatives is 4 acres; these levels of impact are virtually the same. Mechanical fuels treatment would occur on approximately the same number of acres of foraging habitat as the Proposed Action (Alternative 2).

No new road construction would occur under this alternative. Temporary roads would have the same impacts as those described for All Action Alternatives. This alternative would construct the most temporary road when compared to the other action alternatives.

Cumulative Effects

The cumulative effects under this alternative would be similar to those described under all action alternatives. When the expected effects of this alternative are combined with the residual and expected effects of past, present, and future actions, activities, and events in the analysis area, there would be a cumulative reduction in suitable nesting habitat and a reduction in snags potentially used for nesting, roosting, and foraging. Alternative 3 would contribute to past reductions in pileated woodpecker habitat by reducing potential nesting habitat by 5% through commercial thinning and mechanical fuels treatment activities.

Alternative 4

The effects of this alternative would be the same as those described under Common to All Action Alternatives. This alternative would commercially thin 59 acres of suitable nesting habitat, the same amount as the Proposed Action. Mechanical fuels treatment would occur on the fewest acres (167 acres) of suitable foraging habitat under this alternative, when compared to the other action alternatives.

No new road construction would occur under this alternative. Temporary roads would have the same impacts as those described for All Action Alternatives. This alternative would construct 2.9 fewer miles of temporary road than Alternative 3.

Cumulative Effects

The cumulative effects under this alternative would be similar to those described under all action alternatives. When the expected effects of this alternative are combined with the residual and expected effects of past, present, and future actions, activities, and events in the analysis area, there would be a cumulative reduction in suitable nesting habitat and a reduction in snags potentially used for nesting, roosting, and foraging. Alternative 4 would contribute to past reductions in pileated woodpecker habitat by reducing potential nesting habitat by 6% through commercial thinning and mechanical fuels treatment activities.

MANAGEMENT INDICATOR SPECIES: Northern Three-Toed Woodpecker

Current Condition

Preferred habitat for the northern three-toed woodpecker includes late successional, cold/moist forest types (lodgepole/mixed conifer) with high standing-wood density, generally at higher-elevations (Marshall et al. 2003). This habitat occurs in scattered patches at high to mid elevations within the of the analysis area. The analysis area primarily consists of dry forest types. Approximately 29 percent of the analysis area is in the cold and moist upland forest potential vegetation types. The northern three-toed woodpecker has not been observed in the Wildcat analysis area. The northern three-toed woodpecker has generally been associated with old growth lodgepole pine stands. These habitats are scarce in the analysis area. A C2 (Managed Old Growth) stand is present in the northeastern portion of the analysis area; this managed old growth stand generally does not have habitat features indicative of an old growth lodgepole pine stand (i.e. large diameter lodgepole pine).

Table W-20 shows the existing condition of suitable northern three-toed woodpecker habitat in the Wildcat analysis area. Primary reproductive and primary foraging habitat does not currently occur in the analysis area.

Table W-20. Existing condition of suitable northern three-toed woodpecker habitat in the Wildcat analysis area.

Northern Three-toed Woodpecker Habitat	Existing Habitat	
	Acres	Percent [1]
Reproductive	134	12%
Forage Habitat	962	88%
TOTAL HABITAT	1,096	100%

1 Percent of total habitat in habitat type.

Direct and Indirect Effects

Alternative 1

In the short term, there would be no change in the availability of potential habitat for the northern three-toed woodpecker in the analysis area. In the mid and long term (5-15+ years), mixed conifer and lodgepole stands would continue to develop dense canopies and larger trees. In the long term, reproductive habitat would develop. Due to overstocking and high stem densities, particularly in regenerating lodgepole stands in old treatment units, the development of large trees would be slowed. There would also be an increase in foraging habitat in the mid and long term as stands affected by insects in the 1980s and 1990s develop multiple canopy layers and large trees.

Higher stand densities and increased standing and downed fuel loads in mixed conifer and lodgepole stands would increase the risk of wildfire and insect outbreaks in suitable and potential northern three-toed woodpecker habitat. A high-severity wildfire would change the composition and structure of suitable three-toed woodpecker habitat to an open shrubland/grassland with little or no tree cover. Initially (0 to 5 years post fire), three-toed woodpecker would forage in burned stands. Once bark beetle, their primary food source, disappeared from the fire area, the three-toed woodpecker would also leave. Lodgepole pine would quickly recolonize burned areas; however, it would take 30 to 40 years or more for these stands to develop into suitable foraging habitat for this species. In the mean time, the northern three-toed woodpecker would be unlikely to use these habitats due to their structure and composition.

Common to All Action Alternatives

Suitable nesting habitat for the northern three-toed woodpecker does not occur within treatment units; therefore, there would be no effects on this habitat type under any of the action alternatives. All three Action Alternatives would treat potential three-toed woodpecker foraging habitat. Refer to Table W-21 for acres of foraging habitat treated by treatment type and alternative.

Table W-21. Acres of northern three-toed woodpecker foraging habitat treated by alternative.

Habitat Type	Alternative	Acres Treated	Treatment Type		
			Commercial Thinning	Non-Commercial Thinning	Mechanical Fuels
Foraging	Alternative 2	313	104	94	115
	Alternative 3	297	88	94	115
	Alternative 4	259	104	94	61

Treatment of potential foraging habitat would alter stand structure and composition. These treatments would reduce stand density, decreasing the likelihood of wildfire and insect outbreaks. Northern three-toed woodpeckers depend on outbreaks of insects (especially bark beetles) and recent high severity wildfire for foraging. Proposed commercial and non-commercial thinning would reduce the susceptibility of treated stands to these agents in the short and mid term. Foraging substrate (green trees) would be reduced by the proposed activities. The northern three-toed woodpecker also gleans insects from recently dead trees. Because potential impacts on snags in commercial and non-commercial thinning acres are minor (see snag section of this report), and stands would be fully stocked following treatment, there would be negligible impacts on northern three-toed woodpecker under these treatments. Commercially and non-commercially thinned stands would continue to provide foraging habitat for this species after treatment.

Mechanical fuels treatments would also impact habitat for this species by removing green trees and snags used for gleaning insects and reducing the potential for insect outbreaks and wildfire that creates high quality habitat (in the short term) for this species. Potential impacts to green trees in these stands are considered minor, and largely incidental to the removal of fuels. Removal of snags would reduce foraging substrate for this species; however, untreated portions of mechanical fuels treatment units, riparian areas, and elevated snag retention levels in the moist and cold upland forest potential vegetation groups would continue to provide well distributed habitat for this species and provide for locally high insect populations. Because impacts to green trees would be minor, a diversity of snag densities would be available, and Forest Plan standards would be met in treated mechanical fuels units, the expected impacts to suitable northern three-toed woodpecker habitat would be minor under all action alternatives.

Temporary road construction would not affect habitat quality or quantity for this species. The impact on snags and green trees along and adjacent to these routes is expected to be minor due to the width of the affected area. The footprint of temporary roads would exist for a number of years; in the long term, these areas would be re-seeded by trees and shrubs, filling in openings in the forested canopy.

Cumulative Effects

Past activities, actions, and events that have affected northern three-toed woodpecker habitat include timber harvest, disease and insect outbreaks, wildfire, and firewood cutting. Timber harvest (particularly in cold and moist lodgepole and grand/white fire stands) has impacted potential habitat by altering structure and composition of stands, creating openings, and fragmenting habitat. Disease and insects create high quality foraging habitat for this species. Outbreaks of disease and insects of varying size have affected the upper portion of the watershed in the past; stands are currently recovering from past attacks, although endemic levels of insects and disease are occurring in this area. Wildfire (and subsequent increases in bark and wood-boring beetles) also provide high quality habitat for this species. The most recent fire in the watershed was the Monument Complex Fire. As insects move into dead and dying timber, the quality of high and moderate severity portions of the fire will increase; improvements in foraging and nesting habitat will decline as insect densities decrease. Firewood cutting has reduced snag densities adjacent to open roads. Snags potentially used for nest cavities have been felled by this activity.

Present and reasonably foreseeable future activities, actions, and events that affect northern three-toed woodpecker habitat include the Monument Fire Salvage project and firewood cutting. Firewood cutting is having the same effects as those described in the past activities section. The Monument Fire Salvage affected approximately 190 acres within the fire area. There would be no salvage harvest within the Wildcat analysis area; all salvage activities would occur west and south of the analysis area. Proposed salvage would not adversely impact potential habitat for this species due to the size of the area that would be affected; high and moderate severity stands are available throughout the fire area for this species.

When the expected effects of this alternative are combined with the residual and expected effects of past, present, and future actions, activities, and events in the analysis area, there would be no adverse impact on the northern three-toed woodpecker or its habitat. Proposed activities under all of the action alternatives would reduce habitat quality for this species; suitable habitat would continue to be suitable following treatment. Available habitat within and outside proposed treatment units (and within C2 management areas) would continue to contribute towards the conservation of this species in the analysis area.

Alternative 2

The effects of this alternative on northern three-toed woodpecker habitat would be the same as those described in the Common to All Action Alternatives section. This alternative would treat the most acres of potential northern three-toed woodpecker habitat of all the action alternatives.

Proposed construction of new system roads (2.2 miles) would remove potential habitat for this species from production for the life of the road. The proposed system roads would create permanent openings in the forested canopy; however, movement and dispersal between existing suitable and potential habitat separated by the proposed system roads would not be hindered.

Cumulative Effects

The cumulative effects under this alternative would be the same as those described under the Common to All Alternatives section.

MANAGEMENT INDICATOR SPECIES: Pine Marten

Current Condition

Preferred habitat for the pine marten includes late successional, moist forest types (mixed conifer) near riparian areas with high downed wood densities, generally above 4,000 feet in elevation (Ruggiero et al.

1994). This species depends mainly on small mammals such as red-backed voles, squirrels, and snowshoe hare for food. In the winter, the marten forages beneath the snow in downed wood for prey. This species has not been observed in the analysis area. Snow track surveys conducted along Forest Road 53 (northeast of the analysis area) from 1992 through 1995 did not detect the occurrence of marten on this portion of the forest.

Table W-22. Existing condition of suitable pine marten habitat in the Wildcat analysis area.

Pine Marten Habitat	Existing Condition	
	Acres	Percent [1]
Reproductive	668	38%
Forage Habitat	1,085	62%
TOTAL HABITAT	1,753	100%

1 Percent of total habitat in habitat type.

Table W-22 shows the existing condition of marten habitat in the analysis area. Suitable habitat (reproductive and foraging) is widely scattered across the analysis area (including some dry upland forest stands), and occurs as small to moderate sized blocks. The largest block of suitable habitat in the analysis area is 102 acres in size. Generally reproductive habitat and foraging habitat are closely associated with one another.

Direct and Indirect Effects

Alternative 1

In the short term (0 to 5 years), there would be no change in the quality or distribution of pine marten habitat in the analysis area. In the mid (5 to 15 years) and long term (15+ years), the quality and distribution of pine marten habitat would change. In this time frame, old forest and young forest stands would continue to develop multiple canopy layers and increased canopy density. Mortality resulting from insects and disease in stressed stands would increase snag and downed wood densities, improving the condition of foraging habitat for the pine marten. Reproductive habitat would also increase in the future through continued stand development. Currently, suitable habitat does not occur in the extreme north and northeast portions of the analysis area, likely due to heavy overstory mortality and reduced canopy closure resulting from spruce budworm infestations. This portion of the analysis area will grow into a suitable forage/reproductive habitat condition in the mid and long term as canopy closure increases. High downed and standing dead wood densities in these areas will provide high quality habitat for this species. High fuel loading would increase the risk of wildfire in these stands. A wildfire of this type would cause heavy overstory mortality and consume downed wood used for denning and foraging. It would take upwards of 80-100 years for mixed conifer stands to develop a composition and structure that would provide suitable pine marten foraging and reproductive habitat after a widespread high severity wildfire.

Common to All Action Alternatives

Suitable marten habitat would be treated by all three action alternatives. Refer to Table W-23 for acres of suitable marten forage and reproductive habitat treated by treatment type and alternative. Examination of Table W-23 shows that there is little difference between alternatives in terms of acres of marten habitat treated. If pine marten were present in the area, they would avoid the work area while operations are occurring. Existing stand densities (approximately 45% canopy in all affected stands) would be reduced by commercial thinning. Research indicates that pine marten prefer dense overstory canopies with closure of at least 40%, although they have been noted as foraging in stands with as low as 30% canopy closure

(Spencer et al. 1983). Proposed commercial thinning would reduce canopy closure in suitable marten habitat below 40 percent. For this reason, marten would be less likely to use commercially harvested foraging habitat following treatment due to canopy closure reductions. The largest trees in these stands would be retained; smaller overstory and understory trees would be removed. Commercial thinning in suitable habitat would promote old growth habitat features in the long term (large diameter trees, multiple layers, etc.), and improve the resiliency of the treated stand to fire, insects, and disease. As canopy closure increases, commercially thinned stands would grow into suitable habitat for the marten.

Table W-23. Acres of suitable pine marten habitat treated by treatment type.

Habitat Type	Alternative	Acres Treated	Treatment Type		
			Commercial Thinning	Non-Commercial Thinning	Mechanical Fuels
Reproductive	Alternative 2	92	81 (-12%)	3	8
	Alternative 3	85	74 (-11%)	3	8
	Alternative 4	91	81 (-12%)	3	7
Forage	Alternative 2	146	84 (-8%)	18	44
	Alternative 3	139	77 (-7%)	18	44
	Alternative 4	137	84 (-8%)	18	35

Non-commercial thinning would not affect the suitability of marten habitat. This activity would reduce understory vegetation and small diameter overstory vegetation (where the overstory is small diameter regenerating conifers). Large overstory trees would not be affected; conifers, shrubs, and slash in treated portions of stands and untreated islands of small diameter conifers would provide cover for this species post-thinning.

Habitat quality in mechanical fuels treatment units would be impacted by the proposed activities; however, habitat suitability for marten would be maintained in mechanical fuels units after treatment. The health and resilience of these stands to fire and other disturbance agents would improve in response to treatment; treated stands would provide suitable habitat in less time than would untreated habitats. Mechanical fuels treatment is not expected to appreciably reduce canopy closure in affected stands; relatively few green trees (typically diseased) will be removed in these units. Removal of a small number of green trees, especially those that are diseased and malformed would potentially reduce denning and resting sites for pine marten. The impact on pine marten habitat is expected to be minor. Maintenance of untreated islands within the mechanical fuels treatment area (totaling 10%), retention of a portion of spike top trees in proposed treatment units and maintaining moderate to high snag densities (with an emphasis on retaining larger snags and snags with high value to wildlife that are clumped where available) in excess of Forest Plan standards would provide for resting and denning habitats after harvest. Removal of downed woody material also has the potential to affect foraging habitat for this species. Maintenance of small islands of downed wood in units, rather than a uniform distribution of downed wood would maintain suitable subnivian habitat and hiding and resting cover within units. Research indicates that fuels reduction in pine marten habitat reduces habitat for prey and the abundance of prey following treatment (Bull and Blumton 1999). They also found that maintenance of untreated islands within fuels treatment units maintained high densities of prey and suitable subnivian structure for pine marten. Maintenance of untreated islands within the mechanical fuels treatment area (totaling 10%) would maintain high densities of downed wood and high quality prey habitat. Forest Plan standards for snag and downed wood would be met following treatment (see adjusted snag densities for the Wildcat Project). By providing these habitat features at the proposed densities and distribution, habitat for potential prey will be provided for. Although the proposed mechanical fuels treatment would impact the quality of suitable pine marten habitat in the short and mid term, in the long term, improved stand health would improve habitat quality.

Approximately 40 acres of suitable marten habitat lies within natural fuels reduction units. Low intensity underburning would have minor impacts on pine marten habitat. The timing and intensity of the proposed underburns would minimize the impact on downed wood and snags used by this species and its prey.

Temporary and system road construction would not adversely affect this species or its habitat. Temporary roads would be decommissioned following implementation. These roads would not be drivable. Temporary roads would revegetate in the mid and long term. Marten would readily cross these narrow openings in the forested canopy (Hargis and McCullough 1984). Because they would be narrow and revegetate in the mid and long term, temporary roads would not adversely impact this species or restrict their movement through or between suitable habitat patches in the analysis area.

Cumulative Effects

Past activities, actions, and events that have affected pine marten habitat include timber harvest, firewood cutting, insect and disease, and wildfire. Timber harvest has altered stand structure and composition, created openings in the forest canopy, and fragmented habitat. These harvested acres are in varying stages of recovery. Snags and downed wood (used for denning) were removed from harvest units or piled and burned in many cases. Firewood cutting has reduced the density of snags adjacent to open forest roads. Because marten are unlikely to den or rest in areas adjacent to open roads, the residual impact of this activity is relatively small. Insects and disease attacks in the northern portion of the analysis area have reduced canopy closure in many stands below the range preferred by this species. As a result, there is little suitable habitat in the northern portion of the project area. These stands are currently regenerating from these impacts and salvage harvest. The Monument Complex fire burned approximately 35 acres of suitable pine marten habitat at low and moderate intensity. Generally, burned habitat is still considered suitable because overstory mortality was minimal in affected stands. These past activities, actions, and events have combined to create the existing condition of suitable pine marten habitat in the analysis area.

Present and reasonably foreseeable future activities, actions, and events that affect the pine marten and/or its habitat include firewood cutting. Firewood cutting is having similar effects as those described in the past activities section.

When the expected effects of these alternatives are combined with the residual and expected effects of past, present, and future actions, activities, and events in the analysis area, there would be no adverse impact on the pine marten or its habitat. In the short and mid term, proposed treatments would reduce suitable habitat in the analysis area, contributing to past reductions. Although these habitats would not be considered suitable, marten, if present, would likely use these habitats as long as understory cover and snag and downed wood densities are relatively high. Mechanical fuels treatment would not convert suitable habitat to an unsuitable condition; although habitat quality would be reduced by dead wood removal in the short and mid term, the density and distribution of downed and standing dead wood in treatment units and untreated islands would maintain the suitability of these stands for the pine marten; improve the health of potential habitat; maintenance of all residual large diameter trees, connectivity habitat, large downed wood, and snag and downed wood densities that meet or exceed Forest Plan standards would make these stands desirable to the marten in the mid and long term.

Unique to Alternative 2

This alternative would have the same impacts as those described under the Common to All Action Alternatives section. Under this alternative there would be approximately 2.2 miles of new system road constructed in the northern portion of the analysis area (north of FS Road 21). New system road construction would create permanent linear openings in forested stands. Marten may be more vulnerable to avian and terrestrial predators in these areas. It is not expected that new system roads would be a barrier to daily or seasonal movements or dispersal or measurably increase vulnerability of marten to predation because research indicates that marten readily cross narrow openings (single lane gravel roads) while moving between habitat within their home range (Hargis and McCullough 1984). Research also indicates that avian predation is a minor mortality factor in northeast Oregon (Bull and Heater 2001). Proposed system roads would not adversely impact this species or restrict their movement through or between suitable habitat patches in the analysis area.

Cumulative Effects

The cumulative effects under this alternative would be the same as those described under the Common to All Action Alternatives section.

Proposed, Endangered, Threatened, and Sensitive Terrestrial Species

Current Condition

Federally “listed” species includes those identified as endangered, threatened, proposed, or candidate species by the Fish & Wildlife Service under the Endangered Species Act (USDI 1999 and USDI 2001). Sensitive species are those recognized by the Pacific Northwest Regional Forester as animal or plant species for which viability is a concern either a) because of significant current or predicted downward trend in population numbers or density, or b) because of significant current or predicted downward trends in habitat capability that would reduce a species existing distribution (USDA 2004 and USDA 2008). Sensitive species addressed on the Umatilla National Forest include those that have been documented (D - valid, recorded observation) or are suspected (S - based on available habitat to support breeding pairs/groups) to occur within or adjacent to the Umatilla National Forest boundary. Federally listed and sensitive species with a potential to occur in the project area are found in Table W-24. This determination is based on observation records, vegetative and wildlife species inventory and monitoring, published literature on the distribution and habitat utilization of wildlife species, and the experience and professional judgment of wildlife biologists on the Umatilla National Forest.

Table W-24: Endangered, Threatened, Proposed and Sensitive Species with the Potential to Occur within the Wildcat Project Area.

Species	U.S Fish & Wildlife Service	Regional Forester's Sensitive Animals	Umatilla NF Occurrence [1]
Gray wolf *Canis lupus*	Endangered		D
California wolverine *Gulo gulo*		Sensitive	D
Columbia spotted frog *Rana luteiventris*		Sensitive	D
Inland tailed frog *Ascaphus montanus*		Sensitive	D
Lewis’ woodpecker *Melanerpes lewis*		Sensitive	D
White-headed woodpecker *Picoides albolarvatus*		Sensitive	D

1 S = Suspected, likely to occur based on habitat availability to support breeding pairs/groups within Forest boundary; D = Documented, reliable, recorded observation within the Forest boundary.

California wolverine

Current Condition

The wolverine prefers high elevation, conifer forest types, with limited exposure to human interference (Ruggiero et al. 1994, Wolverine Foundations (TWF) 2007). Natal denning habitat includes open rocky slopes (talus or boulders) surrounded or adjacent to high elevation forested habitat that maintains a snow depth greater than 3 feet into March and April (Ruggiero et al. 1994, TWF 2007). The wolverine is an opportunistic scavenger, with large mammal carrion the primary food source year-round. While foraging, they generally avoid large open areas and tend to stay within forested habitat at mid and high elevations (>4,000') and typically travel 18-24 miles to forage (Ruggiero et al. 1994, TWF 2007). The analysis area does not contain subalpine forest types or open rocky slopes for natal denning habitat. Cold upland forest vegetation dominated by lodgepole pine and Englemann spruce is scattered through the central and northern portions of the analysis area. Moist and dry upland forest habitats also provide potential foraging habitat for this species in the analysis area. Table W-25 shows the existing condition of wolverine habitat in the analysis area.

Table W-25. Existing condition of suitable wolverine habitat in the Wildcat analysis area.

Habitat Type	Existing Habitat	
	Acres	Percent [1]
Natal Denning/Reproductive	0	0%
Forage	18,535	100%
TOTAL HABITAT	18,535	100%

1 Percent of total habitat in habitat type.

Snow tracking surveys conducted across the District, since 1991, for wolverine, fisher, American marten, and lynx have resulted in one suspected set of wolverine tracks (February 18, 1994) approximately 8 miles east of the analysis area along the 2105 Road. The quality of these tracks was poor (melted out and poor snow conditions), so positive identification was impossible. The wolverine has not been observed in the analysis area, and is not currently known to occur in the analysis area.

Direct and Indirect Effects

Alternative 1

There would be change in potential wolverine foraging and denning habitat in the analysis area in the short term. Potential natal denning habitat is not present in the analysis area. In the mid and long term, wolverine habitat would continue to develop multi-strata habitat features including dense canopy layers, understory regeneration and shrub cover, and high stand densities. Increased fuel loads resulting from insect and disease outbreaks would increase the risk of high severity wildfire in the analysis area. A fire of this type would alter stand structure and composition, converting suitable foraging habitat for the wolverine to an unsuitable condition, and fragmenting existing habitat.

Common to All Action Alternatives

This species is currently not known to occur in the analysis area. If a California wolverine were present in the project area during implementation, it would likely move elsewhere for the duration of implementation. These movements away from treatment activities would be temporary and short in duration.

Natal denning habitat would not be affected under any of the action alternatives because this habitat is not present in the analysis area. Suitable wolverine foraging habitat would be affected under all three action alternatives. The number of acres treated and treatment type varies by alternative; refer to Table W-26 for acres of treatment by alternative and treatment type. Commercial thinning in suitable habitat would generally not create openings that would be avoided by wolverine, if present. Commercial thinning would thin stands from below, reducing canopy closure, but leaving the largest trees in the stand. All treated stands would be fully stocked following treatment. Commercial thinning would not reduce downed wood used by potential wolverine prey. Commercially thinned stands would remain suitable foraging habitat after treatment because these units would largely maintain existing stand structure after harvest. Non-commercial thinning would not affect the quality or quantity of wolverine foraging habitat in the analysis area.

Table W-26. Acres of suitable California wolverine foraging habitat treated by treatment type.

Habitat Type	Alternative	Acres Treated	Treatment Type		
			Commercial Thinning	Non-Commercial Thinning	Mechanical Fuels
Forage	Alternative 2	4,891	2,085	840	1,966
	Alternative 3	4,457	1,743	748	1,966
	Alternative 4	4,146	2,046	840	1,260

Mechanical fuels treatments would have negligible impacts on canopy closure. Downed wood and snag densities would be reduced in these units, reducing cover and resting areas for potential wolverine prey. Forest Plan standards for snags and downed wood would be met in all mechanical fuels treatment units following treatment. By meeting Forest Plan standards for snags and downed wood, retaining islands of untreated habitat (totaling 10% of the mechanical fuels treatment area), retaining elevated snag densities, and maintenance of existing overstory structure and canopy closure in treatment units, habitat suitability for California wolverine would be maintained.

Landscape and activity fuels burning would occur within suitable wolverine habitat under all action alternatives. Approximately 9,478 acres of suitable habitat lies within natural fuels reduction units within the Wildcat analysis area. Landscape underburning and activity fuels burning would not affect overstory structure or composition in treated forested stands. Timing of burning would be planned to create a low intensity underburn on these acres. Consumption of small diameter downed wood, litter, and ground cover may impact potential prey for the wolverine. The mosaic nature of proposed landscape underburns would provide unburned habitat distributed throughout burn blocks; forage would not be impacted in these areas.

Temporary and new system roads would not impact this species or its habitat. Temporary roads would revegetate in the long term. New system roads would be closed to the public, therefore additional post-treatment road-related disturbance in the analysis area would be minimal.

Cumulative Effects

Past activities, actions, and events that affected California wolverine habitat include timber harvest, wildfire, road construction, and road closures associated with Access and Travel Management. Timber harvest occurred on approximately 8,167 acres since 1980; 22,036 acres have been harvested within the analysis area since reliable record keeping began. Clear cuts (stand initiation structural stages) are still apparent in some areas. This activity has resulted in fragmentation of habitat; openings created by these activities are generally avoided by foraging wolverine. Wildfire has also affected the structure and composition of potential wolverine habitat. High and moderate severity fire converted suitable wolverine foraging habitat to an unsuitable condition. These patches were generally not large continuous blocks; the Monument Complex Fire burned in a mosaic fashion through the lower and middle portions of the analysis area. Road construction associated with timber harvest has resulted in increased disturbance and fragmented suitable foraging habitat. Road closures associated with Access and Travel Management planning reduced disturbance in potential habitat. These past activities, actions, and events have combined to create the existing condition of wolverine habitat in the analysis area.

Ongoing and reasonably foreseeable future activities with a potential to impact wolverine or their habitat include snowmobile use. These activities can disturb wolverine when they occur in suitable foraging and denning habitat. Higher elevation areas with few roads would be the most likely impacted by this activity.

When the expected effects of these alternatives are combined with the residual and expected effects of past, present, and future actions, activities, and events in the analysis area, there would be no cumulative reduction in suitable habitat for this species. The proposed activities would generally not create openings that would be avoided by wolverine, if present in the analysis area. The action alternatives would not adversely impact the wolverine because suitable habitat would continue to be well distributed through the middle and upper portions of the analysis area, impacts to potential prey are expected to be minor, and connectivity of habitat would be maintained.

Determination and Rationale (Alternatives 2, 3, and 4)

The proposed activities under these alternatives would have No Impact on the California wolverine. The rationale for this determination is as follows:

The California wolverine is not known to occur in the analysis area. No potential natal denning habitat is present in the analysis area. For these reasons, there would be no direct impacts on this species.

Treatment activities would not reduce suitable foraging habitat under any of the action alternatives. Given the wide-ranging habits of the wolverine, thinning treatments would not alter movement patterns of the wolverine, if present.

Potential prey may be affected by proposed vegetative treatments and burning; however, untreated islands and unburned habitat would continue to provide an adequate prey base for this species if present in the analysis area.

Road related disturbance would increase during implementation; after implementation, decommissioning and closure of temporary and new system roads would reduce disturbance to near pre-treatment conditions.

Columbia Spotted Frog

Current Condition

The Columbia spotted frog frequents waters and associated vegetated (grassy) shorelines of ponds, springs, marshes, and slow-flowing streams and appears to prefer waters with a bottom layer of dead and decaying vegetation (NatureServe Explorer 2007, Csuti et al. 1997, Corkran and Thoms 1996). They typically occur between 150 and 8,000 feet in elevation (Corkran and Thoms 1996). Spotted frogs breed in the spring in shallow water at pond edges, stream margins, and in inundated floodplain areas (Corkran and Thoms 1996). Springs may be used as over-wintering sites for local populations of spotted frogs.

There have been no observations of the Columbia spotted frog in the analysis area. Due to access issues in the northern portion of the analysis area, this area was not surveyed during intensive presence/absence surveys (2006) on the Heppner Ranger District. Spotted frogs were found in two adjacent subwatersheds. Potential habitat is present in the analysis area. Because suitable habitat is present in the northern portion of the analysis area and a population is present in the adjacent subwatershed, the Columbia spotted frog is assumed to be present in the analysis area. Larger streams (Skookum, Swale, Alder, and Dry Swale Creeks) would likely be used by adults during the summer. Perennial stock ponds in the analysis area would be considered suitable breeding habitat for the Columbia spotted frog. Marshy areas along these streams could be used for breeding during the spring.

Direct and Indirect Effects

Alternative 1

In the short term, the quality and extent of Columbia spotted frog habitat would not change. In the mid and long term, continued recovery of riparian habitat would improve habitat quality for this species. Riparian areas would continue to recover from past disturbances, resulting in increased riparian shading (overstory and shrubs) along streams and pond edges. In the long term, the risk of high severity wildfire would also increase due to continued multi-strata development and increasing fuel loads. A wildfire of this type would consume riparian vegetation used by the spotted frog for cover. A fire of this type would not alter the suitability of potential breeding habitat (ponds) in the analysis area. These habitats are generally in openings where fire effects would be minimal.

Alternative 2, 3, and 4

All commercial thinning and mechanical fuels treatment activities would occur outside of Riparian Habitat Conservation Areas (RHCAs) under all of the action alternatives; therefore, there would be no direct effects on this species or potentially occupied habitat under any of the alternatives for these activities. The exception is commercial thinning in an aspen stand associated with Unit 77 which would occur in the RHCA; however, this stream is intermittent and would not be considered breeding habitat for the spotted frog. Non-commercial thinning within RHCAs would not impact habitat quality or individual spotted frogs; RHCAs (class IV stream channels) that would be treated would not be considered suitable habitat for this species. There is also a potential that sediment could reach streams as a result of the proposed vegetative treatment activities. Breeding habitat and developing tadpoles would not be affected by introduction of sediment into streams due to the small amount of sediment that is expected to enter these habitats. Ponds (potential breeding habitat) and springs (overwintering habitat) would be buffered from treatment under all action alternatives, so there would be no effect on these habitats. Pumping water from ponds for dust abatement has the potential to affect developing tadpoles and froglets by sucking them into pumps or impinging them on screens. National Marine Fisheries Service approved fish screens would be use at all water sources; these screens would eliminate the potential for direct mortality of tadpoles and froglets at these sites.

Proposed underburning and activities fuels treatment activities would not directly affect spotted frogs because burns would be slow moving, low-intensity fires that would back into riparian areas. Due to the low-intensity nature of proposed burning, there would be no adverse impacts on riparian habitats or streams used by this species; they would largely be untouched by this activity.

Use of the existing road system would not affect the spotted frog or potential habitat. Decommissioning of 2.4 miles of closed system roads adjacent to East Fork Alder Creek has the potential to affect this species. Generally, the proposed activities would not impact adult spotted frogs; they are able to move away from disturbance. The majority of proposed work areas are along non-breeding habitat. Removal of stream crossing structures has the potential to cause direct mortality of developing tadpoles. Direct mortality of juvenile spotted frogs would be restricted to an occasional individual. Sediment delivery to streams associated with these activities would not impact this species or habitat quality.

Cumulative Effects

Past activities that affected potential spotted frog habitat include cattle grazing, timber harvest, aspen restoration, and gravel pit/pond construction. Portions of 2 grazing allotments are included in the analysis area. Past cattle grazing affected potential habitat by altering the structure and composition of riparian communities. Riparian habitat quality was adversely impacted by historic grazing. Grazed habitats are currently recovering from past overgrazing. Past cattle grazing also created potential breeding habitat through the creation of water sources (ponds) where they previously did not exist. Past timber harvest occurred within and adjacent to riparian habitat in the allotment. Without regard to treatment type or year, there have been 22,036 acres of timber harvest in the analysis area. These activities resulted in disturbance to riparian habitats, a reduction in stream shading, and reduced habitat quality. Rock pit ponds created by road construction associated with timber harvest increased available habitat for the spotted frog in upland areas. Aspen restoration activities (fencing, planting, etc.) have improved riparian habitat condition. These past activities have combined to create the existing condition of potential spotted frog habitat in the analysis area.

Present activities in the allotment include livestock grazing and aspen restoration. Current cattle grazing is occurring at relatively low stocking levels within the analysis area, when compared to historical grazing. Cattle grazing is not adversely affecting potential spotted frog habitat in the analysis area. Direct impacts to spotted frogs are considered negligible. Aspen restoration activities will improve riparian habitat condition in the future.

Reasonably foreseeable future activities in the allotment include cattle grazing, aspen restoration, and maintenance of water sources. Future cattle grazing and aspen treatments are expected to have the same effects as those described above. Maintenance of water sources has the potential to affect breeding sites and cause mortality of developing tadpoles and froglets. These effects would not persist beyond the year in which pond cleaning occurs.

When the expected effects of this alternative are combined with the residual and expected effects of past, present, and future actions, activities, and events in the analysis area, there would be no adverse impact on potential spotted frog habitat or populations within the analysis area. The level of impact under each of the Action Alternatives is expected to be the same; effects of riparian road decommissioning would be minor.

Determination and Rationale (All Action Alternatives)

Alternatives 2, 3, and 4 may impact individuals, but are not likely to contribute to a trend towards federal listing or cause a loss of viability to the population or species. The rationale for this determination is as follows:

The spotted frog is not currently known to occur in the analysis area; it is assumed present based on the presence of suitable habitat and the proximity of individuals in adjacent drainages.

All commercial thinning and mechanical fuels treatment activities would occur outside of perennial Riparian Habitat Conservation Areas.

Ponds and springs would be buffered from treatment; breeding and overwintering habitat in these areas would not be affected by the proposed activities.

Pumping of water from streams and ponds potentially used for breeding would not impact individuals; screens would eliminate the possibility of direct mortality of developing tadpoles and froglets.

Road decommissioning in and adjacent to suitable habitat has the potential to impact developing tadpoles. Individuals could be crushed or injured by culvert removal activities and decommissioning of the roadbed.

Although the proposed activities may impact individual spotted frogs, impacts would be short in duration.

Inland Tailed Frog

Current Condition

The tailed frog differs from other frogs found on or adjacent to the Umatilla National Forest by selecting cold, high gradient, boulder and cobble dominated streams for breeding. Streams with dense overstory shade are preferred. Froglets and adults are closely associated with streams, often hiding in gravel and cobble substrates. Tadpoles cling to boulders and cobbles; full development of this species requires as many as 5 years to complete.

This species has not been observed in the analysis area. It has been observed approximately 5 miles east of the analysis area. There is a potential that this species is present in the analysis area. Portions of upper Skookum Creek, upper Alder Creek, and East Fork Alder Creek may provide suitable habitat for this species.

Alternative 1

In the short term, the quality and extent of tailed frog habitat would not change. In the mid and long term, continued recovery of riparian habitat would improve habitat quality for this species. Riparian areas would continue to recover from past disturbances (primarily bug kill and past harvest), resulting in increased riparian shading (overstory and shrubs) along streams. In the long term, the risk of high severity wildfire in potential habitat areas would also increase due to continued multi-strata development and increased fuel loads. A wildfire of this type would consume riparian vegetation used by the tailed frog for cover; it would be less likely to occur in analysis area following an event like this.

Alternative 2, 3, and 4

All commercial and non-commercial thinning activities would occur outside of Riparian Habitat Conservation Areas (RHCAs) under all of the action alternatives; therefore, there would be no direct effects on this species or potentially occupied habitat under any of the action alternatives. The exception is commercial thinning in an aspen stand associated with Unit 77 that would occur in the RHCA; however, this stream is unsuitable habitat for the tailed frog. Timber harvest, activity fuels treatment, non-commercial thinning, and road reconstruction/construction activities have the potential to introduce small amounts of sediment to potential habitat; the amount of sediment is expected to be negligible and would not impact potential habitat quality for the tailed frog.

Road decommissioning has a potential to impact habitat for this species. Road decommissioning would result in short term increases in sediment delivery to streams where culverts are removed. Habitat quality on East Fork Alder Creek and a tributary to this stream may be reduced by proposed road decommissioning due to sediment that would increase substrate embeddedness in the short term. Deposited sediment would be transported downstream in the next high water (spring), eliminating impacts to interstitial spaces potentially used by developing tadpoles.

Pumping water from potential habitat would be unlikely given the location of potential habitat. However, if it were to occur, it would have no affect on developing tadpoles or froglets. Screens developed to eliminate the impingement of fish in pumps would be used at all water sources used during implementation.

Cumulative Effects

Past activities that affected potential tailed frog habitat include cattle grazing and timber harvest. Portions of 2 grazing allotments are included in the analysis area. Past cattle grazing affected potential habitat by altering the structure and composition of riparian communities. The quality of riparian shrub habitat (cover for tailed frogs) was adversely impacted by historic grazing. Grazed habitats are currently recovering from past overgrazing. Past timber harvest occurred within and adjacent to riparian habitat in the allotment. Without regard to treatment type or year, there have been 22,036 acres of timber harvest in the analysis area. These activities resulted in disturbance to riparian habitats, a reduction in stream shading, and reduced habitat quality. These past activities have combined to create the existing condition of potential tailed frog habitat in the analysis area.

There are no ongoing or reasonably foreseeable future activities in the analysis area with a potential to impact potential habitat for this species.

When the expected effects of this alternative are combined with the residual and expected effects of past, present, and future actions, activities, and events in the analysis area, there would be no adverse impact on potential tailed frog habitat within the analysis area. The quality of potential habitat would be reduced in the same manner under all three action alternatives. Expected impacts to potential habitat would occur in the short term and be temporary.

Determination and Rationale (All Action Alternatives)

Alternatives 2, 3, and 4 may impact individuals, but are not likely to contribute to a trend towards federal listing or cause a loss of viability to the population or species. The rationale for this determination is as follows:

The tailed frog is not currently known to occur in the analysis area; habitat within the analysis area is marginally suitable.

All commercial thinning and mechanical fuels treatment activities would occur outside of RHCAs. Commercial thinning in aspen stands would not occur in potential habitat for this species.

Pumping of water from streams potentially used for breeding would not impact individuals; screens would eliminate the possibility of direct mortality of developing tadpoles and froglets.

Road decommissioning adjacent to suitable habitat has the potential to introduce sediment that would increase substrate embeddedness in potential habitat. This impact would be short in duration (while culverts are removed) and temporary. High runoff would likely remove sediment deposited on the stream bottom in the spring following decommissioning.

White-headed Woodpecker

Current Condition

The white-headed woodpecker is listed as a Region 6 Sensitive Species. It is also a Management Indicator Species in the Umatilla National Forest Land and Resource Management Plan (USDA 1990). The white-headed woodpecker differs from many of the other primary cavity excavators identified as MIS in the Forest Plan in its near exclusive selection of mature, single-stratum ponderosa pine dominated habitats. This species relies almost exclusively upon the seeds from large ponderosa pine cones for its foraging needs. This species will also utilize insects that are gleaned off ponderosa pine trees. Large ponderosa pine snags are utilized for nesting purposes. Because the white-headed woodpecker has a limited need and use of snags as foraging areas, the species snag requirements are less than those required by other primary cavity excavators such as the Pileated, downy, and hairy woodpeckers. Interior Columbia Basin Ecosystem Management Project (Wisdom et al. 2000) indicates that basin-wide, >50% of watersheds have strong negative declines in the availability of source habitats (old growth ponderosa pine, aspen/cottonwood/willow, large diameter ponderosa pine snags) for this species.

The white-headed woodpecker is present on the Heppner Ranger District. Due to fire suppression in dry upland forest habitats, many areas that historically supported open stands of large diameter ponderosa pine now support mixed ponderosa pine, Douglas-fir, grand fir, and larch stands; they no longer provide suitable habitat for the white-headed woodpecker. Currently, there are approximately 134 acres of old forest single-stratum ponderosa pine in the analysis area; this would be considered suitable habitat for the white-headed woodpecker. An additional 3,364 acres of old forest multi-strata ponderosa pine is present in the analysis area. These acres would be considered potentially suitable habitat for the white-headed woodpecker; some level of vegetative treatment would be required to return these multi-strata stands to a suitable condition for the white-headed woodpecker.

Alternative 1

In the short term, there would be no change in existing potential habitat for this species. In the mid and long term, shade tolerant tree species would continue to encroach into historically open ponderosa pine habitats. The composition of these stands would change; a higher proportion of shade tolerant tree species would be present in these stands. Invading tree species would compete with ponderosa pine for resources. Ultimately, large diameter ponderosa pine trees and snags would be less common, reducing habitat quality for the white-headed woodpecker.

Alternatives 2, 3, and 4

Generally, the effects associated with each of the action alternatives on the white-headed woodpecker and its habitat would be the same; only the extent, or the number of acres treated would vary between alternatives. Under all of the action alternatives, suitable and capable white-headed woodpecker habitat would be treated. Refer to Table W-27 for acres of habitat treated by habitat type and treatment type. The quality of potential white-headed woodpecker habitat would be improved in the mid and long term through commercial thinning in dry upland forest habitat. Tree species uncharacteristic of old forest single-stratum ponderosa pine habitats would be targeted for removal. Ponderosa pine and western larch, and the largest trees in these stands would be favored for retention. Reduced stand densities would improve stand health and stimulate growth in residual trees; growth rates would increase in thinned stands. Under all three action alternatives, suitable habitat would increase in the analysis area. In the short term, treatment activities (disturbance) and felling of hazard trees (potential nest substrates) could impact potential habitat for this species. Treatment would not convert suitable habitat to an unsuitable condition.

Table W-27. Acres of white headed woodpecker habitat treated by habitat type and treatment type.

Habitat Type	Alternative	Acres Treated	Treatment Type (acres)		
			Commercial Thinning	Non-Commercial Thinning	Mechanical Fuels
Potentially Suitable Habitat	Alternative 2	578	320	39	219
	Alternative 3	538	280	39	219
	Alternative 4	455	321	39	95

Burning also has the potential to reduce potential nesting habitat through the consumption of snags. Fall burning would have a greater risk of snag consumption than would spring burning. Burning would have minor impacts on snags under all three action alternatives due to the timing and season of burning; fuel moisture and high humidity would combine to create low intensity ground fires. The most acres of burning would occur under Alternatives 2 and 4.

Aspen restoration activities in proposed units 77 and 82 would impact capable habitat that is currently in an old forest multi-strata condition dominated by ponderosa pine. Proposed treatment in this stand would remove a portion of the competing conifers from approximately 5 acres of declining aspen, including trees over 21 inches dbh. A Forest Plan amendment would be required to permit this activity. These stands would be changed from an old forest multi-strata condition to an old forest single-stratum condition by the proposed treatment activities. These stands would be considered suitable habitat for the white-headed woodpecker after treatment.

Cumulative Effects

Past activities, actions, and events that affected the white-headed woodpecker and its habitat include timber harvest and fire suppression. Past timber harvest targeted large diameter open-grown (single-strata) ponderosa pine that this species is dependent on for foraging, reducing the quality and quantity of habitat for this species. Harvest also impacted large diameter ponderosa pine snags used for nesting by this species, reducing potential habitat. Fire suppression has allowed for the encroachment of fire-intolerant conifer species into historically open ponderosa pine stands. The composition and structure of these stands has changed, reducing the quality of these stands for the white-headed woodpecker. These activities, actions, and events have combined to create the existing condition of white-headed woodpecker habitat in the analysis area.

Ongoing (present) and reasonably foreseeable future activities in the analysis area that affect the white-headed woodpecker or its habitat include fire suppression. This activity is having the same effects as those described previously.

When the effects of these alternatives are combined with the residual and expected effects of past, present, and future activities in the analysis area, there would be no adverse impact on the white-headed woodpecker. The proposed activities under all three Action Alternatives would have a beneficial effect on capable white-headed woodpecker habitat in the mid and long term; all large diameter trees would be retained in conventional commercial harvest units (non-aspen restoration units). Removal of large diameter ponderosa pine on 4 acres of capable habitat to restore aspen habitat quality would contribute to past reductions in large diameter trees. Due to the time required to produce trees of this size, their removal, even on a few acres would reduce suitable habitat for this species. Large legacy trees (those near the maximum limit for age and diameter) have been found to contribute to species diversity and richness, support significantly higher bird densities, and may aid in providing connectivity between distant stands of late and old structure habitat.

Common to Alternatives 2 and 4

Under these alternatives, suitable habitat for the white-headed woodpecker would increase approximately 393 acres. HRV analysis indicates that dry forest old forest single-stratum habitat would increase from 4 to 6 percent in response to treatment.

Cumulative Effects

Would be the same as effects described under Common to Alternative 2, 3, and 4.

Alternatives 3

Under this alternative, suitable habitat for the white-headed woodpecker would increase approximately 342 acres. HRV analysis indicates that dry forest old forest single-stratum habitat would increase from 4 to 6 percent in response to treatment.

Cumulative Effects

Would be the same as effects described under Common to Alternative 2, 3, and 4.

Determination and Rationale (All Action Alternatives)

The proposed activities under all of the action alternatives (Alternatives 2, 3, and 4) would have no impact on the white-headed woodpecker. The rationale for this determination is as follows:

The white-headed woodpecker is present in the analysis area; it has been observed in the southern portion of the analysis area.

Treatment elsewhere in capable habitat would have short term impacts on snags and green trees; in the long term, habitat quality would improve through the proposed activities. Growth would be stimulated in residual trees; stand structure and composition would emulate what historically occurred in dry forest habitat. Suitable habitat would increase in response to treatment; between 342 and 393 acres of suitable habitat would be produced under the Wildcat Project.

Removal of large diameter (greater than 21 inches dbh) ponderosa pine would occur on approximately 5 acres to improve the health of remnant aspen stands. These stands would be changed to a single stratum old forest condition by treatment activities, increasing the amount of suitable habitat in the analysis area.

Burning would have a minor impact on snags and overstory vegetation used for nesting, roosting, and perching.

Lewis' Woodpecker

Current Condition

The Lewis' woodpecker is listed as a Region 6 Sensitive Species. It is also a Management Indicator Species (MIS) on the Umatilla National Forest. The Lewis' woodpecker is typically associated with open ponderosa pine woodland habitat near water. They have also been associated with stand replacement fires (5 to 10 years post-fire); the Lewis' woodpecker is an aerial insectivore that uses dominant snags in burned areas for perching. This species is seasonally present in the lower elevations of the analysis area. This species utilizes large diameter dead and dying trees, typically near streams, for nesting. This species typically nests in pre-existing cavities, but will also excavate cavities.

The Interior Columbia Basin Ecosystem Management Project (Wisdom et al. 2000) indicates 85% of the watersheds throughout the basin show a strong negative trend in source habitats (old forest single-stratum structural stages of ponderosa pine and multi-strata stages of Douglas-fir and western larch, and riparian cottonwood woodlands). In the Blue Mountains, 72% of watersheds have experienced >60% reduction in source habitats[4] when compared to historical conditions.

The Lewis' woodpecker has been observed in the analysis area (FAUNA; District wildlife database). Currently, there are approximately 5,334 acres of suitable Lewis' woodpecker habitat in the analysis area. That portion of the Monument Complex Fire that lies within the analysis area will provide excellent habitat for this species as snags fall in the future.

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[4] Source habitats include old growth ponderosa pine, aspen/cottonwood/willow, and large diameter ponderosa pine snags.

Direct and Indirect Effects

Alternative 1

In the short term, there would be no change in existing Lewis' woodpecker habitat under this alternative. In the mid and long term, shade tolerant (fire intolerant) tree species would continue to encroach into historically open ponderosa pine habitats. The composition of these stands would change; a higher proportion of shade tolerant tree species would be present in these stands. Increased stand densities would increase competition for resources and stress, making stands more susceptible to insects and disease. Fuel loads would increase due to increased mortality. The risk of high severity wildfire would increase accordingly. Post fire habitats would be utilized by this species for both foraging and nesting.

Alternative 2, 3, and 4

Although treatment effects are the same, the extent (acres of treatment) varies by alternative. Refer to Table W-28 for acres of Lewis' woodpecker habitat treated by treatment type and alternative. Treatment would not convert suitable habitat to an unsuitable condition. Treatment activities would reduce stand densities in treatment units, shifting these stands to a more appropriate dry forest composition and structure. Reduced stand densities would improve stand health and stimulate growth in residual trees; growth rates would increase in thinned stands. Harvest would favor the retention of ponderosa pine, a preferred snag species used for nesting by the Lewis' woodpecker. Reduced canopy closure would also benefit the Lewis' woodpecker by providing greater opportunities for aerial foraging.

Table W-28. Acres of Lewis' woodpecker habitat treated by treatment type.

Habitat Type	Alternative	Acres Treated	Treatment Type (acres)		
			Commercial Thinning	Non-Commercial Thinning	Mechanical Fuels
Suitable Habitat	Alternative 2	809	428	107	274
	Alternative 3	739	358	107	274
	Alternative 4	646	428	107	111

The Lewis' woodpecker prefers snags in later stages of decay for nesting. It is expected that some snags would be felled within treatment units to allow for safety; snags in later stages of decay would be more likely to be felled than solid snags. As a result, potential nesting habitat would be lost in the short and mid term due to treatment activities; however, in the long term, potential habitat (foraging and nesting) quality would be improved. It is not expected that this short term reduction in nesting habitat would adversely impact the Lewis' woodpecker population in the analysis area. Burning also has the potential to reduce potential nesting habitat through the consumption of snags. Fall burning would have a greater risk of snag consumption than would spring burning. Burning would have minor impacts on snags under all three action alternatives due to the timing and season of burning; fuel moisture and high humidity would combine to create low intensity ground fires. The most acres of burning would occur under Alternatives 2 and 4.

Aspen restoration activities that would remove large diameter ponderosa pine and Douglas-fir would impact habitat for this species. Removal of large diameter trees from units 77 and 82 would reduce potential nesting and foraging habitat on approximately 5 acres within the analysis area. These acres would be classified as suitable habitat following treatment. Due to the limited size of the affected stand, it is not expected that the Lewis' woodpecker would be negatively impacted.

Cumulative Effects

Past activities, actions, and events that affected the Lewis' woodpecker and its habitat include timber harvest, fire suppression, and wildfire. Past timber harvest targeted large diameter open-grown (single-strata) ponderosa pine and Douglas-fir that this species is dependent on for foraging and nesting. Harvest also impacted large diameter snags, reducing potential nesting habitat. Fire suppression has allowed for the encroachment of fire-intolerant conifer species into historically open ponderosa pine stands. The composition and structure of these stands has changed, reducing the quality of these stands for the Lewis' woodpecker. Douglas-fir stands were also affected by fire suppression; shade tolerant species have invaded these habitats, as well, making them more susceptible to high severity fire due to high fuel loading. That portion of the Monument Complex Fire that lies within the analysis area will provide excellent habitat for this species as snags fall in the future. From several thousand up to 10,000 acres of suitable post-fire habitat was created by this event. These habitats are considered a source habitat for this species. These activities, actions, and events have combined to create the existing condition of Lewis' woodpecker habitat in the analysis area.

Ongoing (present) activities in the analysis area that are affecting the Lewis' woodpecker or its habitat include fire suppression. This activity is having the same effects as those described previously.

When the effects of these alternatives are combined with the residual and expected effects of past, present, and future activities in the analysis area, there would be no adverse impact on the Lewis' woodpecker or its habitat. Although habitat quality may be reduced in the short term due to harvest activities and felling of hazard trees potentially used for nesting and roosting, all of the action alternatives would positively impact habitat for this species in the mid and long term, reversing past habitat reduction. All trees ≥ 21 inches dbh would be retained in conventional commercial harvest units (non-aspen restoration units). Removal of large diameter ponderosa pine and Douglas-fir on 3 acres of suitable habitat to restore aspen habitat quality would contribute to past reductions in large diameter trees and a general reduction in suitable habitat for this species. Large legacy trees (those near the maximum limit for age and diameter) have been found to contribute to species diversity and richness, support significantly higher bird densities, and may aid in providing connectivity between distant stands of late and old structure habitat.

Determination and Rationale (All Action Alternatives)

These alternatives may impact individuals or habitat, but are not likely to contribute to a trend towards federal listing or cause a loss of viability to the population or species. The rationale for this determination is as follows:

The Lewis' woodpecker is present in the analysis area; it has been observed in the southern portion of the analysis area.

The proposed activities have the potential to impact this species and its habitat in the short term; in the long term, habitat quality would improve through the proposed activities. Growth would be stimulated in residual trees; stand structure and composition would emulate what historically occurred in dry forest habitat in the long term.

Removal of large diameter trees in aspen stands would impact suitable and capable habitat in the short term. This accounts for well under one percent of the suitable Lewis' woodpecker habitat in the analysis area.

Burning would have a minor impact on snags and overstory vegetation used for nesting, roosting, and perching.

Gray Wolf

Current Condition

Habitat preference for the gray wolf is prey-dependent rather than cover-dependent. The wolf is a habitat generalist inhabiting a variety of plant communities, typically containing a mix of forested and open areas with a variety of topographic features (Verts and Carraway 1998). Wolves are strongly territorial, with territory size and location strongly related to prey abundance. Wolves prey mainly on large ungulates, such as deer and elk, and to a lesser extent on small mammals. The gray wolf prefers areas with few roads, generally avoiding areas with an open road density greater than one mile per square mile (NatureServe Explorer 2007). Natal dens typically occur as underground burrows, but can also be caves or other types of shelter. Rendezvous sites are generally open areas. A radio-collared gray wolf dispersed to the Blue Mountains from Idaho in March 1999, and was captured approximately 30 miles southeast of the analysis area and relocated to Idaho (Cody 1999). In October 2000, a wolf was killed along US Highway 395, north of Ukiah. Also in 2000, a gray wolf was struck along Interstate 84 west of Baker City, Oregon. The Idaho wolf population has been increasing steadily, and dispersal into the Blue Mountains is expected to continue in the future.

Numerous unconfirmed sightings of gray wolves have occurred on the District in the past several years. Habitat for this species occurs throughout the analysis area; the highest quality habitat is located north of Forest Road 21 where road densities are lowest and several roadless areas are present. Potential prey is readily available in this portion of the District. This species is not currently known to occur in the analysis area or District.

Direct and Indirect Effects

Alternative 1

The quality of gray wolf habitat is not expected to change in the short term. In the mid and long term, open road densities are not expected to change. Big game populations (prey) are also expected to be relatively stable in the mid and long term (at or slightly below state management objectives). In the long term, openings (meadows) potentially used for denning or as rendezvous sites may experience some conifer encroachment over time; however, the size or number of these openings would not be significantly reduced.

Alternative 2, 3, and 4

Vegetative treatments and fuels treatments (activity fuels burning/mechanical treatment) would not directly affect the gray wolf because this species is not known to occur in the analysis area or on the District. Dens and rendezvous sites would also not be affected by the proposed activities because neither of these habitats has been identified on the District. Wolves are habitat generalists; vegetative treatment and burning of potential habitat would not directly impact habitat suitability or the quality of habitat for this species.

Use of closed roads during treatment activities would temporarily increase road-related disturbance in the analysis area. Refer to Table W-29 for a summary of transportation-related activities for the three action alternatives.

Table W-29. Road-related activities under the Wildcat Project.

Alternative	Closed Roads Used (miles)	New System Road Construction (miles)	Temporary Road Construction (miles)
Alternative 2	42	2.2	3.6
Alternative 3	42	0	5.3
Alternative 4	42	0	2.4

All closed roads used during treatment activities would be restricted to harvest and administrative use and would be closed again after activities are completed. There would be no change in existing open road densities under any of the Action Alternatives. Temporary road construction would occur under all three action alternatives. Temporary roads would generally follow existing openings to access treatment units. These roads would be decommissioned following completion of treatment activities. These roads would not be drivable after decommissioning; they would not impact existing road densities in the analysis area.

Proposed vegetative treatments and fuels treatments would affect big game (prey) habitat under all of the Action Alternatives. Refer to the Rocky Mountain Elk section of this report for a comprehensive discussion of the effects of this alternative on elk. HEI would continue to be below Forest Plan standards in the Monument winter range, but meet standards in all other management areas within the analysis area, indicating that high quality habitat for potential prey is present in the analysis area. Treatment activities would cause short-term disturbance on elk in the analysis area during implementation; it is not expected that elk populations or their distribution within the analysis area will be measurably affected by vegetative and fuels treatment activities proposed under any of the action alternatives.

Landscape underburning would improve forage conditions (quantity and quality) within and outside treatment units, improving forage for potential prey. Reductions in canopy closure resulting from commercial and non-commercial thinning would increase the production of grasses, forbs, and shrubs improving habitat for potential prey.

If a wolf were to pass through the area during implementation, it would avoid disturbance, selecting habitats where disturbance is minimal. Avoidance of proposed vegetative treatment units and roads would last only while implementation occurs. After these activities cease, the gray wolf would return to the area.

Cumulative Effects

Past activities and events in the analysis area (and the entire Monument winter range) that affected potential prey resources and the level of human disturbance in the analysis area include timber harvest (including the Rimrock and Bologna Basin projects), road construction, road closures (Access and Travel Management), and private land harvest. Timber harvest has affected forest structure and composition, reducing the amount of cover habitat in the analysis area. Conversely, the amount of foraging habitat for big game has increased in response to past harvest. Road construction associated with timber harvest increased road densities and disturbance within the analysis area, making the area less suitable for gray wolf. More recently, road closures associated with access and travel management activities on the south end of the Umatilla National Forest have reduced road densities. Existing road densities in the northern portion of the analysis area are considered good based on the preferences of the gray wolf for less-roaded areas. An unknown amount of harvest activity has occurred in the past adjacent to the Monument, Bone Point, and Desolation winter ranges. Private land harvesting has fragmented habitat, creating foraging habitat for big game where cover habitat once existed. Past activities have resulted in the current condition of gray wolf habitat in the analysis area (and the entire Monument winter range).

There are no ongoing or reasonably foreseeable future activities, actions, and events with a potential to affect wolf habitat or potential prey resources in the analysis area.

When the expected effects of these alternatives are combined with the residual and expected effects of past, present, and future actions, activities, and events in the analysis area, there would be a cumulative increase in disturbance associated with roads. Disturbance associated with temporary roads would be temporary, and last only while implementation is occurring. The proposed activities under all three action alternatives would not increase open road densities or reduce the size of unroaded areas in the analysis area. Treatment activities would maintain a high level of big game habitat effectiveness in the analysis area.

Unique to Alternative 2

The effects of this alternative would be similar to those described under the Common to All Action Alternatives section. Under this alternative, approximately 2.2 miles of new system road would be constructed along the ridge above East Fork Alder Creek. This road would be closed following completion of vegetative treatment activities. Due to the location of this road within an existing closure area, it is expected that these closures would be effective at eliminating non-permitted use. Occasional administrative use of the new system roads would result in disturbance in the spring, summer, and fall within a previously unroaded area. . A wolf passing through the area may move out of the area in response to disturbance associated with this road. The likelihood of a wolf moving into this area and setting up a territory is very unlikely.

Cumulative Effects

The cumulative effects of this alternative would be similar to those described under the Common to All Action Alternatives section. Occasional administrative use of new system roads would increase road-related disturbance where it previously did not occur. As a result, if a wolf passed through the vicinity of the new system roads while administrative use occurs, it would be less likely to linger in the area, and would move to areas with minimal or no disturbance.

Determination and Rationale (Alternatives 2, 3, and 4)

Under all of the action alternatives, there would be no effect on the gray wolf. The rationale for this determination is as follows:

The gray wolf is not currently known to occur in the analysis area or on the District.

No denning or rendezvous sites have been identified on the District; therefore, there would be no impact on these habitats.

Habitat suitability and quality for the gray wolf would not directly be impacted.

There would be no change in existing open road densities under any of the action alternatives. New system road construction under Alternative 2 would be closed after implementation; intermittent road-related disturbance associated with administrative use would occur in the future. If a wolf were to pass through during implementation or while this road is being used it would move elsewhere.

Habitat effectiveness for prey would meet or exceed Forest Plan standards in all management areas. The exception is the C3 management area; however, there would be no change in the existing cover levels or HEI under any of the proposed alternatives. An adequate prey base would be maintained within the analysis area to support potential gray wolf.

Species of Interest

These are species that are "of interest" to the public at the local or regional level, or were identified as a species of concern by the Fish and Wildlife Service. Generally species of interest or concern come from state threatened, endangered, and sensitive species lists. Occurrence determinations are based on observation records, vegetative and wildlife species inventory and monitoring, published literature on the distribution and habitat utilization of wildlife species, and the experience and professional judgment of wildlife biologists on the Umatilla National Forest. Many of these species are considered uncommon or their status is unknown in the Pacific Northwest. Table W-30 lists the species of interest that could occur, based on observations or the presence of potential habitat in the analysis area. Because there would be no treatment of suitable bighorn sheep habitat, there will be no further analysis of effects on this species.

Table W-30. Species of Interest in the Wildcat Analysis Area

Common Name	Scientific Name	Oregon Status (2008)
California bighorn sheep	*Ovis Canadensis californiana*	None
Northern goshawk	*Accipiter gentilis*	Sensitive-Critical
Olive-sided flycatcher	*Contopus cooperi*	Sensitive-Vulnerable
Long-eared myotis	*Myotis evotis*	Sensitive-Undetermined Status
Long-legged myotis	*Myotis volans*	Sensitive-Undetermined Status
Yuma myotis	*Myotis yumanensis*	None

Northern Goshawk

Current Condition

Preferred habitat for the goshawk consists of coniferous forests with a mosaic of structural stages. Nesting sites typically consist of a dense cluster of large trees, surrounded by a similar forest type with a more open overstory. The understory is relatively open and the nest site is generally situated within one-quarter mile of a stream or other water source. The best foraging habitat occurs in a mosaic of structural stages scattered across the landscape. Potential foraging and nesting habitat is present in the analysis area. Table W-31 shows suitable habitat currently available for the northern goshawk in the analysis area.

Table W-31. Suitable northern goshawk habitat in the Wildcat analysis area.

Northern Goshawk Habitat Type	Existing Habitat	
	Acres	Percent [1]
Reproductive	391	1%
Forage	27,666	99%
TOTAL HABITAT	28,057	100%

1 Percent of total habitat in habitat type.

There are approximately 391 acres of suitable nesting habitat and 27,666 acres of suitable foraging habitat in the analysis area (queried from GIS database). The analysis area provides a mosaic of structural stages, creating microhabitats for prey species. Recent research (Greenwald et al. 2005) indicates that goshawk tend to avoid young early seral stands and stands with less than 40% canopy closure. Queries of potential nesting and foraging habitat used 40% canopy closure as the lower extent for suitable habitat and excluded stand initiation structural stages from potential foraging habitat. The northern goshawk has been observed in the Wildcat analysis area (Heppner Ranger District Wildlife Database). During reconnaissance of the planning area, a goshawk nest was discovered in the south-central portion of the analysis area. This nest was located within a proposed treatment unit. This unit was dropped, and a 30 acre (34-acre) nest stand containing the highest quality nesting habitat adjacent to this nest was identified. A proposed post-fledgling area (PFA) was also identified; this PFA is composed of a mosaic of structural stages, in accordance with habitat parameters suggested by Reynolds et al. (1992). Surveys of suitable habitat in spring 2007 located one nest in the previously known territory, and one other adult northern goshawk. A nest was not found where the second goshawk was located, however, this bird showed territorial behavior indicative of a breeding bird with a nest nearby.

Direct and Indirect Effects

Alternative 1

Potential nesting and foraging habitat would remain unchanged in the short term. In the mid and long term, stands would continue to grow and develop multiple dense canopy layers. Young stands would develop large trees over time. Openings created by past harvest would fill in over time. The availability of nesting habitat would increase in the long term due to a greater abundance of large trees and dense multi-layered habitat, particularly in the northern portion of the analysis area. Stands affected by spruce budworm damage would grow into suitable nesting habitat in the long term. Foraging habitat would be reduced as the area grows denser and more homogenous, resulting in fewer microhabitats for prey species. The multi-layer condition would increase the susceptibility of stands to high-intensity wildfires and insect or disease outbreaks. A major disturbance on the landscape would change the composition and structure to an open shrubland/grassland with little or no tree cover. Suitable nesting and foraging habitat would be converted to an unsuitable condition by a fire of this extent and magnitude.

Common to All Action Alternatives

Vegetative treatment activities (commercial and non-commercial thinning and mechanical fuels treatment) would occur in potential goshawk nesting and foraging habitat under all of the action alternatives. Refer to Table W-32 for acres of treatment by habitat type (nesting and foraging) and treatment type.

Table W-32. Acres of northern goshawk habitat treated by habitat type and treatment type.

Habitat Type	Alternative	Acres Treated	Treatment Type (acres)		
			Commercial Thinning	Non-Commercial Thinning	Mechanical Fuels
Nesting	Alternative 2	48	47 (-12%)	1	0
	Alternative 3	45	44 (-11%)	1	0
	Alternative 4	48	47 (-12%)	1	0
Foraging	Alternative 2	5,219	2,163	946	2,110
	Alternative 3	4,782	1,818	855	2,110
	Alternative 4	4,425	2,124	946	1,355

The largest trees in treatment units would be retained in all proposed units. Treatment in general would reduce stand densities and overstory canopy closure. Goshawk prefer to nest in large trees in stands that have at least 50% canopy closure. Proposed commercial thinning would reduce canopy closure below 50% in treated stands. As a result, goshawk would be less likely to use commercially thinned reproductive habitat for nesting in the short and mid term. Growth of the residual stand in the mid and long term would improve the suitability of these treated stands; they would be classified as nesting habitat in the future.

Commercial thinning in suitable foraging habitat would also reduce canopy closure; however, goshawks prefer a mosaic of open, semi-open, and forested habitats for foraging. There would be no reduction in foraging habitat under any of the action alternatives. By reducing stand densities and understory vegetation (non-commercial thinning), goshawk may be better able to maneuver and hunt in these habitats.

Non-commercial thinning would reduce understory regeneration of conifers. This activity would make accessing young stands less difficult for goshawk. Non-commercial thinning would not change habitat suitability for the goshawk.

Mechanical fuels treatment would occur in stands affected by spruce budworm defoliation in the late 1980s. These stands are not currently considered suitable nesting habitat for the goshawk, therefore small reductions in canopy closure associated with these treatments would not impact the availability of nesting habitat. Fuels treatment would reduce high downed wood and snag densities; potential prey associated with these habitat features may be less abundant in these stands following treatment. Untreated areas within these units, riparian habitat, and units with elevated snag retention would provide well distributed habitat with prey abundance similar to pre-treatment stands. It is not expected that this reduction in potential prey will impact the goshawk; prey reductions would be compensated for by increased accessibility of foraging habitat through thinning. Mechanical fuels treatment would result in a healthy young stand that will grow into suitable nesting habitat in the long term. Nesting structures, including large diameter green trees, dead top and broken top green trees, and snags would be maintained in these units for goshawk and other birds of prey.

Activity fuels burning would not impact potential goshawk nesting or foraging habitat suitability. Potential prey may be reduced as a result of consumption of downed wood and brush (cover). Untreated areas and unburned patches within the underburn area (approximately 50% of the area) will continue to provide high quality prey habitat. Burning and Mechanical treatments are not expected to measurably impact prey species for the goshawk because untreated habitats would be available and well distributed through the analysis area, affected areas would meet Forest Plan standards for large wood that may contribute to habitat for prey, and landscape burning would burn at low intensity in a mosaic fashion.

Roads and road use would not impact the goshawk. Seasonal road use restrictions would be applied in any instance where a road used for haul has the potential to disturb nesting and brooding goshawk.

In the event that a northern goshawk nest is discovered in the project area during layout or implementation, treatments would be adjusted to meet the guidelines provided in the Forest Plan.

Cumulative Effects

Past activities and events in the watershed that affected northern goshawk habitat include timber harvest (33,639 acres) and private land harvest. Past harvest affected the structure and composition of forested habitats and the distribution of late and old structure stands in the analysis area. Past harvest reduced old forest structural stages and high overstory canopy closure desired for nesting. Harvest activities have created a patchwork of structural stages across the landscape, increasing foraging areas for goshawk. Private land harvest has been more intensive than those treatments on National Forest System (NFS) lands. Harvested private lands may be used for foraging; the vast majority of suitable nesting habitat is located on NFS lands within the watershed due to past private land harvest. The Monument Complex Fire affected lower and middle elevation habitats. Dense forest and large trees were consumed by the fire in some locations, primarily stream bottoms. Suitable habitat within the fire area is generally well connected to other suitable habitats due to the mosaic nature of the burn. Past activities have resulted in the current condition of goshawk habitat in the analysis area.

Currently, there are no ongoing or reasonably foreseeable future activities proposed in the analysis area that would affect or have the potential to affect the goshawk or its habitat.

When the effects of this alternative are combined with the residual and expected effects of past, present, and future activities in the analysis area, there would be a short term reduction in suitable nesting habitat within the analysis area. This reduction would add to past losses in nesting habitat resulting from harvest and insect and disease infestations. In the mid and long term, proposed treatment activities in the upper portion of the analysis area would improve habitat conditions for the northern goshawk. It is not expected that the proposed activities would adversely affect this species; these activities would contribute to the conservation of this species and the maintenance and development of resilient, healthy goshawk habitat in the analysis area.

Olive-sided Flycatcher

Current Condition

Preferred habitat for the flycatcher consists of coniferous forest associated with openings and edges near water (streams and wet areas) (Marshall et al. 2003). This includes burned areas with snags and scattered tall, live trees, riparian zones, edges of late and early-successional forests, and open or semi open forest stands with low canopy cover (Marshall et al. 2003). Tall, prominent trees and snags, which serve as foraging and singing perches, are a common feature of nesting habitat (Marshall et al. 2003). Preferred habitat for this species is present in the analysis area. Preferred habitat occurs in riparian corridors within the analysis area. The species has not been documented in the analysis area; it is presumed present because preferred habitat is present in the analysis area.

Direct and Indirect Effects

Alternative 1

In the short term, the quality of habitat for the olive-sided flycatcher would not change. In the mid and long term, riparian communities would continue to develop along existing successional pathways; canopy closure would increase, stands would develop large trees with multiple canopy layers, and riparian vegetation would continue to recover from past disturbance. High severity wildfire (resulting from increased fuel loading and changes in stand composition and structure) would create edge habitat and create large diameter snags potentially used by the flycatcher as perches.

Common to All Action Alternatives

The olive-sided flycatcher is not known to occur in the analysis area; therefore, there would be no direct effects on this species. In general, the effects expected under all of the action alternatives would be the same; the difference between individual alternatives (in terms of magnitude of effect) is the result of variable treatment acres under the action alternatives. Under all of the action alternatives, there would be no harvest activities in riparian corridors except in aspen stands. Commercial thinning would thin stands from below, retaining the largest trees in treatment units (those preferred for nesting). Thinning would decrease canopy closure, reduce stand density, and encourage the growth of understory vegetation, all of which are habitat attributes selected for by this species. It is unlikely that commercial thinning would negatively impact this species or suitable habitat.

Mechanical fuels treatment activities would have variable impacts on this species and its habitat. Based on the habitat preferences of this species, it appears that habitat would be created by proposed mechanical fuels treatment activities due to the preference of the olive-sided flycatcher for stands with low canopy closure and scattered large trees and snags. Research indicates that nesting success in human-created habitats is much lower than occurs in unharvested or recently burned stands (Altman in Marshall et al.

2003, Robertson and Hutto 2007). Habitat may persist in these stands following harvest; however, these habitats may represent an ecological trap where nest success is too low to maintain existing populations. Based on the expected impact to overstory vegetation and stand structure in these stands, it is unlikely that this would occur. Untreated portions of mechanical fuels treatment units, riparian corridors, and untreated stands will provide suitable habitat for this species. Breeding habitat would be well distributed in the analysis area following treatment.

Landscape burning would not be lit in riparian areas; fire would be allowed to back into these areas. If this were to occur, there would be no impact on potential olive-sided flycatcher habitat because underburning would be low intensity. High fuel moisture levels would make it very unlikely that riparian shrubs or overstory vegetation would be consumed by low intensity underburning.

Treatment of aspen within proposed thinning and harvest units would improve habitat quality in these remnant stands in the mid and long term. Removal of conifers, including some over 21 inches in diameter, may reduce nesting and perching habitat in the short term.

Cumulative Effects

Past activities, actions, and events that affected the olive-sided flycatcher included timber harvest, wildfire, and livestock grazing. Timber harvest affected the structure and composition of forested stands. Stand densities were reduced, and edge habitats created. Past harvest appears to have created habitat for this species. Harvest also impacted riparian habitats, altering habitat conditions for the olive-sided flycatcher. Habitat quality was reduced in these areas due to impacts on overstory and streamside vegetation. Past wildfire created edge habitats used extensively by this species. Research indicates that post-fire habitats are vital to the survival of this species. The Monument Complex Fire created ideal foraging habitat along and within the fire perimeter. Livestock grazing impacted potential habitat for this species by affecting the structure and composition of riparian communities along streams. In the past, the analysis area was grazed at high densities. These animals affected vegetation community structure and composition through repeated over-utilization of rangeland habitats. Riparian areas are continuing to recover from past overgrazing. These past activities, actions, and events have combined to create the existing condition of olive-sided flycatcher habitat in the analysis area.

There are no present or future activities that are affecting or have the potential to affect olive-sided flycatcher habitat in the analysis area.

When the expected effects of these alternatives are combined with the residual and expected effects of past, present, and future activities, events, and actions, there would be no cumulative reduction in suitable habitat for this species. Proposed treatment activities would not create openings or other features that would act as ecological traps to this species. Treated stands would continue to provide suitable habitat for this species following treatment. Agents (fire, insects, disease) that create edge habitat in forested stands would be reduced following treatment; untreated portions of the analysis area within the mechanical fuels treatment area and along riparian corridors would continue to contribute to the presence of these agents in the future.

Bats of “Interest”

Current Condition

Bats associated with cave or cave like dwellings (mines, buildings, etc.) for hibernation or roosting (maternity or day/night roost) are not included in this assessment because the analysis area does not provide these habitat features. Available habitat for bats in the analysis area includes dry upland and moist upland forest types that may be associated with water. Forest dwelling bats often use large-diameter snags with exfoliating bark as roosts. They may also use rock crevices as day or night roosts.

Potential roost habitat (large-diameter snags with exfoliating bark) for forest bats occurs throughout the analysis area. In general, bats have not been specifically surveyed (mist-net or bat detection devices) within the analysis area. Although some bats may be rarer in the Blue Mountains than others, some species have the potential to occur in the project area. For example, Whitaker et al. (1981) considered the long-eared bat to be "the most abundant bat in northeastern Oregon forests." While the Yuma myotis was considered "exceeding scarce" in eastern Oregon (Whitaker et al. 1981). The following species will be assessed as a group and not individually: long-eared myotis, long-legged myotis, and Yuma myotis. These three species are year-long residents in the analysis area.

Direct and Indirect Effects

Alternative 1

Potential roosting habitat (large snags with exfoliating bark, rock crevices, etc.) would remain unchanged in the project area in the short term. Over time, stands in the project area would continue to grow and develop dense multi-layered canopies. Large diameter snags would provide roosting habitat in these stands. However, dense multi-layer conditions would increase the susceptibility of stands to high-intensity wildfires and insect or disease outbreaks. Insect and disease outbreaks would tend to create potential roosting habitat. Wildfire would also create snags for roosting, but due to the limited time snags are suitable for roosting (while bark is exfoliating), a high severity wildfire would create a shortage of roosting habitat in the mid and long term.

Common to All Action Alternatives

Because these species use standing dead wood for roosting in forested landscapes, impacts can be inferred through impacts to this habitat feature; refer to the snag and downed wood section for a discussion of impacts to snags within treatment units. Effects will also be discussed below.

Proposed commercial and non-commercial thinning would target green timber rather than dead standing trees (snags). Hazard tree removal may reduce potential roosting habitat. Snag reductions are expected to be minimal, so it is expected that the effects on snag-roosting bats in these treatment types would also be minimal. Proposed mechanical fuels treatment activities would reduce snag densities in treatment units. Reductions in snags in these units would likely reduce potential roosting habitat for bats of interest. In untreated islands within proposed fuels treatment units (totaling 10 percent of the proposed treatment area), riparian areas, and areas outside proposed fuels treatment areas, there would be no impact or minor impacts on potential habitat for these species. These habitats would be well distributed through the fuels treatment area. Elevated snag densities would be maintained in mechanical fuels treatment units, reducing impacts to potential roosting habitat. Where available, a mixture of newly recruited (with tight bark) and older snags will be maintained. It is not expected that snag reductions would adversely impact these species due to the availability of snags elsewhere, and due to the fact that Forest Plan standards for snags would be met or exceeded in all fuels treatment units (see adjusted snag density standards for the Wildcat Project).

Cumulative Effects

Past activities and events in the watershed that affected bat roosting habitat include timber harvest, wildfire, wildfire salvage, and personal use firewood cutting. Timber harvest altered stand structure and composition and removed a portion of the large green trees and snags within affected areas. Removal of large snags with exfoliating bark reduced potential roosting habitat for bats. Reductions in large diameter green trees also reduced potential future roost snags. Wildfire both consumed and created potential roost snags for bats. The longevity of these habitats is relatively short due to the fact that all of the trees in high severity portions of the fire were killed. These trees would be available for a relatively short time while their bark is exfoliating. Low and moderate severity portions of fire areas would provide roost habitat over a longer period of time due to the presence of a green overstory for snag recruitment. Salvage harvest of dead and dying timber would reduce impact potential roost trees; the size of the area that would be affected, the availability of potential roosts elsewhere (burned and unburned), and the fact that riparian habitats would not be affected by proposed salvage, impacts to these species would be minor. Personal use firewood cutting reduced densities of large snags in the analysis area, especially close to open roads. Newer, less decayed stands (often with bark attached or beginning to slip) are generally more sought after than older snags that do not provide good roosting habitat. These activities have resulted in the current habitat condition for bats in the analysis area.

Present and future activities, actions, and events with a potential to affect bats roosting habitat includes personal use firewood cutting. This activity would have the same effects as those described in the past activities section.

When the residual and expected effects of past, present, and reasonably foreseeable future activities are combined with the expected effects of these alternatives, there would be no adverse effect on roosting habitat or bat populations in the analysis area. Impacts on snags are expected to be relatively minor. Forest Plan standards for snags would continue to be met or exceeded following treatment under all of the Action Alternatives. Retained snags in treatment units and adjacent untreated upland stands and riparian habitats would contribute to the conservation of these species in the long term.

Neotropical Migratory Birds

Neotropical migratory birds are those that breed in the United States and winter south of the border in Central and South America. Continental and local declines in population trends for migratory and resident landbirds have developed into an international concern. Partners in Flight (PIF) led an effort to complete a series of Bird Conservation Plans for the entire continental United States to address declining population trends in migratory landbirds. The Partners in Flight Bird Conservation Plans are used to address the requirements contained in Executive Order (EO) 13186 (January 10, 2001), Responsibilities of Federal Agencies to Protect Migratory Birds. Neotropical migrants account for a significant portion of the avian biological diversity in the Wall Creek watershed (USDA 1995b). Of the 164 species of birds known or suspected to occur in the Wall Creek watershed, 83 species, or approximately half, are Neotropical migrants. Forty-eight of these species are associated with riparian habitats, while 34 species use old growth. Thirty-two species use aspen groves for nesting or foraging habitat. Twenty-nine species use sapling/pole stands for either nesting or foraging. Nineteen species use the stand initiation structural stage: many of these are generalist or edge-associated species.

The Conservation Strategy for Landbirds in the Northern Rocky Mountains of Eastern Oregon and Washington (Altman 2000) identifies the following priority habitat types: Dry Forest, Late Successional Mesic Mixed Conifer, Riparian Woodland and Shrub, and several “unique” habitats (Table W-33).

Table W-33. Priority Habitat Features and Associated Landbird Species for Conservation in the Northern Rocky Mountain Landbird Conservation Region of Oregon and Washington (Altman 2000).

Habitat Type	Habitat Feature/Conservation Focus	Focal Species
Dry Forest	Large patches of old forest with large trees and snags	White-headed woodpecker
	Old forest with large trees & snags interspersed with grassy openings and dense thickets	Flammulated owl
	Open understory with regenerating pines	Chipping sparrow
	Patches of burned old forest	Lewis' woodpecker
Mesic Mixed Conifer	Large snags	Vaux's swift
	Overstory canopy closure	Townsend's warbler
	Structurally diverse; multi-layered	Varied thrush
	Dense shrub layer in the forest understory or forested openings	MacGillivray's warbler
	Edges and openings created by wildfire	Olive-sided flycatcher
Riparian Woodland and Shrub	Large snags in riparian woodland	Lewis' woodpecker
	Riparian woodland canopy foliage and structure	Red-eyed vireo
	Riparian woodland understory foliage and structure	Veery
	Shrub density Willow/alder shrub patches	Willow flycatcher
Unique (special) Habitats	Subalpine Forest	Hermit thrush
	Montane meadow	Upland sandpiper
	Steppe shrubland	Vesper sparrow
	Aspen	Red-naped sapsucker
	Alpine	Gray-crowned rosy finch

Dry Forest Habitat

The dry forest habitat type includes coniferous forest composed exclusively of ponderosa pine, or dry stands co-dominated by ponderosa pine and Douglas-fir or grand fir (Altman 2000). Bird species associated with dry forest have shown the greatest population declines and range retractions in the northern Rocky Mountain province (Altman 2000). In particular, bird species highly associated with snags and old-forest conditions have declined. These species include white-headed woodpecker, flammulated owl, white-breasted nuthatch, pygmy nuthatch, Williamson's sapsucker, and Lewis' woodpecker.

Old forest, single-story ponderosa pine habitat has declined by 96 percent in the Blue Mountains Ecological Reporting Units of the Interior Columbia Basin, mainly a result of timber harvest and fire suppression (Wisdom et al. 2000). Habitat restoration is the primary strategy for conservation of landbirds associated with this habitat type.

The dry forest habitat type includes coniferous forest composed exclusively of ponderosa pine or dry stands co-dominated by ponderosa pine and Douglas-fir and/or grand fir (Altman 2000). Dry forest habitat occurs on approximately 54% of the analysis area; these habitats are distributed throughout the analysis area. Habitat criteria for the dry forest habitat type includes: old forest, single-stratum stands, a mosaic of forest structural stages, openings and burned areas, and 350-acre patches of old forest single stratum connected to other old forest single-stratum stands. The habitat criteria listed here summarizes the biological objectives in Altman (2000) for the focal species representing the dry forest habitat type.

In general, the project area meets the dry forest habitat criteria, with the exception of size and spacing of old forest single-stratum (OFSS) habitat. Old forest single stratum habitat is currently 11 to 51 percent below the Historical Range of Variability (HRV) in the dry upland forest potential vegetation type in the analysis area. Patch size of old forest single-stratum stands is well below the suggested 350 acres in Altman (2000). There are only 662 acres of old forest single-stratum habitat in the analysis area; the largest single-stratum stand is 86 acres in size. The Monument Complex Fire also impacted an additional 73 acres of OFSS habitat; fire-caused mortality has reduced green tree density and altered stand structure in a manner that likely reduced its suitability for the white-headed woodpecker. As a result, habitat for white-headed woodpecker is likely more limited in the analysis area than it was prior to the fire. Lewis' woodpecker will use moderate and high severity portions of the fire at high densities in the future. Habitat for the white-headed woodpecker occurs in scattered locations throughout the analysis area. All four species have been observed on the District. The white-headed woodpecker, flammulated owl, and Lewis' woodpecker are seen infrequently; observations are restricted to the southern and middle portions of the analysis area (south of Road 21). The chipping sparrow is common throughout the analysis area.

Mesic Mixed Conifer Habitat

Mesic mixed conifer habitats are primarily cool Douglas-fir, grand fir sites and larch sites. Late successional stages have been commonly harvested with regeneration prescriptions such as clearcuts or shelterwood cuts to reduce insect and disease. Bird species associated with late successional stages have been impacted by the loss of late-seral conditions and snags. The desired condition is a late successional, multi-layered forest with a diversity of structural elements. Conservation focal species and habitat conditions include: Vaux's swift for large snags; Townsend's warbler for overstory canopy closure, varied thrush for structural diversity and multiple layers; MacGillivray's warbler for a dense shrub layer in forest openings or understory; and olive-sided flycatcher for edges and openings created by fire.

Moist upland vegetation accounts for approximately 22% of the analysis area. These habitats are scattered throughout the analysis area, with the greatest concentrations being in the central and northern portions of the analysis area. Multi-layered old forest is well below the Historic Range of Variability, probably due to harvest, fires, and insect and disease (Silviculture Report). About four percent of moist upland forest is currently classified as Old Forest Multi-strata, while historically 10-30 percent of this potential vegetation group provided this structure (Silviculture Report).

Despite the lack of large stands of old forest, elements of and small pockets of old forest do occur within stands that are classified as Understory Reinitiation, Stem Exclusion Closed Canopy, and Young Forest Multi-Strata stands. Some of these stands are 'close to' being classified as old forest and provide multiple layers and high canopy closure.

Riparian Shrub Habitat

Riparian vegetation is particularly important to Neotropical migratory songbirds (Altman 2000). This habitat type includes riparian communities dominated by shrubs (willow, alder, etc.) that occur along bodies of water or in association with wet meadows and wetlands (Altman 2000). The desired condition is a structurally diverse vegetative community of native species that occur in natural patterns relative to hydrological influences. Focal species and habitat conditions include: Lewis' woodpecker for large snags; red-eyed vireo for canopy foliage and structure; veery for understory foliage and structure; and willow flycatcher for willow/alder shrub patches.

Riparian habitat as described above is present in the analysis area along Skookum, Alder, East Fork Alder, Swale, Dry Swale, Bear, and Wildcat Creeks. Wet areas such as seeps, bogs, and springs also provide small patches of riparian habitat. In general, the project area meets the riparian shrub habitat criteria described above. Along streams and creeks in the analysis area, shrub cover occurs in scattered clumps. Willow and alder are common; mountain maple and Pacific yew are uncommon.

Subalpine Forest

This habitat type is the coolest and wettest forest zone, dominated by subalpine fir, Engelmann spruce, lodgepole pine, and huckleberry. Subalpine forest habitat coincides with the moist and cold upland forest potential vegetation groups. Currently, this subalpine habitat is present in approximately 7% of the analysis area. These habitats are restricted to the extreme northern portion of the analysis area and small frost pockets in the central and southern (mid-elevation) portion of the analysis area. Important features of the subalpine forest are a multi-layered structure and dense understory of shrubs (Altman 2000), and the focal species is the hermit thrush. This type of habitat is well-distributed throughout the cold upland forest in the analysis area. Stands are generally dense with heavy dead and down wood components and healthy shrub habitat.

Steppe-Shrubland

Steppe-shrublands occur in a wide range of habitat types, including grassland, sagebrush, montane meadows, fallow fields, juniper-steppe, and dry open woodlands and openings in forested habitats (Altman 2000). Habitat criteria (objectives) for the steppe-shrubland habitat type include maintaining a mosaic of steppe and shrubland habitats with < 10 percent tree cover. Associated bird species include vesper sparrow, lark sparrow, Brewer's sparrow, and long-billed curlew.

The majority of steppe-shrubland habitats in the analysis area meet these objectives, with the exception of where juniper and other fire intolerant species have encroached into these habitats. Grassland habitat occurs on approximately 15% of the analysis area (5,104 acres). Shrublands account for approximately .1% of the analysis area (39 acres). These habitats are scattered throughout the central and southern portions of the analysis area, with the majority in the lowest elevations where dry grassland (winter range for big game) habitat is present.

Aspen

Associated bird species include the red-naped sapsucker, Williamson sapsucker, tree swallow, northern pygmy owl, western screech owl, and others. Aspen stands were once widespread throughout the Blue

Mountains, however, a combination of factors including fire suppression, competition with invading shade-tolerant species, overgrazing (livestock and wild ungulates), and drought have contributed to their decline.

Remnant aspen stands are present within the Wildcat analysis area. They are generally small in size (less than 1 acre), spatially discontinuous, and have a deteriorating overstory. There are approximately 18 known aspen stands of varying size in the analysis area. Due to the small size and condition of most aspen stands, it is likely that additional aspen clones exist in this area. The larger and healthier remaining stands are located along Swale Creek and the 2107 road. In other areas, single trees or very small clumps are all that remain of historic clones. Limited restoration activities (fencing) have occurred in the analysis area. Several stands, including those in proposed units 77 and 82, have been noted as being at increased risk of losing the clone without immediate action to reduce competition, shading, and other factors limiting production in these stands.

Direct and Indirect Effects

Alternative 1

The current condition of habitats for land birds in the analysis area would not change in the short term. No change is expected for riparian, shrub-steppe, or aspen habitats. Bird species that rely on multiple tree layers and high canopy closure would likely remain static. Dry forest could continue to fill in with fir due to continued fire suppression, which could further restrict development of old forest habitat. Insect and disease damage would continue to affect tree species compositions. Snags would likely increase in number, benefiting many snag associated species. The area would remain prone to fire, and there would be few opportunities to restore larch and ponderosa pine where fir has crowded in. If small or low intensity fire were to occur, species associated with edge and burned habitats would thrive, and more single story ponderosa pine habitat might result. If a larger stand-replacing event took place, the now-scarce old forest habitats could be lost. Moist and cold upland forest stands would also continue to develop multiple canopy layers and dense understories. These areas would also be prone to fire due to high fuel loading. Fire in these areas would create edges and perches for olive-sided flycatcher, and encourage shrub regeneration. In the absence of treatment activities, remnant aspen stands would continue to decline in the future.

Common to All Action Alternatives

Timber harvest in the area seeks to improve stand health and resiliency by reducing overstocking, disease, and fuels, and subsequently restoring a diversity of tree species. Based on the forest vegetation analysis, the proposed activities would accelerate development of historic species compositions, structure, and stand densities. In the short term, some stands would generally not provide habitat for many bird species of concern.

Commercial thinning in dry forest would promote the development of a large tree, single-layered canopy with an open understory dominated by herbaceous cover, scattered shrub cover, and pine regeneration. This would occur at varying levels depending on the alternative. No treatments will occur in dry forest stands classified as old forest single-stratum. Bird species that favor open stands of old ponderosa pine have declined as these stands have grown in with more shade-tolerant species. Old forest multi-strata stands would be treated in the dry forest potential vegetation group; treatment would move these stands towards a more historical structure and composition, and promote the creation of old forest single-stratum stands. Birds associated with these habitats would benefit in the mid and long term. Understory burning would have short term impacts on nesting habitat for ground nesting birds, and may result in nest loss; ultimately, this activity would benefit habitat quality and the birds that are associated with these habitats. Snag and downed wood densities would be met or exceeded in treatment units in dry upland forest following treatment. Because no timber harvest would occur in old forest structural stages currently below the Historic Range of Variability, and all trees > 21 inches dbh will be left in commercial thinning units, existing patches and elements of old forest would remain.

Treatment activities in mesic mixed conifer (moist upland forest) and subalpine (cold upland forest) habitat would impact habitat quality in these habitat types. Machinery use in these stands would cause disturbance, and may impact nesting birds. Understory structure (downed wood and shrubs) would be disturbed by the proposed activities. Snags would also be reduced by proposed mechanical fuels treatment activities. Forest Plan standards for downed wood and snags would be met or exceeded in all treatment units after implementation. Snag densities in moist and cold upland forest would be 6 snags per acre (greater than 10 inches dbh) in treatment units after implementation. Although snags would be reduced by the proposed activities, retention densities and the distribution of snags in units and across the landscape would contribute to the conservation of species requiring this habitat feature. Proposed fuels treatment and sanitation harvest would occur in areas prone to insect and disease attacks. Overstory vegetation in these stands would be minimally affected; diseased trees would be removed. Because existing overstory structure would be minimally affected, impacts to species like the varied thrush and hermit thrush would be relatively minor. Harvest treatments to remove diseased trees and replace them with more resilient species would eventually lead to more and better bird habitat and reduce the risk of loss to high severity wildfire. Approximately 10 percent of the mechanical fuels/sanitation treatment area would not be treated to maintain high snag density areas and areas that will support endemic levels of insects and disease. Because no timber harvest would occur in old forest structural stages currently below the Historic Range of Variability, and all trees > 21 inches dbh will be left in commercial thinning units, existing patches and elements of old forest would remain. The reduction of crown and ladder fuels would reduce habitat for some birds, but it would also reduce the chances that a large-scale fire would eliminate large areas of forest habitat.

Road building constitutes a removal of habitat, be it forested, shrub, grass, or lithosol. New road construction would permanently (for the life of the road) remove the affected area from production. It also creates a situation in which nearby snags become a danger to people using the roads and must be removed. New roads in conjunction with timber harvest further decreases available habitat for many bird species. A portion of existing snag habitat would be felled along roads used during implementation. Felling of hazard trees along new roads and haul routes is expected to have minor impacts on snags at the watershed scale; Forest Plan standards for snags would be met within individual treatment units and at the watershed scale following implementation. For this reason, the impacts on species requiring this habitat feature are expected to be minor.

Noncommercial thinning outside of the harvest units would have little to no effects to land birds of conservation concern. This small tree thinning would eventually lead to larger diameter trees and provide more future habitat for birds associated with late successional stages. Within harvest units, this activity would reduce cover and potentially nesting substrates. This impact is expected to be minor and temporary; retained small diameter conifers, shrubs, and new conifer regeneration will provide cover and nesting substrate in the years following treatment.

Landscape underburning in shrub-steppe habitats has the potential to impact neotropical birds, particularly ground nesting birds. Refer to Table W-10 for acres of burning by alternative. Ground cover would be impacted by this activity. Grasses would largely be consumed; because proposed underburns would not impact the root system of grasses due to the low intensity of burning, grasses would resprout in the year following burning. Generally, shrubs would not be adversely impacted. If above ground structures are killed by fire, shrubs would likely resprout due to the low intensity of burning. If burning occurs in the spring, nests could be lost. Because proposed underburns would be low intensity, burn in a mosaic pattern (with only 50 to 70 percent of the area blackened), and impacts to vegetation would only persist in the short term, birds associated with this habitat type would not be adversely affected.

Aspen habitat would be improved through proposed harvest activities. Conifers would be thinned from 5 existing aspen stands. Reduced shading and competition for resources would positively impact aspen. In two of these stands (Units 77 and 82), conifers greater than 21 inches dbh would be removed to promote the restoration of aspen; this would occur on approximately 5 acres. Removal of a portion of the trees over 21 inches dbh (and smaller diameter conifers) would move these stands from an OFMS structure to an OFSS structure. Although these habitats would become or remain suitable habitat for these species, potential nesting, roosting, and foraging habitat for the white-headed woodpecker and the flammulated owl would be reduced through the removal of large diameter trees. In the long term, treatment in these stands would improve aspen habitat quality for the red-naped sapsucker.

No change is expected for the riparian shrub habitat within the analysis area because there would be no treatment in this habitat type under any of the action alternatives.

Cumulative Effects

Past activities, actions, and events in the analysis area that affected neotropical migratory bird habitat and associated neotropical migratory birds include timber harvest, wildfire, prescribed fire, fire suppression, and livestock grazing. Timber harvest altered the structure and composition of forested stands in the analysis area. Generally, these activities reduced late and old structure habitat, increasing the proportion of stand initiation, stem exclusion, and young forest stands. Harvest stimulated growth of understory shrubs, grasses, and small diameter conifers in affected stands, improving habitat for some neotropical migratory birds requiring these habitats. Openings created by these activities are still present on the landscape today. Wildfire and prescribed fire (primarily in dry upland forest) both removed nesting and hiding cover in the short term. In the longer term, these activities and events improve dry forest habitat quality by reducing shade and fire-intolerant vegetation and stimulating shrub and grass production. The Monument Fire created high snag density patches in dry forest habitat; birds requiring this feature will benefit in the short and mid term. Small patches of moist forest habitat were also burned by the fire; impacts to neotropical birds in these stands were variable. Habitat for species requiring high snag densities was bolstered, while habitat for those requiring dense shrubs and multiple canopy layers was reduced. Impacts to shrub-steppe and riparian shrub habitats were generally minor. Fire suppression has resulted in reduced dry forest habitat quality due to invasions of shade-tolerant vegetation and the development of multiple canopy layers. Historic livestock grazing had negative impacts on shrub and grassland communities, altering the structure and species composition in these habitats. This activity also removed nesting cover and structure. More recent livestock grazing impacts dry forest habitat by decreasing ground cover and suppressing shrub communities. Riparian vegetation continues to recover from past grazing activities. These activities have resulted in the current condition of migratory bird habitat in the analysis area.

Ongoing and reasonably foreseeable future activities, actions, and events that affect neotropical migratory bird habitat includes riparian planting and caging, prescribed burning, and fire salvage. Riparian planting would continue to reverse impacts resulting from past grazing activities. The continuity of shrubs along streams would improve in the mid and long term through this activity. Prescribed burning would have short term impacts on dry forest and shrub-steppe habitats. Depending on timing of burning, nests may be lost; due to the low-intensity mosaic nature of proposed burning, impacts to neotropical migratory birds would be minor. Fire salvage in the Monument Fire area impacted approximately 190 acres that burned at high and moderate severity. None of the proposed salvage would occur in the Wildcat analysis area. Approximately

7,525 acres within the watershed burned at high and moderate intensities, creating high-density snag patches. Approximately 97 percent of the high density snag patches (and areas with scattered fire-created snags) within the fire area would not be impacted by salvage harvest; therefore, the impact of this activity is expected to be minor on those species requiring high post-fire snag densities.

The proposed activities would add to past, present, and future actions by causing short term reductions in nesting and hiding cover and disturbing migratory birds, potentially causing nest abandonment and loss. It is not expected that the proposed activities would cumulatively impact the abundance or species composition of migratory bird communities in the analysis area. Proposed treatment activities would also begin to reverse structural and compositional habitat changes resulting from fire suppression and past harvest, promoting the growth of single-stratum dry forest habitats. Dry forest-associated birds would benefit in the mid and long term. Treatment of moist and cold/subalpine forest habitats would reduce existing disease, reduce the risk of future insect and disease attack, and reduce the risk of habitat loss to uncharacteristically large wildfires. Understory vegetation (shrubs and grasses) would be stimulated by these activities, improving both the quality and quantity of suitable habitat for species requiring this feature. Landscape underburning would also have short term impacts on shrub-steppe habitats; the cumulative impact of this activity would be minor due to the intensity, spatial location, timing, and mosaic nature of this activity.

Unique to Alternative 2

Alternative 2 would commercially thin the most acres (2,166) when compared to the other action alternatives. Commercial thinning in dry forest and moist forest stands would promote the development of old forest habitat. Most of these stands have large trees, and thinning would reduce competition so that trees can grow larger.

Mechanical fuels treatment and sanitation harvest would occur on approximately 2,114 acres under this alternative.

This alternative would impact the most neotropical bird habitat with respects to road related activities. Approximately 2.2 miles of new system roads and 3.6 miles of temporary roads would be constructed under this alternative. In terms of acres affected, approximately 14 acres would be affected by road building. Approximately 5 acres of habitat would be permanently removed from production by construction of new system roads. A permanent, narrow, linear opening would be created by news system road construction in the forested canopy. This activity would create edge habitat. The opening created by the road would be approximately 15-20 feet wide. Research indicates that openings of this size do not increase nest predation on interior bird species (Ortega and Capen 2002, Rich et al. 1994). Research also indicates that the abundance of some forest interior species may be less adjacent to edges created by roads; however, interior species do not actively avoid edges and readily cross narrow openings (Ortega and Capen 2002). Proposed system road construction is not expected to negatively impact forest interior neotropical migratory birds.

Cumulative Effects

The cumulative effects under this alternative would be the same as those described under the Common to all action alternatives section.

Common to Alternatives 2 and 4

These alternatives would broadcast burn (underburn) the same number of acres (10,288); the impact on ground nesting birds, although minor, would be greater under these alternatives than under Alternative 3 due to a greater number of acres affected.

Cumulative Effects

The cumulative effects under this alternative would be the same as those described under the Common to all action alternatives section.

Unique to Alternative 3

Alternative 3 would treat fuels and sanitation harvest the same number of acres as the Proposed Action. This alternative would commercially thin 96 fewer acres than the Proposed Action. Approximately 244 acres of dry forest and moist forest habitat would be variable-density thinned under this alternative. Variable density thinning would create a mosaic of higher density and thinned patches within the stand, creating microhabitats for neotropical birds. Use of machinery in these stands would have less impact (when compared to the other action alternatives) due to the fact that less of the treatment unit would be traversed.

No new system roads would be constructed under this alternative. All roads would be temporary, and would revegetate over time, eliminating narrow edges created by clearing of vegetation. Temporary roads would impact approximately 13 acres of habitat.

This alternative would broadcast burn the fewest acres when compared to the other action alternatives. For this reason, the potential impact on ground nesting birds is least under this alternative. Impacts to ground nesting birds are expected to be minor due to the timing and season of burning, and mosaic nature of burns.

Cumulative Effects

The cumulative effects under this alternative would be the same as those described under the Common to all action alternatives section.

Unique to Alternative 4

Alternative 4 proposes to commercially thin 2,127 acres of dry and moist forest habitat. It would also treat fuels and sanitation harvest the fewest acres (1,358) when compared to the other action alternatives. Impact to understory vegetation and snags in mechanical fuels and sanitation portion of the area would be least under this alternative. Impacts associated with roads would also be the least under this alternative. Approximately 2.4 miles of temporary road would be constructed; no new system roads would be built. Temporary roads would impact approximately 6 acres of habitat.

Cumulative Effects

The cumulative effects under this alternative would be the same as those described under the Common to all action alternatives section.

BOTANICAL SPECIES

This section incorporates by reference the Biological Evaluation for Plants for the Wildcat Project contained in the project analysis file at the Heppner Ranger District. Analysis methodologies and other details are contained in the report and the affected environment and predicted effects of the Proposed Action and its alternatives are discussed in this section.

Scope of Analysis

All effects analysis was accomplished at the project area scale including roads used for access to treatment areas. Fourteen complete species surveys have been conducted in the project area and adjacent subwatersheds between 1991 and 2002 as follows:

- Tupper TS 1991
- Little Wall/Madison Allotment 1991
- Heppner DF 1992
- Three Trough1992
- Tupper-Bacon1992
- Heppner DF Subsoiling 1992
- Heppner DF Underburn 1992
- NFJD Road brushing 1992
- Heppner DF 1992
- Texas-Madison 1993
- Tupper TS II (26C) 1995
- Skookum/Alder 26C and 26D 2001
- Swale Cr. Allotment 2002
- In addition, several 'targeted' surveys were implemented in the project area focused on *Eleocharis bolanderi*, a sensitive spikerush in areas of potential habitat in the Wildcat Project area in the spring of 2007. No spikerush populations were found.

Proposed, Endangered, Threatened, and Sensitive plant species

Current Condition

Examination of the Umatilla National Forest proposed, endangered or threatened and sensitive plant coverage in GIS shows no proposed, endangered or threatened plants in the Wildcat Project area and one sensitive plant in the Wildcat project area. A small population of *Botrychium minganense* (BOMI) is not located in a proposed treatment unit but are on an old roadbed (5350) north of proposed non-commercial thin unit #216.

There is no known habitat within the project area units for any non-vascular plant species that are currently on the Region 6 Regional Forester's Sensitive species list.

Direct and Indirect Effects

Alternative 1

There would be less likely of an impact to the *Botrychium minganense* under this alternative because the 5350 road would not be opened for project activity but would be used for other administrative purposes.

Alternative 2, 3, and 4

The closed road 5350 is proposed for temporary opening and use for haul for the Wildcat project. Due to the location of the *Botrychium minganense* (BOMI) in the old roadbed, this plant population will be impacted by road opening activities.

Cumulative Effects

Alternative 2, 3, and 4

Use of the 5350 road for administrative use in addition to the proposed use for haul in the Wildcat project would increase exposure to disturbance of the *Botrychium minganense*. No other past, present, or future actions would affect this population.

Biological Evaluation Determination of Effects and Rationale

Moonwort *Botrychium minganense:* The Wildcat Project may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the species.

Rationale:

The sensitive status of this moonwort species (BOMI) has recently been lowered by the Oregon Heritage program, due to the numerous populations that have been documented in the last several years. With increased surveys focused on its habitat, this species is proving fairly widespread and appears to shift population locations by following disturbance. Due to increased documentation of populations, *Botrychium minganense* has recently been removed from the R6 list as a sensitive in the state of Washington, but remains listed as 'sensitive' in Oregon. There are more than 30 documented occurrences of *B. minganense* on the Umatilla NF alone, many in *Festuca rubra/Pinus contorta* plant communities that are common across the forest above about 4200 feet elevation.

WEEDS

This section incorporates by reference the Noxious Weeds Report for the Wildcat Project contained in the project analysis file at the Heppner Ranger District. Analysis methodologies and other details are contained in the report and the affected environment and predicted effects of the Proposed Action and the alternatives are discussed in this section.

Scope of Analysis

The Wildcat Analysis Area is approximately 25,450 acres in size. There are currently 24 inventoried noxious weed sites occupying approximately 349 acres within the Wildcat Analysis area.

Noxious Weeds

Current Condition

Existing high priority weed sites are relatively small in size as well as density within the Wildcat analysis area. There are currently 24 high priority (New Invader/Established) sites. Diffuse Knapweed, is the primary weed inventoried at these sites.

Of the total 24 sites, 3 sites are approved for chemical treatment under the Umatilla National Forest Environmental Assessment for the Management of Noxious Weeds (1995 Forest EA).

The low priority "established" weeds—are Canada thistle, bull thistle, and St. Johnswort—are fairly widespread within the analysis area and are so extensive Forest-wide that they are not generally inventoried. St. Johnswort and bull thistle are less invasive and/or persistent than the high priority weeds and generally give way to or do not out-compete desirable vegetation. It can be assumed that these three weed species can be found throughout the analysis area.

Most of the high priority (New Invaders/Established) noxious weed sites in the analysis area are found along road corridors. Diffuse Knapweed is of most concern within the analysis area. Spotted Knapweed, Diffuse Knapweed, Dalmation Toadflax and Yellow Toadflax are spread by animals, wind, and vehicles, are extremely competitive, and are generally found along roads and right of ways. However, inventory has shown the spread of these species to be relatively slow due to current treatment practices. Currently there are approximately 349 acres of inventoried knapweed and St. Johnswort within the analysis area. Densities of weed populations per acre are between 1-100 plants per acre. Due to the low amounts of weeds within the analysis area, current threat of spread is low.

Direct and Indirect Effects

Alternative 1

Treatment of the existing noxious weed sites covered in the 1995 Forest EA within and adjacent to the analysis area would receive continued effective treatment. The current costs for noxious weed control within the analysis area are estimated to be approximately $7000/year. This figure includes personnel, equipment, treatment, inventorying, and monitoring.

Low priority weed species that are not inventoried would continue to be found throughout the analysis area and would not be treated.

The potential for vehicles, livestock, and wildlife to transport noxious weed seed from within or from outside the analysis area would exist in all alternatives.

Existing native vegetation would continue to stabilize soil and consume resources (i.e. nutrients, water, and space), which would help deter invasion by opportunistic noxious weed species.

Alternative 2, 3, and 4

The proposed activities could increase the potential for noxious weed invasion where the surface duff layer is disturbed and exposed down to bare mineral soil. The highest risk of infestation would be in disturbed forest areas (even shaded understory habitats), where disturbance exists along transportation corridors. However, compared to the other areas of the Heppner Ranger District and the Umatilla National Forest, the Wildcat area does not have high densities of noxious weeds. Private land that is directly adjacent to the National Forest has not been inventoried but contains infestations of high priority weeds (Diffuse and Spotted Knapweed, Dalmation and Yellow Toadflax, Sulfur Cinquefoil, and Scotch Thistle).

Project design elements listed in Chapter 2 would help avoid conditions that favor the invasion and establishment of noxious weeds. The proposed treatment methods and mitigation would minimize ground disturbance, which would allow the existing competing vegetation to reduce the spread and establishment of low priority weeds.

Table N- 1: Disturbance and Noxious Weed Potential Spread by Alternative

	*Acres/Miles of Potential Disturbances			
	No Action Alternative 1 (Acres)	Proposed Action Alternative 2 (Acres)	Alternative 3 (Acres)	Alternative 4 (Acres)
Commercial Harvest (CH)	0	2,218	1,866	2,179
Forwarder	0	1,387	1,075	2,179
Skidder	0	739	698	0

Mechanical Fuel Treatments	(Acres)	(Acres)	(Acres)	(Acres)
Forwarder	0	1,725	1,725	1,358
Sky line	0	388	388	0
	(Miles)	(Miles)	(Miles)	(Miles)
New System Roads	0	2.2	0	0
Temporary Road Miles	0	3.6	5.3	2.4
Closed roads opened for haul	0	41	41	0
Open roads maintained for haul	0	39	39	0

*Potential spread of noxious weeds is based on the estimated gross acres of acres treated and miles of roads that will be used in the analysis area.

Alternative 2

As shown in Table N-1, Alternative 2 (proposed action) could potentially disturb 2,218 acres more than alternative 1 (No Action). Under alternative 3 there would potentially be 596 less acres disturbed than the proposed action. Under alternative 4 there would potentially be 39 less acres disturbed than the proposed action. All action alternatives are the same in relation to treatment method. Therefore, the probability of increase in establishment and spread of noxious weeds under the proposed action could be higher than alternatives 1, 3, and 4.

Alternative 3

As shown in Table N-1, this alternative would result in less acres being potentially affected than alternative 2 and alternative 4. All action alternatives are the same in relation to treatment method. Therefore, the probability of increase in establishment and spread of noxious weeds would be lower than the Proposed Action or Alternative 4.

Alternative 4

As shown in Table N-1, this alternative would result in less acres being potentially affected than alternative 2 (Proposed Action). Alternative 4 could potentially affect more acres than alternative 3. All action alternatives are the same in relation to treatment method. Therefore, the probability of increase in establishment and spread of noxious weeds would be lower than the Proposed Action and a higher probability than alternative 3.

Cumulative Effects

Alternative 2, 3, and 4

Past road construction and maintenance, grazing, timber harvest and other soil disturbance have provided:

- environments for noxious weed species establishment,
- vectors for noxious weed dispersal,
- and infestations of noxious weeds for seed sources.

See Appendix F for a list of specific past, present, and future projects that could cumulatively interact with the action alternative treatments.

The cumulative effects of all action alternatives on the establishment and spread of high priority noxious weeds would be low to moderate. Past activities within the analysis area have resulted in extremely low densities of high priority noxious weeds. Known sites would be treated before seed is produced and before additional disturbance occurs to reduce the potential spread by equipment associated with this project and other vectors (such as livestock, recreationists, and wildlife).

As identified in the Range Report for the Wildcat project, all action alternatives could increase the accessibility and distribution of livestock (as well as wildlife and recreationists). Since these are vectors for transport of weed seeds, this increased accessibility could result in cumulative spread of noxious weed populations. However, mitigation identified under the proposed activities would inventory for new sites, minimize soil disturbance, and monitor for weed populations for five years after proposed treatments are completed. As a result, there should be little opportunity for transported seeds to become established.

RANGE

This section incorporates by reference the Range Report for the Wildcat Project contained in the project analysis file at the Heppner Ranger District. Analysis methodologies and other details are contained in the report and the affected environment and predicted effects of the Proposed Action and its alternatives are discussed in this section.

Scope of Analysis

For the purpose of discussing domestic livestock grazing, those portions of the Swale, Little Wall and Ditch Creek Allotments that are within the Wildcat Project Area will be analyzed and the portions of the allotments that are outside the analysis area will not be discussed in detail.

Grazing Distribution

Current Condition

Uplands

In general, range vegetation within the Swale Creek, Little Wall and Ditch Creek Allotments includes Lodge Pole/Grand Fir, open pine and bluebunch wheatgrass plant associations, wet and dry meadow types, open Sandberg's bluegrass and one-spike oatgrass plant communities, with transitory rangeland consisting of fir/mixed conifer timber types. Many areas of transitory rangeland were created since the 1930's by past timber harvest and the seeding of nonnative plant species such as orchard grass and fescues. Within the analysis area a total of 52 water developments have been developed on the Swale Creek Allotment and 34 ponds have been constructed on the Little Wall Allotment. There are no water developments within the Ditch Creek riparian pasture that is with in the scope of this analysis. These water developments were constructed to improve livestock distribution within pastures reducing the concentration of livestock. Division fences, riparian fences, and rotational and deferred grazing strategies have also been used to improve range condition within these allotments.

Riparian

Throughout the late 1980s to present class I and II streams were fenced to exclude domestic livestock. Within the Swale Creek, Little Wall and Ditch Creek Allotment approximately 17 miles of stream have been excluded from livestock by constructing hard and temporary seasonal electric fences. The fences are used to limit livestock access to riparian areas to improve stream side vegetation and reduce steam bank alteration caused by domestic livestock. In the future permanent hard fence may be constructed to replace existing seasonal electric fence in areas where the seasonal electric fence is hard to maintain and be effective for meeting long term objectives.

Direct and Indirect Effects

Alternative 1

Livestock grazing distribution on the uplands would stay the same or continue to decrease as stocking in timber stands increase in density and wood continues to accumulate on the ground. Livestock access would stay the same or continue to decrease due to down wood, continuous small regeneration, and visibility. Forage would also stay the same or continue to decrease due to the reduction of sunlight on the forest floor reducing forest floor vegetation.

Alternative 2

This alternative identifies several management treatments that vary in degrees of intensity and duration to improve conditions that will benefit forage and improve access for livestock within the project area. The management treatments and the connected actions increase forage by reducing the amount of canopy cover, and competition for light and nutrients that are favorable for grasses, forbs and shrub plant communities. The identified management treatments will also improve the distribution, access and management of livestock in the project area making it easier for the permittees to locate and move livestock.

Proposed harvest, commercial thinning, precommercial thinning, fuels treatments, and burning could reduce the effectiveness of fences (which are used as a tool to manage livestock in portions of the allotment at specific times). However, the identified design elements under the proposed action would protect fences in their existing condition to prevent livestock movement between pastures. Precommercial thinning has caused concern and injury to horses (saddle and pack horses) that the permittees ride on the allotment to manage livestock. Injury is caused by small trees that are cut with a chainsaw at an angle leaving sharp stubs that are left sticking out of the ground that animals step on.

The obliteration and decommissioning of existing roads in the project area (2107-040, 2107-042, 2107-043) will effect the permittees management of livestock on the allotment. The permittee uses the road system for access to the upper end of the East Fork of Alder Creek to move livestock out of the riparian area and to gather cattle from the Texas Pasture.

Alternative 3

Alternative 3 includes all of the management treatments and activities stated in alternative 2. Only the mechanical fuel treatments would be the same acreage as alternative 2 and the other treatment acres would be reduced. Action alternative 3 would have much of the same effect as action alternative 1 as it relates to livestock grazing. The difference being that maintaining more canopy cover would allow less sunlight to the forest floor and have more competition for light and space in grass forbs and shrub plant associations. Access by livestock would improve over the no action alternative but the changes would be less visible across the project area then in alternative 2.

Alternative 4

Alternative 4 includes all of the management treatments and activities stated in alternative 2 and 3. The difference that may have the biggest effect on livestock grazing in the short term is the change in harvest system from conventional tractor to forwarder. This type of logging system leaves more slash in the units and it limits access by livestock and the permittee has a more difficult time riding and moving or gathering livestock within these forwarder units. With the increase in slash a decrease in available forage for the short term can be expected. The difference being that maintaining more canopy cover would allow less sunlight to the forest floor and have more competition for light and space in grass forbs and shrub plant associations. Access by livestock would improve over the no action alternative but the changes would be less visible across the project area then in alternative 2.

Cumulative Effects

Alternative 2, 3, and 4

The purposed treatments could improve forage for livestock and create better management of pastures within the allotments. With the abundance of forage and the improved management an increase in livestock and/or permitted numbers may be justifiable. Improving the distribution of livestock will most likely be followed up with the need for additional water developments and fencing projects to continue to improve the pastures within the project area.

AIR QUALITY

This section incorporates by reference the Air Quality Report for the Wildcat Project contained in the project analysis file at the Heppner Ranger District. Analysis methodologies and other details are contained in the report and the affected environment and predicted effects of the Proposed Action and its alternatives are discussed in this section.

Scope of Analysis

The analysis area for the Wildcat project is the mountainous geographic area immediately near and surrounding the project area. This analysis takes into consideration the geographic features that influence the movement and dispersion of smoke.

This analysis focuses on the project area and takes into consideration local communities located within a 50-mile radius of the project area. Communities located within this area are Stanfield, Echo, Lexington, Long Creek, Heppner, Pilot Rock, Dale, Ritter, Dayville, Kimberly, Hamilton, Mount Vernon, Monument, Spray, Ukiah, John Day, Pendleton, and Fox.

This analysis also takes into consideration areas outside of the 50-mile radius that could be affected by smoke emissions and dispersion from larger fires. These areas are the communities of La Grande, North Powder, and Baker City and Class 1 airsheds. These airsheds are the Strawberry Mountain Wilderness and the Eagle Caps Wilderness.

PM10 and PM2.5 Smoke Emission

Current Condition

On any given day the air quality of the analysis area is generally fresh, clean and clear. Visibility of the area is excellent with geographical features visible for great distances.

Seasonal activities such as agricultural field plowing releases dust and soil into the air however the analysis area is so large area, these impacts have little to no affect and go undetected.

Seasonal agricultural burning is an activity that can impact air quality. Agricultural burning occurs during the spring and fall months of the years. Within a short time frame, when burning conditions are conducive, farm field and canals are set a fire and allowed to burn for days. Because smoke emissions from these burns are cumulative, the result can be a temporary degradation of air quality by a reduction in visibility and a build up of human health irritants. These conditions are short term and usually last only a few days.

There are no Class I airsheds located within a 50-mile radius of the project area. The North Fork John Day Wilderness, which was established by the Oregon Wilderness Act of 1984, is a class II airshed and does not require the same air quality protection as those identified as Class I Wilderness airsheds.

Outside the 50-mile radius, the Strawberry Mountain Wilderness, located 71 miles southeast, and the Eagle Caps Wilderness, located 90 miles east, are Class I airsheds and are protected from visibility impairment consistent with the Oregon Visibility Protection Plan.

Weather records and historical on-site observations indicate that the prevailing wind pattern in the analysis area flows from the west/southwest to the east/northeast. There are some occasions when the wind flow is the opposite direction, from the east to the west toward the Cascade Range in central Oregon.

Visitor road use creates dust emissions into the air for short periods of time. These conditions are much more noticeable during the fall months when road conditions are dusty and dry. During fall hunting season, warming fires from hunters create smoke and emissions. Smoke from these warming fires is cumulative and can result in decreased visibility and local health hazards due to cold stagnant air associated with the fall months.

Direct and Indirect Effects

Alternative 1

This alternative would maintain the area as described in the existing conditions. However, ground fuels would continue to accumulate and the risk for pollutants from wildfire will continue to exist.

Seasonal lightning caused wildfires will continue to occur with the potential of becoming large with the accumulation of ground fuels. Large uncontrolled wildfires will produce approximately 2 to 3 times as much smoke as prescribed fire in a shorter time period. Large amounts of smoke impact air quality, visibility, communities and human health. Effects of smoke from large wildfires can last for days to months.

Alternative 2, 3, and 4

Prescribed burning on a landscape scale will be used to reduce and eliminate the undesired ground fuels in the project area. Smoke from prescribed burning would temporarily cause impacts to air quality during the spring and fall months.

With the use of prescribed burning, there will be a notable increase in the amount of smoke produced during weather conditions conducive to underburning. Spring burning generally produces a blue haze smoke and reduces visibility to 20 miles or more. Spring time smoke will normally last only a few days and dissipate. Fall burns, which are conducted when fuels are much drier, will consume greater portions of the available fuel on the ground and reduce visibility to 15 miles or less. Because these burns are much hotter, smoke from these burns usually rises above the higher ridges and travels north and northwest. However during night time, residual smoke from smoldering material tends to settle in drainage bottoms and travels to lower elevations. Residual smoke tends to last between 2-5 days depending on the fuel conditions and the scale of the area that was burned.

Table P-1: Proposed burning: Acres

Alternative		1	2	3	4
Landscape	acres	0	10,288	10,079	10,288

Burning					
Activity Burning	acres	0	1,386	1,075	2,179
Pile Burning	acres	0	37	36	27

Emission calculations were based on burning the proposed acres over a 5 year time frame. Generally, 2000 acres can be burned in a year. Ignition can take one to several days to complete. A wildfire under the right conditions has the potential to burn the total acreage in 1-2 days.

Table P-2: Emissions PM10 and PM2.5 produced (tons):

Alternative	1	2	3	4	Wildfire
Landscape Burning					
PM10	0	1,300	1,273	1,300	
PM2.5	0	1,184	1,159	1,184	
Activity Burning					
PM10	0	307	238	483	
PM2.5	0	284	220	446	
Pile Burning					
PM10	0	7	7	5	
PM2.5	0	7	6	5	
Total Emission (PM10+PM2.5)	0	3,089	2,903	3,423	10,940[1]

1 Wildfire emissions were calculated for the same amount of acres as proposed for alternative #2

Cumulative Effects

Alternative 2, 3, and 4

Portions of the analysis area have been burned during the last 17 years. These burns ranged from a few hundred acres to several thousand. They were considered maintenance burns which help to reduce fine fuels and occur and a 7-10 year cycle. These burns consumed fine fuels and a small portion of the medium diameter fuels. Present and reasonably foreseeable activities would include prescribed burning from projects on the Heppner Ranger District: Rimrock Timber Sale (Landscape and activity burning), Mallory Wildlife Enhancement Prescribed Burn (Landscape prescribed burn), Black Mountain (Miscellaneous hand piles), Penland Lake (Miscellaneous hand piles), Wildcat Timber Sale (Landscape and activity burning), Kahler (Landings), Beaverslide (Landings), and Bologna Basin Timber Sale (Activity burning).

Cumulative effects of pollutants PM10 and PM2.5 in the airshed would happen if two project areas were burned within 1-2 days of each other. Smoke impacts would be mainly at night when nighttime winds flow down drainage and valley settling in low spots within the 50 mile radius of the project area. Day time winds generally disperse smoke with it settling at night. The Oregon Smoke management plan would be followed and no burning would take place if restricted by the plan, or any restrictions were forecasted by the Oregon smoke management forecasters. The Oregon Smoke Management Plan would take into consideration the cumulative effects of burning activities occurring on other government or private land.

Climate Change

The Wildcat Fuels Reduction and Vegetation Management Project includes land management activities that have the potential to directly and indirectly affect global climate change through the improvement of forest health and resilience in the event of disturbance. Prescribed fire (underburn), mechanical fuels treatment, non-commercial thinning and commercial harvest are proposed throughout all action alternatives in the Wildcat Project. This section will address the potential qualitative effects each action may have on green house gasses (GHG) emissions and the global carbon cycle.

Prescribed Fire:

Proposed underburn activity in the Wildcat Project ranges from 10,079 – 10,288 acres. On average the Heppner Ranger District can implement roughly 2,000 acres per season. The implementation of the underburn will release carbon dioxide and particulates directly to the atmosphere which will increase the amount of GHG in the short term. However, the long term effects of proposed maintenance and restoration underburning are as follows.

- There is an indirect effect on climate change resulting form the reduction of potential GHG emissions from treated acres. This effect would be realized because the threat of uncharacteristic wildfires on these acres would be reduced. The occurrence of a wildfire on the represented acres will result in 2 – 5 times the release of GHG and particulates to the atmosphere (Consume 3.0).
- There is an indirect effect on climate change through treating these acres because live stands of trees will retain higher capacity and vigor to sequester atmospheric carbon dioxide, compared to stands killed by severe wildfire (Fellows and Goulden, 2008).
- There is an indirect effect on climate change through the potential of incidental thinning of stands with fire to reduce stocking densities, susceptibility to insect and disease attack, and competition for resources between residual (generally larger diameter) trees. These factors will enable residual trees to reduce GHG levels through accumulation of biomass (carbon) and assimilation of atmospheric carbon (CO2) at an increased rate (Fellows and Goulden, 2008).

Mechanical Fuels Treatment:

Proposed mechanical fuels treatment activity in the Wildcat Project ranges from 1,358 – 2,113 acres. The implementation of mechanical fuels treatments in the Wildcat Project will decrease the level of standing dead and down material (woody biomass) within the treatment units. Additionally, the mechanical fuels treatments will non-commercially thin understory trees in designated units. The following long term effects derived from mechanical fuels treatment are as follows.

- There is no direct effect on climate change associated with the removal of woody biomass (carbon) from the mechanical fuels treatments and thinning.
- There is an indirect effect on climate change through the removal of woody biomass from the available fuel bed. This will reduce the potential GHG emissions in the event of an uncharacteristic wildfire.
- There is an indirect effect on climate change through non-commercial thinning of stands to reduce stocking densities, susceptibility to insect and disease attack, and competition for resources between residual (generally larger diameter) trees. These factors will enable residual trees to reduce GHG levels through accumulation of biomass (carbon) and assimilation of atmospheric carbon (CO2) at an increased rate (Fellows and Goulden, 2008).

Non-Commercial Thinning:

Non-commercial thinning activities are proposed for 2,544 – 3,299 acres. The implementation of non-commercial thinning is designed to maximize forest productivity and health providing both increased carbon storage capabilities and long term forest resiliency in the face of natural disturbance. Non-commercial thinning may have the following long term effects.

- There is no direct effect on climate change as a result of thinning understory trees.
- There is an indirect effect on climate change through the removal of overstocked understory trees. This will allow the residual trees to accumulate growth at an increased rate maximizing carbon storage ability.
- There is an indirect effect on climate change through non-commercial thinning of overstocked forest stands. Non-commercial thinning increases forest health by reducing the amount of intra- and interspecific competition between residual trees. The reduction of competition increases the growth of biomass (carbon storage) and increases an individual tree's ability to resist and recover from disturbance (fire, insect, browse damage, disease, or wind).

Commercial Thinning:

Commercial thinning is proposed on 1,622 – 2,218 acres within the Wildcat Project. Commercial thinning reduces tree density within each treatment unit based on recommended species retention, species composition, and forest structure. Prescriptions are designed to provide for long term forest health and resilience. The following effects to carbon storage and GHG emissions are provided by commercial thinning activities in the Wildcat Project.

- There is no direct effect on climate change derived from implementation of commercial thinning activity.
- There is an indirect effect on climate change through the removal of overstocked mature trees. This will allow residual trees to accumulate growth at an increased rate maximizing long term carbon storage ability through the assimilation of atmospheric carbon.
- There is an indirect effect on climate change through the promotion of forest health enabling increased vigor, growth, and resilience to disturbance in the residual trees. Resilience to disturbance is important to the long term health of the forest ecosystem and provides continued carbon storage ability under adverse conditions (i.e. drought).

Incomplete information

Although it is possible to quantify a project's direct effects on carbon sequestration and green house gas emissions, there is no certainty about the actual intensity of individual project indirect effects on global climate change. Uncertainties in managing for climate change, in total, are clearly too large and diverse to support choosing a single approach above the other.

RECREATION

This section incorporates by reference the Recreation and Visual Quality Report for the Wildcat Project contained in the project analysis file at the Heppner Ranger District. Analysis methodologies and other details are contained in the report and the affected environment and predicted effects of the Proposed Action and its alternatives are discussed in this section.

Scope of Analysis

The scale of analysis for recreation resources was accomplished at the project area boundary of 25,450 acres within the National Forest boundary.

Camping

Current Condition

Developed Campsites – There are no developed recreation sites within the analysis area.

Dispersed Campsites – There are no dispersed camping sites in Managed Old Growth (C2), and Grass-Tree Mosaic (C8). There are 88 mapped dispersed sites in the remaining management areas. These sites are scattered throughout the project area, however, there are several sites that are very heavily used along open Road 21 and 2100140. Refer to Table R-1 for the number of dispersed campsites within each management area. A generic description of a dispersed campsite consists of a user-made area that is generally adjacent to a developed road. The site often has a meat pole in the trees, a rock fire ring and a hardened parking/camping surface for one to three families. Dispersed camping has traditionally been a popular activity in the area, particularly during big game hunting season.

Table R-1: Number of Dispersed Sites by Management Area

Dispersed Campsites by Management Area	Number of sites
Viewshed 2 (A4)	1
Dedicated Old Growth (C1)	10
Managed Old Growth (C2)	0
Big Game Winter Range (C3)	2
Wildlife Habitat (C4)	23
Riparian (C5)	15
Grass-Tree Mosaic (C8)	0
Timber and Forage (E1)	26
Timber and Big Game (E2)	11

Direct and Indirect Effects

Alternative 1

Campers would remain undisturbed by noise, smoke, or traffic. Dispersed campsite use patterns would remain the same.

Alternative 2, 3, and 4

Table R-2: Proximity of Proposed Treatment Units to Dispersed Campsites

		Alt 2 & 4	Alt 3
Dispersed Campsites within Units			
	# of Campsites	20	16
	# of Treatment Units	12	10
Dispersed Campsites Adjacent to Units			
	# of Campsites	22	20
	# of Treatment Units	17	16

Visuals - Sites that are near or within harvest units would experience a more open stand. All units, with the exception of those with high spruce budworm infestation, would remain fully stocked after treatment. In these areas, campers may experience a decreased visual experience since sight distances would increase.

Dust and Noise - Some campsites would experience an increase in dust and noise during harvest and thinning activities, and by an increased of traffic on haul routes. Some recreationists could be displaced from their campsite, but the effects would be limited to a small number of sites at one time and would cease as soon as treatment of the adjacent unit is complete (generally 1-2 weeks as work is occurring).

Smoke - Sites could also be affected by smoke from prescribed burning. This would most generally occur on the fringes of the camping season because conditions during the main camping season are too hot and dry to allow adequate control of fire. Late fall campers (primarily hunters) would be most likely affected. Hunters may be displaced from their favorite camping site for one season during prescribed burning window.

Cumulative Effects

No cumulative effects to camping are anticipated.

Trails and Dispersed Recreation

Current Condition

There are a number of popular dispersed recreation activities in the area besides camping:

- hiking
- horse riding
- All Terrain Vehicle (ATV) riding
- mushroom picking
- firewood gathering
- hunting
- sight seeing
- snowmobiling

There are 29.1 miles of trails in the project area: Alder Creek (#3051), Copper Butte (#3052), Skookum (#3053), and Madison (#3054). Copper Butte Trail is entirely within the Texas Butte Roadless Area. The other trails begin in the project area and lead to the Texas Butte Roadless Area. These trails are primarily used by hunters with horses during hunting season. ATV use also occurs on open, one-lane, gravel roads within the analysis area. There are no developed trailheads within the project area. There is 21 miles of snowmobile trails in the project area, 3 miles of ungroomed and 19 miles of groomed.

The areas that the trails dissect have been impacted by the spruce budworm infestation in the late 1980s and early 1990s. Many areas have standing and/or down dead trees creating hazardous fuel conditions. Also, in portions of the area, overstory trees are infected with dwarf mistletoe.

Direct and Indirect Effects

Alternative 1

No trails would be affected under this alternative. Dispersed recreation would also remain unchanged.

Alternative 2, 3, and 4

Under all alternatives, Alder Creek Trail borders commercial thinning unit 22 and noncommercial thinning unit 204 and 221. This trail also goes through mechanical fuels units 96 and 98, and pre-commercial thinning unit 205.

Alternative 2 and 4

Under Alternatives 2 and 4, Madison Trail goes through commercial thinning units 30 and 39. Skookum Trail goes through mechanical fuels units 14 and 74.

Alternative 3

Under Alternative 3, Madison Trail goes through commercial thinning unit 39. Skookum Trail does not travel through any units under this alternative.

In all alternatives, activities associated with commercial thinning, mechanical fuels reduction, prescribe burning would present safety issues for the public. By restoring and maintaining a more sustainable species composition, high intensity fires would be less of a threat to the recreational use of the area, and a safer atmosphere would exist for the recreational user.

General forest aesthetics would be negatively affected during and shortly after the project until the slash is treated and skid trails restored.

Increased vehicle traffic during harvest and thinning activities may deter recreational user activities. An increase in desire to use the area for hiking and dispersed recreational activities may increase in the long term (5-10 years) due to an increase in vegetative health and visual aesthetic.

Hunting activities may also be disturbed during thinning and burning activities. Most encounters would be minimal and short-term (1-2 years).

Cumulative Effects

Two ongoing activities that occur within the project area have the potential to disturb trail users and dispersed camping. Cattle grazing occurs within the entire project area. Impacts from grazing that could affect recreational use would include sights and sounds of current and past grazing along trails and in dispersed camp sites. Although this activity would not prohibit use it would alter a users experience. Fire wood cutting and gathering also occurs along open roads. This activity would not affect trail use but could affect dispersed camping through disturbance. This disturbance would be generally less than a day but at a different time than most of the proposed activities of the Wildcat project thereby extending the total time of disturbances to a forest user. There are no other past or future activities in the project area that would cumulatively affect recreational users in the Wildcat project area.

Visual Quality

Current Condition

A4 Viewshed – 417 acres occurs along approximately 2 miles of FS road 2100. Evidence of many activities can be seen, including: roads, stumps and campsites. Form is open, line is diverse, color includes vegetation, texture is varied with conifer, grass and shrubs. These areas are managed with visual quality objectives of partial retention in the foreground and modification in the middle ground.

C1 Dedicated Old Growth – 1,052 acres occurs within the project area. These stand have predominately larger trees with evidence of decline and decay. Generally two or more age classes exist with abundance of dead and down wood material. These areas are managed in a natural appearing (retention) landscape. Visual quality will be subordinate to old growth habitat goals.

C2 Managed Old Growth – 83 acres occurs within the project area. This area exhibits old growth characteristics with predominately an even aged structure. These areas are managed from a natural appearing (retention) landscape to a modified (maximum modification) visual setting.

C3 Big Game Winter Range- 5,435 acres occurs within the southern half of the project area. This area is patches of conifers ranging from 8 to 16 inches. Form is of clumps of co-dominate trees with open spaces, containing small sapling size conifers with grass and shrub understory, line color, and texture are minimized by vegetation. These areas are managed with visual quality objectives from retention to maximum modification

C4 Wildlife Habitat - 10,202 acres occurs within the northern portion of the project area. The existing condition is similar to C3. These areas are managed with visual quality objectives from retention to maximum modification. Visual quality will be subordinate to wildlife habitat goals.

C5 Riparian – 1,210 acres occurs within the project area. The existing condition is similar to C3, however, more dominate trees are evident with areas appearing in a more natural state. These areas are managed with visual quality objectives from retention to a modified visual setting.

E1 Timber and Forage - 7,251 acres occurs in the center of the project area. The existing condition is similar to C3. These areas are managed to meet at least the maximum modification visual quality objectives.

E2 Timber and Big game - 3,574 acres occurs within the project area. The existing condition is similar to C3. These areas are managed to meet a modified visual setting.

No management activities are proposed within C8 management area. No further discussion will follow. Management areas A4, C3, C4, E1 and E2 would receive treatment and may affect visual quality, therefore, the analysis will only discuss these 5 areas.

Direct and Indirect Effects

Alternative 1

The management areas and their Visual Quality Objectives would not be altered by management activities; changes would be shaped by natural events. Scenic character would be subject to cyclical, natural disturbance processes such as insect and disease, fire, wind, drought, and vegetation succession. The current state of the timber stands and high hazardous fuel loads would contribute to high intensity fires.

Alternative 2, 3, and 4

A4 Viewshed

Alternative 2, 3, and 4 – The A4 Viewshed management area would have 83 acres of thinning treatments (commercial and non-commercial) in alternative 2 and 4 and 79 acres in alternative 3. Various species and tree sizes would remain in a scattered pattern, therefore, the management objectives of partial retention in the foreground and modification in the middle and background would be met. There would be a beneficial effect on visual quality because these areas would promote large tree retention with multi age and size classes subsequently improving stand health and vigor. In order to retain the naturalness in the foreground, stumps would be cut below 1 foot and slash would be cleaned up within one year. In the short term (2-5 years) following treatment the changes in form, line, color, and texture would be noticeable but as ground vegetation grows the visibility of disturbed soil and stumps would be diminished. General forest aesthetics, due to thinning slash and prescribed fire, would be negatively affected during and shortly after the project (1-2 years) until the slash is treated and skid trails restored.

Prescribed burning on 315 acres would increase changes in color in the first year or two, usually considered undesirable by the public, but after spring green-up in the following year the visibility of black ground and tree boles would be reduced.

C3 Big Game Winter Range and C4 Wildlife Habitat

Alternatives 2, 3 and 4 – Within the C3 management area, 97 acres would have thinning treatments in alternatives 2 and 4, and only 3 acres would be thinned in alternative 3. Within the C4 management area, 1,991 acres within alternative 2, 1,645 acres within alternative 3, and 1,952 acres within alternative 4 would have thinning treatments. In the foreground and middle ground this would create an increase in form and line by increasing the space between tree boles and reducing understory vegetation. Thinning slash would be visible in the foreground and middle ground as needles brown. After about 10 years, as the stands grow and the understory becomes more predominate, the residue would be masked and unnoticeable.

An additional 628 acres of prescribed burning in C3 areas, and approximately 2,000 acres of prescribed burning and mechanical fuels treatments in C4 areas, would further reduce ground and understory vegetation creating an increase in open space. This would result in an increased difference in form and line. The forest would remain dominated by conifer overstory and an herbaceous understory. Because all the prescribed burning would not occur in the same season or same year, a mosaic pattern of color change on the forest floor would occur on a yearly basis for about 5 consecutive years. After spring green-up this change in color would diminish.

E1 Timber and Forage and E2 Timber and Big Game

Alternatives 2, 3 and 4 – Within the E1 management area, 787 acres would have thinning treatments in alternatives 2 and 4, and 786 acres would be thinned in alternative 3. Within the E2 management area, 185 acres within all alternatives would have thinning treatments. In the foreground and middle ground this would have the same result as described above.

An additional 2,358 acres of prescribed burning in E1 areas, and approximately 3,445 acres of prescribed burning and mechanical fuels treatments in E2 areas, would further reduce ground and understory vegetation creating an increase in open space. This would have the result as described above.

Cumulative Effects

Past activities have led to the existing visual quality ranging from retention to maximum modification. The degree of modification is mosaic across the forest. Past activities include timber harvest, grazing, prescribed fire, road building and recreation.

Present and reasonably foreseeable activities that affect visual quality are grazing, road maintenance, recreation, fire suppression, and firewood gathering. There are no reasonably foreseeable future activities planned for this project area that are not ongoing at this time.

The effect of this project combined with ongoing projects would result in little change in form and texture of the forest beyond that from the project itself. Line would continue to increase as snags are cut for firewood. Road maintenance and recreation would be more visible with the decrease in forest vegetation. When ladder fuels are removed, camp sites and forest user visibility would increase. Grazing may reduce forest vegetation that is concealing stumps from harvest activities. This would be important in the A4 viewshed management area where forest management activities should remain visually subordinate in foregrounds.

Summary

All activities proposed in the Wildcat project would be consistent with the Forest Plan standards and guides and would aid in moving the area toward Forest Plan desired future conditions for visual resources.

LANDSCAPE CHARACTERISTICS

This section incorporates by reference the Landscape Characteristics section of the Wildcat Project contained in the project analysis file at the Heppner Ranger District. Analysis methodologies and other details are contained in the report and the affected environment and predicted effects of the Proposed Action and its alternatives are discussed in this section.

During public involvement, Oregon Wild referred to their inventory of “non-inventoried roadless areas” they created using criteria they developed and asked the forest service to consider the effects to these areas. They stated their “non-inventoried roadless areas” contain roadless area characteristics such as water quality; healthy soils; fish and wildlife refugia; centers for dispersal, recolonization, and restoration of adjacent disturbed sites; reference sites for research; non-motorized, low-impact recreation; carbon sequestration; refugia that are relatively less at-risk from noxious weeds and other invasive non-native species, and many other significant values.

The Forest Service prepared an inventory of areas with wilderness potential following procedures and criteria found in Forest Service Handbook 1909.12, Chapter 70 (Project File). This inventory is the best available information about this resource topic for the Wildcat project (Project File). Lands with characteristics consistent with the criteria meet the statutory definition of wilderness and were included in the inventory of areas with wilderness potential. Lands with characteristics not consistent with the criteria were excluded from the inventory. Typical reasons lands were excluded include: areas were too small (less than 5,000 acres); they were not contiguous with existing wilderness and/or inventoried roadless areas; they were not self-contained ecosystems and could not be effectively managed as wilderness; and lastly, improvements and developments were substantially recognizable and evident such as stumps, skid trails, roads, landings or discontinuities in canopy closure between harvested and unharvested landscapes. Local knowledge and judgment regarding unique, site-specific conditions were used to locate boundaries at prominent natural or semi-permanent human-made features to facilitate easy on-the-ground identification.

Scope of Analysis

All effects analysis was accomplished within the project area boundary. Of the 9,478 acres of Oregon Wild’s “non-inventoried roadless areas” within the project boundary 2,114 acres met forest service criteria and are within the forest service inventory of areas with wilderness potential. The remaining acres of Oregon Wild’s ‘non-inventoried roadless areas” did not meet forest service criteria and are outside the Forest Service inventory of areas with wilderness potential (Project File).

The current condition of soil, water quality, air quality; plant and animal communities; habitat for threatened, endangered, and sensitive species; noxious weeds, recreation; and cultural resources are described elsewhere in Chapter 3 of this EA. Evaluation criteria used to compare impacts to landscape characteristics are natural integrity and apparent naturalness, solitude and remoteness, and special features.

Current Condition

There are no designated wilderness areas within the Heppner Ranger District or within the project boundary. Wilderness evaluation and wilderness recommendations are a forest planning issue and outside the scope of this site-specific analysis and decision.

There are two Forest Service inventoried roadless areas (Texas Butte, 6,871 acres and Skookum, 7,648 acres) adjacent to but outside the project boundary. No changes were made to these boundaries. No activities or projects are proposed within these two inventoried roadless areas.

No timber harvest, mechanical fuel activities, or road construction are proposed within the inventoried areas with wilderness potential. Table U-1 displays the acres of areas with wilderness potential within the project boundary. All inventoried areas with wilderness potential within the Wildcat project boundary are contiguous with either the Texas Butte or Skookum inventoried roadless areas (Figure U-1).

Table U-1: Acres of Areas with Wilderness Potential

Area With Wilderness Potential	Acres
Texas Butte	**303**
Skookum	**1,810**

Exclusive of the areas with wilderness potential, the existing condition of all remaining lands within and affected by the Wildcat project presents a landscape that has been managed and is generally developed in nature. For the reasons described earlier these lands (including 7,364 acres of Oregon Wild's "non-inventoried roadless areas") did not meet the inventory criteria for an area with wilderness potential. Past management and current developed conditions within the project boundary reflect the intent and decisions made in the Forest Plan (1990 as amended).

Natural integrity and apparent naturalness: Within areas with wilderness potential human influences have had limited impact on the natural appearance or long-term ecological process. Fire has been and most likely will continue to be the factor with the most potential to impact the naturalness and undeveloped nature of the area. Opportunities for primitive recreation are limited to hiking, mostly cross-country, and hunting.

For the remaining managed and developed lands within the Wildcat project boundary the evidence of past and current timber harvest, motorized ATV use, and motorized use on existing forest service system roads is substantially recognizable. Livestock grazing has occurred within all areas for at least the past 100 years, fire suppression activity for approximately that same length of time, and dispersed recreation, including hunting and camping. Ongoing removal of danger trees along forest roads changes the vegetation but does not change the overall sense of naturalness along a developed transportation corridor. Over the past several decades, fire exclusion has altered natural ecological processes. Suppression of fire in these areas has helped create the stand composition and structure that is now present. In the dry upland forest, stands once dominated by open park-like stands of ponderosa pine have closed in with shade tolerant species such as Douglas-fir and grand fir. The amount of this situation across this landscape is uncharacteristic (un-natural) and not desired.

Solitude and remoteness: Within areas with wilderness potential the opportunities for a feeling of solitude, the spirit of adventure and awareness, serenity, and self-reliance do not really exist because nearby, non-conforming sights and sounds of roads and timber harvest can be seen from within both areas with wilderness potential.

For reasons described above, within the remaining managed and developed lands within the Wildcat project boundary, there is little opportunity for either solitude or remoteness. These lands are not recognized or used by the public to find a feeling of solitude, remoteness, the spirit of adventure and awareness, serenity, or self reliance. Existing roads and human use on these roads combined with clear and substantially recognizable evidence of past timber harvest precludes a feeling of solitude and remoteness.

Special features: Outdoor education or specialized scientific studies were identified as possible opportunities within the two areas with wilderness potential.

No special features or unique qualities (geological, air quality, wildlife, T&E habitat, biological, ecological, cultural, or scientific) were identified within the managed and developed landscapes of Wildcat project area *(EA, Chapter 3 and Project File).*

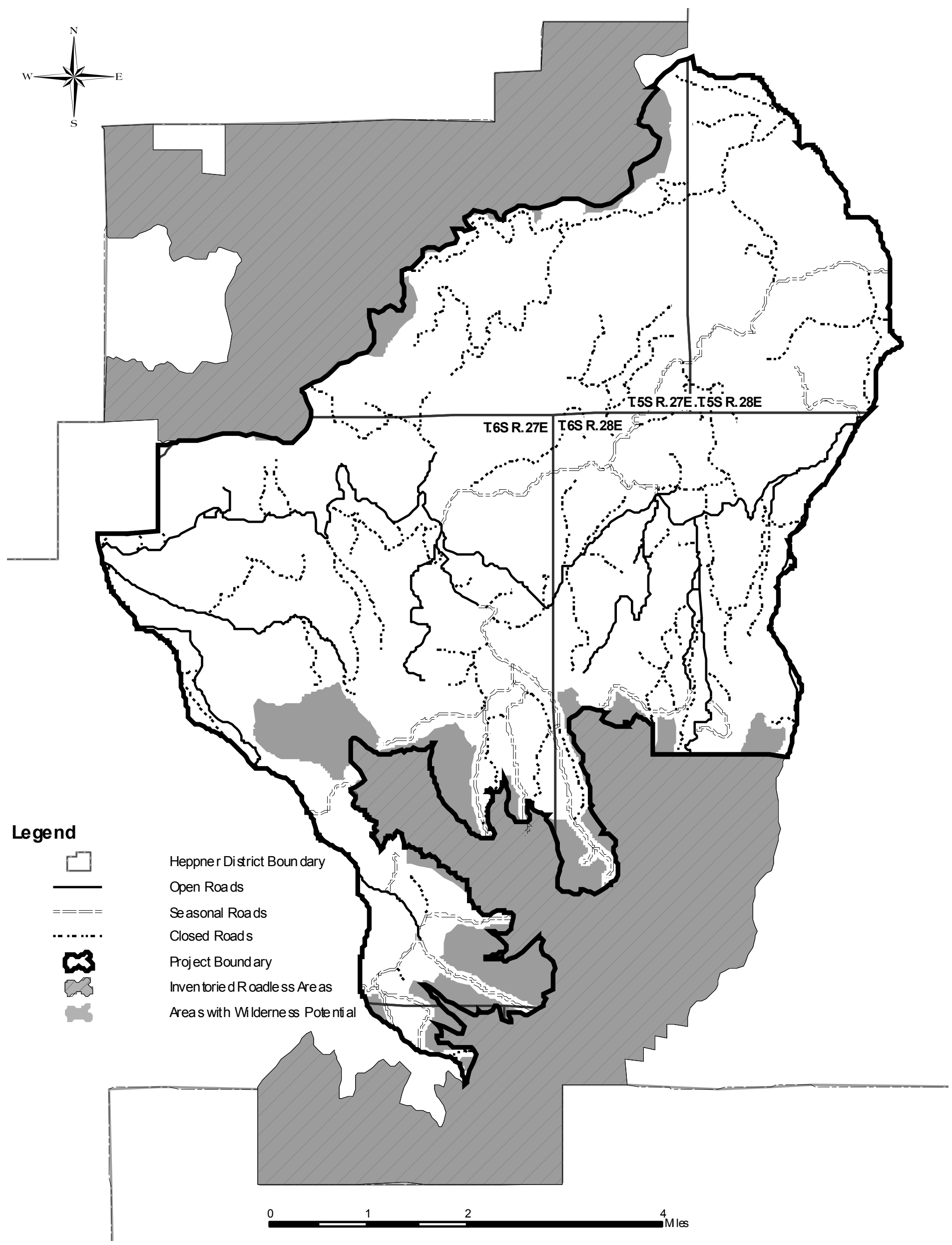

Figure 3.13: Inventoried Areas with Wilderness Potential

Direct and Indirect Effects

Alternative 1

Natural integrity and apparent naturalness: There would be no direct effect on the natural integrity or the apparent naturalness therefore the conditions described in the affected environment would remain unchanged except by natural processes and ongoing management activities. Biological and ecosystem functions would likely continue as they are in the present condition. A potential indirect effect may occur because these areas would move further away from their historical range of variability making stands less resistant to insect and disease infestations. (Chapter 3, Forest Vegetation section.)

Solitude and remoteness: There would be no direct or indirect effects on the current opportunities for solitude and remoteness in both the short or long term therefore the conditions described in the affected environment would remain unchanged except by natural processes and ongoing management activities.

Special features: There would be no direct or indirect effects on special features within inventoried areas with wilderness potential. For the remaining managed and developed lands within the Wildcat project boundary no special features were identified in the affected environment therefore the conditions described in the affected environment would remain unchanged except by natural processes.

Common to Alternative 2, 3, and 4

Natural integrity and apparent naturalness- There would be no direct effect to the natural integrity or apparent naturalness within inventoried areas with wilderness potential (including 2,114 acres of Oregon Wild's "non-inventoried roadless areas") from timber harvest, mechanical fuel activities, and road construction because those actions are not proposed in these areas. Prescribed burning within these areas would change composition and structure of vegetation (EA, Chapter 3). For a few years burned areas would display a blackened color. Outside the burned areas, the conditions described in the affected environment for areas with wilderness potential would remain unchanged except by natural processes and ongoing management activities such as grazing and hunting. The sights and sounds of timber harvest and road building machinery would indirectly reduce a sense of naturalness during project operations but would not persist in the long term.

For the remaining managed and developed lands within the Wildcat project boundary the sights, sounds, and changes in vegetation from timber harvest and associated road construction and use would further decrease the natural integrity and sense of naturalness within harvest units and along roads. The landscape would continue to appear managed and developed. All harvested units would remain forested after harvest although skid trails, stumps, and landings would be evident. Stand structure would change, therefore, diversity of plant and animal communities may shift from current patterns but ecological diversity would remain (Chapter 3, Vegetation section). Impacts to natural integrity and sense of naturalness would likely be evident until stumps and vegetation canopies are no longer substantially recognizable (about 75 to 100 years). Given the current managed state of the area, some forest users may not differentiate the impacts from the action alternatives upon the existing conditions. These lands would continue to not meet inventory criteria for areas with wilderness potential. This outcome is consistent with the intent of the land allocation decisions made in the forest plan. The impacts to soil, water quality, air quality; plant and animal communities; habitat for threatened, endangered, and sensitive species; recreation; noxious weeds; and cultural resources are disclosed in other sections of this Chapter and are not reiterated here.

Solitude and remoteness – There would be no direct effect to solitude and remoteness within inventoried areas with wilderness potential (including 2,114 acres of Oregon Wild's "non-inventoried roadless areas") from timber harvest, mechanical fuel activities, and road construction because those actions are not proposed. Prescribed burning within these areas would change composition and structure of vegetation (EA, Chapter 3). For a few years burned areas would display a blackened color which could reduce a sense of solitude and remoteness to some. Outside the burned areas, the conditions described in the affected environment for areas with wilderness potential would remain unchanged except by natural processes and ongoing management activities such as grazing and hunting. The sights and sounds of timber harvest and road building machinery would indirectly reduce a sense of solitude and remoteness during project operations but would not persist in the long term.

For the remaining managed and developed lands within the Wildcat project boundary the sights, sounds, and changes in vegetation within timber harvest units and associated road construction and use would further decrease the sense of solitude and remoteness. The landscape would continue to appear managed and developed. Some impacts, such as the sounds of project activities, would occur only during the immediate time of the activity. Other impacts, such as tree marking paint and logging slash would be visible in the short term (about 5 to 10 years). Impacts such as closed roads, skid trails, and tree stumps would be evident much longer. The increased numbers of stumps and the open nature of the forest stand would likely be the most apparent visual change resulting from implementation. In the long term (about 50+ years), the project would result in the development of historic open, park-like conditions, characterized by larger diameter trees, though more stumps would be present than currently exist. These lands would continue to not meet inventory criteria for areas with wilderness potential. This outcome is consistent with the intent of the land allocation decisions made in the forest plan. The impacts to wildlife, fish, soils and other recourses are disclosed in other sections of this Chapter and are not reiterated here.

Special features: There would be no direct effect to special features within inventoried areas with wilderness potential because timber harvest, mechanical fuel activities, and road construction actions are not proposed. Therefore the conditions described in the affected environment for areas with wilderness potential would remain unchanged except by natural processes and ongoing management activities such as grazing and hunting.

For the remaining managed and developed lands within the Wildcat project boundary no special features were identified in the affected environment therefore the conditions described in the affected environment would remain unchanged.

Cumulative Effects

There would be no cumulative impacts to natural integrity or apparent naturalness, solitude and remoteness, and special features within inventoried areas with wilderness potential (including 2,114 acres of Oregon Wild's "non-inventoried roadless areas") from timber harvest, mechanical fuel activities, and road construction because those actions are not proposed. Prescribed burning and future wildfires would cumulatively change composition and structure of vegetation which could affect some forest visitor's sense of naturalness and remoteness.

For the remaining managed and developed lands within the Wildcat project boundary there would be no cumulative impacts to special features because there are no special features. Natural integrity or apparent naturalness and solitude and remoteness will be cumulatively impacted by grazing, dispersed camping, and motorized ATV and vehicle use on roads. Effects associated with recreational use, including noxious weed spread, hunting, fishing, erosion, litter, and evidence of fire rings, are expected to remain cumulatively minor. Ongoing removal of danger trees along forest roads changes the vegetation but does not change the overall sense of naturalness or sense of solitude along an existing developed transportation corridor. Overall, cumulative impacts from these activities on natural integrity or apparent naturalness, solitude and remoteness is very small (not measurable/indistinguishable) in proportion to the changes anticipated from the direct and indirect impacts of the alternatives disclosed above.

CULTURAL RESOURCES

This section incorporates by reference the Wildcat Heritage Report contained in the project analysis file at the Heppner Ranger District. Specific information on the methodologies, assumptions, and limitations of analysis and other details are contained in the report. A summary of the current conditions of the affected environment and the predicted effects of the Proposed Action and its alternatives are discussed in this section.

Scope of Analysis

All effects analysis was accomplished at the sub-watershed area scale (Little Wall Creek – Skookum Creek – 170702020803; Swale Creek – 170702020801) on National Forest lands consisting of 33,650 acres.

Current Condition

A review of the forest project records indicates that the all of the Wildcat analysis area has been surveyed. The following table gives a list of the projects that cover all or portions of the Wildcat project area.

There are 10 previously recorded sites either adjacent to (within 50 meters) or within the Wildcat planning area. Of these sites, 1 is historic and is unevaluated, 9 are prehistoric of which 3 are eligible and 6 are not eligible for the National Register of Historic Places.

Direct and Indirect Effects

All Alternatives

A review of the Umatilla National Forest heritage files indicates the current project area has been surveyed numerous times over the years. Several small projects and some larger projects have occurred in the current project area:

SKOOKUM TIMBER SALE
MAHOGANY FLAT PRESCRIBED BURN
WILSON, MORELAND, UPPER WALL TIMBER SALE
FY 1991 STREAM IMPROVEMENT PROJECT
SWALE CREEK PRESCRIBED BURN
THREE TROUGHS PLANNING AREA
GATES AND BARRICADES, GUARDRAILS
26F SUBWATERSHED INVENTORY
SWALE ANALYSIS AREA III
1994 ROAD OBLITERATION
COLD ROADSIDE SALVAGE TIMBER SALE
1994 GUARDRAIL/GATE PROJECT
EASTSIDE PRESCRIBED BURNS
CAMP MORELAND, COTTONWOOD, ETC
GATES AND GUARDRAILS
SUBSOILING AND MECHANICAL THIN
WEST END ROADSIDE HAZARD SALE
SKOOKUM LIVESTOCK EXCLOSURE
SKOOKUM PRESCRIBED UNDERBURN
LITTLE WALL GRAZING PERMIT REISSUANCE
SOUTHERN HAZARD TREE REMOVAL
SUNFLOWER BACON NATURAL FUELS

The above surveys followed the Umatilla National Forest Inventory strategy and can be accurately replicated from report maps and descriptions, and given the number of times the area has been surveyed it is considered adequate by current standards.

There are ten known sites which have the potential to be affected during the proposed activities in the Wildcat analysis area.

Seven of the ten known sites are located in the vicinity of the commercial and pre-commercial cutting units within the Wildcat Timber Sale project boundary. All of these sites are prehistoric and have been evaluated for the National Register of Historic Places (2 are eligible 5 are not eligible). The three remaining sites are located in and around the prescribed burning units. Of these remaining three sites one is historic (unevaluated but will be treated as eligible), two are prehistoric (1 eligible and 1 not eligible). All eligible and unevaluated sites will be avoided during all project activities (including temporary road building and skidding) by either excluding them from the cutting units or by flagging those that occur away from the edge of units.

Those sites which have features or material which may be affected by the burning activities would be blacklined to avoid the fire from affecting those attributes. Sites which may be near proposed firelines would be avoided.

TREATY RIGHTS

Current Condition

The Forest Service, through the Secretary of Agriculture, is vested with statutory authority and responsibility for managing resources of the National Forests. Commensurate with this is the obligation to consult, cooperate, and coordinate with Indian Tribes in developing and planning management decisions regarding resources on National Forest System lands that may affect tribal rights. Elements of respective Indian cultures, such as tribal welfare, land, and resources were entrusted to the United States Government as a result of treaties. Because tribal trust activities often occur in common with the public, the Umatilla National Forest strives to manage ceded land in favor of the concerns of the respective tribes, as far as is practicable, while still providing goods and services to all people.

Locally, the Wildcat Project Area lies within traditional lands of the Confederated Tribes of the Umatilla Indian Reservation and the Confederated Tribes of the Warm Springs Indian Reservation. The area was ceded to the United States Government as a result of the Treaty of 1855. Although the 1855 Treaties do not specifically mandate the federal government to manage habitats, there is an implied assumption that an adequate reserve of water be available for executing treaty-related hunting and fishing activities.

Trust responsibilities resulting from the treaties dictate, in part, that the United States Government facilitate the execution of treaty rights and traditional cultural practices of the Confederated Tribes of the Warm Springs Indian Reservation and Confederated Tribes of the Umatilla Indian Reservation by working with them on a government to government basis in a manner that attempts a reasonable accommodation of their needs, without compromising the legal positions of the respective tribes or the federal government. As a result, Confederated Tribes of the Warm Springs Indian Reservation and the Confederated Tribes of the Umatilla Indian Reservation were contacted via letter on March 2, 2007 to identify any concerns or alternatives they might have regarding the proposed action. No response was received.

Direct, Indirect, and Cumulative Effects

Common to All Action Alternatives

The potential effects of proposed timber harvest, thinning, and fuels treatments are discussed under the Fish Habitat, Water, Wildlife, and Cultural Resources sections. In summary, none of the alternatives would adversely affect fish habitat, water or cultural resources due to initial project design, project design elements, and Best Management Practices. Alternative 2 would result in greater long-term protection of big game habitat, due to a larger area treated, but there would also be a greater reduction in short-term habitat quality. Big game habitat would be affected to varying degrees under all action alternatives, although Alternative 3 would not reduce marginal cover below the Forest Plan standards or further affect elements of HEI in the C3 management area. Alternative 3 would also provide for the retention of various habitat types throughout the project area. See respective sections for a more thorough discussion of effects on water, fish habitat, and wildlife.

ECONOMICS

This section incorporates by reference the Wildcat Economics Report contained in the project analysis file at the Heppner Ranger District. Specific information on the methodologies, assumptions, and limitations of analysis and other details are contained in the report. A summary of the current conditions of the affected environment and the predicted effects of the Proposed Action and its alternatives are discussed in this section.

Scope of Analysis

The direct revenue and costs are identified for each alternative measuring the value of wood products to determine the estimated value of each alternative and viability of the Wildcat timber sale with the alternatives identified. While there are other economic values in terms of revenues and costs that will be created from the implementation of this project to wildlife (terrestrial, aquatic), recreation, roads, soil, water and vegetation, the values are intangible and subject to individual personal judgment. Therefore given the inability to determine each person's values for each resource respective of the alternatives those values are unavailable and cannot be used.

This section deals with the economic viability of the Wildcat Project area timber sales. Economic viability is dependent on costs and revenues associated with a particular timber sale. Timber sales, non-commercial thinning, fuel treatments, and associated resource work can generate employment and stimulate the local economy.

Other environmental factors such as water quality, fish, wildlife, soil productivity, have value that can be expressed in economic or non-economic terms. However, these other environmental factors do not have financial benefits and cost that are identifiable and quantifiable with relationship to the activities proposed for the Wildcat project. Therefore, an analysis would not show any financial or economic difference in those factors between alternatives. Therefore, economic analysis of those other environmental factors will not be included in this report.

Present Net Value

Current Condition

The affected area, or economic impact zone, for the Wildcat project includes Morrow, Grant, Wheeler, and

Umatilla counties in Oregon. Economic profiles have been developed for Morrow, Grant, Wheeler and Umatilla counties and are available at the Heppner Ranger district. The profiles summarize demographic, employment, and income trends in those counties. Refer to the Umatilla National Forest, land and Resource Management Plan, Final Environmental Impact Statement, Appendix B, for additional detail description of the main social and economic characteristics of the area (USDA 1990).

Direct and Indirect Effects

Timber values and logging costs have the most direct effect on the economic viability of this project. Market conditions may fluctuate widely throughout the year, and depending on the time of year this sale is offered for auction, the current estimates may or may not be accurate, which could have an impact on the final sale values. Rising or falling fuel and delivered log prices could create a substantial increase or decrease in sale operation and manufacturing costs.

Table E-1: Financial Summary by Alternative

Item	Alt 1	Alt 2	Alt 3	Alt 4
Discounted Revenues	$0	$1,010,250	$860,250	$984,000
Discounted Costs	$0	$627,072	$581,123	$583,040
Present Net Value (PNV)	$0	$383,179	$279,127	$400,960
Cost/Benefit Ratio (gross value/ associated costs)	N/A	1.61	1.48	1.69
MBF (Volume)	0	6000	5000	6000

Alternative 1

This alternative would not harvest any timber and therefore would not produce any revenue or support direct, indirect or induced employment, or increased income to local economies. Current downward trends in timber harvesting from National Forests lands would continue into the future. Current employment in the wood products sector of the local economy would remain unchanged.

Alternative 2

Alternative 2 was found to be economically viable with a net present value of $383,179. Alternative 2 has a higher present net value (PNV) than alternative 3 because it has more timber volume. Alternative 2 has a lower PNV than alternative 4 because alternative 2 has more road construction, temporary roads, and maintenance costs. Additionally, alternative 2 includes skyline logging where alternative 4 does not. The cost benefit ratio of this alternative is 1.61. The cost benefit ratio takes into account Forest Service costs outlined above including contract administration.

Alternative 3

Alternative 3 was found to be economically viable with a net present value of $279,127. Alternative 3 has a lower PNV than alternative 2 because alternative 3 includes less timber volume, more skyline logging systems, and similar road costs. Alternative 3 has a lower PNV than alternative 4 due to less timber volume and the inclusion of skyline logging in alternative 3. The cost benefit ratio of this alternative is 1.48.

Alternative 4

Alternative 4 was found to be economically viable with a net present value of $400,960. This alternative has a higher PNV than all other alternatives because it includes equal or greater timber volumes in addition to reduced logging costs (skyline logging is not included in this alternative). The cost benefit ratio of this alternative is 1.69.

Cumulative Effects

Past Activities

Past timber harvest activities on all ownerships within the local area have affected the viability of timber harvest to the extent that the present industrial infrastructure and workforce have developed as a result of the past activities. The effects of specific activities on the viability of timber harvest are not measurable.

Present and Reasonably Foreseeable Activities

Due to the competitiveness of the market, and its global nature, none of the alternatives would in themselves affect prices, costs or harvest viability of other present or reasonably foreseeable timber sales in the area.

COMPLIANCE WITH OTHER LAWS, REGULATIONS, AND POLICIES

This section describes how the action alternatives comply with applicable State and Federal laws, regulations, and policies.

National Historic Preservation Act

This section incorporates by reference the Wildcat Heritage Report contained in the project analysis file at the Heppner Ranger District.

Before project implementation, State Historic Preservation Office consultation would be completed under the Programmatic Agreement among the United States Department of Agriculture, Forest Service, Pacific Northwest Region (Region 6), The Advisory Council on Historic Preservation, and the Oregon State Historic Preservation Officer regarding Cultural Resource Management on National Forests in the State of Oregon, dated March 10, 1995.

Identified sites will be protected from all project activities associated with the Wildcat Project. Should additional sites be found during ground disturbing activities, contract provisions would provide protection and the Zone Archaeologist would be immediately notified.

Endangered Species Act and Regional Forester's Sensitive Species

The Endangered Species Act requires protection of all species listed as "threatened" or "endangered" by federal regulating agencies (Fish and Wildlife Service and National Marine Fisheries Service). Biological Evaluations for Endangered, Threatened, and Sensitive plant, wildlife, and fish species have been completed. Determinations were made that none of the proposed projects would adversely affect, contribute to a trend toward Federal listing, nor cause a loss of viability to the listed plant and animal populations or species.

Details regarding the actual species found within the Wildcat analysis area and the potential effects of proposed activities on those species and their habitat are contained under the Terrestrial Wildlife, Aquatic Habitat and Fish, and Botanical Species: Proposed, Endangered, Threatened, and Sensitive species sections of this EA.

Inventoried Roadless Areas, Wilderness, and Wild and Scenic Rivers

No Inventoried Roadless Areas lie within the Wildcat project area. The Texas Butte Roadless area lies to the north of the project area and the Skookum Roadless area lies to the south of the project area. No activities are proposed in this project within either roadless area. There is no wilderness within the project area. There are no wild and scenic rivers within the project area.

Clean Water Act

This section incorporates by reference the Wildcat Hydrology Report contained in the project analysis file at the Heppner Ranger District.

Past roads and timber management activities have been identified as contributing to non-point sources of pollution in the Wildcat project area. The strategy to protect water from non-point source pollution includes implementation of Best Management Practices, Project Design Criteria, and monitoring for detection and validation of water quality concerns. The Forest Plan states that the Forest would implement Best Management Practices to meet water quality standards.

Best Management Practices (BMPs) are steps taken in project planning as well as on-the-ground mitigations which protect water quality. The actions proposed for this project were designed during planning to protect water quality. For example, the design includes no harvest and no ignition in riparian areas. No temporary roads are proposed in riparian areas. Actions in riparian areas have site-specific mitigations to insure that water quality is not compromised. There is a list of Best Management Practices in Appendix A.

Project design criteria are practices that the interdisciplinary team developed during this analysis to address site-specific environmental concerns that may not be sufficiently addressed by existing management requirements. Examples of project design elements are: A) No hauling over open water fords unless dry; or B) Heavy equipment would not operate when soil is wet enough to be damaged by such operation. Damage refers to effects to roads which would not be repaired by normal blading. Damage also refers to environmental effects which would limit the beneficial use of any water body.

Section 303 of the Clean Water Act requires the states to list the streams whose use is impaired because they do not meet water quality standards. The water quality standards which may be affected by thinning and mechanical fuels treatments, road building, and prescribed burning are stream temperature because of reduced shade in riparian areas and sediment and turbidity from soil exposure in Riparian Habitat Conservation Areas.

There are 4 Wildcat analysis area streams on the 303(d) list. The practices that the Wildcat project would use to insure that there would be no degradation to streams are detailed in the Best Management Practices.

By implementing any of the action alternatives including best management practices, project design elements, and continued monitoring the Wildcat project would be in compliance with the Clean Water Act and the Forest Plan.

Clean Air Act

This section incorporates by reference the Wildcat Air Quality Report contained in the project analysis file at the Heppner Ranger District. Methodologies, assumptions, and limitations of analysis and other details are contained in the report and the affected environment and predicted effects of the Proposed Action and its alternatives are discussed in this section.

The airshed over and around the Wildcat analysis area currently meets air quality standards for Class II Airsheds (Oregon Smoke Management Annual Report, 2001). The closest Class I Airshed-designated Wilderness Areas are the Strawberry Mountain Wilderness, approximately 71 air miles away, near John Day, Oregon, and the Eagle Cap Wilderness about 90 air miles away, east of La Grande, Oregon. Due to these distances and prevailing wind patterns, smoke intrusion into these areas is not likely.

All action alternatives would have a prescribed fire component that would create emissions. The emissions created could have an effect on public health. To minimize emissions, prescribed burning would take place under conditions favorable to effective mixing and dispersal of the smoke created to the greatest extent possible. Also, the treatments under each alternative would remove some of the fuels that would otherwise produce particulates, or would rearrange fuels so that they burn cleaner. The effects associated with prescribed burning would be of short duration and have little impact on surrounding communities and Class I Airsheds due to the remoteness of the project area from those areas.

Any prescribed burning operations within the project areas would comply with the State of Oregon's Smoke Management Implementation Plan, and would be implemented within guidelines of the Smoke Management Program. The State would implement restrictions on burning when wind predictions indicate smoke could be carried into sensitive areas. A listing of additional requirements is available in the Oregon Smoke Management Plan. In conclusion, this project would comply with the requirements of the Clean Air Act and be conducted in accordance with the operational guidelines agreed to by the Forest Service and the Oregon Department of Environmental Quality.

Water Rights and Use

This section incorporates by reference the Wildcat Vegetative Management Range Report contained in the project analysis file at the Heppner Ranger District.

A total of 34 ponds have been constructed on the Little Wall Creek Allotment. A total of 52 water developments have been constructed on the Swale creek Allotment. These ponds and troughs were constructed and/or used to help improve livestock distribution within pastures reducing the concentration of livestock. Water use of ponds associated with live stream channels are under permit by the Oregon State Water Resources Department.

There is no de-facto or designated domestic or municipal water supplies in the Wildcat project area.

Executive Order 13186: Neotropical Migratory Birds

This section incorporates by reference the Wildcat Terrestrial Wildlife Report and Biological Evaluation contained in the project analysis file at the Heppner Ranger District.

The Partners in Flight Bird Conservation Plan is used to address the requirements contained in Executive Order (EO) 13186 (January 10, 2001), Responsibilities of Federal Agencies to Protect Migratory Birds. Under Section 3(E) (6), through the National Environmental Policy Act, the Executive Order requires that agencies evaluate the effects of proposed actions on migratory birds, especially species of concern. Partners in Flight Conservation Planning allows the analysis of effects of proposed projects on neotropical migratory birds through the use of guidelines for priority habitats and bird species of concern for each planning unit. The conservation strategy does not directly address all landbirds species of concern, but instead uses “focal” species as indicators to describe the conservation objectives, and measures project effects in different “priority” habitats for the avian communities found in the planning unit. The Umatilla National Forest occurs in the Northern Rocky Mountain Landbird Conservation Planning Region, which includes the Blue Mountains sub-region and the Blue Mountains sub-province. Conservation planning for the Blue Mountains, Ochoco Mountains, and Wallowa Mountains sub-provinces is addressed in the Conservation Strategy for Landbirds in the Northern Rocky Mountains of Eastern Oregon and Washington (Altman 2000).

Activities under all action alternatives would be designed using the above strategy, and therefore would be consistent with Executive Order 13186. See the Neotropical Migratory Birds section for further discussion of effects on Neotropical migratory birds.

Executive Orders 11988 and 11990: Floodplains and Wetlands

This section incorporates by reference the Wildcat Water Resources Report contained in the project analysis file at the Heppner Ranger District.

Executive Order (EO) 11988 requires the Forest Service to avoid "to the extent possible the long and short term adverse impacts associated with the ... occupation ... or modification of floodplains..." The Wildcat Project is consistent with this EO because it does not propose to occupy or modify any floodplain. The Wildcat project would reduce past modifications to floodplains where road obliteration would occur.

Executive Order (EO) 11990 requires the Forest Service to "avoid to the extent possible the long and short term adverse impacts associated with the ... destruction or modification of wetlands." The Wildcat Project is consistent with this EO because it does not propose to destroy or modify any wetland. The Wildcat project would reduce past modifications to wetlands where road obliteration would occur.

Executive Order 12898: Environmental Justice

Executive Order 12898 requires that federal agencies adopt strategies to address environmental justice concerns within the context of agency operations. With implementation of the Proposed Action or any of its alternatives there would be no disproportionately high and adverse human health or environmental effects on minority or low-income populations. The actions would occur in a remote area and nearby communities would mainly be affected by economic impacts as related to contractors implementing harvest, thinning, planting, fuels treatment, and burning activities. Racial and cultural minority groups could also be prevalent in the work forces that implement planting, prescribed fire or thinning activities. Contracts contain clauses that address worker safety.

National Forest Management Act

The Wildcat project is consistent with the National Forest Management Act (NFMA) (36 CFR 219.8(e)) the activities and effects of the Wildcat project are consistent with the Umatilla Land and Resource Management Plan.

Forest Plan Consistency

The Umatilla National Forest produced the Forest Plan in accordance with the National Forest Management Act of 1976. This plan provides guidelines for all natural resource management activities and establishes management standards.

Forest Vegetation

The Umatilla National Forest produced the Forest Plan in accordance with the National Forest Management Act of 1976. This plan provides guidelines for all natural resource management activities and establishes management standards.

The vegetative manipulation (commercial and non-commercial thinning) associated with the Wildcat project is consistent with the Umatilla National Forest Land and Resource Management Plan FEIS and Record of Decision (see Forest Vegetation Report for details).

Regional Forester's Forest Plan Amendment #2 (Eastside Screens) incorporated additional wildlife habitat measures. To address this amendment, patterns of stand structure by biophysical environment have been compared to the Historic Range of Variability (HRV) for the analysis area. The amount and distribution of dry forest in the Old Forest Single Stratum structural stage is currently deficit as compared the historic range of variability. Late and old structural stage stands would be maintained and enhanced as a result of planned activities in the analysis area. No green trees greater than or equal to 21 inches diameter at breast height would be removed by timber harvest with the exception of those trees within the two aspen stands. A site specific Forest Plan amendment will be completed for this action in conjunction with the decision notice for this project. Stands would be thinned to move their condition towards an old forest condition. Harvest of diseased or insect/dwarf mistletoe-infested trees and other fuel reductions would also indirectly aid achievement of Historic Range of Variability for vegetation structure and species composition by reducing future fire intensities within the treated areas. Connectivity would be maintained between Late Old Structure stands; snags, green tree replacements, and down logs would be maintained as recommended in the Wildcat Wildlife Specialists Report and Biological Evaluation.

The non-commercial thinning, commercial thinning, salvage, and prescribed burning included in alternatives 2, 3, and 4 would not create any new forest openings. Uneven-aged management would be used in the commercial thinning units. Burning would be of low intensity where fuel levels are appropriate that newly created openings would not occur.

Fire/Fuels

Current Forest Plan direction identifies fuel standards by management area across the forest. Proposed activities would increase treated units toward the Forest Plan standard of an average of 9 to 12 tons per acre in the 0-3-inch size class (depending on management area). Proposed harvest treatments will increase fuel loading in the short term and may exceed standards on some acres. All harvest treatment areas are planned for prescribed fire treatments which will reduce fuel loading to within standards identified in the forest plan.

The actions and treatments proposed in this project tier to and would successfully implement the Forest Plan Standards and Guidelines for fuels management.

Refer to Chapter 2, project design elements, for Pacfish requirements for prescribed burning and project design criteria measures.

Wildlife Habitat

These activities meet the specifications described in the Forest Plan Amendment #11 (Eastside Screens) interim wildlife standard, Scenario A. The treatment proposals would be consistent with items 1, 3 through 5 of Scenario A (See Appendix D – Screens). Item 2 would be consistent throughout the project area with the exception of two aspen stands. Item 2 standard to maintain all remnant late and old structural live trees ≥ 21” dbh that currently exist would not occur under the three action alternatives. All action alternatives include a forest plan amendment for removal of live trees ≥ 21” dbh.

The Forest Plan standards and guidelines for C3 – Big Game Winter Range require the management of elk habitat to achieve a habitat effectiveness index of no less than 70. Due to the site capability and its influence on the potential to attain a habitat effectiveness index consistent with the forest plan the existing condition within the Big Game Winter Range yields a habitat effectiveness index of only 68. Although the action alternatives would result in no change to the habitat effectiveness index, alternatives 2 and 4 include a Forest Plan amendment. However, proposed activities would increase the amount of forage in the near future and forest canopy in the long-term, so this index would improve over time.

A goshawk nest was discovered in the south-central portion of the analysis area. This nest was located within a proposed commercial thinning unit. This unit was dropped from the project and a 30 acre (34-acre) nest stand containing the highest quality nesting habitat adjacent to this nest was identified. A proposed post-fledgling area (PFA) was also identified; this PFA is composed of a mosaic of structural stages, in accordance with habitat parameters suggested by Reynolds et al. (1992). Should new nest sites be found during project implantation a nest stand and post-fledging area would be identified.

Soils

All alternatives would be consistent with Forest Plan standards and guidelines for achieving soil quality maintenance objectives. The proposed activities would increase detrimental soil conditions on individual units. All units would remain within Forest Plan standards for detrimental soil conditions following all treatments. Because the land would be left in a condition of acceptable productivity, these alternatives comply with the 1990 Forest Plan requirements for Soil Productivity.

Water

All alternatives in this project comply with the Clean Water Act standard of maintaining water quality.

In accordance with the 1990 Forest Plan, the Wildcat Project uses planning and application Best Management Practices (BMPs) to maintain and improve water quality, and includes monitoring of BMP implementation and effectiveness. Results of BMP monitoring have allowed managers to adapt to watershed conditions. Recent monitoring shows that BMPs are being implemented and that they are effective at maintaining water quality in timber harvest areas.

Improvements in riparian conditions in timber sale areas result from using planning and application BMPs, and monitoring to see that BMPs are implemented and that they are effective. Because of using planning and application BMPs, and monitoring the implementation and effectiveness of the BMPs, the Wildcat Project is in accordance with the Clean Water Act and complies with the Clean Water Act requirements of the 1990 Forest Plan.

Aquatic – Fish Habitat

The Umatilla Forest Plan was amended in 1995 to incorporate PACFISH. PACFISH defines Riparian Habitat Conservation Areas surrounding streams and other riparian features, and identifies associated Riparian Management Objectives. Within the Wildcat analysis area, Riparian Habitat Conservation Area boundaries extend 300 feet from fish bearing streams, 150 feet from perennial, non-fish bearing streams, and 150 feet from wetlands larger than one acre, and 100 feet from intermittent streams or wetlands smaller than one acre.

These alternatives are consistent with Forest Plan direction regarding fish. None of the potential combined effects are expected to adversely affect PacFish Riparian Management Objectives or steelhead or redband trout population viability. Application of PacFish direction would maintain or improve fish habitat conditions in the analysis area.

These alternatives are also consistent with the Basin wide Salmon Recovery Strategy (All-H Strategy), as it requires following existing management direction in the short-term and following ICBEMP science in the long-term. These alternatives are also consistent with Wy-Kan-Ush-Mi Wy-Kish-Wit --- The Columbia River Anadromous Fish Restoration Plan of the Nez Perce, Umatilla, Warm Springs and Yakama Tribes. This restoration plan recommends that federal agencies follow existing land use and water quality laws and regulations – this would include PACFISH.

Falling of hazard trees, decommissioning roads, reopening closed roads, forwarding of wood across class four tributaries from five separate units (85, 93, 103, 112, and 177), removing conifer trees from aspen units, thinning noncommercially, and prescribe burning may occur within Riparian Habitat Conservation Areas. These activities are designed to comply with PACFISH Riparian Management Objectives. The project is consistent with the Forest Plan for water resources and riparian management.

Cultural Resources

Completed surveys followed the Umatilla National Forest Inventory strategy and can be accurately replicated from report maps and descriptions. Before project implementation, State Historic Preservation Office consultation would be completed under the programmatic Agreement among the United States Department of Agriculture, Forest Service, Pacific Northwest Region (Region 6), The Advisory Council on Historic Preservation, and the Oregon State Historic Preservation Officer regarding Cultural Resource Management on National Forests in the State of Oregon, dated March 10, 1995.

Identified sites would be protected from all project activities associated with the Wildcat project. Should additional sites be found during ground disturbing activities, contract provisions would provide protection and the Forest Archaeologist would be immediately notified.

Recreation and Landscape Characteristics

The Wildcat project would be in compliance with the Forest Plan, forest wide standards and guidelines for recreation (p. 4-47) and standards and guidelines for Management Areas (Analysis File, Recreation Report). None of the proposed activities or their alternatives would change the Recreation Opportunity Spectrum class as described in the Forest Plan. Access, off-highway vehicle use, and dispersed recreation will not change from the current standards and guidelines.

Landscape characteristics would maintain open-park like stands where they occurred historically and vegetation manipulation would encourage the development and maintenance of large diameter, open canopy structure (Landscape Characteristics). Temporary roads and skid trails would be rehabilitated to a vegetative condition following treatment. All activities would be consistent with visual quality objectives for all management areas (Scenic Quality Report).

Noxious Weeds

The Wildcat Vegetation Management Project is consistent with the Umatilla Land and Resource Management Plan direction, as amended, with respect to noxious weeds. Compliance with Prevention Standards and Forest Plan Goals and Objectives would be implemented to address noxious weeds (Regional Noxious Weed EIS October 2005).

The pertinent new standards that pertain to the Wildcat Project are identified in Appendix A. of Wildcat Vegetative Management Noxious Weeds Report. Umatilla Forest Plan Goals and objectives, as amended are identified in the prevention standards in Pacific Northwest Invasive Plant Program Final Environmental Impact Statement, Record of Decision.

Other Jurisdictions

There are a number of other agencies responsible for management of resources within the Wildcat project area. The Oregon Department of Fish and Wildlife is responsible for management of fish and wildlife populations, whereas the Forest Service manages the habitat for these animals. The Oregon Department of Fish and Wildlife has been contacted regarding this analysis.

The Environmental Protection Agency is responsible for enforcement of environmental quality standards, such as those established for water resources, while the Oregon Department of Environmental Quality sets standards, identifies non-point sources of water pollution, and determines which waters do not meet the goals of the Clean Water Act. The Environmental Protection Agency has certified the Oregon Forest Practices Act as Best Management Practices. Oregon State compared Forest Service practices used to control or prevent non-point sources of water pollution with the Oregon Forest Practices Act and concluded that Forest Service practices meet or exceed State requirements. These are periodically reviewed as practices change. The Forest Service and Oregon Department of Environmental Quality have signed a Memorandum of Understanding (2/12/79 and 12/7/82) outlining this.

Oregon Department of Environmental Quality and the Oregon Department of Forestry are responsible for regulating all prescribed burning operations. The USDA Forest Service Region 6 has a Memorandum of Understanding with Oregon Department of Environmental Quality, Oregon Department of Forestry, and the USDI Bureau of Land Management regarding limits on emissions, as well as reporting procedures. All burning would comply with the State of Oregon's Smoke Management Implementation Plan and, for greater specificity, the memorandum of understanding mentioned above.

Before project implementation, State Historic Preservation Office consultation would be completed under the Programmatic Agreement dated March 10, 1995.

Energy Requirements and Conservation Potential

Some form of energy would be necessary for proposed projects requiring use of mechanized equipment: Non-commercial thinning would involve small machines, while projects such as road repair could require heavy machinery for a small amount of time. Both possibilities would result in minor energy requirements. Alternatives that harvest trees and salvage dead down wood could create supplies of firewood or hog fuel as a by-product, which would contribute to the local supply of energy for home space heating or electricity production.

Consumers, Minority Groups, and Women

Effects on civil rights, including those of minorities and women, would be minimal. Activities associated with the action alternatives would be governed by Forest Service contracts, which are awarded to qualified purchasers regardless of race, color, sex, religion, etc. Such contracts also contain nondiscrimination requirements. While the activities identified here would create jobs and the timber harvest would provide consumer goods, no quantitative output, lack of output, or timing of output associated with these projects would affect the civil rights, privileges, or status quo of consumers, minority groups, and women.

Unavoidable Adverse Effects

Implementation of any of the alternatives, including the No Action alternative, would inevitably result in some adverse environmental effects. The severity of the effects would be minimized by adhering to the direction in the management prescriptions and Standards and Guidelines in Chapter IV of the Forest Plan and additional mitigation proposed in Chapter 2 of this document. These adverse environmental effects are discussed at length under each resource section.

Short-term Use and Long-term Productivity

Short-term uses are generally those that determine the present quality of life for the public. In the Pacific Northwest, this typically includes: timber harvest, livestock grazing, recreation, transportation, utility corridors, and wildlife habitat. Long-term productivity refers to the land's capability to support sound ecosystems producing a continuous supply of resources and values for future generations.

Alternative 1 – Environmental Consequences

There would be no change in short-term uses within the project area. However, there would be a risk of reducing long-term productivity because trees in densely stocked stands would experience increasing stress as they grow and would become more susceptible to insect infestation and disease. Fuels would also continue to accumulate, risking a loss of long-term productivity due to increase wildfire severity.

Alternatives 2, 3, and 4 – Environmental Consequences

Management activities associated with short-term uses (i.e. burning, use of machinery, or removal of wood fiber) could reduce the productivity of some portions of the Wildcat analysis area. Conclusive evidence relative to short-term impacts of timber harvest and prescribed fire adversely affecting long-term site productivity does not exist. However, nitrogen reserves, organic residues, and soil physical properties are critical elements of the ecosystem that must be carefully managed to ensure long-term productivity.

For purposes of this analysis, the duration of this project would be at least five years. Under all action alternatives, the long-term productivity of the National Forest System lands and resources would be protected from unacceptable degradation by the standards and guidelines in the Forest Plan, specific project design elements, and mitigation measures for the alternatives described in Chapter 2 of this document.

Structural improvements contribute towards the opportunity to use the potential productivity of the analysis area. Roads and trails provide necessary access, and roads are considered as long-term improvements that provide for continued use over time. New construction would occur under Alternative 2 and 39 miles of maintenance for each of the action alternatives. Proposed maintenance of open roads would improve accessibility for the public. Animals that use roads or OHV trails open to the public are at risk of hunting, harassment, and injury or death by vehicular collision during their life cycle. Proposed thinning along roads could modify future use by animals, particularly relating to big game during hunting seasons. In noncommercial thinning stands, leaving a 10 to 15 foot strip of regeneration along open and seasonally open roads would aid in reducing big game vulnerability by limiting sight distance.

Late/Old structure, particularly Old Forest Single Stratum, has been greatly diminished within the analysis area. Proposed thinning would accelerate development of these habitats within treated stands, shortening the time that dependent wildlife species are extirpated from the area or are stressed due to less ideal habitats. Treatments in the dry upland forest would transform some of the multi-layer old forest into single-layer old forest. Stress on trees would also be reduced in treated stands, reducing the incidence of insects and disease and improving growth and productivity of remaining trees.

Treatment of insect and disease damaged stands by removing susceptible tree species would improve the long-term forest productivity of affected areas and reduce the risk of spread to adjacent stands and the regeneration trees below currently infected trees.

No long-term effects to water or its beneficial uses are expected from the proposed management activities under any alternative.

Effective fire prevention and suppression, while minimizing damage to existing timber stands and other resources, resulted in long-term changes in vegetative composition and reduced timber productivity, altering the overall ecosystem. Removal of wood fiber and disposal of slash, if done through a proper prescription, would have little effect on long-term site productivity. However, productivity could be adversely affected if large wood is not removed, or slash resulting from harvest is not treated or is inadequately treated. Burning at the wrong time or allowing for a high intensity, long duration fire would result in loss of soil fertility. Most other effects of slash disposal would be short-term and have little effect on productivity.

Harvest, thinning, and prescribed fire can be utilized both effectively and efficiently to reduce fuel loadings and otherwise manipulate the various fuel complexes in the analysis area. This would greatly reduce the consequences of a wildfire within and adjacent to the manipulated fuels complexes. It would also enhance the long-term productivity of wildlife habitat, increase stream flows, provide more visual diversity, and provide the disturbance necessary for the perpetuation of important plant species. The temporary impacts of smoke from prescribed fire under the action alternatives would have minor effects on the short-term use of Forest resources such as recreation sites and visual resources. The use of prescribed fire to reduce the flammability of activity fuels would affect long-term forest productivity by reducing the risks and consequences of a major wildfire. The long-term benefits of prescribed fire in natural fuels more than outweigh the short-term impact to air quality.

Irreversible and Irretrievable Effects

An Irreversible commitment of resources refers to a loss of future options with nonrenewable resources. An Irretrievable commitment of resources refers to loss of opportunity due to a particular choice of resource uses.

Alternative 2 proposes new construction of a permanent road is planned. This road is proposed to be a native surface road. Rock used to surface roads would be an irreversible commitment of mineral resources.

The soil and water protection measures identified in the Forest Plan Standards and Guidelines, project design criteria procedures in Chapter 2, and Best Management Practices in Appendix A are designed to avoid or minimize the potential for irreversible losses from the proposed management practices.

Concerning threatened and endangered plant, wildlife, and fish species, a determination has been made that the proposed actions would not result in irreversible or irretrievable loss of species.

Direct and Indirect Effects of Alternative 1

Timber stands that are not managed at this time present an irretrievable loss of growth potential. Although the lost growth is irretrievable, it is not irreversible because the stands may be managed at a later date.

Potentially, the ability to protect forest within the project area from wildfire could be irretrievably lost, as well.

Direct and Indirect Effects of Alternative 2, 3, and 4

The construction of roads, to provide access to timber, is an irreversible action because of the time it takes for a constructed road to revert to natural conditions. Alternative 2 propose 2.2 miles of road construction.

Removing aggregate (gravel) from mineral material sources would result in an irreversible commitment of resources. Once aggregate is removed from material source sites and placed on roads, it cannot be renewed.

Tree removal would result in an irretrievable loss of the value of removed trees for wildlife habitat, soil productivity, and other values. Log landings would produce irreversible changes in the natural appearance of the landscape. The visual effect of log landings would be reduced by project design elements to reduce soil compaction and erosion (i.e. seeding). Little irreversible loss of soil should occur due to mitigation associated with timber harvest and prescribed fire (Project Design Criteria in Chapter 2).

Chapter 4

Supporting Information

Chapter 4

Consultation and Coordination

Scoping and 30-day Comment Period

Scoping letters were sent to the mail list of interested parties maintained at the Umatilla National Forest Supervisor's Office. This included the Confederated Tribes of the Warm Springs Reservation of Oregon, The Confederated Tribes of the Umatilla Indian Reservation, and Oregon Department of Fish and Wildlife. Eight letters were received in response to scoping the proposed action of this project: John Fullerton, John Edmondson, Rick Issacson, Jim Larsen, American Forest Resource Council, Oregon Wild, Sierra Club, and Oregon Department of Fish and Wildlife. Copies of the Environmental Assessment (March 2008) was provided to those who responded to the scoping efforts. All other individuals, organizations, and government agencies that had received scoping letters were notified of the availability of this Environmental Assessment for a 30-day public review.

Six letters were received in response to the 30 day comment period: John Fullerton, Jim Larsen, Roberta Vandehey, Karen Coulter of Blue Mountains Biodiversity Project, Doug Heiken of Oregon Wild, Asante Riverwind of Oregon Chapter Sierra Club. The individuals or groups that responded to either the scoping or 30 day comment period will be mailed a copy of the Decision Notice, the Wildcat Fuels Reduction and Vegetation Management Environmental Assessment, and FONSI. All others on the list below will be notified of the decision and availability of the EA and Decision document. Request for copies of the EA or decision notice can be obtained by contacting the Heppner Ranger District office.

Tribes

Confederated Tribes of the Umatilla Indian Reservation

Antone Minthorn – Chairman

Armand Minthorn, Cultural Resources Committee Chairman

Teara Farrow, Cultural Resources Protection Program, Acting Program Manager

Carey Miller, Cultural Resources Protection Program, THPO

Eric Quaempts, Department of Natural Resources, Director

John Barkley and Michael Ray Johnson, General Council Chair

Rick George, Environmental Planning, Rights Protection Dept.

Carl Scheeler, Wildlife Program Director

Gary James, Fisheries Program Director

Confederated Tribes of the Warm Springs Indian Reservation

Ron Suppah, Tribal Chairman

Delvis Heath, Sr., Warm Springs Chief

Nelson Wallulatum, Wasco Chief

Joseph Moses, Paiute Chief

Bobby Brunoe, Natural Resources Program General Manager/ THPO

Sally Bird, Cultural Resources Program Manager

Scott Turo, Off-Reservation Habitat Biologist

Nimiipuu Tribe

Samuel N. Penny, Chairman

Keith Lawrence, Wildlife Management

Loren Kronemann, Nez Perce Tribe

Ira Jones, Watershed Management

Ryan Sudbury, Office of Legal Council

Dave Johnson, Fisheries Division

Aaron Miles, Natural Resources Division

Randall Minthorn Chairman, Natural Resources Subcommittee

Brooklyn Babtiste, Vice Chairman, Natural Resources Subcommittee

Vera Sonneck, Cultural Resources Program Director

John DeGroot, Director NPT Forestry

Government Agencies

Bureau of Indian Affairs

Jim Lauer

Umatilla Agency, forester

Cooperative Extension Service

Randy Mills, Extension Agent Umatilla County

Grant County

Soil and Water District

National Marian Fisheries Service

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Oregon Department of Fish & Wildlife

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Oregon Department of Forestry

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Fern Shank

Umatilla Basin Watershed Council

Tracy Bosen

Umatilla County

Tom Johnson – Watermaster, District 5

Union County

Board of Commissioners – Colleen Macleod, Steve McClure, John Lamoreau, R Nellie Hibbert

U.S. Environmental Protection Agency, Region 10

Michael Letourneau

U. S. Fish & Wildlife Service

John Kinney

Marisa Meyer

Portland Field Office Field Supervisor

Universities

University of Oregon, Environmental Studies Center

Western Washington University – Robert Lopresti, Documents Department, Wilson Library

Industry

Associated Oregon Loggers, Inc.

Blue Mountain Lumber Products – Bill Cameron

Boise Cascade Corporation – Tony Steenkolk, John Warness, John Fullerton

Columbia Helicopters – Max Merlich

Crum Farming – Monty Crum

Henderson Logging Inc. – James E. Henderson

Joe Cook Logging

Kinzua Resources LLC – Bob Broden / Andy Munsey

KLE Enterprises Inc. – Ken Evans

Malheur Lumber Company – Walt Gentis

Oregon Log and Fiber – Tom Alway

Pine Creek Logging – Don Barnett

Three Valleys Ranch Fossil Property – John Aaron

Organizations

Adopt-A-Forest – Judith Johnson

American Forest Resource Council – Chuck Burley

ATV-AAC – Pat Harris

Blue Mountains Biodiversity Project – Karen Coulter

Center for Tribal Water Advocacy – Hal Shepherd

Columbia River Inter-Tribal Fish Commission – Jim Weber

Desert Rats – Brigit Mudd

Eastern Oregon Protection Association – Lynn Breese

East Oregonian – Barry Rockford

Forest Service Employees for Environmental Ethics – Forest Fleischman, Policy Advocate

Greystone – Amber Martin

Hells Canyon Preservation Council – Greg Dyson, Mike Medberry, Jennifer Schywartz

Inland Northwest Wildlife Council – Robert D. Panther, Executive Director

Natural Resources Research Library – S.J. and Jessie E. Quinney

Northwest Trail Bikers Association – Norvel Arbogast

Oregon Trout – Jim Myron

Oregon Wild – Tim Lillebo, Chandra LeGue, Doug Heinkin

Pendleton Record

Rocky Mountain Elk Foundation – Rance Block

Sierra Club Oregon Chapter – Asante Riverwind, Ivan Maluski

Washington Wilderness Coalition – Tom Uniack

Wilderness Society – Cynthia Wilkerson

Wildlife Management Institute – Robert P. Davison, NW Field Rep

Individuals

Dick Artley

James P. Bailey

Howard Bryant

Loren Clark

Steve Corey

David Davis

John Edmundson

Stan Foster

Barbara Gilbert

Bret Harting

David Hunt

Richard Isaacson

Lyle Jensen

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Interdisciplinary Team

The following Forest Service personnel served on the Interdisciplinary Team (IDT) that prepared this environmental assessment:

Core Interdisciplinary Team:

Janet Plocharsky	Team Leader
Michael Burns	Silviculture
Brian Spradlin	Fire, Fuels, Air Quality
Randy Scarlett	Wildlife

Interdisciplinary Team Consultants:

Tom Mafera	District Ranger
Kristy Groves	Fisheries
Craig Busskohl	Soils
Ed Farren	Water Quality
Allen Madril	Cultural and Historical Properties
Gary Popek	Geographic Information Services
Carrie Spradlin	Economics, Silviculture
Mike Pond	Economics
Dave Powell	Silviculture
Lori Seitz	Roads Analysis
Janel McCurdy	NEPA, Recreation, Undeveloped Areas
David Hatfield	NEPA, Landscape Characteristics
Brian Spivey	Harvest Systems
Scott Wryn	Fuels
Joan Frazee	Botany
Tim Collins	Range, Noxious Weeds

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Appendix A – Best Management Practices

Best Management Practices are the primary mechanisms used to enable the achievements of water quality standards (Environmental Protection Agency 1987). The Environmental Protection Agency has certified the Oregon Forest Practices Act and Washington Forest Practices Rules and Regulations as best management practices. The States of Oregon and Washington compared Forest Service practices with these State practices and concluded that Forest Service practices meet or exceed state requirements.

Every year since 1996, the Umatilla National Forest has monitored a selection of projects for implementation and effectiveness of best management practices. The results of this monitoring have been published in Umatilla National Forest's Forest Plan Monitoring and Evaluation Reports, which were combined with the Wallowa Whitman and Malheur National Forests' reports in 1998 into Monitoring and Evaluation Reports for the National Forests of the Blue Mountains. A substantial record of results exists. Some of these results are summarized in a poster which has been published on the internet. The poster is available on the Umatilla NF's web site (http://www.fs.fed.us/r6/uma/water/), scroll down to Best Management Practices Monitoring Poster. The poster reports monitoring of timber sale riparian area boundaries, skid trail rehabilitation, and road decommissioning. Specific findings include:

Implementation of Riparian Habitat Conservation Area buffers on harvest units generally met objectives, need improved documentation of stream category during layout. On the Wildcat project the district hydrologist visited streams to determine classifications before project layout. Any reclassifications where updated in the stream layer database before thinning units or burn blocks were designated.

Use of harvester-forwarder systems results in more slash on skid trails, less ground disturbance, and reduces need for structural erosion control (waterbars).

Road decommissioning activities were properly implemented and effective; some sites need re-vegetating.

Documenting best management practices effectiveness still poses challenges, requires longer time frame for monitoring, and integration with instream water quality monitoring programs.

The following Best Management Practices apply to the Wildcat Project.

Timber Management

T-1. Timber Sale Planning Process

- Description – Introduce hydrologic considerations into timber sale planning process
- Location – Harvest units and haul routes.
- Effects – Avoidance of potential damage during and following the sale layout and subsequent logging operation.
- Application – Detrimental impacts to soil, riparian areas, and downstream water sources are reduced.

T-2 Timber Harvest Unit Design

- Description – Design timber harvest to secure favorable conditions of water flow, water quality and fish habitat.
- Location – All harvest units.
- Effects – Where adverse impacts on the water resource can result, the harvest unit design is modified, and/or watershed treatment measures are applied to accelerate the natural recovery rate.
- Application – Detrimental impacts to soil, riparian areas, and downstream water sources are reduced through location of units and Project Design Elements 1, 3-6, 8-11, and 17.

T-3 Use of Erosion Potential Assessment for Timber Harvest Unit Design

- Description – Identify areas with high erosion potential and adjust harvest unit design as necessary.
- Location – All harvest units.
- Effects – Modify or eliminate harvest activities on areas with high erosion potential.
- Application – Unit location modified to avoid areas of high concern; Project Design Elements 1 thru 3 and 8 thru 9 to reduce effects of erosion associated with harvest.

T-4 Use of Area Maps for Designing Water Quality Protection Needs

- Description – Delineate the location of protection areas and available water sources for both the Purchaser and the Sale administrator to insure their recognition and proper consideration and protection on the ground.
- Location – Entire sale area.
- Effects – Detrimental impacts to protected areas are reduced.
- Application – Protected areas are identified on the Sale Area Map.

T-5 Limiting Operating Season

- Description – Ensure that the purchaser conducts operations in a timely manner, within the period specified in the timber sale contract.
- Location – All harvest units and haul routes.
- Effects – Detrimental impacts to soils, water, and other resources are reduced.
- Application – Project Design Element 2 was identified to limit operation periods in order to protect soils.

T-7 Streamside Management Unit Design

- Description – Harvest is designed to ensure protection of streambanks and streamside vegetation.
- Location – All harvest units.
- Effects – Minimize potential adverse effects of logging and related land disturbance

activities on water quality and beneficial uses.

- Application – Units were identified in uplands, and Project Design Elements 5 thru 15 would avoid activities within Riparian Habitat Conservation Areas.

T-8 Streamcourse Protection (Implementation and Enforcement)

- Description – (1) Protect the natural flow of streams, (2) Provide unobstructed passage of streamflows and (3) Prevent sediment and other pollutants from entering streams.
- Location – All harvest units.
- Effects – Potential adverse effects to streams from harvest activities would be minimized to maintain water quality.
- Application – Project Design Elements 7, 8, and 11 would be monitored by the District Aquatics Specialist and/or Timber Sale Administrator.

T-9 Determining Tractor Loggable Ground

- Description – Tractor logging is restricted to lands that can be harvested with a minimum of soil compaction and erosion. Factors considered when selecting tractor operable land are: slope, topography, soil texture, soil drainage, and drainage patterns.
- Location – land suitable for tractor logging is identified in the pre-sale (planning) phase of the timber sale planning process. Provisions in the Timber Sale Contract (TSC) specify the areas and conditions upon which tractors can operate. Requirements governing tractor operations are incorporated in the Timber Sale Contract (TSC).
- Effects – Detrimental impacts (compaction, displacement, erosion) to soils and potential impacts to downstream water quality are reduces by determining the most effective logging operational method.
- Application – All alternatives specify the units located on land harvestable by tractor, and Project Design Elements 1 thru 3 further restrict harvest options to protect soil and water quality.

T-10 Log Landing Location

- Description – Locate landings to minimize creation of hazardous watershed conditions.
- Location – All harvest units.
- Effects – detrimental impacts (compaction, displacement, erosion) to soils and potential impacts to downstream water quality are reduced.
- Application – The Timber Sale Administrator approves landings, using existing landings where possible. New landings will not be constructed inside PACFISH Riparian Habitat Conservation Areas, cultural sites, or in-place emergency rehabilitation structures, however existing landings located within Riparian Habitat Conservation Areas would be used to minimize soil disturbance.

T-11 Tractor Skid Trail Location and Design

- Description – Locate and approve skid trails in advance of skidding to minimize soil compaction, erosion, and water runoff.
- Location – All harvest units.
- Effects – Careful control of skidding patterns can minimize on-site compaction and off-site soil movement.
- Application – Project Design Element 8 would reduce soil disturbance and compaction due to skid trails. The Timber Sale Administrator approves skid trails, using existing trails where possible. No new skid trails will be located inside PACFISH Riparian Habitat Conservation Areas, cultural sites, or in-place emergency rehabilitation structures, however existing skid trails would be used to minimize soil disturbance.

T-13 Erosion Prevention and Control Measures During Timber Sale Operations

- Description – Ensure that the purchaser's operation shall be conducted to minimize soil erosion.
- Location – All harvest units.
- Effects – Prevent/control erosion and sediment movement.
- Application – The Timber Sale Contract sets forth Purchaser's responsibilities, including Project Design Elements 8. The Timber Sale Administrator monitors operations for compliance.

T-14 Revegetation of Areas Disturbed by Harvest Activities

- Description – Where soil has been severely disturbed by the Purchaser's operation, and the establishment of vegetation/cover is needed to minimize erosion and protect water quality, the Purchaser shall take appropriate measures normally used to establish an adequate cover of grass or other vegetation (i.e. seeding) as necessary, or take other agreed upon stabilization measures.
- Location – All harvest units.
- Effects – Vegetation cover will be established on disturbed sites to prevent erosion and sedimentation.
- Application – Project Design Element 8 details when and how re-vegetation will occur.

T-15 Log Landing Erosion Prevention and Control

- Description - Landings will be monitored for erosion and compaction, and treated where necessary.
- Location – All harvest units.
- Effects – Soil erosion and compaction are reduced.
- Application – Project Design Element 8 would require water bars, subsoiling, and seeding as necessary, to be monitored by the Timber Sale Administrator or Aquatics

Specialist.

T-16 Erosion Control on Skid Trails

- Description – Design skid trails to protect water quality by minimizing erosion and sedimentation.
- Location – All skid trails.
- Effects – Water quality is protected by minimizing erosion and sedimentation derived from skid trails.
- Application – Project Design Element 3 would require review and approval of skid trail locations and Project Design Element 8 would require rehabilitation of skid trails after harvest.

T-18 Erosion Control Structure Maintenance

- Description - Ensure that constructed erosion control structures are stabilized and working.
- Location - All harvest units.
- Effects - Long-term soil productivity is maintained and impacts to downstream water quality are reduced.
- Application – Project Design Elements 9 would require that haul routes be maintained to prevent unacceptable resource damage.

T-19 Acceptance of Timber Sale Erosion Control Measures Before Sale Closure

- Description - Ensure purchaser completes adequate erosion control work on timber sales.
- Location - All harvest units.
- Effects - Detrimental impacts to water quality are eliminated by reducing erosion and sediment movement to downstream water sources.
- Application - Timber Sale Administrator would perform inspections before the sale is closed to check for effectiveness of erosion control work completed by the purchaser.

T-21 Servicing and Refueling of Equipment

- Description - Prevent pollutants from being discharged into or near rivers, streams, and impoundments or into natural or man-made channels leading to such areas.
- Location - All harvest units.
- Effects - Detrimental impacts to water quality will be reduced by restricting fueling locations to certain areas.
- Application - Servicing of all equipment would be done only in areas approved by the Forest Service so that any spills would not reach a stream course or wet area. The District has a Hazardous Spill Plan in place. The timber sale contract will prohibit the

spillage of hazardous substances, and will require the purchaser to have a hazardous material plan. The timber sale contract will require the purchaser to have a fuel spill prevention plan if on-site quantities are greater than 660 gallons in one container or a total of more than 1,320 gallons.

T-22 Modification of Timber Sale Contract

- Description - Modify the Timber Sale Contract if new circumstances or conditions arise that indicate that the timber sale will irreversibly damage soil, water, or watershed values.
- Location - All harvest units.
- Effects - Watershed values are placed ahead of timber harvest.
- Application - The Chief of the Forest Service could modify the Timber Sale Contract if watershed values are unacceptably compromised.

Road System

R1 General Guidelines for the Location and Design of Roads

- Description - Locate and design roads to minimize resource damage.
- Location - Construction of new roads to units 1, 7, 45, 71, 88, 119, and 211.
- Effects - Ensures that new roads would be efficiently and effectively designed, and use latest design standards.
- Application - Interdisciplinary team aids in defining resource objectives and developing mitigations.

R2 Erosion Control Plan

- Description - Limit and mitigate erosion and sedimentation prior to construction through effective contract administration.
- Location - Construction of new roads to units 1, 7, 45, 71, 88, 119, and 211.
- Effects - Enlists purchaser's assistance in controlling erosion.
- Application - Erosion control plan is required by Timber Sale Contract.

R3 Timing of Construction Activities

- Description - Minimize erosion by constructing roads during minimal runoff periods.
- Location - Construction of new roads to units 1, 7, 45, 71, 88, 119, and 211.
- Effects - Limits construction to seasons and times when there is a low probability of erosion.
- Application - Authorizes COR or Engineering Representative to determine when the probability of erosion is low.

R-4 (Temporary) Road Slope Stabilization (Planning)

- Description – Road stabilization considerations begin in the reconnaissance and location of temporary roads. Stabilization measures will be planned for completion on all disturbed ground prior to the winter season, when erosion is most severe.
- Location – Construction of temporary roads to or within units 1, 7, 10, 13, 32, 34, 46, 47, 60, 63, 71, 88, 119.
- Effects – Reduce sedimentation by minimizing erosion from road slopes and minimizing the chances for slope failure along roads.
- Application – Project Design Element 8 would minimize the sedimentation from the temporary roads. Specifications are also listed in the Timber Sale Contract.

R-7 Control of Surface Road Drainage Associated with Roads

- Description - Minimize possible detrimental effects of surface drainage of road.
- Location – All haul routes.
- Effects - Reduce sedimentation associated with roads.
- Application - Project Design Element 9 would minimize the erosive effects of water concentrated by road drainage features and disperse runoff from the road using water spreading ditches and drivable dips.

R-18 Maintenance of Roads

- Description - Provide for water quality protection by maintaining roads through the control of waste material placement, keeping drainage facilities open, and by repairing ruts and failures.
- Location - All Level 1 and above roads.
- Effects - Detrimental impacts to water quality from road maintenance activities are reduced.
- Application – Road maintenance will be incorporated into the Timber Sale Contract as needed.

R-19 Road Surface Treatments to Prevent Loss of Material

- Description - Minimize the erosion of road surface materials and consequently reduce the likelihood of sediment production from those areas.
- Location - All Level 1 and above roads.
- Effects - Detrimental impacts to the road prism from erosion and adjacent water sources are prevented.
- Application – Project Design Element 9 would control dust during dry periods.

R-20 Traffic Control During Wet periods

- Description - Reduce road surface damage and rutting of roads to lessen sediment washing from road surfaces.
- Location - All haul routes.
- Effects - Detrimental impacts to forest road surfaces and forest road users are reduced.
- Application – Project Design Elements 12 would protect roads during wet conditions.

R-23 Obliteration of Landings

- Description – Measure designed to obliterate temporary roads and landings and revegetated, drain, etc. To minimize erosion and sedimentation temporary roads will be sub-soiled on completion of activities; landings will be sub-soiled on completion of sale activities. Subsoiling must alleviate compaction without churning the soil.
- Location - All landings and temporary roads used by the timber sale purchaser.
- Effects – Improve wildlife habitat, minimize erosion and reduce sedimentation to downstream water sources.
- Application – Project Design Element 8 would treat landings upon completion of sale activities using subsoiling, waterbarring, and/or seeding (subsoiling must alleviate compaction without churning the soil).

Fire Suppression and Fuels Management

F-1 Fire and Fuel Management Activities

- Description - Reduce the public and private losses that could result from wildfire and/or subsequent flooding and erosion by reducing the frequency, intensity, and destructiveness of wildfire.
- Location - All treatment units.
- Effects - Increased fire-tolerant species in the stands, reduced fuel loads, and breaks in horizontal and vertical fuels which would facilitate application of prescribed natural fire and fire suppression activities, would reduce erosion and sediment related to a large-scale, severe wildfire.
- Application – The action alternatives contain design elements that would reduce activity-related and natural fuels once treatments are complete.

F-2 Consideration of Water Quality in Formulating Prescribed Fire Prescriptions

- Description - Maintain water quality by limiting the amount of soil exposed by prescribed burning.
- Location - All treatment units.
- Effects - Limited soil erosion and reduced water quality impacts.
- Application - Project Design Elements 14 and 15 would ensure that fire prescriptions use factors such as weather, slope, aspect, soil moisture, and fuel moisture to maintain

prescribed flame lengths and maintain desired soil and vegetative cover. Project Design Element 15 would limit effects on soils due to fire control lines.

F-3 Protection of Water Quality During Prescribed Burning Operations

- Description - Maintain soil productivity, minimize erosion, and prevent ash, sediment, nutrients, and debris from entering water bodies.
- Location - All treatment units.
- Effects - Water quality will be maintained; downstream users of water will not be affected.
- Application - Weather and fuel conditions will be checked during prescribed burning to ensure that soil and water protection parameters set by the burn prescription are met; otherwise burn techniques will be adjusted accordingly.

Watershed

W-3 Protection of Wetlands

- Description - Avoid adverse water quality impacts associated with destruction or modification of wetlands by excluding activities within wetlands.
- Location - All harvest units.
- Effects - Wetlands are protected from degradation.
- Application - Project Design Elements 14 and 15 will exclude ground-disturbing activities within wetlands; the fire prescription will address maintaining vegetative cover in wetlands during prescribed burning.

W-4 Hazardous Substance Spill Contingency Plan and Spill Prevention Control and Countermeasure Plan

- Description - Prevent contamination of Umatilla National Forest from accidental spills.
- Location - entire sale area; spill plan is located at the Umatilla N.F. Supervisor's Office.
- Effects - Oil products are prevented from entering the navigable waters of the United States.
- Application - Standard language in the sale contract addresses fueling and maintenance of equipment.

W-5 Cumulative Watershed Effects

- Description - Protect the beneficial uses of water from the cumulative effects of past, present, and future management activities that could result in degraded water quality or stream habitat.
- Location - Entire project area.
- Effects - Activities that could result in cumulative damage to water quality are altered or

eliminated as appropriate.

- Application - A cumulative watershed effects analysis was conducted for the Wildcat project area and beneficial uses that comply with applicable State requirements for protection of waters have been identified in the Environmental Assessment.

W-7 Water Quality Monitoring

- Description - Determine the effects of the proposed action on the beneficial uses of water, monitor baseline watershed conditions for comparison with State Water Quality and Forest Plan standards and estimate long-term trends, ensure the health and safety of water users, and evaluate BMP effectiveness.
- Location - Entire project area.
- Effects - Monitoring would ensure that mitigation to protect water quality is effective, and, if not, would recommend changes for future activities.
- Application – Essential monitoring checks that applicable standard operating procedures were implemented and effective.

W-8 Management by Closure to Use (Seasonal, Temporary, and Permanent)

- Description - Exclude activities that could result in damage to either resources or improvements, such as roads and trails, resulting in impaired water quality.
- Location - All harvest units.
- Effects - Maintain down slope water quality, sustain the current condition of the watershed, and exclude activities that may result in additional resource damage and impair healthy water systems.
- Application - Project Design Elements would limit management activities to protect soil and wildlife during sensitive periods.

Appendix B – Unit Data Sheet

Commercial Thinning Units

Unit No.	Legal	Alt 2	Alt. 3	Alt. 4	Acres	Slope	Aspect	Harvest System¹	PCT	Pre-structure	Post-structure
14	T. 5S., R. 27E., Sec. 33 & 34	Y	N	Y	36	15%	SW	Forwarder	No	OFMS	OFMS
19	T. 5S., R. 27E., Sec. 34 & 35	Y	Y	N	39	25%	SE	Forwarder	No	OFMS	OFMS / OFSS
20	T. 5S., R. 27E., Sec. 33	Y	Y	Y	175	15%	S	Forwarder	No	SECC	SEOC
22	T. 5S., R. 27E., Sec. 34	Y	Y	Y	125	25%	South	Forwarder	No	OFMS	OFMS / OFSS
27	T. 5S., R. 27E., Sec. 33	Y	Y (v)	Y	265	25%	South/SE	Forwarder	No	OFMS	OFMS / OFSS
30	T. 6S., R. 27E., Sec. 4	Y	N	Y	13	30%	East	Forwarder	No	OFMS	OFMS/OFSS
31	T. 6S., R. 27E., Sec. 4	Y	Y	Y	33	30%	SE	Forwarder	No	OFMS	OFMS/OFSS
32	T. 6S., R. 27E., Sec. 4	Y	N	Y	54	20%	South	Forwarder	No	OFMS	OFSS
33	T. 6S., R. 27E., Sec. 3	Y	N	Y	40	15%	East	Forwarder	Yes	OFMS	OFMS
34	T. 6S., R. 27E., Sec. 3	Y	Y	Y	21	15%	South	Tractor	Yes	SECC	SEOC
35	T. 6S., R. 27E., Sec. 3 & 4	Y	Y	Y	20	15%	S/SW	Forwarder	No	YFMS	YFMS
36	T. 6S., R. 27E., Sec. 3	Y	Y	Y	10	10%	South	Tractor	No	SEOC	SEOC
37	T. 6S., R. 27E., Sec. 4 & 9	Y	Y	Y	5	15%	South	Tractor	No	SECC	SEOC
38	T. 6S., R. 27E., Sec. 3	Y	Y	Y	4	5%	South	Tractor	Yes	OFMS	OFMS
39	T. 6S., R. 27E., Sec. 4 & 9	Y	Y (v)	Y	42	30%	South	Tractor	No	SECC	SEOC
40	T. 6S., R. 27E., Sec. 1, 2, 11 & 12	Y	Y	Y	29	22%	S to SW	Tractor	No	SECC	SEOC
41	T. 6S., R. 27E., Sec. 1, 2, 11 & 12	Y	Y	Y	13	24%	S to SW	Tractor	No	SECC	SEOC
42	T. 6S., R. 28E., Sec. 7 & 8	Y	Y	Y	16	15%	N -NW	Tractor	Yes	YFMS	YFMS
43	T. 6S., R. 27E., Sec. 11 & 12	Y	Y (v)	Y	54	35%	NW	Forwarder	No	SECC	SEOC
44	T. 6S., R. 28E., Sec. 7	Y	Y	Y	18	15%	SW	Tractor	No	SECC	SEOC
45	T. 6S., R. 27E., Sec. 10 & 11	Y	Y	Y	7	15%	S to N	Forwarder	Yes	SECC	UR
46	T. 6S., R. 27E., Sec. 10 & 15	Y	Y	Y	12	15%	NW	Forwarder	No	SEOC	SEOC
47	T. 6S., R. 27E., Sec. 10 & 15	Y	Y	Y	4	5%	S	Forwarder	No	SECC	SECC
48	T. 6S., R. 27E., Sec. 11	Y	Y	Y	30	15%	E to NE	Forwarder	Yes	YFMS	YFMS

Unit No.	Legal	Alt 2	Alt. 3	Alt. 4	Acres	Slope	Aspect	Harvest System[1]	PCT	Pre-structure	Post-structure
49	T. 6S., R. 27E., Sec. 10 & 15	Y	Y	Y	3	15%	SE	Forwarder	No	SECC	SEOC
51	T. 6S., R. 27E., Sec. 14	Y	Y	Y	38	15%	East	Forwarder	No	OFMS	OFMS/OFSS
53	T. 6S., R. 27E., Sec. 16	Y	Y	Y	7	10%	East	Tractor	No	SECC	SECC
54	T. 6S., R. 27E., Sec. 15	Y	Y	Y	15	15%	West	Tractor	No	SECC	SEOC
55	T. 6S., R. 27E., Sec. 14	Y	Y	Y	9	15%	West	Tractor	No	SECC	SEOC / OFSS
56	T. 6S., R. 27E., Sec. 14 & 15	Y	Y	Y	17	30%	E to SE	Tractor	No	OFMS	OFMS
57	T. 6S., R. 27E., Sec. 14	Y	Y	Y	9	20%	West	Tractor	No	SECC	SEOC
58	T. 6S., R. 27E., Sec. 16	Y	Y	Y	5	10%	SE	Tractor	No	SECC	SEOC
60	T. 6S., R. 27E., Sec. 14	Y	Y	Y	16	15%	East	Forwarder	No	SECC	SEOC / OFSS
62	T. 6S., R. 27E., Sec. 21	Y	Y	Y	7	15%	East	Tractor	No	SECC	SEOC
63	T. 6S., R. 27E., Sec. 23	Y	N	Y	11	10%	South	Forwarder	No	SECC/OFMS	SEOC / OFSS
67	T. 6S., R. 27E., Sec. 26	Y	N	Y	33	10%	SE	Tractor	No	SECC/OFMS	SEOC / OFSS
68	T. 6S., R. 27E., Sec. 26 & 35	Y	N	Y	31	10%	SE	Forwarder	No	SECC/OFMS	SEOC / OFSS
73	T. 6S., R. 27E., Sec. 16	Y	Y	Y	12	15%	East	Tractor	No	SECC/OFMS	SEOC / OFSS
74	T. 5S., R. 27E., Sec. 33 & 34	Y	N	Y	115	25%	South	Forwarder	No	OFMS	OFMS/OFSS
76	T. 6S., R. 27E., Sec. 16 & 17	Y	Y	Y	17	10%	North	Tractor	No	SECC	SEOC
77	T. 6S., R. 27E., Sec. 35	Y	Y	Y	3	10%	SE	Forwarder	Yes	OFMS	SEOC
79	T. 6S., R. 27E., Sec. 1	Y	Y	Y	77	22%	W - SW	Tractor	No	OFMS	OFMS
80	T. 6S., R. 27E., Sec. 12	Y	Y	Y	12	15%	SE	Forwarder	No	SECC	SEOC
81	T. 6S., R. 27E., Sec. 11 & 12	Y	Y	Y	31	25%	Variable	Forwarder	No	SECC	SEOC
82	T. 6S., R. 27E., Sec. 1 & 12	Y	Y	Y	9	15%	North	Forwarder	No	SECC/OFMS	SEOC
83	T. 5S., R. 28E., Sec. 29	Y	Y	Y	5	5%	South	Forwarder	Yes	YFMS	YFMS
84	T. 5S., R. 28E., Sec. 29	Y	Y	Y	23	5%	South	Forwarder	Yes	YFMS/OFMS	YFMS
85	T. 6S., R. 27E., Sec. 4 & 9	Y	Y (v)	Y	47	15%	South	Forwarder	No	SECC	SEOC
86	T. 6S., R. 27E., Sec. 8	Y	Y	Y	34	5%	South	Forwarder	No	SECC	SEOC
87	T. 6S., R. 27E., Sec. 8	Y	Y	Y	9	5%	South	Forwarder	No	SECC	SEOC

Unit No.	Legal	Alt 2	Alt. 3	Alt. 4	Acres	Slope	Aspect	Harvest System[1]	PCT	Pre-structure	Post-structure
89	T. 6S., R. 28E., Sec. 17 & 18	Y	Y	Y	22	15%	South	Forwarder	No	SECC	SEOC
90	T. 6S., R. 28E., Sec. 17	Y	Y	Y	13	10%	East	Tractor	No	SECC	SEOC
91	T. 6S., R. 28E., Sec. 17	Y	Y	Y	24	25%	West	Tractor	No	SECC	SEOC
111	T. 6S., R. 27E., Sec. 3 & 10	Y	Y (v)	Y	54	30%	South	Tractor	No	SECC	SEOC
122	T. 6S., R. 28E., Sec. 4 & 9	Y	Y	Y	15	25%	West	Skyline	No	SECC	SEOC
124	T. 6S., R. 28E., Sec. 7 & 8	Y	Y	Y	18	25%	SE	Skyline	No	OFMS	OFMS
125	T. 6S., R. 28E., Sec. 8	Y	Y	Y	22	25%	NW	Skyline	No	SECC	SEOC
126	T. 6S., R. 27E., Sec. 14	Y	Y	Y	12	35%	West	Skyline	No	SECC	SEOC
127	T. 6S., R. 27E., Sec. 13 & 14	Y	Y	Y	44	35%	North	Skyline	No	SECC	SEOC
133	T. 6S., R. 28E., Sec. 9, 16 & 17	Y	Y	Y	80	38%	West	Skyline	No	OFMS	OFSS
135	T. 6S., R. 28E., Sec. 16 & 21	Y	Y	Y	71	45%	West	Skyline	No	SECC	SEOC
138	T. 6S., R. 27E., Sec. 8 & 9	Y	Y	Y	32	15%	South	Tractor	Yes	SECC	SEOC
140	T. 6S., R. 27E., Sec. 3 & 10	Y	Y	Y	22	15%	South	Tractor	No	SECC	SEOC
141	T. 6S., R. 27E., Sec. 10	Y	Y	Y	29	15%	SW	Tractor	No	SECC	SEOC
142	T. 6S., R. 27E., Sec. 12	Y	Y	Y	18	15%	South	Tractor	No	SECC	SEOC
143	T. 6S., R. 27E., Sec. 12	Y	Y	Y	6	15%	SE	Tractor	No	SECC	SEOC
144	T. 6S., R. 28E., Sec. 7 & 8	Y	Y	Y	8	10%	East	Tractor	No	SECC/SEOC	SEOC
145	T. 6S., R. 28E., Sec. 8	Y	Y	Y	46	10%	South	Forwarder	Yes	SECC/SEOC	SEOC
146	T. 6S., R. 28E., Sec. 3	Y	Y	Y	5	15%	West	Forwarder	Yes	OFMS	OFMS
177	T. 6S., R. 27E., Sec. 35	Y	N	Y	12	10%	SE	Forwarder	No	OFMS	OFSS
191	T. 6S., R. 28E., Sec. 17	Y	N	Y	8	25%	West	Tractor	No	SECC	SEOC
[1]	Alternative 4 would only use harvester forwarder type systems, no tractor or skyline systems would be used. Areas inaccessible to ground base systems would not be thinned or reduce horizontal or vertical fuels.										
(v)	Alternative 3 units where variable density thinning would be included in the thinning prescription										

Mechanical Fuels Treatment Units

Unit No.	Legal	Alt 2	Alt. 3	Alt. 4	Acres	Slope	Aspect	Harvest[1]	PCT	Pre-structure	Post-structure
1	T. 5S., R. 27E., Sec. 25 & 26	Y	Y	Y	89	35%	NW	Forwarder	Yes[2]	SI	SI
3	T. 5S., R. 27E., Sec. 25	Y	Y	Y	29	25%	South	Forwarder	Yes	SI	SI
4	T. 5S., R. 27E., Sec. 25, 26, & 35	Y	Y	N	118	35%	NW	Skyline	Yes	SI	SI
7	T. 5S., R. 27E., Sec. 25, 26, 35, & 36	Y	Y	N	134	30%	East	Forwarder	Yes	YFMS	YFMS
10	T. 5S., R. 27E., Sec. 25	Y	Y	N	44	20%	E to W	Forwarder	Yes[2]	UR	UR
12	T. 5S., R. 28E., Sec. 30 & 31	Y	Y	Y	106	15%	SE	Forwarder	Yes	OFMS	OFMS
13	T. 5S., R. 27E., Sec. 25, 35 & 36	Y	Y	N	77	0 to 40%	E to W	Forwarder	Yes	OFMS	OFMS
23	T. 5S., R. 27E., Sec. 34 & 35	Y	Y	N	47	35% +	NW	Forwarder	Yes	OFMS	OFMS / OFSS
28	T. 5S., R. 28E., Sec. 31	Y	Y	Y	30	15%	NW	Forwarder	Yes	OFMS	OFMS
71	T. 5S., R. 27E., Sec. 25	Y	Y	N	18	20%	West	Skyline	Yes	OFMS	OFMS/OFSS
72	T. 5S., R. 27E., Sec. 24	Y	Y	Y	44	15%	South	MechFuels	Yes	UR	UR
75	T. 5S., R. 28E., Sec. 19 & 20	Y	Y	Y	69	15%	NW	Tractor	Yes	OFMS	OFMS
78	T. 5S., R. 28E., Sec. 19	Y	Y	Y	53	5%	SW	Forwarder	Yes	OFMS	OFMS
88	T. 5S., R. 27E., Sec. 35	Y	Y	N	113	25%	SE	Forwarder	Yes	OFMS	OFMS
92	T. 5S., R. 27E., Sec. 34	Y	Y	Y	6	25%	East	Forwarder	Yes	UR	UR
93	T. 5S., R. 27E., Sec. 34	Y	Y	Y	24	15%	East	Forwarder	Yes	UR	UR
94	T. 5S., R. 27E., Sec. 34	Y	Y	Y	14	30%	East	Forwarder	Yes[2]	UR	UR
95	T. 5S., R. 27E., Sec. 27	Y	Y	Y	24	25%	South	Forwarder	Yes	UR	UR
96	T. 5S., R. 27E., Sec. 27	Y	Y	Y	97	25%	South	Forwarder	Yes	OFMS	OFMS
97	T. 5S., R. 27E., Sec. 34	Y	Y	Y	23	20%	SE	Forwarder	Yes	UR	UR
98	T. 5S., R. 27E., Sec. 27 & 34	Y	Y	Y	43	25%	South	Forwarder	Yes	OFSS / OFMS	OFSS / OFMS
99	T. 5S., R. 27E., Sec. 26 & 35	Y	Y	Y	66	30%	N & S	Forwarder	Yes[2]	SI / YFMS	SI / YFMS
100	T. 5S., R. 27E., Sec. 25, 26 & 35	Y	Y	Y	155	60%	SE	Forwarder	Yes	OFMS	OFMS
101	T. 5S., R. 27E., Sec. 26	Y	Y	Y	67	20%	South	Forwarder	Yes[2]	SI	SI
102	T. 5S., R. 27E., Sec. 26 & 27	Y	Y	Y	61	38%	SE to SW	Forwarder	Yes	OFMS	OFMS
103	T. 5S., R. 27E., Sec. 26 & 27	Y	Y	Y	52	25%	S - SW	Forwarder	Yes	OFMS	OFMS

Unit No.	Legal	Alt 2	Alt. 3	Alt. 4	Acres	Slope	Aspect	Harvest[1]	PCT	Pre-structure	Post-structure
104	T. 5S., R. 27E., Sec. 27	Y	Y	Y	11	20%	SW	Forwarder	Yes	UR	UR
105	T. 5S., R. 27E., Sec. 22, 23, 26 & 27	Y	Y	Y	15	20%	SE	Forwarder	Yes	UR	UR
106	T. 5S., R. 27E., Sec. 23 & 26	Y	Y	Y	47	30%	South	Forwarder	Yes	SI	SI
107	T. 5S., R. 27E., Sec. 23, 24, 25 & 26	Y	Y	Y	13	65%	South	Forwarder	Yes	OFMS	OFMS
108	T. 5S., R. 28E., Sec. 13 & 18	Y	Y	Y	83	25%	S - SW	Forwarder	Yes	OFMS	OFMS
109	T. 5S., R. 28E., Sec. 19	Y	Y	Y	30	20%	NE	Forwarder	Yes	OFMS	OFMS
112	T. 6S., R. 27E., Sec. 1 & 12	Y	Y	Y	40	30%	SE	Forwarder	Yes	YFMS	YFMS
113	T. 5S., R. 27E., Sec. 35	Y	Y	N	14	30%	South	Skyline	Yes	UR	UR
115	T. 5S., R. 27E., Sec. 35	Y	Y	N	24	35%	South	Skyline	Yes	SI	SI
116	T. 5S., R. 27E., Sec. 35	Y	Y	N	22	25%	SE	Skyline	Yes	SI	SI
117	T. 5S., R. 27E., Sec. 35 & 36	Y	Y	N	26	20%	SW	Skyline	Yes[2]	SI	SI
118	T. 5S., R. 27E., Sec. 25 & 36	Y	Y	N	88	30%	East	Skyline	Yes	UR	UR
119	T. 5S., R. 27E., Sec. 25	Y	Y	N	31	30%	West	Skyline	Yes	SI	SI
120	T. 5S., R. 27E., Sec. 36	Y	Y	Y	47	45%	NW	Forwarder	Yes	UR	UR
194	T. 5S., R. 27E., Sec. 27	Y	Y	Y	21	30%	East	Forwarder	Yes	UR	UR
[2]	Alternative 3 would eliminate PCT treatment in units identified.										

Non-commercial thinning units

Unit No.	Legal	Alt 2	Alt. 3	Alt. 4	Acres	Slope	Aspect	Harvest	PCT	Pre-structure	Post-structure
200	T. 5S., R. 27E., Sec. 27 & 34	Y	Y	Y	36	25%	E - SE	PCT	Yes	SI	SI
201	T. 5S., R. 27E., Sec. 33 & 34	Y	Y	Y	36	25%	East	PCT	Yes	SI	SI
203	T. 5S., R. 27E., Sec. 27 & 34	Y	Y	Y	6	30%	West	PCT	Yes	SI	SI
204	T. 5S., R. 27E., Sec. 27 & 34	Y	Y	Y	28	30%	East/West	PCT	Yes	SI	SI
205	T. 5S., R. 27E., Sec. 27	Y	Y	Y	36	20%	SE	PCT	Yes	SI	SI
206	T. 5S., R. 27E., Sec. 27	Y	Y	Y	16	40%	South	PCT	Yes	SI	SI
207	T. 5S., R. 27E., Sec. 24	Y	Y	Y	26	30%	NE	PCT	Yes	SI	SI
208	T. 6S., R. 28E., Sec. 4 & 9	Y	Y	Y	31	15%	SE	PCT	Yes	SI	SI
209	T. 6S., R. 27E., Sec. 3	Y	Y	Y	25	15%	East	PCT	Yes	SI	SI
210	T. 5S., R. 28E., Sec. 19	Y	Y	Y	14	25%	South	PCT	Yes	SI	SI
211	T. 5S., R. 27E., Sec. 24 & 25	Y	Y	Y	21	15%	East	PCT	Yes	SI	SI
212	T. 6S., R. 28E., Sec. 6	Y	Y	Y	11	20%	NE	PCT	Yes	SI	SI
213	T. 5S., R. 27E., Sec. 25	Y	Y	Y	16	25%	South	PCT	Yes	SI	SI
214	T. 5S., R. 27E., Sec. 25	Y	Y	Y	10	25%	North	PCT	Yes	SI	SI
215	T. 5S., R. 27E., Sec. 24	Y	Y	Y	16	20%	South	PCT	Yes	SI	SI
216	T. 5S., R. 28E., Sec. 19	Y	Y	Y	17	15%	NE	PCT	Yes	SI	SI
217	T. 5S., R. 28E., Sec. 29 & 30	Y	Y	Y	8	20%	S - SW	PCT	Yes	SI	SI
218	T. 5S., R. 28E., Sec. 20 & 29	Y	Y	Y	15	5%	South	PCT	Yes	SI	SI
219	T. 5S., R. 28E., Sec. 29	Y	Y	Y	5	15%	S - SE	PCT	Yes	SI	SI
220	T. 5S., R. 27E., Sec. 36	Y	Y	Y	15	15%	E - W	PCT	Yes	SI	SI
221	T. 5S., R. 27E., Sec. 34	Y	Y	Y	15	15%	S - SW	PCT	Yes	SI	SI
222	T. 5S., R. 27E., Sec. 27	Y	N	Y	3	20%	SE	PCT	Yes	SI	SI
223	T. 5S., R. 27E., Sec. 35	Y	Y	Y	6	10%	North	PCT	Yes	SI	SI
224	T. 5S., R. 27E., Sec. 35	Y	Y	Y	5	15%	South	PCT	Yes	SI	SI
225	T. 5S., R. 27E., Sec. 24	Y	N	Y	26	40%	NE/SE	PCT	Yes	SI	SI
226	T. 6S., R. 27E., Sec. 2	Y	Y	Y	44	30%	NE	PCT	Yes	SI	SI
227	T. 6S., R. 27E., Sec. 2	Y	N	Y	21	15%	South	PCT	Yes	SI	SI
228	T. 5S., R. 27E., Sec. 33	Y	Y	Y	17	14%	SE	PCT	Yes	SI	SI
229	T. 6S., R. 27E., Sec. 14	Y	Y	Y	15	15%	West	PCT	Yes	SI	SI

Unit No.	Legal	Alt 2	Alt. 3	Alt. 4	Acres	Slope	Aspect	Harvest	PCT	Pre-structure	Post-structure
230	T. 6S., R. 27E., Sec. 14	Y	Y	Y	22	15%	SE	PCT	Yes	SI	SI
231	T. 5S., R. 27E., Sec. 23 & 26	Y	Y	Y	6	10%	West	PCT	Yes	SI	SI
232	T. 5S., R. 28E., Sec. 19 & 20	Y	Y	Y	44	20%	South	PCT	Yes	SI	SI
233	T. 5S., R. 28E., Sec. 18 & 19	Y	Y	Y	61	15%	W - SW	PCT	Yes	SI	SI
234	T. 5S., R. 27E., Sec. 24	Y	Y	Y	6	10%	South	PCT	Yes	SI	SI
235	T. 5S., R. 28E., Sec. 30	Y	Y	Y	50	25%	SE	PCT	Yes	SI	SI
236	T. 5S., R. 28E., Sec. 19 & 30	Y	Y	Y	36	25%	North	PCT	Yes	SI	SI
237	T. 6S., R. 28E., Sec. 17	Y	Y	Y	11	5%	South	PCT	Yes	SI	SI
238	T. 5S., R. 28E., Sec. 28 & 29	Y	Y	Y	30	15%	South	PCT	Yes	SI	SI
239	T. 5S., R. 28E., Sec. 28 & 29	Y	Y	Y	5	15%	NW	PCT	Yes	SI	SI
240	T. 6S., R. 28E., Sec. 6	Y	Y	Y	16	5%	South	PCT	Yes	SI	SI
241	T. 6S., R. 27E., Sec. 9	Y	Y	Y	5	20%	South	PCT	Yes	SI	SI
242	T. 6S., R. 27E., Sec. 3	Y	Y	Y	21	40%	East	PCT	Yes	SI	SI
243	T. 6S., R. 27E., Sec. 2	Y	Y	Y	3	10%	NE	PCT	Yes	SI	SI
244	T. 6S., R. 28E., Sec. 4 & 9	Y	Y	Y	12	35%	East	PCT	Yes	YFMS	YFMS
245	T. 6S., R. 27E., Sec. 3 & 4	Y	Y	Y	13	15%	SW	PCT	Yes	SI	SI
246	T. 6S., R. 27E., Sec. 1	Y	Y	Y	20	15%	South	PCT	Yes	SI	SI
247	T. 6S., R. 27E., Sec. 1	Y	Y	Y	8	15%	South	PCT	Yes	SI	SI

Appendix C – Screens Consistency

On August 18, 1993, the Regional Forester for the USDA Forest Service, Region 6 issued direction to screen timber sales to ensure that all sales are consistent with the National Forest Management Act viability requirements for old growth-associated species (Lowe, 1993). That direction was modified and extended on May 20, 1994 (Lowe, 1994) and further modified in 1995 (USDA Forest Service 1995a). The 1995 document amended the Umatilla National Forest Land and Resource Management Plan (Forest Plan) as Forest Plan Amendment #11. That current direction, often referred to as the "Timber Sale Screens", includes specific direction to pass each timber sale proposal through a set of interim ecosystem and wildlife standards.

This document documents how the timber sale activities proposed in the Wildcat Environmental Analysis (EA) complies with the Timber Sale Screens. In the following table, the left hand column displays specific direction from the Screens. The column on the right describes how the Wildcat EA addresses that direction.

Interim Wildlife Standard	Wildcat
The interim wildlife standard has two possible scenarios to follow based on the Historical Range of Variability (HRV) for each biophysical environment within a given watershed. For the purposes of this standard, late and old structural stages (LOS) can be either "Multi-strata with Large Trees", or "Single Strata with Large Trees", as described in Table 1 of the Ecosystem Standard. These LOS stages can occur separately or in some cases, both may occur within a given biophysical environment. LOS stages are calculated separately in the interim ecosystem standard. Use Scenario A whenever any one type of LOS is below HRV. If both types occur within a single biophysical environment and one is above HRV and one below, use Scenario A. Only use Scenario B when both LOS stages within a particular biophysical environment are at or above HRV.	Wildcat falls within **Scenario A**. For the purpose of calculating HRV, all effects analysis was calculated on the subwatershed area scale on National Forest lands. In dry forest biophysical environments, old forest single-stratum (OFSS) was below the lower limit of HRV and old forest multi-strata (OFMS) was above the upper limit of HRV. Because OFSS is below HRV, the project falls within Scenario A. In the moist forest biophysical environments, old forest multi strata (OFMS) was below the lower limit of HRV and old forest single strata (OFSS) is within HRV. Because OFMS is below HRV, the project falls within Scenario A.

a. The following types of sales will not be subject to the interim standards: personal use firewood sales; post and post sales; sales to protect health and safety; and sales to modify vegetation within recreation special use areas. b. The following sale types were exempted from consideration of HRV through the interim ecosystem standard, but must still meet the intent of the wildlife standards by following the direction provided in Scenario A, 1) through 4), as applicable to the type of sale being proposed, and regardless of whether the stand is LOS or not: precommercial thinning sales, sales of material sold as fiber, sales of dead material less than sawlog size (7-inch dbh) with incidental green volume, salvage sales with incidental green volume located outside currently mapped old growth, commercial thinning and/or understory removal sales located outside currently mapped old growth.	An HRV analysis has been completed for the Wildcat Analysis Area. The HRV analysis is included in the analysis file for the project, and is summarized in the EA.
Scenario A	
If either one or both of the late and old structural (LOS) stages falls BELOW HRV in a particular biophysical environment within a watershed, then there should be NO NET LOSS OF LOS from that biophysical environment. DO NOT allow timber sale harvest activities to occur within LOS stages that are BELOW HRV.	During the early planning for this project, units recommended for treatment were compared with maps of structural classes. All units that fell within dry forest OFSS or moist forest OFMS stands were either dropped from further consideration, or were modified to exclude them from areas of treatment.

1) Some timber sale activities can occur within LOS stages that are within or above HRV in a manner to maintain or enhance LOS within that biophysical environment. It is allowable to manipulate one type of LOS to move stands into the LOS stage that is deficit if this meets historical conditions.	Dry forest OFMS is above HRV in the Wildcat Analysis Area. Many of the units proposed for treatment fall within dry forest OFMS stands. The proposed treatment for those units, thinning from below, would move those stands closer to OFSS conditions. Some stands proposed for treatment have a substantial understory component of noncommercial size. That understory component would remain largely intact following the timber sale treatment. Subsequent treatments proposed in the EA, i.e., prescribed fire and precommercial thinning, would remove a portion of the understory in some areas. Some stands would be expected to remain in the OFMS while others would move into OFSS. The stands remaining in OFMS would be expected to move into OFSS classification over time if additional prescribed fire or thinning treatments are implemented, or through natural mortality of the understory trees. Depending on stand conditions following harvest and the types and timing that might be selected for future treatments, the stands that are currently OFMS could move into OFSS classification in the next 10 to 20 years.

2) Outside of LOS, many types of timber sale activities are allowed. The intent is still to maintain and/or enhance LOS components in stands subject to timber harvest as much as possible, by adhering to the following standards:	
2a) Maintain all remnant late and old seral and/or structural live trees ≥ 21" dbh that currently exist within stands proposed for harvest activities.	As described in the EA, all live trees greater than or equal to 21 inches dbh would be left except for within aspen habitat in Units 77 and 82 that are designated for aspen restoration. The letter entitled "Guidance for Implementing Eastside Screen" dated September 5, 2003 gives five examples of situations for which site-specific Forest Plan amendments might be appropriate. Number 5 identifies "overstory removal (including some trees over 21" dbh) to protect rare or declining understory elements, such as aspen.

2b) Manipulate vegetative structure that does not meet late and old structural (LOS) conditions, (as described in Table 1 of the Ecosystem Standard), in a manner that moves it towards these conditions as appropriate to meet HRV.	The prescription for the units outside of LOS is thinning from below. Thinning those stands would speed the development of OFSS conditions in those stands. This treatment would cut and remove many of the smaller trees within the stands and would save the larger, healthier trees. The effect would be to move the stands toward a single-stratum condition and would increase growth on the remaining trees so that they would grow to a large size more quickly. That combination of effects would enhance OFSS components in the dry biophysical environment and OFMS in the moist biophysical environment.
2c) Maintain open, parklike stand conditions where this condition occurred historically. Manipulate vegetation in a manner to encourage the development and maintenance of large diameter, open canopy structure. (While understory removal is allowed, some amount of seedlings, saplings, and poles need to be maintained for the development of future stands).	Dry forests in the Wildcat Analysis Area would have historically had a high percentage of OFSS stands. OFSS stands are often described as "open, parklike." As described above, the proposed treatments maintain OFSS conditions or move stands toward OFSS conditions.

3) Maintain connectivity and reduce fragmentation of LOS stands by adhering to the following standards: INTENT STATEMENT: While data is still being collected, it is the best understanding of wildlife science, today, that wildlife species associated with late and old structural conditions, especially those sensitive to "edge", rely on the connectivity of these habitats to allow free movement and interaction of adults and dispersal of young. Connectivity corridors do not necessarily meet the same description of "suitable" habitat for breeding, but allow free movement between suitable breeding habitats. Until a full conservation assessment is completed that describes in more detail the movement patterns and needs of various species and communities of species in eastside ecosystems, it is important to insure that blocks of habitat maintain a high degree of connectivity between them, and that blocks of habitat do not become fragmented in the short-term.	Habitat connectivity was evaluated by overlaying maps of OFSS and OFMS stands, old growth stands designated by the Umatilla Forest Plan, Management areas C1, C2, C3, C4, E1 and E2; and timber harvest alternatives from the EA. During the planning stages of this project stands were identified as connectivity corridors in the Analysis Area. Minimum vegetation requirements for connection corridors were considered in identifying areas to be thinned. Connectivity corridors between old forest habitat blocks and Forest Plan designated old growth meet Forest Plan standards for connectivity.

3a) Maintain or enhance the current level of connectivity between LOS stands and between all Forest Plan designated "old growth/MR" habitats by maintaining stands between them that serve the purpose of connection as described below: (1) Network pattern - LOS stands and MR/Old Growth habitats need to be connected with each other inside the watershed as well as to like stands in adjacent watersheds in a contiguous network pattern by at least 2 different directions. (2) Connectivity Corridor Stand Description Stands in which medium diameter or larger trees are common, and canopy closures are within the top one-third of site potential. Stand widths should be at least 400 ft. wide at their narrowest point. The only exception to stand width is when it is impossible to meet 400 ft with current vegetative structure, AND these "narrower stands" are the only connections available; (use them as last resorts). In the case of lodgepole pine, consider medium to large trees as appropriate diameters to this	

stand type. If stands meeting this description are not available in order to provide at least 2 different connections for a particular LOS stand or MR/Old Growth habitat, leave the next best stands for connections. Again, each LOS and MR/Old Growth habitat must be connected at least 2 different ways. (3) Length of Connection Corridors - The length of corridors between LOS stands and MR habitats depends on the distance between such stands. Length of corridors should be as short as possible. (4) Harvesting within connectivity corridors is permitted if all the criteria in (2) above can be met, and if some amount of understory (if any occurs) is left in patches or scattered to assist in supporting stand density and cover. Some understory removal, stocking control, or salvage may be possible activities, depending on the site. 3b) To reduce fragmentation of LOS stands, or at least not increase it from current levels, stands that do not currently meet LOS that are located within, or surrounded by, blocks of LOS stands should not be considered for even-aged regeneration, or group selection at this time. Non-regeneration or single tree selection (UEAM) activities in these areas should only proceed if the prescription moves the stand towards LOS conditions as soon as possible.	
4) Adhere to the following specific wildlife prescriptions. These standards are set at MINIMUM levels of consideration. Follow Forest Plan standards and guidelines when they EXCEED the following prescriptive levels: a) Snags, Green Tree Replacements and Down Logs: INTENT STATEMENT - Most (if not all) wildlife species rely on moderate to high levels of snags and down logs for nesting, roosting, denning and feeding. Large down logs are a common and important component of most old and late structural forests. Past management practices have greatly reduced the number of large snags and down logs in managed stands.	

(1) All sale activities (including intermediate and regeneration harvest in both even-age and uneven-age systems, and salvage) will maintain snags and green replacement trees of > 21 inches dbh, (or whatever is the representative dbh of the overstory layer if it is less than 21 inches), at 100% potential population levels of primary cavity excavators. This should be determined using the best available science on species requirements as applied through current snag models or other documented procedures. NOTE: for Scenario A, the live remnant trees (≥21" dbh) left can be considered for part of the green replacement tree requirement.	Under Alternatives 2 through 4, snags quantities would be left at numbers specified in the Wildcat Wildlife Specialists Report. Once those standards for snags have been met, excess snags *may* be removed. Snags will be grouped if possible. All green replacement trees over 21 inches dbh will be left except in Units 77 and 82, which are designated as aspen restoration units. A Forest Plan Amendment will be needed to remove trees over 21 inches dbh in these units.

(2) Pre-activity (currently existing) down logs may be removed only when they exceed the quantities listed below. When pre-activity levels of down logs are below the quantities listed, do not remove downed logging debris that fits within the listed categories. It is not the intention of this direction to leave standing trees for future logs in addition to the required snag numbers, or to fall merchantable material to meet the down log requirements. The snag numbers are designed to meet future down log needs in combination with natural mortality. Exceptions to meeting the down log requirement can be made where fire protection needs for life and property cannot be accomplished with this quantity of debris left on site. The down log criteria are not intended to preclude the use of prescribed burning as an activity fuels modification treatment. Fire prescription parameters will ensure that consumption will not exceed 3 inches total (1 1/2 inch per side) of diameter reduction in the featured large logs (sizes below). Tools such as the CONSUME and FOFEM computer models, fire behavior nomograms, and local fire effects documentation can aid in diameter reduction estimates. Leave logs in current lengths; do not cut them into pieces. Longer logs may count for multiple "pieces" without cutting them. Cutting them may destroy some habitat uses and also cause them to decay more rapidly. It is also not expected that the "pieces" left will be scattered equally across all acres.	The Wildcat EA includes mitigation that "Where possible, all pre-existing down material will be left and skidding will avoid existing downed logs to minimize breakage."

SPECIES	PCS. PER ACRE	DIA. SMALL END	PIECE LENGTH &TOTAL LINEAL LENGTH
Ponderosa Pine	3-6	12"	>6 ft. 20-40 ft.
Mixed Conifer	15-20	12"	>6 ft. 100-140 ft.

5) GOSHAWKS: INTENT STATEMENT: Goshawks are known to use interior forest habitats of mature/old growth structure. Habitat uses, nesting stand characteristics, and key habitat structural components in eastern Oregon/Washington are currently being studied. Until further information is known and management plans approved to insure species viability, the following standards are to be met as a minimum. Forest Plan standards and guidelines that EXCEED the levels described below should be used instead of, or in addition to the following: (a) Protect every known active and historically used goshawk nest-site from disturbance. "Historical" refers to known nesting activity occurring at the site in the last 5 years. Seasonal restrictions on activities near nest sites will be required for activity types that may disturb or harass pair while bonding and nesting. (b) 30 acres of the most suitable nesting habitat surrounding all active and historical nest tree(s) will be deferred from harvest. c) A 400 acre "Post Fledging Area" (PFA) will be established around every known active nest site. While harvest activities can occur within this area, retain the LOS stands and enhance younger stands towards LOS condition, as possible.	There is one known Goshawk nest in the project area. All units in or near the 30 acre nest site were dropped during development. The two units that remain within the 400 acre post fledgling area will be treated to enhance LOS. In another area, a Goshawk answered the call, but a nest was never found. If a Goshawk nest is found during implementation, the requirements in the Screens would be met.

Appendix D – Roads Analysis

Due to the size of this document the Roads Analysis is not included in the paper copy of the EA. The Roads analysis is available upon request.

Please contact the Heppner Ranger District Office at 541-676-9187.

Appendix E – Existing and Predicted Detrimental Soil Condition (DSC)

Activity Unit	Existing Disturbance Condition	Existing Detrimental Soil Condition % range	Estimated Added DSC from Harvest Activity	Estimated Added DSC from Fuels Activity	Total average% Potential DSC Post-Activity	Gross Unit Treatment Acreage	Acres DSC
1	L	0-2	2-4	1-3	6	89	5
3	L	0-1	2-4	1-3	6	29	2
4	L	0-1	0-2	1-3	4	118	5
7	L	1-3	2-4	1-3	7	134	9
10	L	0-1	2-4	1-3	6	44	3
12	L	0-1	2-4	1-3	6	106	6
13	L	1-2	2-4	1-3	7	77	5
14	L	0-1	2-4	1-3	6	36	2
19	L	1-3	2-4	1-3	7	39	3
20	L	2-4	2-4	1-3	8	175	14
22	L	2-4	2-4	1-3	8	125	10
23	L	0-1	2-4	1-3	6	47	3
27	L	1-3	2-4	1-3	7	265	19
28	L	0-2	2-4	1-3	6	30	2
30	L	1-2	2-4	1-3	7	13	1
31	L	2-4	2-4	1-3	8	33	3
33	M	3-5	2-4	1-3	9	40	4
34	L	2-4	4-8	1-3	11	21	2
35	L	2-4	2-4	1-3	8	20	2
36	L	1-3	4-8	1-3	10	10	1
37	L	1-3	4-8	1-3	10	5	1
38	L	2-4	4-8	1-3	11	4	1
39	L	1-3	4-8	1-3	10	42	4
40	L	1-3	4-8	1-3	10	29	3
41	L	2-4	4-8	1-3	11	13	1
42	L	2-6	4-8	1-3	12	16	2
43	L	0-2	2-4	1-3	6	54	3

Activity Unit	Existing Disturbance Condition	Existing Detrimental Soil Condition % range	Estimated Added DSC from Harvest Activity	Estimated Added DSC from Fuels Activity	Total average% Potential DSC Post-Activity	Gross Unit Treatment Acreage	Acres DSC
44	L	1-3	4-8	1-3	10	18	2
45	M	2-4	2-4	1-3	8	7	1
46	L	1-3	2-4	1-3	7	12	1
47	L	1-3	2-4	1-3	6	4	1
48	M	2-4	2-4	1-3	8	30	2
49	L	1-3	2-4	1-3	7	3	1
51	L	1-3	2-4	1-3	7	38	3
53	L	2-4	4-8	1-3	11	7	1
55	L	1-3	4-8	1-3	10	9	1
56	L	0-2	4-8	1-3	9	17	2
57	L	1-3	4-8	1-3	10	9	1
58	L	1-3	4-8	1-3	10	5	1
60	L	0-2	4-8	1-3	9	16	1
62	L	1-3	4-8	1-3	11	7	1
63	L	0-2	2-4	1-3	6	11	1
67	L	1-3	4-8	1-3	10	33	3
68+	L	1-3	3-5	1-3	8	31	2
71	L	0-2	0-2	1-3	4	18	1
72	L	1-3	-	1-3	4	44	2
73	L	1-3	4-8	1-3	10	12	1
74	L	1-3	2-4	1-3	7	115	8
75	L	1-3	4-8	1-3	10	69	7
76	L	1-3	4-8	1-3	10	17	2
77+	L	0-2	0-2	1-3	4	3	1
78	L	1-3	2-4	1-3	7	53	4
79	L	1-3	4-8	1-3	10	77	8
80	L	3-5	2-4	1-3	9	12	1
81	L	3-5	2-4	1-3	9	31	3

Activity Unit	Existing Disturbance Condition	Existing Detrimental Soil Condition % range	Estimated Added DSC from Harvest Activity	Estimated Added DSC from Fuels Activity	Total average% Potential DSC Post-Activity	Gross Unit Treatment Acreage	Acres DSC
82	L	1-3	0-2	1-3	5	9	1
83	L	2-4	0-2	1-3	6	5	1
84	L	1-3	0-2	1-3	5	23	1
85	L	1-3	2-4	1-3	7	47	3
86	M	3-5	2-4	1-3	9	34	3
87	L	2-6	2-4	1-3	9	9	1
88	L	0-2	2-4	1-3	6	113	7
89+	L	1-3	3-5	1-3	8	22	2
90+	L	1-3	5-9	1-3	11	13	1
91+	L	0-2	5-9	1-3	10	24	2
92		1-3	2-4	1-3	7	6	1
93		1-3	2-4	1-3	7	24	2
94		1-3	2-4	1-3	7	14	1
95	L	1-3	2-4	1-3	7	24	2
96	L	1-3	2-4	1-3	7	97	7
97		1-3	2-4	1-3	7	23	2
98	L	1-3	2-4	1-3	7	43	3
99	L	1-3	2-4	1-3	7	66	5
100	L	1-3	2-4	1-3	7	155	11
101	L	1-3	2-4	1-3	7	67	5
102	L	1-3	2-4	1-3	7	61	4
103	L	1-3	2-4	1-3	7	52	4
104	L	1-3	2-4	1-3	7	11	1
105	L	1-3	2-4	1-3	7	15	1
106	L	1-3	2-4	1-3	7	47	3
107	L	1-3	2-4	1-3	7	13	1
108	L	1-3	2-4	1-3	7	83	6
109	L	1-3	2-4	1-3	7	30	2

Activity Unit	Existing Disturbance Condition	Existing Detrimental Soil Condition % range	Estimated Added DSC from Harvest Activity	Estimated Added DSC from Fuels Activity	Total average% Potential DSC Post-Activity	Gross Unit Treatment Acreage	Acres DSC
111	M	2-6	4-8	1-3	12	54	6
112	L	1-3	2-4	1-3	7	40	3
113		1-3	0-2	1-3	5	14	1
115		1-3	0-2	1-3	5	24	1
116		1-3	0-2	1-3	5	22	1
117		1-3	0-2	1-3	5	26	1
118		1-3	0-2	1-3	5	88	4
119		1-3	0-2	1-3	5	31	2
120		1-3	2-4	1-3	7	47	3
122	L	1-3	0-2	1-3	5	15	1
124	L	2-4	0-2	1-3	6	18	1
125		1-3	0-2	1-3	5	22	1
126		1-3	0-2	1-3	5	12	1
127		1-3	0-2	1-3	5	44	2
133+	L	1-3	1-3	1-3	6	80	5
135+	L	1-3	1-3	1-3	6	71	4
138	L	1-3	4-8	1-3	10	32	3
140	M	3-5	4-8	1-3	12	22	3
141	L	2-4	4-8	1-3	11	29	3
142	L	3-5	4-8	1-3	12	18	2
143	L	1-3	4-8	1-3	10	6	1
144	L	1-3	4-8	1-3	10	8	1
145	L	1-3	2-4	1-3	7	46	3
146	L	1-3	2-4	1-3	7	5	1
177+		1-3	3-5	1-3	6	12	1
191+		1-3	5-9	1-3	11	8	1
194		1-3	2-4	1-3	7	21	1
200	L	1-3	0-2	1-3	5	36	2

Activity Unit	Existing Disturbance Condition	Existing Detrimental Soil Condition % range	Estimated Added DSC from Harvest Activity	Estimated Added DSC from Fuels Activity	Total average% Potential DSC Post-Activity	Gross Unit Treatment Acreage	Acres DSC
201	L	1-3	0-2	1-3	5	36	2
203	L	1-3	0-2	1-3	5	6	1
204	L	1-3	0-2	1-3	5	28	1
205	L	1-3	0-2	1-3	5	36	2
206	L	1-3	0-2	1-3	5	16	1
207	L	1-3	0-2	1-3	5	26	1
208	L	1-3	0-2	1-3	5	31	2
209	L	1-3	0-2	1-3	5	25	1
210	L	1-3	0-2	1-3	5	14	1
211	L	1-3	0-2	1-3	5	21	1
212	L	1-3	0-2	1-3	5	11	1
213	L	1-3	0-2	1-3	5	16	1
214	L	1-3	0-2	1-3	5	10	1
215	L	1-3	0-2	1-3	5	16	1
216	L	1-3	0-2	1-3	5	17	1
217	L	1-3	0-2	1-3	5	8	1
218	L	1-3	0-2	1-3	5	15	1
219	L	1-3	0-2	1-3	5	5	1
220	L	1-3	0-2	1-3	5	15	1
221	L	1-3	0-2	1-3	5	15	1
222	L	1-3	0-2	1-3	5	3	1
223	L	1-3	0-2	1-3	5	6	1
224	L	1-3	0-2	1-3	5	5	1
225	L	1-3	0-2	1-3	5	26	1
226	L	1-3	0-2	1-3	5	44	2
227	L	1-3	0-2	1-3	5	21	1
228	L	1-3	0-2	1-3	5	17	1
229	L	1-3	0-2	1-3	5	15	1
230	L	1-3	0-2	1-3	5	22	1

Activity Unit	Existing Disturbance Condition	Existing Detrimental Soil Condition % range	Estimated Added DSC from Harvest Activity	Estimated Added DSC from Fuels Activity	Total average% Potential DSC Post-Activity	Gross Unit Treatment Acreage	Acres DSC
231	L	1-3	0-2	1-3	5	6	1
232	L	1-3	0-2	1-3	5	44	2
233	L	1-3	0-2	1-3	5	61	3
234	L	1-3	0-2	1-3	5	6	1
235	L	1-3	0-2	1-3	5	50	3
236	L	1-3	0-2	1-3	5	36	2
237+	L	1-3	0-2	1-3	5	11	1
238	L	1-3	0-2	1-3	5	30	2
239	L	1-3	0-2	1-3	5	5	1
240	L	1-3	0-2	1-3	5	16	1
241	L	1-3	0-2	1-3	5	5	1
242	L	1-3	0-2	1-3	5	21	1
243	L	1-3	0-2	1-3	5	3	1
244	L	1-3	0-2	1-3	5	12	1
245	L	1-3	0-2	1-3	5	13	1
246	L	1-3	0-2	1-3	5	20	1
247	L	1-3	0-2	1-3	5	8	1

Appendix F – Cumulative Effects List of Projects Considered

The following list of management activities have occurred within the project area boundary. Management activities from this list and activities that occur outside of the project boundary but within a specific resource analysis area that are applicable to the individual resource are analyzed in Chapter 3.

Project		Description	Condition
Timber Harvest			
Year	Project Name	Size and Type	
Future	Ditch Danger Tree	Approximately 10 road miles: Selective removal of danger trees	
2008	Monument Fire Salvage	189 acres: Salvage	
1996	53 Roadside Salvage	192 acres: Intermediate harvest method, mortality	
1996	Cold Salvage	747 acres: Intermediate harvest method, mortality	
1989-1991	Dry Swale	97 acres: Intermediate harvest method, mortality	
1991-1992	Dry Swale Ditch	228 acres: Regeneration harvest, clearcut	
1997-1999	Hitchen Post Salvage	469 acres: Regeneration harvest, seed cut	
1984	Hog	3,324 acres: Regeneration harvest, overstory removal	
1999	Hollywood Salvage	29 acres: Intermediate harvest method, thinning	
1981-1983	Jackpot	97 acres: Intermediate harvest method, thinning	
1974	Little Bear	121 acres: Regeneration harvest, individual tree	
1997-1998	Lonestar Salvage	351 acres: Intermediate harvest method, mortality	
1996	Madison Salvage	23 acres: Regeneration harvest, seed cut, seed tree	
1984-1985	Mallory	129 acres: Intermediate harvest method, mortality	

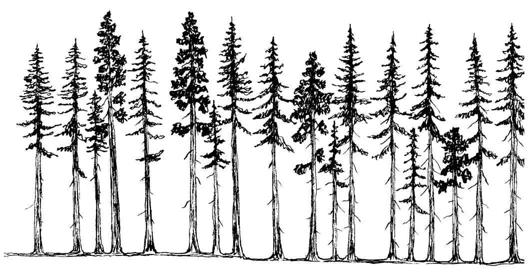
1996	Martin Salvage	11 acres: Regeneration harvest, seed cut, seed tree	
1989	Martin	78 acres: Regeneration harvest, clearcut	
1980-1983	Scattered	92 acres: Intermediate harvest method, mortality	
1997	Skookum Commercial Thin	122 acres: Intermediate harvest method, thinning	
1988-1990	Skookum	1270 acres: Regeneration harvest, removal cut, overstory	
1973	Swale Creek	1663 acres: Regeneration harvest, individual tree	
1986	Swale	142 acres: Regeneration harvest, seed cut , seed tree	
1987-1988	Texas	111 acres: Intermediate harvest method, mortality	
1986-1989	Texas	600 acres: Regeneration harvest, clearcut	
1993	Tupper Salvage	226 acres: Regeneration harvest, individual tree	
1977	Two Springs	316 acres: Regeneration harvest, individual tree	
1949-1967	(10) Unknown	7,693 acres: Regeneration harvest, partial removal	
Precommercial Thin			
1973-2002		Precommercial thinning has taken place on about 1,100 acres within the project area.	
2007-2008	Texas	220 acres	
Reforestation			
1985-2004		2,300 acres of reforestation has occurred within the project boundary	
2008	Monument Complex	120 acres are planned for reforestation	
Prescribed Fire			

1984-2001		20,405 acres of prescribed fire has occurred within the project boundary. Many areas have received prescribed fire on two separate occasions	
1984	Hog	349 acres	Landscape level prescribed fire has been used to reduce naturally occurring fuels over large areas and to increase grazing quality for both big game and cattle. These fires are generally low intensity fires burning in a mosaic pattern. The ground area actually burned is less than the acres shown. District records indicate that the following acres have been burned for natural fuels reduction within the project area.
1985	Hog	273 acres	
1988	Winter Range	382 acres	
1990	Turner Mt.	434 acres	
1993	Three Trough	2504 acres	
1994	Three Trough and Coffee Pot	4031 acres	
1998	Lower Skookum	191 acres	
1999	Lower Skookum	53 acres	
Fire Suppression			
2007	Monument Complex	53,548 acre fire occurred near the southern portion of the project area. 4,896 acres were inside the project area boundary.	This wildfire occurred during July when conditions created a moderate burn resulting in low mortality of vegetation. 180 acres of thinning areas and 729 acres of a prescribed burn block were within the fire boundary.
1970-2004	Fires less than 10 acres	Suppression activities occurred on 160 fires within the project area	Vegetation has recovered
1910	Fire 13	18,141 acre fire occurred near the project area. 422 acres were inside the project area boundary.	Fully Recovered
Habitat Improvements	Instream Structures	Alder Creek – 34 structures Skookum Creek – 124 structures Swale Creek – 8 structures	55 of these structures have been identified as needing maintenance work. The remainder

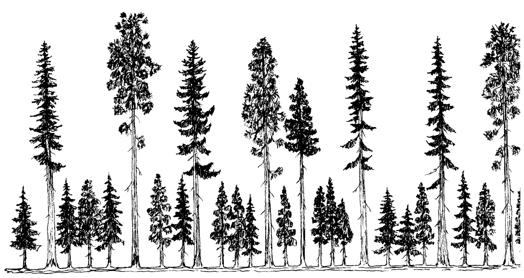
			are functioning
Ongoing	Riparian planting and caging	All perennial streams	Included in existing condition for aquatic habitat
	Fence construction	Electric and permanent fence was constructed to protect riparian habitat for the Middle Columbia steelhead. Grazing rotation and monitoring have successfully maintained forest plan standards and guides.	
Transportation	Existing Roads	There are 134.5 miles of road within the two subwatersheds.	
	Road use-all forest activities	60 miles of open road, including seasonally open roads	Road surface displacement/contamina tion of aggregate, user developed roads.
Proposed for 2009	Ditch Danger Tree removal	About 11 miles of open or administrative roads are in the project area.	Danger trees identified at risk of falling onto road would be felled and possibly removed. All logging is done from open roads. Only a few trees per mile of road are removed. Included in standing dead section of Chapter 3.
	Road maintenance	Approximately 134 miles of roads are currently shown on the Planning Area. Of those, 60 miles are managed as open or seasonally open roads. 3.4 Miles are under County jurisdiction and generally maintained yearly. The open Forest roads are mostly maintenance level 2 and not maintained on a regular basis.	May include roadside vegetation brushing or road surface grading.
Grazing			
	Late 1800's – mid 1900's Historic Grazing		Extensive grazing caused a decrease in vegetative coverage and loss of organic layer on areas of shallow soils and a change of hysterical forb-species to less palatable species

			in areas of deeper soils.
	Recent years 1995 to present	Portions of Little Wall and Swale Creek allotments	Increased use of area roads, fence maintenance activities using both horses and ATVs. Continued use of forage
Minerals and forest products			
	Mushrooms	Mushroom gathering most commonly occurs in the spring and early summer months. Travel occurs on open roads and by foot. Commercial camps have occurred in the recent past.	
	Firewood	District firewood cutting allows for cutting and gathering any dead standing or dead down tree, less than 24 inches in diameter at stump height that is within 300 foot slope distance from any open road. Gathering is not allowed within 300 feet of any live stream, water body, campground, or OHV trial. Ponderosa pine can not be cut for firewood.	
	Mining	No active mines in the project area.	
Recreation			
	Hunting	Turkey, grouse, mule deer, rocky mountain elk, cougar, bear: results in day use and dispersed camping throughout the project area. Heaviest use period is from September through November.	Use is seasonal and limited to local sites.
	Dispersed camping, other	No designated camp grounds, 17 dispersed camp sites all located within RHCAs	
	Hiking	29 miles of trials	
	Snowmobiling and skiing	Throughout the area during the winter months. 19 miles of groomed trails and 3 miles ungroomed.	

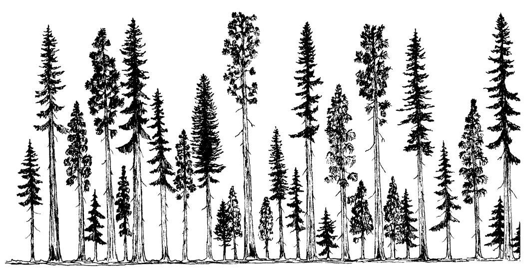
Stand Initiation (SI). Following a stand-replacing disturbance such as wildfire or tree harvest, growing space is occupied rapidly by vegetation that either survives the disturbance or colonizes the area. Survivors literally survive the disturbance above ground, or initiate new growth from their underground roots or from seeds on the site. Colonizers disperse seed into disturbed areas, the seed germinates, and then new seedlings establish and develop. A single canopy stratum of tree seedlings and saplings is present in this class.



Stem Exclusion (SECC or **SEOC)**. In this structure class, trees initially grow fast and quickly occupy all of their growing space, competing strongly for sunlight and moisture. Because trees are tall and reduce light, understory plants (including smaller trees) are shaded and grow more slowly. Species that need sunlight usually die; shrubs and herbs may become dormant. In this class, establishment of new trees is precluded by a lack of sunlight (**stem exclusion closed canopy**) or by a lack of moisture (**stem exclusion open canopy**).



Understory Reinitiation (UR). As the forest develops, a new age class of trees (cohort) eventually gets established after overstory trees begin to die or because they no longer fully occupy their growing space. This period of overstory crown shyness occurs when tall trees abrade each other in the wind (Putz et al. 1984). Regrowth of understory seedlings and other vegetation then occurs, and trees begin to stratify into vertical layers. This class consists of a low to moderate density overstory with small trees underneath.



Young Forest Multi Strata (YFMS). In this stage of forest development, three or more tree layers have become established as a result of minor disturbances (including tree harvest) that cause progressive but partial mortality of overstory trees, thereby perpetuating a multi-layer, multi-cohort structure. This class consists of a broken overstory layer with a mix of sizes present (large trees are scarce); it provides high vertical and horizontal diversity (O'Hara et al. 1996).

Old Forest (OFSS or **OFMS)**. Many age classes and vegetation layers mark this structure class and it usually contains large old trees. Decaying fallen trees may also be present that leave a discontinuous overstory canopy. The illustration shows a single-layer stand of ponderosa pine that evolved under the influence of frequent, recurring surface fires (**old forest single stratum**). On cold or moist sites without frequent fires, multi-layer stands with large trees in the uppermost stratum may be present (**old forest multi strata**).