Addendum

to the

ENVIRONMENTAL ASSESSMENT

for the

West Fork Illinois River Landscape Management Project

EA #OR117-04-07

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
MEDFORD DISTRICT
GRANTS PASS RESOURCE AREA

June 2005

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
MEDFORD DISTRICT

EA ADDENDUM

RESOURCE AREA: *Grants Pass* FY & EA: OR117-04-07
ACTION/TITLE: *West Fork Illinois River Landscape Management Project*
LOCATION: T40S-R8W-Sec 9, 20, 21, 27, 28, 32, 33
T41S-R9W-Sec 2, 3, 9, 10, 12, 13, 14, 15, Willamette Meridian

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Addendum Introduction / Background

The Environmental Analysis (EA) for the West Fork Illinois Landscape Management Project was completed and released for public review and comment on July 13, 2004. The purpose of this addendum is to update the EA. It incorporates corrections to the EA, it documents additional analysis of the proposed actions, addresses issues raised in public comments received, and it incorporates new information. It provides additional analysis of the environmental consequences of the proposed actions on the unique values of the nominated Waldo-Takilma Area of Critical Environmental Concern (ACEC).

Section numbers used in this addendum correspond to those in the EA. Updated tables in this addendum will follow the numbering convention from the EA, but will be preceded by the letter "A" for Addendum. New tables in the addendum will be numeric and preceded by the letter "A".

1.0 Introduction (EA p. 1)

The Rogue River/South Coast Biological Assessment / Biological Opinion number is corrected to read: 1-15-03-F-511 October 2003

1.3 Planning Issues for the Project (EA p. 2)

(6) Nominated ACEC

The eastern portion of the West Fork Illinois River project area overlaps an area nominated by the public for ACEC designation. The BLM has reviewed this nomination with a preliminary finding that a portion of the area has values that may warrant ACEC designation. ACECs can only be designated through the BLM's Resource Management Planning (RMP) process. Final determination and designation is thus outside the scope of West Fork project decision. Until an RMP process review occurs, special management attention will ensure that nominated ACEC values are protected. The area the BLM has initially analyzed as having ACEC potential is shown on updated Maps 2a and 3a (Appendix A).

An ACEC nomination, the identification of resource values that meet "relevant and important criteria" and the determination that there is a nominated ACEC for consideration in the RMP process do not preclude active resource management activities in the interim. "Temporary management includes those reasonable measures necessary to protect significant resource values from degradation until the area is fully evaluated through the resource management planning process" (BLM Manual 1613.21(E)). Resource management activities appropriate to the underlying land allocation and RMP management direction are permissible as long as the nominated ACEC values are not degraded.

2.0 Proposed Action and Alternatives (EA p. 4)

2.2 Proposed Action: Alternatives 2 and 3

2.2.1 Introduction

Summary Descriptions of the Proposed Action Alternative 2 and Alternative 3 (Tables B-1 and B-2 in the EA) are updated and replaced by Tables B-1.1 and B-2.1 (Addendum Appendix B). Updates include more accurate acreage and volume estimates and proposed treatment updates. Consequently, EA Table 2-2 (EA p. 5) is updated and replaced with the following table (updated numbers are in bold type):

Table A2-1: Comparison of Action Alternatives		
Proposed Treatment	**Alternative 2 Acres & est. volume**	**Alternative 3 Acres & est. volume**
Matrix harvest	**497 (3.9 mmbf)** (569 in EA)	**370 (2.7 mmbf)** (442 in EA)
Riparian Reserve treatments	**117 (0.4 mmbf)** (115 in EA)	0
	Acres	Acres
Fuel Hazard Reduction (matrix)	271	108
Fuel Hazard Reduction (riparian reserves)	**98** (94 in EA)	0
Wildlife Habitat Rest. and Enhance. (matrix)	1,267	598
Wildlife Habitat Rest. and Enhance. (riparian reserves)	355	0
Wildlife Habitat Rest. and Enhance. (proposed RNA)	631	0
Young Stand Management (matrix)	94	94
Young Stand Management (riparian reserves)	12	0

*Total BLM Acres in Project Area = 2,875

2.2.2 Potential Research Natural Area (RNA) and Nominated ACEC (EA p. 5)

2.2.2.1 ACEC (EA p. 6)

On September 24, 2001, the BLM received an Area of Critical Environmental Concern (ACEC) nomination (Waldo-Takilma ACEC) from three organizations: Siskiyou Regional Ecosystem Project, Native Plant Society of Oregon and World Wildlife Fund. The values upon which the nomination was based were presented as a list of broad resource value statements.

The ACEC nomination listed the following botanical values as the basis for the nomination. These values were assessed by the BLM with regard to their relevance and importance:

1. Exceptional biological diversity in a small geographic area.
2. Mosaic of ultramafic (serpentine) influenced lands and closed canopy forest
3. Ultramafic influenced lands with a variety of rare and sensitive plants and with peridotite or serpentine influenced plant communities including chaparral, Jeffrey pine savanna, and open-canopied mixed conifer forest.

A BLM interdisciplinary team of resource specialists conducted a preliminary assessment of the nomination based on the values presented and the assessment approach set forth in BLM Manual 1613. This preliminary assessment is based on four relevance and five importance criteria. Three of these relevance criteria and two importance criteria were pertinent in evaluating the nomination:

(a) Relevance criteria

1) A significant historic, cultural, or scenic value (including but not limited to rare or sensitive archaeological resources and religious or cultural resources important to Native Americans).

2) A fish and wildlife resource (including but not limited to habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).

3) A natural process or system (including but not limited to endangered, sensitive, or threatened plant species; rare, endemic, or relic plants and plant communities which are terrestrial, aquatic, or riparian; or rare geological features).

(b) Importance criteria

Each resource value that appeared to meet at least one relevance criterion was further assessed based on the following two importance criteria:

1) Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource.
2) Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.

The ACEC nomination listed the following botanical values as the basis for the nomination. These values were assessed by the BLM with regard to their relevance and importance:

(1) Exceptional biological diversity in a small geographic area.
(2) Mosaic of ultramafic (serpentine) influenced lands and closed canopy forest
(3) Ultramafic influenced lands with a variety of rare and sensitive plants and with peridotite or serpentine influenced plant communities including chaparral, Jeffrey pine savanna, and open-canopied mixed conifer forest.

This preliminary assessment found that a portion of the nominated area may meet four relevance and importance criteria for ACEC nominations (BLM Manual 1613): 1) Botany, 2) Historical/Cultural, 3) Soils/Geology, and 4) Wildlife and Vegetation. Only botany, historical/cultural, and soils/geology are germane to this addendum. The wildlife / vegetation relevance and importance criteria would likely be met for only a small part of the nominated area (70 acre tanoak stand in T40S, R8W, Section 34) which is in the East Fork of the Illinois watershed, and is outside the West Fork project area.

(1) Botany

Relevance - A natural process or system (including but not limited to endangered, sensitive, or threatened plant species; rare, endemic, or relic plants and plant communities which are terrestrial, aquatic, or riparian; or rare geological features).

Importance - Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource; and has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.

(2) Historical/cultural

Relevance - A significant historic, cultural, or scenic value (including but not limited to rare or sensitive archaeological resources and religious or cultural resources important to Native Americans).

Importance - Has more than locally significant qualities which give it special worth, consequence, meaning, distinctiveness or cause for concern, especially compared to any similar resource.

Features within the proposed ACEC represent one of the best examples of historic mining in southwestern Oregon. Sixteen sites within the nominated ACEC are a part of the Upper Illinois Valley, Oregon Mining Resources listing on the National Register of Historic Places because of the quality, integrity and significance related to placer mining and development of the area.

(3) Soils/geology – (sections 33, 34, 35, 26, and 27).

Relevance - A natural process or system. Less than 2% (probably less than 1%) of the surface of North America is comprised of ultramafic rocks and associated soils.

Importance - Has qualities that make it unique at the local Illinois Valley level because of the elaborate relationships of soils (and corresponding plant species) developed from serpentine, mixed serpentine material, and metavolcanic minerals.

Updated Maps 2a and 3a (Addendum Appendix A) identify the nominated ACEC that will be addressed in the RMP planning process (43 CFR § 1610.7-2). In the interim, special management attention will ensure that nominated ACEC values are protected.

Proposed Resource Management Activities

Resource management activities appropriate to the underlying land allocation and RMP management direction are permissible as long as the nominated ACEC values are not degraded. Inside the nominated ACEC, the West Fork EA proposes commercial thinning/modified group selection, fuel hazard reduction, and wildlife habitat restoration under Alternatives 2 and 3. Estimated effects to the nominated ACEC values (botany, historical/cultural and soils/geology) are analyzed in the following section, Chapter 3, Environmental Consequences. Estimated acres of each treatment type in the nominated ACEC are shown in Table A-1 (this is summarized from Addendum Appendix B, Tables AB-1 and AB-2). The units proposed for harvest would be tractor and/or cable yarded, with follow-up fuels and understory treatments to be accomplished by understory thinning/slashing, handpiling/burning, understory burning, and machine mastication. Units proposed for fuel hazard reduction and wildlife habitat restoration would be treated with a combination of underburning/broadcast burning, understory thinning/slashing, and machine mastication. Table A-1 shows the maximum number of potential machine mastication acres that are in the nominated ACEC. Actual acres treated by machine mastication are expected to be less based on factors such as actual post harvest fuel treatment needs and topography.

Table A2-2: Proposed Treatments in the Nominated ACEC

Treatment	Alternative 2 (acres)	Alternative 3 (acres)
Commercial thin/ Modified group select	175	150
Fuel hazard reduction (no machine mastication)	16	0
Wildlife habitat restoration	586	563
Machine mastication fuel hazard reduction	365	327

2.2.11 Roads and Transportation – Alternatives 2 & 3 (EA p. 17)

Since the release of the West Fork Illinois EA, additional analysis of the action alternatives identified an additional log landing option for Unit 21-3 (Addendum Appendix A, Maps 2a and 3a). An existing low standard road on private land in T40S, R8W, Section 28 would be improved and an approximately 265' extension (also on private land) would be constructed. Implementation would be contingent on obtaining permission for access from the landowner.

Table C-1: Proposed Road Use, Construction, Renovation, Improvement, Maintenance (EA Appendix C) is replaced by Table AC-1 (Addendum Appendix C). This adds the spur in section 28 and adds estimated

harvest volume that would be removed from road rights-of-way on BLM land and on private land in T41S, R9W, Sections 12 and 13.

2.2.12 Recreation and Cultural Resources – Alternatives 2 & 3 (new)

The table below shows historic sites and the protection or treatment planned for those sites. Cultural sites in the project area are in open, limited or closed categories for off-highway vehicle (OHV) use (RMP p.109). In open areas, all types of OHVs are permitted at all times in any location subject to operating regulations and vehicle standards. Limited areas are restricted by time, location OHV type. OHV use is prohibited in closed areas (43 CFR, subparts 8341 and 8342). In limited OHV use areas in the project area, roads and trails will be designated for OHV use through inventory and signing.

Table A2-3: Cultural Resources Protection / Enhancement Measures

Site Name/OHV designation	Nat'l Register of Historic Places Status	Management Recommendations Alternatives 2 and 3	
Fry Gulch Mine / limited	Listed	30' no treatment buffer. Develop minimal interpretive measures.	
Kate's Lithics / limited	Eligible	Establish a no treatment buffer.	
Logan Cut / limited	Listed	25' no treatment buffer from edge of outer gorge. Within 25-50' of the gorge, treatments could include understory thinning and handpiling/burning (directionally fall trees away from buffer). Develop interpretive display for the Waldo Placer Mining Complex.	
Waldo Town Site Cemetery / limited	Listed	200' no treatment buffer on west side of cemetery. Directionally fall trees away from buffer. No treatment on east side of cemetery (area will be flagged). Close access road to vehicles. Close access road to vehicles. Develop minimal interpretive measures (Alt. 2). Fully develop interpretive measures (Alt. 3).	
Little Green Apple Flat / closed	Not eligible	No protection needed; however, do not cut the apple tree (flagged with black and orange flagging).	
Roadside Refuse Scatter / limited	Not eligible	No protection needed.	
Deep Gravel Mine / closed and limited	Listed	Known cultural features that would be impacted by treatments would be buffered. Manual fuel and veg treatment, density mgt and under burning would be allowed on west side of site. Protect Wimer Ditch (see Wimer Ditch, below). Develop minimal interpretive measures (Alt. 2). Fully develop interpretive measures (Alt. 3).	
Waldo-Fry Auxiliary Ditches-limited	Eligible	Alt. 2: Directionally fall trees away from ditches, minimize equipment crossings. Develop a trail system and minimal interpretive measures.	Alt. 3: 50' no treatment buffer, directionally fall trees away from ditches, maintain visual buffer, develop a trail system, protect from fuels treatments as identified in PDFs (EA addendum p. 6).
Waldo Mine / limited	Listed	Buffer cultural features and implement vegetation treatment, density mgt. and fuels treatment. Continue to allow dispersed recreation and dispersed camping. Develop minimal interpretive measures (Alt. 2). Fully develop interpretive measures (Alt. 3).	
Fry Gulch Flats / limited	Unclear	30' no treatment buffer around cultural features.	
Waldo Chinese Cemetery / limited	Listed	Protect site integrity, maintain 200' no treatment buffer around edge of cemetery, directionally fall trees away from buffer.	
Osgood Ditch / limited & open	Listed	50' no treatment buffer. Directionally fall trees away from ditch. Include in an interpretive plan. Develop a trail system.	
		Alt. 2: Minimal breaching of ditch allowed, rebuild berm.	Alt. 3: No breaching of ditch allowed.
Wimer Road Mining Claim / Refuse / limited	Not eligible	Establish a 30' buffer around the cultural features.	

Table A2-3: Cultural Resources Protection / Enhancement Measures			
Site Name/OHV designation	**Nat'l Register of Historic Places Status**	**Management Recommendations Alternatives 2 and 3**	
Blazed Tree Claim and Refuse / limited	Not eligible	Establish a 30' buffer around the cultural features.	
Over-the-River Cabin and Camp / limited	Eligible	Establish a 30' buffer around the cultural features.	
Turner Albright Mine / limited	Not eligible	Establish a 30' buffer around the cultural features (Alt. 2). No treatment planned (Alt. 3).	
Turner Cabin Barn / limited	Eligible	30' buffer around the cultural features. Develop minimal interpretive measures.	100' buffer and protect from fuels treatments as identified in PDFs (EA addendum p. 6).Develop minimal interpretive measures.
Seats Canal / limited & open	Unclear	No treatment planned.	
Buckbrush Refuse Scatter / limited	Not eligible	No treatment planned.	
Serpentine Claim Refuse / limited	Not eligible	30' no treatment buffer.	
Every-body's Dump / limited	Unclear	No treatment planned.	
Wimer Ditch / closed & limited	Listed	50' no treatment buffer along ditch. Directionally fall trees away from ditches. Include in an interpretive plan. Develop a trail system.	
		Alt. 2: Minimal breaching of ditch allowed, rebuild berm.	Alt. 3: No breaching of ditch allowed.

2.3 Project Design Features (EA p. 18)

2.3.3 Seasonal Operation Restrictions (EA p. 19)

Table 2-4: Seasonal Operating Restrictions (EA p.19) is replaced by the following Table A2-4. It corrects northern spotted owl (NSO) operating dates, the biological assessment date, and restricted area around raptor nests.

Table A2-4: Seasonal Operating Restrictions			
Location	**Restricted Activities**	**Restricted Dates**	**Reasons / Comments**
Entire project area	Logging, hauling and special forest product activities	Oct. 15 through May 15	Erosion Control. Dates could vary depending on weather and soil moisture.
Infested POC areas	All operations	Oct. 15 through May 15 (due to their limited windows, fuel treatments and planting could occur during this time)	*P. lateralis* control. Equipment washing would occur during wet season operations. Dates could vary depending on weather and soil moisture.
1/4 mile radius around active spotted owl nest sites.	Timber harvest (felling and yarding), chainsaw use, and prescribed burning	March 1 to June 30 (or later if deemed necessary)	Dates and restriction depend on nesting status. (Rogue River/South Coast Biological Assessment, 2003)
Entire sale area - 1/4 to 1/2 mile radius around any raptor nest	Timber harvest (felling and yarding) and chainsaw use.	Variable depending on the species	BLM Instruction Memo OR-99-036.
All harvest units and road construction ROWs.	Various activities depending on the species	Variable depending on the species	Restrictions only if special status species are located. (BLM Instruct. Memo OR-99-036)

2.3.8 Botanical Resources (EA p. 22)

Noxious weeds would be treated using an integrated pest management approach (RMP p. 92). Populations will be contained using appropriate methods based on species and conditions under the guidance of the Medford District Integrated Weed Management Plan (PA-OR110-98-14). All noxious weed populations that are treated will be monitored for treatment assessment.

For seeding and restoration, seed and straw used for restoration, bare soil, and post treatment throughout the project area will be native species and weed free to prevent the further spread of populations of noxious weeds.

For prevention of noxious weeds, all heavy equipment will be cleaned prior to moving onto BLM lands. Equipment will also be cleaned when moving from known noxious weed areas into weed-free areas.

2.3.11 Cultural Resources (EA p. 23)

Known cultural sites would be buffered with flagging prior to project implementation. No treatment would occur in the buffered areas. No fire line construction, prescribed burning, or hand piling/burning would occur within 20' of flagged cultural resources.

Timber would be felled away from cultural resource site buffers, including unflagged historical ditches and hydraulic cuts as identified on a map. Any ditch crossings by mechanical equipment would require prior approval from a cultural resource technician. Ditches would receive a 50' visual buffer to screen treatments from recreational trail users. Hydraulic (mining) cut banks would receive a 25' no treatment buffer.

Historic fruit trees (marked with black and orange striped flagging) would not be removed.

The Waldo Cemetery would have a 200' no treatment buffer on the west side (no treatment at all would occur on the east side).

If any unrecorded cultural sites are found during project implementation, activities near the site would halt until a cultural resource specialist could determine appropriate protection measures.

3.0 Environmental Consequences (EA p. 25)

3.1 Introduction

Current conditions in the project area result from a multitude of natural events and human actions that have taken place over many decades. Cumulative effects are defined as the, "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions" (40 CFR § 1508.7). A description of current conditions inherently includes the effects of past actions and serves as a more accurate and useful starting point for a cumulative effects analysis than by "adding up" the effects of individual past actions. "Generally, agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions." (CEQ Memorandum 'Guidance on the

Consideration of Past Actions in Cumulative Effects Analysis' June 24, 2005.) Cataloguing past projects and their individual effects would not be useful in discerning the contribution of the incremental impact of the project's action alternatives. However, cataloguing and analyzing other present and reasonably foreseeable actions relevant to the effects of the proposed action *is* necessary and is described below. By comparing the "no action" alternative (current condition) to the action alternatives, we can discern the "cumulative impact" resulting from adding the "incremental impact" of the proposed action to the current environmental conditions and trends.

Scoping for this project did not identify a need to exhaustively list individual past actions or analyze their environmental effects in order to fully analyze the effects, including cumulative, of this project's action alternatives. No individual past actions have been identified that would have a cause-and-effect relationship with the West Fork Illinois proposals. The following overview provides a context in which to analyze the effects of the West Fork project. Addressing the acreage affected by timber harvest on a decadal basis provides information on the extent of the major actions that have occurred since the mid-1950s, and the potential changes in stands and habitats since then. This decadal information also puts the project into the context of current conditions and allows for comparison of the action alternatives with the no action alternative (existing conditions). Additional resource-specific cumulative effects are addressed as necessary under each resource section.

3.1.1 Cumulative Effects Overview

The West Fork Illinois Forest Management Project is in the West Fork Illinois River 5th field watershed, a 76,932 acre watershed that is a tributary to the Illinois River. In the watershed, 5,644 acres, or 7% is in federal BLM ownership, 43,500 acres or 57% are USFS, and 27,788 or 36% are State/County, and private. Most of the federal lands are in various types of reserves (LSR, riparian, RNA, etc.). There are 3,200 acres of matrix on Forest Service lands and 3,622 acres of matrix on BLM lands in the watershed. This amount is further reduced by timber land base suitability withdrawals on approximately 2,009 acres of BLM lands for a total of 7% of the federal lands suitable for commercial timber harvest.

Table A-3 summarizes past harvest activities on BLM land within the West Fork Illinois watershed by decade. These past activities have shaped the current condition and are considered in the cumulative effects analysis. This information was available and used in the preparation of the West Fork Illinois Project EA, but was not summarized or displayed in the EA. For clarity and display purposes, the data is summarized in this Addendum. The West Fork Illinois project contains the only planned timber harvest in the watershed on BLM or Forest Service land within the next five years.

BLM lands in the watershed have remained relatively unaffected by major timber harvest activity. From 1946 to 2004, approximately 1,312 acres or 23% of BLM land were harvested (Table A-3). Even-age harvest methods (clear cut, seed tree, shelterwood, and overstory removal) occurred on only 360 acres (6% of BLM lands) in this same time period. The most significant impacts to the watershed were caused by mining which peaked in the late 1800s and continued to a lesser extent into the 1940s. Many of the roads that exist today were constructed to access these mines. Another important factor in shaping the affected environment was a large scale wildfire that occurred in the late 1870s. This fire left approximately 10 to 15 conifers per acre and the subsequent regeneration is the current dominant cohort in the Douglas-fir stands. This cohort is 120 to 130 years old.

Table A3-1: Harvest in West Fork Illinois River watershed on BLM land

Decade	Harvest Method	Acres	Timber sale name(s)

1950s	OSR/CT	1	Unnamed O&C sales
	Mortality salvage	25	
	Selective cut	223	
	DECADE TOTAL	***249***	
1960s	Mortality Salvage	24	Unnamed O&C sale
	DECADE TOTAL	***24***	
1970s	Clear cut	6	Waldo Select CJ Hydro Logan Mine
	Mortality salvage	19	
	Selective cut	330	
	Shelterwood	25	
	Seed tree cut	49	
	DECADE TOTAL	***429***	
1980s	Clear cut	157	Logan Lo Cal Combo Double Feature Indian Hill Salvage
	Mortality Salvage	47	
	DECADE TOTAL	***204***	
1990s	Clear cut	30	Junction Overlook NorEast Fernwood Negotiated
	2 Stage OSR	23	
	Overstory removal	7	
	Select Cut	50	
	Commercial Thin	92	
	Shelterwood	62	
	Mortality Salvage	23	
	DECADE TOTAL	***287***	
2000 thru 2004	Commercial Thin	119	3+3
DECADE TOTAL		***119***	

Footnotes: Data compiled from BLM Microstorms database.
The same acres may have had two or more entries at different times during the analysis period (totals are not additive).

Rotational harvest on private timber lands, mining, and residential and agricultural development have decreased vegetative cover in the watershed. Private land harvest and residential development are expected to continue. More detailed, reliable data on past harvest and mining on non-federal land in the watershed since the arrival of European and Asian settlers and miners is largely unavailable.

3.2 Site Specific Beneficial or Adverse Effects of the Alternatives

3.2.1 Resource: Soil / Water (EA p. 25)

Cumulative Effects

Commercial harvest on BLM managed lands in the watershed since 1970 has impacted about 1.0% of the watershed (Table A-2). Approximately 3% of BLM and private ownership is in an early seral sapling/pole vegetation class. Ten percent of the West Fork Illinois is in a brush classification (USDI BLM 2003). A majority of the brush classification occurs in the serpentine soils in the western area and is considered a natural condition. While research found stream flow responses to timber harvest variable, consistent detectable changes to stream flow occurred when 25-30% of the watershed was in clearcut condition (Beschta et. al. 2000, Harr 1979, Harr 1975, Harr 1980, Jones 2000, Thomas and Megahan 2000, Ziemer 1981).

In this watershed, treatments would occur on approximately 3% of the 5th field watershed. In all treatment units, overstory and understory vegetation would remain; there would be no clearcuts. At this low level of vegetation removal, there would be no increase in water availability leading to increased stream flow.

The average road density on BLM land is 1.16 mi/mi^2. Across the watershed, approximately 2% of the area is roaded. For comparison, researchers (Jones and Grant 1996, Jones 2000) found no statistically significant increases in peak flows attributed to roads alone in watersheds with road densities of 4.7 mi/mi^2 and 5.7 mi/mi^2. Similarly, Ziemer (1981) found no changes to the hydrograph when roads occupied 5% of the basin. Road effects on peak flows were detectable when 12% of the watershed was roaded (Harr et al. 1975).

There would be 180 acres of tractor based loggin on non-serpentine soils. Within these units, based on skid road spacing of 150 feet or 5% of the area, 10 acres would be compacted from skid road development. At a maximum, using the same percentage as tractor based logging, machine mastication would add an additional 24 acres of compaction. It is expected that actual acres of compaction would be less given the low psi equipment (half the psi of tractors used for logging), soil moisture restrictions, and single pass operation. Additionally, slash buster machinery typically rides atop slash debris and duff, further reducing compaction potential. In total the project would add 34 acres of compaction or 0.04 percent of the watershed. The proposed additional 250' temporary road in Section 28 would contribute 0.1 acre to the road network. Further, the temporary road would not cross any water course and, therefore, would not alter stream flows or increase sediment to the stream network.

Compaction levels, commensurate with limited past harvest and road development, falls far below the RMP standard set at 12% for productivity. Additionally, fuels and silviculture assessments report an increase in ground cover, understory canopy and tree densities indicating that compaction levels are not limiting vegetation productivity.

Future mining on existing claims could create direct effects to the channel via placer mining, or indirect effects through runoff from hard rock mining. Proposed activities would not occur in the stream channel and would not modify channel conditions or water quality. Therefore, the proposed action would add to the disturbance associated with future mining.

3.2.2 Resource: Fisheries (EA p. 30)

Cumulative Effects

The cumulative effects analysis presented in the fisheries section of the West Fork Illinois LMP EA relied on both the findings of the West Fork Illinois Watershed Analysis and on field observations. Current aquatic and fisheries conditions are the result of past land use and disturbance history in the project area and watershed. The West Fork Illinois River watershed's poor riparian structure, inadequate large woody debris, elevated summer water temperatures, sedimentation, and irrigation withdrawals have contributed to a decline in salmon populations. As stated in the EA, timber harvest has been an important land use in the past and will probably continue to be in the future. The cumulative effects analysis of the EA considered the results of past logging on the landscape and included the logging that reasonably can be predicted to take place in the watershed on non-federal land (continued rotational timber harvest). The West Fork project is the only planned project for federal land in the watershed. The timber harvest summary (Table A-3) in this Addendum is consistent with and complementary to the fisheries cumulative effects analysis presented in the EA because it shows the distribution of logging activity over the landscape spatially and over time. Based on that analysis, the effects of the proposed actions would not be likely to disrupt normal behavior such as migration, spawning, egg incubation, rearing and feeding, and that fish survival and production would be maintained. Significant modifications or degradations of habitat would not occur. The habitat would be expected to improve as late-successional forest develops in

the riparian reserves. Specifically, the proposed optional operator spur in Section 28 is not anticipated to affect fish or aquatic resources because it would not be near any water course and would not alter stream flows or increase sediment in any stream. There would be no causal mechanism for the road to affect fish or aquatic resources.

In addition to past logging as stated above, the effects of past mining in the Logan Cut and Fry Gulch drainages are an important aspect of the environmental baseline in these areas as well. Logan Cut and Fry Gulch were both used as drains for the outwash of hydraulic mining outside of the project area. No cumulative effects are anticipated related to the past mining in Logan Cut because the proposed actions would have no sediment routing mechanism to the stream. Sediment routing to streams in Fry Gulch is not expected to have a cumulative effect on fish because sediment inputs would be very minimal, localized, and distant from fish habitat. In the one place where sediment inputs are closer to fish habitat, a settling pond remaining from the hydraulic mining era would trap sediment before reaching fish streams, and there would be no cumulative effect. No present or future mining activities which would affect fish habitat are known in either area.

3.2.4 Resource: Botany (EA p. 42)

The botany section remains the same as the original EA except where new plant species, population numbers or information was added.

3.2.4.1 Affected Environment

The project area encompasses some popular wildflower viewing areas including a portion of the historic Waldo town site and the Whiskey Creek fen on the historic Wimer road. Both areas are considered type localities (the point of scientific discovery) for numerous serpentine endemic species. The affected environment on BLM land is a diverse mosaic of dry, low elevation Douglas-fir and tanoak forests interspersed with some small white oak woodlands, ephemeral wetlands, serpentine wetlands, serpentine savannah and serpentine shrub lands. Unique plant communities not common to BLM land in the Illinois Valley occur in the project area. These communities include western white pine-Jeffrey pine/huckleberry oak/beargrass or western white pine-tanoak/huckleberry oak/beargrass plant associations. Also, the riparian plant association of Port-Orford cedar-western white pine/huckleberry oak occurs here. The serpentine wetlands are dominated by the California pitcher plant/bog plant association.

Table A3-5 summarizes the Survey and Manage (S&M) and Special Status plant species (SSP) found during project surveys. If new species or populations are located during project layout, the plants will be protected using the appropriate management or mitigation recommendations.

Table A3-2: S&M and Special Status Plants Found in Project Area *

Species	Habitat	Protection Status	# of Populations
Lomatium cookii (Cook's lomatium)	Wet meadows and wet forest openings	Federally Listed Endangered	5
*Cypripedium fasciculatum (*Clustered ladyslipper)	Moist microsites in mixed evergreen forests	S&M, Category C; Bureau Sensitive	6
*Cypripedium montanum (*Mountain ladyslipper)	Mixed evergreen forests	S&M, Category C; Bureau Tracking	2
*Calochortus howellii (*Howell's mariposa lily)	Dry serpentine savannah	Bureau Sensitive	15
*Epilobium oreganum (*Siskiyou willow herb)	Serpentine wetland edges	Bureau Sensitive	1
*Erythronium howellii (*Howell's fawn lily)	Serpentine forest edges	Bureau Sensitive	28

Gentiana setigera (Waldo gentian)	Serpentine riparian	Bureau Sensitive	1
Limnanthes gracilis var. gracilis (Slender meadow foam)	Wet meadows / wet forest openings	Bureau Sensitive	7
Microseris howellii (Howell's silverpuffs)	Dry serpentine savannah	Bureau Sensitive	20
Pseudoleskeella serpentinense (Serpentine moss)	Rocks in serpentine	Bureau Sensitive	5
Senecio hesperius (Siskiyou butterweed)	Dry serpentine savannah	Bureau Sensitive	19
Viola primulifolia ssp. Occidentalis (Western bog violet)	Serpentine wetlands	Bureau Sensitive	3
Crumia latifolia (Three-lined moss)	Wet rocks, cliffs, flowing streams	Bureau Assessment	1
Carex livida (Livid sedge)	Wetlands	Bureau Assessment	1
Delphinium nudicaule (Red larkspur)	Oak woodlands	Bureau Assessment	1
Fritillaria glauca (Siskiyou fritillaria)	Dry serpentine savannah/barrens	Bureau Assessment	11
Monardella purpurea (Serpentine monardella)	Open serpentine	Bureau Assessment	10
Salix delnortensis (Del Norte willow)	Serpentine riparian	Bureau Assessment	3
Streptanthus howellii (Howell's streptanthus)	Serpentine shrublands	Bureau Assessment	1

* as of February 2005

Bureau Sensitive plants are required to be protected and managed by the Bureau. Bureau Assessment species are currently not eligible for federal listing, but are of a conservation concern and may need protection or mitigation in BLM activities. It is Oregon State Office policy that the Bureau of Land management will protect, manage, and conserve those sensitive species and their habitats such that any Bureau action will not contribute to the need to list any of these species (IM OR-91-57). Bureau Tracking species are not considered Special Status species for management purposes, but these species' occurrences are documented to better determine future status and management for that species. Protection for these species is discretionary.

Bureau Tracking species found in the project area are *Arabis koehleri var. stipitata, Balsomorhiza sericea,Cardamine nuttallii var. gemmata, Cardamine nuttallii var. dissecta, Carex serpenticola, Castilleja brevilobata, Cypripedium californicum, Darlingtonia californica, Dicentra formosa ssp. oregana, Eriogonum pendulum, Epilobium rigidum, Hedwigia stellata, Hieracium bolanderi, Lewisia oppositifolia, Poa piperi, Sanicula peckiana,* and *Thlaspi montanum var. siskiyouens* and *Vancouveria chrysantha.*

a. Vascular plants

Lomatium cookii is federally listed as "endangered" (November 2002). Critical habitat has not been designated. The range of this species is disjunct with 13 occurrences in the Rogue Valley and 25 in the Illinois Valley. The Illinois Valley habitat for this species consists of alluvial silts and clays within serpentine soils. The meadows where the species is found are dominated by California oat-grass and occur with Oregon white oak-ponderosa pine/Jeffery pine savannah. An open shrub layer of wedge-leaf ceanothus and white-leaf manzanita is interspersed with native and introduced grasses and herbs. The extent of suitable habitat for Cook's lomatium has not been estimated for the Illinois Valley. The total population in the Illinois Valley is also unknown, but is estimated to be less than 250,000 plants on 150 acres of occupied habitat. Because of the small occupied acreage, scattered distribution and threats to its habitat such as development and off-highway vehicle impacts, the trend for populations within the Illinois Valley is thought to be downward (USDA / USDI 2003)).

The project area is not within the range of the federally listed *Fritillaria gentneri.*

The project is within the range of the federally listed (endangered) *Arabis macdonaldiana*. This species occurs at higher elevations primarily in California on Forest Service lands (about 94 occurrences). Approximately 11 occurrences on Forest Service lands in Josephine County are known, but none are on

BLM. Therefore, no effect from the project would occur to this species.

Cypripedium fasciculatum and *C. montanum* habitat is present in the project area. It is typically found where moist conditions prevail. These orchid species are very long-lived; perhaps as long as 95 years (Mgmt. Recommendations 1998). It can take up to 15 years for them to emerge above ground and they require specific mycorrhizae for germination. Intact organic soil profiles with these fungal connections are an important habitat feature for new population establishment. These fungal connections are important not only for establishment, but also during early dormant (underground) years and potentially throughout the life cycle of these orchids. The range of *C. fasciculatum* extends from northern California north into Oregon and Washington and east into Idaho, Montana, Wyoming, Utah and Colorado. The range of *C. montanum* is found throughout California, north into Oregon and Washington and east into Idaho, Montana, Wyoming, Utah and Alaska.

Calochortus howellii is scattered throughout the project area in dry serpentine savannah. It is one of the narrower ranging serpentine species, endemic only to the Illinois Valley.

Through most of the project area, the transition between forests and serpentine openings provide excellent edge habitat for *Erythronium howellii*. This species has a very narrow range encompassing only the southern end of the Illinois Valley and a small portion of Del Norte County in northern California. The majority of the known populations exist in the East Fork Illinois watershed on BLM land; however, 28 populations, some quite extensive, have been located in the project area. The populations occur in canopy closures ranging from 10-60%. Many of these populations are along edges or in openings, but some also extend deeper into open forested stands. This is most likely because the forest edge has expanded. That is, populations that were once on the edge are now under forest canopy due to conifer encroachment. The species appears to tolerate canopy openings, but it is unknown how much ground disturbance can be tolerated.

One large population of *Delphinium nudicaule* was found in similar habitat to *Erythronium howellii*: the ecotone between a Douglas-fir-tanoak forest and rock outcrops. This species is common in California, but relatively few sites have been found in Jackson and Josephine counties.

Streptanthus howellii was also found in similar habitat. The species tends to be found in openings and can move into areas that have been disturbed, such as old roadbeds. There are relatively few sites in Josephine County.

Fritillaria glauca was found in barren serpentine openings interspersed in shrubs. This species can also be found off of serpentine substrate.

Salix delnortensis occurs in serpentine riparian areas at low elevations in Curry and Josephine counties in Oregon and Del Norte and Siskiyou counties in California. Few sites are known on the Medford District.

Senecio hesperius and *Monardella purpurea* have been located on dry serpentine areas. *S. hesperius* is endemic to the Illinois Valley. Both species are usually found on dry, rocky serpentine slopes or serpentine savannahs where grass species may be competing with it. Populations tend to be sparsely scattered when found.

Limnanthes gracilis var. gracilis can be found in ephemerally wet areas in both serpentine and non-serpentine soils at low elevations. It is found in the Illinois Valley, the Rogue Valley in Josephine County and historically in Jackson County. Its habitat (wet valley grasslands and openings) is highly threatened

by development and agriculture throughout its range.

The serpentine fen species are the rarest species found in the project area due to limited habitat. Fen habitat acreage is much smaller than that of dry serpentine savannahs.

One small population of *Gentiana setigera* was found in the project area. This species is one of five Bureau Sensitive plants associated with serpentine fens and wetlands. It is found in Curry, Josephine and Del Norte counties, with one small population in Mendocino county. *Epilobium oreganum* (found in the Curry, Josephine, Del Norte and Trinity county, CA) and *Viola primulifolia ssp occidentalis* (found in Curry, Josephine and Del Norte counties) are found in these same habitats with small populations within the project area. These two species have locations within the proposed West Fork Illinois RNA. *Carex livida* is also a species found in serpentine fens or wetlands. It is a species currently being studied taxonomically; the plants found on serpentine, may be a different species from plants found on non-serpentine. *Carex livida* has a much larger range throughout the Northwest. In southwestern Oregon it is only documented in serpentine wetlands.

Much of the serpentine species' habitat in the project area has been disturbed by past mining operations. Therefore, population changes, if any, have been difficult to determine.

b. Non-vascular plants

The moss species, *Pseudoleskeela serpentinense*, has been located in rocky serpentine areas. This species appears to be endemic to serpentine substrate. Also, one occurrence of *Crumia latifolia* was located. This moss, usually found on calcareous substrate, was located in a seasonal drainage in serpentine. No other non-vascular Survey & Manage or Special Status species have been located in the project area.

c. Fungi

Ten former Survey and Manage fungi species, now managed as Bureau Sensitive Species (BSS) have suspected or documented occurrence on lands administered by Medford District BLM. For these 10 fungi species, specific information regarding connectivity, range (including presence or absence within the project area), habitat requirements, and disturbance effects are lacking. The 2004 *FSEIS to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines* addressed incomplete or unavailable information regarding these species (USDA/USDI 2004 p. 108-109), and the effects of land management activities as described under the Northwest Forest Plan. It disclosed the lack of survey information for reserve areas compared to matrix and adaptive management areas.

These BSS fungi species are known to occur in southwestern Oregon in the Klamath Mountains and Cascade Range (Table A-4). These species would best be detected during fall surveys. Surveys for special status fungi species have not been completed for proposed treatment areas in the project area. Above-ground fruiting structures (sporocarps) are short-lived, seasonal in occurrence, and annually variable making surveys difficult (USDA and USDI 2004). According to BLM Information Bulletin No. OR-2004-145, it is expected that field units will not conduct field surveys for these species, due to survey impracticality. Protection of known sites along with ongoing large-scale inventory work would provide the measures and means to meet agency policy. While formal surveys for fungi were not conducted in the project area, incidental sites were found while surveying for other required species (discussed below).

The following table summarizes the information known regarding the ten former Survey and Manage fungi. It summarizes whether habitat and known sites are sufficient to support stable populations in the

Northwest Forest Plan area and whether insufficiencies were due to federal actions. Outcomes not due to federal actions could include such factors as: (1) limited potential habitat and few populations on federally managed lands; (2) potential for stochastic events; (3) low number of individuals; (4) limited distribution; and, (5) narrow ecological amplitude (USDA and USDI 2004). It describes the broad forest community components where these species may be found. The final column summarizes results from a likelihood of occurrence key designed to assist in conservation planning (USDA/USDI Interagency Special Status and Sensitive Species program website) for the project.

Table A3-3. Habitat Sufficiency, Forest Community Components, Likelihood of occurrence For BSS Fungi based on 2004 FEIS

Scientific Name	Number Sites in NFP[1]	Number Sites in Reserves[2]	% in Reserves	Forest Community Component	Likelihood of Occurrence/Risk to Species
Habitat Not Sufficient – not due to federal action					
Boletus pulcherrimus	36	5	13.9	PSME, PIPO,ABCO	Low likelihood of occurrence; low risk to species viability
Dermocybe humboldtensis	4	1	25.0	PSME,PIPO	Low likelihood of occurrence; low risk to species viability
Gastroboletus vividus	4	2	50.0	ABCO,Pine	Low likelihood of occurrence; low risk to species viability
Ramaria spinulosa var. diminutiva	1	0	0	PSME,Pine	Low likelihood of occurrence; low risk to species viability
Rhizopogon chamaleontinus	1	0	0	PSME	Reasonable likelihood of occurrence; low risk to species viability
Rhizopogon ellipsosporus	3	0	0	PSME	Reasonable likelihood of occurrence; low risk to species viability
Rhizopogon exiguus	5	3	60.0	PSME	Reasonable likelihood of occurrence; low risk to species viability
Habitat Not Sufficient – due to management					
Phaeocollybia californica	30	5	16.7	PSME	Reasonable likelihood of occurrence; low risk to species viability
Habitat Sufficient					
Phaeocollybia olivacea	93	19	20.4	PSME,ABCO, QUKE,Pine	Reasonable likelihood of occurrence; low risk to species viability
Phaeocollybia oregonensis	11	5	45.5	ABCO	Low likelihood of occurrence; low risk to species viability

[1] Source: ISMS database 11-20-04, Handbook to Strategy 1 Fungal Species in the NWFP, Handbook to Additional Fungal Species of Special Concern in the NWFP, Medford District data.
[2] Reserves = Land Use Allocations Late Successional Reserve and Congressionally Reserved
Bold species = occurs on or within Medford District, PSME = Douglas-fir, forest community component, PIPO = Ponderosa pine, forest community component, ABCO = White fir, forest community component, QUKE = California black oak, forest

community component, Pine = Pinaceae family (includes pine, fir, Douglas-fir, spruce, hemlock), forest community component

The 10 Bureau Sensitive fungi are species that form mycorrhizae or mutually beneficial relationships with the rootlets of host plants that are typically conifers. The mycorrhizae form an underground mycelial network that can be considered the vegetative body of the fungi. Sporocarps, the fruiting bodies or "mushrooms", may develop above or below the ground surface depending on the species. Spores produced by the fruiting bodies are then transported by animals or wind. The extent of the underground mycelial network in relation to the fruiting bodies found above ground is unknown. The habitat components for these species are very broad with only general plant community types known.

Those species where habitat sufficiency outcome is not due to federal actions and that are not known to be found in or adjacent to the project area are *Boletus pulcherrimus, Dermocybe humboldtensis, Gastroboletus vividus,* and *Ramaria spinulosa var. diminutiva.* The actions proposed would not change this outcome put forth by the FEIS. Also, general habitat components (the ABCO plant community) for one species, *Phaeocollybia oregonensis,* are not present in the project area (Table A-4).

Five species would have a reasonable likelihood to occur in the project area. *Rhizopogon exiguous, R. chamaleotinus* and *R. ellipsosporus* habitat was determined to not be sufficient to support stable populations in the Northwest Forest Plan area and this insufficiency was not due to land management actions. Three species, *Rhizopogon exiguous, R. chamaleotinus, R. ellipsosporus* were found in Josephine county during BLM State Office strategic surveys. *R. exiguous* was found in the lower Applegate 5th field watershed approximately 20 miles northeast of the West Fork Illinois project. It has a very broad habitat description; it is associated with the roots of Douglas fir and western hemlock. It is endemic to Oregon and Washington and has known sites also in Lane and Benton county. *R. chamaleotinus* was found in the Rogue River, Taylor creek 5th field watershed approximately 32 miles northeast of the West Fork Illinois project. Its habitat is also broad; it is found in association with Douglas fir and scattered sugar pine roots. Besides its one known site in the range of the northern spotted owl, it is also known from Idaho (Castellano et al 2003). *Rhizopogon ellipsosporus* was found during State Office strategic surveys in the Lower Applegate River 5th field watershed 23 miles northeast of the project and in the West Fork Illinois watershed one mile north of the project. It is also broadly associated with the roots of Douglas fir and sugar pine. It has been found in both Josephine and Jackson counties.

Phaeocollybia olivacea was determined to have habitat (including known sites) sufficient to support stable populations in the Northwest Forest Plan area. These species would stabilize in a pattern similar to or different from their reference distribution because a substantial number of known sites are located in reserves or managed under the Agencies' Special Status Species Programs (USDA, USDI 2004, p. 152). *Phaeocollybia olivacea* has been found in the Rogue River, Taylor creek watershed as well as the Williams 5th field watershed approximately 30 miles northeast and 16 miles northeast from the project area, respectively. One potential *Phaeocollybia olivacea* collection within the project area is currently being verified. It was found in T40S, R8W, Sec.28, OI unit 004. If this species is verified, there is a reasonable likelihood that suitable habitat for this species exists elsewhere in the project area in the Tanoak plant series. This species is endemic to western United States from the central Oregon coast south to Santa Cruz county. It has a very broad habitat description essentially stating that it can be found in oak family or pine family mixed forests in coastal lowlands (Castellano et al 2003).

For *Phaeocollybia californica,* the 2004 FSEIS determined the outcome of insufficient habitat is due to land management activities. Known sites of *Phaeocollybia californica* are not substantially protected by reserves and are susceptible to adverse impacts from soil disturbance and/or a significant loss of host species. Although Matrix Standards and Guidelines of the Northwest Forest Plan provide for minimizing

soil and litter disturbance, there is lack of knowledge about how much disturbance can be tolerated by these species. Loss of even a few known sites could adversely impact this species persistence within the Northwest Forest Plan area (USDA, USDI 2000, p. 154).

Phaeocollybia californica is historically known from the East Fork Illinois watershed one mile east of the project area. It was also listed on a general species list for a survey in the Deer Creek watershed (its exact location is unknown). The species is broadly associated with the roots of Pacific silver fir, sitka spruce, Douglas fir and western hemlock. It is endemic to Washington and Oregon and as mentioned above has 30 known sites ranging from the Olympic peninsula to southwestern Oregon.

Given the broad habitat and the lack of surveys completed for any of these species, it can be assumed that more sites do exist. It is unknown how rare these species really are, but it is known they are associated with the common tree species discussed above. As mentioned, the 2004 *FSEIS to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines* addressed incomplete or unavailable information regarding these species (USDA/USDI 2004 p. 108-109). It disclosed the unknown strength of the association between these species and late successional conditions as well as unknown information regarding connectivity, habitat needs and range. It stated that any discussion of risk based on rarity and likelihood of disturbance must recognize that, for many species, only a small percentage of potential habitat has been surveyed.

d. Nominated ACEC

The nominated ACEC has a higher diversity of soil types than in other designated ACECs in the Illinois Valley. The natural vegetation patterns of the Illinois Valley are closely related to soil type and geomorphology. The variety of slopes and aspects also allow for a greater variety of plant communities including forests, shrublands, serpentine savannahs and barrens. The plant community variety in turn results in extensive and varied ecotones (transition zones or edges between two very different plant associations) which can support species unique to such edges.

Approximately 281 plant species are endemic to the Klamath-Siskiyou ecoregion (Sawyer 1996). The Illinois Valley is just a small portion of this ecoregion, but it is unique because of its high number of endemic species. Most serpentine species endemic to the Illinois Valley occur in the nominated ACEC including *Calochortus howellii, Senecio howellii, Fritillaria glauca, Lewisia oppositifolia, Microseris howellii, Streptanthus howellii* and *Thlaspi montanum var. siskiyouense.* These are all currently identified as Bureau Special Status. An Oregon Natural Heritage Program report (1997) noted that the West Fork Illinois watershed has the greatest number of rare plant species of all 1,400 watersheds in Oregon.

While tanoak communities are common in the region, the tanoak community in the nominated ACEC is unusual due to its mature seral stage and extent (70 acres in T40S, R8W, Section 34). This parcel lies entirely in the East Fork of the Illinois watershed, and is therefore outside the West Fork project area.

3.2.4.2 Environmental Consequences

a. Alternative 1: No Action

The effects of the No Action alternative on S&M and SS species would be positive or negative depending on the species. Canopy closures, the limited amount of moist microsites, and mycorrhizal connections would be maintained in the absence of timber harvest.

The No Action alternative would result in an increased fire hazard and potential for severe wildfire. In the event of a wildland fire, areas of high fuel hazard and dense understory areas could burn intensely enough to potentially eliminate S&M and SS species from the site for at least the short term. This could threaten *Cypripedium* populations and habitat which have been shown not to survive such fires (Management Recommendations 1998) as well as potential unknown fungi sites or habitat. Fire has played an extremely important role in influencing the plant communities of southwestern Oregon. The mixed evergreen forests and shrub lands typically found in the Illinois Valley and in this project area have been created and perpetuated in the past by fire. This regime has been disrupted by fire suppression (Franklin and Dyrness 1988).

In the absence of fire disturbance due to wildland fire suppression, increased grass thatch and shrub encroachment would continue on serpentine savannahs which would reduce S&M or SS species habitat, population diversity and density. Within the project area, *Erythronium howellii* habitat could decline as edge openings fill in with trees and shrubs.

b. Alternative 2 & 3

1. Effects of Recreation, Cultural Resources, Special Forest Products, and Young Stand Management

Due to PDFs that buffer population sites, there should be no direct effects to S&M or SS species. Special forest product sites are in timber harvest units and are therefore discussed as part of those treatments below. Young stand management units contain neither S&M or SS species nor their habitat. Treatments that occur mainly in young or mid-seral stands which are not optimal habitat for S&M fungi would have a low likelihood for unknown populations. Recreation or cultural projects would be very small scale and therefore would not have any substantial effect on potential habitat. Reduced OHV traffic due to designated use areas would benefit all populations and potential habitat by reducing the likelihood that individual plants would be damaged or killed or that potential habitat would be disturbed. Depending on the plant community, recovery after closure would vary. For tanoak plant communities, recovery could begin within a season, whereas serpentine communities where topsoil has been disturbed may require more active restoration.

2. Effects of riparian treatments

Riparian treatments in two sections, 41-9-3 and 41-9-9, could affect special status plant individuals. The Bureau sensitive species, *Gentiana setigera* grows in a small enough area that direct effects would be avoided through PDFs (buffering). The Bureau assessment species, *Salix delnortensis* is scattered throughout both treatment areas. Individual plants could be damaged or killed by the riparian treatments. Due to the scattered nature of individuals, the extent of the population and that habitat for the species will be maintained over the long term, this individual damage will not lead to the need to list this species. Individual Bureau tracking vascular plants, due to their density throughout the treatment units, could be damaged or killed. Habitat for these species should not be disrupted, though, because none require high canopy closure. Patches in adjacent, untreated areas will be available for recolonization. Therefore, this project should not lead to the need to list these species.

3. Effects of POC treatments

POC sanitation effects (canopy removal) could change microsite conditions. Mechanical tree removal would speed up the process already started by infection. PDFs would reduce direct effects to any S&M or

SS plants. The only SS species known to be adjacent to the road corridors being treated is *Senecio hesperius.* This serpentine endemic has a large number of known populations (>100) in southwestern Oregon (Geographic Biotic Observations Database, Medford BLM, 2005); therefore indirect effects from these treatments would be negligible and would not affect the species as a whole.

4. Effects of Stand Treatments

a) Special Status / Survey and Manage Plants

1) Harvest treatments

Five Bureau Sensitive fungi species (*Rhizopogon chamaleontinus, R. ellipsosporus, R. exiguus, Phaeocollybia californica, P. olivacea)* are reasonably likely to occur in the proposed project area, but habitat requirements for these species are too broad or poorly understood to reasonably mitigate adverse effects through management of habitat at the project specific scale. Broad-scale inventories with management of all known sites may contribute towards species viability (Likelihood of Occurrence key - USDA/USDI Interagency Special Status and Sensitive Species program website).

The prescription for the West Fork Illinois project calls for the commercial harvest of less than 1% of the total BLM watershed acres. Any known fungi sites will not be directly affected because a no-harvest, no-ground disturbance protection buffer will be implemented **(**EA pdfs, pp. 22).

Indirect effects to fungi from stand treatments could include changes in microsite conditions (i.e. temperature, humidity, light intensity, and wind) from reduction of canopy cover, edge effects, changes in soil moisture regimes, fragmentation of the mycelial network, reduction in availability of host trees, reduction of root and root tip availability, decrease in organic soil layer, soil compaction/bulk density increase, and a decrease in the amount of coarse woody debris that may serve as a source of moisture in the dry months. These effects may reduce or eliminate sporocarp reproduction, change fungal species composition and species diversity, and decrease fungal biomass. Management methods that retain living trees and shrubs provide host trees and substrates to maintain mycorrhizal networks (Amaranthus and Perry 1994). A study by Luoma, et al. (2004) examined the effects of varying levels and patterns of green-tree retention on ectomycorrhizal sporocarp production; aggregated versus dispersed patterns of green tree retention were compared. Results of the study showed that while sporocarp production declined in all treatments, effects varied. Sporocarp production was substantially reduced only after 85% of basal area was removed. No effect was detected in fall mushrooms at higher percentages of green-tree retention under a dispersed pattern of treatment (such as a commercial thin from below). This was most likely due to the greater area occupied by the root systems of the remaining trees. The physical spacing of the trees allowed the initial fall rains to reach the forest floor better than when intercepted by the canopy of aggregate patterns.

The prescription calls for reduction in stand densities to 35%, which equates roughly to 40% canopy retention. Based on the above study results, the dispersed pattern of commercial thinning proposed should not affect Bureau Sensitive fungi that were not surveyed for, but could be present. These species may survive subsequent habitat conditions because the design of commercial harvest treatments would favor retaining habitat components for fungi. Habitat components important to fungi include dead, down wood; standing dead trees; and live old-growth trees; as well as a diversity of host species (including trees and underbrush) and microhabitats (USDA/USDI 2004 p. 148) Proposed activities and project design features for West Fork Illinois including treatments retaining 40% or greater canopy cover, retention of coarse woody debris and surrounding vegetation, retaining old growth trees and associated trees, riparian

reserves, special status plant reserves, and logging systems that minimize or localize ground disturbance will support fungi viability. While there is a reasonable likelihood of occurrence for these species in the project area, because such PDFs will be in place, there is a low risk that unknown populations would be affected because so little potential habitat would be affected.

2) Fuels Treatments

Fuels treatments could also affect unknown populations or potential fungi habitat. The impacts of prescribed burning for removal of slash and site preparation depends on fire intensity. High intensity burns that affect mineral soils may eliminate mycorrhizal fungi and create habitat that is colonized by non-mycorrhizal plant species including weeds. A recent study by Smith, et al (2004) examined short-term effects of seasonal prescribed burning on ectomycorrhizal fungi. Results showed that fall under burning (in dry ponderosa pine stands of eastern Oregon) significantly reduced duff depth, live root biomass, and ectomycorrhizae species richness compared to spring under burning, for at least two years. Also, the probability of residual tree mortality was greater for fall burning. The data suggests that spring burning should be favored over fall burning if the objective is to maintain ectomycorrhizae species diversity.

High intensity burns, such as pile burning, that enter mineral soils would create a localized disturbance including death of fungi down into mineral soil (the more diverse portion of the soil), incineration of the organic soil layer, loss of available nutrients, reduced soil moisture, decreased fungal biomass, decreased fungal species diversity, altered fungal species composition, degraded soil structure, and reduced fungi, all of which contribute to non-mycorrhizal species' (many that are weedy) ability to become established at (Amaranthus and Perry 1994, Korb et al 2004).

While hand piles may have these effects, their footprint across the landscape is small compared to the area where pile burning would not occur. For the project, an average of 70 hand piles per acre would be treated. Based on a 6' by 6' hand pile, only 6% of an acre would be directly affected by 70 hand piles. Hand piles would be well distributed across the landscape. While there is a reasonable likelihood of occurrence for five fungi species in the project areas, the small percentage of area hand piled and the ability for spring under burning to occur, should reduce the risk to these species. Any directly affected unknown populations should have the opportunity to recover due to the mosaic of mychorrhizae left intact and the reduced burn intensity PDF (EA p.19).

b) Bureau Sensitive Fungi

1) Harvest

For those species where habitat sufficiency outcome is not due to federal actions and that are not known to be found in or adjacent to the Illinois Valley, the stand treatments in the West Fork Illinois project would not change this outcome put forth by the FEIS. These species are *Boletus pulcherrimus, Dermocybe humboldtensis, Gastroboletus vividus, Ramaria spinulosa var. diminutiva.*

Rhizopogon exiguous, R. ellipsosporus and *R. chamaleotinus* habitat was determined to not be sufficient to support stable populations in the Northwest Forest Plan area and this insufficiency was not due to land

management actions. These species have been found near the Illinois Valley within 20 to 30 miles of the project. While the West Fork Illinois project should not change this determination, similar habitat does exist in which these species could occur due to the proximity of these other sites.

Phaeocollybia olivacea was determined to have habitat (including known sites) sufficient to support stable populations in the Northwest Forest Plan area. These species would stabilize in a pattern similar to or different from their reference distribution because a substantial number of known sites are in reserves or are managed under the agencies' Special Status Species Programs (USDA, USDI 2004, p. 152). Any effects to potential habitat in the West Fork Illinois project should not change this determination due to the small percentage of watershed treated (< 1%). The possible *Phaeocollybia olivacea* occurrence in T40S, R8W, Sec. 28, unit 004 would not be directly affected by treatments. There is reasonable likelihood that PDFs (buffering) would help maintain this local occurrence if its identity is verified.

For one of the ten fungi species (*Phaeocollybia californica*), the 2004 FSEIS determined the outcome of insufficient habitat is due to land management activities. Known sites of *Phaeocollybia californica* are not substantially protected by reserves and are susceptible to adverse impacts from soil disturbance and/or a significant loss of host species. Although matrix Standards and Guidelines of the NWFP provide for minimizing soil and litter disturbance, there is lack of knowledge about how much disturbance can be tolerated by these species. Loss of even a few known sites could adversely impact this species persistence within the Northwest Forest Plan area (USDA, USDI 2000, p. 154).

The potential exists for these five special status fungi species to occur in the project area**.** Predicting the likelihood of occurrence is difficult as habitat requirements for many of the suspected species is broad or poorly understood; at best only qualitative measures can be used to predict occurrences. Predicting the likelihood that stand treatments (timber harvest activities and fuel treatments) will have an effect on potential habitat is also unknown.

Adverse effects to fungi from stand treatments could include changes in microsite conditions (i.e. temperature, humidity, light intensity, and wind) from reduction of canopy cover, edge effects, changes in soil moisture regimes, fragmentation of the mycelial network, reduction in availability of host trees, reduction of root and root tip availability, decrease in organic soil layer, soil compaction/bulk density increase, and a decrease in the amount of coarse woody debris that may serve as a source of moisture in the dry months. These effects may reduce or eliminate sporocarp reproduction, change fungal species composition and species diversity, and decrease fungal biomass. Management methods that retain living trees and shrubs provide host trees and substrates to maintain mycorrhizal networks (Amaranthus and Perry 1994). A study by Luoma, et al. (2004) examined the effects of varying levels and patterns of green-tree retention on ectomycorrhizal sporocarp production; levels tested were 15, 40, 75 and 100% existing live tree basal area for aggregated and dispersed patterns of green tree retention. Complete elimination and reduction of sporocarp production was observed in the 15% aggregated and 15% dispersed treatments respectively. Aggregate patterns at 40% retention also showed a decrease in sporocarp production. No effect was observed in stands with 40% green tree retention in dispersed patterns. Total fall mushroom biomass decreased significantly in the 40% aggregate and the 15% dispersed and aggregate treatments compared to the 75% aggregate, 40% dispersed, and the control.

The prescription for the West Fork Illinois project calls for the commercial harvest on less than 1% of the total BLM watershed acres. The prescription calls for reduction in stand densities to 35%, which equates roughly to 40% canopy retention. Based on the above study results, the dispersed pattern of commercial thinning proposed should not affect Bureau Sensitive fungi that were not surveyed for, but could be present. These species may survive subsequent habitat conditions because the design of commercial

harvest treatments would favor retaining habitat components for fungi. Habitat components important to fungi include dead, down wood; standing dead trees; and live old-growth trees; as well as a diversity of host species (including trees and underbrush) and microhabitats (USDA/USDI 2004 p. 148) Proposed activities and project design features for West Fork Illinois including treatments retaining 40% or greater canopy cover, retention of coarse woody debris and surrounding vegetation, retaining old growth trees and associated trees, riparian reserves, special status plant reserves, and logging systems that minimize or localize ground disturbance will support fungi viability. While there is a reasonable likelihood of occurrence for these species in the project area, because such PDFs will be in place, there is a low risk that unknown populations would be affected because so little potential habitat would be affected.

2) Fuels Treatments

Fuels treatments could also affect unknown populations or potential fungi habitat. The impacts of prescribed burning for removal of slash and site preparation depends on fire intensity. High intensity burns that affect mineral soils may eliminate mycorrhizal fungi and create habitat that is colonized by non-mycorrhizal plant species including weeds. A recent study by Smith, et al (2004) examined short-term effects of seasonal prescribed burning on ectomycorrhizal fungi. Results showed that fall under burning (in dry ponderosa pine stands of eastern Oregon) significantly reduced duff depth, live root biomass, and ectomycorrhizae species richness compared to spring under burning, for at least two years. Also, the probability of residual tree mortality was greater for fall burning. The data suggests that spring burning should be favored over fall burning if the objective is to maintain ectomycorrhizae species diversity.

High intensity burns, such as pile burning, that enter mineral soils would create a localized disturbance including death of fungi down into mineral soil (the more diverse portion of the soil), incineration of the organic soil layer, loss of available nutrients, reduced soil moisture, decreased fungal biomass, decreased fungal species diversity, altered fungal species composition, degraded soil structure, and reduced fungi, all of which contribute to non-mycorrhizal species' (many that are weedy) ability to become established at (Amaranthus and Perry 1994, Korb et al 2004).

While hand piles may have these effects, their footprint across the landscape is small compared to the area where pile burning would not occur. For the project, an average of 70 hand piles per acre would be treated. Based on a 6' by 6' hand pile, only 6% of an acre would be directly affected by 70 hand piles. Hand piles would be well distributed across the landscape covering only 278 acres (or 1.6%) of the entire project. At the 5th field watershed scale, this equates to hand piles occurring over 0.4% of the watershed. While there is a reasonable likelihood of occurrence for five fungi species in the project areas, the small percentage of area hand piled and the ability for spring under burning to occur, should reduce the risk to these species. Any directly affected unknown populations should have the opportunity to recover due to the mosaic of mychorrhizae left intact and the reduced burn intensity PDF (EA p.19).

5. Effects of machine mastication

Instead of handpiling and burning, under burning machine masticated sites would better replicate natural, low intensity burns on the landscape, thus protecting special status species from high intensity fire. Occasionally during machine mastication, a thick (>6") layer of slash occurs that could result in a long term smoldering fire, following under burning which could damage the soil and seedbed and hinder reestablishment of the herbaceous layer. This potential for smoldering and impediment of germination would decrease over time as slash settles and decomposes. Although these effects are possible, careful administration during the operation of this equipment, plus the PDF requirements for leaving untreated

areas and avoiding placing material in buffered areas, would ensure that deep layers will not be created across the landscape or where special status plants are located (EA p.20).

Surveys conducted in the nominated ACEC revealed several special status species in T40S, R8W, Sec. 33, unit 002. Due to the abundance of species in this area, this unit will not be treated with machine mastication. Machine mastication would not diminish the other nominated values in the nominated ACEC. Wildlife and botanical habitat PDFs require that a mosaic of plant communities be left to continue to protect the exceptional biological diversity of the area.

6. Effects of Roads

Surveys in 1999 located a population of *Lomatium cookii* in Section 28 east of Waldo Hill Cemetery and adjacent to a road initially proposed for reconstruction. Surveys in May 2004 found that this population had spread into the old road. Therefore, the road is no longer proposed for reconstruction and there would be no effect to the population of this federally listed species.

An operator spur road is proposed in T40S, R8W, Sec. 21. S&M and SS plant populations were not found in the proposed area. Therefore, there should be no effects to these species.

A total of 1.43 miles of new road would be constructed, consisting of small spurs ranging from 0.1 to 0.3 miles. While there is potential for Bureau Sensitive fungi habitat to be impacted from this construction, the risk is very low considering that such construction is small compared to the watershed scale.

7. Cumulative Effects

Past activities in the vicinity of the West Fork Illinois 5th field watershed that have reduced habitat for some SS species include fire-- most recently, the Biscuit fire and its associated suppression and rehabilitation activities. Reasonably foreseeable actions across all land ownerships in forested settings include continued timber harvest, fuels treatments and clearing of forest and valley lowlands for development as well as other wildland fires that may occur. More SS plant populations will continue to need protection and management as a part of these actions. Special status plant populations on federal lands will be protected and conserved, although potential habitat may be reduced. This reduction is not anticipated to lead to the listing of the forested *Cypripedium* species, because populations are stable in other portions of their range and one species is adapted to canopy openings and edge habitats. Therefore, cumulative effects of these actions and the proposed actions should not adversely impact federal populations of these species. Populations on non-federal lands will most likely remain undetected and unprotected. The long term effect is a probable reduction in occurrences and habitat for these species on non-federal lands.

Past actions may have affected fungi habitat directly through damage to sporocarps or underground portions of populations or indirectly through changes in habitat as described in detail above. Whether these changes have affected fungi habitat substantially is unknown due to the lack of information regarding the five fungi species discussed above.

Reasonably foreseeable effects to fungi habitat are unknown. Information regarding the frequency of occurrence for S&M fungi are only available from surveys done at the landscape scale; not the project level. Also information available on the habitat for such species is very broad and does not provide the

specificity needed to analyze project level or cumulative actions. The only way to obtain more detailed information at the project level would be through surveys which have been determined to be impractical by the Oregon/Washington State Office (BLM IB No. OR-2004-145). It is unlikely that other avenues for conducting pre-project evaluations, such as habitat examinations, habitat evaluation, evaluation of species-habitat associations and presence of suitable or potential habitat, and the review of existing survey records, inventories and spatial data would yield sufficient information to make an adequate evaluation at the field level (BLM IB No. OR-2004-145).

Information that is available states that fire has played an important role in influencing the plant communities of southwestern Oregon. The mixed evergreen forests typically found in the project area have been created and perpetuated in the past by fire. This regime has been disrupted by fire control activities (Franklin and Dyrness 1988, Atzet and Wheeler 1982). If individual species have evolved under a more natural fire cycle, then the assumption can be made that these species will persist under more open conditions. If dense stands and hazardous fuel loadings can be reduced in a way that ensures that the habitat components important to fungi can be retained through a mosaic across the landscape, then risk of damage due to high intensity wildland fire would be reduced for fungi and as well as other Special Status plant species.

In summary, based upon known information about these fungi species, it can be construed that the proposed actions are unlikely to have substantial effects and furthermore, it is unlikely that creation of more open stand conditions, hypothesized to occur historically, would have a substantive indirect effect on these species. Additionally, the actions proposed under West Fork Illinois would not incrementally add to changing fungi habitat substantially due to the size of the project in relation to the West Fork Illinois watershed.

Reasonably foreseeable actions on serpentine habitats in the Illinois Valley are development, mining, road building and off highway vehicle use. These actions have reduced habitat in the past, for example, in the vicinity of the historic town of Waldo, where areas hydraulically mined in the 1930s still remain unvegetated due to lack of topsoil. Serpentine soils provide some of the world's only nickel and chromium deposits. Gold is and has in the past been mined. The majority of serpentine BLM holdings in the Illinois Valley contain mining claims. Currently, mining activities are small scale. If the scale increased, long term effects on these species, especially those endemic to the Illinois Valley, could be adverse depending on the amount of mining that may take place in the future. While mineral potential exists, several restricting factors limit the ability to develop new mines in the area. These factors include regulations regarding extensive details of proposed operations, financial guarantees, restrictions on occupancy, and the price of gold. Therefore, reasonably foreseeable large scale mining is unlikely.

Habitat restoration (prescribed burning) planned for most BLM projects in the watershed would help return some federally owned serpentine areas to a more naturally functioning state. By reducing overly dense shrub layers, development of the herbaceous layer would be facilitated. Therefore, areas dominated by one or two shrub species would develop greater species diversity. Also, fuel hazard reduction that thins dense understories would increase stand and tree vigor and would simulate a more natural fire regime. These actions would reduce the potential for high intensity fire and thus would reduce the potential wildfire related adverse impacts to SS species in forested communities.

Impacts of foreseeable actions on the federally listed *Lomatium cookii* or *Arabis macdonaldiana* habitat include those associated with development on private lands which could reduce or extirpate local populations or habitat. Furthermore, private land development adjacent to federal land could provide access points to federal land for OHV use. Damage from OHVs has already been documented for

numerous populations of sensitive species on both BLM and Forest Service lands. Also, noxious weeds brought in during private land development have the potential to invade plant habitat or populations. Therefore, cumulative effects from land development or related activities could occur within the range of *Lomatium cookii* or *Arabis macdonaldiana* on private lands. Because of PDFs that protect known SS plant sites or minimize damage to potential habitat (EA pp. 19, 22) and proposed actions to control OHV use through designations (see section 2.2.12), the West Fork Illinois project should not incrementally add to these effects.

3.2.5 Resource: Wildlife (EA p. 49-61)

The entire wildlife effects section is replaced.

The BLM manages 5,644 acres (7%) in the West Fork Illinois River 5th field watershed. The majority of the BLM land is serpentine forest with inclusions of non-forested areas. Past activities in the watershed on federal land include mining, road construction, and timber harvest. Past harvest (described in Table A-2) contributed to current forest habitat conditions. Fire suppression contributed to current forest and non-forest habitat conditions. Forest stand densities have increased, and stands now support more trees/acre with a less diverse canopy structure (EA p.38), thus reducing habitat features such as open grown conifers. Fire suppression has also created decadent brush fields in historically open habitats such as Jeffrey pine savannahs (EA p.38). Past road construction, mining, and agricultural and housing development have contributed to current riparian habitat conditions for terrestrial and aquatic species. Available surface water and water quality have been reduced (EA pp.26-27). The quantity and quality of lower elevation terrestrial habitat has been reduced due to mining, agriculture and housing development.

Since completion of the West Fork Illinois River Watershed Analysis (WA) in 2003, the Bureau Special Status Species list has been updated and there have been several changes in management direction specifically as they relate to the NWFP Survey and Manage Mitigation Measures (USDA and USDI 2004b). This new information was used to determine habitat types and analyze species expected to be present in the West Fork project area. This has resulted in some differences in the discussions found here compared to that in the WA.

On September 30, 2002, the Secretaries of Agriculture and Interior entered into a settlement agreement with Douglas Timber Operators and the American Forest Resource Council concerning a lawsuit involving the 2001 *Record of Decision for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (USDA and USDI 2001a,b). The settlement agreement required the agencies to examine, in a Supplemental Environmental Impact Statement (SEIS), an alternative "that replaces the Survey and Manage mitigation requirements with existing Forest Service and BLM special status species programs to achieve the goals of the Northwest Forest Plan (NWFP) through a more streamlined process…" The selected alternative in the *Final Supplemental Environmental Impact Statement to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines* was Alternative 2 (USDA and USDI 2004c). The March 2004 *Record of Decision to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines* (USDA and USDI 2004b) documents this decision and the reasons for selecting Alternative 2, which discontinued the Survey and Manage program and transferred selected Survey and Manage taxa to agency Special Status Species Programs (SSSP). Survey and Manage taxa that met the criteria for SSSP lists would now be managed pursuant to the SSSP policies of the respective agencies (BLM OR/WA and CA, and USFS Regions 5 and 6). Agency manual direction and/or regional policies for BLM's Special Status Species Program and USFS's Sensitive Species Management Program were used in SEIS analysis (USDI BLM 2001a,b).

Habitats in the project area will be discussed as they relate to the Special Status Species (SSS) policy for species known or suspected to occur in the project area. Proposed treatments may affect SSS due to modified habitat (see species discussions below). There is one federally threatened species (Northern Spotted Owl), three Bureau Sensitive species (pacific fisher, Northern Goshawk and Townsend's big-eared bat) and two Bureau Assessment species (fringed myotis and Pacific pallid bat) that are known or suspected to occur in the project area. The red tree vole, Great Gray Owl, and Del Norte salamander are Survey and Manage species, and will be further discussed because their status as S&M species has changed throughout the planning of this project.

3.2.5.1 Affected Environment and Environmental Consequences

Great gray owl and red tree vole surveys were completed in the project area per S&M policy and protocols in effect at that time (USDA & USDI 2000; 2001a; 2001b; 2002a; 2002b; 2003a). Del Norte salamander surveys were partially completed before the species S&M category changed in the S&M 2001 ROD and pre-disturbance surveys were no longer required (USDA & USDI 2001a,b). Extensive protocol surveys were conducted to locate and color band spotted owls across the Grants Pass Resource Area and in the project area during the early 1990s. Results of these surveys are discussed below.

a. Northern Spotted Owl

1) Affected Environment

Suitability of habitat for spotted owls on BLM lands was rated utilizing the McKelvey rating system. There are 751 acres of suitable nesting, roosting, foraging spotted owl habitat (NRF) in the watershed. The watershed (all ownerships) is composed of approximately 54% ultramafic soils (serpentine) that are not capable of providing NRF or dispersal habitat for spotted owls USDI BLM 2003; USFWS 2003). BLM lands border the eastern edge of the West Illinois Valley Late Successional Reserve (West IV LSR).

There are 504 acres of spotted owl nesting, roosting and foraging (NRF) habitat and 423 acres of dispersal habitat in the project area. Spotted owl habitat patches occur infrequently and are fragmented in the watershed due to the amount of serpentine soils. This area was not identified as a spotted owl dispersal area of concern (USFWS 2003). There are no known spotted owl activity centers in the project area. There is no designated critical habitat for the owl in the watershed. Spotted owls have been documented dispersing through areas of checkerboard ownership that have a higher level of fragmented habitat than the West Fork Illinois watershed or the project area.

Non-forest habitats such as serpentine meadows, chaparral, oak woodlands and Jeffrey pine savannahs are prevalent in the project area (EA p. 39). These habitats depend on fire for maintenance and restoration. Wildfire suppression has interrupted fire return intervals and these historically open habitats have been encroached upon by small trees and brush, resulting in increased fire hazard, brush decadence and reduced herbaceous vegetation.

2) Environmental Consequences - Alternative 1: No Action

The amount of owl habitat would likely remain at its current level. Stand development would continue to be influenced by fire suppression, high stem densities and ladder fuels. The risk of a stand replacement fire event would remain the same. Development of large tree structure would be slower than historically occurred because stand development patterns have changed due to fire suppression (Sensenig 2002).

Stand development in previously managed stands would slow due to vegetation competition. Postponing stand treatments would increase the risk of fire damage to existing habitat and would delay habitat development in stands capable of providing habitat. Connectivity between the East IV/Williams and West IV LSRs would likely remain unchanged

3) Environmental Consequences - Alternatives 2 and 3

Alternative 2 proposes commercial harvest in 258 acres of spotted owl habitat. Alternative 3 proposes harvest in 226 acres. The project area is not currently known to be used by spotted owls for nesting / reproduction but is likely used for foraging and dispersal. Proposed treatments would downgrade spotted owl habitat to dispersal habitat. The following discussion addresses effects to spotted owl habitat and their prey.

The commercial thin/modified group select (CT/MGS) prescription and, to a lesser extent, fuel hazard reduction in Douglas-fir and tanoak stands, would cause short term disturbance to understory plants and below ground fungi through tree removal and surface disturbance. CT/MGS (40% canopy closure maintained) would likely reduce flying squirrel populations through reduced truffle production and fragmentation of arboreal travel ways (Colgan et al. 1999). Spotted owl foraging would also likely be reduced until canopy closures increase to 60% (10-15 years) and forest floor rodent (prey) populations increase (Meiman et al. 2003, Wilson and Carey 2000). Stands with 40% canopy closure would likely be utilized more for dispersal than foraging. Thinned stands with 60% canopy closure would degrade flying squirrel habitat and truffle production but would likely maintain arboreal travel ways. CT/MGS may accelerate the development of spotted owl habitat and dense prey populations especially when decadence (snags, cavity trees and down logs) is provided for, as in the West Fork project. There may be short term impacts on truffle production, flying squirrel abundance, and owl foraging, but habitat and prey populations recover more quickly with these prescriptions compared to more aggressive treatments (clear cutting, structural retention). The CT/MGS prescription increases tree growth, crown differentiation, understory development, and understory plants' flowering and fruiting (Wender et al. 2004, EA p. 41), which provide ancillary foods to spotted owl prey. More aggressive treatments have greater negative mechanical impacts, and produce greater loss of canopy connectivity, spatial heterogeneity, and woody plant diversity (CT/MGS focuses on multiple species management (EA p. 13-14).

In addition to timber harvest units, hazard trees (per OSHA requirements) along haul roads would also be harvested. Less than 10% (less than 5 truck loads) of the roadsides would have hazard trees felled. The impact on habitat of hazard tree removal would be negligible.

Fuel hazard reduction could be perceived as creating "edge" and degrading suitable owl habitat. Recent research (indicates that owl productivity is enhanced by having an edge component in the home range Franklin, et al. 2000, Zabel et al. 1995). Woodrats, the primary prey of spotted owls, are more vulnerable to predation at habitat edge openings.

Culvert replacements, POC sanitation and noxious weed treatments would have negligible effects on owls and their habitat. Reforestation would not benefit spotted owls until replanted areas are at least 30 years old and support marginal foraging.

Alternative 2 proposes commercial harvest in 258 acres of spotted owl habitat. Alternative 3 proposes 226 acres. Proposed treatments would modify spotted owl habitat from nesting, roosting and foraging habitat to dispersal habitat. Currently there are no known spotted owls utilizing the project area for

reproduction. Short term effects for both action alternatives to spotted owls would be the reduction in canopy closure and structural complexity, that would make stands more accessible by predators such as great horned owls. Long term effects for both action alternatives would include an increase in average tree diameter, canopy closure and structural complexity consistent with late-successional forests upon which this species depends. Treatments would accelerate development of stands to late-successional conditions faster than the no action alternative. Alternative 2 would accelerate development of late-successional conditions on approximately 1% more area than alternative 3.

In summary, approximately 258 acres in alternative 2 and 226 acres in alternative 3 of suitable spotted owl habitat would be degraded to dispersal habitat. This would result in short term impacts to prey availability and a potential shift in owl use of that habitat. But because there are no known nest sites in the project area, spotted owl take is not anticipated. This project and the expected effects to spotted owls are compliant with the formal consultation with U.S. Fish and Wildlife Service (USFWS) issued in the Biological Opinion (#1-15-03-F-511, October, 2003).

b. Red Tree Vole

1) Affected Environment

The red tree vole habitat is mesic Douglas fir forest. Although the red tree vole may occur in younger stands, old growth forests seem to provide optimum habitat. Nests are built on suitable foundations such as large tree limbs, whorls, and the nests of birds or squirrels. They feed mostly on fir needles, bark, and lichens (Verts and Carraway 1998). Red tree vole nests have been found in the project area and the watershed and are an important prey species for the spotted owl.

There are approximately 2,850 acres of potential RTV habitat in the project area. The RTV is an arboreal species of rodent with very low dispersal capabilities. The broad management objective for this species is to retain sufficient habitat to maintain its potential for reproduction, dispersal and genetic exchange. Surveys have been conducted in suitable habitat and protection measures (buffering) have been implemented in accordance with the S&M management recommendations prior to the 2004 S&M ROD (EA p.22). Population numbers are unknown. The red tree vole is a Bureau Tracking species and is not considered a management species under the SSSP.

2) Environmental Consequences – Alternative 1: No Action

Effects from the no action alternative as described above for the spotted owl are relevant in their entirety for the red tree vole because their habitat structure and conditions are the same (USDA and USDI 2000, p.386). In summary, forested stands in the project area would continue to develop towards older forest conditions through natural succession. Successional development of stands would continue to be influenced by fire suppression, high stem densities and ladder fuels. The risk of a stand replacement fire event would continue to be a threat. Development of late-successional habitats in the project area would be delayed by no action because stand development patterns have changed due to fire suppression efforts. Connectivity from the East IV/Williams to the West IV LSR would remain at its current level.

3) Environmental Consequences - Alternatives 2 and 3

Effects from alternatives 2 and 3 as described above for the spotted owl are relevant in their entirety as they relate to spotted owl prey species, which includes the RTV (Forsman et al. 2004).

In the xeric forests of the Rogue Valley and in the project area there is a poor understanding of RTV distribution and habitat relationships, especially as habitat becomes more isolated with progressively less connectivity towards the edges of this zone where it intergrades with oak woodlands (USDA and USDI 2000). However, while there is insufficient information to determine if populations are stable in the project area, habitat is sufficiently abundant to support stable populations range-wide in the NWFP area (USDA and USDA 2004c, p.208). Additionally, RTV sites in the project area are being managed according to Survey and Manage guidelines.

Red tree vole (RTV) sites have been buffered per protection measures outlined in the management recommendations. Short term effects to RTV from both action alternatives include the restriction of successful dispersal beyond established buffers to riparian or other unharvested areas. Dispersal would be restricted from buffered areas into untreated adjacent habitats until canopy closures recover to 60% or greater. Long term effects for both action alternatives include an increase in mature and late-successional habitats in the project area, with high canopy closures that may facilitate more successful dispersal of the species across the landscape. Additionally, the proposed pre-commercial thinning and brushing throughout the project area would accelerate the development of potential red tree vole habitat in the future, contributing to the maintenance of the species and its habitat in the watershed. Alternative 2 proposes to treat more acres than alternative 3, and would make available more potential habitat for red tree voles in the long term.

c. Northern Goshawks

1) Affected Environment

The Northern Goshawk, a Bureau Sensitive species, is found in a variety of mature, deciduous and coniferous forest types. Nesting habitat is mature forest with high canopy closure and an open understory. Suitable habitat is in the project area but no nests have been found. Goshawks are rarely found in the Grants Pass Resource Area, likely due to the brush and small diameter tree component found in the understory of most stands.

A petition to list the Northern Goshawk in the western United States as a threatened species was considered by the U. S. Fish and Wildlife Service (USFWS) in 1998 and the final conclusion was published that year (Federal Register, Vol. 63, No. 124, June 29, 1998, 35183-35184). USFWS found no evidence to support the contention that the goshawk was in danger of extinction or that the species was likely to become endangered in the foreseeable future throughout all or a significant portion of its range. Incidental sightings of goshawks in the watershed indicate they are present, although in low numbers. No nests have been located and there are no historic records of nesting in the watershed.

Fire exclusion may have reduced the suitability of some stands for goshawk by allowing the understory to develop. The only known historic goshawk nest in the GPRA is near Galice, approximately 20 air miles from the West Fork Illinois watershed.

2) Environmental Consequences - Alternative 1: No Action

Spotted owl habitat, defined by the McKelvey rating system, incorporates habitat structure and canopy closures important to Northern Goshawks. Therefore, McKelvey will be used for assessing the impacts of the alternatives to the northern goshawk. Effects of the no action alternative were described above for the spotted owl and are relevant in their entirety for the northern goshawk, because the impacts to goshawk habitat structure and conditions would be the same (Reynolds et al. 1992).

3) Environmental Consequences - Alternatives 2 and 3

Effects of the action alternatives on the spotted owl as described above are relevant to the northern goshawk because habitat and prey species are similar (Reynolds et al. 1992). However, goshawks would forage more in thinned stands than would owls. Goshawks are habitat generalists and thinned stands would provide more suitable foraging habitat and unimpeded flight paths for this sit-and-wait predator.

Noise disturbance from timber sale operations could impact goshawks during the breeding season. However, seasonal restrictions would be imposed on units near active goshawk nest sites (EA Addendum p. 6) which would minimize that disturbance and likely prevent nest abandonment. Goshawks are highly mobile habitat generalists and could further avoid disturbance by utilizing more distant habitat in the project area and watershed.

d. Del Norte Salamanders

1) Affected Environment

Rock and talus habitat is sporadically distributed throughout the project area, occurring primarily near rock outcrops, ridge tops, and riparian areas. Surveys have been partially completed for the project area although pre-disturbance surveys are no longer required. Surveys detected presence in T40S, R8W, Sec 33; T41, R9W, Sec 2, 10, 12, 13, and 15. Pre-disturbance surveys are no longer required (S&M ROD, 2001). A summary of the S&M policy changes was previously described. The Del Norte is currently a Bureau Tracking species and is not considered a management species under the SSSP. Regardless, buffers and management recommendations in place under the S&M program would be in place for this project.

2) Environmental Consequences - Alternative 1: No Action

The amount of Del Norte talus habitat would remain at its current level. Forested vegetation on talus and surrounding Del Norte habitat would remain at risk from wildfire. Talus slopes are not highly productive sites and would not be expected to provide late-successional habitat. However, in conjunction with adjacent vegetation, high canopy closures can be attained from overstory trees to maintain a cool, moist microclimate important to salamanders. Fuel loading and ladder fuel conditions make Del Norte habitat susceptible to risk of high severity fire which would reduce canopy closure of talus habitat randomly across the landscape, retarding succession and development of shade tolerant trees.

3) Environmental Consequences - Alternatives 2 and 3

Both action alternatives propose treatments in talus habitat. Known Del Norte sites have been buffered according to management recommendations in place prior to the 2004 S&M ROD (USDA and USDI, 2001). Where potential habitat has been identified, treatments would not reduce canopy closures below 40% as per management recommendations. Additionally, fuels would be hand piled and pile burning would occur when temperatures are near freezing or below to minimize salamander mortality. Short term effects would include warmer, drier conditions in some habitat areas which could reduce salamander use of those areas. However, these effects are expected to mimic what would have occurred under normal disturbance regimes prior to the fire suppression era. Long term effects would be a reduced risk of stand replacing fire, which would likely maintain high canopy closures and Del Norte populations. Alternative 2 proposes to treat more areas of Del Norte habitat than alternative 3, which would provide a greater long term benefit to the species through the reduced risk of severe fire.

e. Great Gray Owl

1) Affected Environment

There are approximately 638 acres of potential Great Gray Owl (*Strix nebulosa*) reproductive habitat in the project area. The Great Gray Owl forages in open areas such as meadows or clear cuts, conifer forests, and oak woodlands (USDA and USDI 2002c). Great grey owls have been located nesting in a variety of stand types, but appear to prefer mature park like stands with a closed canopy (>60%) and an open understory and room for flight. Nests are in tree cavities, large broken-top snags, or abandoned raptor, corvid (jays, crows, ravens, etc.), or squirrel nests. Historical numbers of great gray owls are unknown. The Great Gray Owl's diet consists mostly of small mammals, particularly voles and pocket gophers. The young leave the nest before they can fly and need leaning trees to enable them to climb up off the ground.

Studies show logging can create "temporary meadows" capable of supporting rodent populations used by breeding Great Gray Owls. Unlike naturally occurring mountain meadows, forest clearings created by logging undergo rapid forest reestablishment. Therefore, successional development makes the usefulness of such openings short lived.

In this project, surveys were conducted to protocol along meadows, clear cuts and lower elevations in the project area. No great gray owls were detected. Since the late 1990s, eleven landscape management project areas evenly distributed across the Grants Pass Resource Area have been surveyed for great gray owls using the two year survey protocol (USDI BLM 2004). Only one project area on the Grants Pass Resource Area (east of Williams) has documented nesting great gray owls. Additionally, no nesting territories have been detected west of Williams on Forest Service or other BLM lands (ISMS database). No great grey owl nest sites have been documented in the Glendale Resource Area to the north, but the Salem District BLM has a known nest site (ISMS database).

2) Environmental Consequences – Alternative 1: No Action

Forested stands would continue to develop along their current pathways. Successional stand development would continue to be influenced by fire suppression, high stem densities and ladder fuels. The risk of stand replacement fire events would remain at current levels or increase. Foraging areas would continue to be encroached upon by fire intolerant plant species, thereby reducing potential foraging opportunities.

3) Environmental Consequences - Alternatives 2 and 3

Alternatives 2 and 3 propose treatment in potential great gray owl habitat. Because no owls were located during protocol surveys in suitable habitat, it is unlikely that treatments would have a negative effect on this species. However, treatments may modify potential nesting habitat to a non-nesting condition. Short term effects for both action alternatives include reducing canopy closures and structural complexity within stands, and providing opportunities for predators, such as the great horned owl to become established. However, these habitat changes would also open stands to allow for unobstructed flight, potentially increasing the amount of suitable habitat. Long term effects for both action alternatives include the accelerated development of late-successional forest habitat conditions and enhancement of foraging areas from thinning and burning. Alternative 2 proposes to treat more acres than alternative 3, providing more potential nesting and foraging opportunities in the future for great gray owls.

f. Pacific Fisher

1) Affected Environment

The Pacific fisher (*Martes pennanti*) has been extirpated from extensive regions of its historical range in the Pacific states (Powell and Zielinski 1994). Fishers are one of the most habitat specialized mammal species in North America. However, views differ about the fisher's need for extensive tracts of mature, largely coniferous, forest stands. Most researchers in the western United States emphasize that fishers are associated with extensive mature conifer forests, and that elements of these forests (such as old live trees, snags and large logs) are required (Harris et al. 1982, Rosenberg and Raphael 1986, Weir and Harestad 2003, Zielinski et al. (in press), Zielinski et al. 2004). In contrast, research in the Northeastern and Midwestern United States suggests that mid-successional mixed broad-leaved and coniferous forests provide suitable fisher habitat (Krohn 1994). Fishers are generally closely associated with low to mid-elevation forests with a coniferous component, large snags or decadent live trees and logs for denning and resting, and complex physical structure near the forest floor to support adequate prey populations. Fishers in southern Oregon have been documented using a variety of habitats such as young successional open habitats, oak woodlands and previously harvested areas (pers. comm. Jeff VonKienast). Telemetry studies have determined that fishers are wide-ranging animals (Zielinski et al. 2004). One female moved 26 km from her original trap location. One male captured on the Rogue River National Forest north of Prospect moved 55 km northeast to the Deschutes National Forest (Aubry and Raley 2002). In the Rogue River study, males had a larger home range (~147 km^2) during the breeding season compared to ~63 km^2 during the non-breeding season (Aubry and Raley 2002). Given that fishers are capable of moving long distances, the entire West Fork Illinois project area and watershed can be considered fisher habitat; however, certain inferences can be made on suitability of habitat for natal dens, resting and foraging.

The fisher was petitioned for listing as endangered or threatened under the Endangered Species Act on three occasions. On July 10, 2003, a 12 month status review by the U. S. Fish and Wildlife Service (USFWS) was initiated to determine if listing was warranted (Federal Register Vol. 68, No. 132, July 10, 2003, 41169-41174). USFWS published a finding in April 2004 that a petition to list fishers as a "Federally Threatened" species was warranted but precluded by higher priority listing actions (Federal Register Vol. 69, No. 68, April 8, 2004, 18769-18792). The species remains a USFWS candidate species (USDI USFWS 2004).

Fishers are restricted to two small, disjunct and genetically isolated populations in southwestern Oregon: an introduced population in the Southern Cascades and an extant, historic population in the Siskiyou Mountains (Wisely et al. 2004). The Siskiyou Mountain population is likely connected to a coastal population in Humboldt and Trinity counties of California, because there are no human or habitat barriers to their genetic interchange (pers. comm. K. Aubry 2004).

The Grants Pass Resource Area has conducted surveys for forest carnivores using bait stations with motion and infrared detection cameras throughout the resource area. Fishers have been detected during these surveys near Williams and near the top of the Deer Creek drainage, and observations have been recorded on BLM lands near Galice Creek. Fishers are suspected to occur in the West Fork Illinois watershed and project area.

The McKelvey rating system discussed above includes and adequately describes habitat structures and canopy closures important to fishers and will be used for assessing impacts of the alternatives to the fisher. There are 504 acres of denning and resting habitat and 423 acres of foraging habitat for fishers.

2) Environmental Consequences - Alternative 1: No Action

Effects for the no action alternative were described above for the spotted owl and are relevant in their entirety for effects to the fisher due to similar habitat conditions and requirements (Powell & Zielinski 1994, Aubry & Raley 2002). Ultimately, the greatest risk of no action is the wildfire related loss of large remnant conifers and hardwoods important to fisher natal and maternal denning sites.

3) Environmental Consequences - Alternatives 2 and 3

Effects for the action alternatives were described above for the spotted owl and are relevant in their entirety for effects to the fisher due to similar habitat conditions and requirements (Powell & Zielinski 1994, Aubry & Raley 2002).

As described above, CT/MGS, riparian reserve thinning and to a lesser extent fuels reduction (understory thinning, hand piling/burning, under burning, and mechanical thinning) would have short term negative effects on understory plants and below ground fungi. Fishers generally avoid forested stands with less than 40% canopy cover, likely due to the reduced abundance of prey species (squirrels, snowshoe hares, brush rabbits, white-footed mice, deer mice, red-backed voles, and meadow voles). However, fishers have been known to forage in these types of stands in southwest Oregon. Habitat effects to prey species are relatively short term, as understories usually recover in 5 or fewer years. The overstory canopy often reaches 60% cover in 10-15 years. Riparian reserve thinning and other units with canopy closures between 50-60% would minimally reduce fisher prey species or their habitat. The effects of uneven-aged timber management practices, such as for this project, are likely to have less effect on fisher habitat than even-aged management (Powell and Zielinski 1994).

Timber sale noise disturbance impacts are unknown. There is evidence that fishers avoid people and roaded areas (Harris and Ogan 1997, Douglas and Strickland 1987, Powell 1993). Many roads in the project area are already closed year round or seasonally. Alternatives 2 and 3 propose constructing approximately 1.4 miles of new road, and 0.4 miles of an existing spur would be reconstructed. Of the new construction, 0.3 miles would be decommissioned and the existing spur (0.4 miles) would be subsequently blocked (Appendix C). Fishers may be displaced by disturbance near denning sites, but as timber sale operations would be temporally and geographically limited to an area smaller than the average fisher home range, they would be able to move away from noisy, active areas.

Forest fragmentation remains a concern for fishers, as stated by Powell and Zielinski (1994):

> Presumably, fishers experience habitat loss when timber harvest removes overstory canopy from areas larger and more extensive than natural wind throw and fire would. Small patch cuts interspersed with large, connected, uncut areas should not seriously affect fisher populations. In fact, these small scale disturbances may increase the abundance and availability of some fisher prey.

In the West Fork Illinois River watershed, serpentine soils are the main cause of late-successional habitat fragmentation. BLM checkerboard ownership may be one of the primary factors limiting the ability of BLM lands to provide optimal habitat for fishers (USDA and USDI 1994b).

Private timberlands may provide foraging and dispersal for fishers, but would not provide the large live trees, snags and logs necessary for natal and maternal den sites and resting sites. Although they generally avoid recent clearcuts, telemetry research indicates that fishers use recovering clearcuts and mid-seral

stands on both private and federal lands in southern Oregon (Aubrey and Raley 2002).

Fishers are naturally rare and have a disjunct distribution in the Pacific Northwest. Appendix J-2 of the NWFP determined that their range included 34% non-federal land and that although federal lands may provide suitable well-distributed habitat, fisher populations may never become well distributed due partly to limited federal land ownership at lower elevations and the species' naturally low abundance. The NWFP concluded that "habitat is of sufficient quality, distribution, and abundance to allow the species population to stabilize. However, significant gaps in the historic species distribution on federal lands may cause some limitation in interactions, and thus loss of genetic exchange among local populations (USDA and USDI 1994b).

Alternatives 2 and 3 would, in the short term, degrade fisher habitat through thinning and noise disturbance that would reduce prey species. However, the action alternatives would not contribute to the need to federally list the fisher for the following reasons: 1) While some habitat would be degraded, it would still remain suitable for fisher dispersal and foraging; 2) fishers are wide-ranging species and thus are able to move to avoid disturbance; 3) seasonal restrictions for soils and POC would restrict activities until at least six weeks after birth of young (generally around April 1); and 4) habitat features such as large snags and coarse down wood would be maintained across the project.

g. Species Associated with Snags and Coarse Down Wood

1) Affected Environment

A review of DecAid's snag association tables identified 47 wildlife species associated with down wood (down logs, branches, and root wads), 64 species associated with snags, and 29 species associated with tree cavities. Some species, such as Pileated Woodpeckers, were included in all three categories (Mellen et al, 2003).

Primary excavators create cavities used by other species (secondary cavity users). Primary excavators also transmit heartrot and other decay fungi, by probing and excavating, into trees; heartrot is important to other primary excavators not able to excavate sound wood (Aubry and Raley, 2002). The following SSSP species are either primary cavity excavators or secondary cavity nesters, suspected to occur in the project area and the West Fork Illinois River watershed (fisher, fringed myotis (*Myotis thysanodes*), Pacific pallid bat (*Antrozous pallidus pacificus*) and the Townsend's big-eared bat (*Corynorhinus townsendii*).

Fishers use live tree and snag cavities (many of which are excavated by Pileated Woodpeckers) as well as down logs in southern Oregon (Aubry and Raley 2002, pers. comm. K. Aubry 2004). Bats use live tree and snag cavities as well as rock crevices, mines, caves, stumps, loose bark, bridges, buildings, and other protected sites (Verts and Carraway 1998). Pallid bats roost in rock crevices, tree hollows, mines, caves and a variety of anthropogenic structures, including vacant and occupied buildings (Sherwin 1998a). Townsend's big-eared bats hibernate in caves and mines during winter (Sherwin 1998b). The fringed myotis is a crevice dweller found in crevices of mines, caves, rocks, and large conifers. There are no known mines or caves or bat roosting sites known in the project area; however Townsend's big-eared bats have been found in the watershed and fringed myotis and pallid bats are known to occur in the Grants Pass Resource Area. Older forest stands receive greater use by bats due to the availability of roosts, a complex vertical structure and less clutter.

Four bat species (the silver-haired bat (*Lasionycteris noctivagans*), long-eared myotis (*Myotis evotis*), long-legged myotis (*Myotis volans*), and pallid bat) are listed in the NWFP as protection buffer species

(USDA and USDI 1994a,b). These bats are crevice dwellers and may use crevices under loose bark and in decaying stumps, or wedge into spaces in tree bark. Some species may roost in cavities created by rot or excavated by woodpeckers. These protection buffer species were not removed or modified in the 2004 Survey and Manage ROD (USDA and USDI 2004b). There are no known caves or abandoned mines, wooden bridges or buildings in the project area that would warrant management as an occupied bat site. Studies show that older stands and thinned stands received more use by bats than unthinned stands, clearcuts and shelterwoods. Riparian habitats received the greatest use of all habitats (pers. comm. H. Ober 2003).

Some important spotted owl prey species use down wood. Dusky-footed woodrats (*Neotoma fuscipes*) build stick nests, sometimes incorporating logs as part of the structure. They also may fortify hollow logs with sticks to use for dens. Other prey species, such as the western red-backed vole (*Clethrionomys californicus*) use sound logs for travel lanes and rotting logs for foraging, nesting, or internal travel routes. Moisture in and under rotting logs is involved in production of fungi, which is the main food for the northern flying squirrel (*Glaucomys sabrinus*) and the western red-backed vole.

2) Environmental Consequences - Alternative 1: No Action

Effects of the no action alternative were described above for the fisher and are relevant in their entirety for effects to bats and cavity users due to similar habitats (Weller and Zabel 2001). Additional effects to bats include restrictions on access to snags in dense stands due to cluttered flight paths (clutter results in echolocation interference) (pers. comm. J. Hayes 2003).

3) Environmental Consequences - Alternatives 2 and 3

Snags that provide potential roost sites may be felled to meet OSHA safety standards. However, project design features (PDFs) would ensure adequate snag retention and recruitment by retaining all snags >16" DBH (EA p.21). Proposed thinning would reduce understory clutter and thus improve flyways.

The NWFP identified snag and green tree retention mitigation measures that would reduce the risk of local extinctions and improve the likelihood that well-distributed populations of snag dependent species would be maintained (USDI and USDA 1994b). Where snags are currently available, alternatives 2 and 3 meet or exceed these snag and green tree retention guidelines. The CT/MGS prescription would maintain habitat structure and foraging substrates associated with snags and large conifers, though retained snags and large conifers can be susceptible to wind throw. The greatest concern for bat habitat is the retention of undisturbed roosting sites in snags, caves, mines, bridges, abandoned buildings or other potential roost sites during critical seasons for bats. Under alternatives 2 and 3, snag levels would be maintained and treatments would not affect caves, mines or anthropogenic structures, and therefore, bat populations would be minimally affected by project activities.

h. Songbirds

1) Affected Environment

Songbirds use a wide variety of habitats, including late-successional forests, riparian areas, brush in recovering clearcuts, and small trees in developing stands. Some birds, such as the Olive-sided Flycatcher, perch on residual canopy trees and forage over clear cuts. Many land birds are associated with deciduous shrubs and trees in early successional habitats (i.e. Orange-crowned Warblers and Rufous Hummingbirds). Any action that changes or removes vegetation used by one species may benefit another.

For example, thinning in the understory may negatively affect a species which uses dense understory, such as the Winter Wren, but would benefit other species, such as Hammond's Flycatcher, which forages in open mid-stories.

Neotropical migrants migrate to Central or South America each year. They are addressed here due to widespread concern regarding downward population trends, habitat declines, and the BLM's efforts to comply with Executive Order 13186, the Migratory Bird Treaty Act (per an MOU between the BLM, U.S. Forest Service and the U.S. Fish and Wildlife Service. None documented as occurring on the Medford District BLM are listed as endangered or threatened. In February 2003, USFWS identified migratory non-game birds that were species of conservation concern (Federal Register July 10, 2003 Vol. 68, No. 25, 6179). Six of the birds on this list (Table A-5) are known to occur on the Medford District BLM (USDI USFWS 2002). Neotropical birds, as a group, are not special status species.

Table A3-4: Birds of Conservation Concern for Medford District BLM

Species	Presence in W.F. Illinois Watershed
Peregrine Falcon	None known nesting
Flammulated Owl	Unknown
Olive-sided flycatcher	Present
Rufous Hummingbird	Present
Lewis' Woodpecker	Unknown
White-headed Woodpecker	Unknown

Resident birds remain in the same general area (e.g., the Pileated Woodpecker) or migrate to lower elevations in the winter (e.g., the Dark-eyed Junco). Populations of late-successional dependent migratory or resident birds for the West Fork Illinois watershed are unknown. Breeding bird surveys indicate increasing evidence that regionally, songbirds are declining (Sauer et al. 2004). However, the cause of these declines is still unclear.

2) Environmental Consequences - Alternative 1: No Action

Meadows, oak woodlands and Jeffrey pine savannahs would continue to be encroached upon by small trees and shrubs. Development and maintenance of forest and non-forest habitats have stagnated because of lack of fire or other disturbance; this trend would continue. Some bird species have benefited from the lack of fire while others have declined due to habitat changes outside the historic range of variability. Ultimately, the greatest risk is the loss of large diameter remnant conifers and hardwoods important to land birds. Alternative 1 would not enhance the development of large diameter conifers. Over time, these habitat structures would be lost without future recruitment (Sensenig 2002, Mazurek et al. 2004).

3) Environmental Consequences - Alternatives 2 and 3

Alternatives 2 and 3 would treat a variety of songbird habitats. Birds that use mature and old growth trees, such as Brown Creepers, would have reduced amounts of late-successional forest available because of habitat removal and reduced canopy closure. However, species such as the Rufous Hummingbird which use nectar producing plants would benefit from the increase in forbs and flowering shrubs which would occur post treatment. This increase would continue until the tree canopy recovers and shades out these plants. Short term effects to meadows, oak woodlands and Jeffrey pine savannahs would include reduced stem densities, shrub abundance and structure. These changes could reduce the occurrence of species that have benefited from fire suppression such as the Nashville Warbler (J. Alexander, pers. comm.). Long term effects would include increased native grass abundance and the maintenance and

enhancement of meadows, oak woodlands and Jeffrey pine savannahs. Species that would benefit long term from these treatments include the Flammulated Owl, Western Bluebird, and prey species such as small mammals and a host of insects associated with these habitats. Alternative 2 proposes to treat more acres of Jeffrey pine savannah than alternative 3. Therefore, over time, alternative 2 would benefit more species associated with this unique plant community than alternative 3.

Short term effects to forested stands for both action alternatives include reduced stem densities, ladder fuels and canopy closure. Treatments would retain large structure and large diameter snags and down wood. Species that have benefited from lack of fire and dense understories could be adversely affected by these treatments. Songbird composition and abundance in treated stands could be reduced in the short term (Janes 2003, Hagar et al. 2001, Siegel et al. 2003, USGS 2003). However, it is likely that by moving stands toward their historic range of variability, some species that have been adversely affected by fire suppression would benefit. Long term effects include accelerated development of large tree structure for interior forest species. Alternative 2 proposes to treat more acres than Alternative 3, contributing to moving stands in the project area towards their historic range of variability benefiting those species historically present.

i. Invertebrates

1) Affected Environment and Environmental Consequences

The following invertebrate discussion as it relates to the March 2004 *Record of Decision to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines* has been previously described under the RTV section. There are two Bureau Sensitive snail species: the Oregon shoulderband (*Helminthoglypta hertleini*) and the travelling sideband (*Monadenia fidelis celeuthia*).

Since the late 1990s, more than 15 landscape management project areas throughout the Grants Pass Resource Area have been surveyed for these two species using the terrestrial mollusk survey protocol (USDA and USDI 1997, USDA and USDI 2002b, USDA and USDI 2003a,b). Only three project areas in GPRA (one east of Williams and two north of Grants Pass) have detected this species. Oregon shoulderbands were found in rocky areas associated with damp grassy areas, oak woodlands, and shrub lands, or in conifer forests closely associated with these habitat types. Shoulderband survey data analysis determined that they were not late-successional or old growth habitat dependent, and surveys are no longer required (USDA & USDI 2003a). During past surveys, unknown mollusks were collected and submitted to taxa experts. None of the *Monadenia* species submitted were identified as the travelling sideband. Surveys on the Grants Pass Resource Area have revealed no detections for the sideband and only three detections for the shoulderband east and north of the project area. Surveys have been conducted on other areas in the Medford District BLM area using the same protocol for terrestrial mollusks. The traveling sideband is known to occur in the Ashland Resource Area and the Oregon shoulderband occurs more commonly to the north in the Glendale Resource Area.

2) Environmental Consequences - Alternative 1,

The forest would continue to develop older forest conditions, which would be favorable to molluscs. There would be an increase in habitat conditions for species requiring late-seral conditions. Foraging opportunities for species associated with shade intolerant hardwoods would diminish. The potential for stand replacing fire would remain high.

3) Environmental Consequences - Alternative 2 and 3

All commercial timber harvest units were surveyed for S&M molluscs. None were located. If they are found during project activities, the approved management recommendations (USDI and USDA 2001a,b) would be implemented. This group generally requires cool moist environments with the exception of *Helminthoglypta hertleini* which utilizes rocky talus in open exposed slopes. With the implementation of the management recommendations there are no anticipated impact to these species. Habitat in sites adjacent to known sites could experience short term effects, including warmer, drier conditions which could reduce mollusc use of those areas. This effect could extend into known sites because of the edge effect, but would be minimized because of the retention of approximately 40% canopy cover in treated units. These effects could mimic what would have occurred under normal disturbance regimes prior to the fire suppression era. Long term effects would be a reduced risk of stand replacing fire, which would likely maintain high canopy closures and mollusc populations. Alternative 2 proposes to treat more areas of habitat than alternative 3, which would provide a greater long term benefit to the species through the reduced risk of severe fire.

j. Big Game

1) Affected Environment

Deer and elk are not late-successional dependent species. They depend upon early seral vegetation for forage and need dense vegetation for hiding cover. The project area provides year round habitat for deer and elk. Since the late 1970s, the belief that thermal cover constitutes a key component of ungulate habitat has resulted in its widespread application, to the extent that virtually all elk habitat evaluation procedures currently use this variable as a measure of abundance in the Pacific Northwest (Wisdom et al. 1986, Thomas et al. 1988) and in many other regions in the western United States (Christensen et al. 1993). These habitat evaluation procedures were used extensively in the development of national forest plans (Edge et al. 1990) and in the Medford BLM RMP and its EIS. Nonetheless, the concept of thermal cover remained a poorly tested hypothesis until Cook et al. (1998) concluded that thermal cover (summer and winter) had little relevance to herd productivity and demographics. The Medford District RMP designated big game winter range (USDI BLM 1995, MAP 7); however there is none designated in the project area or watershed.

In contrast to thermal cover, nutrition effects on big game populations are reasonably well established (Clutton-Brock et al. 1982, Verme and Ullrey 1984, Coughenour and Singer 1996). In fact, there is a long recognized inverse relationship between forage production and forest canopy closure (Pase 1958, Young et al. 1967, McConnell and Smith 1970), such that emphasis on thermal cover over food production can reduce forage and, in turn, carrying capacity. The quality and quantity of forage directly relates to physical condition of deer and elk, and plays an important role in their management.

2) Environmental Consequences - Alternative 1: No Action

Effects of the no action alternative to deer and elk would be two fold: 1) early successional habitat would not be created and decadent forage would not be rejuvenated. Historic fire regimes prior to fire suppression provided for these open habitats, and for succulent browse important to the nutritional needs of does and cows; and 2) fuel hazard would not be reduced, thereby maintaining the risk of habitat loss, especially cover for security and fawning/calving habitat.

3) Environmental Consequences - Alternatives 2 and 3

Commercial harvest would reduce canopy closure and increase forage. Timber harvest and fuel hazard reduction would open the understory, providing for easier access and increased forage availability, but would reduce security cover. However, adequate security cover would be maintained in untreated areas and in riparian reserves. Alternatives 2 and 3 would likely benefit deer and elk primarily through the increase in available forage.

k. Cumulative Effects

Cumulative effects in the project area result from the incremental impact of the alternatives, added to other past, present and reasonably foreseeable future actions regardless of who undertakes the action. The majority of remaining older forest occurs on public lands managed by the BLM and the Forest Service. Past activities have changed the distribution and abundance of many wildlife species in the watershed. Species associated with younger forested conditions have benefited from these changes. Species associated with late-successional forests, such as the spotted owl, have declined, but as habitat in the West Fork Illinois watershed are naturally fragmented because of edaphic factors, the impact on these species is likely less than in more contiguous late-successional habitats. Land development and agriculture have reduced low elevation habitats, creating barriers and prohibiting dispersal of some species. Overall, these past activities have resulted in a loss of habitat.

Fire suppression, mining, road building, grazing, land development, agriculture and timber harvest throughout the watershed have altered historic conditions. The majority of remaining older forest occurs on BLM and Forest Service lands. These past activities have changed the distribution and abundance of habitats and many wildlife species. For example, riparian habitats have been altered by road construction and mining, changing the hydrology and vegetation potential from historic conditions, which has affected the quality of connective habitat these areas provide.

Approximately 1,312 acres have been harvested from BLM lands in the West Fork Illinois watershed since 1950 (Table A-3); however, as some of these acres may have been treated more than once, this is likely an overestimate of the acreage impacted by timber harvest. Although the precise impact of this harvest on spotted owl habitat and other late-successional dependent species is unknown, the 138 acres of mortality salvage since 1950 had no effect on suitable NRF habitat; salvage, by definition occurs in already dead stands which is not suitable habitat. Recent BLM timber sales in the watershed include 119 acres in the 3+3 project and 44 acres in the Noreast project (Table A-3). Additional areas of thinning and/or burning for fuel hazard reduction have been associated with these sales. No additional timber sale activities on federal lands are projected to occur in the watershed in the next five years. Timber harvest has occurred on approximately 40 acres (Rough and Ready lands) in the past five years near the West Fork project area. Nearby lands owned by Perpetua are planned for harvest of 100 acres/year over the next three years. Other landowners' plans are unknown. For analysis purposes, rotational harvest of privately owned timberland in the watershed is expected to continue at current levels; none are expected to attain late-successional conditions.

As a result of the NWFP, there has been a shift in management on federal lands in the Rogue Basin. Prior to the plan, harvest treatments were dominated by regeneration harvest. In the West Fork Illinois watershed, harvest treatments shifted to density management as a result of the NWFP. This has resulted in the treatment of many more acres compared to regeneration harvest of equivalent timber volume. Density management has fewer adverse effects on wildlife than regeneration harvest. Additionally, due to the National Fire Plan, management activities have been designed to move vegetation towards its historic range of variability by reducing fuel levels. This combination has resulted in treatments more in line with historic disturbance regimes.

Range-wide, northern spotted owl populations declined 3.7% annually from 1985-2003 (USFWS 2004). In the Tyee, Klamath, and South Cascades study areas in southwestern Oregon, spotted owl populations appeared stable from 1985-2003 (USFWS 2004). Habitat loss due to timber harvest was identified as the paramount threat in 1990 (USFWS 2004). The NWFP and RMP anticipated a loss of habitat due to timber harvest (USDA/USDI 1994 Vol. 1; RMP).

The rate of suitable habitat loss due to timber harvest on private, state, and federal forest lands declined in the late 1980s and early 1990s (USFWS 2004 p.24). The harvest rates in suitable habitat on BLM lands in Oregon was 3% per year (22,000 acres) in 1990 and dropped to 0.52% per year (4,911 acres) by 2003 (USFWS 2004 p.28). During this period of declining rates of habitat loss, spotted owl populations in southwestern Oregon appeared stable. The future rate of habitat loss due to timber harvest on federal lands is expected to be less than 4% per decade (USDA, USDI, 2004 p.111). Since harvest rates on federal lands in Oregon are expected to remain low for the foreseeable future, it is reasonable to expect that the northern spotted owl population would remain stable in southwestern Oregon. The harvest of up to 258 acres of suitable habitat for this project is included in the projected BLM timber harvest program for southwestern Oregon. In addition, it is estimated that in the NWFP area, late-successional forest habitat development through in-growth (tree growth) is occurring at approximately 8% (600,000 acres) per decade over the baseline condition established in the NWFP (USFWS, 2004, p.26). Private forest lands and federal, non-reserved matrix lands are not expected to develop into suitable spotted owl habitat. Managed, mid-seral stands on federal, non-reserved matrix and on private lands produce spotted owl dispersal habitat that may be used to connect blocks of late seral habitat in the federal reserves.

In 2002, the Biscuit Fire burned almost 500,000 acres, primarily on the Siskiyou National Forest. Although approximately 95,500 acres (45,000 acres in four LSRs) of spotted owl NRF habitat was lost, there is still approximately 69,168 acres of suitable habitat remaining in these LSRs (Biological Opinion, log #1-15-03-F-511, 2003). It is unknown to what extent these sites will continue to be used by spotted owls. However, it has been determined that impacts from the Biscuit Fire would not be likely to preclude movement of spotted owls between the Coast and Cascades Provinces (BO, log #15-03-F-511, 2003).

The emergence of barred owls as invasive competitors, West Nile virus, and sudden oak death as new threats to spotted owls suggests an increase in risk to the species since 1990. These newly identified threats are poorly understood, are likely to be pervasive, and will be difficult to alleviate. However, this risk was not sufficient to change the status of the spotted owl (USFWS, 2004, p.55).

In summary, the rate of habitat loss is substantially reduced from recent trends, there is substantial in-growth and habitat recovery, and newly identified threats are unconnected to the proposed action. Therefore, even with 306 acres of suitable nesting, roosting, foraging habitat downgraded to dispersal, this project would not incrementally affect the stability of the northern spotted owl population in southwestern Oregon. Additionally, the West Fork Illinois project would have relatively minor effects to species persistence in the watershed. Cumulatively, this project combined with other actions in the watershed would not contribute to the need to federally list any Bureau sensitive or assessment wildlife species.

3.2.6 Resource: Cultural (EA p. 61)

Cumulative Effects

Cumulative effects include increased protection of cultural sites on federal lands, including protection from fire. These sites are important, as they are often the last remnants of history and prehistory within

the area, due to the lack of protection of sites on private lands. These projects also have components which will help interpret, where applicable, the unique history and prehistory of the Illinois Valley.

3.2.7 Resource: Fire and Fuels (EA p. 62)

In response to comments received during the formal comment period for the West Fork Illinois EA, it is important to clarify how forest stand thinning affects fire hazard. Stands would be thinned to varying degrees opening tree canopies, reducing crown bulk densities and increasing crown base height. An increase in solar radiation on the forest floor may increase surface temperatures, decrease fine fuel moisture, decrease relative humidity, and increase surface wind speeds compared to untreated stands, thus increasing fire hazard if surface fuels are left untreated. The Sierra Nevada Ecosystem Project Report (1996) addressed the effects of timber harvest, primarily clear cuts, on fire hazard (p.4): "Timber harvest, through its effects on forest structure, local microclimate, and fuel accumulation, has increased fire severity more than any other human activity if not accompanied by adequate reduction of the fuels." Past timber harvest activities often did not include the treatment of fuels generated by logging. Past timber harvest practices typically included clear cut prescriptions, which removed all overstory vegetation and dramatically changed forest structure and microclimates. The West Fork Illinois River project does not propose any clear cutting. Furthermore, treating activity fuels would reduce the potential for high severity, high intensity fire in the project area and across the watershed.

Studies by Pollet and Omi (2000), Moore et al (1955) Van Wagner (1968), and Omi et al (2002) provide strong evidence of fuel treatment efficacy. It is expected that extreme fire behavior would be moderated in treated stands and over story mortality reduced by as much as 60% compared to untreated stands. Fires starting in untreated stands on BLM land would adversely affect adjacent private lands due to the potential that crown fire would move from BLM to private lands. Conversely, fires originating on private lands would adversely affect BLM lands as crown fire move across land ownerships. Even with past and anticipated treatments, the potential for high severity fire remains very high across the watershed. Cumulative effects for the alternatives are discussed in the EA (p.68).

3.2.8 Resource: Visual Resource Management / Recreation (EA p. 69)

Cumulative Effects

VRM: Cumulative effects of projects in the West Fork of the Illinois River watershed on visuals would be negligible, due to the fact that neither the project nor the watershed is highly visible from Highway 199. Changes would not dominate the view of the casual observer. Comparable harvest prescriptions and PDFs on recent forest management/commercial thinning projects in the Grants Pass Resource Area have gone largely un-noticed by the general public (e.g., Round Bull along Hwy 199, Stratton Hog along the Rogue River, and Savage Green along Interstate 5).

Recreation: Cumulative effects of projects in the West Fork of the Illinois River watershed on recreation activities may include increased unauthorized OHV use in low elevation, easily accessible units, once those units are opened up after vegetation treatments have occurred. Designating roads and trails for OHV use should reduce unauthorized use to minimal levels.

3.2.9 Effects of Action Alternatives on the Nominated ACEC Key Values

(New section - insert in EA p. 69)

3.2.9.1 Soils / Water

The action alternatives would not diminish the unique geology or soil chemistry in the nominated Waldo-Takilma ACEC. There would be no skid trails or roads developed on soils units meeting relevance and importance criteria included in the ACEC nomination. PDFs reducing impacts to slope stability and surface erosion (EA pp.18-19) would protect fragile soils across the project area. Thus, the important soil values providing habitat for a highly diverse plant assemblage would be maintained.

3.2.9.2 Historical / Cultural

The action alternatives would not diminish the unique cultural resources within the nominated Waldo-Takilma ACEC. The sites would be buffered from damaging activities. The action alternatives would benefit some cultural sites by reducing the fuel hazard around the sites.

3.2.9.3 Botanical

The action alternatives would not diminish botanical values in the nominated ACEC. PDFs would ensure that a mosaic of plant communities continue to protect the exceptional biological diversity of the area. The proposed actions would not reduce or degrade habitat for the variety of rare, S&M and SS plant species in the nominated ACEC.

Populations would not be impacted by the action alternatives because they would be buffered. Most of the rare, S&M and SS plant species in the nominated ACEC are found in serpentine savannah communities. These communities would benefit from habitat restoration burning.

Alternative 1 (no action) may result in a reduced populations of certain species (e.g., *Erythronium howellii)* that require edge conditions and canopy openings due to shrub and tree encroachment resulting from fire suppression and the lack of thinning.

3.2.10 Logging Activity Impacts to Residents

Noise related to helicopter logging proposed under alternatives 2 and 3 would impact residents living near or adjacent to proposed helicopter units and landings. These impacts would occur during daylight operating hours. The number of passes to and from a helicopter landing could range from two to 150 or more passes per day. Previous experience indicates that rural interface residents are most affected in the early morning and evening, but noise may be audible most of the day depending on how close residences are to flight paths and the noise blocking or enhancing effect of local topography.

Restrictions such as limitations on operational times or days reduce but do not eliminate helicopter noise. In general, helicopters would operate at any time during daylight hours. Flight operations can be greatly influenced by weather conditions and FAA rules such as pilot work/rest requirements. It is not uncommon for a helicopter to be grounded by low clouds or wind for hours or days at a time.

Noise is greatest when the helicopter operates within 500 feet residences. For Alternative 2 in T41S, R9W there would be approximately twelve days of operational noise for numerous residences within 500 feet of helicopter units. For most of these residences, the duration of helicopter operations within 500 feet will be short (a day or two?) as the current logging site shifts away from those residences. For Alternative 3, operational noise days are reduced by half (approximately six days). For Alternatives 2 and 3 in T40S, R8W it there would be approximately 15 days (spread over three locations) of operational noise for

residences within one half mile of helicopter units. Noise days could be reduced by a third due to no treatment buffers.

Other logging associated effects on residents or forest visitors include chainsaw noise, dust, and log truck traffic. Chain saw noise has different properties and duration than helicopters but the possible effects on people are similar to those described for helicopters. Chainsaw noise would be dispersed and of short duration so restrictions are not deemed necessary. Dust from log trucks would be mitigated by watering, lignin, and/or speed reductions. Log truck traffic on publicly owned roads would follow all laws, regulations, and speed limits, and special measures would be implemented as needed during special times of the day such as school bus pick-ups and drop-offs.

Appendix B: Proposed Vegetation Treatments

Table B-1: Summary Description of the Proposed Action -Alternative 2

T-R-S-OI#	Project Unit #	Land Alloc	TPCC	Unit Acres	Seral Stage Current	Seral Stage Post	Plant Series	Vegetation Treatment	Fuels Treatment-Understory Treatment	Logging System	Estimated Total Unit Vol	Estimated Harvest Volumes (MBF) Matrix Acres	Matrix Vol/ Acre	Riparian Acres	Riparian Vol\ Acre	Total Unit	Non Harvest Treatment Acres Matrix	Non Harvest Treatment Acres Riparian	Comments
40-8-9-001	9-1	Matrix/ Riparian	RTR	14	Mature	Mature	TO	CT/MGS	UT / UB / MM	T	972	9	10	5	7	125			
40-8-9-002	9-2	Matrix/ Riparian	NW	36	Mature	Mature	DF	None	None										
40-8-9-003	9-3	Matrix/ Riparian	RTR	68	Early/ Mature	Early/ Mature	TO/DF /WO	CT/MGS	UT / HP / UB / MM	T	1360	*17*	*5*	*34*	*2*	*162*			
40-8-9-004	9-4	Matrix/ Riparian	RTR	28	Early	Early	TO	Young Stand Mgt	SL / HP / MM								25	3	
40-8-9-005	9-5	Matrix/ Riparian	RTR	42	Early	Early	TO	Young Stand Mgt	SL / HP / MM								34	8	
40-8-9-006	9-6	Matrix/ Riparian	RTR	6	Mature	Mature	DF	None	None										
40-8-9-007	9-7	Matrix/ Riparian	RMR	37	Early	Early	TO	Young Stand Mgt	SL / HP / MM								36	1	
40-8-9-009	9-9	Matrix/ Riparian	RTR	11	Mature	Mature	DF	None	None										
40-8-9-010	9-10	Matrix/ Riparian	RTR	44	Mature	Mature	TO	CT/MGS	UT / UB / HP / MM	T	1390	*32*	*5*	*16*	*5*	*234*			
40-8-9-011	9-11	Matrix/ Riparian	RTR	14	Mature	Mature	TO	None	None										
40-8-9-012	9-12	Matrix	RTR	32	Mature	Mature	DF	Fuel Haz Reduction	SL / UB / HP / MM								32		
40-8-9-013	9-13	Matrix/ Riparian	RTR	13	Mature	Mature	DF	None	None										
40-8-20-001	20-1	Matrix/ Riparian	RTR	41	Mature	Mature	DF	CT/MGS	UT / HP / UB	T/H	1258	36	8	5	4	308			
40-8-20-002	20-2	Matrix	LSW	18			NF	None	None										
40-8-21-001	21-1	Matrix/ Riparian	RTR	33	Mature	Mature	DF	CT/MGS	UT / HP / UB	T/H	510	28	5	5	3	155			
40-8-21-002	21-2	Matrix/ Riparian	LSW	55			JP/ WO	Wildlife Hab Rest	SL / HP / UB								42	13	
40-8-21-003	21-3	Matrix/ Riparian	RTR	83	Mature	Mature	TO	CT/MGS	UT / HP / UB	T	2905	*65*	*8*	*5*	5	*540*			
40-8-21-004	21-4	Matrix/ Riparian	LSW	7			WO	Wildlife Hab Rest	SL / HP / UB								7	0	
40-8-27-005	27-5	Matrix/ Riparian	RTW	1	Mature	Mature	DF	None	None										

Table B-1: Summary Description of the Proposed Action -Alternative 2 (cont'd)

T-R-S-OI#	Project Unit #	Land Alloc	TPCC	Unit Acres	Seral Stage Current	Seral Stage Post	Plant Series	Vegetation Treatment	Fuels Treatment-Understory Treatment	Logging System	Estimated Total Unit Vol	Estimated Harvest Volumes (MBF) Matrix Acres	Matrix Vol/ Acre	Riparian Acres	Riparian Vol\ Acre	Total Unit	Non Harvest Treatment Acres Matrix	Non Harvest Treatment Acres Riparian	Comments
40-8-27-006	27-6	Matrix	RTR	2	Mature	Mature	DF	CT/MGS	UT / HP / UB	T/C	100	2	10			20			
40-8-28-001	28-1	Matrix/ Riparian	LSW	208			JP/ WO	Wildlife Hab Rest	SL / HP/ UB / MM								171	37	
40-8-28-002	28-2	Matrix/ Riparian	RTR/ RMR	11	Mature	Mature	TO	CT/MGS	UT / UB / HP / MM	T	210	11	10	1	5	115			
40-8-28-003	28-3	Matrix	NR	23			JP	Wildlife Hab Rest	MM / UB								23	0	
40-8-28-004	28-4A	Matrix	RTR	9	Mid/ Mature	Mid/ Mature	DF/TO	Fuel Haz Reduction	SL / UB / HP								9	0	Waldo and Chinese Cemeteries
40-8-28-004	28-4B	Matrix	RTR	10	Mid/ Mature	Mid/ Mature	DF/TO	CT/MGS	UT / HP / UB / MM	T	300	10	7			70			
40-8-28-005	28-5	Matrix/ Riparian	NR	29			JP	Wildlife Hab Rest	SL / HP / UB / MM								13	16	
40-8-28-006	28-6	Matrix/ Riparian	RMR	44	Mid/ Mature	Mid/ Mature	TO	CT/MGS	UT / HP / UB / MM	T	1334	*24*	7	*2*	*1*	*162*			
40-8-28-007	28-7	Matrix	RMR/ RTR	21	Mature	Mature	DF	CT/MGS	UT / HP / UB / MM	T/C/H	1150	21	10			210			
40-8-32-001	32-1	Matrix/ Riparian	RTR/ RMR	35	Mature	Mature	TO	CT/MGS	UT / HP / UB	T/C/H	825	32	8	3	4	268			
40-8-32-002	32-2	Matrix/ Riparian	LSW	6			G/S	Fuel Haz Reduction	SL / HP / UB								6	0	
40-8-33-001	33-1	Matrix/ Riparian	RTR	19	Mature	Mature	DF	CT/MGS	UT / HP / UB	T/C/H	208	17	6	2	4	110			
40-8-33-002	33-2A	Matrix	LSW	33			JP	Wildlife Hab Rest	BB / MM								33	0	
40-8-33-002	33-2B	Matrix/ Riparian	LSW	234			JP	Wildlife Hab Rest	BB / MM								194	40	
40-8-33-003	33-3	Matrix/ Riparian	RMR	15	Mid/ Mature	Mid/ Mature	TO	CT/MGS	UT / HP / UB / MM	T/C	435	9	10	6	5	120			
40-8-33-004	33-4	Matrix	RMR	7			TO/DF	Fuel Haz Reduction	UB								7	0	
40-8-33-007	33-7C	Matrix	RMR	4			JP	Wildlife Hab Rest	BB / MM								4	0	
41-9-2-001	2-1	Matrix/ Riparian	RMR	10	Mature	Mature	DF/TO	CT/MGS	UT / HP	H	216	9	6	1	3	57			

Table B-1: Summary Description of the Proposed Action -Alternative 2 (cont'd)

T-R-S-OI#	Project Unit #	Land Alloc	TPCC	Unit Acres	Seral Stage Current	Seral Stage Post	Plant Series	Vegetation Treatment	Fuels Treatment-Understory Treatment	Logging System	Estimated Total Unit Vol	Estimated Harvest Volumes (MBF) Matrix Acres	Matrix Vol/ Acre	Riparian Acres	Riparian Vol\ Acre	Total Unit	Non Harvest Treatment Acres Matrix	Non Harvest Treatment Acres Riparian	Comments
41-9-2-002	2-2	Matrix/ Riparian	RTR	23	Early/ Mid	Early/ Mid	DF	Fuel Haz Reduction	SL / HP								19	4	
41-9-2-003	2-3	Matrix/ Riparian	RTR	26	Mid/ Mature	Mid/ Mature	DF/TO	CT/MGS	UT / HP	H	200	24	6	2	3	150			
41-9-2-004	2-4	Matrix	RTW	20			G/S	Fuel Haz Reduction	HP / SL / UB								20	0	
41-9-3-001	3-1A	Matrix/ Riparian	LSW	157			JP	Wildlife Hab Rest	SL / HP / UB								67	90	POC Roadside Sanitation
41-9-3-001	3-1B	Matrix/ Riparian	LSW	23			JP	Wildlife Hab Rest	SL / UB / HP								15	8	POC Roadside Sanitation
41-9-3-002	3-2	Matrix	RTR	18			TO/DF	Fuel Haz Reduction	SL / HP								18	0	
41-9-9-001	9-1A	Matrix/ Riparian	LSW	22			JP	Wildlife Hab Rest	SL / HP / UB								2	20	POC Roadside Sanitation\Potential RNA
41-9-9-001	9-1B	Matrix/ Riparian	LSW	609			JP	Wildlife Hab Rest	SL / UB / HP								493	116	POC Roadside Sanitation\Potential RNA
41-9-10-001	10-1	Matrix/ Riparian	RMR/ RTR	31	Mature	Mature	TO	CT/MGS	UT / UB / HP	C/H	825	25	8	6	4	224			
41-9-10-002	10-2	Matrix/ Riparian	RTW	7			TO/DF	Fuel Haz Reduction	SL / UB / HP								0	7	
41-9-10-003	10-3A	Matrix/ Riparian	RTR/ RMR	68	Early/ Mid	Early/ Mid	TO	Fuel Haz Reduction	SL / HP / UB								31	37	
41-9-10-003	10-3B	Matrix/ Riparian	RMR/ RTR	68	Early/ Mature	Early/ Mature	TO	CT/MGS	UT / UB / HP	T/H	1168	48	5	20	2	280			
41-9-10-004	10-4A	Matrix/ Riparian	LSW	61			JP	Wildlife Hab Rest	SL / UB / HP								58	3	
41-9-10-004	10-4B	Matrix/ Riparian	LSW	79			JP	Wildlife Hab Rest	SL / BB / HP								73	6	
41-9-10-005	10-5	Matrix	FNR	23			JP	Wildlife Hab Rest	SL / HP / UB								21	2	
41-9-10-006	10-6	Matrix	RTR	10	Early/ Mid	Early/ Mid	DF	Fuel Haz Reduction	SL / HP								10	0	
41-9-12-001	12-1	Matrix/ Riparian	RMR/ RTR	40	Mature	Mature	TO	CT/MGS	UT / HP / UB	T/C/H	1000	*19*	*9*	*o*	*0*	*173*			
41-9-13-001	13-1	Matrix/ Riparian	RMR/ RTR	40	Mature	Mature	TO	CT/MGS	UT / HP / UB	T/C/H	792	*35*	*8*	*0*	*0*	*299*			
41-9-14-001	14-1A	Matrix/ Riparian	RTR	11	Early/ Mid	Early/ Mid	TO	Fuel Haz Reduction	SL / UB / HP								10	1	

Table B-1: Summary Description of the Proposed Action -Alternative 2 (cont'd)

T-R-S-OI#	Project Unit #	Land Alloc	TPCC	Unit Acres	Seral Stage Current	Seral Stage Post	Plant Series	Vegetation Treatment	Fuels Treatment-Understory Treatment	Logging System	Estimated Total Unit Vol	Estimated Harvest Volumes (MBF) Matrix Acres	Matrix Vol/ Acre	Riparian Acres	Riparian Vol\ Acre	Total Unit	Non Harvest Treatment Acres Matrix	Non Harvest Treatment Acres Riparian	Comments
41-9-14-001	14-1B	Matrix/ Riparian	RTR	28	Mature	Mature	TO	CT/MGS	UT / HP / UB	H	280	24	3	4	1	76			
41-9-15-001	15-1	Matrix/ Riparian	RMR	30			TO/DF	Fuel Haz Reduction	SL / HP / UB								15	15	
41-9-15-002	15-2	Matrix/ Riparian	LSW	35			JP	Wildlife Hab Rest	SL / HP / UB								31	4	
41-9-15-003	15-3	Matrix/ Riparian	RTW	76			TO/DF	Fuel Haz Reduction	SL / HP / UB								47	29	
41-9-15-004	15-4	Matrix/ Riparian	FNR/ RTR	48	Early	Early	DF	Fuel Haz Reduction	SL / HP / UB								47	1	
41-9-15-005	15-5	Matrix/ Riparian	FNR/ RTR	17			TO/DF	None	None										
41-9-15-006	15-6	Matrix	FNR/ RTR	2			JP	Wildlife Hab Rest	SL / HP / UB								2	0	
Total											***2875***	***17438***		***497***		***117***	***3,856***		

Footnotes:

Project Unit #, OI#, Project unit number corresponds to BLM operations inventory number that represents an inventoried area of land / vegetation.

TPCC (Timber Productivity Capability Classification): RTR - regeneration restricted due to hot temperatures and low soil moisture; RMR- regeneration restricted due to low soil moisture. FNR-fragile nutrient restricted; LSW- low site withdrawn; RMW-restricted moisture withdrawn

Stand Seral Stage: **Early** - Vegetation is dominated by shrubs or conifers and hardwood trees in a seedling/ sapling size class (<5"DBH)

Mid - Vegetation is tree dominated. Trees at least small pole size (>4"DBH). Larger scattered trees may be present.

Mature - Forest has begun to differentiate into distinct canopy layers. Overstory dominant and codominant trees are conifers greater than 20" DBH; understory trees will be conifer-hardwood mix.

Plant Community - TO (Tanoak), DF (Douglas-fir), JP (Jeffery Pine), WO (White oak)

Treatment Descriptions - Harvest Treatments

1. **Silvicultural Prescription** CT - Commercial Thin (removal of commercial conifers from an even aged stand or patch to encourage growth of remaining trees), Mod GS – Modified Group Selection (harvest where a vigorous sugar or Ponderosa pine or non-tanoak hardwood is left and surrounding commercial and non-commercial conifers are removed), SR - Structural Retention (regeneration timber harvest conducted with the partial objective of opening a forest stand to the point where favored tree species will be reestablished), and SC - Stand Conversion (A process in which vegetation that currently dominates a site is removed and is replaced with a species that better meets timber management objectives).
2. **Harvest Acres** - These are gross acres and do not include buffers for plants, animals, etc. **Harvest acres vs. Unit acres:** The difference in these acreages is attributable to large variability within the unit, unit inclusions of riparian reserves, non-forest, etc.
3. **Understory / Fuels Treatments - UB** - underburn, **BB** - broadcast burn, **MM** – machine mastication, **HP** - hand piling of slash and subsequent burning of piles, **SL** - thinning / slashing of understory vegetation, **GR** – Girdling of trees up to 8"DBH.

Treatment Descriptions - Non-Harvest Treatments

Jeffrey Pine Restoration - Prescribed burning, usually broadcast burning. Certain habitats may include understory thinning or slashing of certain species up to 8"DBH and hand pile and burn.

POC (Port Orford Cedar) treatment - Includes treatments to prevent the spread of the pathogen *Phytophthora lateralis (Pl)* Port Orford cedar would be removed from along roads and from infested sites to slow down the spread of the pathogen into uninfected POC areas.

Riparian Restoration - Includes understory thinning of shrubs, hardwoods, and conifers up to 6"DBH, hand pile and burn. Certain areas may include planting or seeding of riparian vegetation, placement of large logs or other woody debris into the stream channel, and/or stream stabilization measures.

White Oak restoration - Includes understory thinning of small oaks and/or slashing of invading conifers up to 8" DBH hand pile and burn and/or underburning.

Young Stand Management - Includes treatments such as tree planting, brushing, precommercial thinning, pruning, understory thinning which thins shrubs, hardwoods and conifers up to 8"DBH (diameter breast height), hand piling and burning and/or underburning.

Wildlife Habitat Restoration – Restoration of plant communities to their natural range of conditions.

Fuel Hazard Reduction – Treatment of hazardous fuels using appropriate tools to reduce the threat of wildfire to communities and forest resources.

Logging systems - T-Tractor, He-Helicopter, C-Cable

Table B-2: Summary Description of the Proposed Action -Alternative 3

T-R-S-OI#	Project Unit #	Land Alloc	TPCC	Unit Acres	Seral Stage Current	Seral Stage Post	Plant Series	Vegetation Treatment	Fuels Treatment-Understory Treatment	Logging System	Estimated Total Unit Vol	Estimated Harvest Volumes (MBF) Matrix Acres	Matrix Vol/ Acre	Riparian Acres	Riparian Vol\ Acre	Total Unit	Non Harvest Treatment Acres Matrix	Non Harvest Treatment Acres Riparian	Comments
40-8-9-001	9-1	Matrix/ Riparian	RTR	14	Mature	Mature	TO	CT/MGS	UT / UB / HP / MM	T	972	9	10			90			
40-8-9-002	9-2	Matrix/ Riparian	NW	36	Mature	Mature	DF	None	None										
40-8-9-003	9-3	Matrix/ Riparian	RTR	68	Early/ Mature	Early/ Mature	TO/DF /WO	CT/MGS	UT / HP / UB	T	1360	*17*	5			*85*			
40-8-9-004	9-4	Matrix/ Riparian	RTR	28	Early	Early	TO	Young Stand Mgt	SL / HP / MM								25	0	
40-8-9-005	9-5	Matrix/ Riparian	RTR	42	Early	Early	TO	Young Stand Mgt	SL / HP								34	0	
40-8-9-006	9-6	Matrix/ Riparian	RTR	6	Mature	Mature	DF	None	None										
40-8-9-007	9-7	Matrix/ Riparian	RMR	37	Early	Early	TO	Young Stand Mgt	SL / HP								32	0	
40-8-9-009	9-9	Matrix/ Riparian	RTR	11	Mature	Mature	DF	None	None										
40-8-9-010	9-10	Matrix/ Riparian	RTR	44	Mature	Mature	TO	Fuel Haz Reduction	SL / HP / UB / MM										
40-8-9-011	9-11	Matrix/ Riparian	RTR	14	Mature	Mature	TO	None	None										
40-8-9-012	9-12	Matrix	RTR	32	Mature	Mature	DF	None	None										
40-8-9-013	9-13	Matrix/ Riparian	RTR	13	Mature	Mature	DF	None	None										
40-8-20-001	20-1	Matrix/ Riparian	RTR	41	Mature	Mature	DF	CT/MGS	UT / HP / UB	T/H	1258	36	8			288			
40-8-20-002	20-2	Matrix	LSW	18			NF	None	None										
40-8-21-001	21-1	Matrix/ Riparian	RTR	33	Mature	Mature	DF	None	None										
40-8-21-002	21-2	Matrix/ Riparian	LSW	55			JP/ WO	Wildlife Hab Rest	SL / UB								42	0	
40-8-21-003	21-3	Matrix/ Riparian	RTR	83	Mature	Mature	TO	CT/MGS	UT / UB	T	2905	*65*	*8*			*520*			
40-8-21-004	21-4	Matrix/ Riparian	LSW	7			WO	None	None										
40-8-27-005	27-5	Matrix/ Riparian	RTW	1	Mature	Mature	DF	None	None										

Table B-2: Summary Description of the Proposed Action -Alternative 3(cont'd)

T-R-S-QI#	Project Unit #	Land Alloc	TPCC	Unit Acres	Seral Stage Current	Seral Stage Post	Plant Series	Vegetation Treatment	Fuels Treatment-Understory Treatment	Logging System	Estimated Harvest Volumes (MBF) Estimated Total Unit Vol	Matrix Acres	Matrix Vol/ Acre	Riparian Acres	Riparian Vol\ Acre	Total Unit	Non Harvest Treatment Acres Matrix	Non Harvest Treatment Acres Riparian	Comments
40-8-27-006	27-6	Matrix	RTR	2	Mature	Mature	DF	CT/MGS	UT / HP / UB	T/C	100	2	10			20			
40-8-28-001	28-1	Matrix/ Riparian	LSW	208			JP/ WO	Wildlife Hab Rest	SL / HP / UB / MM								171	0	
40-8-28-002	28-2	Matrix/ Riparian	RTR/ RMR	11	Mature	Mature	TO	CT/MGS	SL / HP / UB / MM	T	210	11	10			110			
40-8-28-003	28-3	Matrix	NR	23			JP	None	None										
40-8-28-004	28-4A	Matrix	RTR	9	Mid/ Mature	Mid/ Mature	DF/TO	None	None										Waldo and Chinese Cemeteries
40-8-28-004	28-4B	Matrix	RTR	10	Mid/ Mature	Mid/ Mature	DF/TO	CT/MGS	UT / HP / UB / MM	T	300	10	7			70			
40-8-28-005	28-5	Matrix/ Riparian	NR	29			JP	Wildlife Hab Rest	SL / HP / UB / MM								13	0	
40-8-28-006	28-6	Matrix/ Riparian	RMR	44	Mid/ Mature	Mid/ Mature	TO	CT/MGS	UT / HP / UB / MM	T	1334	*24*	7			*186*			
40-8-28-007	28-7	Matrix	RMR/ RTR	21	Mature	Mature	DF	CT/MGS	UT / HP / UB / MM	T/C/H	1150	21	10			210			
40-8-32-001	32-1	Matrix/ Riparian	RTR/ RMR	35	Mature	Mature	TO	CT/MGS	UT / HP / UB / LS	T/C/H	825	32	8			256			
40-8-32-002	32-2	Matrix/ Riparian	LSW	6			G/S	None	None										
40-8-33-001	33-1	Matrix/ Riparian	RTR	19	Mature	Mature	DF	CT/MGS	UT / HP / UB	T/C/H	208	17	6			102			
40-8-33-002	33-2A	Matrix	LSW	33			JP	Wildlife Hab Rest	BB / MM								33	0	
40-8-33-002	33-2B	Matrix/ Riparian	LSW	234			JP	Wildlife Hab Rest	BB / MM								194	0	
40-8-33-003	33-3	Matrix/ Riparian	RMR	15	Mid/ Mature	Mid/ Mature	TO	None	None										
40-8-33-004	33-4	Matrix	RMR	7			TO/DF	None	None										
40-8-33-007	33-7C	Matrix	RMR	4			JP	Wildlife Hab Rest	BB / MM								4	0	
41-9-2-001	2-1	Matrix/ Riparian	RMR	10	Mature	Mature	DF/TO	None	None										
41-9-2-002	2-2	Matrix/ Riparian	RTR	23	Early/ Mid	Early/ Mid	DF	None	None										

Table B-2: Summary Description of the Proposed Action -Alternative 3(cont'd)

T-R-S-OI#	Project Unit #	Land Alloc	TPCC	Unit Acres	Seral Stage Current	Seral Stage Post	Plant Series	Vegetation Treatment	Fuels Treatment-Understory Treatment	Logging System	Estimated Total Unit Vol	Estimated Harvest Volumes (MBF) Matrix Acres	Matrix Vol/ Acre	Riparian Acres	Riparian Vol\ Acre	Total Unit	Non Harvest Treatment Acres Matrix	Non Harvest Treatment Acres Riparian	Comments
41-9-2-003	2-3	Matrix/ Riparian	RTR	26	Mid/ Mature	Mid/ Mature	DF/TO	None	None										
41-9-2-004	2-4	Matrix	RTW	20			G/S	None	None										
41-9-3-001	3-1A	Matrix/ Riparian	LSW	157			JP	Wildlife Hab Rest	SL / HP / UB								67	0	POC Roadside Sanitation
41-9-3-001	3-1B	Matrix/ Riparian	LSW	23			JP	Wildlife Hab Rest	SL / UB / HP								15	8	POC Roadside Sanitation
41-9-3-002	3-2	Matrix	RTR	18			TO/DF	None	None										
41-9-9-001	9-1A	Matrix/ Riparian	LSW	22			JP	None	None										POC Roadside Sanitation\Potential RNA
41-9-9-001	9-1B	Matrix/ Riparian	LSW	609			JP	None	None										POC Roadside Sanitation\Potential RNA
41-9-10-001	10-1	Matrix/ Riparian	RMR/ RTR	31	Mature	Mature	TO	Fuel Haz Reduction	SL / HP								25	0	
41-9-10-002	10-2	Matrix/ Riparian	RTW	7			TO/DF	None	None										
41-9-10-003	10-3A	Matrix/ Riparian	RTR/ RMR	68	Early/ Mid	Early/ Mid	TO	Fuel Haz Reduction	SL / HP / UB								31	0	
41-9-10-003	10-3B	Matrix/ Riparian	RMR/ RTR	68	Early/ Mature	Early/ Mature	TO	CT/MGS	UT / UB / HP	T/H	1168	48	5			240			
41-9-10-004	10-4A	Matrix/ Riparian	LSW	61			JP	Wildlife Hab Rest	SL / UB / HP								58	0	
41-9-10-004	10-4B	Matrix/ Riparian	LSW	79			JP	None	None										
41-9-10-005	10-5	Matrix	FNR	23			JP	None	None										
41-9-10-006	10-6	Matrix	RTR	10	Early/ Mid	Early/ Mid	DF	Fuel Haz Reduction	SL / HP / LS								10	0	
41-9-12-001	12-1	Matrix/ Riparian	RMR/ RTR	40	Mature	Mature	TO	CT/MGS	UT / HP / UB	T/C/H	1000	*19*	*9*			*171*			
41-9-13-001	13-1	Matrix/ Riparian	RMR/ RTR	40	Mature	Mature	TO	CT/MGS	UT / HP / UB	T/C/H	792	*35*	*8*			*280*			
41-9-14-001	14-1A	Matrix/ Riparian	RTR	11	Early/ Mid	Early/ Mid	TO	Fuel Haz Reduction	SL / UB / HP								10	0	
41-9-14-001	14-1B	Matrix/ Riparian	RTR	28	Mature	Mature	TO	CT/MGS	UT / HP / UB / GR	H	200	24	3			72			

Table B-2: Summary Description of the Proposed Action -Alternative 3(cont'd)

T-R-S-OI#	Project Unit #	Land Alloc	TPCC	Unit Acres	Seral Stage Current	Seral Stage Post	Plant Series	Vegetation Treatment	Fuels Treatment-Understory Treatment	Logging System	Estimated Harvest Volumes (MBF) Total Unit Vol	Matrix Acres	Matrix Vol/ Acre	Riparian Acres	Riparian Vol\ Acre	Total Unit	Non Harvest Treatment Acres Matrix	Non Harvest Treatment Acres Riparian	Comments
41-9-15-001	15-1	Matrix/ Riparian	RMR	30			TO/DF	None	None										
41-9-15-002	15-2	Matrix/ Riparian	LSW	35			JP	None	None										
41-9-15-003	15-3	Matrix/ Riparian	RTW	76			TO/DF	None	None										
41-9-15-004	15-4	Matrix/ Riparian	FNR/ RTR	48	Early	Early	DF	None	None										
41-9-15-005	15-5	Matrix/ Riparian	FNR/ RTR	17			TO/DF	None	None										
41-9-15-006	15-6	Matrix	FNR/ RTR	2			JP	None	None										
Grand Total				***2875***							***13782***	***370***				***2,700***			

Footnotes:

Project Unit #, OI#, Project unit number corresponds to BLM operations inventory number that represents an inventoried area of land / vegetation.

TPCC (Timber Productivity Capability Classification): RTR - regeneration restricted due to hot temperatures and low soil moisture; RMR- regeneration restricted due to low soil moisture. FNR-fragile nutrient restricted; LSW- low site withdrawn; RMW-restricted moisture withdrawn

Stand Seral Stage: **Early** - Vegetation is dominated by shrubs or conifers and hardwood trees in a seedling/ sapling size class (<5"DBH)

Mid - Vegetation is tree dominated. Trees at least small pole size (>4"DBH). Larger scattered trees may be present.

Mature - Forest has begun to differentiate into distinct canopy layers. Overstory dominant and codominant trees are conifers greater than 20" DBH; understory trees will be conifer-hardwood mix.

Plant Community - TO (Tanoak), DF (Douglas-fir), JP (Jeffery Pine), WO (White oak)

Treatment Descriptions - Harvest Treatments

1. **Silvicultural Prescription** CT - Commercial Thin (removal of commercial conifers from an even aged stand or patch to encourage growth of remaining trees), Mod GS – Modified Group Selection (harvest where a vigorous sugar or Ponderosa pine or non-tanoak hardwood is left and surrounding commercial and non-commercial conifers are removed), SR - Structural Retention (regeneration timber harvest conducted with the partial objective of opening a forest stand to the point where favored tree species will be reestablished), and SC - Stand Conversion (A process in which vegetation that currently dominates a site is removed and is replaced with a species that better meets timber management objectives).
2. **Harvest Acres** - These are gross acres and do not include buffers for plants, animals, etc. **Harvest acres vs. Unit acres:** The difference in these acreages is attributable to large variability within the unit, unit inclusions of riparian reserves, non-forest, etc.
3. **Understory / Fuels Treatments - UB** - underburn, **BB** - broadcast burn, **MM** - Machine mastication, **HP** - hand piling of slash and subsequent burning of piles, **SL** - thinning / slashing of understory vegetation, **GR** – Girdling of trees up to 8"DBH.

Treatment Descriptions - Non-Harvest Treatments

Jeffrey Pine Restoration - Prescribed burning, usually broadcast burning. Certain habitats may include understory thinning or slashing of certain species up to 8"DBH and hand pile and burn.

POC (Port Orford Cedar) treatment - Includes treatments to prevent the spread of the pathogen *Phytophthora lateralis (Pl)* Port Orford cedar would be removed from along roads and from infested sites to slow down the spread of the pathogen into uninfected POC areas.

Riparian Restoration - Includes understory thinning of shrubs, hardwoods, and conifers up to 6"DBH, hand pile and burn. Certain areas may include planting or seeding of riparian vegetation, placement of large logs or other woody debris into the stream channel, and/or stream stabilization measures.

White Oak restoration - Includes understory thinning of small oaks and/or slashing of invading conifers up to 8"DBH, hand pile and burn and/or underburning.

Young Stand Management - Includes treatments such as tree planting, brushing, precommercial thinning, pruning, understory thinning which thins shrubs, hardwoods and conifers up to 8"DBH (diameter breast height), hand piling and burning and/or underburning.

Wildlife Habitat Restoration – Restoration of plant communities to their natural range of conditions.

Fuel Hazard Reduction – Treatment of hazardous fuels using appropriate tools to reduce the threat of wildfire to communities and forest resources. Logging systems - T-Tractor, He-Helicopter, C-Cable

Appendix C: Proposed Road Treatments

Table C-1.1: Proposed Road Use, Construction, Renovation, Improvement, Maintenance							
Road Number/ Road Seg.	Road Control	Total Length (miles)	Current Condition/ Surface type	Miles of Proposed Treatment:			COMMENTS
				Main-tenance	Construc.	Renovation	
FS 4402	USFS	4.5	ASC	4.5			USFS road, maintain in existing condition
FS 4803	USFS	1.70	ASC	1.70			USFS road, maintain in existing condition
40-8-4A	BLM	1.23	GRR	1.23			Blade, repair drainage, brush, spot rock as needed
40-8-4B	BLM	1.40	NAT	1.40			Blade, repair drainage, brush, spot rock as needed
40-8-9	BLM	0.4	NAT	0.4		0.4	Blade, repair drainage, brush, spot rock as needed
40-8-9.1	BLM	0.3	NAT	0.3		0.3	Blade, brush, spot rock as needed
40-8-21	BLM	0.24	NAT	0.24		0	Blade, repair drainage, spot rock as needed
40-8-28A	BLM	0.34	NAT	0.34		0	Blade, repair drainage, brush, spot rock as needed.
40-8-28B	BLM	0.7	NAT	0.7		0	Blade, repair drainage, brush, spot rock as needed
40-8-28.1	BLM	0.45	NAT	0.45		0	Blade, repair drainage, brush, spot rock as needed
40-8-28.2A	BLM	0.20	NAT	0.20		0.20	Blade, repair drainage, brush, spot rock as needed
40-8-28.2C	BLM	0.75	NAT	0.75		0.75	Renovate, blade, repair drainage, spot rock as needed, install 4 culverts 18"x32', install gate or block road after timber sale
40-8-28.2D	Private	0.65	NAT	0.65		0.65	Renovate, blade, repair drainage, spot rock as needed
40-8-28.3A	BLM	0.1	NAT	0.1		0.1	Renovate, blade, repair drainage, spot rock as needed
40-8-28.3B	Private	0.25	NAT	0.25		0.25	Renovate, blade, repair drainage, spot rock as needed. Requires road easement across private land
40-8-28.3C	BLM	0.20	NAT	0.20		0.20	Renovate, blade, repair drainage, spot rock as needed
40-8-33	BLM	0.2	NAT	0.2		0.2	Reconstruct road, outslope, brush, install drainage dips and culverts, spot rock as needed
40-8-27A	BLM	0.2	NAT	0.2		0	Blade, repair drainage, brush, spot rock as needed
41-9-2	Private	0.20	NAT	0.20		0	Blade, repair drainage, brush, spot rock as needed
41-9-14.1	Private	3.10	NAT	3.10		0	Blade, repair drainage, brush, spot rock as needed
41-9-14	Private	0.50	NAT	0.50		0	Blade, repair drainage, brush, spot rock as needed
41-9-13	Private	1.9	NAT	1.9		0	Blade, repair drainage, brush, spot rock as needed
41-9-9A	BLM	0.40	NAT	0.4		0.4	Install gate, replace log culvert and surface over crossings.
41-9-12B	BLM	0.35	NAT		0.35	0	New road (approx. 28 mbf)
41-9-12A	Private	0.10	NAT		0.10	0	New road on private land
41-9-12.1	BLM	0.10	NAT		0.10	0	New road
41-9-13.1B	BLM	0.35	NAT		0.35	0	New road (approx. 65mbf)
41-9-13.1A	Private	0.10	NAT		0.1	0	New road on private land (approx. 8 mbf)
Sec 41-9-12 Op. Spurs	BLM	0.13	NAT		0.13	0	New operator spur; decommission following use.
Sec 41-9-13 Op. Spur	BLM	0.20	NAT		0.20	0	New operator spur; decommission following use.
Sec 40-8-28 Op. Spur	BLM	0.44	NAT		0.1	0.43	Reconstruct existing spur; barricade following use.
				19.91	1.43	3.88	

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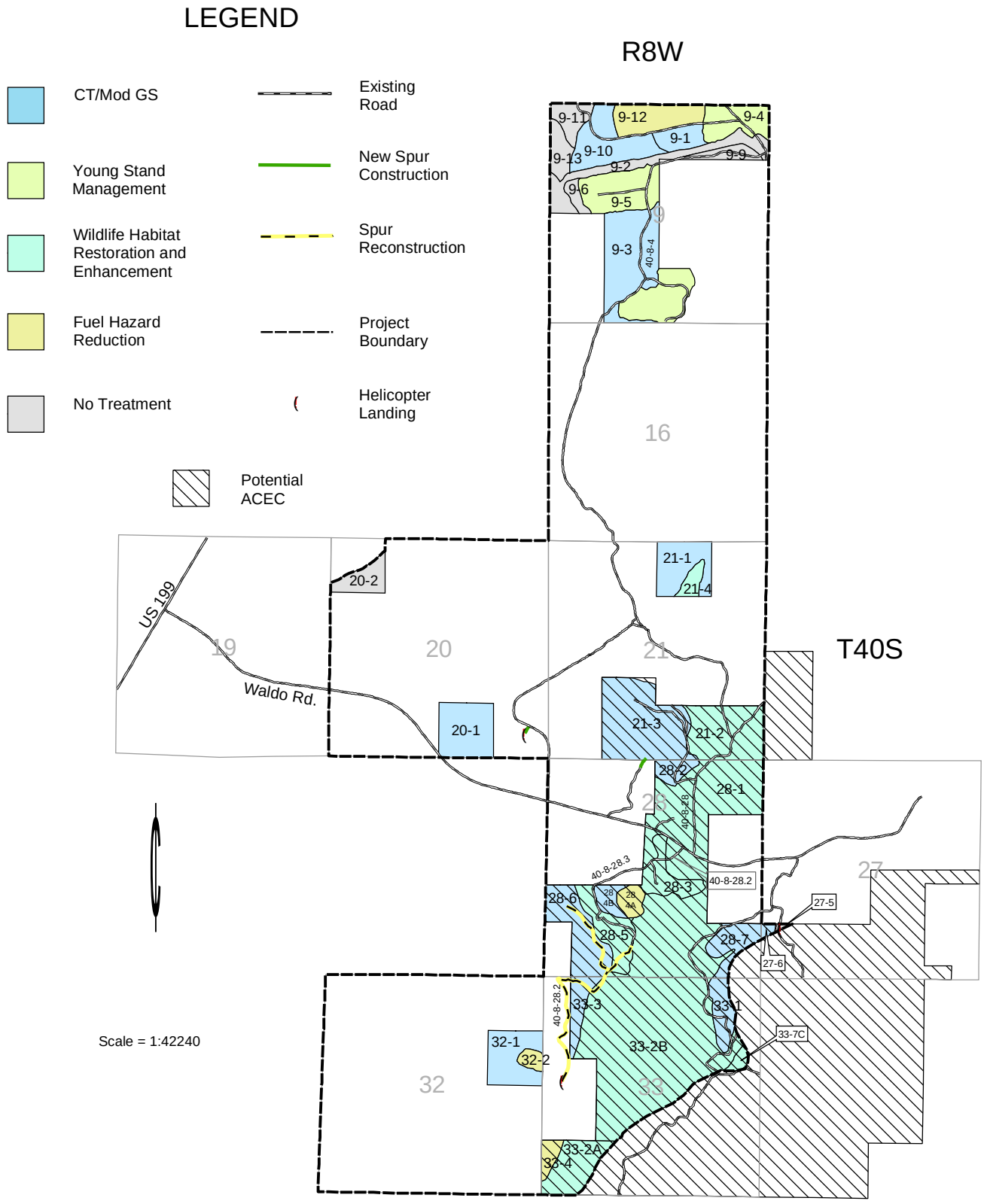
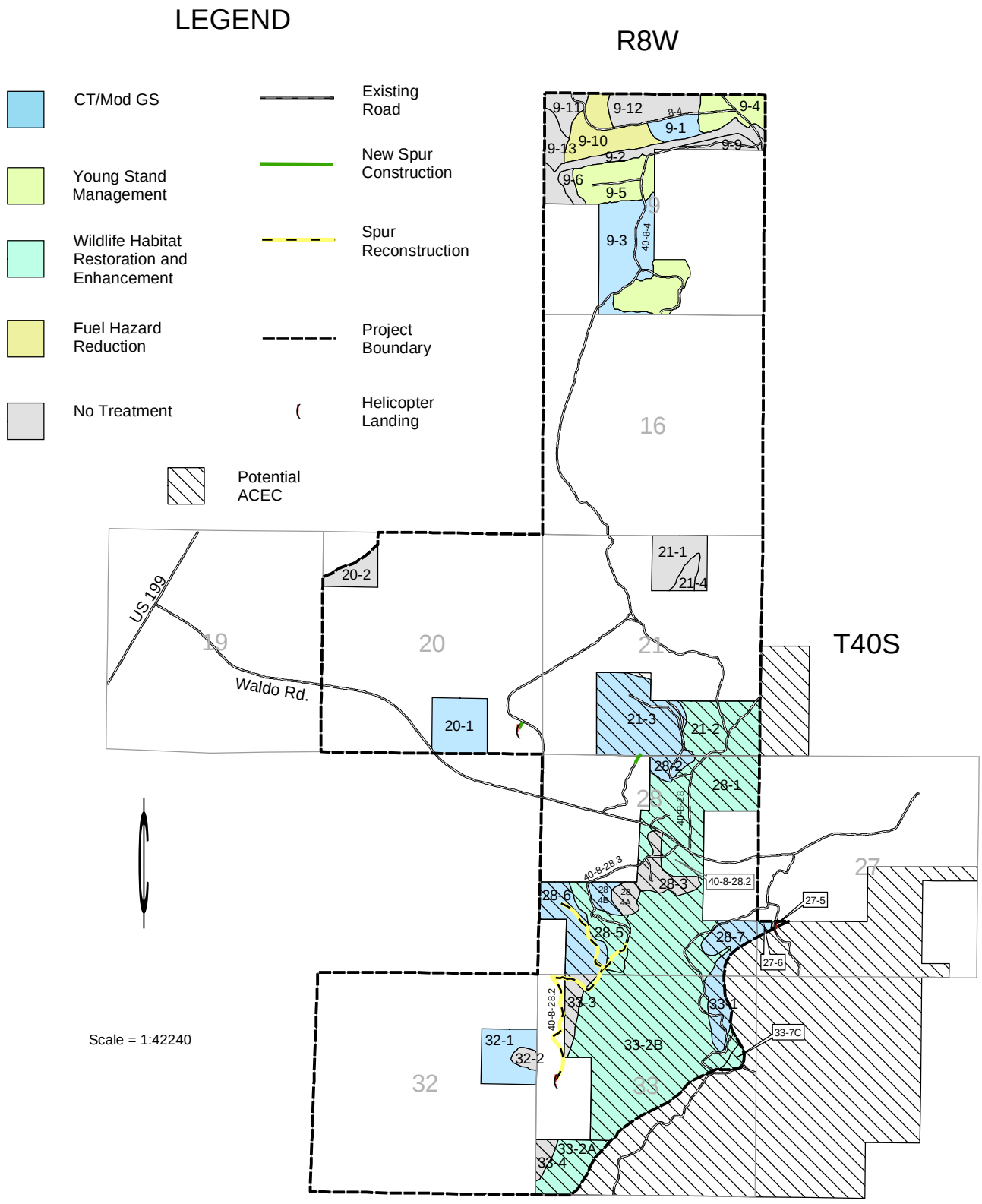


West Fork Illinois River Landscape Management Project
Map 2a - Alternative 2
Addendum

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

John McGlothlin

February, 2005



West Fork Illinois River Landscape Management Project
Map 3a - Alternative 3
Addendum

John McGlothlin

February, 2005