

Pre-Operations Report

Operation Name: Boulder Creek

County: Marion

Management Basin: Scattered

Table 1. Operation Areas, Types and Acres

Area	Type of Operation	Gross Acres	Net Acres
I	Moderate Partial Cut	237	214
II	Modified Clearcut	23	23
III	Modified Clearcut	15	14
TOTAL		275	251

I. PHYSICAL DESCRIPTION OF OPERATION AREA:

The operation is located within a temperate climate area. Typically the fall and winter seasons are wet. This area receives approximately 70 to 90 inches of rainfall per year. The operation is located within the *Tsuga heterophylla* Zone (*Natural Vegetation of Oregon and Washington, Franklin & Dyrness, 1973*).

The landforms are moderate ridge tops and moderate to steep side-slopes of two divides between Dry Creek and two western most tributaries of Boulder Creek. The underlying rocks are sedimentary and igneous origin mapped as "Undifferentiated tuffaceous sedimentary rocks."

The proposed operation ranges from 2,600 to 3,330 feet in elevation. The soil is classed as USFS soil resource inventory types 212 and 21. These soils are thin, gravely loams. The soils are well to excessively drained. Permeability is very rapid in the surface soils. The operation supports Site Class IV Douglas-fir and western hemlock.

II. CURRENT STAND CONDITION:

The stands within the operation areas are currently classified as Understory and average 60 years of age. Douglas-fir, western hemlock, red alder, black cottonwood and western red cedar comprise the overstory of the stand. The western hemlock in Areas II and III are heavily infested with dwarf-mistletoe. These stands also are suffering from bear and snow damage. Western hemlock, dogwood, vine maple, salal, ferns and huckleberry can be found in the understory.

There are approximately 8 snags per acre; very little sound down wood; and 7,000 cubic feet per acre of down wood in all decay classes within Area I. (SLI, 2005)

Table 2. Stand Inventory Information

Area	Prescription	Stand ID	Species	Age	DBH	BA	TPA	SDI	Acres ²
I ¹	PC-M	12394, 12039	DF	60	15	248	206	65	237
		Target³			19	150	75	35	
II,III ⁴	MC	12394, 12039	DFWH WRC	60	15	220	180	57	38

1 The source of stand inventory information is SLI from 2005.

2 The acres are based on GIS and include roads, streams buffers, reserve areas, etc.

3 The Target identifies expected stand characteristics (DBH, BA, TPA and SDI) after harvesting has been completed.

4 The source of stand inventory information is field reconnaissance in 2008.

III. DESIRED STAND CONDITION:

This operation is located in the Scattered Basin. This basin is a diverse mixture of ownership, stand ages, species mixtures, and site quality. As indicated by its name, the Scattered Basin is a conglomeration of scattered ODF ownership parcels that range in size from 40 acres to 1000 acres. The operation is located within a parcel which is approximately 320 acres in size. Most of the smaller parcels within the basin are viewed as land exchange candidates due to the intermingled nature of the ownership. Boulder Creek has been identified as a potential land exchange parcel.

The desired future condition for all operation areas is Layered. (*Cascade District Implementation Plan, 2003*) Performing a commercial thinning on Areas II and III will not move these areas toward Layered. Most of the hemlock within these areas are heavily infected with mistletoe and need to be removed. The majority of the trees within the areas are hemlock so most of the leave trees will be of other conifer species. Adding these openings will further enhance the DFC for the entire stand.

The **Anticipated Pathway for Area I** begins with thinning the overstory which currently supports about 206 trees per acre (TPA)

- This will be a medium density, first entry, commercial thinning in a 60-year old stand.
- In 15-20 years (age 75) the stand will be commercially thinned for the second time. This thinning will be moderate to heavy. Following this

operation, the understory will be cultured by regulating density and species mixture, and managing competing vegetation.

- Regeneration Harvest is expected to occur between overstory age 110 and 150 years.

The **Anticipated Pathway for Areas II and III** begins with regeneration harvest of the overstory.

- Modified clearcut of the current stand. Replant with a mixture of Douglas-fir and noble fir.
- Slash will be machine piled on the ground based portions of the operation.
- At age 10-15, a pre-commercial thin is anticipated given the planting density and natural seed-in.
- A first entry commercial thinning is planned around age 45.
- Subsequent thinning entries will be evaluated at 15–20 year intervals to culture the overstory and understory and meet management objectives.

Table 3. Stand Structure Information

Area	Stand ID	Current	Post Harvest ¹	Desired Future	Acres
I	12394, 12039	UDS	UDS	LYR	237
II	12394, 12039	UDS	REG	LYR	23
III	12394	UDS	REG	LYR	15

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

IV. PROPOSED MANAGEMENT PRESCRIPTION:

The **proposed management prescription for Area I** is:

- Reserve from cutting all western red cedar, black cotton wood, maple, white pine, silver fir, and alder less than 10 inches DBH. These trees will not count toward the overall TPA, BA, and SDI%.
- Old growth trees will be reserved from cutting and will not count toward the overall TPA, BA, and SDI%.
- Reserve existing snags and down wood. No additional snags or down wood will be added at this entry.
- Harvest all western hemlock, and all alder 10 inches or larger outside of posted buffer zones.
- All Douglas-fir trees greater than 8 inches DBH thin to: basal area of 150; TPA 75; ave DBH 19 inches; and SDI 35%.
- To promote development of mature forest conditions, thin as much of the RMAs as allowed under FMP without damaging the streamside.

- Harvest approximately 10,200 BF per acre.
- If portions of the operation exceed 240 sqft BA/ac after implementation of the Rx. The Sale Administrator may authorize the purchaser to remove additional D-fir trees and or other conifers in order to lower the residual basal area to 240 sqft BA/ac.

The **proposed management prescription** for Areas II and III is:

- Modified clearcut of the current stands.
- Approximately 7 to 9 green conifer trees per acre will be retained. 5-7 trees per acre are for landscape targets and 2 per acre are for future snag recruitment. Reserve any old growth trees.
- Reserve trees for Area II will be in GTR I, south of Area II and extending to the property line. GTR I will be thinned to the specifications of Area I.
- Reserve trees for Area III will be in GTR II, north of Area III, east of the road and extending to the property line. GTR II will be thinned to the specifications of Area I.
- The slash from the operation will be piled and burned on the flat ground and planting spots will be created within the slash on the steeper ground to prepare the site for planting.
- The site will be replanted with Douglas-fir and noble fir seedlings.
- Down wood will be evaluated at sale layout. If additional down wood is needed to meet landscape targets, it will be added. This material is expected to come during the operation from cull material and top logs with oversized knots.

V. ESTIMATED TIMBER AND REVENUE INFORMATION:

Table 4. Timber and Revenue

Ownership		Sale Type	
BOF	CSL	Cash	Recovery
100%	0%	<input type="checkbox"/>	x
Planned Quarter:		1	

	Conifer	Hardwood	Total
Net Volume (MBF)	3,100	100	3,200
Stumpage Value (\$/MBF)	\$220	\$200	
Estimated Gross Value	\$682,000	\$20,000	\$ 702,000
		Project Costs:	\$29,000
		Estimated Net Value:	\$673,000

Table 5. Transportation Planning Summary (Miles).

Activity	Mainline	Collector	Rocked Spur	Dirt Spur
Construct				1.25
Improve				1.02
Maintain				2.27
Close/Block				2.27
Vacate				

VII. AQUATIC RESOURCES AND WATER QUALITY:

There are approximately 8 small non-fish bearing streams within the operation. These streams all flow into Boulder Creek. A no harvest buffer of at least 25 feet horizontal distance will be posted on all of the small perennial nonfish bearing streams. In the remaining portion of the Riparian Management Areas (RMA) sufficient trees will be retained to comply with FMP standards.

See Pages 6 and 7 of the AOP Summary (under Timber Harvest Operations) for the riparian area management guidelines to be utilized.

VIII. T&E SPECIES CONSIDERATIONS:

This operation was surveyed for Northern Spotted Owls during the 2005, 2006, 2007 and 2008 survey seasons. It will be surveyed again during the 2009 survey season. In 2005 the sale area was within the home range of the Dry Creek and the Dry Hanson owls. The status of the Dry Creek site has gone historic after no responses in 2005, 2006, and 2007. The Dry Hanson site is still in the pair status. In 2005, 2006, and 2007 the pair was found but no young were present. In 2008 the Dry Hanson pair was located and fledged one young. In 2007 a Preliminary Biological Assessment was completed by the NWOA biologist. This assessment will be updated to take into consideration the historic status of the Dry Creek site and the addition of one small clearcut within the home range of the Dry Hanson owl.

The operation area was checked against District knowledge for any listed plant location. The operation area was also checked against the Oregon Natural Heritage Program's database of known listed plant locations. No listed plant records were identified within the operation area.

IX. SLOPE STABILITY AND GEOTECHNICAL ISSUES:

This assessment is based on analysis of USGS 1:24,000 topographic maps and available geologic maps. There may be a few high landslide hazard locations in the sale area. Area III and the eastern portion of Area I drain into Boulder Creek. Area II and the western portion of Area I drain into Dry Creek. The risk of landslides delivering to these streams from the sale area is low.

X. RECREATION RESOURCES:

There are no developed recreation facilities inside the timber sale boundary. Known recreation activities are dispersed in nature such as hunting, site seeing and target shooting. It will be important for both the operators and visiting public to use caution on roadways. To deter illegal motorized off-road use, illegal fires and garbage dumping in this area, skid roads/spurs will be closed.

XI. CULTURAL RESOURCES:

Pre-operation reconnaissance revealed no visible cultural resource features or artifacts. If discovery is made, the cultural resource will be protected and field staff will consult with the Cultural Resource Specialist in Salem.

XII. SCENIC RESOURCES:

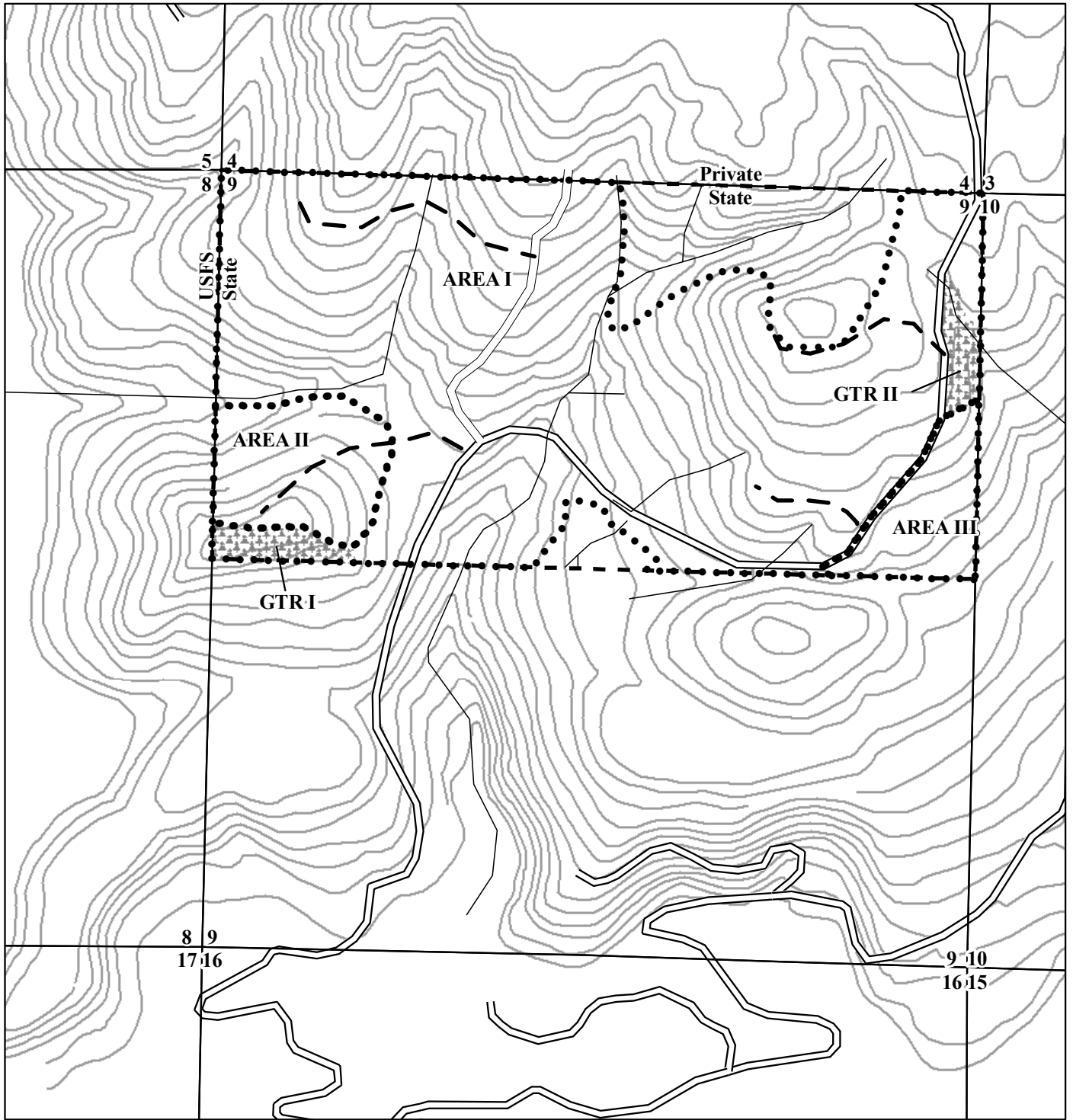
There are no scenic resources associated with this operation.

XIII. OTHER RESOURCE CONSIDERATIONS:

The east ½ of property will need to be surveyed (1½ miles of property line).

XIV. LAND MANAGEMENT CLASSIFICATION SUMMARY:

The operation contains Focused Stewardship, Aquatic and Riparian Habitat for eight small streams. See Section VII, Aquatic Resources and Water Quality, for more information.



Legend

- Sale Boundary
- — — Road Construction
- ==== Surfacd Road
- Unsurfaced
- ▨ Green Tree Retention
- Type F Stream
- Type N Stream
- Unknown Stream
- - - Santiam State Forest
- 40 Foot Contour Lines

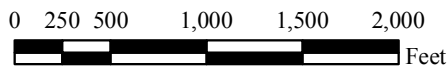
BOULDER CREEK

FY 2010 AOP
 NORTH CASCADE DISTRICT
 ATTACHMENT A : TOPOGRAPHY

PORTIONS OF SECTIONS 9
 T10S, R6E, W.M.
 MARION COUNTY, OR

Scale
 1:12,000

1 inch equals 1,000 feet

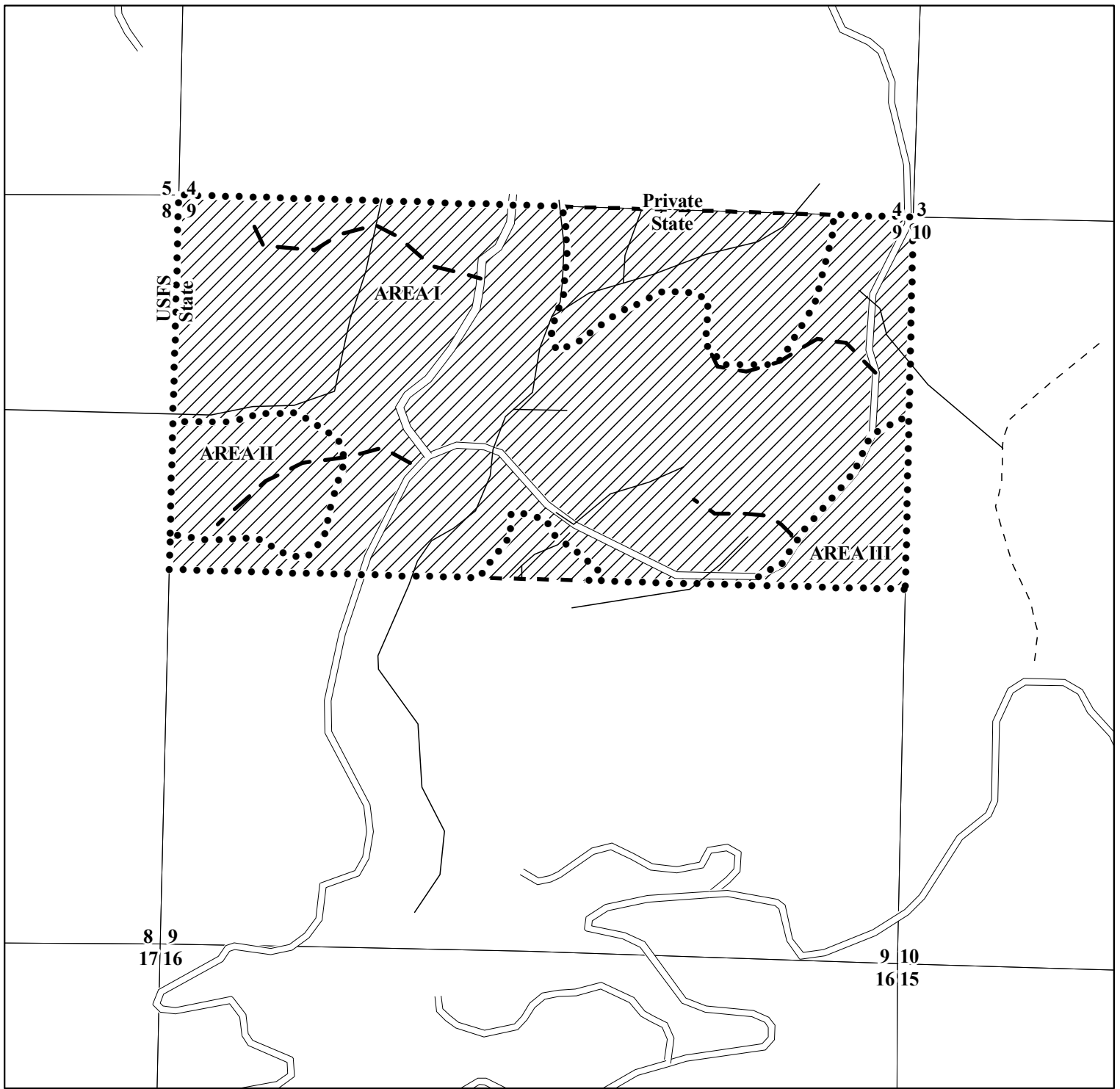


APPROX. NET ACRES:

AREA	ACRES
I	214 (PC)
II	23 (MC)
III	14 (MC)
TOTAL	251



This product is for informational use and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes.



Legend

- Sale Boundary
- — — Road Construction
- ==== Surfaced Road
- ==== Unsurfaced
- Type F Stream
- Type N Stream
- Unknown Stream
- ////// LYR
- ==== OFS
- - - - Santiam State Forest

BOULDER CREEK

FY 2010 AOP
 NORTH CASCADE DISTRICT
 ATTACHMENT B : DESIRED FUTURE CONDITION
 PORTIONS OF SECTION 9
 T10S, R6E, W.M.
 MARION COUNTY, OR

APPROX. NET ACRES:

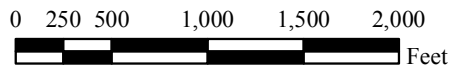
AREA	ACRES
I	214 (PC)
II	23 (MC)
III	14 (MC)

TOTAL 251

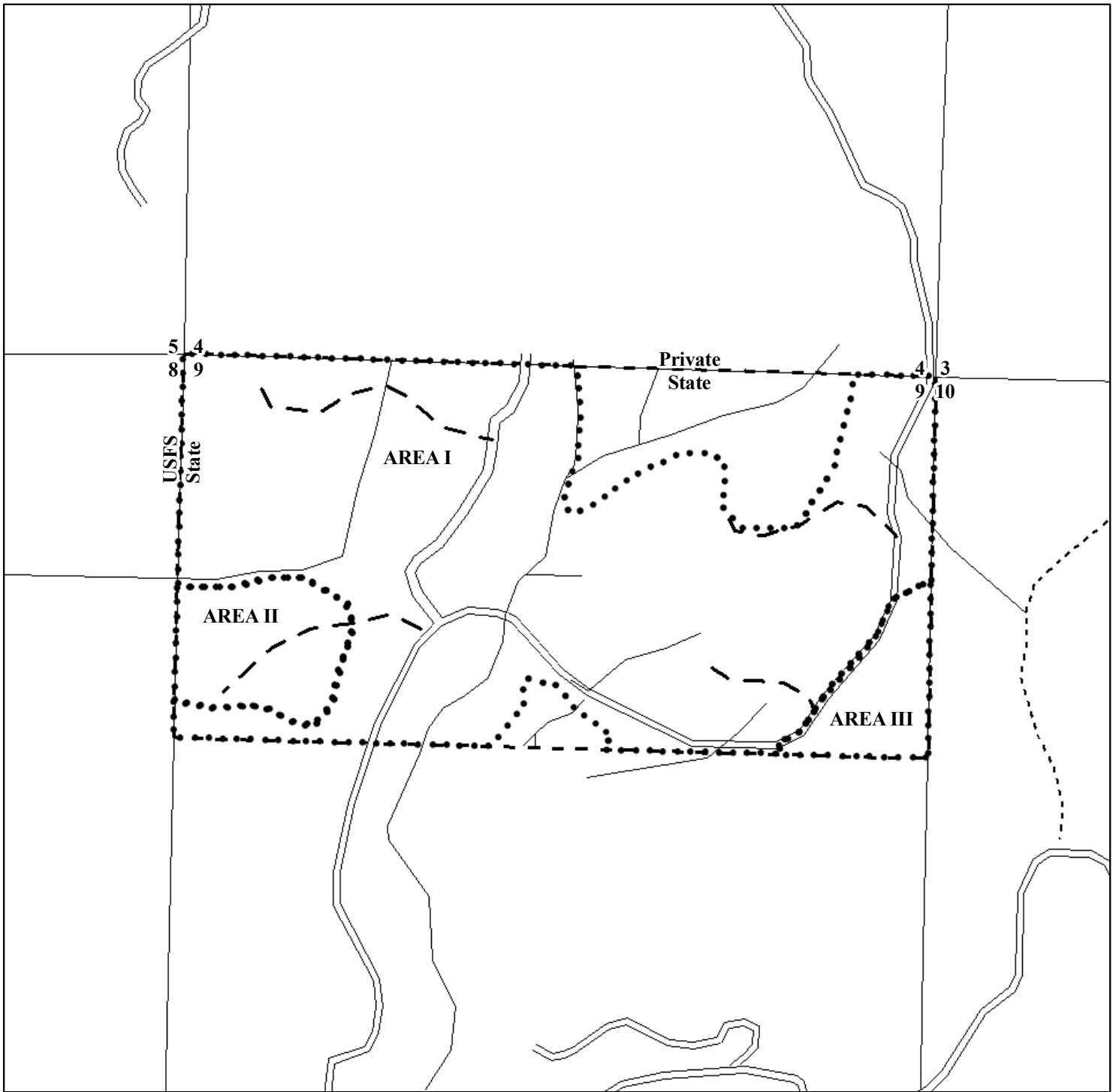


Scale
 1:12,000

1 inch equals 1,000 feet



This product is for informational use and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes.



Legend

- Sale Boundary
- ==== Surfaced Road
- Unsurfaced
- Type F Stream
- Type N Stream
- Unknown Stream
- - - - - Santiam State Forest

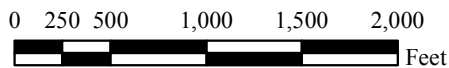
BOULDER CREEK

FY 2010 AOP
 NORTH CASCADE DISTRICT
 ATTACHMENT C: KEY RESOURCES

PORTIONS OF SECTION 9
 T10S, R6E, W.M.
 MARION COUNTY, OR

Scale
 1:12,000

1 inch equals 1,000 feet




APPROX. NET ACRES:

AREA	ACRES
I	214 (PC)
II	23 (MC)
III	<u>14 (MC)</u>
TOTAL	251



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Preliminary Biological Assessment of the Proposed Boulder Creek Timber Sale: Potential Impacts to the Dry-Hansen Northern Spotted Owl Site

Prepared by: Clint Smith 

Date: 26 February 2008

Introduction

Purpose. The proposed Boulder Creek timber sale (FY10) is partially located (74 of 251 acres) within 1.2 miles of the Dry-Hansen northern spotted owl activity center (owl circle). The purpose of this Biological Assessment (BA) is to summarize the habitat conditions within this owl circle and within the portions of the proposed sale area located within the owl circle. The anticipated effects of the sale prescription on spotted owl habitat quality will be discussed. A risk assessment will be offered and implications discussed with regards to the rescinded U.S. Fish & Wildlife Service "Incidental Take Guidelines" (Guidelines), (U.S. Fish & Wildlife Service 1990).

Policy Direction. ODF's Northern Spotted Owl Operational Policies list the following requirements that are relevant to spotted owl sites in the North Cascades District:

3.17 Protect spotted owl sites as follows:

3.17.1 As described below in 3.18 through 3.22.

3.17.2 Considering other relevant risk factors as documented in the biological assessment described in 3.23...

3.20 On all other state forest lands within the range of the northern spotted owl, **except** for the Elliott State Forest, protect northern spotted owl sites using the following standards:

3.20.1 Establish a core area (Definition 7.3) of at least 70 acres of the best available suitable owl habitat encompassing the nest site and/or activity center of a pair of spotted owls according to Procedure 2.1.P4.1.

3.20.2 Avoid any harvest activity within this core area.

3.20.3 Avoid any harvest activity which results in less than 500 acres of suitable habitat within a 0.7-mile radius (1000 acres) of a nest site and/or activity center.

3.20.4 Avoid any harvest activity which results in coverage by suitable owl habitat less than specified below for a circle with a radius centered on a nest site and/or center of activity ("owl circle") and as prescribed by physiographic province (Provincial radius – Definition 7.13) and as specified below:

3.20.4.1 Oregon Cascades province – 1.2 mile circle of 1182 acres...

3.20.5 Allow exceptions to the above standards only after considering specific information on home range size, habitat use, nest site, or the center of activity of well-studied owls in similar habitat in the same portion of the range (see Guidance 2.1.G4.2).

Background

Survey History. Federal ownership within the landscape surrounding the Boulder Creek sale area has been surveyed in the past by the U.S. Forest Service (USFS). These surveys identified several spotted owl sites, many of which still are considered active.

ODF's contract spotted owl surveyors (Kingfisher Ecological) have conducted spotted owl surveys on State and Federal ownerships within 1.2 miles of the Boulder Creek sale area in 2005-2006 using a combination of night surveys from road stations and day-time walk-through transects. Additional walk-in transects were added for the 2007 survey season, and surveys were continued in 2007-2008

Site Information. The USFS located a pair at the Dry-Hansen site in 1987, 1990, 1991, 1993, 1996, and 1998. According to the USFS, a male occupied this pair site in 2003, but there were no responses in 2004. Early in the 2005

season, USFS surveyors found an un-banded, non-nesting male at this site. Later in the season, Kingfisher surveyors heard a male at night on two occasions, a female at night on two occasions, and a pair once at night. In 2006, a male and female were heard on several occasions. Late in the season, the male and female were found ½ mile apart on the same follow-up visit. Both birds were moused; no young were present. In 2007, a female was heard two times at night and found late in the season; no young were present. In 2008, a pair and one young were found east of the AC. The AC remains the same. A male barred owl was present in 2007. Site status remains 'Pair.' (Kingfisher Ecological Inc. Northern Spotted Owl Surveys, Oregon State Lands, 2008, for Oregon Department of Forestry, final survey report.)

Sale Prescription. The following description is from the North Cascade District's preliminary draft Pre-operations Report:

The proposed management prescription for Area I is:

- Reserve from cutting all western red cedar, black cotton wood, maple, white pine, silver fir, and alder less than 10 inches DBH. These trees will not count toward the overall TPA, BA, and SDI%.
- Old growth trees will be reserved from cutting and will not count toward the overall TPA, BA, and SDI%.
- Reserve existing snags and down wood. No additional snags or down wood will be added at this entry.
- Harvest all western hemlock, and all alder 10 inches or larger outside of posted buffer zones.
- All Douglas-fir trees greater than 8 inches DBH thin to: basal area of 150; TPA 75; ave DBH 19 inches; and SDI 35%.
- Thin as much of the RMAs as is allowed without damaging the streamside.
- Harvest approximately 10,200 BF per acre.
- If portions of the operation exceed 240 sq ft BA/ac after implementation of the Rx, the Sale Administrator may authorize the purchaser to remove additional D-fir trees and or other conifers in order to lower the residual basal area to 240 sq ft BA/ac.

The proposed management prescription for Areas II and III is:

- Modified clearcut of the current stands.
- Approximately 7 to 9 green conifer trees per acre will be retained. 5-7 trees per acre are for landscape targets and 2 per acre are for future snag recruitment. Reserve any old growth trees.
- Reserve trees for Area II will be in GTR I, south of Area II and extending to the property line. GTR I will be thinned to the specifications of Area I.
- The slash from the operation will be piled and burned on the flat ground and planting spots will be created within the slash on the steeper ground to prepare the site for planting.
- The site will be replanted with Douglas-fir and noble fir seedlings.
- Down wood will be evaluated at sale layout. If additional down wood is needed to meet landscape targets, it will be added. This material is expected to come from cull material and top logs with oversize knots.

Assumptions

In this section, I will cite research conducted using spotted owls living in 2nd growth stands on ODF ownership within the northern Oregon Coast Range. I understand that due to differences in geographic location and possibly due to ecosystem differences, the results of this research may not be directly applicable to spotted owls within ODF's North Cascades District. However, the ODF research is some of the best available information on spotted owl use of 2nd growth habitats. Most of the Dry-Hansen spotted owl observations have been made in mature and old-growth stands. However, the amount of these stands in the owl circle is limited, and highly fragmented by young plantations (Figure 1). Because relatively young, 2nd growth stands predominate within the southern portion of the owl circle, including the ODF ownership, I believe that the results of the Coast Range research are relevant to this situation.

Defining the home range. The home ranges and habitat use of the birds using the Dry-Hansen spotted owl site are not known. Known owl locations are plotted in Figure 1, but this represents incomplete information.

Anthony et al. (1999) found that spotted owls in 2nd growth forests in the northern Oregon Coast Range frequently have very large home ranges, extending well beyond 1.5 miles. In the absence of better information on the home ranges of any birds using the site, the following discussion on the habitat situation will describe stand conditions within a 1.2 mile radius around the established activity center, as recommended by the Guidelines.

Defining Suitable Habitat. It is difficult to define suitable habitat for spotted owls in younger forests. Documentation provided with the "Procedures Leading to Endangered Species Compliance for the Northern Spotted Owl" (U.S. Fish & Wildlife Service, 1990) describes spotted owl suitable habitat as stands that exhibit: "...moderate to high canopy closure; a multilayered, multispecies canopy dominated by large overstory trees; a high incidence of large trees with large cavities, broken tops, and other indications of decadence; numerous large snags; heavy accumulations of logs and other woody debris on the forest floor; and considerable open space within and beneath the canopy. These attributes are usually found in old growth, but they are sometimes found in younger forests, especially those that contain remnant large trees or patches of large trees from earlier stands...It is important to note that the age of forests is not as important a factor in determining habitat suitability as are vegetational and structural components..."

The majority of stands used by spotted owls on ODF ownership do not meet the above definition of suitable habitat.

ODF has some data on the use of younger forest types from North Coast spotted owl sites on ODF lands. An attempt to create a habitat suitability index (HSI) for spotted owls was conducted by Islam et al. (1997). Although this investigation was limited by various factors, the major finding was a positive correlation between owl site occupancy and the acreage of stands averaging 18 inches or greater in DBH (according to ODF's OSCUR timber inventory database) within ¼ and ½ mile of the owl site activity center.

A telemetry study of several owls on the Clatsop State Forest (Anthony et al. 1999) found many spotted owl foraging locations in smaller diameter stands averaging 12-17 inches and greater. The investigators in the HSI study noted that many owl responses had occurred in stands ranging from 12-17 inches in average DBH, but that there was no correlation between this size class and owl occupancy. They thought that some stands less than 18 inches DBH probably were suitable to some degree, but the attributes that determine habitat suitability were not apparent. The telemetry study and a concurrent study of habitat in areas where owls were located (Tappeiner et al. 1999) have found that hardwoods, especially hardwood/conifer edges, are an important component of spotted owl foraging habitat in both the Clatsop and Elliott State Forests. The habitat study also found that spotted owl nesting and foraging sites had larger average DBH and fewer trees per acre than non-use areas. So, other factors in addition to DBH that contribute to spotted owl habitat quality likely include hardwoods (especially hardwood/conifer edges), stand age, snags, down wood, and horizontal diversity.

My observation is that within many of the younger stands used by spotted owls on ODF ownership, suitable habitat occurs at the patch rather than at the stand level. This may help explain why spotted owls living in landscapes on ODF ownership, with amounts of 'habitat' that greatly exceed the minimum recommendations of the Incidental Take Guidelines, have such poor demographic performance (Anthony et al. 2000). It may take many more acres of younger stands to provide the number of suitable habitat patches that would be contained in a much lesser acreage of old-growth forest. The energetics of a bird moving between the more sparsely distributed habitat patches also may reduce viability. Therefore, retaining 2nd growth 'habitat' at or near the minimum standards could result in negative impacts to individual spotted owl sites.

Because of the correlation between acreage of 18"+ DBH stands to spotted owl occupancy (Islam et al. 1997), it may be reasonable to assume that these stands provide suitable habitat for spotted owls. However, the majority of the 18"+ DBH stands on ODF ownership do not contain all the structural components described in the earlier paragraph. From a biological perspective, not all stands averaging 12"+ DBH provide suitable habitat for spotted owls. Indeed, I routinely make determinations that 12-17" DBH stands within and adjacent to proposed sale areas do not provide suitable spotted owl habitat based upon stand density, structural diversity, and tree diversity, considering the following factors:

- *Stand Density.* Extremely dense stands could preclude spotted owl use because of the difficulty for owls to maneuver through the stand. Studies on ODF managed lands showed that spotted owls foraged in stands that had more sparse spacing and larger tree diameters than stands not used for foraging (Tappeiner et al. 1999).
- *Structural Diversity.* Stands lacking in vertical and horizontal diversity may provide poor habitat for prey species and/or few perching/hunting opportunities for spotted owls.
- *Tree Diversity.* Single species stands may provide poor habitat for prey species and/or few perching/hunting opportunities for spotted owls. Studies on ODF managed lands have shown that hardwood stem density (Tappeiner et al. 1999) and especially conifer/hardwood edge (Anthony et al. 1999) were significant predictors of spotted owl use of younger stands.

The standard used to determine habitat suitability in this BA was the same as that used when determining survey requirements: "If ODF were proposing a timber sale in a comparable stand, would I recommend spotted owl surveys?"

In this analysis, I have assumed that recently thinned stands have converted 'Suitable' habitat to 'Non-suitable.'

Habitat on Federal and Private Ownership. Habitat acreages on Federal (USDA Forest Service) and on private ownership within this owl circle were estimated using aerial photo analysis combined with ground truthing. I also had access to estimated DBH data from stand ages from the Federal timber inventory. However, I discovered during ground-truthing that this Federal DBH information is not very reliable for many of these stands, and is not directly comparable to the ODF DBH information. Therefore, I have not summarized the Federal DBH data in tables.

Because I do not have access to timber inventory data for the private ownership, this habitat information also is not directly comparable to the ODF OCSUR data.

I conducted the on-site habitat assessment with Jerry Chetock from the North Cascades District using recent stereo aerial photographs. We ground truthed several stands where habitat suitability could not be determined from aerial photo interpretation. There was one stand of questionable habitat suitable located within the Dry-Hansen owl circle that we did not visit; so I have designated habitat suitability of that stand as "Unknown" in the figures and tables. Robin Biesecker has obtained information on recent thinnings on Federal ownership, and has determined that no additional harvest within suitable habitat has occurred on private ownership since I originally completed this habitat analysis in 2007.

Evaluation of Habitat on ODF Ownership. As directed by current policy (Northern Spotted Owl Surveying on State Forest Lands, General File # 3-2-1-330.2), I (with Jerry Chetock) also have conducted a site-specific evaluation of habitat suitability on the 11-17" DBH stands on ODF ownership, using the same techniques and standards as described in the previous section on non-ODF ownership.

All stands were digitized and acreages were calculated using ArcView.

Impact Assessment and Discussion

Landscape Analysis. Figure 1 shows the spotted owl activity center, owl circle, spotted owl observations, timber sale location, and the results of the photo- and ground-based habitat assessment on State and Federal ownerships.

Table 1 summarizes average stand DBH on ODF ownership within 1.2 miles of the Dry-Hansen activity center. Table 2 summarizes stand ages on ODF ownerships within the 1.2-mile radius Dry-Hansen circle. Table 3 summarizes the Suitable Spotted Owl habitat within 1.2 miles of the Dry-Hansen Spotted Owl activity center on all ownership. Because the proposed Boulder Creek sale is located more than 0.7 miles beyond the Dry-Hansen activity center, I have not summarized habitat information for the 0.7-mile radius Dry-Hansen owl circle.

Age and DBH information on ODF ownership comes from ODF's OSCUR timber inventory database (Stand99). Average DBH is estimated using a growth model, so these estimates may not be entirely accurate.

Although, most historic observation of the Dry-Hansen owls have been in mature and old-growth stands, the amount of these stands is limited and highly fragmented (Figure 1), it is likely that a spotted owl living within this landscape would range beyond 1.2 miles. Due to competition from another owl site located in the northwestern portion of the Dry-Hansen owl circle, it is likely this range extension would be to the south, rather than to the north.

Anticipated Effects of the Sale Prescription. Although the sale area consists of relatively young and small timber, I have classified much of the sale (all of the sale within the owl circle) as 'Suitable' spotted owl habitat due to tree species diversity and horizontal diversity within the stand. Harvest of this sale will thin the overstory trees and will allow increased light into the understory, which should stimulate the growth of tolerant conifer in the understory, enhance development of understory brush species, and increase growth of residual overstory trees. There likely will be short-term detrimental effects of applying a uniform prescription over such a large area. The planned removal of red alder 10" DBH and greater outside of RMAs also is likely to result in degradation of spotted owl habitat quality for an indeterminate period. When I conducted my on-site review of habitat suitability, I felt the presence of red alder within these stands greatly contributed toward habitat quality of spotted owl habitat within the ODF parcel. All western hemlock in the stand will be removed, and I do not understand how this will help move the stand toward the desired future prescription of Layered. It seems likely that the red alder and western hemlock prescriptions for this sale will not promote development of higher quality spotted owl habitat over the long term. The planned clearcut harvest in Area II will not only convert suitable habitat to 'Non-suitable', but the resulting clearcut edge (hard edge) likely will further degrade the value of the surrounding stand, further delaying recovery of habitat suitability.

The Boulder Creek sale will impact no suitable habitat within 0.7 miles and 74 acres of suitable habitat within 1.2 miles of the Dry-Hansen activity center.

Discussion

Landscape Condition.

Suitable habitat amounts in the Dry-Hansen owl circle will be above (but not greatly exceeding) the minimum acreage amount suggested by the Incidental Take Guidelines after harvest of the Boulder Creek sale (1193 acres, Table 3). As shown in Figure 1-2, the habitat in the northern portion of this owl circle is greatly fragmented by clearcut harvests. However, much of the remaining suitable habitat in the northern portion of the circle is old-growth or old-growth structure.

Anticipated Impacts of the Harvest Prescription.

Short Term. I anticipate that habitat quality within the sale area will be reduced over the short term after implementation of the harvest prescription. Suitable habitat will be rendered unsuitable within and near the planned clearcut harvest unit.

Long Term. Although the desired future condition for the sale is Layered, it seems unlikely to me that the planned harvest will improve spotted owl habitat quality due to the planned clearcut harvest prescription, as well as the planned red alder and western hemlock removal as part of the partial cut prescription.

Risk Assessment

Biological Risk Assessment. The Dry-Hansen spotted owl circle will have a relatively low amount of suitable habitat remaining after harvest of the Boulder Creek sale. My calculations yield only 11 acres of habitat more than the minimum policy standard; the actual acreage could probably be less or more because of the likely cumulative error in digitizing stand types over the entire circle. I prepared a BA for this sale and owl circle in January 2007. At that time, I anticipated that harvest of this sale posed a 'Low' risk to the Dry-Hansen spotted owl site. However, after reviewing information that has become available over the past 2 years, I have concluded that harvesting this sale poses a greater risk than I had anticipated in 2007:

- Suitable habitat within the owl circle is becoming increasingly fragmented by ongoing harvest activity. Examination of Figure 1 should illustrate that the largest and most contiguous block of suitable habitat is within and adjacent to the southern and southeastern portion of the circle, including the ODF parcel where the proposed sale is located. It appears that there is an active harvest plan on the Federal ownership, so I anticipate this habitat modification outside of the ODF parcel will continue.

- When I prepared the original risk assessment, I had assumed that competition with spotted owls using the Dry Creek site (activity center was immediately west of the ODF parcel) would make it unlikely for the Dry-Hansen birds to use habitat in the vicinity of the sale area. However, the Dry Creek site has been declared 'Historic', and my examination of the survey data in light of that fact indicates that the last confirmed sighting of the Dry Creek birds was in 1997. A spotted owl observation detected in 2005 from a station south of the old Dry Creek AC (near the ODF parcel) was attributed to the Dry-Hansen site. Given the low amount of suitable habitat within the owl circle, and the contiguous nature of the suitable habitat between the AC and the ODF parcel, I now anticipate it is likely that the ODF parcel is within the home range of these birds, and that modification of this habitat poses a risk to the birds.
- Competition with the Wind Creek spotted owl site to the northwest (AC is shown on Figure 1), increases likelihood that the Dry-Hansen birds are utilizing suitable habitat within and outside the southern portion of the owl circle.
- The harvest prescription has changed. A clearcut harvest unit has been added. All western hemlock and red alder >10" DBH will be removed, both of which will increase the detrimental impact of the harvest activity on habitat quality, and delay the recovery time.
- Much of the suitable habitat within the inner portion of the owl circle (near the activity) consists of old-growth timber or stands with old-growth structure. Therefore, it is likely that these birds can survive with a lesser amount of suitable habitat than birds living within landscapes dominated by second-growth timber. For this reason, I have not rated risk to the birds as 'High.'

In conclusion, I anticipate that harvest of the Boulder Creek sale will pose a 'Moderate' risk to continued survival, persistence, and productivity of the Dry-Hansen spotted owl site. This is because this harvest will reduce suitable habitat to very near the minimum policy standard and will further fragment the largest block of suitable habitat within and adjacent to the owl circle.

Compliance with the Incidental Take Guidelines. According to my calculations, habitat acreages for the affected owl circle will exceed the recommendations of the Incidental Take Guidelines after harvest of the proposed Boulder Creek. Therefore, according to my calculations, harvest of Boulder Creek would be consistent with ODF's policy requirements.

Consultation with ODFW

Rod Kraemer with the Oregon Department of Fish & Wildlife has reviewed the final draft of this BA, and provided the following comments:

"Sufficient suitable spotted owl habitat within 1.2 miles of the Dry-Hansen northern spotted owl activity center will be maintained in accordance with U.S. Fish and Wildlife Service recommendations to reduce potential risk of 'incidental take'.

Carefully designed thinning operations developed after detailed site evaluations may accelerate the development of stands into forests with structural attributes more likely to accommodate northern spotted owls. A multi-layered, multi-species canopy dominated by large overstory trees is an important component of suitable spotted owl habitat. However, it is not clear how the removal of red alder in the proposed prescription for this sale will help promote the development of higher quality spotted owl habitat over time. In younger, or less structurally diverse forest stands and landscapes, hardwoods may contribute structural diversity that are otherwise in short supply in relatively young, homogenous landscapes lacking older-forest structures."

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Table 1. Average Stand DBH (according to ODF's OSCUR timber inventory database -- 'Stand99' and photo/ground review) on ODF ownership within a 1.2-mile radius of the Dry-Hansen Northern Spotted Owl activity center.

DBH	Total ODF Acres		Boulder Creek		Acres Outside Sales	
	Suitable	Non-suitable	Suitable	Non-suitable	Suitable	Non-suitable
0-11	--	0	--	0	--	0
12-17	74	0	74	0	0	0
18-25	0	--	0	--	0	--
26"+	0	--	0	--	0	--
Total	74	0	74	0	0	0

Table 2. Stand age (according to ODF's OSCUR timber inventory database -- 'Stand02') on ODF ownership within a 1.2-mile radius of the Dry-Hansen Northern Spotted Owl activity center

Age	ODF Acres	Boulder Creek Acres	ODF Acres Outside Sales
0-39	0	0	0
40-49	6	6	0
50-59	68	68	0
60-69	0	0	0
70-99	0	0	0
100+	0	0	0
Totals	74	74	0

Table 3. Spotted Owl habitat on all ownerships within 1.2 miles of the Dry-Hansen Northern Spotted Owl activity center.

ODF	Suitable		Non-Suitable		Unknown
	Suitable	Non-Suitable	Suitable	Non-Suitable	Unknown
Federal	74	0	1234	38	0
Private	1407	14	114	0	0
Total	1495	1348	1348	38	38
Recent Federal Thinnings	224	--	--	0	0
Recent Private Thinnings	4	--	--	0	0
Total	1267	1576	1576	38	38
Boulder Creek Sale	74	1650	1650	0	0
Total Acres outside Sales	1193	1650	1650	38	38