

Pre-Operations Report 2009 Alternate Sale

Operation Name: Savage Creek Thin
County: Josephine County
Management Basin: Rogue

Table 1. Operation Areas, Types, and Acres

Area	Type of Operation	Gross Acres	Net Acres
1	Partial Cut	78	70

I. PHYSICAL DESCRIPTION OF OPERATION AREA:

Savage Creek Thin is in the Rogue watershed above Savage Creek. This sale is on an east facing slope, with 3 draws that bisect it. The sale is situated mid-slope, with slopes ranging from 45-65%.

The soils for the sale area are of the Vannoy-Voorhies Complex (79F). Soils of this type are 20-40 inches deep to bedrock, loamy, and well drained. Erosion and rutting are potential hazards. Harvesting and road construction considerations include slope steepness and to a lesser extent, soil strength. The potential for seedling mortality is low as is the potential for damage to the soil by fire.

II. CURRENT STAND CONDITION:

Overstory: This forest is a mixed conifer and hardwood forest; the overstory is conifer and the middle-height trees are hardwoods. The forest cover is Douglas-fir, chinkapin, madrone, oak, and some minor species conifers. The density in trees per acre and crown canopy closure is dense and patchy in spots, and more open in some areas.

Understory: Shrubs, herbs, and grasses cover 26% of the forest floor. The primary vegetative species found there include Manzanita, hazel, poison oak, ferns, and grasses.

Snags: There are 16 snags per acre, 12 hardwood and 4 conifer. There are 8 snags per acre over 12" DBH and 1 snag per acre over 24". Most of the snags are in decay class 1 and 2.

Down woody debris: The total down wood accumulation is 1,161 cubic feet (207 cubic feet in decay class 1 and 2) per acre.

Current Stand Structure: Closed single canopy mixed conifer/hardwood with some layering beginning to develop.

Insects and disease: Scattered dead trees are evidence of stressed trees in the stand. Bark beetles that may be in the area include Douglas-fir beetle (*Dendroctonus pseudotsugae*), Douglas-fir engraver (*Scolytus spp.*), mountain pine beetle (*Dendroctonus ponderosae*), red turpentine beetle (*Dendroctonus valens*), and Western pine beetle (*Dendroctonus brevicomis*).

Table 2. Stand Inventory Information

Area	Prescription	Stand ID ¹	Species	Age 07	DBH	BA	TPA	SDI	Acres ²
1	Partial Cut- Thin	5107	Conifer	80	14	171	189	50	78
			Hardwd		11	47	81	20	
	Residual Stand		All		13	100	120	30	

1. The source of stand inventory information is 2003 Stand Level Inventory.
2. The acres listed above are the total gross acres based on GIS including roads, and streams buffers.
3. The Target identifies expected stand characteristics (DBH, BA, TPA and SDI) after harvesting has been completed.

III. DESIRED FUTURE CONDITION/VISION:

The purpose of the following stand management treatments is to reduce moisture stress and competition lowering the risk presented by disease and wildfire, and to raise revenue for the Common School Fund by removing a small amount of timber. Thinning will help reduce interspecies competition and stress on the trees helping to prevent beetle outbreaks and disease. Removing some of the ladder fuels will help prevent fire from reaching the canopies and killing the dominant overstory trees. The stand is classified to grow into Layered and OFS sometime in the future. The thinning will help it along that trajectory. The thinning will help create layering with some hardwoods acting as the mid-layer.

Table 3. Stand Structure Information:

Area	Stand ID	Current	Post Harvest ¹	Desired Future	Acres ²
1	5107	CSC	LYR	OFS	78

1. The stand is expected to develop into this condition in the five to ten years after this operation is completed.
2. Gross acres.

IV. PROPOSED MANAGEMENT PRESCRIPTION:

Desired Silvicultural Results: The sale area will be a basal area thinning from below to remove the suppressed, intermediate and some of the codominant trees from these stands. Some of the healthy advanced understory will be retained to promote layering. An upper diameter limit will be established to preserve the largest and healthiest trees in the stands. Density management will increase growth and development of the overstory and understory. Thinning these stands will increase the health and vigor of the residual

conifer and hardwood trees as well as reduce the likelihood of insects, disease, wildfire, or other stand replacing events. Portions of the sale area will remain in unthinned patches at least 1 acre in size due to limitations in logging capabilities. The largest and healthiest trees will be left throughout the sale, as well as any trees that have the Old Growth characteristics of rough bark, large limbs and deformed tops.

Snags: Snag creation will be required. An estimated 1 to 1.5 snags per acre will occur as a result of logging and natural mortality. The sale area will be assessed after logging to determine the amount of snags to create. It is likely that an additional 1 snag per 2 acres will be created by tree topping or girdling. All pre-existing snags that are not safety or fire hazards will be retained. Any snags that are felled will be retained for down woody debris.

Down woody debris: Approximately 100 cu. ft. per acre of class 1 debris will be added through normal logging operations including trees that are damaged and eventually blow down and cull log segments required to be left on the ground. Additionally any time a stand is opened up from management activities the possibility of isolated blow down or top breakage exists. No yarding of down woody debris will be permitted.

Insects and disease: This area has a mix of conifers, on a dry site that may be more susceptible to a combination of drought, insects, and overstocking. The sale will focus on removing the trees that have smaller, less developed crowns, poor vigor and thus are more susceptible to insects and disease.

Fuels Modification: Residual slash, tree tops and limbs, will be burned if unacceptable accumulations remain after harvest.

Regeneration: Regeneration from seed will occur naturally in more open thinned areas. Some pockets may be replanted, but it is not anticipated that crown canopy will be reduced enough to require replanting.

V. ESTIMATED TIMBER AND REVENUE OUTPUTS:

Table 4. Timber and Revenue

Ownership		Sale Type	
BOF	CSL	Cash	Recovery
0%	100%		X
Planned Quarter:			

	Conifer	Hardwood	Total
Net Volume (MBF)	350	20	370
Stumpage Value (\$/MBF)	\$250	\$30	
Estimated Gross Value	\$87,500	\$600	\$88,100
		Project Costs:	\$20,000
		Estimated Net Value:	\$68,100

*70 acres net * 5 MBF/acre= 350 MBF

VI. HARVESTING AND ACCESS CONSIDERATIONS:

Access: There is an existing road system that will allow access through Savage Creek or Greens Creek Road. The Greens Creek Road is a much longer way to the sale, and has some steep grades that make it less desirable than the Savage Creek access. The license agreements will be easier to obtain through Greens Creek than through Savage Creek. A license agreement request has been initiated through the cooperative right-of-way agreement with the BLM. Road improvement and a stream crossing (over a culvert) would have to be done along an old road grade to a point before the State property in the north. A short spur of road will have to be built on BLM. New road will have to be built across the ODF managed land for the timber sale.

Harvesting: Cable yarding in the summer.

Table 5. Transportation Management Summary (Miles)

Activity	Mainline	Collector	Rocked Spur	Dirt Spur
Construct				0.5
Improve				0.5
Maintain				
Close/Block				
Vacate				

VII. AQUATIC RESOURCES AND WATER QUALITY:

There are no fish-bearing streams in the sale area. There is one main draw that runs west to east that has the potential to be a seasonal, or perennial stream. All of the draws will be checked to see if they have stream channels that flow water seasonally or perennially. All streams will be posted according to the Southwest Oregon Forest Management Plan riparian management area rules. To the extent that harvesting will

be occurring in the “inner” and “outer” RMA zones, live tree and snag retention will exceed the requirement standards in the SWO FMP.

VIII. WILDLIFE AND T&E SPECIES CONSIDERATIONS:

Northern Spotted Owl: The SOA Wildlife Biologist has determined that the sale area is suitable for Northern Spotted Owls due to the age and size of the trees. Surveys for NSO’s have taken place in years previous and in 2006 and 2007. The sale is within 1.3 miles of two owl sites.

Marbled Murrelet: This sale is outside the known inland range of the marbled murrelet and will not require surveys.

Threatened and Endangered Fish: There are no fish-bearing streams in the sale area.

Threatened and Endangered Plants: The sale area will be checked against District knowledge for any listed plant location as well as the Oregon Natural Heritage Program (ONHP) database of known listed plant locations.

IX. SLOPE STABILITY AND GEOTECHNICAL ISSUES:

A hazard assessment was conducted by a Geotechnical Specialist to determine slope stability. The soils in the sale area have high concentrations of clay. In clays, the water drains from the soil or runs over the surface of the soil faster than it is absorbed. This means that the water will run off of the surface rather than building pressure in-between the bedrock and soil. This area is not a high or moderate risk for fast moving debris flows. The sale area and the slopes below it are low risk of rapidly moving landslides. Please see the attached report.

X. RECREATION RESOURCES:

There are no developed trails or facilities in close proximity to the sale.

XI. CULTURAL RESOURCES:

The sale area was checked against a cultural resources database and maps. The sale area is not likely to have cultural resources. During sale preparation, the sale area will be reviewed for cultural artifacts.

XII. SCENIC RESOURCES:

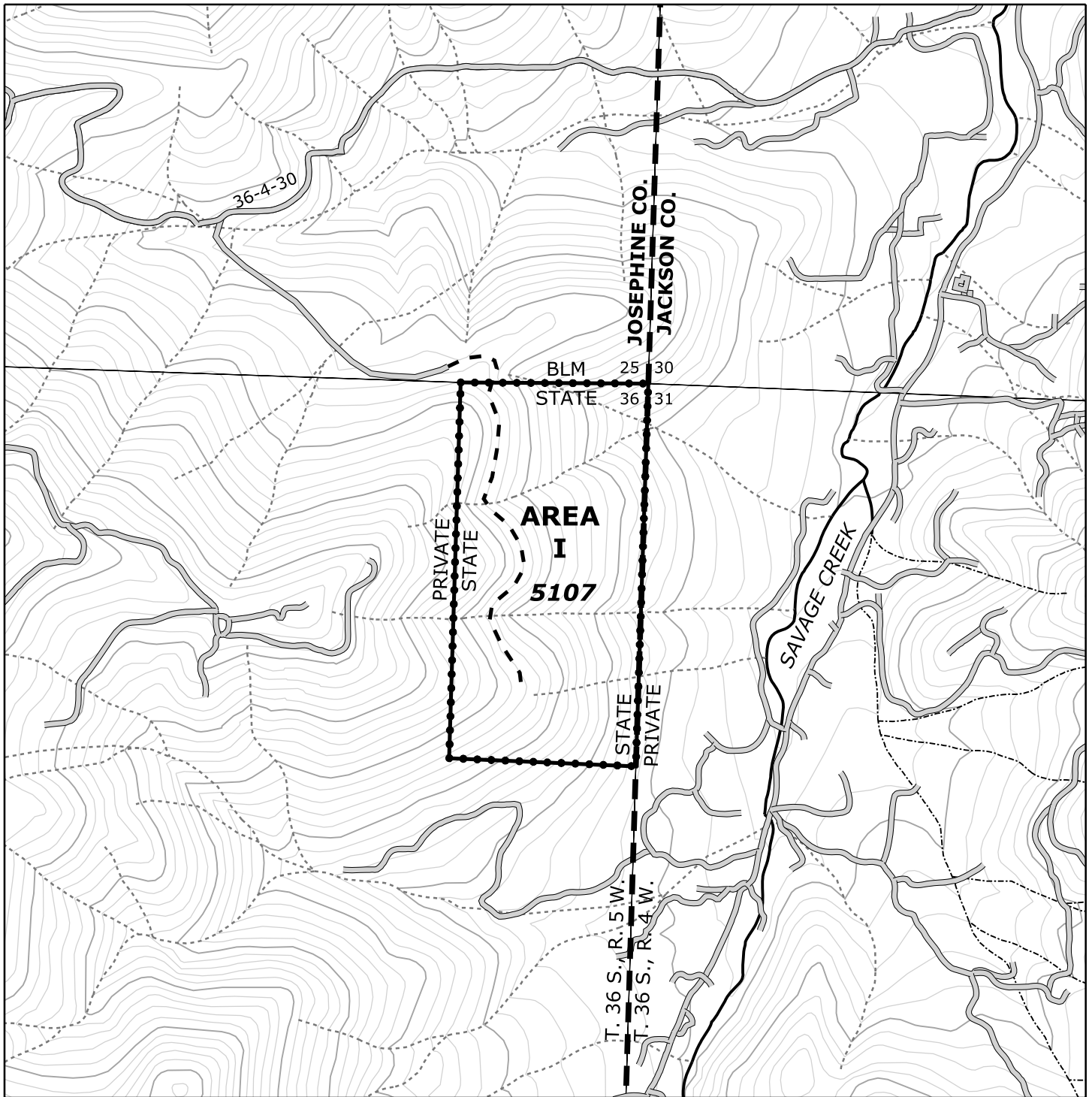
The Visual Classification is rated as Level III – Low Sensitivity.

XIII. OTHER RESOURCE CONSIDERATIONS:

There are no other resource considerations within or adjacent to the sale area.

XIV. LAND MANAGEMENT CLASSIFICATION SUMMARY:

The sale has streams that receive “focused” or “special stewardship”. Small seasonal streams receive focused stewardship in the inner and outer RMA zones where a specified basal area retention is required. Small perennial streams receive special stewardship or specific stream buffer protection in the stream bank zone. The inner and outer RMA zones of the perennial streams receive focused stewardship. The small fish-bearing streams receive the above stewardship with an added emphasis, or special stewardship in the aquatic and inner riparian management areas. The stewardship is accomplished through stream buffers of increasing size as the stream becomes larger and supports fish. Specific requirements are listed in the appendix of the Southwest Oregon Forest Management Plan riparian management area rules.



Savage Creek Thin

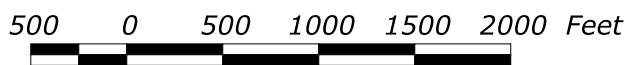
- Alternate Sale -



S.W.O. District - 2009
Annual Operations Plan

ACRES (est. gross)	
AREA I	: 78 acres
TOTAL	: 78 acres

T. 36 S., R. 5 W., Sec. 36; W.M.
Josephine County, Oregon



Contour Interval : 40 feet

MEMORANDUM

TO: Chris Rudd
FROM: Randy Smith
SUBJECT: Preliminary Biological Assessment for the **Savage Creek Thin** Timber Sale
DATE: January 31, 2008

Executive Summary

Savage Creek Thin is a proposed sale in the 2009 Annual Operations Plan of the Southwest Oregon District and is located within the home range of the Bootstrap and Greens Creek northern spotted owl sites.

The sale is 1.1 miles from the Bootstrap Activity Center (AC) and will impact 30 acres of the 1.3 mile circle. The sale is also within 1.2 miles of the Greens Creek AC and will impact 9 acres of the 1.3 mile circle.

No spotted owls have been observed within the sale area during protocol surveys.

After harvest of the sale, 65% and 69% suitable habitat will remain post harvest within the 1.3 mile circles for the Bootstrap and Greens Creek activity centers. Suitable habitat within both circles will exceed the ITG.

This sale is outside of the known inland range of the marbled murrelet (>50 miles from the ocean). As currently proposed, the Savage Creek Thin timber sale is expected to have a low risk of negatively affecting the occupancy and productivity of the Bootstrap and Greens Creek northern spotted owl sites.

Introduction

Purpose

The Southwest Oregon District is proposing the Savage Creek Thin timber sale in their 2009 Annual Operations Plan. This sale contains suitable habitat for northern spotted owls. Portions of the sale are within the 1.3 mile circles for the Bootstrap and Greens Creek northern spotted owl activity centers. This memo presents the relevant biological information needed to assess the potential effects of the Savage Creek Thin timber sale on northern spotted owls.

Policy Direction

Northern Spotted Owls

In the Southwest Oregon District, the standard for protection of northern spotted owls, according to ODF policy (Holloway 2002), is to apply the U.S. Fish and Wildlife Service rescinded Incidental Take Guidelines (ITG) as outlined in "Procedures leading to Endangered Species Act compliance for the northern spotted owl" (U.S. Fish and Wildlife Service 1990). According to the ITG, the best available habitat is identified for a 70 acre core area; at least 500 acres of suitable habitat should be maintained within a 0.7 mile radius and within the home range circle (in this province 1.3 miles), approximately 40% suitable habitat (1,336 acres) should be maintained. Additional factors to be considered and documented in this biological assessment include proximity of the operation to a site, the prescription proposed, the size of the operation, the history of management activity near the site, and other relevant factors.

Background

Survey History and Site Information

Bootstrap

Potential spotted owl habitat surrounding the timber sale was surveyed according to protocol endorsed by the USFWS (Anonymous, 1991). In 2000 and 2002 a non-nesting pair was located at this site. This site was not surveyed in 2001 and 2003. The historic pair nested on private ownership in 2004 and fledged two young. In 2005, the same pair nested in a new tree 30' from the 2004 tree and fledged one young. The historic female was found with an un-banded male in 2006 and 2007 and they did not nest.

Greens Creek

A non-nesting pair occupied this site in 1999 and 2000. The site was not surveyed in 2001. A single male was heard in 2002 along with a pair of barred owls. There was no response in 2003. A single male response was detected in 2004 and the site was downgraded to resident single. In 2005, an un-banded female was found in a nearby area and she did not appear to be nesting. The BLM had found owls in this same area in 2000 and considered it the same site. There were no responses in 2006 or 2007.

Sale Area Information

According to Stand Level Inventory (SLI) information from 2003, the Savage Creek Thin sale consists of 80 gross acres in one sale area. The sale area is currently classified as closed single canopy (CSC) with mixed conifers/hardwoods and some layering beginning to develop. The desired future condition for this stand is older forest structure (OFS). The sale is a mixed conifer and hardwood forest comprised of 80 year-old Douglas-fir with large amounts of madrone, chinquapin, incense cedar and various oak species. The average conifer DBH in the stand is 14 inches with a density of 190 trees per acre (TPA). The hardwoods average 11 inches DBH and 80 TPA. The brush layer consists of manzanita, hazel, poison oak and ferns. SLI reports 8 snags per acre >12 inches DBH with one conifer snag greater than 24 inches per acre. Most snags present are comprised of smaller hardwoods. The sale area has approximately 1,100 cubic feet per acre of existing down wood in all decay classes.

Prescription

The commercial prescription will primarily be a basal area thinning from below of the intermediate size classes of conifer and hardwoods. The target will be to retain a mixed species stand with a stand basal area (BA) of 100 square feet/acre distributed across stand diameters and 120 TPA. A goal of the thinning in this area is to promote development of layered and older forest structure stands while reducing fuel loading lowering the risk of a stand replacement fire. Existing down wood and snags that are not safety hazards will be retained. Some of the healthy advanced understory, including hardwoods, will be reserved to promote layering. An upper diameter limit will be established to preserve the largest and healthiest trees in the stands. Thinning these stands will increase the health and vigor of the residual conifer and hardwood trees as well as reduce the likelihood of insects, disease, wildfire, or other stand replacing events. Portions of the sale area will remain in unthinned patches at least 1 acre in size. These unthinned patches will be randomly placed throughout the sale area and in areas limited due to logging capabilities. An estimated 1 to 1.5 snags per acre will occur as a result of logging and natural mortality and, in addition, it is likely 1 snag per 2 acres will be created by topping or girdling. Approximately 100 cubic feet/acre of class 1 wood will be added through normal harvest operations. Regeneration from seed will occur naturally as a result of the thinning. No suitable habitat will be removed outside the sale area due to new road construction.

Assumptions

Defining the Home Range

We do not have specific information about the home range of the northern spotted owl site affecting this thinning sale. According to "Procedures leading to Endangered Species Act compliance for the northern spotted owl" (U.S. Fish and Wildlife Service 1990), the median home range size for spotted owl pairs in the Klamath Province is 3,340 acres, or the equivalent of the area encompassed by a

circle with a radius of 1.3 miles. Although spotted owls generally do not have circular home ranges, in the absence of more specific information about the home range of this site, I will assume that a 1.3 mile radius circle around the nest or activity center approximates the home range of this site. All stands for this analysis were digitized and circle radii/acreages were calculated using ArcMap 9.2 software.

Defining Suitable Habitat

Although spotted owl habitat has generally been described as old growth, spotted owls are known to use a variety of forest types in this part of the Oregon Klamath province. The home ranges of spotted owls in this region contain large percentages of stands in intermediate stages of stand development (Anthony and Wagner 1999). Spotted owls are known to nest in stands as young as 60-80 years old that have suitable structures on state forest lands in the Southwest Oregon District (approximately 40% of known nests on ODF lands in the District are in this age class) and to forage in even younger stands.

A complicating factor in identifying suitable spotted owl habitat on this District is the land ownership pattern. The area around the Bootstrap and Greens Creek spotted owl site includes lands managed by federal, state, private industrial and private non-industrial landowners. Because specific stand data on private and some federal ownership was not available for our use, this assessment of habitat suitability within the Bootstrap and Greens Creek home range circles is based on aerial photos. Determination of habitat status within the owl circles was done by considering 2005 series air photos, 2007 field assessments, and owl use data.

Impact Assessment and Discussion

Landscape Analysis

The following discussion assesses the habitat situation within 1.3 miles of the Bootstrap and Greens Creek spotted owl activity centers, as recommended by the ITG (Table 1, Figure 1). This sale does not impact either of the Bootstrap or Greens Creek 0.7 mile circles.

Bootstrap. The Savage Creek Thin timber sale will partial cut 30 acres within the 1.3 mile circle for the Bootstrap spotted owl site. A habitat analysis of the Bootstrap spotted owl site indicates that there are approximately 2229 acres of suitable habitat within 1.3 miles of the activity center. If the sale area is excluded from the suitable habitat, 2199 acres (65%) of suitable habitat are available within 1.3 miles of the activity center. Based on this preliminary habitat analysis, this site will maintain enough unmodified suitable habitat within the 1.3 mile circle after harvest to be consistent with the ITG.

Greens Creek. The Savage Creek Thin timber sale will partial cut 9 acres within the 1.3 mile circle for the Greens Creek spotted owl site. A habitat analysis of the Greens Creek spotted owl site indicates that there are approximately 2352 acres of suitable habitat within 1.3 miles of the activity center. If the sale area is excluded from the suitable habitat, 2343 acres (69%) of suitable habitat are available within 1.3 miles of the activity center. Based on this preliminary habitat analysis, this site will maintain enough unmodified suitable habitat within the 1.3 mile circle after harvest to be consistent with the ITG.

Effects of the Prescription

The effects of thinning on spotted owl habitat are not well understood. Spotted owls are known to use stands that have been thinned for foraging and for nesting (Anthony et al. 2000; Tappeiner et al. 1999), and this research indicates that in the long term, thinning is a tool that can develop spotted owl habitat (Tappeiner et al. 1999). However, the short-term effects of thinning are less clear. In a case study of a thinning near an owl core area in Clatsop County, spotted owls displaced their foraging activity for at least a couple of years after the harvest (Anthony, et al. 2000). Other

anecdotal evidence on state forest lands in this District indicates that on at least one occasion, spotted owls have used recently thinned stands for nesting within two years of harvest.

Following completion of the partial cut operations, I do not anticipate the sale area will be suitable northern spotted owl habitat for many years. I believe that the lack of canopy closure, sparse understory vegetation, and a reduced conifer basal area will not provide suitable habitat for owls or prey species for some time after harvest operations have been completed.

Discussion

The Bootstrap spotted owl site is 1.1 miles from the proposed Savage Creek Thin timber sale. Approximately 30 acres of the sale are within the 1.3 mile circle. Although portions of the sale within the 1.3 mile circle will not be suitable immediately post-harvest, the proposed thinning prescription will retain habitat elements and enhance future development of habitat important to northern spotted owls. The Bootstrap spotted owl activity center is on private ownership. Harvest plans on private ownership are not known at this time. A significant portion of this circle is on private ownership and a majority is currently suitable habitat for owls. Federally managed land makes up 38% of the area within 1.3 miles of the spotted owl activity center, 1% is managed by ODF and 61% is managed by other landowners. There is a block of approximately 200 acres of high quality contiguous habitat around the activity center primarily to the east on federal and private lands which likely serves as a core use area. This area could become increasingly important if more of the private lands to the north, west and south of the AC are operated upon and increase fragmentation.

The Greens Creek spotted owl site is 1.2 miles from the proposed Savage Creek Thin timber sale. Approximately 9 acres of the sale are within the 1.3 mile circle. Although portions of the sale within the 1.3 mile circle will not be suitable immediately post-harvest, the proposed thinning prescription will retain habitat elements and enhance future development of habitat important to northern spotted owls. The Greens Creek spotted owl activity center is on BLM ownership and is not located within a Late Successional Reserve (LSR). Federally managed land makes up 51% of the area within 1.3 miles of the spotted owl activity center, <1% is managed by ODF and 49% is managed by other landowners. There is a block of approximately 550 acres of high quality contiguous habitat around the activity center on federal lands which likely serves as a core use area. The remaining habitat on state and other lands near the both these spotted owl activity centers is of lower quality but still appears to be able to provide ample foraging and roosting opportunities for spotted owls.

The habitat analysis of this site indicates that the ITG will be met within 1.3 miles of the activity center after harvest of the sale area.

Conclusions and Risk Assessment

Biological Risk

As currently proposed, the Savage Creek Thin sale is expected to have a low risk of negatively affecting the occupancy and productivity of the Bootstrap and Greens Creek spotted owl sites based on the following factors:

Bootstrap

- ◆ The sale is along the outer edge of the 1.3 mile circle;
- ◆ Habitat quality and quantity immediately surrounding the activity center is high along with good connectivity to habitat East of the activity center;
- ◆ There has been very little recent harvest activity within the 1.3 mile circle;
- ◆ Approximately 65% of the 1.3 mile circle will remain as unmodified suitable habitat after harvest of the sale, exceeding the ITG;

Greens Creek

- ◆ The sale is along the outer edge of the 1.3 mile circle;
- ◆ Habitat quality and quantity immediately surrounding the activity center is high along with good connectivity to habitat surrounding the activity center;
- ◆ There has been very little recent harvest activity within the 1.3 mile circle;

- ◆ Approximately 69% of the 1.3 mile circle will remain as unmodified suitable habitat after harvest of the sale, exceeding the ITG;

Compliance with Policy

After completion of harvest operations associated with the Savage Creek Thin timber sale, the remaining suitable habitat within the Bootstrap and Greens Creek owl circles will exceed the standards identified in the U.S. Fish and Wildlife Service rescinded Incidental Take Guidelines. Assessment of other relevant factors indicates that the risk of negatively impacting these owl sites is low.

Consultation

Mark Vargas, District Wildlife Biologist with the Oregon Department of Fish and Wildlife, provided the following comments; "I have checked my map of the proposed timber sale location and do not have any other known nest sites in that local area. I concur with your assessment that suitable habitat will remain post harvest within the 1.3 mile circles for the Bootstrap and Greens Creek activity centers. And as currently proposed the Savage Creek Thin timber sale should have a low risk of negatively affecting the occupancy and productivity of the Bootstrap and Greens Creek northern spotted owl sites".

Literature Cited

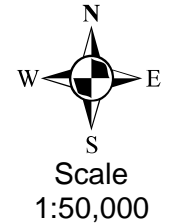
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cc: Dan Thorpe, Rob Nall, Marcia Humes, Greg Kreimeyer, Mark Vargas – ODFW Central Point

Table 1. Acres of suitable habitat within 1.3 mile circles of the Bootstrap and Greens Creek northern spotted owl activity centers. Suitable habitat determined through 2005 air-photo analysis and 2007 field assessment.

	Acres	Bootstrap 1.3 mi	Greens Creek 1.3 mi
Suitable Habitat:			
State		31	9
Federal		797	1537
Private		1401	806
Total		2229	2352
Sale acres in circle removed as habitat	80	30	9
Unmodified suitable habitat remaining		2199	2343
% suitable post harvest		65%	69%

Figure 1. Suitable habitat on state and federal lands within 1.3 miles of two northern spotted owl activity centers relative to the Savage Creek Thin timber sale.*



Legend

- Spotted Owl Activity Center
- Savage Creek Thin Timber Sale**
- Partial Cut
- 1.3 Mile Buffer
- State and Federal Habitat**
- Suitable
- Non-suitable



*Suitable habitat on privately-owned lands is not shown in this figure.



Oregon

Department of Forestry

Southern Oregon Area Office
1758 NE Airport Road
Roseburg, OR 97470
Phone: (541) 440-3412
FAX: (541) 440-3424

January 24, 2008

Chris Rudd
Oregon Department of Forestry
State Lands Forester
Grants Pass

Dear Chris,

On January 22, 2008 you and I visited the State Lands proposed Savage Thin Sale and areas adjacent to downslope residences at 800, 810 and 840 Savage Creek Road in Jackson County. The Savage Thin Sale is in T36S, R5W, S36 and the residences are in T36S, R4W, S31. Per your comments, the residence for 694 Savage Creek Road is not located within a FRA due to elevation (approximately 20 feet) above the adjacent (potentially) delivering channel.

The purpose of the visit was to observe transport and deposition zones below High Landslide Hazard Locations (HLHL) in order to determine whether any of the reviewed structures were located within Further Review Areas (FRA) of the HLHL within the proposed sale. Observations were made in accordance with protocol specified in Oregon Department of Forestry Technical Note 2: High Landslide Hazard Locations, Shallow, Rapidly Moving Landslides and Public Safety: Screening and Practices.

As described in Technical Note 2, there are three zones of shallow, rapidly moving landslides, initiation, transport and deposition, where the former corresponds to HLHL. HLHL were identified based on mapped slopes. Observations of transport and deposition zones were made in the field. The following discussion summarizes our observations from the transport and deposition zones.

800 Savage Creek Rd.

A small gully heads in the SW corner of the 810 Savage Creek Rd. taxlot and runs east-northeast past the 810 Savage Creek Rd. residence toward the NW corner of the 800 Savage Creek Rd. residence. No channel is expressed within the gully until exiting a culvert below the driveway for the 810 Savage Creek Rd. residence at which point a discharge of less than 1 cubic feet per second (cfs) was observed. Stream gradient from the culvert outlet downstream to Savage Creek Rd. (approximately 450 feet) averaged 14% where flow is captured by another culvert and routed below the road. Below Savage Creek Rd. water is

collected in a 4" pipe and carried to Savage Creek around the northern portion of the building pad. Total basin length for this gully/stream is approximately 1200 feet.

No debris fan or lag deposit was observed for the gully/stream that drains around 800 Savage Creek Rd.

810 Savage Creek Rd.

The stream that drains to the south of the 810 Savage Creek residence was walked from the point of culvert outlet below Savage Creek Rd. to a point approximately 500 feet within the Savage Thin Sale. Immediately above the Savage Creek Rd. an approximately 20 feet long by 8 feet wide deposit of soil and angular basic igneous rock fragments was observed. Based on visual-manual classification performed in accordance with ASTM D-2488, the soil fraction of the deposit is classified as Fat CLAY with Sand, CH in accordance with the Unified Soil Classification System. Given that clay is typically not susceptible to failure in debris slide mode and the proximity of the deposit to the road, it is interpreted that the origin of the deposit is road construction related.

Upslope from Savage Creek Rd. the stream gradient ranged from 15 to 20% and was characterized by well rounded moss covered rocks. These are indicative of a low power stream and also indicate that no debris flow has occurred within the recent geomorphic history of the basin.

At the point in the stream closest to the foundation for 810 Savage Creek Rd., the elevation difference between them was approximately 25 feet.

840 Savage Creek Rd.

A small gully/creek, which was carrying no water at the time of our visit, runs south of the 840 Savage Creek Rd. residence, approaching no closer than approximately 150 feet. Elevation difference between the foundation of the residence and the gully/creek is approximately 20 feet.

No debris fan or lag deposit was observed for the gully/creek that drains around 840 Savage Creek Rd.

Interpretation/Conclusions

Considered together, the observations from each of the three drainages which originate within the proposed Savage Thin Sale indicate that debris flows/torrents have not been generated in any of the stream systems in the recent geomorphic history of the site. This interpretation is supported by the convex geomorphology of the site, which indicates near-surface basic igneous rock with residual clay soil development and subsequent downslope creep, the textural characteristics of the soil, which indicate relatively high clay content, the absence of scoured transport zones within the stream systems observed and the absence of debris fans or lag deposits near the confluence of the streams and Savage Creek.

Based on the abundance and internal consistency of observations that indicate that the site has not been subject to debris slide failure and transport processes, it is interpreted that the site is inherently not subject to periodic occurrence of shallow, rapidly moving landslides. When coupled with the geometrical separation (lateral and vertical) that each of the residences possesses relative to potential delivering streams, the Impact Rating for each residence is considered **Unlikely** and the Downslope Public Safety Risk is considered **Low**.

Respectfully,

Mike Dewey, RG

