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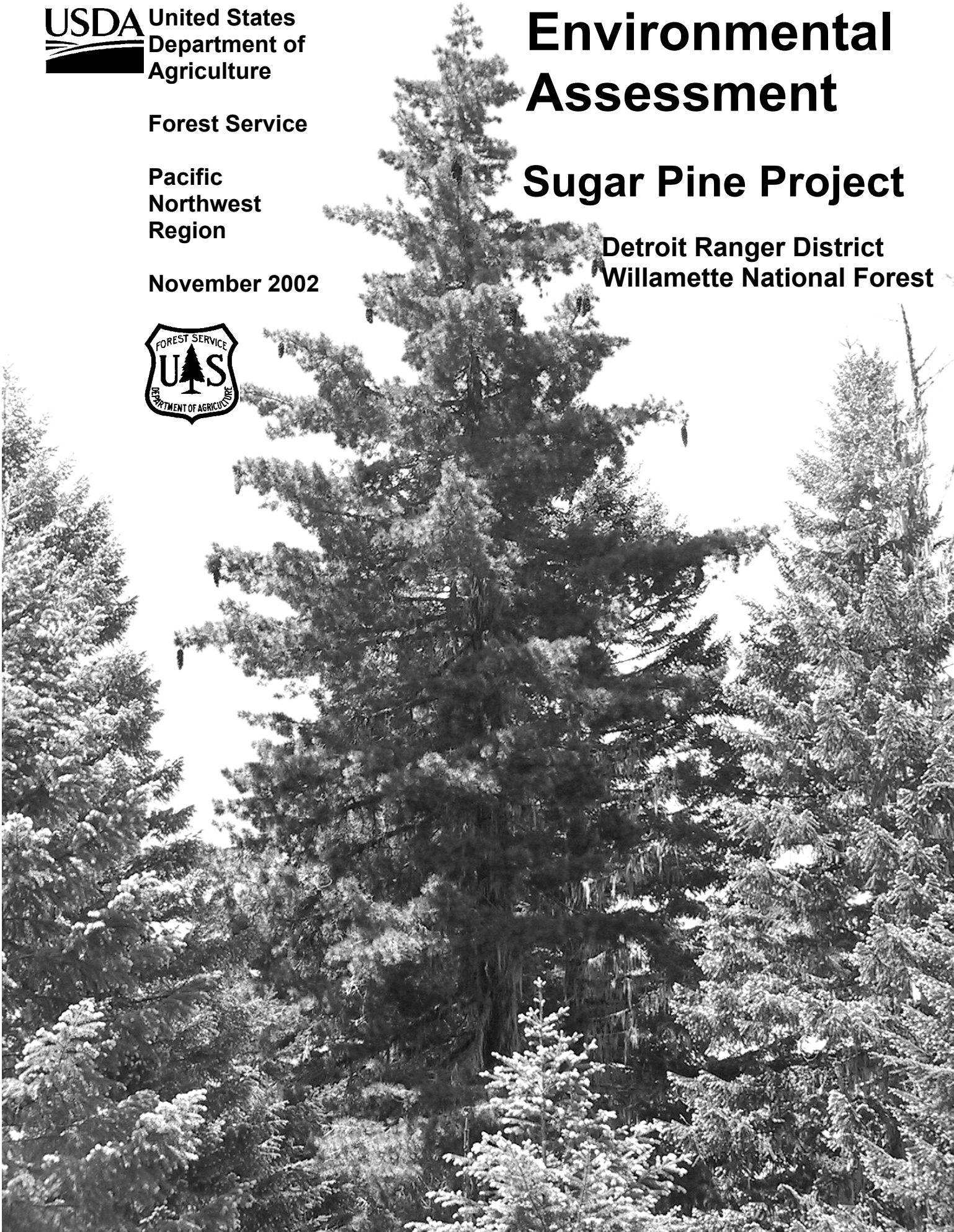
**November 2002**



# **Environmental Assessment**

## **Sugar Pine Project**

**Detroit Ranger District  
Willamette National Forest**



# Environmental Assessment

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## Sugar Pine Project

November 2002

Lead Agency: USDA Forest Service  
Willamette National Forest  
Detroit Ranger District  
Marion County, Oregon

Responsible Official: Gina Owens - Acting District Ranger  
Detroit Ranger District  
Willamette National Forest

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Comments Must Be Received By: January 3, 2003

Submit Written Comments To: Gina Owens – Acting District Ranger  
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Mill City, OR 97360

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# Sugar Pine Project Environmental Assessment

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# CHAPTER I: PURPOSE AND NEED FOR ACTION

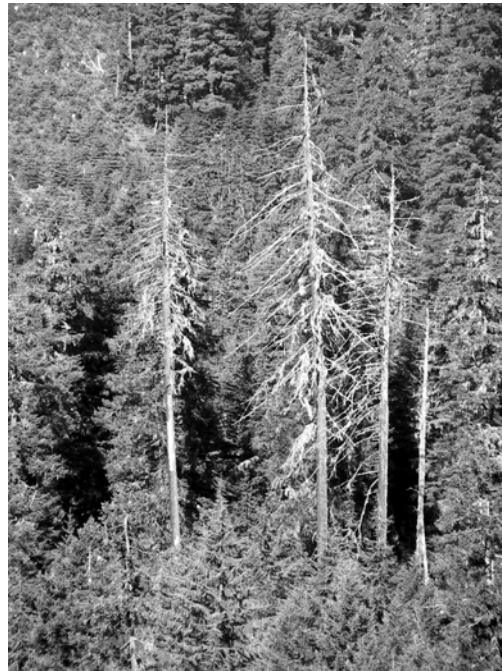
## 1. Purpose and Need for Action

This proposed project is located within the East Humbug Creek drainage (T. 9 S., R. 6 E., Sec. 14 & 15, W.M.), six miles northeast of the town of Detroit, Oregon (See Figure 1.1). The project addresses the recent death of old growth sugar pine in the East Humbug drainage. The area is within the Breitenbush Watershed Analysis area completed in 1996. That analysis identified high sugar pine mortality as a concern and the need for restoring fire to stands exhibiting evidence of natural underburning.

Based on the comparison of the current condition and the desired conditions (as described in the *Willamette National Forest Land and Resource Management Plan, as amended by the Record of Decision and Standards and Guidelines for Management of Habitat for Late Successional Species and Old Growth Dependent Species Within the Range of the Northern Spotted Owl (NWFP 1994)*) the Detroit District Ranger has determined that there is a need for maintaining the existing large remnant overstory sugar pine trees and promoting the regeneration of new sugar pine in the East Humbug drainage on the Detroit District. The National Forest Management Act (Article 219.27) states, “preserve and enhance the diversity of plant and animal communities...so that they are at least as great as that which would be expected in a natural forest and the diversity of tree species is similar to that existing in the planning area.”

Specifically, the purpose of the project is to:

- ❑ Reduce mortality to sugar pine from mountain pine beetles;
- ❑ Reduce the number (stocking) of smaller diameter trees and other vegetation from competing with sugar pine trees;
- ❑ Provide openings in which to establish sugar pine regeneration;
- ❑ Reduce overall, the amount of ground fuels and ladder fuels to lessen the risk of a stand replacing fire; and
- ❑ Reintroduce fire to the sugar pine ecosystem.



**Photo 1: Dead, old growth sugar pine in stand S**

## 2. Existing Condition

The project area is near the northern limit of sugar pine's natural range. The East Humbug drainage lies in a local rain shadow and has dry, southerly aspects that favor sugar pine. Within the last decade about half of the large sugar pine trees in this area have died. It is believed that this level of mortality is currently higher than in the past, since this rate of mortality could not be sustained over a long period without eliminating the species. The mortality is greatest in the stands with the highest tree densities. It is projected that within two decades, given the current dense stand conditions, nearly all of the old growth sugar pine in the drainage will be dead.

The current condition of sugar pine in the East Humbug watershed is described in a 1995 Oregon State University Masters Thesis, Fire History and Fire Regimes of East Humbug and Scorpion Creeks and their Relation to the Range of *Pinus lambertiana*, by Edward S. Garza. This study concluded: "Sugar pine is found most commonly on sites that burn more frequently and where fires do not consume large areas of forest canopy... The median fire return interval is 94 years with a minimum interval of 22 years. All aspects within the drainage have about the same return interval. The last stand replacing fire in the drainage occurred during the 1890's. Careful use of thinning and fire might improve the chance that sugar pine will persist."

Currently, fuel loadings in this project area range from about 19 to 46 tons per acre for down material which exceeds Willamette National Forest Plan Update No. 2 for Forest wide Standards and Guides, Table IV-32 Hazard Reduction Specifications. Up to 15 to 23 tons/acre of fuel loading are allowed in this specification. These "Hazard Reduction Specifications" represent the upper limit of fuel loadings for which we are able to successfully initial attack a wildfire with ground forces. The range of the current fuel loadings increases the likelihood that a wildfire will become a "stand replacement" fire in the Sugar Pine project area.

Streams are characterized within the Breitenbush Watershed Analysis page II-19. A long history of fires removed much of the larger vegetation from the landscape, leaving streams without an adequate supply of large woody material to provide structure and store sediments. These areas generated increased peak flows and a landscape more susceptible to debris torrents. This natural occurring fire-peak / flow-debris torrent scenario continues to greatly influence channel development in this area. These channels tend to act like pipes and pump sediments through to higher order stream channels. Due to the extended history of fire prevention, these headwalls are loading themselves for a future intense rainfall event at which time they will release their material into the higher order streams. This is consistent with the natural sediment regime for the area.

Riparian reserves associated to the proposed stands are composed of mainly upland species with localized riparian species. There exists a clear ecotone break between the true riparian and the even age high density portions of the reserve. Incidental sugar pine trees occur within the margins of these reserves. Where sugar pine trees occur within these reserves, it is expected that the adjacent stand would reflect historic fire frequency conditions and would represent historic conditions within the reserve. Units J, K, L, M, N, and P are located high on the hillside and contain 1<sup>st</sup> and 2<sup>nd</sup> order channels (small intermittent and ephemeral streams). Units R and S contain 1<sup>st</sup> and 2<sup>nd</sup> order channels and are adjacent to named fish bearing streams (Fox and East Humbug Creeks).

During the summer of 2000, the Detroit District Geologist, Douglas Shank, inventoried 160 live and mostly mature sugar pine within the ten stands of the planning area. His findings were as follows:

1. On the average, at least one dead sugar pine tree was observed for each live sugar pine tree recorded; most of the mortality has occurred within the last decade and sugar pine of all sizes have died.
2. It appears an inverse correlation exists between stems per acre and living sugar pine; as the number of stems increases the number of living sugar pine rapidly decreases – chinquapin, especially over 8 inches in diameter, strongly competed with the sugar pine.
3. Where slash was burned around overstory sugar pine leave trees in adjacent timber sale units, most are still healthy.
4. Where sugar pine is growing in more open areas with reduced competition, it is generally growing well and there is some natural regeneration. White pine blister rust, *Cronartium ribicola*, an exotic tree disease is, however, causing high mortality to young sugar pine. Blister rust resistant sugar pine is available for planting but competition from other established vegetation in existing stands limits current planting opportunities.



**Photo 2: Young, natural sugar pine in an opening**



<b>Table 1.1: Sugar Pine Project - Summary of Stand Conditions</b>					
<b>STAND</b>	<b>*Acres</b>	<b>Basal Area <sup>1</sup> (Sq. ft./acre)</b>	<b>Total # of Live Sugar Pine</b>	<b>Fuel Loading (Tons/ac.)</b>	<b>Fuel Depth (ft.)</b>
<b>J</b>	6	296	5	20	1.8
<b>K</b>	13	310	12	26	2.1
<b>L</b>	9	243	9	38	2.2
<b>M</b>	10	97	22	20	1.6
<b>N</b>	36	213	25	20	1.7
<b>P</b>	18	284	13	19	1.6
<b>R</b>	36	171	15	21	1.5
<b>S</b>	59	146	39	46	1.0
<b>TOTAL:</b>	<b>187</b>	<b>Ave. 195</b>	<b>140</b>	<b>Ave. 26</b>	<b>Ave. 1.7</b>

\* Acreages used throughout this document are estimated and may change during project implementation due to more precise mapping, or adjustment of the area to be treated in order to meet standards and guides for various resources

<sup>1</sup> Basal area is measured for all tree species in the project area



**Photo 3: Dense, small diameter understory**



### 3. Desired Condition

The Willamette National Forest Land and Resource Management Plan, as amended by the Record of Decision and Standards and Guidelines for Management of Habitat for Late Successional Species and Old Growth Dependent Species Within the Range of the Northern Spotted Owl (NWFP 1994), designates the project area as Matrix land with included riparian reserves. All of the potential treatment acres are within Land Management Allocation 14a, General Forest, or 11a, Scenic Modification – Middleground. About six stream courses are within Management Allocation 15, Riparian. The desired future condition is a healthy forest ecosystem providing a mix of commodity, watershed, wildlife, and recreation outputs. Scenic allocations will be managed to retain the natural features of the forest landscape.

Components of the Desired Condition that are specific to the project area are as follows:

1. The level of mortality in sugar pine from bark beetles is low and long-term survival in the Humbug drainage is not threatened. Sugar pine occurs in a range of sizes and ages distributed throughout area.
2. Insect and disease occurrence is at no more than an endemic level for the stands and there is reduced competition induced mortality.
3. The probability of large, stand replacing fires is reduced due to the lack of ground and ladder fuels.
4. Fuel loadings are below the Forest's Plan Standard and Guides allowable fuel profile. Post harvest fuel loadings meet specifications in accordance with burning prescriptions designed to reduce fire hazard and enhance the Sugar Pine ecosystem.
5. Plants and animals associated with fire dependent ecosystems are abundant because vegetation conditions allow fire to play its historic role of a low intensity underburn.
6. The amount of large woody debris, both down and standing are maintained at or above current levels. In areas where this material has been depleted as a result of past harvesting, the amount is increased as a result of rehabilitation projects, natural mortality of trees, or both.



**Photo 4: A group of older Douglas-fir trees in stand “S” which survived underburning following a small fire in the 1980’s.**

#### **4. Proposed Action**

This section describes the proposed action developed by the Detroit Ranger District Interdisciplinary Team (IDT) to meet the purpose and need for action. A proposed action is not a decision. Specifics of the proposed action, and alternatives to the proposed action, considered in this analysis are described in Chapter 2 of this EA.

The project area is located within the East Humbug Creek drainage (T. 9 S., R. 6 E., Sec. 14 & 15, W.M.), approximately six miles northeast of the town of Detroit, Oregon on the Detroit Ranger District of the Willamette National Forest. This project would occur within the next two years and includes the following proposed actions:

- 1) Treat eight forest stands totaling an estimated 187 acres by either commercial thinning or understory removal or a combination of both (Figure 1.2). The understory removal would remove most trees below 11 inches in diameter (see Table 2.1). The 30+ inch diameter old growth trees in the stands would be retained. Snags, trees and large down woody debris would be retained as directed by the NWFP (1994).
- 2) The treatments would be carried out using skyline and ground-based logging equipment. No new roads would be constructed.

- 3) Brush and slash would be treated through a variety of methods that include a combination of yarding unmerchantable material (YUM) to landings (with subsequent disposal through chipping and removal, piling and burning, or selling material as firewood), by piling and burning within the units, and underburning (see Table 2.1). All units with underburning will be fire-lined utilizing existing firelines from adjacent old burn units and/or adjacent roads.
- 4) Following understory removal, sugar pine and Douglas-fir seedlings would be planted in openings to represent natural conditions.

This project also includes similar and connected actions within the project area that are described in Appendix B – KV Projects. These projects include:

- planting of sugar pine & Douglas-fir seedlings;
- mitigation actions such as noxious weed control and monitoring, and firewood sales to reduce fuel loading; and
- enhancement projects such as dispersed site hardening, pre-commercial thinning, aerial fertilization, in-stream fish structure installation, and tree pruning to prevent white pine blister rust.

## **5. Public Scoping Process and Consultation with Others**

### **Public Scoping Process**

Public scoping is an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action. This section summarizes the public involvement effort made during the planning and analysis stages for this project. The effort included a public scoping packet, mailings, and written and oral communication with the public. Forest Service specialists were also contacted to provide agency concerns and potential issues with the proposed action. Interdisciplinary Team meeting notes are located in Section E of the project record.

Notification of this project was first published in the February 2000 issue of *Forest Focus*, the Willamette National Forest's Schedule of Proposed Actions. In November 2001, a public scoping notice with information about the project was sent to 135 individuals, organizations, agencies, and tribes. Eleven responses were received. A complete record of letters received, messages, and other correspondence are located in Section D of the project record; mailing lists and public scoping information are located in Section C.

### **Consultation with Others**

The Sugar Pine proposal was discussed with representatives of the Grand Ronde Tribes at the annual program of work consultation meeting in May 2002. Representatives of the Warm Springs and Siletz Tribes as well as the Grand Ronde Tribes received a copy of the public scoping notice. No comments were received from any of the tribal groups.

Consultation was conducted with the U.S. Fish & Wildlife Service (USFW) through a programmatic Biological Assessment for wildlife habitat projects submitted on October 11, 2001. A Biological Opinion (1-7-02-F-200) was received on May 21, 2002.

Additional consultation has been submitted to the USFW on August 12, 2002 for treatments within riparian areas not discussed in the programmatic BA previously submitted. A

Decision for this project will not be completed until the Biological Opinion is received from the USFW.

No formal consultation has occurred with the National Marine Fisheries Service (NMFS) due to the lack of Threatened, Endangered, and Sensitive fisheries species above Detroit and Big Cliff Dams.

Consultation with the Oregon State Historic Preservation Officer (SHPO) is not required for this project because survey results did not identify any effects on cultural resources in the project area. A copy of the heritage resource report has been forwarded to SHPO for documentation purposes.

## 6. Significant Issues

Within the context of NEPA, an issue is defined as a discussion, debate, or dispute regarding the environmental effects. Significant issues are used in the environmental analysis for formulating alternatives developing mitigation and tracking effects. The following issue is considered to be significant by the District Ranger.

### Limit Cutting to Spot Treatment Around Sugar Pine

**Issue Statement:** Comments were received from M. Donnelly and J. Hall that tree cutting be limited to the immediate vicinity of sugar pines and not involve entire stand treatments because they believe that treating the entire stand would have an adverse effect on long-term silvicultural health, watershed protection and credibility with the public.

**Forest Service Response:** This issue was used to develop Alternative 3.

## 7. Other Issues Identified but Determined to be Non-Significant

The following is a list of issues that were identified during scoping for this project. These issues were determined not to be significant by the District Ranger and are eliminated from detailed study. Provided is a brief statement of why they would not have a significant effect on the human environment. These issues were not used to develop alternatives to the proposed action, or to develop mitigation measures.

### A. Limit Harvest to Small Diameter Trees

**Issue Statement:** Several comments raised the concern that the silvicultural prescription did not define "small diameter trees" adequately and a request was made that the maximum diameter of cut trees be 17 inches or less or less than 15 inches with 90% of the trees cut to be 11 inches diameter or less

**Forest Service Response:** This is not considered a significant issue because it is very close to what is already described in the Proposed Action. In Chapter 2, where all the alternatives are described in detail, the description of the Proposed Action (Alternative 2) further defines "small diameter trees". All trees greater than 30-inches in diameter

would be retained, and most trees greater than 11-inches in diameter would be retained. Table 2-1 provides the average cut tree diameter and average leave tree diameter for each stand that would be treated.

## **B. Logging Systems & Steep Slopes**

**Issue Statement:** Comments received expressed concern over soil compaction and disturbance and its effects on ecosystem function and water quality. Specific requests were mentioned regarding a desire for no tractor logging or road construction.

**Forest Service Response:** This is not considered to be a significant issue because logging systems and log suspension requirements will be selected and enforced through the timber sale contract to meet Forest Plan standards for soil effects. Experience has shown that applying Best Management Practices and adhering to Forest Plan Standards and Guides will minimize soil impacts and result in no measurable effects to water quality (General Water Quality Best Management Practices, PNW, November 1988: T-4, T-5, T-7, T-8, T-9, T-11, T-12, T-13, and T-16). Approximately 11% of the volume will be harvested using ground based logging systems (tractor, harvester/forwarder). No new road construction is planned for this project.

## **C. Leave The Trees That Are Cut**

**Issue Statement:** A comment was received suggesting that cut trees could be left in some portions of the sale where logs would be difficult to remove.

**Forest Service Response:** This is not considered to be a significant issue. This is a valid suggestion and if there were areas where it would be difficult to remove logs then they can be left. However, we would need to ensure that leaving down wood would not have additional affects on fuel loading. Leaving all the cut trees in a particular area could greatly exceed levels needed for down wood and would exceed maximum fuel loading requirements of 15 – 23 tons per acre (as described in Forest Plan Update Number 2, Oct 21, 1993). Standards and Guidelines for downed wood (240 linear feet per acre greater than 20 inches diameter at the small end or largest available) will be met. If portions of stands are not feasible to log without meeting Standards and Guides, they will be dropped from treatment.

## **D. Economics of Sale**

**Issue Statement:** A comment was made that the economic value of the standing trees (non-timber value) is greater than the commercial value of the cut logs. There were requests for an economic analysis addressing both market and non-market values.

**Forest Service Response:** This comment is outside the scope of this project because economic analysis of this type was done at the Forest Plan level. The purpose for this project is not to produce timber volume, but to restore and maintain (through fuel reduction) sugar pine to the ecosystem. An economic analysis for this project is not

relevant to the choice among different alternatives. Therefore, a economic cost/benefit analysis will not be completed for the Sugar Pine Project.

#### **E. Effects on Wildlife Species**

**Issue Statement:** A concern was raised that the project, through timber harvesting and road construction, would impact the viability of wildlife species. Several comments were received concerning the effect of treatments on various wildlife species.

**Forest Service Response:** This is not considered to be a significant issue because experience and monitoring has shown that removing timber as described in the Proposed Action can be accomplished without affecting species viability. The effects of timber harvesting and species viability is addressed in the Willamette National Forest Plan, and updated in the Northwest Forest Plan. A Biological Evaluation has been prepared for this project addressing impacts to Threatened, Endangered, and Sensitive Species and their viability (Section F, Project Record). Applicable Standards and Guides as well as any Survey and Manage requirements will be applied. No new road construction is planned for this project.

#### **F. Protection of Riparian Reserves**

**Issue Statement:** Concerns were expressed regarding applying the proposed treatment in Riparian Reserves, meeting Aquatic Conservation Strategy Objectives and not skyline yarding through Riparian Reserves.

**Forest Service Response:** This is not considered to be a significant issue. Experience and monitoring have shown that by applying Best Management Practices and following Forest Plan Standards & Guides, water quality and riparian values will not be negatively impacted. Monitoring data from timber sales on the Detroit Ranger District have shown no effect to water quality from riparian thinning or the use of skyline corridors with full suspension through riparian reserves. Results have shown that riparian thinning actually speeds up the attainment of Aquatic Conservation Strategy Objectives #8 and #9 without retarding the attainment of the remaining objectives.

The primary effects of thinning in riparian reserves are:

- a. A more rapid increase in average stand diameter;
- b. Retention and enhancement of crown height to total tree height ratios;
- c. Reduced tree mortality; and
- d. Increased light to the forest floor which stimulates understory vegetation and the development of a second tree canopy much earlier than without thinning.

### **8. Responsible Official and Decision to be Made**

The District Ranger, as the responsible official, will decide whether to select the no action alternative or one of the action alternatives that treat the eight stands as proposed or with modifications.

## CHAPTER 2 – ALTERNATIVES

### 1. Alternatives Considered but Eliminated from Detailed Study

An alternative was considered that limited the cutting of trees to the immediate vicinity of sugar pine and also limited the diameter of trees cut. This alternative was not considered in detail because it would not meet the purpose and need for this project; it would restrict cutting of trees near sugar pine to such an extent that competition would not be sufficiently changed to reduce the risk of future mortality to the sugar pine. Removal of the trees that were cut and the ability to effectively treat fuels would be extremely difficult to accomplish and would increase the likelihood of damage to the sugar pine during logging and burning. Little opportunity would exist for regeneration of sugar pine and reintroduction of fire into this ecosystem could not be accomplished.

### 2. Alternative One – No Action

The no action alternative proposes no changes to the current condition at this time. This alternative serves as a baseline from which to understand the changes associated with the action alternatives. A description of the existing condition of the watershed can be found in the Breitenbush Watershed Analysis, completed in October 1996.

### 3. Alternative Two – Proposed Action

Alternative Two proposes to treat eight stands totaling an estimated 187 acres (including 81 acres of riparian reserves) by either commercial thinning or a combination of commercial thinning and understory removal.

Commercial thinning would involve removal of small diameter trees throughout the designated stands to provide growing space for the larger trees. To retain old growth trees in the stands, no trees over 30-inches DBH would be cut. All trees within 30-feet of sugar pine and less than 30-inches DBH would be cut.

Understory removal would remove all trees below 11 inches in diameter (see Table 2.1). Dwarf-mistletoe infected hemlock within 30-feet of sugar pine and greater than 30 inches in diameter would be girdled and serve as wildlife snags.

In all stands to be treated, snags and large woody material would be retained as directed by the Forest Plan. No new roads would be constructed. Logging systems to be used include skyline and ground-based (tractor and/or harvester/forwarder). Skyline corridors may require additional cutting of trees outside of stand R; however, no trees greater than 30-inches will be cut.

Brush and slash would be treated through a variety of methods that include a combination of yarding to landings, by piling and burning, and underburning. Slash yarded to landings will be disposed of by chipping and removal, firewood sales, or by piling and burning. (see Table 2.1). The best time of year to underburn sugar pine is late summer or early fall when the trees are least susceptible to burning damage. This underburning would be guided by prescriptions designed to allow for desirable fire



effects to sugar pine and to meet Oregon State smoke management guidelines. Firewood, or posts and poles would be sold from small diameter trees yarded to landings.

Sugar pine and Douglas-fir seedlings would be planted within small openings that will occur in areas harvested by understory removal. New seedlings will be planted in a manner to avoid competition with existing sugar pine.

**Table 2.1: Alternative 2 - Proposed Action Summary**

Stand	Acres	Harvest Type	Avg. Cut Tree DBH (in.)	Avg. Leave Tree DBH (in)	Target Basal Area (Sq. Ft.)	Cut MBF/ Acre	Stand Total Cut MBF	Logging System	Fuel Treatment
J	6	CT & UR	12.6	24.6	170	12	72	Skyline	YUM/ Underburn
K	13	CT & UR	11.7	25.3	165	17	221	Skyline	YUM/ Underburn
L	9	CT & UR	10.8	23.5	125	17	153	Skyline	YUM/ Underburn
M	10	CT & UR	8.5	14.2	50	3	30	Tractor	Grapple Pile
N	36	CT	12.6	17.4	160	6	216	Tractor/ Skyline	Underburn
P	18	CT	10.9	23.5	180	12	216	Tractor/ Skyline	Underburn
R*	36	CT & UR	9.5	28.6	75	9	436	Tractor/ Skyline	YUM/ Underburn
S	59	CT & UR	9.1	19.2	77	6	354	Skyline	YUM/ Underburn
<b>TOTAL</b>	<b>187</b>		<b>Ave. 10.7</b>	<b>Ave. 22.0</b>			<b>1698</b>		

**Notes:**

CT = Commercial Thinning from below where the smaller stems are cut to provide more growing space for the larger trees. To retain old growth remnants no trees over 30 inches DBH would be cut. All trees within 30 feet of sugar pine and less than 30 inches DBH will be cut.

UR = Understory Removal, trees below a certain diameter are designated for removal. Dwarf mistletoe infected hemlock within 30 feet of sugar pine that are greater than 30 inches DBH will be girdled and serve as wildlife snags.

DBH = diameter at 4½ feet above the ground.

MBF = thousand board feet

YUM = Yard Unmerchantable Material – Small diameter trees would be removed to a landing for disposal or sale as firewood or other forest products.

\* Approximately 10 skyline corridors in a second growth stand east of Stand R would account for about 2.8 acres of clearing at an average width of 15 feet.

#### 4. Alternative Three – Spot Treatment

This alternative proposes to treat a 100-foot radius area around identified sugar pine. All trees less than 30-inches in diameter would be removed. Dwarf mistletoe infected hemlock within 30-feet of sugar pine that are greater than 30-inches DBH will be girdled and serve as wildlife snags. The 100-foot distance was prescribed to give full crown release to sugar pines, allow for safe falling of trees, permit removal of logs with a helicopter while minimizing damage to sugar pine, and allow for sufficient room to treat fuels. Brush and slash would be treated through a combination of yarding unmerchantable material, hand piling and burning. No other portion of the stand outside of the 100-foot radius would be harvested.

STAND	Acres*	Harvest Type	Avg. Cut Tree DBH (in.)	Avg. Leave Tree DBH (in)	Target Basal Area (Sq.Ft.)	Cut MBF/ Acre	Stand Total Cut MBF	Logging System	Fuel Treatment
J	3.5	Spot	12.6	1/	N/A	10	35	Helicopter	Hand Pile
K	8.4	Spot	16.0		N/A	22	184	Helicopter	Hand Pile
L	6.3	Spot	14.2		N/A	14	18	Helicopter	Hand Pile
M	9.0	Spot	10.8		N/A	3	27	Tractor	Grapple Pile
N	17.5	Spot	12.6	17.4	N/A	6	105	Tractor/Skyline	Grapple Pile
P	9.1	Spot	10.9	23.5	N/A	12	109	Tractor/Skyline	Grapple Pile
R	10.5	Spot	12.7		N/A	6	63	Tractor/Helicopter	Grapple Pile/Hand Pile
S	27.3	Spot	12.4		N/A	8	218	Skyline	Hand Pile
<b>TOTAL</b>	<b>91.6</b>		<b>Ave. 12.8</b>				<b>759</b>		

**Notes:**

- Spot: In spot treated areas, all sugar pine will be left and all trees less than 30" DBH will be cut within 100 feet of the targeted sugar pine
- 1/ Diameter of leave trees will depend on size of sugar pine and trees greater than 30" DBH that are left.
- \* Acreage calculated is the area encompassed by a 100-foot radius around each sugar pine protected, equaling approximately 0.7 acres per tree identified. Some sugar pine are close enough to each other so that the clearing radii would overlap resulting in a smaller treatment area.

**Table 2.3: Comparison of Effects by Alternative**

<b>Purpose &amp; Need</b>	<b>Alternative 1 No Action</b>	<b>Alternative 2 Proposed Action</b>	<b>Alternative 3 Spot Treatment</b>
<b>Reduce mortality to sugar pine from mountain pine beetles.</b>	Current rate of high mortality will continue.	Maximum number of trees will be released and protected from fire.	Most sugar pine will be released, fire will remain a threat to survival.
<b>Reduce the number (stocking) of smaller diameter trees and other vegetation from competing with sugar pine trees</b>	No change from existing condition.	Reduces the number of small diameter trees and other vegetation from competing with sugar pine.	Same as Alternative 2
<b>Provide openings in which to establish sugar pine regeneration</b>	No change from existing condition.	Openings provided by understory removal throughout the stands.	Openings created only within 100-foot diameter of select sugar pine trees.
<b>Reduce overall, the amount of ground fuels and ladder fuels to lessen the risk of a stand replacing fire</b>	No change from existing condition.	Maximizes the reduction of fuel loading and ladder fuels throughout the stands.	Minimal overall reduction in fuel loading associated with small openings and pile burning.
<b>Reintroduce fire to the sugar pine ecosystem</b>	No change from existing condition.	Maximizes reintroduction of fire and beneficial ecosystem effects.	Fire cannot be safely reintroduced to the sugar pine ecosystem.
<b>Acres harvested</b>	0	187 acres	91.6 acres
<b>Acres under burned Acres grapple piled</b>	0 0	177 acres 10 acres	0 acres 0 acres
<b>MBF timber harvested</b>	0	1698 MBF	759 MBF

## CHAPTER 3 - ENVIRONMENTAL CONSEQUENCES

This chapter discloses the effects that are relative to the issues raised the public and determined by the District Ranger to be significant. Descriptions are no longer than necessary to understand the effects of the alternatives. The environmental consequences form the scientific and analytical basis for the comparison of the alternatives. The discussion includes environmental impacts of the alternatives including the proposed action, and the relationship between short term uses of the human environment and the maintenance and enhancement of long term productivity, and any irreversible or irretrievable commitment of resources.

### 1. Environmental Consequences Related to the Key Issue

**Significant Issue** - Tree cutting should be limited to the immediate vicinity of sugar pines and not involve entire stand treatments because treating the entire stand would have an adverse effect on long-term silvicultural health, watershed protection and credibility with the public.

#### **Alternative 1 – No Action**

##### **Direct, Indirect, and Cumulative Effects**

No treatment would occur with the No Action alternative therefore there would be no direct effects from Alternative 1. Indirect effects on silvicultural health and watershed protection may include continued high risk of stand replacement fire and continued sugar pine mortality. In addition, the no action alternative indirectly risks a loss of credibility with the public because of inaction in the face of a compelling need to restore the ecological function of sugar pine in an area historically maintained by frequent fires. Cumulatively there will likely be a continued decline of sugar pine in the northern range of the species.

#### **Alternative 2 – Proposed Action**

##### **Direct, Indirect, and Cumulative Effects**

The proposed action prescribes treating entire stands and therefore does not limit cutting to around sugar pines. Treating the entire stand would 1) maximize the reduction in competition for surviving sugar pine; and 2) maximize the development of small openings to allow for sugar pine regeneration in areas where sugar pine have existed in the past. Small diameter suppressed trees that would compete with sugar pine are removed allowing increased growth of the sugar pine seedlings and remaining trees. Activity generated fuels are removed with a combination of underburning, and a limited amount of grapple piling, thus reducing the overall fire risk to the area and protecting watershed conditions in the long term. Public credibility is retained by taking actions that address the purpose and need as described in the scoping notice (November 19, 2001) and Chapter 1 of this EA.

#### **Alternative 3 – Spot Treatment**

##### **Direct, Indirect, and Cumulative Effects**

Spot treatment may be beneficial to the surviving old sugar pine in the short-term but would not afford long-term protection from fire if the large remaining portion of the stand does not undergo fuel reduction. These stands were historically more open with frequent fires. The current condition of high density, high fuel loading stands on steep slopes does not represent a sustainable condition. The diversity of plants and animals that are favored by more open stand conditions are limited due to these high densities.

Spot treatment also greatly limits the opportunity to regenerate sugar pine that will not thrive in small openings. Given the age of many of the existing large sugar pine, it is important to establish an up-and-coming generation to replace the trees that are nearing the end of their life span. Further, to the degree that Alternative 3 does not deal with high fuel loadings and high density conditions elsewhere in the stand, it sustains a high level of risk for stand replacing fires and ultimately a risk to watershed conditions. Because Alternative 3 only deals with part of the problem for these stands, as defined in the purpose and need, public credibility is at risk.

## 2. Other Beneficial and Adverse Impacts

**Sugar Pine and Stand Health** – The sugar pine population in this area will continue to decline with Alternative 1. The reduction of stand density and treatment of fuels in Alternative 2 will benefit sugar pine by reducing the mortality from mountain pine beetle and the risk of stand replacing fires. In addition to benefits to sugar pine from reductions in stand density, other tree species will also increase in vigor and growth as a result of more growing space. In alternative 3, mortality from mountain pine beetle is reduced immediately adjacent to the sugar pine; however, this remains a risk to the surrounding stand because of the continued stand density. Risk also remains high for stand replacing fires.

**Fuels & Air Quality** – Alternative 1 will not directly generate smoke in the area. However, in the event of a large stand replacing fire, smoke would be generated in higher concentrations by consuming greater amounts of fuel than through controlled measures. For both action alternatives, thinning the stands would generate slash, increasing the fuels and the risk of fire hazard from the fuels in the short-term (1-2 years). Prescribed fire methods would be used to reduce the risk of fire hazards from these fuels. Burning the slash would generate smoke, causing short term effects to air quality such as a hazy atmosphere, low visibility, and a smoky smell in the area; however, wind and other atmospheric conditions dissipate the smoke within 1-2 days. The communities of Detroit, Idanha, and the Breitenbush may experience smoke from this burning. All prescribed burning operations would comply with Oregon Smoke Management Guidelines to minimize impacts to populated areas. These guidelines include burning during specific fuel moisture and weather conditions that allow for rapid dispersal of smoke.

The risk of a large, stand replacing fire will remain unchanged for Alternative 1, but will be reduced in Alternative 2 by removing the amount of ladder fuels and treating slash. In Alternative 3, this would only occur directly adjacent to the sugar pine, leaving high density stands in the area. For alternative 2, by increasing the spacing between trees, removing smaller suppressed trees, and treating ground fuels, the risk of a stand replacing crown fire will be greatly reduced. Alternative 3 does not substantially reduce the risk of a stand replacing fire.

**Recreation and Scenic Resources** – For Alternative 1, there would be no effects to recreation users. For Alternatives 2 and 3, the project would not adversely affect recreation resources. The project would have minor short-term impacts to recreation during the operation period. For public safety, some traffic delays are expected on Road 4698 during skyline operations while loads are being transported above the road. Road 4698 has relatively low use and accesses few dispersed sites. One moderately used

dispersed campsite would need to be closed during operations and may displace campers to other available campsites in the area. Since hauling operations are restricted on Road 46 during weekends and holidays between Memorial and Labor Day weekends, truck traffic on the Breitenbush Road and arterial roads would be limited to weekdays only during the peak recreation use season. Truck encounters with recreation traffic would occur during the week when visitor use is lowest.

No visual impacts are expected with the implementation of Alternative 1. The majority of the project lies within matrix lands and a small portion within the 11a-Scenic Modification Middleground portion of the Breitenbush Viewshed, and is not visible from the Breitenbush Road. In Alternatives 2 and 3, the project is expected to benefit scenic resources by improving the health of stands containing sugar pine, which have been declining. Sugar pine is a native species and those found on the Detroit Ranger District represent the northernmost trees within its range. Sugar pine has aesthetic and recreation value (cone collection) as well as economic and ecological value which are important to people. The project would enhance the diversity of the stand, and help retain the natural features of the forest landscape, which is an objective of scenic management in the Forest Plan.

**Soils** – There would be no direct impact to soils from Alternative 1. However, due to a continued unmitigated risk of stand replacing wildfires, there is a long term risk to Forest soils. For both action alternatives, the major short term impacts to soil productivity from harvest activity, as discussed in the Willamette National Forest Final Environmental Impact Statement (FEIS 1990), include localized displacement, compaction, nutrient loss, and instability. These detrimental soil conditions are defined in the Forest Plan Standards and Guidelines, FW-081. The Standards require that the total area of cumulative detrimental soil conditions should not exceed 20% of the total acreage within the activity area, including roads and landings. Currently, there is evidence that less than 1% of the project area has been affected by detrimental soil conditions from past harvest activities. The maximum effect of the Sugar Pine Project in total is less than four acres or about 2% of the project area of 187 acres. Because the old skid trails in the project area will be reused and subsequently their detrimental effects undone by post-sale subsoiling, the 2% new effects are not additive with the existing condition. In addition, no individual unit will have adverse impacts greater than about 6% (Unit M). In relation to the Forest Standard, this is both individually or cumulatively well below the 15% threshold. This is the only project planned in this analysis area for the foreseeable future on National Forest System Land.

Compliance with Forest Plan standard FW-081 would be achieved by implementing Best Management Practices (T-2, T-9, T-11, T-12, VM-1, and F-3).

**Stream Channels** – It is expected that within five years the riparian stand would have become more diverse because of the thinning. There are no expected impacts to stream channels from Alternative 1. For both action alternatives, the harvest prescription would not remove trees directly within stream channels or remove trees contributing to channel bank stability. A variable width no-cut buffer averaging fifty feet would be established within the riparian reserves. Therefore, this project is not expected to have any direct, indirect or cumulative effects on the stream channels in the area.

**Water Quality** – For all alternatives this project will comply with the requirements of the Clean Water Act and other water quality guidelines outlined in the Forest Plan. There are no 303d listed streams, designated wetlands, or floodplains within the project area. With the implementation of Best Management Practices in Alternatives 2 and 3, there are no expected direct, indirect, or cumulative effects to water quality in the area. Utilizing Best Management Practices and Contract requirements, would result in no adverse impacts to downstream beneficial users. See Appendix E for a complete discussion of Best Management Practices Objectives & Mitigation, and the Aquatic Conservation Strategy Objectives.

**Water Quantity** – There are no expected direct impacts to water quantity from Alternative 1. However, indirectly the risk of a stand replacing fire would eventually affect water quantity. Harvesting the trees, whether by thinning the entire stand (Alternative 2) or by spot cutting around the sugar pines (Alternative 3) would result in some disturbance to the forest floor and canopy. This disturbance would create some bare areas, change the species composition of the riparian areas, and increase species diversity. General hydrologic functions (springs, seeps, etc.) of the area are anticipated to experience slight fluctuations resulting from the removal of vegetation during the thinning. This fluctuation would be seasonal and short term (lasting up to 5 years) due to the remaining vegetation utilizing the available water once the stand responds to the thinning. A seasonal increase in groundwater could result in localized wet areas increasing in size or duration. Stream flow could also be affected in amount and duration of flow. These effects should be short lived until such time that trees remaining on the site would utilize the available water.

### **3. Unique Characteristics of the Geographic Area:**

Sugar Pine is a unique feature of this area and is confined to a narrow band on the Detroit Ranger District. This is the northernmost end of the sugar pine range as a species. Local microclimate and a fire history characterized by a short return interval are factors contributing to the occurrence of the species in this area. The no action alternative leaves sugar pine at risk for further mortality. The proposed action is designed to retain sugar pine as feature in this area. Alternative 3 protects the remaining old sugar pine.

**Wild and Scenic Rivers:** The Breitenbush River, which has been identified as an eligible Wild and Scenic River in the Willamette Forest Plan, is located approximately 0.75 miles from the nearest point of the project area. None of the alternatives will affect the eligibility status of the river.

**Farmlands, Forest lands, and Rangelands:** Department of Agriculture Land Use Policy (DR 9500-3) as discussed in FSH 1909.15-93-1, 65.21 Exhibit 01 states that “Continued conversion of the Nation’s farmlands, forest lands, and rangelands may impair the ability of the United States to produce sufficient food, fiber, and wood to meet the domestic needs and the demands of export markets.” The Department’s responsibility is to assure that the United States retains a farm, range, and forest land base sufficient to produce adequate supplies at reasonable production costs of high quality food, fiber and wood. All forested lands located within harvest units have been



determined to be suitable for timber production. The Sugar Pine project area has no farmland or rangeland. Therefore, no effects are expected from any of the alternatives to these resources.

#### **4. Effects Likely to be Highly Controversial**

There is often public controversy over the harvesting of timber. However, there does not appear to be controversy among resource experts regarding the effects of projects like this. There exists no controversy among resource experts regarding the expected effects of the no action alternative. Treatments similar to those planned in the proposed action have been applied over a number of years within both the Detroit Ranger District and the East Humbug drainage and have met the Standards and Guides required in the Willamette National Forest Plan. No known controversy exists with treatments planned in Alternative 3.

#### **5. Effects to Districts, Sites, Highways, Structures, or Objects Listed in or Eligible for Listing in the National Register of Historic Places, or Loss or Destruction of Significant Scientific, Cultural, or Historic Resources**

**Heritage/Cultural Resources:** For all alternatives, no direct, indirect or cumulative effects are expected. Within the project area, there are no districts, historic or pre-historic sites, highways, structures, or objects listed in or eligible for listing in the National Register. Field surveys were completed in 2001 in compliance with 35 CFR 800, the National Historic Preservation Act, the National Environmental Policy Act, Executive Order 11593, and the 1995 Programmatic Agreement between ACHP, Oregon SHPO and the USDA Forest Service, Region 6. Field surveys did not locate any new sites. As a result, this project would have no effect on heritage resources. If cultural resources are encountered during the course of the project, earth-disturbing activities in the vicinity would be suspended and the District Archaeologist notified to evaluate the discovery and recommend subsequent courses of action.

#### **6. Wetlands & Floodplains**

##### **Existing Condition**

No floodplains occur within the areas located in the planning area. There are several small (less than 1/4 acre) wetlands within the proposed project area. The topography of the area allows these to occur next to colluvial deposits adjacent to stream channels. Wetland areas less than 1/4 acre will be treated as special habitat areas (FW-211).

##### **Direct & Indirect Effects of Alternative 1**

No changes to the existing condition are expected as a result of selecting Alternative 1. Therefore, there would be no direct, indirect or cumulative effects.

### **Direct & Indirect Effects of Alternatives 2 and 3**

The harvesting of trees, as prescribed in Alternatives 2 and 3, may result in short-term increases to the water-table elevation of these wetlands. These increases are anticipated to be negligible after the first few years following harvest due to the increase in transpiration that follows increased stand growth.

Wet areas will be dealt with on an individual basis under the stand specific recommendations and wetland areas less than 1/4 acre will be buffered as special habitat areas (FW-211).

## **7. Threatened, Endangered, and Sensitive Species**

### **Northern Bald Eagle – Threatened**

#### **Existing Condition**

Bald eagles require habitat consisting of scattered old-growth conifer trees near available fish sources. Bald eagles forage widely during non-nesting season, and scavenge on carcasses such as deer and elk.

#### **Direct, Indirect, and Cumulative Effects**

The project is not within a bald eagle management area or adjacent foraging habitat. Therefore, all alternatives do not adversely affect bald eagles or their habitat.

### **Northern Spotted Owl – Threatened**

#### **Existing Habitat**

Spotted owl habitat is present in the project area, and spotted owls have been detected near the project area. However, the project is not in an area of concern or critical habitat area for spotted owls or in a late successional reserve. Foraging use of recently reforested clearcuts by spotted owls is very limited. However, spotted owls are known to forage a short distance into a clearcut opening from a forested edge, if a prey item is detected.

#### **Direct & Indirect Effects of Alternative 1**

No changes to the existing condition are expected as a result of selecting Alternative 1. Therefore, there would be no direct effects. There could be indirect and cumulative effects to spotted owl habitat in the event of a stand replacing fire as a result of not treating accumulated fuels in the area.

#### **Direct and Indirect Effects of Alternative 2**

The proposed action may affect, but is not likely to adversely affect spotted owl habitat. In the short term (5-10 years) foraging, nesting and dispersal habitat will be degraded in the project area by removing some trees which are large enough to function as habitat. However, the habitat will not be downgraded and will continue to function as suitable nesting, foraging and dispersal habitat. The project will be restricted from occurring during the critical nesting period for spotted owls, unless they are determined not to be nesting by surveying to regional protocol. Fire risk to spotted owl habitat will be reduced as a result of treating existing fuels and high density stands.

### **Direct and Indirect Effects of Alternative 3**

This alternative may affect, and is likely to adversely affect spotted owl habitat. Foraging, nesting and dispersal habitat will be removed in the project area by removing all trees less than 30-inches diameter in a 100-foot radius circle around sugar pine trees. The project will be restricted from occurring during the critical nesting period for spotted owls, unless they are determined not to be nesting by surveying to regional protocol. Fire risk to spotted owl habitat will not be significantly reduced by only treating existing fuels around the sugar pines.

### **Cumulative effects**

Alternative 1 results in continued risk of cumulative effects on spotted owl habitat due to the unmitigated risk of stand replacement fires. Because alternatives 2 and 3 are designed in conformance with the Northwest Forest Plan spotted owl guides, they are not expected to have cumulative effects on the Northern spotted owl or its habitat.

### **Pacific Northwest Region 6 - Sensitive Species**

Potential habitat for the following species is not being affected, or is not present in the project area; therefore, no direct, indirect, or cumulative effects will occur for these species:

**Horned Grebe, Bufflehead, Peregrine Falcon, Black Swift, Baird's Shrew, Pacific Fringe-tailed Bat, California Wolverine, Pacific Fisher, Northwestern Pond Turtle, Cascade Torrent Salamander, Foothill Yellow-legged Frog, and the Oregon Spotted Frog.**

### **Canada Lynx - Threatened**

Potential habitat for Canada Lynx is not present in the project area; therefore no direct, indirect, or cumulative effects will occur for Canada Lynx.

### **Harlequin Duck - Region 6 Sensitive Existing Condition**

Harlequin ducks use rivers, streams, and creeks as feeding habitat and commonly nest on banks. Shrubby riparian vegetation, lack of human disturbance, and loafing sites are important factors for harlequin ducks (Cassirer and Groves, 1989). Streams which are potentially suitable for harlequin duck foraging and nesting are located adjacent to unit S.

### **Direct, Indirect and Cumulative Effects for All Alternatives**

Alternative 1 has no potential for direct, indirect, or cumulative effects to harlequin ducks or their habitat. The action alternatives will not affect harlequin ducks or their habitat if seasonal restrictions from March 15<sup>th</sup> to July 15<sup>th</sup> are adhered to for activities in unit S.

## **Pacific Shrew and Oregon Slender Salamander – Region 6 Sensitive**

### **Existing Condition**

Potential habitat for Pacific Shrew and the Oregon Slender Salamander exists in the project area. Forested area will be disturbed or removed by project activities.

### **Direct & Indirect Effects of Alternative 1**

There would be no direct effects from Alternative 1 because there would be no changes to the existing condition. However there remains a risk of stand replacing fire under an Alternative 1 scenario and therefore there are potential indirect and cumulative effects to Pacific Shrew and Oregon Slender Salamander and their habitat.

### **Direct, Indirect, and Cumulative Effects - Alternatives 2 and 3**

Harvesting of the trees and the slash treatment for both action alternatives may impact individuals, or their habitat if they are present and using the forested environment. However, impacts are not expected to jeopardize the species or move it toward Federal listing as a threatened or endangered species (see Biological Evaluation for Sugar Pine Project, May 23,2002).

## **Threatened, Endangered, and Sensitive Plant Species**

### **Existing Condition**

Surveys for sensitive plants were completed in the Fall of 2001 and Spring of 2002. (Biological Evaluation – Botany May 29, 2002). The pre-field review identified five R-6 sensitive species as having possible habitat in the Sugar Pine project area. These species include *Asplenium septentrionale*, *Botrychium montanum*, *Corydalis aqua-gelidae*, *Pellaea andromedaefolia*, and *Polystichum californicum*. Two of these species occur in riparian zones similar to those represented in the project area (*Botrychium montanum* – also on dry slopes, *Corydalis aqua-gelidae*), and the remaining three species are ferns found on moist to dry cliffs. There are no known sensitive plant sites in the vicinity of the Sugar Pine project area.

### **Direct, Indirect, and Cumulative Effects**

Surveys found no evidence of the occurrence of the species identified in the pre-field review or any of the species on the R-6 list. Therefore, no direct, indirect, or cumulative effects to R-6 sensitive species are anticipated as a result of the implementation of any of the alternatives.

## **8. Management Indicator Species**

This section only discloses the effects on pileated woodpeckers, pine marten, and big game. Effects on the bald eagle, northern spotted owl, and peregrine falcon were discussed in the previous section on T, E, and S species. Effects on primary cavity excavators are included in the next section on snags and course woody material.

Pileated woodpeckers and pine marten will not be adversely affected by this project as habitat areas for these species are not located in the project area.

## **Big Game**

### **Existing Condition**

The project is located in winter range within the Humbug and Short Management Emphasis Areas. Current values for forage are the most limiting factor in attaining desired habitat effectiveness values.

### **Alternative 1**

There would be no direct effects from Alternative 1 because there would be no changes to the existing condition.

### **Alternative 2**

Thinning effects would not be significant enough to be reflected in the model for habitat effectiveness. Forage value may increase, however this may be at a level that is too low to be considered a change in value.

### **Alternative 3**

Forage values will increase in the 100-foot radius openings created around live sugar pine trees. Approximately 96 acres will be affected by this alternative. Forage values are the most limiting factor in the Humbug and Short MEA's; however, this project would help to improve the quality of forage in these areas.

## **9. Wildlife Tree Habitat (Snags) – Primary Cavity Excavators**

### **Existing Condition**

"Habitat capability for primary cavity excavators (indicators for cavity-nesting species) shall be maintained to provide at least 40% or greater potential populations". Primary cavity excavator habitat is generally defined as snags greater than 18 inches in diameter and greater than 20 feet in height in decay classes I, II or III. More detailed definitions can be reviewed in the Willamette Forest Plan (p.IV-65, 66).

Current (1998) snag levels for the Humbug sub-drainage (92d) are 58.4%; and 45.1 for the Fox sub-drainage (92e). Current average tree diameters in the proposed project area meet size requirements. Recently insect killed sugar pine are providing snag habitat, plus additional snag recruitment will continue to occur from mortality in the future.

### **Alternative 1**

There would be no direct effects from Alternative 1 because there would be no changes to the existing condition.

### **Alternative 2**

Some snags may be removed for safety reasons during project work. Trees being removed are generally below 17" in diameter. Some trees above 17", which could provide future snag habitat, will be removed. Snags for primary cavity excavators will be retained in the sub-drainages and project area at or above recommended levels.

### **Alternative 3**

Some snags may be removed for safety reasons during project work. Trees being removed around sugar pine trees will reduce the number of live trees available to become snags from natural mortality. Reduced natural recruitment may lower the overall snag levels in the treatment units. As long as the sub-drainages affected remain

above the snag levels needed to provide 40% of potential population levels for cavity excavators the area has acceptable snag levels. Natural mortality is expected to exceed the 40% level as total acres treated around individual trees is very small.

## **10. Course Woody Material**

The Willamette National forest recommended course woody debris amount is 240 linear feet of logs per acre greater than or equal to 20 inches in diameter.

### **Alternative 1**

There would be no direct effects from Alternative 1 because there would be no changes to the existing condition.

### **Alternatives 2 and 3**

This level would be maintained in the units being treated either by retaining existing material or providing the material as part of the either action alternative. Alternatives 2 and 3 are not expected to have any direct, indirect, or cumulative effects on course woody material levels.

## **11. Migratory Birds**

No changes to the existing condition are expected as a result of selecting Alternative 1. Therefore, there would be no direct effects. However there remains a risk of stand replacing fire under an Alternative 1 scenario and therefore there are potential indirect effects both beneficial and detrimental depending on species to migratory birds and their habitat. The small scale of the project area renders it unlikely that there will be cumulative effects to migratory birds from Alternative 1.

For Alternatives 2 and 3, migratory birds may be disturbed and nests unintentionally destroyed during proposed activities. Each type of migratory bird specializes in a habitat niche and are widely distributed across the district during the summer nesting season. Altering habitat may favor one species and not favor another with the overall effect being insignificant. Generally forested habitats will contain warblers, swallows, swifts and other migratory species. Riparian areas with alder and maple may contain the same species as the forest with higher densities of riparian specialized species of warblers, flycatchers, etc. Overall, the project will not provide a significant habitat change from existing conditions. The species mix is expected to remain the same with minor variation in where open habitat specialized birds are located.

## **12. Fisheries**

None of the fish or aquatic insects found in streams in or near the project area is listed under the Endangered Species Act or is on the Regional Foresters Sensitive Species list. The nearest listed fish and designated critical habitat is found below Big Cliff Dam more than 12 miles downstream. Due to this fact it is not necessary to complete a Biological Assessment or a Biological Evaluation for this project for fish. Further, there is no Essential Fish Habitat that exists above Detroit Dam on the North Santiam River as described in the Magnuson-Stevens Act (1976).

### **13. Survey & Manage Species - Wildlife**

#### **Canada Lynx and Great Gray Owls**

The project area is not within habitat for these species; therefore no direct, indirect, or cumulative effects will occur for these species.

#### **Amphibians**

Ranges of all amphibians listed as survey and manage species do not extend into the Detroit Ranger District. Therefore no direct, indirect, or cumulative effects will occur for these species.

#### **Red Tree Vole**

Potential habitat occurs in the proposed units. Surveys for red tree voles have been completed and no voles or nesting structures were discovered during the survey process; therefore no direct, indirect, or cumulative effects will occur for these species.

#### **Mollusks**

Two species of mollusks listed as survey and manage species are suspected to occur on the Detroit Ranger District. Determining habitat preferences and ranges of these species is a component of survey and manage requirements. These species are expected to occur in conifer forests with hardwood components. Mosses, leaf litter especially near hardwood logs, ferns and areas under shrubs are key features used by these mollusks. Survey protocols have been developed for terrestrial and aquatic mollusk species. More detailed expected habitat requirements for these species are listed in the protocol. Surveys in 2001 and 2002 did not locate survey and manage mollusk species; therefore there will be no direct, indirect or cumulative effects to listed survey & manage mollusk species.

### **14. Survey & Manage Species - Plants**

#### **Existing Condition**

Surveys were completed in the Fall of 2001 and Spring of 2002 (Biological Evaluation – Botany May 29, 2002). During field reconnaissance, one population of *Pseudocyphellaria rainierensis* was found in proposed Unit S. Over 30 occurrences of this lichen were recorded. None of these 30 occurrences will be directly disturbed by this project, and most are located well below the unit boundary within a no-cut riparian reserve that consists mostly of late successional habitat. The majority of Unit S consists of younger aged trees with a scattering of older Douglas-fir and sugar pine.

#### **Direct, Indirect, Cumulative Effects for Alternative 1**

The no-action alternative (Alternative 1) will ensure that existing occurrences will not be impacted by human disturbance. However, without the fuels treatment associated with the action alternatives, the risk of habitat disturbance due to fire increases with accumulating hazardous fuels through time.

#### **Direct, Indirect, Cumulative Effects for Alternatives 2 and 3**

In order to protect the few occurrences of *Pseudocyphellaria rainierensis* and the microhabitat from the effects of logging disturbance and fuels treatment, minimum 75 ft. buffers have been placed on those occurrences close to the boundary, and all tree felling will be uphill, away from these occurrences. As a result of these mitigations, no



direct, indirect, or cumulative effects to any Category A or C survey and manage species as a result of Alternative 2 or 3 implementation is anticipated.

## **15. Noxious Weeds**

### **Existing Condition**

Surveys for noxious weeds were completed in the Fall of 2001 and Spring of 2002 (Biological Evaluation – Botany May 29, 2002). Noxious weeds present in the project area include Scot's broom (*Cytisus scoparius*) and scattered St. John's wort (*Hypericum perforatum*) along the roads. Locally abundant patches of Scot's broom occur on Forest Service Road 4696 at the East Humbug Creek Bridge; at the junction of Forest Service Road 4698 and 4698-812; and a large infestation on Forest Service Road 4698-810.

### **Direct, Indirect, and Cumulative Effects**

Mitigations designed to prevent noxious weed spread as a result of project implementation are prescribed. The no-action alternative will not generate project or KV funds for noxious weed control efforts. Where practical, noxious weeds will be removed from the site and replaced with native vegetation under all action alternatives.

## **16. Health & Safety**

Concerns about public safety would be mitigated in the action alternatives during logging and fuels treatment (prescribed burning). Warning signs and flaggers will be used along roads to inform and protect the public during the harvesting and prescribed burning operations. Road maintenance activities, including brushing and falling of hazard trees, will improve overall safety for the public with the implementation of either of the action alternatives but not so with the no action alternative. Post-sale fuel treatment will lessen the risk and severity of future wildfires for alternative 2, to a lesser degree in alternative 3 and not at all in alternative 1.

## **17. Environmental Justice**

The Sugar Pine Project is located near the Cities of Detroit and Idanha, Oregon. These communities are not considered to be minority or low income communities; however, low income families do reside in both cities. According to information from the Oregon Economic and Community Development Department (OECD, 2000) both cities are considered to be within a distressed area. For the City of Detroit, approximately 44% of the population is considered to be in Low to Moderate Income range; whereas for the City of Idanha, approximately 66% of the population is in this range. Both of these Cities have experienced a significant decline in timber based jobs over the past decade contributing to the factors that determine a distressed community. Implementation of an alternative that precludes any local employment, such as falling, tractor or skyline operations, may impact those families that rely on timber based employment for their income. Therefore, implementation of either of the action alternatives is not expected to pose a disproportionately high or adverse effect to those populations. Alternative 1 may pose such an effect however. The action alternatives, as described, comply with Executive Order 12989 "Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations".

## CHAPTER 4 – List of Preparers

The following are the members of the interdisciplinary team (IDT) responsible for conducting the environmental analysis for the Sugar Pine Project.

**Stephanie Phillips** – District Ranger

- B.S. Forest Resource Management
- M.S. Silviculture
- 21 years experience Forest Service

**Dave Leach** – Natural Resources Asst. / Project Leader / Silviculturist

- R6/PNW Certified Silviculturist
- B.S. Forest Management
- 31 years experience Forest Service

**Dave Halemeier** - Hydrologist

- B.S. Resource Planning and Interpretation
- M.S. Natural Resources, Watershed Management
- 29 years experience Forest Service

**Mike Roantree** – Botanist

- B.S. Botany
- M.A. Biology
- 17 years experience Forest Service

**Daryl Whitmore** – Wildlife Biologist

- A.S. Forest Industries Technology
- B.S. Natural Resource Management
- 15 years experience Forest Service

**Dani Rosetti** – Recreation Planner

- B.S. Forest Resources & Recreation Management
- 14 years experience Forest Service

**Jim Romero** – Resource Planner and Writer/Editor

- B.S. Forest Management
- 15 years experience Forest Service

**Doug Shank** – Geologist

- B.S. Geology
- M.S. Geology
- 25 years experience Forest Service

**Cara Kelly** – Archaeologist

- B.S. Anthropology
- M.A.I.S. Anthropology
- 14 years experience Forest Service

**Wayne Some** – Fish Biologist

- B.S. Fisheries
- 26 years experience Forest Service

**Kelly Esterbrook** – Fuels Planner, Assistant Fire Management Officer

- Technical Fire Management
- 25 years experience Forest Service

# **Appendices**

## **Sugar Pine Project Environmental Assessment**

- A: Integrated Unit Prescriptions**
- B: Knutson-Vandenberg (KV) Collections and Project Descriptions**
- C: Monitoring Plan**
- D: Response to Public Comments**
- E: Best Management Practices (BMPs) and Aquatic Conservation Strategy Objectives (ACSOs)**

# APPENDIX A

## Sugar Pine Project

### Integrated Unit Prescriptions

Unit prescriptions consist of general requirements and specific unit information to be implemented during layout and marking of the units, and during actual harvest operations on each unit.

#### **Prescriptions applicable to all harvest units:**

**Special Forest Products:** Special forest products found in commercial thinning units may be sold according to the Standards and Guides of the Willamette National Forest Plan. Vine maple, salal, manzanita, and sword fern are the primary products found in the proposed units.

**Snags and Old Growth:** Retain snags where safety permits. Leave all residual old growth > 30 inches dbh, except mistletoe infected western hemlock within 30 feet of sugar pine.

**Riparian Reserves:** 1) Fall away from streams; 2) Leave trees contributing to channel-bank and shoreline stability; and 3) A variable width no-cut buffer averaging fifty feet in width would be established within the riparian reserves.

**Directional Falling:** Fall trees away from streams.

**Logging Systems:** Live sugar pine cannot be used as tailholds or rub trees in skyline systems. Tractor skid road location should attempt to avoid sugar pine. If trees must be located adjacent to skid roads they must be protected during skidding operations. Sugar pine should be avoided in locating landings.

**Suspension:** One-end suspension required, except across riparian reserves where full suspension is required.

**Landings/Road Construction & Reconstruction:** Additional information provided by unit listed in the following pages.

**Seasonal Restrictions:** Follow seasonal restrictions as described in the Alternatives.

**Reforestation:** Stands requiring reforestation will be planted the spring following site preparation.

**Site prep/fuel treatment:** Brush and slash will be treated through a variety of methods that include a combination of yarding unmerchantable material (YUM) to landings (with subsequent disposal through chipping and removal, piling and burning, or selling material as firewood), by piling and burning within the units, and underburning. Underburning will be done in late summer or fall to minimize mortality to sugar pine. All units with underburning will be firelined utilizing existing firelines from adjacent old burn units and/or adjacent roads.

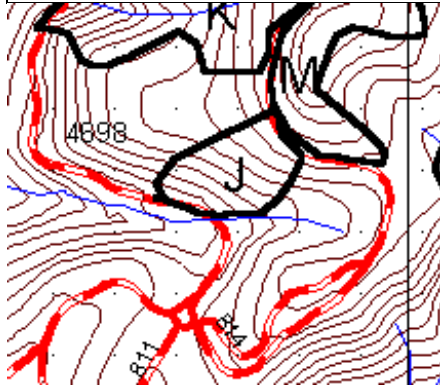
**Fertilization:** Following site preparation and reforestation, all units will be fertilized with urea nitrogen to enhance growth of planted and established trees on these low fertility sites.

### **Prescriptions applicable to all harvest units (continued)**

**Noxious Weeds:** Prior to constructing landings and beginning logging operations, noxious weed occurrences in the sale area will be located and controlled. All project equipment should be cleaned to meet the requirements in Contract clause C6.35. Re-vegetate all temporarily disturbed areas with native seed and plantings where practical. Minimize all non-essential soil disturbances. Use only certified weed-free seed and straw for temporary erosion control or re-vegetation purposes, and use weed-free rock sources for any rock or gravel used during the project.

**Relative Density:** A relative density (RD) will be shown in the integrated prescription for each stand. This is an expression of stand density relative to the maximum theoretical maximum density (RD100). A relative density of RD 55 (zone of imminent mortality) or greater indicates increasing suppression and mortality due to competition.

<b>Sugar Pine Stand J</b>	
<b>Stand Number (s): 4021719</b>	
<b>Location (Township, Range, Section): T9SR6E SECTION 15</b>	
<b>LMP Allocations 14</b>	
<b>Average Slope = 50%</b>	<b>Elevation = 2400 ft.</b>
<b>Estimated Unit Size = 6 acres</b>	<b>Estimated Volume = 72MBF</b>
<b>Silvicultural Prescription – COMMERCIAL THIN/UNDERSTORY REMOVAL</b>	<b>Logging Method – SKYLINE</b>



**Key Points:** Approximately 5 old growth sugar pine are to be released and protected in this unit.

**Unit Access:** From 4698 road, top and bottom of unit.

**Stand Conditions:** This stand is primarily 60 to 90 years old with scattered remnant trees of approximately 350 years old. The stand is predominantly Douglas-fir with minor amounts of western redcedar, western hemlock, golden chinkapin, sugar pine, and incense cedar. There are approximately 5 sugar pine > 12 inches dbh in the stand. Total basal area for the stand is 296 square feet. The predominant plant association is western hemlock/Rhododendron-salal.

**Stand Health:** Low fertility site with a high relative density of RD63. Mountain pine beetle and white pine blister rust are causing high mortality in sugar pine.

**Silvicultural Treatment/Marking:** Leave all sugar pine > 12" dbh. Within 30 feet of sugar pine cut all trees < 30" dbh. In the remainder of the unit (beyond 30' from sugar pine) leave all trees > 18" dbh. Total leave tree basal area should be approximately 170 square feet.

**Riparian Treatment:** Fall away from streams. Leave trees contributing to channel-bank and shoreline stability. Do not create an opening greater than ½ acre within reserve.

**Landings:** Landings to be located on the 4698 road above the unit.

**Logging Operations:** Flaggers or signing will be necessary during logging operations.

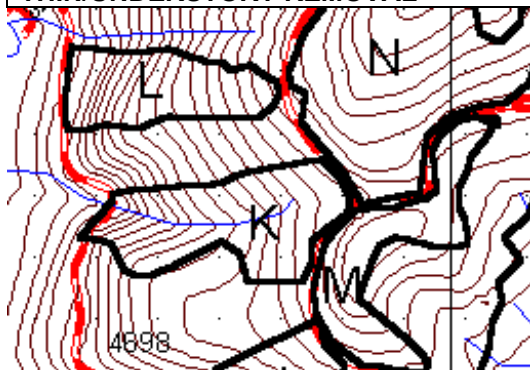
**Road construction/Reconstruction:** Heavy maintenance on 4698 road.

**Fuel Treatment:** YUM, underburn in the fall. There is potential for utilization of small diameter poles and chinkapin yarded from the unit.

**Reforestation:** Plant with sugar pine and Douglas-fir

**Noxious Weeds:** There is locally abundant Scot's broom on the adjacent Rd. 4698-812. Remove prior to any project operations.

<b>Sugar Pine Stand K</b>	
<b>Stand Number (s):</b> 4017739	
<b>Location (Township, Range, Section):</b> T9SR6E SECTION 15	
<b>LMP Allocations</b> 14	
<b>Average Slope =</b> 65%	<b>Elevation =</b> 2500 ft.
<b>Estimated Unit Size =</b> 13 acres	<b>Estimated Volume =</b> 221MBF
<b>Silvicultural Prescription –</b> COMMERCIAL THIN/UNDERSTORY REMOVAL	<b>Logging Method –</b> SKYLINE



**Key Points:** Approximately 12 old growth sugar pine to be released and protected.

**Unit Access:** From 4698 road, top and bottom of unit.

**Stand Conditions:** This stand is multi-aged due to past fires with an understory of 60 to 200 year-old trees and scattered remnant trees of approximately 400 years old. The stand is predominantly Douglas-fir with minor amounts of western redcedar, western hemlock, golden chinkapin, sugar pine, and white pine. There are approximately 12 sugar pine > 12 inches dbh in the stand. Total basal area for the stand is 323 square feet, with 486 trees per acre. The predominant plant association is western hemlock/rhododendron/beargrass.

**Stand Health:** Low fertility site with a high relative density of RD 66. Mountain pine beetle and white pine blister rust are causing high mortality in sugar pine.

**Silvicultural Treatment/Marking:** Leave all sugar pine > 12" dbh. Within 30 feet of sugar pine cut all trees < 30" dbh. In the remainder of the unit (beyond 30' from sugar pine) leave all trees > 20" dbh. Total leave tree basal area should be approximately 165 square feet.

**Riparian Treatment:** Fall away from streams. Leave trees contributing to channel-bank and shoreline stability. Do not create an opening greater than ½ acre within reserve.

**Landings:** Landings to be located on the 4698 road above the unit.

**Logging Operations:** Flaggers or signing will be necessary during logging operations.

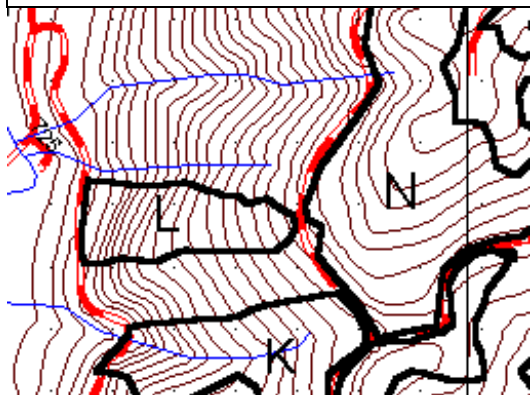
**Road construction/Reconstruction:** Heavy maintenance on 4698 road.

**Fuel Treatment:** YUM, underburn in the fall. There is potential for utilization of small diameter poles and chinkapin yarded from the unit.

**Reforestation:** Plant with sugar pine and Douglas-fir



<b>Sugar Pine Stand L</b>	
<b>Stand Number (s):</b> 4021710,4021709,4002606	
<b>Location (Township, Range, Section):</b> T9SR6E SECTION 15	
<b>LMP Allocations</b> 14	
<b>Average Slope = 60%</b>	<b>Elevation = 2500 ft.</b>
<b>Estimated Unit Size = 9 acres</b>	<b>Estimated Volume = 153 MBF</b>
<b>Silvicultural Prescription - COMMERCIAL</b>	



**Key Points:** Approximately 9 sugar pine to be released and protected.

**Unit Access:** From 4698 road, top and bottom of unit.

**Stand Conditions:** This stand is characterized by an understory of 60 to 80 year-old trees and scattered remnant trees of approximately 300 years old. The stand is predominantly Douglas-fir with minor amounts of western redcedar, western hemlock, golden chinkapin, sugar pine, and white pine. There are approximately 9 sugar pine > 12 inches dbh in the stand. Total basal area for the stand is 243 square feet, with 425 trees per acre. The predominant plant association is western hemlock/rhododendron/beargrass.

**Stand Health:** Low fertility site with a high relative density of RD 56. Mountain pine beetle and white pine blister rust are causing high mortality in sugar pine.

**Silvicultural Treatment/Marking:** Leave all sugar pine > 12" dbh. Within 30 feet of sugar pine cut all trees < 30" dbh. In the remainder of the unit (beyond 30' from sugar pine) leave all trees > 17" dbh. Total leave tree basal area should be approximately 125 square feet.

**Riparian Treatment:** Fall away from streams. Leave trees contributing to channel-bank and shoreline stability. Do not create an opening greater than ½ acre within reserve.

**Landings:** Landings to be located on the 4698 road above the unit.

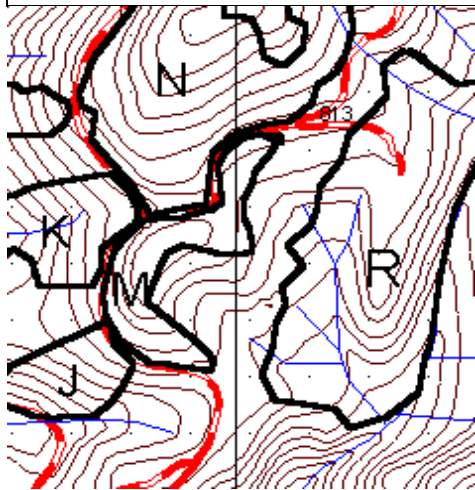
**Logging Operations:** Flaggers or signing will be necessary during logging operations.

**Road construction/Reconstruction:** Heavy maintenance on 4698 road.

**Fuel Treatment:** YUM, underburn in the fall. There is potential for utilization of small diameter poles and chinkapin yarded from the unit.

**Reforestation:** Plant with sugar pine and Douglas-fir

<b>Sugar Pine Stand M</b>	
<b>Stand Number (s):</b>	4002438, 4021712, 4021713
<b>Location (Township, Range, Section): T9SR6E SECTION 15</b>	
<b>LMP Allocations</b>	11A
<b>Average Slope =</b>	25%
<b>Elevation =</b>	2600 ft.
<b>Estimated Unit Size =</b>	10 acres
<b>Estimated Volume =</b>	30 MBF
<b>Silvicultural Prescription – COMMERCIAL</b>	



**Key Points:** Approximately 22 sugar pine to be protected and released.

**Unit Access:** From the 4698 and 812 roads.

**Stand Conditions:** This is a highly variable stand, portions of which were previously logged. Sugar pine are a combination of sapling size and larger trees over 20 inches dbh. The predominant tree species in the stand is Douglas-fir. Other species are, western hemlock, western redcedar, golden chinkapin, and red alder. Total basal area for the stand is 97 square feet with an average of 625 trees per acre, but varies greatly with some areas over 200 square feet. The predominant plant association is western hemlock/rhododendron/beargrass.

**Stand Health:** Low fertility site with a RD 26. Mountain pine beetle and white pine blister rust are causing high mortality in sugar pine.

**Silvicultural Treatment/Marking:** Leave all sugar pine > 7" dbh. Within 30 feet of sugar pine cut all trees < 30" dbh. In the remainder of the unit (beyond 30' from sugar pine) leave all trees > 11" dbh. Total leave tree basal area should be approximately 50 square feet.

**Riparian Treatment:** Fall away from streams. Leave trees contributing to channel-bank and shoreline stability. Do not create an opening greater than ½ acre within reserve.

**Landings:** Landings will be located on the 4698 and 812 roads.

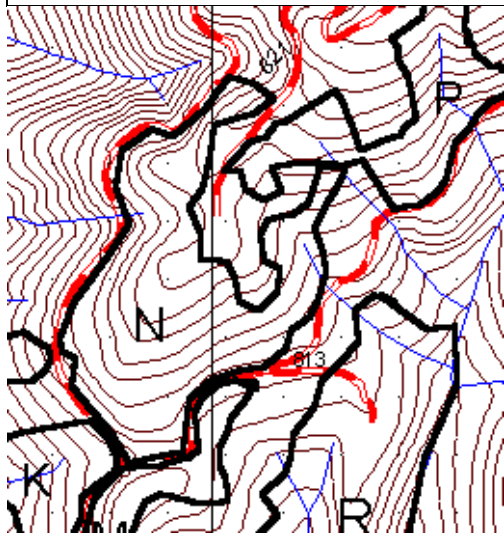
**Logging Operations:** Public access may be blocked on the 812 road during logging.

**Fuel Treatment:** Grapple pile. Protect sugar pine, including those < 7" dbh during piling and pile burning.

**Reforestation:** Plant with sugar pine and Douglas-fir.

**Noxious Weeds:** There is locally abundant Scot's broom at the junction of Rd. 4698 and 4698-812. Remove prior to any project operations.

<b>Sugar Pine Stand N</b>	
<b>Stand Number (s):</b> 4002465, 4021707, 40017733	
<b>Location (Township, Range, Section):</b> T9SR6E SECTION 14&15	
<b>LMP Allocations</b> 14, 11A	
<b>Average Slope = 45%</b>	<b>Elevation = 3000 ft.</b>
<b>Estimated Unit Size = 36 acres</b>	<b>Estimated Volume = 216 MBF</b>



**Key Points:** There are approximately 25 second-growth and old-growth sugar pine to be protected and released.

**Unit Access:** Access is from 4698, 821 and 812 roads.

**Stand Conditions:** This stand is predominantly a 75 year old Douglas-fir stand with minor amounts of western hemlock, sugar pine and golden chinkapin. There are a few very scattered old-growth trees in the stand. Total basal area for the stand is 213 square feet with 196 trees per acre. Portions of the stand were thinned during the 1970's to create a shaded fuel break along Fox Ridge. There are existing skid roads in this part of the stand. The predominant plant association is Western hemlock/rhododendron-dwarf Oregon grape.

**Stand Health:** Stand density is SD 55. Except for mortality in sugar pine due to stand density and blister rust, the stand is relative healthy. Overall density is above recommended levels for Douglas-fir stands and is in need of thinning to maintain stand vigor and reduce mortality.

**Silvicultural Treatment/Marking:** Leave all sugar pine over 12 inches dbh. Cut all trees < 30" dbh within 30 feet of sugar pine. In portions of the stand not adjacent to sugar pine, commercially thin leaving the best dominant and co-dominant trees to an average basal area of 160 square feet per acre.

**Riparian Treatment:** Fall away from streams. Leave trees contributing to channel-bank and shoreline stability. Do not create an opening greater than 1/2 acre within reserve.

**Landings:** Tractor and skyline landings will be located on the 4698, 821, and 812 roads.

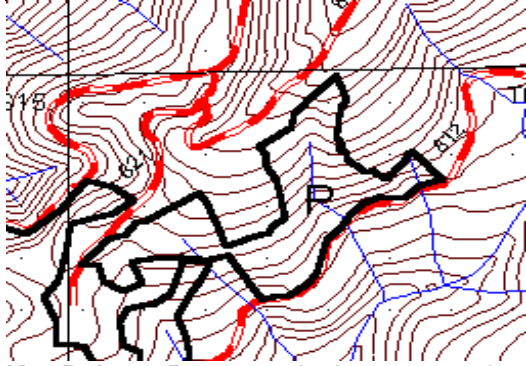
**Logging Operations:** Signing for public safety will be needed on the 4698 road. Public access may be blocked on the 821 and 812 roads during logging.

**Road construction/Reconstruction:** Heavy maintenance on 4698 road.

**Fuel Treatment:** Underburn in the fall.

**Reforestation:** None required.

<b>Sugar Pine Stand P</b>	
<b>Stand Number (s):</b> 4002348, 4021703, 4021701	
<b>Location (Township, Range, Section):</b> T9SR6E SECTION 14	
<b>LMP Allocations</b> 11A	
<b>Average Slope =</b> 25-55%	<b>Elevation =</b> 3100 ft.
<b>Estimated Unit Size =</b> 18 acres	<b>Estimated Volume =</b> 216 MBF



**Key Points:** Protect and release approximately 13 sugar pine located in this stand.

**Unit Access:** From the 812 and 821 roads.

**Stand Conditions:** This stand is predominantly composed of 90 year-old Douglas-fir with minor components of western hemlock and sugar pine. Total stand basal area is 284 square feet per acre with 199 trees per acre. The predominant plant association is Western hemlock/ dwarf Oregon grape.

**Stand Health:** Except for mortality in sugar pine due to stand density and blister rust, the stand is relative healthy. Stand density is SD 60 which is well above recommended levels for Douglas-fir stands and is in need of thinning to maintain stand vigor and reduce mortality.

**Silvicultural Treatment/Marking:** Leave all sugar pine over 12 inches dbh. Cut all trees < 30" dbh within 30 feet of sugar pine. In portions of the stand not adjacent to sugar pine, commercially thin leaving the best dominant and co-dominant trees to an average basal area of 180 square feet per acre.

**Riparian Treatment:** Fall away from streams. Leave trees contributing to channel-bank and shoreline stability. Do not create an opening greater than ½ acre within reserve.

**Landings:** Landings will be located along the 821 and 812 roads.

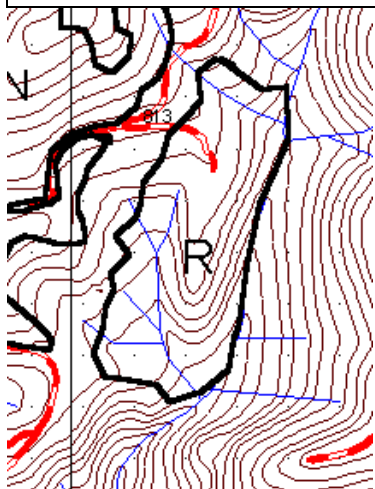
**Logging Operations:** Public access may be blocked on these roads during logging.

**Road construction/Reconstruction:**

**Fuel Treatment:** Underburn in the fall.

**Reforestation:** None required.

<b>Sugar Pine Stand R</b>	
<b>Stand Number (s): 4002650, 4002591, 4021720</b>	
<b>Location (Township, Range, Section): T9SR6E SECTION 14</b>	
<b>LMP Allocations 11A</b>	
<b>Average Slope = 50%</b>	<b>Elevation = 2600</b>
<b>Estimated Unit Size = 36</b>	<b>Estimated Volume = 324MBF</b>
<b>Silvicultural Prescription - COMMERCIAL</b>	



**Key Points:** Protect and release approximately 16 located sugar pine in this unit.

**Unit Access:** From 813 road.

**Stand Conditions:** This is a highly variable stand with areas of 75 year-old Douglas-fir, patches of remnant old growth and scattered sugar pine with an understory of pole sized trees and brush. Minor species in addition to sugar pine include western hemlock, western redcedar, and golden chinkapin. Overall basal area is 171 square feet per acre with approximately 192 trees per acre. The predominant plant association is Western hemlock/rhododendron-dwarf Oregon grape.

**Stand Health:** Low fertility site with a relative density of RD 39. The stand density is highly variable with additional competition from evergreen brush species. Mountain pine beetle and white pine blister rust are causing high mortality in sugar pine. There is a Phellinus root rot pocket of approximately one acre located near the center of the stand with active mortality and blowdown.

**Silvicultural Treatment/Marking:** Leave all sugar pine > 12" dbh. Within 30 feet of sugar pine cut all trees < 30" dbh. In the remainder of the unit (beyond 30' from sugar pine) leave the best dominant and co-dominant trees at an average basal area of 75 square feet.

In the root rot pocket, cut all Douglas-fir and western hemlock and those trees within 50 feet of the last visible infected tree. Leave all western redcedar and hardwoods.

**Riparian Treatment:** Fall away from streams. Leave trees contributing to channel-bank and shoreline stability. Do not create an opening greater than ½ acre within reserve.

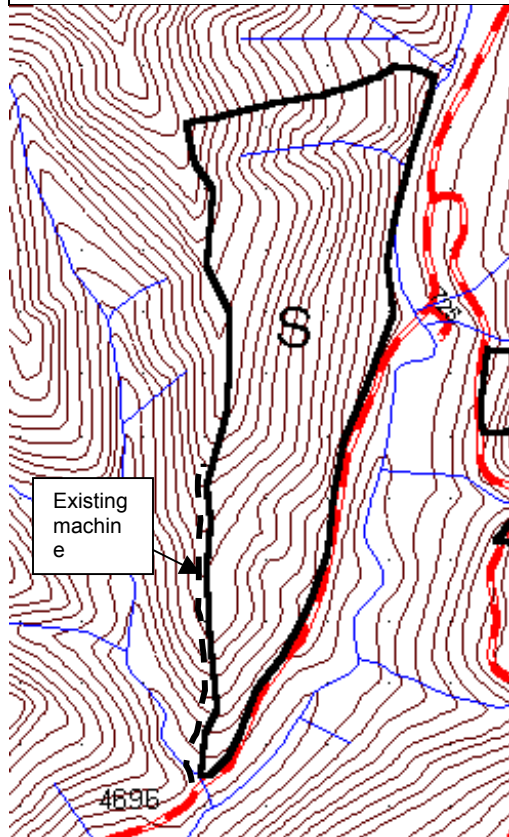
**Landings:** Landings will be located on the 813 road.

**Logging Operations:** Public use on the 813 road may be restricted during logging operations.

**Fuel Treatment:** YUM and underburn in the fall.

**Reforestation:** Plant openings with sugar pine and Douglas-fir. In the root rot pocket plant with sugar pine, and western redcedar.

<b>Sugar Pine Stand S</b>	
<b>Stand Number (s):</b> 4002298, 4002400, 4021545, 4021546	
<b>Location (Township, Range, Section):</b> T9SR6E SECTION 15	
<b>LMP Allocations</b> 14	
<b>Average Slope =</b> 65%	<b>Elevation =</b> 2300 ft.
<b>Estimated Unit Size =</b> 59 acres	<b>Estimated Volume =</b> 354 MBF
<b>Silvicultural Prescription -</b> COMMERCIAL	



**Key Points:** There are approximately 39 sugar pine located to be protected and released. There is a Survey and Managed lichen in the stand along East Humbug Creek.

**Unit Access:** From the 4696 road and from an existing fireline from the road along the main ridge.

**Stand Conditions:** This is a highly variable stand with portions of the stand composed of dense second growth, 70 to 90 years old, areas of large old growth, and areas that are mixed with both age classes. Most of the understory is pole sized Douglas-fir and western hemlock with lesser amounts of western redcedar, sugar pine and golden chinkapin. The overstory is primarily Douglas-fir with some hemlock, redcedar and sugar pine. The total basal area for the stand is 175 square feet with about 456 trees per acre. The predominant plant association is Western hemlock/rhododendron/beargrass.

**Stand Health:** The stand density for this stand is rated at SD49 but does not reflect the amount of competition resulting from small diameter trees and brush. Mountain pine beetle and white pine blister rust are causing high mortality in sugar pine. Nearly all western hemlock are severely infected with dwarf mistletoe. Many understory hemlock are in a shrub form due to mistletoe infections.

## **Sugar Pine Unit S – Integrated Prescription (continued)**

**Silvicultural Treatment/Marking:** Leave all sugar pine > 12" dbh. Within 30 feet of sugar pine cut all trees < 30" dbh. All hemlock > 30" dbh and within 30 feet of a sugar pine will be girdled to create wildlife snags. In the remainder of the unit (beyond 30' from sugar pine) leave all trees > 12.9" dbh. Total leave tree basal area should be approximately 125 square feet.

**Riparian Treatment:** . Fall away from streams. Leave trees contributing to channel-bank and shoreline stability. Do not create an opening greater than ½ acre within reserve.

**Landings:** Landing will be located on the 4696 and 4698 roads

**Logging Operations:** A skyline yarder will walk up the old fireline and along the main ridgeline. Logs will be fully suspended over East Humbug Creek and landed either on the 4698 or 4696 roads. Flaggers and or signing will be required for public safety.

**Road construction/Reconstruction:** Heavy maintenance on the 4698 and 4696 roads.

**Fuel Treatment:** YUM and/or underburn or broadcast burn in the fall. There is potential for utilization of small diameter poles and chinkapin yarded from the unit.

**Reforestation:** Plant with sugar pine and Douglas-fir

**Noxious Weeds:** There is locally abundant Scot's broom at the East Humbug Creek bridge area adjacent to Unit S. Remove prior to any project operations.

**Survey and Manage:** Minimum 75 ft. buffers on recorded occurrences of the lichen *Pseudocyphellaria rainierensis* (SE boundary already flagged in). Fall trees uphill on eastern (downhill) boundary.

## Appendix B Sugar Pine Project Knutson-Vandenberg Collections & Project Descriptions

The Knutson-Vandenberg (K-V) Act of June 9, 1930 (ch. 416,46 Stat. 527, as Amended:16 U.S.C. 576-576b) “protecting and improving the future stand productivity of the renewable resources of the forest land on such sale area, including sale area improvement operation, maintenance and construction, reforestation and wildlife habitat management.”

### **KV Project Prioritization**

Projects will be prioritized in the following order:

- 1) Project activities required by law (NFMA);
- 2) Mitigation required as part of this decision;
- 3) Enhancement opportunities associated with this decision.

<b>Category</b>	<b>Activity Priorities</b>
<b>1</b>	<b>Regeneration planting of Sugar Pine and Douglas-fir seedlings</b>
<b>2</b>	<b>Noxious Weed Control &amp; Monitoring</b>
	<b>Firewood Program</b>
<b>3</b>	<b>Hardening of Dispersed Recreation Sites along Humbug Creek.</b>
	<b>Unit R Erosion Control</b>
	<b>Pre-Commercial Thinning</b>
	<b>Aerial Fertilization</b>
	<b>Install in-stream fish structures in East Humbug Creek</b>
	<b>Pruning to control white pine blister rust</b>

\* In the event the project does not generate enough KV funding, activities in Category 1 and 2 would be completed with appropriated funds. For Category 3, these activities may be dropped.

<b>Activity</b>	<b>Alternative 2</b>	<b>Alternative 3</b>
<b>Planting of Sugar Pine &amp; Douglas-fir Seedlings *</b>	<b>\$ 24,300</b>	<b>\$ 7,425</b>
<b>Noxious Weed Control &amp; Monitoring</b>	40 acres X \$ 10.00 / acre for 5 years = \$400/year <b>\$ 2,000</b>	40 acres X \$ 10.00 / acre for 5 years = \$400/year <b>\$ 2,000</b>
<b>Firewood Program</b>	<b>\$ 1,000 per year for 5 years = \$ 5,000</b>	<b>\$ 1,000 per year for 5 years = \$ 5,000</b>
<b>Harding of Dispersed Recreation Sites along Humbug Creek.</b>	<b>\$ 3,500</b>	<b>\$ 3,500</b>
<b>Unit R Erosion Control</b>	<b>\$ 1,500</b>	<b>\$ 1,500</b>
<b>Pre-Commercial Thinning *</b>	<b>\$ 26,400</b>	<b>\$ 26,400</b>
<b>Aerial Fertilization *</b>	<b>\$ 52,500</b>	<b>\$ 39,200</b>
<b>Install in-stream fish structures in Humbug Creek</b>	<b>50 structures X \$170 = \$8,500</b>	<b>50 structures X \$170 = \$8,500</b>
<b>Pruning</b>	<b>\$ 26,400</b>	<b>\$ 26,400</b>
<b>TOTAL K-V Collections Needed</b>	<b>\$ 145,100</b>	<b>\$ 119,925</b>

\* See Table B-3 for a summary and breakdown of Silviculture K-V activities.



## **Descriptions of KV Projects**

### **Category 1 – Project activities required by law (NFMA)**

#### **Timber Stand Improvement**

Created openings in timber sale units will be hand planted with approximately 600 trees per acre. Sugar pine and Douglas-fir will be the primary species planted.

### **Category 2 – Mitigation**

#### **Noxious Weed Control & Monitoring**

Ground disturbing activities, including commercial thinning and the use of roads and landings, encourage the spread of noxious weeds by providing a mineral seed bed and spreading weed seed. Although timber sale clauses require vehicles to be cleaned prior to working on the timber sale, logging vehicles can inadvertently spread weed seed from other areas of the forest by carrying it on tires and caked on mud. KV monies are collected to survey the project area annually for five years for the presence of noxious weeds and to control their spread. Control methods will include manual removal. Herbicides are only used as a last resort and may only be used in accordance with the *Willamette National Forest Integrated Weed Management EA* (UDSA Forest Service 1993).

#### **Firewood**

KV monies would be collected to reduce the risk of fire starts as the result of increased fuel loading at the landings. Units will be YUM yarded which increases the amount of slash at the landing areas. This increased slash could be reduced through the personal use firewood program. Without the collection of personal use firewood an increase in slash disposal would occur and a increased risk of fire as the result of increased fuel loading in the area. Money would be used to monitor the effects of the personal use firewood program and to provide administrative costs for the program.

### **Category 3 – Enhancement Activities**

#### **Unit R Erosion Control**

Erosion control and site hardening for dispersed site would involve placing of resistant material on the landing to allow for dispersed camping. Estimate \$1,500 dollars for the placement of material.

#### **Hardening of Dispersed Recreation Sites along Humbug Creek**

Harden the site through the use of wood chips or native material. Establish barriers to entering the stream and control water seeping at the site. Hardening of this site will prevent damage to the existing stand and reduce the surface erosion from the site. Estimate wood chips or native material, barriers and labor to be approximately \$3,500 dollars.

### **Pre-Commercial Thinning**

Young plantations, 10 to 20 years old, within ¼ mile of harvest units and that exceed stand density guidelines, >400 trees per acre, will be thinned to an average of 300 trees per acre. Thinning selection will favor the fastest growing dominant trees of all species. Species diversity will be maintained. Riparian areas will be thinned to accelerate the development of Late successional characteristics. All five needled pines, sugar pine and western white pine, will be retained except those with dead tops or blister rust bole cankers.

### **Aerial Fertilization**

Proposed harvest units and adjacent plantations will be fertilized at a rate of 200 pounds of nitrogen per acre to enhance tree growth and improve forage conditions. Soils within the project area are below average for the Detroit Ranger District for levels of nitrogen. Urea fertilizer prill will be applied by aircraft. All live streams will be buffered and water monitoring conducted.

### **Install in-stream fish structures in East Humbug Creek**

Large woody material (LWM) that has fallen in the riparian reserve will be pulled into the creek using a walking-backhoe. This project will take place in East Humbug Creek, adjacent to Unit S, where the stream is presently low in habitat complexity. In some places it may be necessary to use cable to secure 2 or 3 trees together to be more effective in improving fish habitat. Adding large wood to the stream will increase hiding cover, nutrient retention and overall fish numbers.

### **Pruning to Control white pine blister rust**

Sugar pine and western white pine in existing plantations will be pruned for the control of white pine blister rust. Lower branches up to ½ of total tree height will be removed. Blister rust is an introduced disease that typically infects lower branches of these trees and spreads to the bole of the tree causing tree death. Pruning has shown to reduce the level of mortality in these species.

<b>Table B-3: Summary of Sugar Pine K-V Proposal - Silvicultural Treatments</b>									
<b>UNIT# STAND#</b>	<b>TOTAL ACRES</b>	<b>Alternative 2 – Treatment Acres</b>				<b>Alternative 3 – Treatment Acres</b>			
		<b>PLANT</b>	<b>PCT</b>	<b>FERT</b>	<b>PRUNE</b>	<b>PLANT</b>	<b>PCT</b>	<b>FERT</b>	<b>PRUNE</b>
<b>UNIT J</b>	6	2		6		1		4	
21735	3			3				3	
2873	13		13	13	13		13	13	13
2847	8			8	8			8	8
<b>UNIT K</b>	13	4		13		2		8	
17706	9			9				9	
2776	6			6	6			6	6
<b>UNIT L</b>	9	3		9		1		6	
2585	8			8	8			8	8
2664	10			10	10			10	10
2523	4			4	4			4	4
<b>UNIT M</b>	10	2		10		1		9	
2578	30			30	30			30	30
<b>UNIT N</b>	36			36				18	
<b>UNIT P</b>	18			18				9	
<b>UNIT R</b>	36	5		36		1		11	
2893	4		4	4	4		4	4	4
<b>UNIT S</b>	59	20		59		5		27	
2294	33		33	33	33		33	33	33
2422	18		18	18	18		18	18	18
2517	12		12	12	12		12	12	12
2685	20		20	20	20		20	20	20
2803	10		10	10	10		10	10	10
<b>TOTAL ACRES</b>		36	110	375	176	11	110	280	176
<b>COST / ACRE</b>		\$675	\$240	\$140	\$150	\$675	\$240	\$140	\$150
<b>TOTAL COST/ACRE</b>		\$24,300	\$26,400	\$52,500	\$26,400	\$7,425	\$26,400	\$39,200	\$26,400
		<b>ALTERNATIVE 2 = \$129,600</b>				<b>ALTERNATIVE 3 = \$92,000</b>			

**PLANT**     Planting  
**PCT**        Pre-Commercial Thinning  
**FERT**       Aerial Fertilization  
**PRUNE**     Pruning

## **Appendix C**

### **Sugar Pine Project**

### **Monitoring Plan**

#### **Large Sugar Pine Trees**

Monitoring sugar pine survival – the purpose of this plan will be to monitor the survival of sugar pine within the project area through project implementation. Approximately 140 large, greater than 12” dbh, sugar pine were located during sale reconnaissance and an approximate location was plotted on a 4 inch / mile map. It is proposed to monitor the survival of 30 trees within 3 units of the project. These units would represent three recognized combinations of stand treatments or stand conditions that exist within the project boundary. The selected units and conditions are listed below:

Stand “N” - Even-aged 90 year-old stand to be commercially thinned and underburned.

Stand “K” - West facing aspect, mixed age class, variable stand to be treated with either an understory removal or commercial thinning prescription.

Stand “S” - East facing aspect, mixed age class, variable stand to be treated with either an understory removal or commercial thinning prescription. This is a much more dense stand with heavier fuel loading than the west aspect slopes.

Ten trees would be located in each stand and their position marked with a GPS unit. Trees would be numbered and tagged with hidden tags. Trees would be checked for survival following completion of harvest operations and again following fuel treatment. Tagged trees would also be checked annually for at least five years. A cause of death will be determined for any trees that die during the monitoring period. A loss of less than 10% of sampled sugar pine due to harvesting and fuel treatment over the monitoring period will be considered successful. Monitoring results should also consider those that may die from natural causes. One of the major purposes for the project is to reduce mortality from mountain pine beetle. Beetle mortality in treated stands should be compared to the level in untreated stands within the vicinity of the project.

#### **Regeneration**

Small openings will be created within some units that will require tree planting. Monitoring will involve contract compliance inspection during planting and survival exams at the end of the 1<sup>st</sup> and 3<sup>rd</sup> growing seasons. A minimum of 256 surviving trees per acre is needed to meet Forest stocking requirements.

## **Appendix D: Response to Comments**

### **Sugar Pine Project – Environmental Analysis**

#### **Public Involvement Process**

The Detroit Ranger District Interdisciplinary Planning Team (ID Team) first initiated the Sugar Pine project in Fall 2001. The project was first described in the February 2000 Willamette National Forest planning newsletter “*Forest Focus*” which is mailed to approximately 250 people quarterly. Between the Fall of 2000 to the Summer of 2002, the ID Team conducted several internal meetings to review the proposed action and further develop the project.

A public scoping notice, describing the purpose and need and proposed action, was mailed on November 15, 2000 to 135 individuals and groups that have expressed an interest in current projects on the Detroit Ranger District. The USDA Forest Service received 11 comment letters during the public scoping period and written comments concerning the Sugar Pine Project are included in the Project Record.

Substantive comments from each letter were added to the tables on the following pages according to resource concern. References have been made to the Sugar Pine Project EA and Appendices where appropriate.

<b>Issue / Concern: Silvicultural Prescriptions</b>		
<b>Commenter</b>	<b>Comment</b>	<b>Response</b>
Karen Sjogren	My concerns are what are the species of the trees to be removed? Are they all sugar pines?	This will be defined in the Proposed Action. Trees to be removed will be those trees less than 30" diameter that are in competition with the sugar pines. This includes all species. Some small sugar pine will be killed or damaged during harvest or fuels treatment operations. Most of these trees are of poor vigor due to intense competition and many are infected with white pine blister rust. Additional sugar pine will be planted following fuels treatment.
Michael Donnelly	For long-term silvicultural health and public relations credibility, we would recommend instituting a max diameter limit of 15" or less, with 90% of trees to be cut under 11".	Defined in the Proposed Action. The proposal is not to remove any trees greater than 30 inches, but primarily the smaller diameter classes that are competing for nutrients and water with the sugar pine. The size of trees to be removed varies within each stand. Average cut tree diameters are projected to range between 8 and 17 inches.
Michael Donnelly	It is important that tree-cutting be limited to the immediate vicinity of the sugar pines. Our on-the-ground reconnaissance shows that we are talking about less than 200 trees that need to be thinned around. If the proposal ends up endorsing logging throughout the unit boundaries with a uniform prescription, then we will have a real problem with long-term silvicultural health, watershed protection and public credibility.	Discussed in Alternative 2. There may also be benefits by harvesting other trees within the unit and will be discussed in the Effects Analysis.
Ann Cavanagh	Proposal doesn't tell whether trees to be removed are sugar pine or other species. It wouldn't make sense to cut sugar pine and then plant sugar pine seedlings.	This will be described more clearly in the Alternatives. Trees to be removed will be those trees less than 30" diameter that are in competition with the sugar pines. This includes all species. Some small sugar pine will be killed or damaged during harvest or fuels treatment operations. Most of these trees are of poor vigor due to intense competition and many are infected with white pine blister rust. Additional sugar pine will be planted following fuels treatment.

<b>Issue / Concern: Harvest Methods</b>		
<b>Commenter</b>	<b>Comment</b>	<b>Response</b>
Jeremy Hall	ONRC requests that the Detroit District call for cutting small diameter trees only in the immediate vicinity of the sugar pine trees in the proposed units. Could a diameter limit of 17" be established for take trees?	Defined in the Proposed Action. The proposal is not to remove any 30" trees, but primarily the smaller diameter classes that are competing for nutrients and water with the sugar pine. The size of trees to be removed varies within each stand. Average cut tree diameters are projected to range between 8 and 17 inches.
Jeremy Hall	The slope steepness in these units would not be amenable to tractor yarding. Skyline and helicopter yarding systems should be the best systems to use. Since cut trees would be distributed in patches throughout the stand (i.e. around the sugar pines), this project would be a good candidate for helicopter logging, as logs to be yarded would be in concentrated areas.	Defined in the Alternatives. Skyline and helicopter logging systems are proposed on some units, but ground-based systems are proposed on slopes <30%. This standard is in compliance with forest Plan Standard & Guide, FW-083.
Michael Donnelly	One of our main concerns about this projects pertains to the methods of extracting or removing the cut-down trees. Yarding and road construction, with their subsequent earth-compaction and soil disturbance, have immense, long-lasting impacts on health of the forest ecosystem and watershed damage. No temporary or permanent road spurs should be constructed. No tractor yarding should be permitted by the operator. There should be absolutely no yarding through riparian reserves, even if skyline yarding methods are employed.	Defined in the Alternatives. Skyline, helicopter and ground-based logging systems are proposed. No new road construction is identified in the proposed action. Skyline yarding may occur in Riparian Reserves with full suspension over any live streams. Logs will be yarded away from streams.
Michael Donnelly	If the trees that are to be cut are going to be difficult to get to landings, then the Forest Service should consider limbing them and leaving them on the ground so they can provide woody debris, which benefits long-term forest health. Limbing them up would enable the trees to break down more rapidly and be less of a risk of being ladder fuels for stand replacement fires. We are willing to concede that cut trees that are easy to get to with existing, maintained roads and little soil compaction may be removed.	Helicopter logging is proposed for portions of this project and will enable removal of trees not accessible by other logging systems. Excessive existing fuels and projected slash pose a high risk to long-term survival of sugar pine. Requirements for leaving down woody material as well as maximum allowable fuel loadings are both described in the Forest Plan. Mitigation measures will be described in the alternatives to address these issues.

<b>Issue / Concern: Vegetative Diversity</b>		
<b>Commenter</b>	<b>Comment</b>	<b>Response</b>
Karen Sjogren	What is the natural species diversity in a sugar pine forest, and would the removal of understory vegetation decrease the diversity?	This will be described in the purpose & need for the project.

<b>Issue / Concern: Support for the Project</b>		
<b>Commenter</b>	<b>Comment</b>	<b>Response</b>
Robert Young	This proposal appears to be a much needed project - If public opinion and environmental issues allow it to be implemented.	Thank you for your comment.
Hans Heyer	I am very much for the thinning of the selected Sugar-Pine project. It is very important to keep the forest healthy and fire safe.	Thank you for your comment.
Tom Fencil	This type of management in need on the entire forest, outside of wilderness areas. Not only would it help the local economy it would improve the overall health of the forests. More deer & elk (hence hunting opportunities). More recreational opportunities.	Thank you for your comment.
Tom Fencil	1) It would provide some badly needed work for local people & revenue for communities. 2) Help prevent wildfires, disease & insect infestations. 3) Provide more food & habitat for Big Game animals. 4) Provide improved scenic values & recreational values. 5) Provide some logs for local mills. 6) Help the spotted owl by opening the understory for hunting.	Thank you for your comment.



**Issue / Concern: Harvest Methods Soil Compaction**

<b>Commenter</b>	<b>Comment</b>	<b>Response</b>
Ann Cavanagh	Won't logging machinery compact soil around the old trees and damage their roots?	Ground-based systems are proposed on slopes <30%. This standard is in compliance with forest Plan Standard & Guide, FW-083. Tractors will be restricted to designated skid roads with logs pulled to the skid roads. Possible effects on soils and residual sugar pines will be disclosed in the environmental effects chapter of the EA.

**Issue / Concern: Fire Risk**

<b>Commenter</b>	<b>Comment</b>	<b>Response</b>
Ann Cavanagh	If no timber is sold off, but the small fuels are not removed due to lack of funding, then won't fire danger increase?	This statement implies a No Treatment Alternative. Mitigation measures will be described in the alternatives to address these issues.

**Issue / Concern: Cumulative Effects**

<b>Commenter</b>	<b>Comment</b>	<b>Response</b>
Bryan Bird	Is it essential that the analysis include an in depth treatment of cumulative effects especially in regards to soil, water quality, fragmentation, old growth, TES, MIS, and neo-tropical migrant birds.	Cumulative effects analysis will be included in the environmental effects chapter and documented in the EA.

<b>Issue / Concern: Social &amp; Economic Values</b>		
<b>Commenter</b>	<b>Comment</b>	<b>Response</b>
Bryan Bird	Are the greater values of standing forest ecosystems disregarded for the short-term financial benefit of the sale of trees to the timber industry.	The purpose and need for this project is to restore the selected stands to their historical structure while protecting the unique sugar pine resource. The short fire return interval conditions that were naturally prevalent cannot be reintroduced with current high fuel loading and ladder fuels that compete with and jeopardize sugar pine survival. Removal of trees must occur prior to fire reintroduction.
Bryan Bird, 9	We are concerned with the adverse economic effects of commercial logging on public lands and the damage and loss of ecosystem service values associated with standing or otherwise intact forest ecosystems.	Beyond the scope of this project. These issues were discussed in the Willamette National Forest Plan.
Bryan Bird	The Forest Service's failure to quantify such effects at the project level or for the logging program as a whole is contrary to many federal and USFS regulations. The opportunity costs of the logging program, which include the value of uses foregone on areas logged plus the benefits associated with alternative uses of timber sale funds should be evaluated on a project basis. We request an impartial analysis of all values, both market and non-market associated with each alternative including the no-action and no commercial harvest alternatives. This includes employment and income (including multipliers) associated with non-timber uses.	These comments are beyond the scope of this project. A comparison of logging costs for each alternative will be completed and documented in the EA.
Robert Young	Financing will be one other problem.	A comparison of logging costs for each alternative will be completed and documented in the EA.

<b>Issue / Concern: Social &amp; Economic Values – (Continued)</b>		
<b>Commenter</b>	<b>Comment</b>	<b>Response</b>
Bryan Bird	The project will damage social and economic uses and values associated with natural forests (including forests that are affected by beneficial natural disturbance) for the benefit of the timber industry, even though non-timber uses and values are far more important to local communities and the regional economy.	The purpose and need for this project is to restore the selected stands to their historical structure while protecting the unique sugar pine resource. The short fire return interval conditions that were naturally prevalent cannot be reintroduced with current high fuel loading and ladder fuels that compete with and jeopardize sugar pine survival. Removal of trees must occur prior to fire reintroduction.

<b>Issue / Concern: Alternatives</b>		
<b>Commenter</b>	<b>Comment</b>	<b>Response</b>
Bryan Bird, 9	We request that a restoration only alternative, one emphasizing natural disturbance processes, be developed and given fair and adequate consideration.	The purpose and need for this project is to restore the selected stands to their historical structure while protecting the unique sugar pine resource. The short fire return interval conditions that were naturally prevalent cannot be reintroduced with current high fuel loading and ladder fuels that compete with and jeopardize sugar pine survival. Removal of trees must occur prior to fire reintroduction.

<b>Issue / Concern: General Questions</b>		
<b>Commenter</b>	<b>Comment</b>	<b>Response</b>
Ann Cavanagh	What would keep people from trampling the seedlings when they go looking for those huge decorative pine cones?	It is anticipated that the amount of seedlings damaged by periodic public use would be no impact to the survival of the sugar pines in the area. Also, due to the remote nature and steepness of this area, it is not expected that this area will have a high visitor use.

**Issue / Concern: Recreation/Interpretation**

<b>Commenter</b>	<b>Comment</b>	<b>Response</b>
Karen Sjogren	FS might consider limited access to these trees for educational/recreational purposes if the trees would not thereby be threatened, since sugar pine are not common in the area.	Thank you for the suggestion.

**Issue / Concern: Effects on Wildlife**

<b>Commenter</b>	<b>Comment</b>	<b>Response</b>
Karen Sjogren	What would the impact be of removing the understory vegetation, as well as logging operations on dependent wildlife species?	Effects to wildlife species will be documented in the Biological Evaluation completed for this project and described in the environmental effects chapter of the EA.

**Issue / Concern: Wildlife Seasonal Restrictions**

<b>Commenter</b>	<b>Comment</b>	<b>Response</b>
Karen Sjogren	How would the timing of operations seasonally limit the impact on wildlife, especially nesting birds and big game.	Seasonal restrictions will be described as mitigation measures in the alternatives. Effects to wildlife species will be documented in the Biological Evaluation completed for this project and described in the environmental effects chapter of the EA.

<b>Issue / Concern: Water Quality</b>		
<b>Commenter</b>	<b>Comment</b>	<b>Response</b>
Ann Cavanagh	How will streams be protected - specifically? This is watershed for Salem and other cities.	This will be defined in each alternative, including the Proposed Action. Mitigation measures, such as the implementation of Best Management Practices will be described in the Appendix to address this issue.

<b>Issue / Concern: Riparian Reserves</b>		
<b>Commenter</b>	<b>Comment</b>	<b>Response</b>
Jeremy Hall	Many of the units have riparian reserve issues. No skyline yarding or other ground disturbing activities should take place in the riparian reserve areas. In many of the riparian reserves, it may make(sense) since to leave cut trees so they can be recruited into streams.	A determination to harvest trees within riparian reserves will be made by the District Hydrologist and Interdisciplinary planning team. Requirements for leaving down woody material as well as maximum allowable fuel loadings are both described in the Forest Plan under FW-252. Mitigation measures will be described in the alternatives to address these issues.

<b>Issue / Concern: Species Viability</b>		
<b>Commenter</b>	<b>Comment</b>	<b>Response</b>
Bryan Bird	The project will jeopardize the viability of species that thrive in forest ecosystems through activities associated with timber harvest and road building, intervene in natural disturbance processes that are vital to ecosystem sustainability, and degrade water quality and watershed condition.	The proposed project will change current stand conditions that have resulted from a century of fire exclusion. Based on local fire history, more frequent disturbances should have occurred during this period. Current stand conditions jeopardize the viability of sugar pine in the area. Uncontrolled fires under current stand conditions would cause further losses in the sugar pine population. Other fire associated species are also not favored by the current condition of stands.
Karen Sjogren	It is important to me that sufficient snags and down woody debris be retained for wildlife habitat.	Requirements for leaving down woody material as well as maximum allowable fuel loadings are both described in the Forest Plan under FW-252.
Bryan Bird	The planned activities are likely to jeopardize the viability of species that find optimal habitat in interior forests, forests with well-developed structures, and forests naturally disturbed by physical and biological processes. For many of these species, the Forest Service has no up-to-date population data describing population numbers, locations, and trends, nor monitoring data on which the agency can rely to determine that the actions proposed in the context of the Sugar Pine Project will maintain numbers and distribution of these species sufficient for insuring long-term viability.	The proposed project is within Matrix lands designated under the NW Forest Plan. There is no requirement to optimize habitat for interior species on all acres. The planned treatment is proposed to improve the viability of sugar pine but will also benefit those species associated with the disturbance regime that was historically prevalent within the project area. Effects on viability of species are addressed in the Biological Evaluation.

# Appendix E

## Sugar Pine Project

### Best Management Practices & Aquatic Conservation Strategy Objectives

#### **Best Management Practices**

Best Management Practices (BMP's) are utilized in the development of mitigation and compliance to ACSO's. These BMP's can be found in "General Water Quality Best Management Practices" Pacific Northwest Region, November, 1988.

Utilizing BMP's for this project specifically address direction and guidance in the protection of water quality. Sugar Pine project objectives and mitigation for water quality are:

1. **Objective:** Continual recovery of downstream riparian and channel conditions.

**Mitigation:** Design units to insure channel bank stability, and provide adequate buffers to reduce sediment inputs and minimize peak flow effects (BMP T-2; T-7; T-8; T-12). Boundaries are placed in such a manner to avoid compromising stability of the channel banks. No trees are cut which attribute to bank stability.

2. **Objective:** Maintain or improve the quality of water for domestic and fisheries users.

**Mitigation:** Designate riparian management units and specific prescriptions for each individual unit adjacent to stream courses requiring protection (BMP; T-7).

3. **Objective:** Maintain natural filtration of surface, overland flow, through post sale activities.

**Mitigation:** Establish appropriate riparian management units and establish fire lines to ensure maintenance of established buffers, filter strips (BMP T-7; T-8; F-2; F-3).

4. **Objective:** Maintain or improve existing temperature regime along perennial streams in relation to water quality.

**Mitigation:** Designation of riparian management units to maintain and improve shade canopies over stream channels (BMP T-2; T-7; T-8).

5. **Objective:** Maintain or improve channel bank stability.

**Mitigation:** Establish riparian management units that include channel bank areas and or establish marking prescriptions that prevent any tree attributing to bank stability from being marked (BMP T-2; T-6; T-7; T-8).

6. **Objective:** Control the amount of sediment leaving the road system.

**Mitigation:** Utilize appropriate B and C clauses within the contract to insure that winter haul occurs on roads with adequate surface rock and that erosion control techniques such as mulching of bare soils associated to the road system occur.

## **Aquatic Conservation Strategy Objectives (ACSO)**

The objectives surrounding the attainment of the Aquatic Conservation strategy are discussed below. This discussion relates to the proposed action alternative.

***ACSO 1. Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to insure protection of the aquatic systems to which species, populations and communities are uniquely adapted.***

Under the action alternatives, this project will enhance the diversity and help maintain the distribution of sugar pine within the watershed. This project's focus is; to restore and maintain through time, diversity and complexity of the watershed and the aquatic systems to which species, populations, and communities have adapted. The Breitenbush Watershed Analysis recommends various management techniques or processes to accomplish long range, (>50 yrs.), landscape level conditions. The proposed project was developed from these recommendations (i.e. preserve the range of sugar pine within the area).

***ACSO 2. Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, Longitudinal, and drainage network connections including floodplains wetlands, up slope areas, headwater tributaries and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.***

Spatial and temporal connectivity within and between watersheds will be maintained through the implementation of Forest Plan riparian reserve widths (DTWA pg. V-27). All streams were identified and one standard tree height width, 172 feet, buffer was placed on either side of the channel. These areas allow for connectivity between ridge tops and valley bottoms when ephemeral and perennial stream are considered part of the riparian network.

Treated acres within these riparian reserves will only be those areas associated to individual trees or a determined type change within the designated reserve. Retention of 70 percent canopy closure after harvest will occur on those segments that affect stream temperature. Chemically and physically unobstructed routes critical to life history requirements will remain intact as a result of this prescription. Spatial connectivity may be restored for some plant and animal species that cannot survive under dense canopy. An increase in insects and arthropods is expected to result from a development of a under story. This prey base increase is expected to benefit animal species.

Proposed removal of material would be expected to reduce the fuel loading of the site and assist in maintaining connectivity through time. Lower risk of fire would result from this activity. Excessive amount of slash material would not be generated by this project. Slash accumulations would be treated by lopping, scattering and/or piling and or under-burning, dependent on the risk associated to each action. Where this occurs material would be pulled away from ponds, seeps, or other standing or slow moving water. This would allow for the maintenance of water chemistry of the area.



***ACSO 3. Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.***

Physical integrity of the aquatic system is anticipated to be maintained through the utilization of Best Management Practices (BMP's). Specific BMP's utilized for physical integrity are T-2 (Timber Harvest Unit Design); T-7 (Stream side Management Unit Designation); T-8 (Stream course Protection); and T-12 (Suspended Log Yarding in Timber Harvesting). These practices maintain the physical integrity of the aquatic system through designation of parameters in the prescriptions (i.e. maintenance of; root strength, shade canopy, and large woody material).

Harvest systems are designed to yard away from all streams in accordance with BMPs T-8 and T-12 (helicopter and other yarding). Decision to remove riparian leave trees may occur with interdisciplinary team consultation on occasion. Material may not meet the long-term objectives or pose a health and safety risk to those on the site. Retention of riparian reserve widths, would maintain channel bank stability. Management within these reserves further aid long-term stability by reducing fire effects.

***ACSO 4. Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the systems and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.***

Water quality parameters of interest for this objective relate to this projects affect on temperature, chemistry and suspended loads. All action alternatives within the riparian reserves are expected with riparian reserve management prescriptions, to provide adequate shading and maintain stream temperatures within state standards (Compliance with Forest Plan MA-15-06). Stand type breaks will be followed to and individual sugar pine trees located to insure the riparian conditions are maintained.

Biological, physical, and chemical integrity of water quality will be maintained through utilization of BMP's. Avoid cutting trees contributing to bank stability, pulling slash away from slow moving water and buffering of live streams during post treatment activities (e.g. fertilization), are examples of the recommendation utilized to protect biological, physical, and chemical integrity.

***ACSO 5. Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transportation.***

Fire and early management heavily influenced the aquatic ecosystems that occur in the proposed harvest units. The diversity of historic locations of large down wood and large diameter standing trees, (North facing slopes) are the result of isolated pockets fire missed. Sediment input into the stream would be episodic following fire activities. Vegetative slopes have reduced sediment input and reduced effects of peak flows on channel bank erosion, by reducing the snow accumulation typically found on hillsides following fire. The aquatic ecosystems have evolved under this scenario and would be maintained through the maintenance of the riparian reserves.

The episodic pattern of sediment pulses that would of occurred due to the frequency of fire would retard slightly (10-40 yrs.), due to maintenance of riparian reserves. This would eventually be reestablished when a catastrophic fire occurs. Until such time prudent measures would be

taken to reduce the effect of fire through maintenance and management of the components of the riparian reserve (fuel loading; tree density).

***ACSO 6. Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.***

In-stream flows are addressed in the Forest Plan and the Breitenbush Watershed Analysis for this area. Documentation within the watershed analysis limited its discussion to Hydrology of the area and doesn't respond directly to the in-stream flow portions of this question. The Willamette National Forest Plan bridges this limitation through; FW-113; FW-111; FW-093; FW-089. These forest-wide standards and guidelines are required (shall's), in the plan. Upon implementing these Standards it is anticipated that the in-stream flows would be maintained and restored sufficiently to create and sustain riparian, aquatic and wetland habitats, and to retain patterns of sediment, nutrient, and wood routing.

***ACSO 7. Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.***

There are minor wetlands in or adjacent to the proposed stands. This projects effect on downstream flood plains or wetlands is negligible due to the prescriptions proposed. The wetlands are associated to the riparian network and will be buffered and protected. No flood plains are found within the project area.

There are several small (less than 1/4 acre) wetlands within the proposed project area. Topography of the area, allows these to occur, next to colluvial deposits adjacent to stream channels. Short-term impacts may occur to the water-table elevation of these wetlands. These impacts are anticipated to be negligible due to the increase in transpiration that follows increase stand growth.

***ACSO 8. Maintain and restore species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability***

Selective harvesting will help shift the tree species composition and maintain a diverse plant community. Sugar Pine will be retained and will benefit from the removal of surrounding fir and hemlock. Treating the understory stands will also create better conditions for maintaining sugar pine.

Plant diversity and abundance should generally increase along treated riparian areas. Thinning dense stands is expected to result in suitable conditions for a number of understory species. The abundance of existing herbs and shrubs is expected to increase, and the increased light and nutrients may lead to establishment of additional species. Species adapted to survival under a dense over story, however, may be displaced.

Treatment of the riparian reserves will increase structural diversity as individual riparian trees increase in size at a faster rate due to increased light and available nutrients. These larger

trees will eventually (>50 yrs.), provide snags and down wood of larger diameter than would not otherwise have been available. In the interim, snags resulting from logging damage will provide needed material.

***ACSO 9. Maintain and restore habitat to support well distributed populations of native plant, invertebrate and vertebrate riparian dependent species.***

BMP's and mitigation measures designed to address in stream and riparian habitats (i.e. seasonal restrictions, canopy closures requirements, and soil protection requirements), should help minimize impacts to riparian-dependent invertebrate and vertebrate species. Individual species may experience short-term impacts through canopy opening and yarding of material from riparian reserves. These short-term affects are not anticipated to effect the distribution of populations of these riparian dependent species. This anticipation is based on past disturbances (natural), within the area and the plant, invertebrate, vertebrate, and riparian dependent species populations' response.

Treatment is expected to increase the abundance of native herbs and shrubs because more light and nutrients will be available for growth. The increase in plant biomass is expected to lead to increased prey base (insects and arthropods) for animals associated with riparian areas. Species requiring down wood, including fungi, lichens, mosses, and a variety of mollusks, bryophytes and animals, may suffer a short term (1-50 years) loss of habitat as trees are removed that otherwise would have eventually fallen to the ground and provided habitat.