

Appendix E - Best Management Practices (BMPs)

Timber Harvest BMPs

1-1: Timber sale planning process. The objective of Practice 1-1 is to incorporate soil quality considerations into the timber sale planning process. This BMP is addressed by the ID Team for the Porcupine Project by including a soil scientist. This report documents soils considerations as identified by the resource specialists, Porcupine ID Team, and public scoping.

1-2: Timber harvest unit design. The objective of Practice 1-2 is to ensure that timber harvest unit design will avoid soil erosion by limiting harvest on slopes exceeding 30 percent.

1-3: Determination of surface erosion hazard for timber harvest unit design. The objective of Practice 1-3 is to identify high erosion hazard areas in order to adjust treatment measures to prevent downstream water quality degradation. The erosion hazard for soils in the Porcupine Project Area was assessed by a soil scientist using the Soil Survey of the Shasta-Trinity Forest Area, California. This survey is used to determine the soil mapping unit for each of the proposed management areas. The interpretations listed in the soil map unit description include an assessment of the Erosion Hazard Rating (EHR). This rating was checked and field verified using the USDA Forest Service Soil and Water Conservation Handbook (FSH 2509.22), Computation of Erosion Hazard Rating (2/90) during site visits to each potential treatment zone.

1-5: Limiting the operating period (LOP) of timber sale activities. The objective of Practice 1-5 is to ensure that the purchasers conduct their operations, including erosion control work and road maintenance in a timely manner and within the timeframe specified in the timber sale contract. The extent of the wet weather and snowmelt season in Northern California can be very unpredictable, therefore a fixed LOP for wet weather conditions will not be set for any of the proposed actions described in the Environmental Assessment. Timber sale contract provisions can be used to close down operations because of wet weather, high water, or other considerations in order to protect resources. The spring snowmelt period (April-May) is the time when the potential for erosion impacts are greatest. The sale administrator will be responsible for ensuring that timber harvest activities will not degrade the soil and water resource.

1-9: Determining tractor loggable ground. The objective of Practice 1-9 is to minimize erosion and sedimentation resulting from ground disturbance of tractor logging systems. As a general guideline tractor logging should not occur on slopes greater than 35 percent. This objective was accomplished by ground verifying each unit for slope considerations during prescription development for the proposed action.

1-10: Tractor skidding design. The objective of Practice 1-10 is to design skidding patterns to best fit the terrain, the volume, velocity, concentration, and direction of runoff water in order to minimize erosion and sedimentation. As a general guideline, the skid trail network cannot exceed 15 percent of the area in each treatment unit. The sale administrator will accomplish this practice by reviewing and approving by agreement the skid trail design as provided by the purchaser.

1-12: Log landing location. The objective of Practice 1-12 is to locate new landings in such a way as to avoid watershed impacts and associated water quality degradation. This objective will be accomplished by following guidelines for proper landing locations as described on page 35 of Water

Quality Management for National Forest System Lands in California¹. All landings will be either designated in advance or approved by the sale administrator by agreement based on the guidelines. No landings will be located within Riparian Reserves.

1-13: Erosion prevention and control measures during timber sale operations. The objective of Practice 1-13 is to ensure that the purchaser's operations will be conducted reasonably to minimize soil erosion. Drainage and erosion control work on temporary roads, skid trails, and permanent roads should be kept current during harvest activities. Equipment shall not be operated when ground conditions are such that excessive damage will result. The timber sale administrator will implement this practice through regular site visits and inspections.

1-16: Log landing erosion control. The objective of Practice 1-16 is to reduce the impacts of erosion and subsequent sedimentation associated with log landings by use of mitigating measures. The timber sale administrator will implement this practice through regular site visits and inspections. No landings will occur in Riparian Reserves in the Porcupine Project Area.

1-17: Erosion control on skid trails. The objective of Practice 1-17 is to protect water quality by minimizing erosion and sedimentation derived from skid trails. Skid trail erosion control work should be kept current during implementation. Erosion control and drainage of skid trails should be complete prior shutting down operations due to wet weather. The timber sale administrator will implement this practice through regular site visits and inspections. No skid trails will occur within Riparian Reserves in the Porcupine Project Area.

1-21: Acceptance of timber sale erosion control measures before sale closure. The objective of Practice 1-21 is to ensure adequacy of the required erosion control work on timber sales. This practice will be implemented by the sale administrator. Prior to closure of the sale each unit will be inspected to ensure that skid trails and landings have been water-barred and/or properly drained.

Road and Building Site Construction BMPs

2-12: Servicing and refueling of equipment. The objective of Practice 2-12 is to prevent pollutants such as fuels, lubricants, and other harmful materials from being discharged into or near rivers, streams and impoundments, or into natural or man-made channels. This practice will be implemented by having the sale administrator designate the location, size and allowable uses of service and refueling areas.

2-22: Maintenance of roads. The objective of Practice 2-22 is to maintain roads in a manner which provides for water quality protection by minimizing rutting, failures, sidecasting and blockage of drainage facilities all of which can cause erosion and sedimentation, and deteriorating watershed conditions. This practice will be accomplished by the purchaser, sale administrator and transportation planner.

2-24: Traffic control during wet periods. The objective of Practice 2-22 is to reduce road surface disturbance and rutting of roads and to minimize sediment washing from disturbed road surfaces. This practice will be implemented by the sale administrator in conjunction with Practices 1-5, 1-13, 1-16 and 1-17. A soil scientist or hydrologist will assist in the determination of the need for wet weather restrictions as requested by the sale administrator.

¹ USDA Forest Service. 2002. Water quality management for National Forest System lands in California – Best Management Practices, Pacific Southwest Region, Vallejo, California

2-26: Obliteration or Decommissioning of Roads. The objective of Practice 2-26 is to reduce sediment generated from temporary roads, unneeded system (classified) and non-system (unclassified) roads by obliterating or decommissioning them at the completion of intended use. This practice will be implemented by specifying in the Timber Sale Contract that all temporary roads will be completely obliterated (ripped and blocked) following the completion of their intended use. Sale area improvement dollars may also be used to complete obliteration of temporary roads.

Vegetative Manipulation BMPs

5-2: Slope limitation for mechanical equipment operation. The objective of Practice 5-2 is to decrease sediment production and stream turbidity while mechanically treating slopes. As a general guideline, tractors should not be used on slopes exceeding 35 percent. The project planner accomplished this objective by ground verifying each unit for slope considerations and incorporating equipment needs into the prescription for each unit.

5-6: Soil moisture limitations for mechanical equipment operations. The objective of Practice 5-6 is to prevent compaction, rutting, and gullyng, with resultant sediment production and turbidity. The sale administrator will implement this practice by notifying the unit soil scientist if ground conditions appear to wet for operations. The soil scientist will ground verify soil moisture conditions in order to determine if operations can proceed.

Appendix F- Issue Management

Summary

The Porcupine Vegetation and Road Management Project was first listed in the Shasta-Trinity National Forest Schedule of Proposed Actions on July 1, 2006. A notice of opportunity to comment was published in the Mount Shasta Herald on April 25, 2007. Three letters requesting comment on the proposed actions were sent to individuals and organizations that expressed interest in the project on April 20, 2007. Responses were received from the following individuals and organizations:

- Rich Svilich, American Forest Resource Council, letter dated 5/1/07.
- Klamath-Siskiyou Wildlands Center, KFA, EPIC, undated letter received 5/24/07.

This was a consolidated letter from:

- Kimberly Baker, Klamath Forest Alliance
- George Sexton, Klamath Siskiyou Wildlands Center
- Scott Greacen, EPIC – Environmental Protection Information Center
- Robert Hoover, Sierra Pacific Industries, letter dated 5/23/07.

All comments were reviewed and considered for analysis.

Summary of Scoping Comments

Source	Comment	Resource Area	Grouping or Linking to Other Comments
AFRC	1: Timber sale economics	Econ.	SPI 2; Project feasibility
"	2 :Effectiveness of thinning treatments	Silv.	Stand treatments
"	3: Effectiveness of fuel treatments	Fuels, silv.	Stand treatments
"	4: Thinning guidelines	Silv.	Stand treatments
"	5: Diameter limits	Proj. mgmt.	KSW 1; Project mgmt.
"	6: Limited operating periods	All resources	Project feasibility
"	7: Protection of archaeological sites	Arch., proj. mgmt.	Project mgmt.
"	8: Road System	Trans.	Transportation system
KSW, KSA, EPIC	1: Alternative actions	Silv., fuels, proj. mgmt.	AFRC 5; Project mgmt.
"	2: LSR management	Wildlife, silv., fuels	Late Successional Reserve
"	3: Northern spotted owl habitat	Wildlife	Wildlife analysis
"	4: Goshawk habitat	Wildlife	Wildlife analysis
"	5: Pacific fisher habitat	Wildlife	Wildlife analysis
"	6: Willow flycatcher habitat	Wildlife	Wildlife analysis
"	7: Management indicator species	Wildlife	Wildlife analysis
"	8: Neotropical migratory birds	Wildlife	Wildlife analysis
"	9: Survey and Manage	Wildlife, Botany	Wildlife analysis
"	10: Sensitive plant and animal species	Wildlife, Botany	Botany analysis
"	11:BMPs and PDFs	All resources	Multi-resource analysis
"	12: Late-successional forest	Wildlife, silv	Late-successional forest
"	13: Coarse woody debris	Wildlife, soils	Coarse woody debris
"	14: Soils	Soils	Soils analysis
"	15: Aquatic Conservation Strategy	Silv, wildlife, proj. mgmt.	Multi-resource analysis
"	16: Noxious weeds	Botany	Non-native invasive species
"	17: Disclose Full Range of Responsible Opinion in Regard to Potential Fire Severity	Fuels; all resources	Fuels analysis
"	18: Logging creates dangerous fuel conditions	Fuels, proj. mgmt.	Fuels analysis
"	19: Plantations are Unnaturally combustible	Fuels, silv.	Fuels analysis
"	20: Effective hazardous fuels management starts small	Fuels	Fuels analysis
"	21: Mechanical thinning creates fire hazards	Fuels	Fuels analysis
"	22: Ecological effects of mechanical thinning	Silv, soils, hydro., wildlife	Multi-resource analysis
"	23: Tractor harvest and piling are significant impacts	Silv, soils, hydro, wildlife, econ.	Multi-resource analysis

Environmental Assessment

Source	Comment	Resource Area	Grouping or Linking to Other Comments
"	24: Roads	Soils, hydro., wildlife	Multi-resource analysis
"	25: Regeneration harvest	Fuels	Fuels analysis
"	26: Large trees calm fire behavior	Fuels	Fuels analysis
"	27: Be accurate in describing fire intensity	Fuels	Not applicable to project
SPI	1: Disclose post-treatment activities	Silv., fuels	Project management
"	2: Economic feasibility	Econ.	Project feasibility
"	3: Economic impact of historic railroad grade protection	Econ., arch.	Project feasibility
IDT	1: Northern spotted owl habitat	Wildlife	Wildlife analysis
"	2: Regeneration harvest of mature and overmature stands	Silv.	Project management
"	3: Project level RAP recommendations	Project mgmt, trans.	Project management

Sources: AFRC = American Forest Resource Council; KSW = Klamath Siskiyou Wildlands Center; KFA = Kalamath Forest Alliance; EPIC = Environmental Protection Information Center; SCI = Sierra Pacific Industries

Identification and Grouping of Issues

Comment	Source	Significant Issue?	Response
<p>Project Feasibility The environmental assessment should consider timber sale economics and use current market values. Excessive restrictions on the period of harvest operations negatively impact sale economics and the timely treatment of stands. Timber sale economics should be considered in the analysis.</p> <hr/> <p>The impact of protecting historic railroad grades on timber sale economics needs to be considered.</p>	<p>AFRC 1</p> <hr/> <p>AFRC 6</p> <hr/> <p>SPI 2</p> <hr/> <p>SPI 3</p>	<p>No</p>	<p>An economic evaluation of the alternatives will be included in the environmental assessment.</p> <p>Limited operating periods may be imposed on harvest operations in order to protect specific resources. Those resources to be protected and rational for the restriction will be disclosed in the analysis. The impacts of restrictions and protection measures on timber sale operations will be included in the economic analysis.</p> <p>Protection of historic railroad grades is required by law; however, protection is not expected to affect project timber sale economics. Impacts on timber sale operations will be disclosed in the economic analysis.</p>
<p>Stand Treatments The long-term effectiveness of thinning treatments should be displayed in the analysis. The long-term effectiveness of proposed fuel treatments should be displayed in the analysis. Stand density index (SDI) and basal area should be used to describe thinning treatments rather than crown closure.</p>	<p>AFRC 2</p> <hr/> <p>AFRC 3</p> <hr/> <p>AFRC 4</p>	<p>No</p>	<p>The long-term effectiveness of fuel and thinning treatments will be disclosed in the environmental assessment.</p> <p>The analysis will use stand density index (SDI) and basal area to describe stocking conditions.</p>
<p>Project Management Alternatives based on arbitrary diameter limits should not be considered. All archaeological issues should be resolved prior to completing the EA.</p>	<p>AFRC 5</p> <hr/> <p>AFRC 7</p>	<p>No</p>	<p>An alternative that utilizes diameter limits for tree removal will be discussed. A diameter limit would not meet stand treatment objectives.</p>

Comment	Source	Significant Issue?	Response
<p>The need for post treatment activities and the timing of the activities should be disclosed in the analysis.</p>	<p>SPI 1</p>		<p>The project area has been inventoried for heritage resources. Protection measures have been applied for all historic properties. The project decision will not be signed until the heritage resource report has been reviewed and approved by the Forest Archaeologist in consultation with the CA SHPO.</p> <p>All planned post-treatment activities and their timeframes will be disclosed in the environmental assessment.</p>
<p>The project area includes matrix lands with areas of commercial wood products emphasis. The purpose of this prescription is to obtain an optimum yield of wood fiber products from productive forest lands. Mature or overmature stands within these lands should be regenerated for optimum yield of wood fiber.</p>	<p>IDT</p>	<p>Yes</p>	<p>An alternative will be considered which includes additional regeneration harvest of mature and overmature stands within the matrix land allocation and areas commercial wood products emphasis</p>
<p>Project level RAP recommendations should be included in the project alternatives.</p>	<p>IDT</p>	<p>Yes</p>	<p>Project level RAP recommendations will be included in project alternatives.</p>
<p>An alternative to the proposed action should focus on the purpose and need of forest health and fire risk reduction rather than the production of commercial wood products. This alternative should preclude the harvest of large trees (12 inches in diameter and greater) and include no new road construction or road reconstruction.</p>	<p>KSWC, KFA, EPIC 1</p>	<p>Yes</p>	<p>An alternative that utilizes diameter limits for tree removal will be discussed. This alternative would not meet treatment objectives. The production of commercial wood products from project area stands is consistent with Forest Plan direction.</p>
<p>Road System The proposed action should include road construction and reconstruction to facilitate timber harvest.</p>	<p>AFRC 8</p>	<p>No</p>	<p>No new road construction is needed to facilitate harvest unit access. The existing system of roads provides adequate harvest access. The proposed action includes road reconstruction needed to facilitate safe the safe transport of forest products. The environmental assessment will display the road system necessary to provide harvest access, including roads to be reconstructed.</p>

Porcupine Vegetation Management Project

Comment	Source	Significant Issue?	Response
<p>Late-successional Reserves Any activities within the Late-Successional Reserve must have clear benefits and be justified in the EA.</p>	KSWC, KFA, EPIC 2	Yes	Existing LSR conditions have been documented in the <i>Shasta-Trinity National Forest Wide Late Successional Reserve Assessment</i> , 1999, Chapter 2 page 2-105. Proposed treatments are consistent with Forest Plan direction for LSR management. The environmental assessment will disclose LSR treatment effects and how well the proposed treatments achieve desired LSR conditions. The environmental assessment will include an alternative with no treatments within the LSR to provide a clear comparison of treatment effects across a range of management alternatives.
<p>Late-successional Forest All stands or areas of late-successional forest should be retained.</p>	KSWC, KFA, EPIC 12	No	The environmental assessment will disclose the effects of the proposed treatments on late-successional forest.
<p>Wildlife New information regarding the northern spotted owl is available. The EA must analyze and disclose the impacts of the proposed activities on the northern spotted owl and take into account all new information. ----- The impacts of the proposed action on goshawks should be included in the analysis. ----- The environmental assessment needs to address the impacts of the project on the Pacific fisher and reflect new information. ----- The environmental assessment must disclose impacts to the willow flycatcher. ----- The environmental assessment must disclose the effects of the proposed activities on neotropical migratory bird species. ----- The environmental assessment needs to analyze and disclose the potential impacts of the project on Management Indicator Assemblages. ----- A pair of northern spotted owls are roosting near the project area. ----- Project activities could disturb the pair.</p>	<p>KSWC, KFA, EPIC 3 ----- KSWC, KFA, EPIC 4 ----- KSWC, KFA, EPIC 5 ----- KSWC, KFA, EPIC 6 ----- KSWC, KFA, EPIC 8 ----- KSWC, KFA, EPIC 7 ----- IDT 1</p>	No	<p>The environmental assessment and supporting documents will disclose the effects of the proposed activities on species with habitat available in the project area: northern spotted owl, goshawks, Pacific fisher, and neotropical migratory birds, utilizing the applicable and recently available findings. The project area does not support suitable habitat for the willow flycatcher.</p> <p>The environmental assessment will disclose the findings of the MIA Report.</p> <p>Project design will include a limited operating period on selected units to provide protection to the northern spotted owl pair during critical periods.</p>

Comment	Source	Significant Issue?	Response
<p>Botany and Wildlife The environmental assessment must disclose the effects of the proposed activities on survey and manage species.</p>	KSWC, KFA, EPIC 9	No	The environmental assessment will disclose the effects of the proposed action and alternatives on survey and manage species. Any survey and manage species located within the project boundary would be avoided with an appropriate buffer during project implementation.
<p>The environmental assessment must disclose the impacts of the project on Regional Forester’s sensitive species.</p>	KSWC, KFA, EPIC 10		Surveys for sensitive plants were completed in spring and summer of 2006 and 2007. The impact of the project on sensitive species will be addressed in the botany and wildlife biological evaluations and disclosed in the environmental assessment.
<p>Non-native Invasive Species Proposed activities have the potential to introduce and spread noxious weeds. Generic mitigation measures from the Land and Resource Management Plan have not proven effective. Additional measures are necessary and the effectiveness of all measures to limit the introduction and spread of noxious weeds should be disclosed in the environmental assessment.</p>	KSWC, KFA, EPIC 16	No	A noxious weed risk assessment will be developed for this project as required by Forest Service Manual 2080 and will include mitigations to minimize the risk of introduction and spread of the CDFR listed noxious weeds. The environmental assessment will disclose the effects of the proposed activities on non-native invasive plant species. Mitigation measures and/or project design features to minimize the introduction and spread of non-native invasive plant species will be included and their effectiveness will be disclosed.
<p>Coarse Woody Debris The project needs to provide coarse woody debris to build soil and provide habitat.</p>	KSWC, KFA, EPIC 13	No	Provisions for retaining coarse woody debris have been incorporated into the proposed action.
<p>Soils Soil integrity needs to be addressed on a unit-by-unit basis.</p>	KSWC, KFA, EPIC 14	No	The impacts of the project on forest soils will be described in the soils report and disclosed in the environmental assessment.

Porcupine Vegetation Management Project

Comment	Source	Significant Issue?	Response
<p>Fuels The EA must inform the decision maker of the full range of responsible opinion on potential fire severity effects, including conclusions in the following paper: Odion, D.C., E.J. Frost, J.R. Strittholt, H. Jiang, D.A. DellaSala and M.A. Moritz. 2004. Patterns of fire severity and forest conditions in the western Klamath Mountains, California. Conservation Biology 18(4): 927-936”.</p>	KSWC, KFA, EPIC 17	No	The effects analysis for all resources will include a discussion of the full range of possible environmental effects. The findings in the Odion report have little relevance to this project because they are based on vegetation and topographic conditions that are not found in the project area. The comment does not provide any discussion that would link the study to the Porcupine Vegetation and Road Management Project.
<p>Logging will result in heavy accumulations of ground fuels.</p>	KSWC, KFA, EPIC 18	No	Project design will minimize fuel loading. The comment describes conditions that would not occur through implementation of the proposed action. The proposed action description will clearly display all fuel treatments. The environmental assessment will disclose the effects of the proposed activities on post-treatment fuel loading.
<p>Tree planting would establish even-aged plantations containing unnaturally combustible fuel complexes, further increasing fire severity and difficulty of control of the next fire.</p>	KSWC, KFA, EPIC 19	No	The proposed action does not include tree planting, however the regeneration of a lodgepole pine stand is planned. The environmental assessment will disclose the effects of regenerating an even-aged stand of lodgepole pine on fuels and fire severity.
<p>Effective fuels management needs to emphasize treating understory fuels.</p>	KSWC, KFA, EPIC 20	No	The discussion in the comment is generally consistent with the proposed treatments. There appears to be no debate or dispute about environmental effects from this comment.
<p>The EA needs to address the effects of reduced crown canopy on microclimate conditions within treated stands and the subsequent implications for fire suppression effectiveness and fire fighter safety.</p>	KSWC, KFA, EPIC 21	No	The EA will consider the net effect of changes to both fuel hazard and stand microclimate.
<p>Large-diameter, standing trees and down logs should be retained to mitigate potential fire risk and hazard.</p>	KSWC, KFA, EPIC 26	No	The environmental assessment will disclose the effects of the proposed activities on potential fire risk and hazard.
<p>General Resource Analysis The EA must disclose and analyze the likely impacts of the proposed activities and cumulative effects and not rely on vague PDFs and BMPs.</p>	KSWC, KFA, EPIC 11	No	The effectiveness of each PDF and BMP will be disclosed in the appropriate resource section of the EA. The EA will include a cumulative effects analysis for each resource

Comment	Source	Significant Issue?	Response
Proposed treatments within Riparian Reserves must meet ACS objectives. The environmental assessment must disclose how proposed treatments within Riparian Reserves meet the nine Aquatic Conservation Strategy Objectives.	KSWC, KFA, EPIC 15	No	The environmental assessment and any associated decisions will follow direction contained in the May 22, 2007 Memorandum regarding compliance with the Aquatic Conservation Strategy.
Mechanical thinning can adversely affect the environment.	KSWC, KFA, EPIC 22	No	The comment raises numerous concerns about the ecological effects of mechanical thinning. These concerns have been reviewed and all were determined to be items that will be addressed and the impacts disclosed in the EA.
The analysis must consider the effects of tractor yarding and tractor piling.	KSWC, KFA, EPIC 23	No	The effects of various ground-disturbing activities will be evaluated and disclosed in the effects analysis in the EA, including economic feasibility.
The analysis must consider the cumulative effects of all ground-based disturbance including road construction and tractor yarding/piling.	KSWC, KFA, EPIC 24	No	The effects of various ground-disturbing activities will be evaluated and disclosed in the environmental assessment.
No Issue The project proposes regeneration harvest on 40 acres. We are generally opposed to regeneration logging on national forests.	KSWC, KFA, EPIC 25		This is not an issue.
Not Relevant to the Project The environmental assessment should clearly describe the difference in salvage logging impacts on forests that have experienced fire of different severity; do not lump areas of moderate and severe fire intensity in the analysis.	KSWC, KFA, EPIC 27		This issue is not relevant to this project because there is no proposal for post-fire salvage harvest.

Sources: AFRC = American Forest Resource Council; KSW = Klamath Siskiyou Wildlands Center; KFA = Klamath Forest Alliance; EPIC = Environmental Protection Information Center; SPI = Sierra Pacific Industries

AFRC Comment #1 – Timber Sale Economics

Source: Rich Svlich, American Forest Resource Council, letter dated 5/1/07

Comment: “During your analysis seriously consider sale economics. Please assess the sale economics in your proposal and alternatives using the most current market values. Reduced volumes per acre can have significant impacts on the economics of any offering. Ponderosa pine is the primary species within this project and the current market for this species can be negatively affected with projects containing small volumes per acre, limited operating periods, and long haul distances.

We recommend the project team utilize the economic evaluation process developed for the Region by Steve Rheinberger and Gerald Smith. The analysis process is titled “*Region 5 Timber Sale Marketing Analysis and Sale Evaluation Study*.” Don Golnick from the Regional Office can provide the team with a copy if they don’t currently have one. This process was developed for the Region in order for project teams to have the ability to track economic viability for any project from initiation all the way through the prep and appraisal stages. It is kept up to date with current prices. There are three steps involved with this analysis, the first requiring basic information (not detailed) in order to identify the initial economic viability of a proposed action. This tool appears to have some valuable components especially when more detailed information is available. It allows team members to look at individual units and logging systems when assessing the economic viability of a project before it is prepared and offered for sell.” (AFRC letter, page 1)

Issue Statement: The environmental assessment should consider timber sale economics and use current market values.

Discussion: An economic evaluation of alternatives will be included in the environmental assessment.

The project planning team has acquired a copy of the “*Region 5 Timber Sale Marketing Analysis and Sale Evaluation Study*” and will consider its use in the economic evaluation of alternatives.

Disposition: An economic evaluation of alternatives will be included in the environmental assessment.

Resource Area: Economics

AFRC Comment #2 – Effectiveness of Thinning Treatments

Source: Rich Svlich, American Forest Resource Council, letter dated 5/1/07

Comment: “During your analysis display how long the thinning treatments will be effective and when additional treatments will be necessary in order to meet your forest health objectives.” (AFRC letter, page 2)

Issue Statement: The long-term effectiveness of thinning treatments should be displayed in the analysis.

Discussion: The Silvicultural Report prepared for projects on Matrix lands typically displays projected stand growth for the next 20 years, based on the expected reentry into stands. The report will describe expected growth and forest health conditions. This analysis will be included in the environmental assessment.

Disposition: The long-term effectiveness of thinning treatments will be analyzed in the silvicultural report and disclosed in the environmental assessment.

Resource Area: Silviculture

AFRC Comment #3 – Effectiveness of Fuel Treatments

Source: Rich Svilich, American Forest Resource Council, letter dated 5/1/07

Comment: “The proposed fuel treatments need to not only deal with ground related fuels but need to adequately address the aerial fuel issue as well. Crowns need to be spaced out enough in order to discourage wind driven crown fires and the treatments need to be effective for an established timeframe. The analysis should show how long the proposed fuel treatments, burning, fuelbreak construction, or commercial thinning will be effective for.” (AFRC letter, page 2)

Issue Statement: The long-term effectiveness of proposed fuel treatments should be displayed in the analysis.

Discussion: The Purpose and Need section of the EA will discuss the need to treat ground fuels, ladder fuels, and the crown canopy. The Fuels Report will include an analysis of the long-term effectiveness of proposed fuel treatments, including the effects of the “No Action” alternative. The Silviculturist Report for projects on Matrix lands typically displays projected stand growth for the next 20 years. These analyses will be included in the environmental assessment.

Disposition: The long-term effectiveness of fuels treatments will be analyzed in the environmental assessment.

Resource Area: Fuels, Silviculture

AFRC Comment #4 – Thinning Guidelines

Source: Rich Svlich, American Forest Resource Council, letter dated 5/1/07

Comment: “During your development and narration of proposed prescriptions please utilize SDI and basal area as your key descriptive components. These factors can easily be measured and displayed in terms of longevity of treatment effectiveness. Crown closure is more nebulous and difficult to identify and track on the ground.” (AFRC letter, page 2)

Issue Statement: Stand density index (SDI) and basal area should be used to describe thinning treatments rather than crown closure.

Discussion: Stand density index (SDI) and basal area are the methods being used to describe thinning treatments on the project. These methods can be applied effectively during implementation of the project and later during monitoring. These methods will be used to describe the long-term effectiveness of treatments in the environmental assessment. Crown canopy is difficult to measure and track but may be used to describe current and anticipated habitat conditions where crown canopy cover is an important attribute.

Disposition: The analysis will use stand density index (SDI) and basal area to describe stocking conditions.

Resource Area: Silviculture

AFRC Comment #5 – Diameter Limits

Source: Rich Svlich, American Forest Resource Council, letter dated 5/1/07

Comment: “We ask you not consider an alternative in detail that deals with diameter limits. This would be counterproductive to your employee’s time during the NEPA analysis. Diameter limits are arbitrary designations that do not have any silvicultural merit. They are counterproductive to meeting most of your identified purpose and need statements. AFRC does not and will not support diameter limits as they are not compatible with your current land management goals for this project area.” (AFRC letter, page 2)

Issue Statement: Alternatives based on arbitrary diameter limits should not be considered.

Discussion: Arbitrary diameter limits that do not clearly contribute toward meeting the purpose and need for the project or toward meeting stand objectives will not be analyzed in detail. Diameter limits will only be considered when supported by appropriate peer-reviewed scientific documentation.

Disposition: An alternative that utilizes diameter limits for tree removal will not be analyzed in detail. The EA will disclose why this alternative was not considered.

Resource Area: Project Management

AFRC Comment #6 – Limited Operating Periods

Source: Rich Svlich, American Forest Resource Council, letter dated 5/1/07

Comment: “During project alternative development there is a need to minimize the use of limited operating periods. Limited operating periods have significant negative impacts on sale economics and the ability to efficiently treat these stands in a timely manner. Short seasons have serious impacts on a purchaser’s ability to find operators, especially with PAL having such a significant impact at the end of any operating season.” (AFRC letter, page 2)

Issue Statement: Excessive restrictions on the period of harvest operations negatively impact sale economics and the timely treatment of stands.

Discussion: The impact of limited operating periods on timber sale operations is recognized. The project may require restrictions on operations in some treatment units to protect specific resources such as soils sensitive to compaction or wildlife species. Any operating restrictions will be unit specific. The environmental assessment will consider the impacts of timing restrictions on timber sale operations.

Disposition: Limited operating periods may be imposed on harvest operations in order to protect specific resources. Those resources to be protected and rational for the restriction will be disclosed in the analysis. The impacts of these restrictions on timber sale operations will be included in the economic analysis.

Resource Area: All resources; economics.

AFRC Comment #7 – Protection of Archaeological Sites

Source: Rich Svilich, American Forest Resource Council, letter dated 5/1/07

Comment: “It is essential that any archaeological issues and sites be “reasonably” dealt with during the NEPA analysis. These issues cannot be resolved after a sale is sold. It takes away from the already limited timeframes from being able to accomplish the work to meet your land management objectives. We ask that you take a reasonable effort in putting any railroad grade issues to rest with SHIPO during the NEPA process.” (AFRC letter, page 3)

Issue Statement: All archaeological issues should be resolved prior to completing the EA.

Discussion: The project decision will not be signed until the project has been reviewed and approved by the Forest Archaeologist in consultation with the CA SHPO . Railroad grades in the project area have been inventoried, mapped (by GPS) and a condition assessment for each segment has been completed. The status and protection needed for each segment will be reviewed by the Forest Archeologist. A review of known railroad grades and old wagon roads in the project area indicates that protection of these linear features will not significantly affect logging operations. Crossing the linear features will occur in previously breached segments or across those segments where contributing factors would not be compromised. All sites and linear segments within or immediately adjacent to treatment units have been posted and/or flagged for avoidance.

Disposition: The project area has been inventoried for heritage resources. Protection measures have been applied for all historic properties. The project decision will not be signed until the heritage resources report has been reviewed and approved by the Forest Archaeologist in consultation with the CA State Historic Preservation Office.

Resource Area: Project management, Archaeology.

AFRC Comment #8 – Road System

Source: Rich Svlich, American Forest Resource Council, letter dated 5/1/07

Comment: “It is important that an adequate road system be developed and utilized in order to effectively and efficiently harvest the timber from this project. While decommissioning unneeded roads is understandable and supportable we also ask that serious consideration be made for additional road construction and reconstruction that will assist with the implementation of this project.” (AFRC letter, page 2)

Issue Statement: The proposed action should include road construction and reconstruction to facilitate timber harvest.

Discussion: The project area currently has a system of roads that provides access for timber harvest. New road construction to provide adequate access for timber harvest is not needed. The comment did not identify specific units or areas that need new road construction to facilitate timber harvest. Reconstruction is identified as part of the proposed action and road segments that need improvement to facilitate safe transport of timber products will be identified.

Disposition: No new road construction is needed to facilitate harvest unit access. The existing system of roads provides adequate harvest access. The proposed action includes road reconstruction needed to facilitate safe the safe transport of forest products. The environmental assessment will display the road system necessary to provide harvest access, including roads to be reconstructed.

Resource Area: Transportation

KSWC, KFA, EPIC Comment #1 – Alternative Actions

Source: KSWC, KFA, EPIC, letter received 5/24/07

Comment: “While our organizations support targeted fuels-reduction efforts that reduces the risk of irreparable damage to key habitats, we are very concerned by the magnitude of this project, especially in light of some of the specific practices highlight below. We urge the Shasta McCloud Management Unit to develop an alternative which 1) includes a diameter limit that precludes the logging of large trees (we would suggest a 12” diameter limit) 2) precludes the development of new or reconstructed roads; and 3) is not structured around a commercial timber sale, thus providing the public assurances that the Forest Service’s management choices are directed to the stated purpose and needs of forest health and fire risk reduction. To the extent practicable we would encourage the forest to consider the use of stewardship contracts to accomplish the project goals.”

Issue Statement: An alternative to the proposed action should focus on the purpose and need of forest health and fire risk reduction rather than the production of commercial wood products. This alternative should preclude the harvest of large trees (12 inches in diameter and greater) and include no new road construction or road reconstruction.

Discussion: The majority of the project area (93 percent) is in the Matrix land allocation. Forest Plan desired conditions for the Matrix allocation include “a sustained level of forest products from suitable Matrix lands as a by product of ecosystem management is expected to provide approximately 159 million board feet per decade in wood products.” (LRMP p 4-76) Proposed activities would contribute to this goal. Limiting harvest to trees less than 12 inches in diameter would forego treatment objectives: high stocking levels include overstory trees; disease infected lodgepole pine overstory trees would continue to infect adjacent young lodgepole pine; the species composition of mixed stands (white fir, incense cedar, ponderosa pine) on dry, fire maintained sites would not shift back to pine; aspen would remain overtopped and suppressed by large diameter pine .

Disposition: The production of commercial wood products from project area stands is consistent with Forest Plan direction. An alternative that utilizes diameter limits will be discussed and dismissed because project objectives would not be met.

Resource Area: Silviculture, Fuels

KSWC, KFA, EPIC Comment #2 – Management in Late-Successional Reserves

Source: KSWC, KFA, EPIC, letter received 5/24/07

Comment: “The ROD for the Shasta-Trinity Forest Plan (LRMP) FEIS states that:

C-11- LSR’s are to managed to protect and enhance conditions of late successional and old-growth forest ecosystems, which serve as habitat for and old-growth related species including NSO.

B-4- LSR’s are designed to serve a number of purposes. First, they provide distribution, quantity and quality of old-growth habitat sufficient to avoid foreclosure of future management options. Second, they provide habitat for populations of species that are associated with late successional forests. Third, they will help ensure that late successional species diversity will be conserved.

B-4- Given the remaining low proportion of late-successional ecosystems in the landscape at the present time, these older forests should be protected from fire and other stand-resetting disturbances.

Any action in late-successional habitat must be justified with *demonstrated benefits* to such habitat in order to comply with the NFP. These benefits must be “clear” from either the local analysis or from relevant scientific literature. Professional opinion that benefits may result is an inadequate justification for mechanical intervention in existing late-successional forest habitat. The EA must disclose in detail how tractor logging will impact LSRs.

Desired future condition in the McCloud Flats area is described in the Shasta-Trinity LRMP Pg. 4-81, “Dead and dying trees and snags are at higher levels than within Matrix. Patches of dead trees and snags are scattered across the landscape.” The sivicultural prescriptions as well as current conditions in LSR’s must be disclosed in the EIS.”

Issue Statement: Any activities within the Late-Successional Reserve must have clear benefits and be justified in the EA.

Discussion: The Record of Decision on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl established the network of Late Successional reserves.

Existing conditions within the Porcupine LSR are documented in the *Shasta-Trinity National Forest Wide Late Successional Reserve Assessment*, 1999, Chapter 2 page 2-105. Late successional habitat makes up only 15 percent of the area, while early and mid-successional conditions account for 67 percent of the habitat. Forest Plan desired conditions state “Late successional forest stands are managed to maintain the health and diversity components through the use of prescribed fire and thinning from below. Younger to mature forest stands are managed to replace older dead and dying stands. (Forest Plan, page 4-77).

Total proposed treatments in the Porcupine LSR total 481 acres. Mid-successional stage stands (312 acres) would be thinned to: 1) manage as replacement stand for current late-successional stand; 2) encourage development of late successional characteristics by reducing stand density to enhance growth and improve forest stand health/vigor; 3) reduce crown fire potential and reduce surface fuel loads to acceptable levels. Late-successional stands (169 acres) would be thinned from below to: 1) maintain late-successional, structural

diverse (multi-storied) characteristics; 2) reduce stand density to maintain forest health; 3) reduce crown fire potential and reduce surface fuel loads to acceptable levels.

Proposed treatments are consistent with desired management. Project analysis will document how well the proposed treatments achieve desired LSR conditions. An alternative with no treatments within the LSR would provide a clear comparison of management alternatives.

Disposition: Existing LSR conditions have been documented in the *Shasta-Trinity National Forest Wide Late Successional Reserve Assessment*, 1999, Chapter 2 page 2-105. Proposed treatments are consistent with Forest Plan direction for LSR management. The environmental assessment will display LSR treatment effects and how well the proposed treatments achieve desired LSR conditions. The environmental assessment will also include an alternative with no treatments within the LSR to provide a range of management options and a clear comparison of treatment effects.

Resource Area: Wildlife, Silviculture, Fuels

KSWC, KFA, EPIC Comment #3 – Northern Spotted Owl

Source: KSWC, KFA, EPIC, letter received 5/24/07

Comment: “Significant new information regarding NSO population decline across its range, and the emergence of new threats not contemplated when the Northwest Forest Plan or the Shasta-Trinity LRMP were signed, require the agency to consider and disclose information that contradicts the assumptions of the Forest Plan and the LRMP prior to issuing a decision to implement the projects, such as this one, which may affect Northern Spotted Owls.

Please address the following questions and concerns:

- What is the current condition of the nearby LSRs? Are they functioning?
- What is the status of connectivity in the matrix?
- Does the Forest Service anticipate “take” from this timber sale?
- We strongly recommend consideration of an alternative that does not degrade or remove suitable nesting, roosting or foraging NSO habitat.
- What is the current status and trend of NSO populations in the project area, in the Shasta McCloud Management Unit, and in the California Cascades Province?

Please address the findings contained in the US Fish and Wildlife Service Spotted Owl Status Review Report of November 2004. Please discuss the potential relevance of this highly significant new information on the proposed project. This information on the threatened northern spotted owl indicates that there are significant new uncertainties for the owl that have not been fully considered at the regional or local scale. As explained below this has direct relevance wherever owl habitat is affected. These new concerns include:

- Competition and displacement from the barred owl that is dramatically increasing in numbers throughout the range of the spotted owl. The barred owl is barely mentioned in the 1994 SEIS. There is no discussion at all in the body of the 1994 SEIS volume I, and there is only one mention of “possible” adverse impacts in volume II of the 1994 SEIS; **Implications:** Based on principles of island biogeography, more habitat unfragmented by roads and regeneration may need to be protected to ensure that these two owl species can co-exist. See related comment below on coupled lattice map models.
- The effects of West Nile Virus, which is fatal to the spotted owl; **Implications:** A larger NSO population may be better able to survive the stochastic pressures of this disease. It may be important to avoid any further “take” of birds or habitat at least until the disease has run its course. Mature stands like those in the project area may also be important because they may be dryer and have fewer mosquito vectors. Geographic isolation might also help protect them from the contagious spread of the disease. The Little Doe DEIS fails to analyze these factors or disclose the level of “take” anticipated for the project.
- The potential loss of habitat from Sudden Oak Death syndrome; **Implications:** Loss of habitat to SOD in drier forests -- roughly that portion of the NSO’s range which lies south and east of the project area – could dramatically reduce the effectiveness of NSO habitat. In combination with impacts from Barred Owl competition in the wetter forests to the north and west of the project area, SOD raises very serious concerns about the adequacy of the NWFP’s reserve design, and makes remaining habitat more valuable than previously considered in any programmatic NEPA document.

- Greater than expected loss of habitat to wildfire over the last several years; **Implications:** Loss of habitat to fire, such as the Sims fire, and the risk of more such losses, makes all remaining habitat more valuable than previously considered in any programmatic NEPA document.
- The potential effect of climate change on regional vegetation patterns and climate patterns, including an increased risk of large, hot fires already noted in northwestern California (see **Westerling et al 2005**); **Implications:** Under a new climate regime, we may not be able to regrow new owl habitat in the reserves as assumed in the NW Forest Plan. Existing unfragmented mature forests are relatively resilient to climate change. It is risky to expect to be able to grow new owl habitat in the reserves under an uncertain climate regime. Global climate change also affects local and regional weather. Spotted owls are known to be sensitive to cold and rain during the nesting season. If inclement weather increases during nesting season, spotted owl nesting success will likely be adversely affected. Unfragmented forests provide owls more protection from inclement weather.
- Overly Aggressive Fuel Reduction Logging and Misapplication of the Healthy Forest Initiative and Healthy Forest Restoration Act. **Implications:** While it is true that some treatments if carefully done could help reduce the risk of fire while also retaining some owl habitat values, many such fuel reduction treatments in owl habitat will degrade some existing owl habitat (or make those forests more vulnerable to fire or barred owl invasion), so the remaining owl habitat throughout the owl's range becomes more important than previously considered in any programmatic NEPA document.
- The 9th Circuit ruled in Gifford Pinchot Task Force v. USFWS, 378 F.3d at 1062, that avoiding jeopardy is not enough to comply with the requirements of the ESA, NEPA, and NFMA. And that critical habitat is intended for recovery. The Gifford Pinchot case invalidated the FWS's regulatory definition of Adverse Modification of Critical Habitat and found that FWS's application of the erroneous standard in the relevant Biological Opinions was not harmless error. The Gifford Pinchot case also held that FWS could not rely on the presence of suitable owl habitat in the late successional reserve network to find that the loss of critical habitat was not "destruction or adverse modification." **Implications:** The decision to approve logging must not be based on an erroneous standard. A change in information, requiring NEPA supplementation "need not be strictly environmental . . . ; the test is whether the new information so alters the project's character that a new 'hard-look' at the environmental consequences is needed." . . . [I]nformation "that does not seriously change the environmental picture, but that nevertheless affects, or could affect, the decisionmaking process, is subject to the procedural requirements of NEPA." Natural Resources Defense Council v. Lujan, 768 F. Supp. 870, 886-87 (D.D.C. 1991).
- There has also been a continuous loss of suitable owl habitat on non-federal lands that should be considered as a cumulative impact on the viability of the species. **Implications:** Continued loss of habitat on private lands renders remaining suitable habitat on federal land more valuable than it was in 1994 when there was more owl habitat on all ownerships.
- The entire Northwest Forest Plan is premised on the existence of the network of reserves across the landscape of the NSO's range. That premise has now been thrown into question by two developments.

- The draft Recovery Plan for the NSO published by USFWS on April 26, 2007 (72 FR 20865) contemplates either (in Option 1) a significant reduction in the size of owl reserves or (in Option 2) a significantly smaller set of shifting reserves.
Implications: If adopted, this Recovery Plan could lead to the adoption of revisions to the NFP forests LRMPs which would not necessarily meet the Forest Service's obligation under the NFMA to provide sufficient high-quality habitat to provide for the viability of the NSO across its range.
- On Sept 7, 2005 the BLM published a notice of intent to prepare an EIS to revise its western Oregon RMP which will consider eliminating the reserve system on BLM lands. See: <http://www.blm.gov/or/plans/wopr/index.htm> Continued logging will cause further loss of suitable habitat and will have long-term consequences. It is arbitrary and capricious to allow implementation of a plan premised on the existence of reserves if those reserves are going away. **Implications:** If there is a chance that BLM reserves will no longer be protected, then remaining USFS unfragmented forests must be protected to retain options for the conservation of the Threatened spotted owl, marbled murrelet, and listed Coho salmon. The spotted owl cumulative effects analysis in the 1994 SEIS is no longer valid and must be reconsidered at the regional scale. No project-level NEPA document can rely on the 1994 effects analysis because the publication of the WOPR NOI means that elimination of the reserves is a "reasonably foreseeable" action.

The agencies can no longer rely on the 1994 NWFP FSEIS because there is significant new information that could alter the results of the previous analysis.

In September of 2004, FWS' contractor, Sustainable Ecosystems Institute, completed a 500+ page report on the current status of the spotted owl. The report brings to light a series of new concerns about the continued viability of the spotted owl, and the agency must prepare a new NEPA analysis to review and consider all the new information about new threats contained in this report. See Courtney, Blakesley, Bigely, Cody, Dumbacher, Fleischer, Franklin, Franklin, Gutierrez, Marzuluff, Sztukowski. September 2004. Scientific evaluation of the status of the Northern Spotted Owl. Sustainable Ecosystems Institute, Portland, Oregon. <http://www.sei.org/owl/finalreport/finalreport.htm> A few months later, the FWS completed its status review and analysis of the SEIS report. This official FWS report, dated November 2004, describes relevant new information about the owl and is available at: http://pacific.fws.gov/ecoservices/endangered/recovery/pdf/NSO_5-yr_Summary.pdf

Dr. Jerry Franklin summarized the findings of the recent Northern Spotted Owl Status Review scientific review panel as follows:

The implications of the scientific findings with regards to conservation strategies.

... in view of current uncertainties, such as the eventual outcome of the Spotted Owl/Barred Owl competition, West Nile Virus, and Sudden Oak Death, and whatever else comes along -- such as global change and other kinds of introductions -- existing suitable habitat could be important to the persistence of the Northern Spotted Owl. [repeated with emphasis] Existing suitable habitat could be important to the persistence of the Northern Spotted Owl, i.e., risk to Northern Spotted Owl may increase if additional suitable habitat is removed. It is not clear where the Spotted Owl may find the refuge or refuges from new threats within existing suitable habitat. Barred Owl intrusions do not negate the need for structurally complex forest habitat to sustain Northern Spotted Owl based on existing knowledge.

U.S. Fish & Wildlife Service Scientific Review Panel For The Northern Spotted Owl. June 22, 2004 Public Hearing. Washington State University, Vancouver Campus. Transcript Of Proceedings, page 121. <http://www.sei.org/owl/meetings/minutes/june-meeting-transcripts.pdf>

Barred owls are larger and more aggressive than spotted owls, pushing the spotted owls from their nesting areas. Their habitat and prey preferences appear to overlap with the spotted owl, and they can interbreed with unknown consequences. Barred owl numbers are clearly increasing (yet the methods used to detect them may vastly underestimate their numbers). Additional information re Barred Owls may be found in the following reports:

Robert R. Pearson. **Spotted Owl Habitat Considerations with regard to Barred Owl Presence** <http://www.sei.org/owl/meetings/Presentations/March/Pearson.pdf>

Kelly, E. G., E. D. Forsman and R. G. Anthony **Is the Barred Owl Displacing the Northern Spotted Owl?** <http://www.sei.org/owl/meetings/Presentations/December/Kelly.pdf>

Robert R. Pearson and Kent B. Livezey. **Distribution, numbers, and site characteristics of Spotted Owls and Barred Owls in the Cascade Mountains of Washington** <http://www.sei.org/owl/meetings/Presentations/December/LivezeyPearson.pdf>

Scott Gremel. **The Effects of Barred Owls on Spotted Owls in Olympic National Park, Washington.** <http://www.sei.org/owl/meetings/Presentations/December/SEI-SGPres.pdf>

Martin Cody, **Assessment of the Potential Threat of the Barred Owl to Northern Spotted Owl.** Presentation at the final meeting of the SEI status review panel. June 22, 2004. <http://sei.org/owl/meetings/Presentations/June/Cody-Barred-Owls.pdf>

This is not just a hypothetical concern. According to recent monitoring of barred owl on the Willamette National Forest—

“The percentage of sites containing at least a single barred owl (*Strix varia*) increased dramatically between 2000 and 2001; the high level of barred owl responses continued into 2002 as well (Figure 5)... it is important to note that our survey methods are not designed to locate barred owls. ... The data do suggest, however, that barred owls are becoming increasingly common in the study area and several pairs of spotted owls have been either displaced or are inhibited from responding to our surveys as a result. In addition, a second hybrid owl was located on the study area in the Horse Creek LSR.”

-ANNUAL RESEARCH REPORT. FY 2002. 5 December 2002. Title: The Ecology of Northern Spotted Owls (*Strix occidentalis caurina*) on the Willamette National Forest, Oregon: Habitat Use and Demography. Principal Investigator: Dr. Robert Anthony (Demography-RWU 4203). <http://www.reo.gov/monitoring/nso/reports/HJA2002-annual-report.pdf>

Anthony, Forsman, Franklin et al. 2004. Draft “Status And Trends In Demography Of Northern Spotted Owls, 1985-2003. Interagency Regional Monitoring Program (April 30, 2004) says:

There also was evidence that populations on the RAI, OLY, COA, and HJA study areas were decreasing also. ... Of the 8 monitoring areas, there was evidence that populations were declining on CLE, COA and HJA based on 95% confidence intervals that did not overlap 1.0 or barely included 1.0. (p 47)

... there was strong evidence that populations on the CLE, WEN, OLY, RAI, WSR, HJA, COA, and SIM study areas declined during the study (Fig. 11a-c). Estimated declines on the CLE, WEN, RAI, and WSR study areas were substantial over the last decade where population sizes were only 40-60% of the initial populations. Declines on the OLY, HJA, COA, and SIM study areas were not as great but are noteworthy; population sizes in 2002 were approximately 70-80% of the initial populations on those areas. The decline in the population on HJA appeared to occur during 1993 and 1999,... (p 50)

...during the study, and populations on the OLY, HJA, COA, and SIM study areas had declined by about 20-30%. (p 59)

The impact of the barred owl on the spotted owl was barely considered when the Northwest Forest Plan was approved in 1994. One of the implications of barred owl competition and the overall decline of the northern spotted owl is that land management agencies may need to protect all the remaining unfragmented mature and old growth forest habitat in order to increase the chances that spotted owls and barred owls can co-exist. In order to retain options while this issue is being sorted out the agency must consider protecting all remaining Nesting Roosting and *Foraging* habitat.

THE EA MUST ANALYZE AND DISCLOSE THE POTENTIAL IMPACTS OF THE PROPOSED TRACTOR LOGGING ON NORTHERN SPOTTED OWLS

We bring the Forest Service's attention to a study indicating that radio-tagged NSO's showed greatly reduced forage and roosting use in recently thinned stands as compared to pre-treatment. See Meiman, S., et al. 2002. "Effects of commercial thinning on spotted owl home range and habitat use patterns: A case study." Oregon State University, Corvallis OR.

The US Fish and Wildlife Service has commented in its Fiscal Year 2004-2008 Biological Opinion for the Rogue-Siskiyou National Forest and the Medford District BLM. See USDI Fish & Wildlife Service. 2003. Formal and informal consultation on activities that may affect listed species in the Rogue River Basin for fiscal year 2004 through fiscal year (FY) 2008 (log #: 1-15-03-F-511). (BiOp). Roseburg, OR October 20.

Removal and degradation of spotted owl habitat in the Matrix may occur at higher rates than assumed in the NWFP because increasing use of density management affects more acres to meet the projected PSQ. If the PSQ is not adjusted, density management may also lead to more rapid re-entry of stands. **This management pattern could produce stands that will never recover spotted owl habitat attributes after the first entry and eventual conversion to young stands with legacy trees;** i.e., density management may result in a similar outcome for habitat as regeneration harvest, but arrive there via a pathway and schedule that both accelerate and obscures declines in habitat quality. Emphasis added."

Issue Statement: New information regarding the northern spotted owl is available. The EA must analyze and disclose the impacts of the proposed activities on the northern spotted owl and take into account all new information.

Discussion: Information published after the release of the Shasta-Trinity National Forest Land a Resource Management Plan bring to light new concerns for the northern spotted owl, as well as reiterate known issues across its range. Some of these issues are relevant to the proposed

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activities; some are not. The issues that may affect the northern spotted owl in this project will be analyzed and disclosed in the BA, and included in the environmental assessment.

Disposition: The environmental assessment and supporting documents will analyze the effects of the proposed activities on the northern spotted owl, utilizing the applicable and recently available findings.

Resource Area: Wildlife

KSWC, KFA, EPIC Comment #4 – Goshawks

Source: KSWC, KFA, EPIC, letter dated 5/20/07

Comment: “Current management direction is to protect each know nest site. The EA should address the impacts of the proposed 4,000 acres of tractor logging on Goshawks. A recent peer-reviewed survey of Goshawk habitat use suggests that current management of the bird’s habitat may be inadequate to provide for its persistence in viable populations. Greenwald et al, *A review of northern goshawk habitat selection in the home range and implications for forest management in the western United States*. Wildlife Society Bulletin 2005, 33(1): 120-129.

Issue Statement: The impacts of the proposed action on goshawks should be included in the analysis.

Discussion: The proposed activities do not fall exclusively in northern goshawk habitat. Proposed activities within potential goshawk habitat are designed to enhance or maintain mature forest characteristics. Other wildlife species that utilize mature forest stands would benefit as well.

Disposition: The environmental assessment will disclose the effects of the proposed activities on goshawks and goshawk habitat.

Resource Area: Wildlife

KSWC, KFA, EPIC Comment #5 – Pacific Fisher

Source: KSWC, KFA, EPIC, letter dated 5/20/07

Comment: “On April 8, 2004, the U.S. Fish and Wildlife Service (“FWS”) issued a decision finding that the listing of the Pacific fisher is warranted under the Endangered Species Act due to its imperiled status, but deferring action due to workload constraints (a “warranted but precluded” decision). FWS concluded in 2004 that the West Coast population of the fisher (the “distinct population segment” or “DPS”) warrants listing under the Endangered Species Act. 69 Fed. Reg. 18769 (April 8, 2004). According to the FWS, “preliminary analyses indicate West Coast fisher populations ... may be at significant risk of extinction.” *Id.* at 18789.

The FWS cites logging as one of the primary causes of fisher decline across the U.S. *Id.* at 18778. The FWS ultimately concluded that: “Federal, State, and private land management activities may affect key elements of fisher habitat; reduction of any of these key habitat elements could pose a risk to the fisher. Current regulations provide insufficient certainty that conservation efforts will be implemented or that they will be effective in reducing the level of threat to the fisher. We, therefore, believe that the existing regulatory mechanisms are not sufficient to protect the DPS as a whole from habitat pressures.” *Id.* at 18792.

The USFWS warranted but precluded findings contain a detailed review on the conservation status of the fisher, including a comprehensive analysis of threats to the continued existence of the species. 69 Fed. Reg. 18770, 18770 (April 8, 2004). For example, FWS noted that “habitat loss and fragmentation appear to be significant threats to the fisher. Forested habitat in the Pacific coast region decreased by about 8.5 million acres between 1953 and 1997.” *Id.* at 18780. “Forest cover in the Pacific coast is projected to continue to decrease through 2050, with timberland area projected to be about 6 percent smaller in 2050 than in 1997.” *Id.* “Thus fisher habitat is projected to decline in Washington, Oregon, and California in the foreseeable future.” *Id.*

The FWS status review also discloses that “[v]egetation management activities such as timber harvest and fuels reduction treatments . . . can destroy, alter, or fragment forest habitat suitable for fishers.” *Id.* at 18778. “A number of studies have shown that the fisher avoids areas with little forest cover or significant human disturbance and conversely prefers large areas of contiguous interior forest.” *Id.* at 18773. “The fisher’s need for overhead cover is very well documented. Many researchers report that fishers select stands with continuous canopy cover to provide security cover from predators.” *Id.* “Fishers probably avoid open areas because in winter open areas have deeper, less supportive snow which inhibits travel, and because they are more vulnerable to potential predators without forest cover.” *Id.* “Furthermore, preferred prey species may be more abundant or vulnerable in areas with higher canopy closure.” *Id.*

In the annual Candidate Notice of Review, issued by the FWS each year, the FWS reiterated the concerns highlighted in the fisher’s warranted but precluded determination, noting that “extant fisher populations are small and isolated from one another” and that “[m]ajor threats that fragment or remove key elements of fisher habitat include various forest vegetation management practices such as timber harvests....” 71 Fed. Reg. 53777 (Sept. 12, 2006).

These findings and conclusions must be discussed or acknowledged in the analysis of the proposed project. The EIS should also discuss the increase in OHV use in the area resulting from construction of new roads and increased access and the impacts of such OHV use on Pacific Fishers.

In a recent paper Zielinski, et al carefully examined the assumption imbedded in the NWFP that protection of a reserve network focused on NSO would adequately protect habitat for fishers. They concluded that, while there is some overlap between the two species' habitat needs, "*the current location of LSRs may not be the best solution to maintaining well-connected habitats for these area-limited species in northwestern California.*" William J. Zielinski, et al., Using landscape suitability models to reconcile conservation planning for two key forest predators, Biological Conservation (2006), doi:10.1016/j.biocon.2006.07.003. This conclusion raises serious concerns about the adequacy of the existing regulatory framework to maintain the viability – or put another way, to prevent the decline toward ESA listing, of the fisher.

This new information regarding the fisher should be reflected in the EA and must take a hard look at the impacts of this project on Pacific Fishers."

Issue Statement: The environmental assessment needs to address the impacts of the project on the Pacific fisher and reflect new information.

Discussion: Fisher observations within the project area are lacking and known records within ten miles of the project area are old. Fisher habitat in the project area is severely restricted by extensive lava fields, lack of surface and running water. New information regarding fisher and its habitat will be taken into consideration during project design and analysis.

Disposition: The environmental assessment will disclose the effects of the proposed activities on the Pacific fisher and take into account new information.

Resource Area: Wildlife

KSWC, KFA, EPIC Comment #6 – Willow Flycatcher

Source: KSWC, KFA, EPIC, letter received 5/24/07

Comment: “The Willow Flycatcher is a Region 5 and a state listed threatened species. It is associated with riparian woodland vegetation. Current management direction is to provide for population viability through the protection of habitat in the form of riparian habitat such as riparian management reserves and wet meadows. The EA must disclose the impacts to the Willow Flycatcher from tractor logging 40 acres in Riparian Reserves and analyze the effects on the species from fuels modification.”

Issue Statement: The environmental assessment must disclose impacts to the willow flycatcher.

Discussion: Riparian reserves within the project area are intermittent or ephemeral in nature and do not have the characteristic vegetation and water regime necessary for suitable willow flycatcher habitat. No willow flycatchers have been recorded within the project area.

Disposition: The migratory bird report and associated section in the EA will disclose the effects of proposed actions on bird species with habitat available in the project area. The project area does not contain habitat suitable for the willow flycatcher..

Resource Area: Wildlife

KSWC, KFA, EPIC Comment #7 – Management Indicator Species

Source: KSWC, KFA, EPIC, letter received 5/24/07

Comment: “The EA needs to analyze and disclose the potential impacts of the project on Management Indicator Species (MIS) as defined by the Shasta-Trinity LRMP.

The role of management indicator species in National Forest planning is described in the 1982 implementing regulations for the National Forest Management Act (NFMA) of 1976:

“In order to estimate the effects of each [Forest Plan] alternative on fish and wildlife populations, certain vertebrate and/or invertebrate species present in the area shall be identified and selected as management indicator species and the reasons for their selection will be stated. ***These species shall be selected because their population changes are believed to indicate the effects of management activities.*** In the selection of management indicator species, the following categories shall be represented where appropriate: Endangered and Threatened plant and animal species identified on State and Federal lists for the planning area; species with special habitat needs that may be influenced significantly by planned management programs; species commonly hunted, fished or trapped; non-game species of special interest; and ***additional plant or animal species selected because their population changes are believed to indicate the effects of management activities on other species of selected major biological communities or on water quality*** [36 CFR 219.19 (a)(1)].” (emphasis added)

The EA should contain information describing population numbers, locations, and trends for key wildlife species, and monitoring data to determine that the proposed action would maintain numbers and distribution of these species sufficient to ensure long-term viability. As well, if the FS wishes to use habitat inventory information to address MIS, please provide a thorough explanation of the research results which justify such an approach. Please note that it is not enough to suggest that it is too difficult or expensive to obtain the necessary data to satisfy the requirements of the Forest Plan with respect to MIS.”

Issue Statement: The EA needs to analyze and disclose the potential impacts of the project on Management Indicator Assemblages.

Discussion: The Shasta-Trinity National Forest Land and Resource Management Plan (Forest Plan) requires that each project evaluate and disclose the impacts of the project on the habitat components of the wildlife management indicator assemblages in a Management Indicator Assemblage Report. The EA will include a management indicator species assemblage (MIA) report. The findings of this report will be disclosed in the EA.

Disposition: The environmental assessment will disclose the findings of the MIA Report.

Resource Area: Wildlife

KSWC, KFA, EPIC Comment #8 – Neotropical Migratory Birds

Source: KSWC, KFA, EPIC, letter received 5/24/07

Comment: “The EA must disclose and analyze the effects of tractor logging 4,000 acres and machine piling on neotropical migratory bird species.

The regional decline of migratory birds is a significant issue for this project. Numerous studies have reported local and regional trends in breeding and migratory bird populations throughout North America (e.g., DeGraaf and Rappole 1995, Sauer et al. 2004). These studies suggest geographically widespread population declines that have provoked conservation concern for birds, particularly neotropical migrants (Askins 1993, Terborgh 1989.) The 2005 report from the Klamath Bird Observatory entitled Local and Regional Trends in Breeding and Migratory Bird Populations in the Klamath and Rogue River Valleys: Monitoring Results for 1993-2003 may be viewed at: <http://www.klamathbird.org/Publications/pubs.htm>. This paper indicates that several species on songbirds are suffering declining population trends at the regional level.”

Issue Statement: The environmental assessment must disclose the effects of the proposed activities on neotropical migratory bird species.

Discussion: This analysis will be included in the environmental assessment.

Disposition: The environmental assessment will disclose the effects of the proposed action and alternatives on neotropical migratory bird species.

Resource Area: Wildlife

KSWC, KFA, EPIC Comment #9 – Survey and Manage

Source: KSWC, KFA, EPIC, letter received 5/24/07

Comment: “Information about survey timing should be included in the EA and the EA should discuss the influence of surveys on project layout and design. Survey results and buffer mitigation measures for all survey and management species should be made available to the public and the decision maker in a timely enough manner to allow for informed public commenting and federal decision making.

Please be advised that pursuant to the 2001 S&M ROD the government placed some hard-to-survey species in a category that required strategic surveys by a certain date, and if/when that deadline was missed, the USFS is required to stop logging LSOG forests OR complete “equivalent effort surveys.” Currently Equivalent Effort Survey is required for nine species:

- Lichens: *Bryoria subcana*, *Tholurna dissimilis*
- Bryophytes: *Kurzia makinoana*, *Marsupella emarginata* v. *aquatica*, *Orthodontium gracile*, *Tritomaria exsectiformis*
- Mollusks: *Deroceras hesperium*, *Hemphillia pantherina*, *Monadenia chaceana*.

The Forest Service must not rely on the illegal non-NEPA plan amendment “of the 2003 Annual Species Review” to avoid surveys that were anticipated by the Northwest Forest Plan and the Shasta-Trinity LRMP. The Forest Service cannot rely on non-NEPA documents to significantly amend the Northwest Forest Plan and the LRMP so-as to expedite regeneration logging. See KS Wild v. Boody, 9th Cir 2006. No. 06-35214 (CV 03-3124, District of Oregon).”

Issue Statement: The environmental assessment must disclose the effects of the proposed activities on survey and manage species.

Discussion: Surveys for these species (including sensitive plants, survey and manage, and noxious weeds) were completed in spring and summer of 2006 and 2007. This analysis will be included in the environmental assessment and botany and wildlife specialist reports.

Disposition: The EA will disclose the effects of the proposed action and alternatives on survey and manage species. Any survey and manage species located within the project boundary would be avoided with an appropriate buffer during project implementation.

Resource Area: Wildlife, Botany

KSWC, KFA, EPIC Comment #10 – Sensitive Plant and Wildlife Species

Source: KSWC, KFA, EPIC, letter received 5/24/07

Comment: “The EA must disclose impacts to all Sensitive plant species including the long-haired star-tulip and Salmon Mountains wake robin. The EA should also disclose impacts to the rare and possibly sensitive Columbia cress.”

Issue Statement: The environmental assessment must disclose the impacts of the project on Regional Forester’s sensitive species.

Discussion: This analysis will be included in the environmental assessment, the botany and wildlife biological evaluation for this project. All occurrences of sensitive plant species would be avoided with an appropriate buffer during project implementation. Several Regional Forester’s sensitive wildlife species have the potential to occur in within the project area. Project effects on these species will be analyzed and documented in the wildlife biological evaluation and specialist report.

Disposition: Surveys for sensitive plants were completed in spring and summer of 2006 and 2007. The impact of the project on sensitive species will be addressed in the botany and wildlife biological evaluations and disclosed in the environmental assessment.

Resource Area: Botany, Wildlife

KSWC, KFA, EPIC Comment #11 – Best Management Practices (BMPs) and Project Design Features (PDFs)

Source: KSWC, KFA, EPIC, letter received 5/24/07

Comment: “NEPA procedures must insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken.” 40 CFR 1500.1(b). NEPA was enacted to ensure that important environmental effects ‘will not be overlooked or underestimated only to be discovered after resources have been committed or the die otherwise cast.’ Robertson v. Methow Valley Citizens, 490 US 332, 348, 109 S.Ct. 1835. ‘... NEPA requires consideration of the potential impact of an action before the action takes place.’ Tenakee Springs v. Clough, 915 F.2d 1308, 1313.

The EA must disclose and analyze the likely impacts of the proposed logging, yarding, road construction and tractor piling on the environment and not rely on vague PDFs and BMPs.

Please note that the prevention of potentially adverse impacts at the project site is indeed necessary, but not sufficient to avoid cumulative effects (CEQ 1971). As Reid (1993) states:

The BMP approach is based on the premise that if on-site effects of a project are held to an acceptable level, then the project is acceptable, regardless of activities going on around it. Interactions between projects are beyond the scope of BMP analysis, and operational controls are applied only to individual projects.

However useful site specific BMPs are in minimizing effects of individual actions, they still do not address the cumulative effects of multiple actions occurring in the watershed which, though individually "minimized" through application of site-specific BMPs, may still be significant, in their totality, and have undesirable consequences for beneficial uses such as salmon populations and salmon habitat.

The argument that applying a BMP while conducting a specific forest practice minimizes site specific effects and thus also minimizes cumulative effects is logically flawed. Every BMP is an action and has an effect ... thus generally, the more the BMPs are applied the greater the cumulative effect. Only by minimizing the number of actions, i.e., the number of individual applications of BMPs, would cumulative effects be minimized. This is precisely why a cumulative effects assessment is needed—to establish the watershed-specific limits and excesses of BMP applications.

Beschta et al. (1995) also identified several conditions precedent for accurate analysis of cumulative watershed effects, including: 1) accurate understandings of natural variation in environment; 2) reliable baseline information at the local and regional scale (ideally from "reference" sites); 3) accurate assessments of the probable effects on key resources of past, present and foreseeable future activities; 4) development of reliable models that relate resource conditions within a dynamic spatial framework; and 5) establishment of levels of acceptable change in the environment.”

Issue Statement: The EA must disclose and analyze the likely impacts of the proposed activities and cumulative effects and not rely on vague PDFs and BMPs.

Discussion: The potential effects of the proposed action or alternatives actions on the soil resource will be analyzed on a site specific basis. Once the likely impacts have been determined they will be analyzed within the framework of cumulative effects. After all likely effects have been determined within the site specific and cumulative areas, Best Management Practices

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(BMPs) will be applied where appropriate. BMP effectiveness will be discussed within the context of the site specific and cumulative areas as well.

Disposition: The effectiveness of each PDF and BMP will be disclosed in the appropriate resource section of the EA. The EA will include a cumulative effects analysis for each resource.

Resource Area: All resources

KSWC, KFA, EPIC Comment #12 – Late-Successional Forests

Source: KSWC, KFA, EPIC, letter received 5/24/07

Comment: “Landscape areas **where little late-successional forest persists** should be managed to retain late-successional patches. This standard and guideline will be applied in fifth field watersheds (20 to 200 square miles) in which Federal forest lands are currently comprised of 15 percent or less late-successional forest. This assessment should include all allocations in the watershed. Within such an area, **all remaining late-successional stands should be protected.**”

-Northwest Forest Plan, Standards and Guidelines, C-44.

“Late-successional forest communities are the result of a unique interaction of disturbance, regeneration, succession and climate that probably can never be created with management. At present, we do not even fully understand the structure, species composition, and function of these forests. The best we can hope to accomplish through silviculture is to at least partially restore or accelerate the development of some of the structural and compositional features of such forests. Because they will be regenerated by different processes during a different period from that of the existing late-successional forests, it is highly likely that silviculturally created stand will look and function differently from current old stands that developed over the last 1,000 years. Consequently, conserving a network of natural old-growth stands is imperative for preserving biodiversity into the future.”

-FEMAT IV-31,32.

Issue Statement: All stands or areas of late-successional forest should be retained.

Discussion: Proposed treatments within the LSR would treat 312 acres of mid-successional forest and 169 acres of late-successional forest. Silvicultural objectives include: 1) manage as replacement stand for late-successional forest; 2) encourage development of late-successional characteristics; 3) reduce crown fire potential and reduce surface fuel loads; 4) reduce stand density to maintain forest health. Stands with late-successional characteristics outside the LSR would be thinned to remove ladder fuels and reduce the likelihood of stand replacing disturbances such as high levels of insect caused mortality or stand replacing wildfire by removing trees 4-13 inches in diameter.

Disposition: The environmental assessment will disclose the effects of the proposed treatments and alternative actions on late-successional forest. The analysis will include an alternative with no treatments within the LSR.

Resource Area: Wildlife, Silviculture

KSWC, KFA, EPIC Comment #13 – Coarse Woody Debris

Source: KSWC, KFA, EPIC, letter received 5/24/07

Comment: “Coarse woody material densities should support the natural range of biota for the site. Snags and down logs build soil and provide habitat for a variety of organisms critical to ecosystem recovery after natural disturbance. The adaptive management direction of the NFP encourages site-specific research and planning for CWD retention.”

Issue Statement: The project needs to provide coarse woody debris to build soil and provide habitat.

Discussion: Coarse woody debris will be retained at levels consistent with Forest Plan standards and guidelines.

Forest Plan designated areas for adaptive management areas are not within the project area.

Disposition: Provisions for retaining coarse woody debris have been incorporated into the proposed action.

Resource Area: Wildlife, Soils

KSWC, KFA, EPIC Comment #14 – Soils

Source: Klamath-Siskiyou Wildlands Center, KFA, EPIC, letter dated 5/20/07

Comment: “Soil integrity is a key issue for this timber sale. The agency is proposing to tractor log 4,300 acres and conduct tractor piling on an unknown number of acres. Tractor logging can cause serious impacts to soils. We urge the Forest Service to be diligent in its efforts to minimize negative impacts to the soil resource.

The Forest Service should only log when the logging will be "carried out in a manner consistent with the protection of soil." 16 USC §1604(g)(3)(F)(v); 36 CFR §219.27(c)(6). Management plans and projects must "insure that timber will be harvested from National Forest System lands only where—"soil, slope, or other watershed conditions will not be irreversibly damaged." 16 USC § 1604(g)(3)(E)(i). By enacting this section, Congress intended that the Forest Service "provide empirical guarantees that timber harvesting will not damage soils, water conditions, and fish habitats." Charles F. Wilkinson and Michael Anderson, *Land and Resource Planning in the National Forests* 161 (1987).

Further, the NFMA regulations require the "conservation of soil and water." 36 CFR §219.27. Section 219.27(a)(1) provides that "[a]ll management prescriptions shall— [c]onserve soil and water resources and not allow significant or permanent impairment of the productivity of the land." Section 219.27(b)(5) provides that "[m]anagement prescriptions that involve vegetative manipulation of tree cover for any purpose shall—[a]void permanent impairment of site productivity and ensure conservation of soil and water resources." Further, [c]onservation of soil and water resources involves the analysis, protection, enhancement, treatment, and evaluation of soil and water resources and their responses under management and shall be guided by instructions in official technical handbooks." 36 C.F.R. §219.27(f).

Please address soil chemistry, productivity, hydrology, and biological integrity on a site-specific (*i.e.*, unit-by-unit) basis. Please map soil types and composites using field reconnaissance data and include the maps in the NEPA document. Include a qualified, journey-level soil scientist on the ID Team. Design actions and mitigation *after* you have collected field reconnaissance data on soils at every site proposed for action.”

Issue Statement: Soil integrity needs to be addressed on a unit-by-unit basis.

Discussion: A soil scientist is included on the project IDT. Soils in the project area have been previously mapped in the Forest soil survey² and this soil type mapping has been field verified for all proposed treatment units. Erosion hazard ratings and other potential soil concerns have been identified for each proposed treatment unit. A soils report will be describe the effects of the project on the soils resource.

Disposition: The impacts of the project on forest soils will be described in the soils report and disclosed in the environmental assessment.

Resource Area: Soils

² Landspa et al. 1983. *Soil Survey of Shasta-Trinity Forest Area, California*, USDA Forest Service and Soil Conservation Service.

KSWC, KFA, EPIC Comment #15 – Aquatic Conservation Strategy

Source: KSWC, KFA, EPIC, letter received 5/24/07

Comment: “The Aquatic Conservation Strategy (ACS) of the NFP was “developed to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on all public lands.” NFP FEIS at B-81. The ACS describes nine objectives that must be met for proposed projects. The EIS should discuss whether and how the proposed action would comply with the nine ACS objectives at the site-specific scale.

On Pg. 4-54 of the Shasta-Trinity LRMP it states, “**Prohibit timber harvest**, including fuelwood cutting, **in Riparian Reserves**, except as described below.

Riparian Reserve acres shall not be included in calculations of the timber base.

- (1) Where catastrophic events such as fire, flooding, volcanic, wind, or insect damage result in degraded riparian conditions, allow salvage and fuelwood cutting if required to attain ACS objectives.
- (2) Salvage trees only when WA determines that present and future CWD needs are met and other ACS objectives are not adversely affected.
- (3) Apply silvicultural practices for RR’s to control stocking, reestablish and manage stands, and acquire desired vegetation characteristics needed to attain ACS objectives.

Therefore, it is imperative for the EA to discuss in detail how tractor logging in Riparian Reserves meets ACS objectives.”

Issue Statement: Proposed treatments within Riparian Reserves must meet ACS objectives. The environmental assessment must disclose how proposed treatments within Riparian Reserves meet the nine Aquatic Conservation Strategy Objectives.

Discussion: Proposed treatments within the Riparian Reserves would restore and maintain aspen forest and meadow habitat. The aspen stand is in decline. The overstory aspen trees are dying and the stand is regenerating through root sprouts, however conifer overstory and browse are limiting the successful regeneration of the stand. Conifers are now growing in areas that were once meadows. ACS objectives include “maintain and restore the species composition and structural diversity of plant communities....”.

As a result of recent court rulings pertaining to the ACS, direction has been issued for determining project consistency. The following paragraphs are an excerpt from the May 22, 2007 FS-Memorandum regarding compliance with the Aquatic Conservation Strategy:

Consistency with the Aquatic Conservation Strategy – Analysis and Documentation Requirements

As a result of PCFFA IV, we must now assess project consistency with the nine ACS objectives as we did prior to the 2004 Record of Decision for the ACS amendment. New project NEPA decisions must be consistent with the wording regarding ACS consistency, including consistency with the nine ACS objectives, as ACS consistency is described in the 1994 NWFP ROD on page B-10. This excerpt is provided from Page B-10:

“The intent is to ensure that a decision maker must find that the proposed management activity is consistent with the Aquatic Conservation Strategy objectives. The decision

maker will use the results of watershed analysis to support the finding. In order to make the finding that a project or management action “meets” or “does not prevent attainment” of the Aquatic Conservation Strategy objectives, the analysis must include a description of the existing condition, a description of the range of natural variability of the important physical and biological components of a given watershed, and how the proposed project or management action maintains the existing condition or moves it within the range of natural variability.” (1994 ROD, Attachment B, p. B-10)

Project-level NEPA decisions made subsequent to the March 30, 2007, court ruling must be consistent with the above excerpt from page B-10. In other words, an analysis of the project, considering the applicable ACS objectives, must be included within the body of the project environmental assessment (EA) or environmental impact statement (EIS). As with any NEPA analysis, appropriate consideration of potential cumulative effects is key to informed decision making. Where project analysis is documented in a specialist’s report, that analysis should be summarized and referenced in the body of the EA or EIS, including relevant conclusions. Actions that are categorically excluded from documentation in an EA or EIS (40 CFR 1508.4) should be documented consistent with agency NEPA procedures.

In making the ACS consistency finding and to be guided by *PCFFA II*, the decision maker must:

1. Review projects against the ACS objectives at the project or site scale, rather than only at the watershed scale. This review can be accomplished through cumulative effects analyses (e.g., by evaluating the incremental effect of the project added to the existing condition, and the effects of other present and reasonably foreseeable future actions) on watershed conditions.
2. Evaluate the immediate (short-term) impacts, as well as long-term impacts of an action.
3. Provide a description of the existing watershed condition, including the important physical and biological components of the 5th field watershed.
4. Provide written evidence that the decision maker considered relevant findings of watershed analysis.

Decisions documents (e.g., decision notices, decision memoranda, records of decision, or decision rationale) must include the finding of ACS consistency, with a statement of the findings required in the paragraph on page B-10 of the 1994 ROD, quoted above.

Disposition: The environmental assessment and any associated decisions will follow direction contained in the May 22, 2007 Memorandum regarding compliance with the Aquatic Conservation Strategy.

Resource Area: Silviculture, Wildlife, Botany; Project management

KSWC, KFA, EPIC Comment #16 – Noxious Weeds

Source: KSWC, KFA, EPIC, letter received 5/24/07

Comment: “Road construction, landing construction, ground-based yarding and timber haul operations risk introduction and spread of noxious weeds. Vehicular travel is the highest risk vector for alien plant invasions. Please be explicit about mitigation measures and their empirical effectiveness under similar site conditions. Learn from past operations. Please do not blindly rely on generic mitigation measures from the Land and Resource Management Plan that have not proven effective in this landscape.”

Issue Statement: Proposed activities have the potential to introduce and spread noxious weeds. Generic mitigation measures from the Land and Resource Management Plan have not proven effective. Additional measures are necessary and the effectiveness of all measures to limit the introduction and spread of noxious weeds should be disclosed in the environmental assessment.

Discussion: Currently there are very few occurrences of California Department of Food and Agriculture (CDFA) listed noxious weeds in the project area. The project will have project-specific design features to minimize weeds with mitigations such as pre-inspection of gravel sources to certify as weed-free before for road maintenance. Project features such as these will reduce the risk of introduction of weeds into areas that are generally weed-free.

Disposition: As required by the Forest Service Manual 2080 a noxious weed risk assessment will be developed for this project and will include mitigations to minimize the risk of introduction and spread of the CDFA listed noxious weeds. The environmental assessment will disclose the effects of the proposed activities on non-native invasive plant species. Mitigation measures and/or project design features to minimize the introduction and spread of non-native invasive plant species will be included and their effectiveness will be disclosed.

Resource Area: Botany

KSWC, KFA, EPIC Comment #17 – Disclose Full Range of Responsible Opinion in Regard to Potential Fire Severity

Source: KSWC, KFA, EPIC, letter received 5/24/07

Comment: “Where scientists disagree about possible adverse environmental effects, the EA must inform decision-makers of 'the full-range of responsible opinion' on the environmental effects. Citizens Against Toxic Sprays v. Bergland, 428 F.Supp. 908, 922 (D.Or 1977). An EIS that fails to disclose and respond to the opinions held by well respected scientists concerning the hazards of the proposed project is "fatally deficient." Seattle Audobon Society v. Mosely, 798 F.Supp. 1473, 1479 (W.D. Wash. 1992). And, in evaluating the reasonably foreseeable impacts of a proposed project in which information is incomplete or unavailable, "the agency shall always make clear that such information is lacking." 40 CFR §1502.22. The EIS *must* include:

1) a statement that such information is incomplete or unavailable; 2) a statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment, 3) a summary of existing credible scientific evidence which is relevant to evaluating the reasonable foreseeable significant adverse impacts on the human environment, and 4) the agency's evaluation of such impacts based upon theoretical approached or research methods generally accepted in the scientific community.Id.

In one case, the court ruled that an FEIS and ROD were insufficient under NEPA "not because experts disagree, but because the FEIS lacks reasoned discussion of major scientific objections." Seattle Audobon Society v. Mosely, 798 F.Supp. 1473, 1482 (W.D. Wash. 1992), affirmed, 998 F.2d 699 (9th Cir. 1993). "The EIS did not address in any meaningful way the various uncertainties surrounding the scientific evidence (concerning post-fire salvage logging)." Seattle Audobon Society v. Espy, 998 F.2d 699, 704 (9th Cir. 1993).

Please address the conclusions found in the following published peer-reviewed paper: Odion, D.C., E.J. Frost, J.R. Strittholt, H. Jiang, D.A. DellaSala and M.A. Moritz. 2004. Patterns of fire severity and forest conditions in the western Klamath Mountains, California. *Conservation Biology* 18(4): 927-936”

SUMMARY OF THE ODION PAPER

Contemporary wildland fires in the western Klamath Mountains exhibit severity patterns consistent with those of historical fires. Low-severity fire effects predominate with variable amounts of moderate and highly severe effects creating landscape patches. Only differences in mapping criteria applied to fires in 2001 and 2002 reflect severity patterns different from those of historical fires.

Long absence of fire predicts low severity fire effects. Absence of fire enables closed canopy forest vegetation to replace shrub and open forest vegetation through succession. Shade reduces available fuel below the canopy as well as its potential surface heat output during fire events, making canopy fires less likely to occur. Therefore, severe fire effects are not correlated with the age of woody fuels. Instead, weather and climate dictate canopy fire behavior in closed canopy forests.

The proportion of highly severe fire effects in 1987 was greatest in open forest and non-forest vegetation. High-severity effects to vegetation communities dominated by shrubs, hardwoods

and young trees tend to maintain that vegetation over time, just as fires of lower severity in closed canopy forests tend to maintain that vegetation type. This heterogeneity of fire effects may be an important contributor to landscape structure and biodiversity. Stand replacing fires, to some degree, are ecologically beneficial.

The spatial distribution of highly severe fire effects in 1987 was strongly associated with the previous occurrence of fires that exhibited high-severity effects in the same locations. Much of the observed high-severity “reburn” effects happened where post-fire salvage logging in 1977 had left behind flammable slash and tree plantations.

Tree plantations, which typically follow high-severity fires under traditional forestry practices, exhibited “twice the burn severity” of closed canopy forests (20percent), even though they accounted for only four (4) percent of the study area. The relative combustibility of structurally homogenous tree plantations supports a self-reinforcing “feedback” dynamic of high-severity fires, and the authors anticipate continued high-severity fires in roaded and planted portions of the landscape.

MANAGEMENT IMPLICATIONS OF THE ODION PAPER

The central conclusion of the paper is that long absence of fire predicts low-severity fire effects in Klamath mixed evergreen forests. This conclusion has four management implications:

1. The fuel build-up model formulated for southwestern ponderosa pine forests does not apply to Klamath mixed evergreen forests, and fuel treatments intended to prevent crown fires based on this model are misdirected.
2. Fuel treatments designed to impose a low-severity fire regime may be ecologically detrimental because highly severe fire effects, to some degree, support diverse vegetation community structures and habitats for which the Klamath region is globally unique. Some fuel treatments also may adversely affect soils, water quality, wildlife habitat, and spread noxious weeds.
3. Fuel treatments may be ecologically beneficial in tree plantations where past logging left behind unnatural fuel profiles.
4. Naturally ignited wildland fires may be beneficial to a variety of conservation objectives in Klamath forests. Home ignitability mitigation in the wildland-urban interface may increase options for backcountry wildland fire use.

Issue Statement: The EA must inform the decision maker of the full range of responsible opinion on potential fire severity effects, including conclusions in the following paper: Odion, D.C., E.J. Frost, J.R. Strittholt, H. Jiang, D.A. DellaSala and M.A. Moritz. 2004. Patterns of fire severity and forest conditions in the western Klamath Mountains, California. *Conservation Biology* 18(4): 927-936”.

Discussion: The paper by Odion et al. (2004) was reviewed and determined not to apply to the Porcupine Vegetation and Road Management Project. This study is frequently cited in public comments for projects on the McCloud Flats. The Odion report discusses the fire severity in a portion of the Klamath-Siskiyou ecoregion of northwestern California as mapped on page 929. The study area includes vegetation, topography, and environmental conditions that differ greatly from the conditions in the Porcupine Vegetation and Road Management Project area. Natural vegetation in the study area is predominantly Douglas-fir forest with a tanoak understory in rugged topography with steep river drainages. The Porcupine Vegetation and Road Management Project area is predominantly ponderosa and mixed conifer forest on relatively flat terrain. Fires in the Odion study area are driven by topography, in contrast to wind driven fires on the McCloud Flats.

Disposition: The effects analysis for all resources will include a discussion of the full range of possible environmental effects. The findings in the Odion report have little relevance to the Porcupine Vegetation and Road Management Project analysis because they are based on vegetation and topographic conditions that are not found in the Porcupine Vegetation and Road Management Project area,. The comment does not provide any discussion that would link the study to the Porcupine Vegetation and Road Management Project.

Resource Area: Fuels, All resources

KSWC, KFA, EPIC Comment #18 – Logging Creates Dangerous Fuel Conditions

Source: KSWC, KFA, EPIC, letter received 5/24/07

Comment: “The proposed regeneration logging would substantially increase available fuel loads by relocating tree crown material (i.e., tree tops, limbs, needles) that is not currently available to burn to the soil surface, where it would become available fuel for flaming combustion. Relocating flammable biomass from the canopy to the soil surface would dramatically change the fuel complex in the project area and significantly increase the immediate risk of a severe fire.

The National Fire Danger Rating System assesses fire behavior and determines whether control efforts will be effective. That model considers heavy logging slash to generate the highest fireline intensity of any wildland fuel type when it is dry (Andrews and Rothermel 1982). The change in the fuel model resulting from logging would cause higher rates of fire spread and greater flame lengths when an ignition occurs. Logging without timely treatment of slash is the single most important factor contributing to an increase in the severity of wildfires (Stephens 1998, van Wagtenonk 1996, Weatherspoon 1996).

Direct attack of fire would not be possible under certain weather conditions, so indirect suppression measures would become necessary. This, in turn, would increase the size and cost of the next wildfire. It also increases the likelihood of severe soil heating in the logging units, and it threatens fire fighters and rural residences near the project area by making wildfires more erratic and difficult to control.”

Issue Statement: Logging will result in heavy accumulations of ground fuels.

Discussion: The comment incorrectly assumes that tree tops, limbs and needles would be left on site and contribute to hazardous accumulations of ground fuels. The proposed action includes whole-tree yarding of trees 4 inches DBH and larger. Additional post-treatment activities to reduce fuels are planned: slashing, hand pile and burn, machine pile and burn, and underburn.

Because the project would avoid heavy accumulations of logging slash and would reduce existing ground fuels to acceptable levels, concerns for fire suppression, soil damage, and threat to rural residences are not valid.

Disposition: The comment describes conditions that would not occur through implementation of the proposed action due to project design features to minimize fuels. The proposed action description will clearly display all fuel treatments. The environmental assessment will disclose the effects of the proposed activities on post-treatment fuel loading.

Resource Area: Project Management, Fuels

KSWC, KFA, EPIC Comment #19 – Plantations are Unnaturally Combustible

Source: KSWC, KFA, EPIC, letter received 5/24/07

Comment: “Tree planting authorized in the project would establish even-age plantations containing unnaturally combustible fuel complexes, further increasing the severity and difficulty of control of the next fire. Plantations are far more susceptible to severe fire effects than unmanaged forests (DellaSala et al. 1995), especially where logging slash remains untreated (Weatherspoon and Skinner 1995). The elevated susceptibility of plantations to severe fire is due to:

- Structural characteristics that promote high heat energy output by fire (Sapsis and Brandow 1997).
- Warm, windy and dry microclimates compared to what would exist in an unlogged forest that possessed more structural diversity and ground shading (Countryman 1955, van Wagendonk 1996).
- Accumulations of fine logging debris on the ground surface (Weatherspoon and Skinner 1995).

The number and distribution of even-aged plantations has altered fire behavior and effects at both stand and landscape scales (Hann et al. 1997, Huff et al. 1995). The existence of very combustible even-age tree patches on a forest landscape creates the potential for “a self-reinforcing cycle of catastrophic fire” that the project would perpetuate (Perry 1995). Most plantations occur next to roads, which spread invasive and exotic plants with poor resistance to fire (DellaSala and Frost 2001), and increase the risk of human-caused ignitions (USDA 2000).

In 2002 the Timber Rock Fire burned through 27,000 acres in the Elk Creek Watershed on the Upper Rogue River. The Damage Appraisal Report by the Oregon Department of Forestry found that of the forests 200 years and older that burned only 10% burned high intensity, while 100% of the tree farms less than 35 years old burned so intense that all the trees died.

The ID Team may be interested in the findings of the March 2003 *Wildfire Effects Evaluation Project* conducted by the adjacent Umpqua NF. This report found that:

"The young vegetation, including plantations, experienced a disproportionately high amount of stand replacement mortality caused by crown fires as compared to older, unmanaged forests. Seventy four percent of the plantations that were less than 20 years old were lost. Plantations had a tendency to increase the rate of fire spread and increased the overall area of stand-replacement fire effects by spreading to neighboring stands." Page 4

"Fire burned most plantations with high intensity and spread rapidly through the canopy of these young stands." page 20.

"Plantation mortality is disproportionately high compared to the total area that plantations occupied within the fire perimeter. In fact, mortality in plantations accounted for 41 percent of all mortality on the fires, while the plantation area represented only 22 percent of the total area within the fire perimeter." page 26-27.

"As noted previously, these early seral stands cover a greater portion of the landscape today than occurred historically. Crown fire spreads readily through these young stands: rates of

fire spread can be high and significant areas or mortality can occur in and adjacent to these stands." page 32.

"The extent, and dispersed pattern, of managed, regenerated stands prior to the fire was outside the range of natural variability in most landscape areas. This early-seral vegetation pattern, and the types and arrangement of fuels present, increased the fire's rate of spread and the area of stand-replacement fire effects." page 64.

And finally, the report says that the fire behavior in the old growth was normal--

"The pattern of mortality in the unmanaged forest resembles historic stand-replacement patch size and shape." page 64."

Issue Statement: Tree planting would establish even-aged plantations containing unnaturally combustible fuel complexes, further increasing fire severity and difficulty of control of the next fire.

Discussion: No conifer planting is proposed. Proposed actions include the regeneration of 39 acres of lodgepole pine, which commonly regenerates in even-aged stands after disturbance events such as stand replacing wildfire.

Lodgepole pine is a prolific seed producer. The annual seedfall helps restocking relatively minor disturbances in the stand. The efficacy of this seed source can be seen where disturbance occurs near or within lodgepole pine stands³.

Disposition: The proposed action does not include tree planting, however the regeneration of a lodgepole pine stand is planned. The environmental assessment will disclose the effects of regenerating an even-aged stand of lodgepole pine on fuels and fire severity.

Resource Area: Fuels, Silviculture

³ Lotan, James E. and William B. Chritchfield. Lodgepole Pine. In *Silvics of North America. 1. Conifers; 2. Hardwoods*. Agricultural Handbook 654. Russel M. Burns and Barabara H Honkala Technical Coordinators. 1990. U.S. Department of Agriculture, Forest Service, Washington DC, Vol. 2, 877 p.

KSWC, KFA, EPIC Comment #20 – Effective Hazardous Fuels Management Starts Small

Source: KSWC, KFA, EPIC, letter received 5/24/07

Comment: “Fire behavior and severity depend on fuel properties and their spatial arrangement.

Fuel bed structure plays a key role in fire ignition and spread, and is central to developing an effective fuel management strategy (Graham et al. 2004). The bulk density (weight within a given volume) of *surface fuels* consisting of grasses, shrubs, litter and dead woody material in contact with the ground are critical frontal surface fire behavior (heat output and spread rate – intensity) compared to simple fuel loading (weight per unit area) (Agee 1996, Sandberg et al. 2001). High surface fire intensity usually increases the likelihood of overstory canopy ignition and torching (Scott and Reinhardt 2001).

The shrub and small tree fuel stratum also is important to crown fire ignition because it supports surface fire intensity and serves as *ladder fuel* that facilitates vertical movement of fire from the ground surface into the canopy. The size of the gap between the ground and tree canopies is critical to ignition of crown fire from a surface fire (Van Wagner 1977, Graham et al. 2004). Van Wagner (1977) reports that crown fires are ignited after a surface fire reaches critical fire line intensity relative to the height of the base of aerial fuels in the crown. This crown ignition can become a running crown fire if its spread rate surpasses a certain canopy density threshold. Agee (1996) suggests a *canopy bulk density* threshold of 0.1 kg/ha as a general determinant for crown fire activity under extreme weather conditions. However, Keyes and O’Hara (2002) note the incompatibility of such open forest conditions with key forest management objectives including wildlife conservation and prevention of understory initiation and ladder fuel development, especially in the absence of an institutional commitment to stand maintenance.

Omi and Martinson (2002) sampled wildfire areas to describe the effectiveness of fuel treatments on subsequent fire severity. The strongest correlation they found was that between crown base height and “stand damage,” which they used as a measure of severity. Importantly, canopy bulk density was not strongly correlated to fire severity. Instead,

height to live crown, the variable that determines crown fire initiation rather than propagation, had the strongest correlation to fire severity in the areas we sampled... [W]e also found the more common stand descriptors of stand density and basal area to be important factors. But especially crucial are variables that determine tree resistance to fire damage, such as diameter and height. Thus, “fuel treatments” that reduce basal area or density from above (i.e., removal of the largest stems) will be ineffective within the context of wildfire management (p. 22).

The Omi and Martinson (2002) study failed to collect information about fuel profiles before the fires, and the scale of events considered confounds replication. However, the authors claim that their results can be extrapolated widely to other sites. A key implication of the study is the importance of treating fuels “from below” in order to prevent widespread occurrence of stand replacing wildland fires. Keyes and O’Hara (2002, 107) concur that increasing a stand’s crown base height is critical and argue, “pruning lower dead and live branches yields the most direct and effective impact.”

Issue Statement: Effective fuels management needs to emphasize treating understory fuels.

Discussion: The comment provides scientific literature emphasizing treatment of fuels in the lower vegetation layers as more effective fuels management than reducing crown bulk density. The discussion in the comment is generally consistent with treatments described in the proposed action.

The Omi and Martinson (2002) study was reviewed and supports proposed treatments in the Porcupine Vegetation and Road Management Project as an effective method of reducing wildfire severity. Thinning from below, as proposed in the Porcupine Vegetation and Road Management Project, is described as more effective in raising height to live crown than in reducing crown bulk density. Thinning from above would have the opposite effect. Omi and Martinson identify height to live crown as the most important variable affecting fire severity. Larger tree diameter and height are also emphasized as important variables in determining a tree's resistance to fire damage. Treatments proposed in the Porcupine Vegetation and Road Management Project would emphasize retaining the largest trees in the stands while removing the smaller understory trees with a subsequent increase in the height to live crown. Therefore, the Porcupine Vegetation and Road Management Project is consistent with both the comment and the study by Omi and Martinson. There appears to be no debate or dispute about environmental effects from this comment.

The quote from Keyes and O'Hara (2002) that "pruning lower dead and live branches yields the most direct and effective impact" has been taken out of context. The report goes on to say that this method is desirable for younger stands but that "a more traditional method is thinning from below, an approach that is more efficient than pruning when the target crown base height is very high." A pruning-only treatment would not meet forest health objectives and would limit the ability to treat ground fuels.

Disposition: The discussion in the comment is generally consistent with the proposed treatments. There appears to be no debate or dispute about environmental effects from this comment.

Resource Area: Fuels

KSWC, KFA, EPIC Comment #21 – Mechanical Thinning Creates Fire hazards

Source: KSWC, KFA, EPIC, letter received 5/24/07

Comment: “Thinning in the context of commercial forestry is not new, but its usefulness as a tool to reduce fire behavior is scientifically controversial and experimental (Carey and Schumann 2003, DellaSala and Frost 2001, FEMAT 1993). The Congressional Research Service tried but failed to locate research documenting a positive relationship between timber harvest and decreased fire intensity or severity, even though the idea is “logical and widely accepted” (Gorte 2000a). It found that “other independent variables” such as weather and topography “are critical factors in determining the extent and severity of any particular fire,” confirming similar findings by fire ecologists (Beaty and Taylor 2001, Odion et al. 2004).

Thinning may reduce total fuel loads (i.e., biomass weight per unit area), but it also opens forest canopies and allows increased solar radiation and wind to reach the forest floor (Agee 1996, Countryman 1956). The net effect is to reduce subcanopy moisture and increase the flammability of surface fuels:

In the open, solar radiation impinges directly on the earth’s surface. Because both the earth and the air above it are poor conductors, heat is concentrated at the surface and in the layer of air next to it. Ground fuels can thus become superheated ... A mature, closed stand has a fireclimate strikingly different from that in the open. Here nearly all of the solar radiation is intercepted by the crowns ... Because of the lower temperature and higher humidity, fuels within closed stands are more moist than those in the open under ordinary weather conditions ... [F]irebrands that do not contain enough heat to start a fire in a closed stand may readily start one in the open. Fires starting in the open also burn more intensely and build up to conflagration proportions more quickly since less of the heat produced by the fire is used in evaporating water from the drier fuels (Countryman 1956, 15-16).

To the extent that commercial thinning and group selection cutting strives to create relatively open forest stand conditions, changes to fire climate and intensified fire behaviour are likely to occur after timber harvest. The EA should address the potential for reduced canopy closure to increase solar radiation, ground level wind speed, surface fuel moisture and flammability to result from proposed timber harvest. Implications for fire suppression effectiveness and worker safety also should be addressed.

Mechanical thinning also generates large quantities of flammable slash by transferring branches, twigs and needles from the canopy to the ground (Allen et al. 2002, Graham et al. 2004, Stephens 1998, van Wagendonk 1996, Weatherspoon 1996). The CRS noted:

Timber harvesting removes the relatively large diameter wood that can be converted into wood products, but leaves behind the small material, especially twigs and needles. The concentration of these “fine fuels” on the forest floor increases the rate of spread of wildfires. Thus, one might expect acres burned to be positively correlated with timber harvest volume (Gorte 2000b).

Federal land managers routinely report that mechanical thinning projects increase fine surface fuels in the form of logging slash by 3 to 15 tons per acre, which can create faster rates of fire spread and greater flame lengths, resulting in intensified fire behavior and extended fire duration (USDI 2002a, 2002b). Indeed, the 2002 Squires Peak fire in the Middle Applegate watershed exploded past containment lines when it spread into logging slash left behind after the Spencer Lomas timber sale accomplished significantly reduced forest stand canopy bulk density (Kettler 2002a, 2002b). Ironically, the Medford District

BLM framed the purpose and need for Spencer Lomas as fire hazard reduction (USDI 2001).”

Issue Statement: The EA needs to address the effects of reduced crown canopy on microclimate conditions within treated stands and the subsequent implications for fire suppression effectiveness and fire fighter safety.

Discussion: Weatherspoon (1996) discusses changes to fuels and microclimate as a result of opening up forest canopies:

“The ways in which changes in these two sets of factors—fuels and microclimate—as a result of a management activity interact to affect wildfire hazard can be quite complex. The net effect, in terms of the direction of change in hazard, may be obvious in many cases, however. For example, removing most of the large trees from a stand, leaving most of the understory in place, and doing little or no slash treatment—a situation all too familiar in the past—will certainly increase the overall hazard and expected damage to the stand in the event of a wildfire. Everything points in the same direction: removing most of the fire-tolerant large trees; retaining most of the easily damaged small trees; increasing the loading (quantity) and depth of the surface fuel bed; and creating a warmer, drier, windier environment near the forest floor during times of significant fire danger. In contrast, heavily thinning an overstocked stand from below and using whole-tree removal (or chipping and spreading the limbs and tops), followed by a prescribed understory burn to reduce natural fuels, will almost certainly reduce the wildfire hazard of the stand. Computer simulations of the effects of such treatments on fire behavior (van Wagtenonk 1996), along with anecdotal reports of how such stands have fared during a wildfire in comparison with surrounding untreated stands, provide strong support for this conclusion. In this case, the “negative” effects on microclimate of opening the stand are outweighed by the reduction in live and dead fuel loading and continuity.”⁴

The proposed action would thin overstocked stands from below, use whole-tree removal, and reduce accumulations of ground fuels. Based on Weatherspoon’s discussion, the “negative” effects of opening the stand would be outweighed by the reduction in fuel loading and continuity.

The last three paragraphs of the comment claim that thinning “generates large quantities of flammable slash”. The proposed action would use whole tree yarding, pile and burn, and broadcast burning to reduce activity fuel. Post-activity fuel loads will be in the range of 10-15 tons/acre – a level that has been determined to be adequate to meet soil quality standards and wildlife habitat needs while reducing fuel loads to an acceptable level. This comment is not valid for the project because it does not consider the effect of whole-tree removal and post-harvest fuel treatments.

Literature cited in the comment actually supports proposed activities as an effective method of reducing wildfire intensity.

Disposition: The EA will consider the net effect of changes to both fuel hazard and stand microclimate.

Resource Area: Fuels

⁴ Weatherspoon, C. Phillip. *Fire-Silviculture Relationships in Sierra Forest*, from Sierra Nevada Ecosystem Project: Final Report to Congress, vol. II, Assessments and scientific basis for management options. Davis: University of California, Centers for Water and Wildland Resources, 1996. (see Volume II, Chapter 44, page 1174)

KSWC, KFA, EPIC Comment #22 – Ecological Effects of Mechanical Thinning

Source: KSWC, KFA, EPIC, letter received 5/24/07

Comment: “Scientific understanding of the ecological effects of mechanical thinning is incomplete, but evidence suggests that such treatments, even when carefully implemented, can adversely affect the environment in key ways. Mechanical thinning can:

- Remove large trees that are disease and fire resistant (DellaSala et al. 1995, USGAO 1999, Gorte 2000a, 2000b).
- Increase mortality of residual trees due to pathogens and mechanical damage to boles and roots (Filip 1994, Hagle and Schmitz 1993).
- Damage soil integrity through increased erosion, compaction and loss of litter (Harvey et al. 1994, Meurisse and Geist 1994).
- Create sediment pulses in streams that harm fish (Grant and Wolff 1991, Beschta 1978).
- Retain insufficient densities of large trees and woody debris to sustain viable populations of cavity nesting and woody debris dependent species (DellaSala et al. 1995).
- Reduce habitat quality for sensitive species associated with cool, moist micro sites or closed canopy forests (FEMAT 1993).

Mechanical thinning proposals advanced by federal foresters routinely require incidental take permits to harass, harm or kill species listed as threatened under the Endangered Species Act. To the degree that thinning opens forest canopies and eliminates multi-layered internal forest structure, it generally is not compatible with conservation of habitat for spotted owl or other sensitive species that may exist in the analysis area.”

Issue Statement: Mechanical thinning can adversely affect the environment.

Discussion: The first bullet states that thinning can remove large trees. Thinning prescriptions proposed in the Porcupine Vegetation and Road Management Project would actually retain the largest trees in stands. All proposed thinning would thin from below.

The second bullet states that increased mortality can result from thinning due to pathogens and mechanical damage. Some trees may receive mechanical damage; however, overall forest health should increase due reduced stocking and an associated increase in available water and nutrients to residual trees. The adverse effects of thinning will be weighed against the benefits of proposed treatments in the EA.

The third bullet states that soil integrity may be damaged through erosion, compaction, and loss of organic material. Site specific investigations have been conducted by soil scientists and unit by unit recommendations will be made in order to limit any potentially adverse effects upon the soil resource. Project design criteria and BMPs would be implemented where applicable to ensure the continuing integrity of soils. Soil impacts resulting from thinning will be discussed in the soils report and disclosed in the EA.

The fifth bullet states that thinning can result in insufficient large trees for cavity nesting species. As discussed above, thinning prescriptions proposed in the Porcupine Road and Vegetation Management Project would not remove the largest trees in the stands. The bullet

also states that thinning can result in insufficient wood debris. Coarse woody debris would be retained at levels consistent with Forest Plan standards and guidelines.

Changes to habitat for species associated with closed canopy conditions will be discussed in the effects analysis in the EA.

Disposition: The comment raises numerous concerns about the ecological effects of mechanical thinning. These concerns have been reviewed and all were determined to be items that will be addressed and the impacts disclosed in the EA.

Resource Area: Silviculture, Soils, Hydrology, Wildlife

KSW Comment #23 – Tractor Yarding and Piling are Significant Impacts

Source: KSWC, KFA, EPIC, letter received 5/24/07

Comment: “Ground-based yarding systems are not compatible sustainable fire production or soil and hydrological health. Especially when it is over 4,300 acres.

We were disturbed to note that the Porcupine project is proposing tractor piling. Mechanical piling is universally recognized as an outdated practice that has disproportionately harmful impacts on watershed values.

Please see:

Evelyn Bull et al. *Trees and Logs Important to Wildlife in the Interior Columbia River Basin* PNW-GTR-391 (1977).

BLM, USGS, *Biological Soil Crusts: Ecology and Management* (Technical Reference 1730-2 (2001) (Available from BLM Publication Management Distribution Service, Bldg 41, E-16 (BC-650B) Denver, CO 80255+0047

We further encourage the project planners to familiarize themselves with soil compaction monitoring reports from 1985 through 1997 on the Payette National Forest. While the Payette contains different ecotypes and soil types than does the McCloud Flats, the monitoring reports clearly show long-lasting and significant soil damage from tractor piling activities. Similar monitoring in the Idaho Panhandle (Jerry Niehoff) and the Kootenai National Forest (Lou Kuennen) demonstrate significant impacts to soils.

We also encourage the project planners to address the findings contained in Geppert, R.R., Lorenz, C.W., and Larson, A.G., 1984. *Cumulative Effects of Forest Practices on the Environment: A State of the Knowledge*. Wash. For. Practices Board Proj. No. 0130, Dept. of Natural Resources, Olympia, Wash.

Our organizations strongly believe that manual piling is far preferable to tractor piling. Manual piling has none of the negative impacts to soils associated with tractor piling, provides an increased opportunity for local employment and significantly reduces long term damage to soil health and productivity.”

Issue Statement: The analysis must consider the effects of tractor yarding and tractor piling.

Discussion: Machine piling and burning has been prescribed as an activity fuel treatment in especially dense or multi-storied stands. It would also create seedbeds for natural regeneration where the overstory canopy is open. The proposed action includes 413 acres of machine piling and burning; 38 acres in the lodgepole pine green-tree retention (regeneration) harvest; 343 acres in multi-storied late-successional forest with heavy ladder fuels; 32 acres in mid-successional forest within roaded recreation management prescription with a high fuel hazard.

The potential effects of tractor yarding and piling on the soils resource will be analyzed on a unit by unit basis. Project design criteria and BMPs will be used to minimize likely adverse impacts where the need is determined and the effectiveness of such practices has been demonstrated.

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Disposition: The effects of various ground-disturbing activities will be evaluated and disclosed in the effects analysis in the EA, including economic feasibility.

Resource Area: Silviculture, Soils, Hydrology, Wildlife

KSWC, KFA, EPIC Comment #24 – Roads

Source: KSWC, KFA, EPIC; letter dated 5/20/07

Comment: “We remain extremely concerned about the potential for this action to increase the risk of sedimentation, peak flows, and soil compaction due ground-based disturbance from possible “temporary” road construction and tractor yarding/piling.

A peer-reviewed article by Trombulack and Frissell (2000) detailing some of the negative impacts of road construction and use on Terrestrial and Aquatic ecosystems and must now be included in the Administrative Record for this timber sale. The abstract for the article reads as follows:

Roads are a widespread and increasing feature of most landscapes. We reviewed the scientific literature on the ecological effects of roads and found support for the general conclusion that they are associated with negative effects on biotic integrity in both terrestrial and aquatic ecosystems. Roads of all kinds have seven general effects: mortality from road construction, mortality from collision with vehicles, modification of animal behavior, alteration of the physical environment, alteration of the chemical environment, spread of exotics, and increased use of areas by humans. Road construction kills sessile and slow-moving organisms, injures organisms adjacent to a road, and alters physical conditions beneath a road. Vehicle collisions affect the demography of many species, both vertebrates and invertebrates; mitigation measures to reduce roadkill have been only partly successful. Roads alter animal behavior by causing changes in home ranges, movement, reproductive success, escape response, and physiological state. Roads change soil density, temperature, soil water content, light levels, dust, surface waters, patterns of runoff, and sedimentation, as well as adding heavy metals (especially lead), salts, organic molecules, ozone, and nutrients to roadside environments. Roads promote the dispersal of exotic species by altering habitats, stressing native species, and providing movement corridors. Roads also promote increased hunting, fishing, passive harassment of animals, and landscape modifications. Not all species and ecosystems are equally affected by roads, but overall the presence of roads is highly correlated with changes in species composition, population sizes, and hydrologic and geomorphic processes that shape aquatic and riparian systems. More experimental research is needed to complement post-hoc correlative studies. Our review underscores the importance to conservation of avoiding construction of new roads in roadless or sparsely roaded areas and of removal or restoration of existing roads to benefit both terrestrial and aquatic biota.

-Trombulak, S.C. and C.A. Frissell. 2000. Review of ecological effects of roads on terrestrial and aquatic communities. *Conservation Biology* 14(1): 18-30.

The cumulative impacts of “temporary” road construction, tractor yarding and tractor piling in this highly impacted watershed should be fully disclosed in the EA. In addition to disclosing these cumulative impacts, we strongly urge the Forest Service to simply avoid the negative impacts associated with these practices.

The impacts of tractor logging on soil health and water quality are well established. Please see Rice and Datzman 1981.

Issue Statement: The analysis must consider the cumulative effects of all ground-based disturbance including road construction and tractor yarding/piling.

Discussion: A project-level roads analysis evaluated the existing road system and identified additional needs and opportunities. The transportation system within the project area is essentially complete and no additional new road construction is anticipated. Temporary short spur roads may be necessary to access some treatment units, however, an existing network of skid-trails would be utilized wherever possible in order to decrease new ground disturbance. Where appropriate, measures will be taken to prepare beds on which machinery would travel in order to protect the soil resource. Removal of roads would occur as part of meadow restoration activities, and temporary spur roads and skid-trails would be de-compacted after harvest operations are complete. Where appropriate, temporary road and skid trails may be covered with organic material or seeded with native plants to restore protective vegetation cover. The effects of all road activities will be disclosed in the environmental assessment.

The project is proposing both hand piling and machine piling. Machine piling would not be used in areas of sensitive soils.

Disposition: The effects of various ground-disturbing activities will be evaluated and disclosed in the environmental assessment.

Resource Area: Soils, Hydrology, Wildlife

KSW Comment #25 – Regeneration

Source: KSWC, KFA, EPIC, letter received 5/24/07

Comment: The project proposes to regeneration harvest on 40 acres. We are generally opposed to regeneration logging on national forests.

Issue Statement: There is no issue.

Discussion: This is not an issue.

Disposition: This is not an issue.

KSWC, KFA, EPIC Comment #26– Large Trees Calm Fire Behavior

Source: KSWC, KFA, EPIC, letter received 5/24/07

Comment: “Large-diameter, standing trees and down logs exhibit several features that tend to mitigate their potential fire risk and hazard. Depending on weather conditions and time of year, their presence on the landscape can serve to lower the risk of rapid, intense fire spreading to adjacent areas. In general, fires burning through heavy fuels such as large-diameter downed logs tend to burn slowly, and depending on their spatial arrangement and fuel moisture levels, large downed logs can actually dampen a fire's intensity and rate of spread.

Large-diameter heavy fuels have low surface area-to-volume (S/V) ratios, which tend to inhibit the amount of oxygen feeding combustion. This is why large-diameter fuels, such as the main stems of standing and downed trees, are not included in agency fire spread models such as BEHAVE. The BEHAVE model only incorporates live fuels up to 1-inch in diameter and dead fuels up to three inches in diameter because these small-diameter fine fuels have high S/V ratios, and thus fuel high fire intensities and rapid rates of spread. Fuels larger than three inches in diameter do not factor in on fire spread calculations because they do not affect fire behavior until long after the fire front has passed.

Site-specific conditions like fuel moisture levels, which can differ according to stage of decay, season of the year, and prevailing weather conditions, can further enhance the relatively low flammability of large-diameter snags and logs. Downed logs can store large amounts of water, especially if the logs lay directly on the ground surface. Forest Service research on hot, dry forest sites in the Klamath-Siskiyou region revealed that even after prolonged drought and high intensity fire events, tremendous amounts of water can still be found in the interior of logs. Indeed, the centers of large logs can actually be cool and moist even when the outer shell of a log is on fire. Consequently, large logs can provide vital refugia or “fire shelters” that enable a number of wildlife species, as well as mycorrhizal fungi and other micro-flora and fauna essential to post-fire natural recovery, to survive fires.

Over a typical fire season, this interior stored water is released slowly over time in the form of water vapor. This water release (coupled with the shade that snags and downed logs provide) can raise the relative humidity of micro-sites, which in turn tends to decrease the rate of evapotranspiration of adjacent live vegetation, and retains higher fuel moisture levels in adjacent dead fine fuels. These microclimatic effects make local sites adjacent to large-diameter downed logs moister and “greener” compared to sites devoid of large downed logs. With significant amounts of stored interior water, large-diameter downed logs can function like “heat sinks” because so much heat energy is required for fire to evaporate the water, heat and ignite the woody biomass. In effect, large downed logs with sufficient stored water function like natural fire extinguishers that can retard fire intensity and rate of spread.

Large downed logs can also provide important shade structures that obstruct solar radiation and surface winds. These microclimate influences can result in lower ground surface temperatures and reduced surface wind speeds, which translate into higher live and dead fuel moisture levels compared to areas cleared of shade from standing or downed trees. Large downed logs can also reduce the speed and variability of surface winds, which inhibits extreme or erratic fire behavior. Thus, the ability of large downed logs to store water and provide shade from the sun and wind can function to lower the fire intensity and rate of spread on those specific sites.

We refer the agency to; "A Report to the President In Response to the Wildfires of 2000" September 8, 2000 by USDA FOREST SERVICE and DEPARTMENT OF THE INTERIOR. Find this report at: <http://www.fireplan.gov/president.cfm>.

The following is taken directly from PART III of the report, "Key Elements of the Administration's Wildland Fire Management Policy."

"The removal of large, merchantable trees from forests does not reduce fire risk and may, in fact, increase such risk. Fire ecologists note that large trees are "insurance for the future - they are critical to ecosystem resilience."

Targeting smaller trees and leaving both large trees and snags standing addresses the core of the fuels issue.

The Congressional Research Service (CRS) addressed the effect of logging on wildfires in an August 2000 report and found that the current wave of forest fires is not related to a decline in timber harvest on Federal lands. From a quantitative perspective, the CRS study indicates a very weak relationship between acres logged and the extent and severity of forest fires. To the contrary, in the most recent period (1980 through 1999) the data indicate that fewer acres burned in areas where logging activity was limited.

Since 1945, the fluctuation pattern of acres burned in the 11 Western States has shown a steady rise with some of the worst fire seasons in the late 1980's, when timber harvest peaked at 12 billion board feet. In fact, the 10-year average annual number of acres burned nationwide in the 1980's when logging activity was heaviest was higher (4.2 million acres) than in both the 1970's (3.2 million acres) and the 1990's (3.6 million acres).

Qualitative analysis by CRS supports the same conclusion. The CRS stated: "[T]imber harvesting removes the relatively large diameter wood that can be converted into wood products, but leaves behind the small material, especially twigs and needles. The concentration of these fine fuels on the forest floor increases the rate of spread of wildfires."

Similarly, the National Research Council found that logging and clearcutting can cause rapid regeneration of shrubs and trees that can create highly flammable fuel conditions within a few years of cutting. Without adequate treatment of small woody material, logging may exacerbate fire risk rather than lower it.

The forthcoming NEPA document must analyze and disclose the factors that mitigate the flammability of large fuels. It also failed to analyze the full range of adverse effects on wildlife, vegetation, and natural recovery processes (such as elimination of refugia during future fire events) that would result from salvage logging the large-diameter snags and logs.

Issue Statement: Large-diameter, standing trees and down logs should be retained to mitigate potential fire risk and hazard.

Discussion: The proposed treatments, with the exception of the lodgepole regeneration harvest, would thin the stand from below, remove small diameter trees and retain large diameter trees. Proposed activities would treat small diameter stems through biomass thinning (and removal), slashing, hand pile and burn, machine pile and burn, and underburn. Down logs would be retained within Forest Plan standards.

Disposition: The environmental assessment will disclose the effects of the proposed activities on potential fire risk and hazard.

Resource Area: Fuels

KSWC, KFA, EPIC Comment #27– Be Accurate in Describing Fire Intensity

Source: KSWC, KFA, EPIC, letter received 5/24/07

Comment: “Please do no “lump” moderate and severe fire intensity in your analysis. The NEPA document should clearly describe the difference in salvage logging impacts on forests that have experienced fire of different severity. For instance, soils that are severely burned are likely to respond to ground-based yarding differently than sils that are moderately burned.”

Issue Statement: The environmental assessment should clearly describe the difference in salvage logging impacts on forests that have experience fire of different severity; do not lump areas of moderate and severe fire intensity in the analysis.

Discussion: No post-fire salvage harvest has been proposed. This issue is not relevant to this project.

Disposition: This issue is not relevant to this project because there is no proposal for post-fire salvage harvest.

Resource Area: Fuels

SPI Comment #1 – Post-Treatment Activities

Source: Robert Hoover, Sierra Pacific Industries, letter dated 5/23/07

Comment: “During development of the EA, outline the necessity for and timelines of post-treatment activities.”

Issue Statement: The need for post treatment activities and the timing of the activities should be disclosed in the analysis.

Discussion: All planned post-treatment activities and their timing will be clearly disclosed in the description of the proposed action, alternatives, or mitigation sections of the document. Resource analysis will include discussion of the proposed activities or mitigation measures and their effectiveness or need.

Disposition: All planned post-treatment activities and there timeframes will be disclosed in the environmental assessment.

Resource Area: Silviculture, Fuels

SPI Comment #2 – Economic Feasibility

Source: Robert Hoover, Sierra Pacific Industries, letter dated 5/23/07

Comment: “Feasibility analysis should be kept in the forefront during the development of this project. Use of commercial timber sales should be the primary mechanism for project implementation. Please use the most current market values during the economic analysis.”

Issue Statement: Timber sale economics should be considered in the analysis.

Discussion: Although the project objectives are focused on forest health, fuels reduction, and meadow restoration, commercial timber sales are recognized as the primary mechanism for moving the project area towards the desired condition.

An economic evaluation of alternatives will be included in the environmental consequences section of the environmental assessment.

The project planning team has acquired a copy of the “*Region 5 Timber Sale Marketing Analysis and Sale Evaluation Study*” and will consider its use in the economic evaluation of alternatives.

Disposition: An economic evaluation of the alternatives will be included in the environmental assessment.

Resource Area: Economics

SPI Comment #3 – Economic Impact of Historic Railroad Grade Protection

Source: Robert Hoover, Sierra Pacific Industries, letter dated 5/23/07

Comment: “Please look closely at the economic impacts that protection/avoidance of railroad grades will have on the timber sales spawned by the project.”

Issue Statement: The impact of protecting historic railroad grades on timber sale economics needs to be considered.

Discussion: Protection and avoidance of old historical railroad grades can add additional costs to timber sale economics; however protection of historic sites is required by law. The Forest is evaluating the significance of these sites, in consultation with the CA State Historic Preservation Office, to determine the need for future protection. Crossing locations are being identified with the District archaeological staff to allow timber harvest operations to continue without significant impacts to the site. Trees growing within or adjacent to the grades can be harvested mechanically or by hand without adversely affecting the resource. In addition, removal of trees within or adjacent to sites would provide protection by preventing root damage or windfall.

Although several railroad grades within the Porcupine Vegetation and Road Management Project will require protection, they are not expected to significantly affect timber sale economics. Avoidance of the sites would not create unreasonable skidding distances. Reasonable alternatives are available at all sites.

Disposition: Protection of railroad grades is not expected to affect project timber sale economics. Any impacts on timber sale operations will be disclosed in the economic analysis in the EA.

Resource Area: Economics, Archaeology

IDT #1 – Northern Spotted Owl Habitat

Source: Sean Hill, IDT Wildlife Biologist

Comment:

Issue Statement: A pair of northern spotted owls was found roosting near the northern portion of the Porcupine project area. Spotted owl survey responses during 2006 and 2007 were located across much of Six Shooter Butte, which lies adjacent to the project. Despite uncertainty of the location of a nesting or roosting stand, habitat was modeled using suitable habitat and response locations, with the result that modeled habitat covers most of Six Shooter Butte. Using this as a base “home range” or “activity center”, some of the proposed treatments within the Porcupine LSR fall within the potential home range. This area is classified as foraging habitat. Proposed treatments would maintain the foraging habitat, however management activities during critical periods could disturb the owls.

Discussion: Proposed treatments within the LSR and home range should reduce the risk of habitat loss due to forest insects or wildfire, and maintain foraging habitat. Treatment activities could cause disturbance. However, restricting activities during key periods should provide protection.

Disposition: Project design will include restrictions on harvest and post sale operations within potential northern spotted owl home range from February through August.

Resource Area: Wildlife

IDT #2 – Regeneration Harvest of Mature and Overmature Stands

Source: John Natvig, IDT Leader

Comment:

Issue Statement: The project area includes matrix lands with areas of commercial wood products emphasis. The purpose of this prescription is to obtain an optimum yield of wood fiber products from productive forest lands. Mature and overmature stands within these lands should be regenerated for optimum yield of wood fiber.

Discussion: The proposed action only includes the regeneration harvest of one stand. Additional stands are mature or overmature and could be regenerated.

Disposition: An alternative will be considered which includes additional regeneration harvest of mature and overmature stands within the matrix land allocation and areas commercial wood products emphasis

Resource Area: Silviculture

IDT #2 – Project Level RAP Recommended Actions

Source: John Natvig, IDT Leader

Comment:

Issue Statement: A project level RAP was completed in June 2007. The RAP recommendations for road closure, decommissioning, upgrade, and additions to the road system should be included project actions.

Discussion: The project level RAP recommendations could be incorporated into alternative actions. These are similar and/or connected actions to the proposed action. Many of the recommendations for closure, decommissioning, and upgrade can be implemented through the timber sale contract associated with an action alternative. Roads recommended for closure or decommissioning and used during timber sale harvest operations would be closed. The road proposed for upgrade would facilitate log and chip hauling by improved surfacing. Road actions not directly related to the timber sale could be implemented within the same timeframe through other funding sources.

Disposition: Project level RAP recommendations for road closure, decommissioning, upgrade, and additions to the road system will be included in alternative actions.

Resource Area: Project management