

Pre-Operations Report

Operation Name: Millers Woods Thin

County (%): Lincoln (100%)

Elevation: 367 – 1,399 ft

Legal Description: T11S R8W, Section(s) 18, 19; T11S R9W, Section(s) 24

Tax Code(s):

BOF%: 93% **CSL%:** 7%

Sale Quarter: 3

I. VOLUME AND VALUE SUMMARY

Table 1. Types, Acres, and Value

Unit	Harvest Type	Anticipated Product ^c	Gross Acres	Net Acres	MBF/ Acre ^a	MBF/ Unit ^a	\$/MBF ^b	\$/Unit
1	PC	DF-S, RA-S	78	59	7.0	413	\$300	\$123,900
2	PC	DF-S, RA-S	67	53	7.0	371	\$300	\$111,300
3	PC	DF-S, RA-S	62	54	7.0	378	\$300	\$113,400
4	R/W	DF-S, RA-S	1	1	26.0	26	\$300	\$7,800
Total		Regeneration	1	1		1,188		
		Partial Cut	207	166				
						Gross Value		\$356,400
a. Estimated harvest volume per acre for Unit.						Project Costs		\$45,981
b. Estimated 'price' (excluding Project Costs)						Net Value		\$310,419
c. Anticipated Product (AA-B-C) – AA) SLI species code of the bid species, B) Size Class (S – small [average DBH < 15], M – medium [average DBH 15 to 23], L – large (average DBH > 23]), C) Special Product (P – Premium, H – Hardwood)								

II. CURRENT STAND CONDITION:

Table 2. Stand Inventory Information

Unit	Stand ID	Measured/Imputed ^a	Species	Age	TPA	DBH	BA	SDI	Net Acres ^b
1	18616	M	DF,RA	32	228	13	227	63%	58
1	19046	I = 18406	DF,RA	48	273	13	246	68%	1
2	18886	I = 18406	DF,RA	33	273	13	246	68%	53
3	18307	M	DF,RA	32	251	12	187	54%	53

a. Identify the source of stand inventory information. Use the following codes: M = Measured SLI data, I = Imputed SLI data, P = Pre-Cruise Plots, O = other (if other, describe below).

b. Net Acres have been rounded to the nearest whole acre in this table. Stand that comprise less than one acre of a harvest unit are not reported in this table, so the total "Net Acres" per unit in this table may not equal the total "Net Acres" per unit in table 1.

- The stands within this sale were clearcut and replanted around 1990. There is no record of previous pre-commercial or commercial thinning.

Table 3. Additional Stand Information

Unit	Stand ID	Snags/ Acre ^a	Down Wood/ Acre ^b	Forest Health		
				SNC	Phellinus	Other ^c
1	18616	0	834			
1	19046	5	892			
2	18886	5	892			
3	18307	0	970			

- a. Identify the number of hard snags per acre (decay classes 1 and 2)
b. Identify the cubic feet per acre of hard down wood (decay classes 1 and 2)
c. Describe "Other" forest health issue.

III. WILDLIFE AND T&E SPECIES CONSIDERATIONS:

Foresters need to read the Biological Survey Tracking Form (BSTF) prior to sale layout in order to ensure all T&E related information is understood. (Consult the ODF Wildlife Biologist assigned to the District for the BSTF.)

1. A portion of the operation is within (Check all that apply):

☐ TAS ☐ NSO Circle or Home Range, or Baseline or Elevated Baseline Thiessen (BA required)
☒ MMMA (BA required) ☐ None

2. Are Surveys for NSO being conducted for any portion of this operation?

☐ No ☒ Density Surveys ☐ Operational Surveys ☐ Combination (Density/Operational)

Notes:

3. Are Surveys for MM being conducted for any portion of this operation?

☒ Yes (complete) ☐ No (Not habitat) ☐ N/A (outside of MM survey zone)

Notes: New MMMA's will be designated based on MM significant detections found during surveys for this sale. The Preliminary sale shape is based on an estimation of the MMMA locations. The sale shape will be updated once the final MMMA GIS data is published and prior to being sold.

4. Are there any additional considerations (FPA Resource Sites, Species of Concern sites/Plant [from ORBIC¹], big game habitat/management, other)?

☐ No ☒ Yes, please describe: Goeden's lepidostoman caddisfly. No additional protection measures needed.

IV. DESIRED FUTURE CONDITION AND PRESCRIPTION:

Table 4. Stand Structure Information

Unit	Stand ID	Current	Desired Future	Inside of HCA	Net Acres ^a
1	18616	UDS	GEN	No	58
1	19046	UDS	GEN	No	1
2	18886	UDS	GEN	No	53
3	18307	UDS	GEN	No	45
3	18307	UDS	GEN	Yes	8

a. Net Acres have been rounded to the nearest whole acre in this table. Stand that comprise less than one acre of a harvest unit are not reported in this table, so the total “Net Acres” per unit in this table may not equal the total “Net Acres” per unit in table 1.

Table 5. Partial Cut Prescription (Complete only for Partial Cut and HCA Harvests)

Unit	Harvest Type	Harvest Species	Residual			
			Species	TPA	BA	% SDI
1	PC	DF	DF/RA	120	130	34
2	PC	DF	DF/RA	120	130	34
3	PC	DF	DF/RA	130	120	33

- Units 1 -2 are first entry thinnings which will improve the growing conditions for these stands, capturing anticipated mortality while maintaining a pathway of high productivity within the residual stand. Residual tree selection will emphasize preserving the trees of good form and vigor with the largest diameter and height. Minor species will be evaluated to reserve based on the composition of the stand and the amount of diversity present.
- Unit 3 is a planned healthy conifer first entry thin. Approximately 8 acres of this unit are within a Habitat Conservation Area. This area is a dense 31-year-old Douglas-fir stand with a component of red alder. The intent of thinning within this area is to promote habitat by thinning out the dense structure allowing more light to reach the forest floor. This will help maintain growth and enhance limb and crown structure of the dominant cohort and foster natural recruitment of minor tree and understory species. It will also improve trajectories for understory development, compositional diversity, and canopy layering ultimately aiding in the development of higher quality suitable habitat and mature forest connectivity. Residual tree selection will emphasize preserving the trees of good form and vigor with the largest diameter and height. Minor species will be evaluated to reserve based on the composition of the stand and the amount of diversity present. District staff will work with the ODF Biologist to further refine prescription strategies for these areas during sale layouts.

V. HARVESTING AND ACCESS CONSIDERATIONS:

Table 6. Harvest System and Access Summary

Unit	Harvest System		Slope (%)	Area Access	Seasonal Access
	% Cable	% Ground			
1	100	0	35-65	Established	All weather
2	80	20	>65	Simple	Combo
3	100	0	>65	Simple	Dry weather only

*Unit 3 may require intermediate supports to reach SE corner. This will be further evaluated during sale layout.

1. Haul Route: For Unit 1, portions of Unit 2 and Unit 3, in unit spurs to Miler Bench Road to Cline Creek Road to Hwy 20. For portions of Unit 2, Stromboulder Road to Burnt Woods Ridge Road to Salmon Creek Road to Hwy 20.
2. Haul Route Condition: The haul route has recently been improved. Minor brushing and spot rocking will occur on surfaced spurs. All unsurfaced spurs will need to be re-opened prior to use.
3. Are easements required for the haul route? ☒ Yes ☐ No
 - Cline Creek Road has permanent easements (311.21016,311.21029). Salmon Creek Road has permanent easements (311.21040, 311.21027). A temporary road use permit from Weyerhaeuser will be required to haul over an unnamed spur off of Miller Bench Road.

Table 7. Transportation Management Summary (Miles)

Activity	Mainline	Collector	Rocked Spur	Dirt Spur
Construct	0	0	0	0.1
Improve, Rock, and/or Maintain	0	0	2.2	0.3
Block (Dormant)	0	0	0	0.4
Vacate	0	0	0	0
Stream Crossings: install on existing road (IE)/replace on existing road (R)/install on new construction road (NC)				
Type F - SSBT ^a	0	0	0	0
Type F – Non-SSBT	0	0	0	0
Type N	0	0	0	0

a. Salmon Steelhead and Bull Trout (SSBT)

4. Rock Sources for this operation: Purchaser will buy rock from State approved commercial rock source.
5. Are property line surveys required for this operation? ☐ Yes ☒ No
 - Property lines in Units 1 and 3 were surveyed and blazed. If blazes cannot be found sale boundary will be backed off of property line.
6. Is there planned new road construction planned within RCAs/HCA's? ☐ Yes ☒ No

VI. AQUATIC RESOURCES:

1. Do any streams require additional review for the following?
 - Fish presence ☐ No ☒ Yes
 - Perennial/Seasonal: ☒ No ☐ Yes
 - H.E.R./P.D.F.T: ☒ No ☐ Yes
 - Unknown streams may exist within all Units but it is believed that these are seasonal or perennial and will not require fish presence surveys. Buffers shown on the map indicate where it is believed perennial streams are located. Streams will be verified during sale layout.
2. Is a portion of the operation within an Aquatic Anchor? ☐ No ☒ Yes, name: Wolf Creek (2 acres)

- Within the designated Aquatic Anchor no harvest stream buffers will be extended out to 50 feet when regeneration harvesting near small perennial, debris flow-prone, and high-energy non-fish streams as outlined in the State Forest Division Species of Concern Policy. These additional buffers are already incorporated into the sale buffers and are shown on the map. If additional information on streams is found during sale layout the buffers will be adjusted as required.
3. Are any Points of Diversion (Domestic Water) located downstream within 3,000 feet of Operation?
☒ No ☐ Yes, describe protection measures:
 4. Is there a Stream Enhancement Project planned? ☒ No ☐ Yes, please describe:

VII. SLOPE STABILITY ISSUES:

Table 8. Summary of Slope Stability Assessment

Unit	Harvest Review Complete?	Public Safety Review Complete?	Additional Comment
1	Y	Y	--
2	Y	Y	--
3	Y	Y	See road review comment

- **Geotech Review:** Initial geotechnical reviews have been completed and those findings have been incorporated into No Harvest buffers. Additional consultation with Geotechnical Specialists will be done during sale layout as needed.

VIII. RECREATION RESOURCES:

1. Recreation issues/coordination: ☒ No ☐ Yes, please describe:
 - No recreation resources exist within the sale boundaries or are within proximity to the sale areas.

IX. HISTORIC AND CULTURAL RESOURCES:

1. Has the sale been reviewed by a qualified archaeologist for potential historic or cultural resource presence?
☒ Yes ☐ No

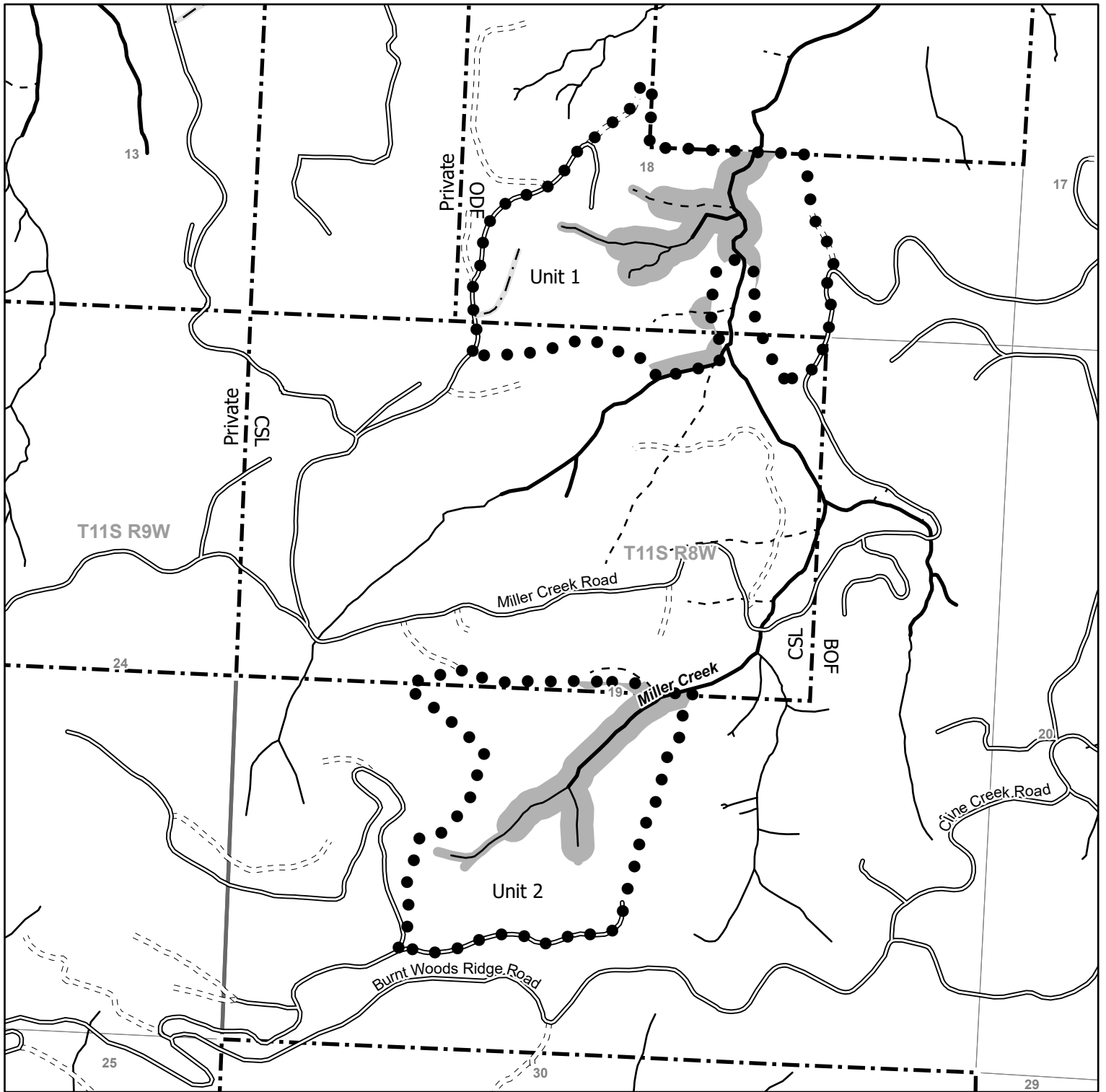
X. SCENIC RESOURCES:

1. Are there scenic resources in the vicinity of this operation that need additional consideration?
☐ No ☒ Yes, please describe:
 - Unit 2 may be visible from Hwy 20. The potential for scenic impacts will be considered when planning the thinning prescription..

XI. OTHER RESOURCE CONSIDERATIONS:

1. Has a review of the FLMCS layer determined that any resources not mentioned in the report above need additional planning? ☐ No ☒ Yes, describe below
 - Buried fiber optic line runs along Miller Creek Road
2. Are there any other resources present that need additional consideration? ☐ No ☒ Yes, please describe:

Adjacent Landowners: Private Non-Industrial and Private-Industrial



**FY 2025 - West Oregon District
Millers Woods Thin
Portions of Section(s) 18, 19, T11S, R8W;
Section(s) 24, T11S R9W, WM.
Lincoln County**

State Forest Division
02/15/2024

This product is for informational use and may not be
suitable for legal, engineering, or surveying purposes.
Variations may exist between and among data sets
in use by the Department of Forestry. This map was
developed using the Statewide Stream Layer.

1:12,000

1,000 500 0 1,000 Feet

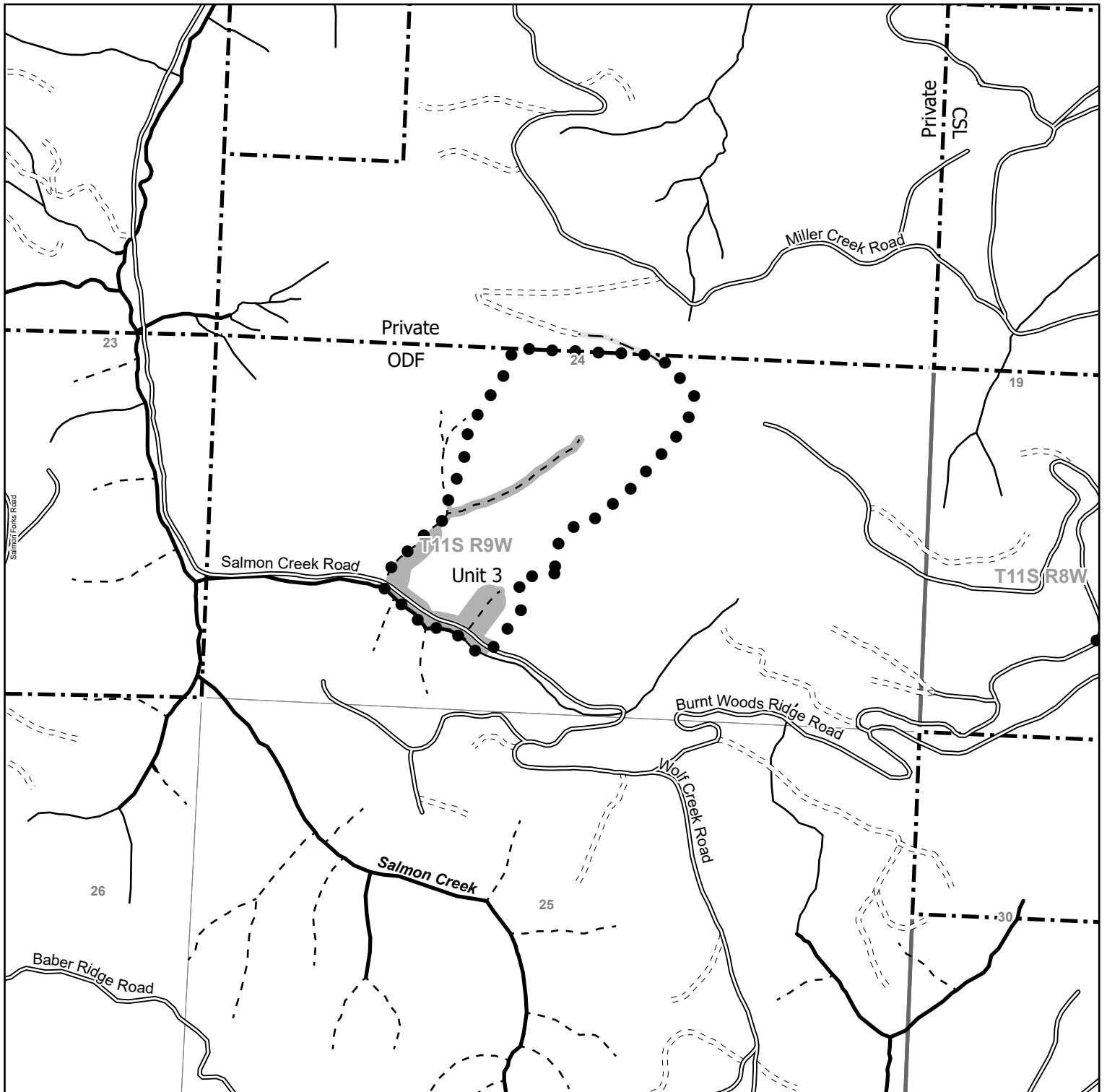
Legend

- ● Sale Boundary
- No Harvest Area
- - - New Road Construction
- Surfaced
- - - Unsurfaced
- Fish Stream
- Perennial Nonfish Stream
- - - Unknown Stream
- Ownership Boundary

Unit 1	59 Acres (PC)
Unit 2	53 Acres (PC)
Unit 3	54 Acres (PC)
Unit 4	1 Acres (R/W)

Total 167 Acres





FY 2025 - West Oregon District
Millers Woods Thin
Portions of Section(s) 18, 19, T11S, R8W;
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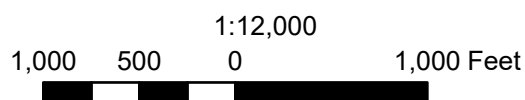
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Oregon

Tina Kotek, Governor

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"STEWARDSHIP IN FORESTRY"

TO: Cody Valencia, Unit Forester, West Oregon District

FROM: Dax Strubb, Wildlife Biologist, Northwest Oregon Area

SUBJECT: **Preliminary Biological Assessment for the Millers Woods Thin Timber Sale**

DATE: March 28, 2024

Millers Woods Thin is a timber sale in the 2025 Annual Operations Plan (AOP) of the West Oregon District (Lincoln County) that entails first-entry commercial thinning of young conifer stands. All three harvest units are partially located within the buffer portion of the Salmon Creek, Salmon Creek East, Wolf Creek West, and North Miller Creek Marbled Murrelet Management Areas (MMMA). Selective harvest thinning, road improvement, guyline and tailhold anchors are proposed within the buffer portion of the collective MMMA.

Timber harvest-related activities in the buffer (the 100-m buffer) of the Salmon Creek, Salmon Creek East, Wolf Creek West, and North Miller Creek MMMA have the potential to negatively affect nesting birds and their designated occupied habitat (DOH) therein. Protection measures, such as seasonal and operational restrictions, can be used to avoid or minimize the potential to impact murrelets and their habitat. If the protection measures described in this BA are applied during the planning and operational phases of the timber harvest, the Millers Woods Thin timber sale is expected to have a **low** risk of incidental take of marbled murrelets. However, operations should be halted and regulatory agencies be consulted immediately if the outlined protection measures are not followed.

INTRODUCTION

Purpose

West Oregon District has proposed the timber sale, Millers Woods Thin (FY 2025) in Lincoln County (Figure 1). Harvest Unit 1 is adjacent to and partially within the North Miller Creek MMMA buffer (12.1 acres). Harvest Unit 2 is adjacent to and partially within the Wolf Creek West MMMA buffer (8.7 acres). Harvest Unit 3 is adjacent to and partially within the Salmon Creek East MMMA buffer (5.6 acres) and the Salmon Creek MMMA buffer (6.2 acres).

The district has proposed a partial cut thinning for this timber sale within the MMMA buffers, which will increase stand structure and encourage growth and limb development of the remaining trees in the stand by reducing competition for available resources. Planned harvest outside of the MMMA will also include partial cuts with the same prescriptions. Other proposed harvest-related operations in the buffers will include tailhold and guyline anchors, in addition to road improvement.

This Biological Assessment aims to describe the establishment and status of the MMMA, assess potential impacts this timber sale may have on these DOH areas, and detail the measures recommended to minimize impacts. ODF policies are discussed and an assessment of the potential risk of harvest to occupancy and productivity of marbled murrelets is provided.

Policy Direction

Per ODF Policies, impacts from management activities within a MMMA should be quantified and measures implemented to avoid or minimize potential impacts to the species and its habitat. This BA complies with the following ODF Policies (ODF 2013):

- Policy 1.1.2.15 – Designing MMMA's on ODF-managed lands.
- Policy 1.1.2.16 – Designating occupied habitat.
- Policy 1.1.2.17 – Designating 100-meter-wide buffers.
- Policy 1.1.2.18 – Document and retain MMMA documentation.
- Policy 1.1.2.19 – Timber harvest-related activities in designated occupied habitat.
- Policy 1.1.2.20 – Seasonal restrictions in designated occupied habitat.
- Policy 1.1.2.21 – Permitting timber harvest-related activities in designated buffers.
- Policy 1.1.2.23 – Seasonal restrictions in designated buffers.
- Policy 1.1.2.27 – Review any timber harvest-related activities within ¼ mile of any survey area associated with any subcanopy detection indicative of occupancy.

BACKGROUND

Sale Information

The harvest is a 166 net acre first-entry commercial thin in Douglas-fir dominant stands. Current stand characteristics include 32 to 33-year-old trees, stocked at 228 to 273 trees per acre (TPA), an approximate average diameter of 12 to 13 inches, and a basal area of roughly 187 to 246 ft²/acre.

Based on 2020 LiDAR imagery, the tree heights in the sale area range from 80-100 feet (Figure 2). The stand is too young and dense to grow larger limbs and thus trees in the sale units have yet to develop platform structures. Canopy cover within the sale is approximately >80% with canopy overlap among adjacent trees in many areas. Limited variation in canopy closure and patchiness exists throughout the stand due to abiotic components such as soils, topography, and sunlight, or biotic components such as disease and competition (Figure 2).

Due to the numerous drainages and topography within the sale, there is some within-stand variability in the amount of cover and height of vegetation, but generally understory cover is light to moderate (approximately 40 to 75%). Present understory plant composition includes swordfern, salal, Himalayan blackberry, Oregon grape, and vine maple.

The treatment is a partial cut that would result in a decreased tree density of approximately 120 to 130 TPA, reduce the basal area to 120 to 130 ft²/acre, and maintain at least 40% canopy cover. Hauling operations will use existing road systems located throughout the area (Figure 1).

MMMA Information

North Miller Creek

The North Miller Creek MMMA was designated in 2024 following two sub-canopy detections during the 2022 and 2023 survey seasons. Stands within the MMMA have a recent history of murrelet occurrence, with detections limited to three observations documented during three separate surveys throughout both survey seasons. The current MMMA includes 36 acres of DOH and 75 acres of buffer (Figure 2).

Suitable nesting habitat is concentrated in draws and riparian areas left from previous harvests. Like many MMMA's in the West Oregon District, there is a large difference in height (i.e., > 100 feet) between trees within DOH and in the buffer where harvest unit 1 is partially located. The understory plant composition within the DOH portion of the MMMA includes a well-developed shrub and hardwood layer, including vine maple, big-leaf maple, red alder, and salal, along with a minor component of salmonberry.

Harvest Unit 1 includes operations planned within the 100-m buffer of the MMMA. Approximately 16.1 acres of buffer will be thinned by cable yarding (Table 1). There is a high likelihood tailholds may be selected within the buffer to accommodate yarding corridors through existing openings in the DOH of the MMMA.

Wolf Creek West

The Wolf Creek West MMMA was designated in 2024 following three sub-canopy detections during the 2023 survey season. Stands within the MMMA have a robust history of murrelet occurrence and were detected twenty-two times during eight separate surveys conducted across five survey seasons from 2011 to 2023. The current MMMA includes 68.9 acres of DOH and 73.3 acres of buffer (Figure 2).

Suitable nesting habitat is consistent throughout the MMMA, ranging from riparian areas to ridge tops. Like many MMMA's in the West Oregon District, there is a large difference in height (i.e., > 100 feet) between trees within DOH and in the buffer where harvest unit 2 is partially located. The understory plant composition within the DOH portion of the MMMA includes a well-developed shrub and hardwood layer, including vine maple, big leaf maple, red alder, and salal, along with a minor component of salmonberry, elderberry, and hazel.

Harvest Unit 2 includes operations planned within the 100-m buffer of the MMMA. Approximately 11.9 acres of buffer will be thinned by cable yarding (Table 1). There is a high likelihood that guylines may be selected within the MMMA buffer and DOH.

Salmon Creek East

The Salmon Creek East MMMA was designated in 2024 following five sub-canopy detections during the 2023 survey season. Stands within the MMMA have a recent history of murrelet occurrence and were detected eight times during two separate surveys conducted across the 2022 and 2023 survey seasons. The current MMMA includes 82.5 acres of DOH and 115.8 acres of buffer (Figure 2).

Suitable nesting habitat is variable throughout the DOH, ranging from riparian areas to ridge tops. Like many MMMA's in the West Oregon District, there is a large difference in height (i.e., > 100 feet) between trees within DOH and in the buffer where harvest unit 3 is partially located. The understory plant composition within the DOH portion of the MMMA includes a well-developed shrub and hardwood layer, including vine maple, big leaf maple, red alder, and salal, along with a minor component of salmonberry, elderberry, and hazel.

Harvest Unit 3 has operations planned within the buffer along the western side of the MMMA. Approximately 6 acres of the buffer will be thinned by cable yarding, which constitutes approximately 5% of the buffer area (Table 1). There is a high likelihood tailholds may be selected within the buffer of the MMMA.

Salmon Creek

The Salmon Creek MMMA was originally established in 2002 and included 32 acres. Based on the revised ODF Policy, the MMMA boundary was reconfigured in 2014 to coincide with the 2000-2002 survey site boundary when significant detections occurred. The reconfiguration expanded the MMMA and currently includes 155 acres of occupied habitat and 124 acres of buffer (Figure 2).

Distinct patches of open canopy cover with a low density of overstory trees and understory brush exist within the buffer. Riparian areas are found throughout the buffer and include an approximate 1.4-mile length of Salmon Creek, which bisects the MMMA. No large windthrow patches within the buffer were noted during the review of 2014 through 2020 aerial photos. Plant composition within the buffer includes a well-developed shrub and hardwood layer. The understory shrub layer includes berry-producing plant species such as salal and salmonberry. Within the occupied habitat in the MMMA, the primary stand condition consists of an open overstory and a well-developed understory shrub layer. The distribution of suitable nesting habitat within occupied habitat is patchy and typically found along slopes adjacent to riparian areas (Figure 2).

Stands within the MMMA have a recent history of murrelet occurrence and were detected seventy-one times during ten separate surveys conducted across five survey seasons from 2000 to 2022.

Harvest Unit 3 has operations planned within the buffer along the eastern side of the MMMA. Approximately 6 acres of buffer will be thinned by cable yarding which constitutes approximately 5% of the buffer area (Table 1). There is a high likelihood of the need for tailholds within the buffer and DOH of the MMMA.

IMPACT ASSESSMENT

Various timber harvest-related activities may negatively affect murrelets and nesting habitat directly by causing mechanical damage to suitable nesting trees and related habitat features or indirectly via subsequent nest predation or wind-throw (Luginbuhl et al. 2001, Malt and Lank 2007 and 2009, Raphael et al. 2002). Of the potential impacts considered in this BA, mechanical damage to trees, windthrow, and nest predation have the highest probability of influencing risk to nesting birds within each MMMA. Because the sale has not been prepared in the field, the exact

arrangement of landings, cable corridors, and tailholds are unknown at this time; however, possible site-specific effects are discussed below. Cumulative impacts associated with past and future operations were considered.

Mechanical Damage

Reduction of canopy cover within and adjacent to marbled murrelet nesting habitat can affect the availability of nest platforms and micro-site conditions at potential nest platforms (Ralph et al. 1995). Impacts to nest platforms or trees can occur during the falling and removal of trees. Micro-site conditions can be altered when open canopies change the exposure, temperature, or moisture conditions at the platform limb (van Rooyen et al. 2011).

Thinning and tailholds are proposed directly adjacent to DOH and tailholds are anticipated within DOH. Removal of cover trees adjacent to suitable nesting trees may damage limbs or increase exposure, and potentially eliminate the structure or reduce its suitability because of degraded micro-site conditions. Before harvest, the identification of suitable nest trees, their associated cover trees, and the implementation of operational avoidance plans should substantially minimize the risk of damaging and degrading nesting habitat. A full list of protection and avoidance measures is discussed in the following section.

Noise Disturbance

Human-caused noise disturbance has resulted in the loss of eggs and chicks at nests (Hamer and Nelson 1998, Hébert and Golightly 2006). Sources of the noise have included chainsaws, vehicles, and recreational activity. Most nest failures in northern California were observed after exposure to chainsaw noise during the early portion of the nesting period while adults were still incubating eggs (Hébert and Golightly 2006). The potential impacts from noise disturbance will be mitigated by applying seasonal timing restrictions that prohibit the use of chainsaws and other mechanized equipment within and adjacent to the DOH portion of the MMMA during the nesting period.

Windthrow

Timber harvest can influence the probability of windthrow in a stand by acting on-site and stand-specific factors such as percent slope, slope aspect, elevation, tree height/age, and tree density (Ruel 1995, Sinton et al. 2000). Windthrow can damage an entire stand or portions therein and affect the availability/quality of nesting habitat and nesting success (van Rooyen et al. 2011). In the Oregon Cascade Range, Sinton et al. (2000) found a higher incidence of windthrow along the edges of clearcuts than natural edges. In the Cummings Creek Wilderness of the Coast Range, windthrow was significantly higher on hillsides than riparian areas that contained older trees with no previous fire history (Wimberly and Spies 2001). In 70–150-year-old Douglas-fir stands in Washington and Oregon, Williamson and Price (1971) sustained a 30% reduction of windthrow effects when 60–85% of the original basal area was retained.

Although the risk of windthrow is difficult to anticipate, several characteristics suggest a reduced likelihood of windthrow in the MMMA buffer. The approximately 33-year-old, 90-foot-tall trees proposed to be harvested within the buffers are considered a soft edge, which may reduce the probability of windthrow and edge effects within and surrounding DOH (van Rooyen et al. 2011). Most of the harvest units within each MMMA are located near riparian areas or lower hillside slopes where surrounding ridges may deflect wind and protect the buffer trees; however, careful consideration of wind-firm residual trees is warranted for the area within the Wolf Creek West MMMA in Harvest Unit 2 that is located near a ridge top and may experience windthrow.

Nest Predation

There is consensus that timber harvest activities in or near murrelet habitat have the potential to increase the risk of predation by changing forest structure at various scales thereby attracting known predators such as corvids (i.e., jays and ravens) or other predators (Malt and Lank 2007 and 2009). The use of cable corridors may provide increased access to nests and/or promote a berry flush above pre-harvest conditions (e.g., blackberry, salmonberry, huckleberry, elderberry, etc.) in the understory, potentially resulting in higher levels of predator activity (Malt and Lank 2007 and 2009). Currently, the dense overstory canopy cover of most of the sale areas is likely to suppress berry production throughout most of the stand. Exceptions to this include areas near existing and abandoned roads, riparian areas, and old landings.

At the stand level, there is evidence that nest predation is higher along hard edges and near human settlements (Marzluff and Neatherlin 2006). Malt and Lank (2007, 2009) found that younger stands (i.e., soft edges) adjacent to habitat can reduce predation rates at and near edges. There is a > 100-foot difference in tree heights between the buffer and DOH such that only the tallest trees in the buffer are at the same height as the lower portions of the canopy in the

DOH. Thus, the portion of the sale area that is within the buffer may continue to provide ameliorating effects on predation risk relative to more open stands or clearcut harvest.

Cumulative Impacts

Past, present, and reasonably foreseeable future activities within the MMMA were considered to evaluate whether the planned timber harvest would contribute to incremental impacts that may affect murrelets and their nesting habitat. The activities taken into consideration below are human activities such as timber harvest, recreational trails and campsites, and natural events such as fire and windthrow.

Evidence of past and planned timber harvest near all four MMMA is well documented (Figure 2). Multiple timber harvest projects have occurred in the last ten years and recent surveys have demonstrated continued use within the area despite continued harvest. The Mount Baber ATV Club has a long-standing off-highway vehicle trail along Salmon Creek Road that bisects the Salmon Creek and Salmon Creek East MMMA. Off-highway vehicles use the same road as vehicular traffic in this location and the event permits for the club include seasonal restrictions that don't allow club events to occur during marbled murrelet nesting season. The Mount Baber ATV Club and state staff have explored alternative trail routes to avoid resource conflict, but the project remains in the planning stages.

PROTECTION AND AVOIDANCE MEASURES

The key to successfully implementing this operation, while maintaining a low risk to murrelets and their habitat, is understanding that special considerations will be necessary when operating near murrelet habitat. Operators must understand that prior planning and approval is required in areas of concern when designing logging plans, selecting tailholds, conducting yarding activities, and choosing cable corridor locations. Involvement of the Area Biologist or Designee early in the harvest process should greatly increase the likelihood of successful implementation of the protection measures resulting in minimized risk to murrelets and their habitat.

The proposed timber harvest has been reviewed by an Area Biologist to assess impacts on marbled murrelets and their nesting habitat. The assessment included an evaluation of MMMA configurations, overstory canopy cover, understory components, and topography. To consider the sale a low risk of impacting murrelets and their nesting habitat, the following protection measures must be implemented for harvest operations within each MMMA. They should be included in the contract language:

Thinning Prescription

The USFWS has advised that thinning prescriptions should not result in less than 40% canopy cover, where berry-producing species are present, to avoid short-term berry flushes and long-term increases in food abundance for potential nest predators such as corvids. The proposed prescriptions for first-entry commercial thinning are expected to retain post-harvest canopy cover greater than 40%.

Thinning in the buffer and at the edge of DOH will not remove trees that contain suitable nest platforms or adjacent trees that provide cover to potential nest platforms. Suitable nesting habitat is defined as relatively flat structures that are at least 4 inches wide, 33 feet from the ground, and contain thick (e.g., > 0.5 inch) moss, epiphyte, or duff layers. Suitable nesting structures may include tree limbs, dwarf mistletoe brooms, or unique platform features resulting from damage (e.g., epicormic branching and reiterated tops).

Seasonal Timing Restrictions

Refer to ODF State Forest Division Operational Policy for Marbled Murrelets for specific timing restrictions regarding harvest-related operational activities including road construction, felling for landing areas and corridors, yarding activities, and installation of tailhold and guyline anchors. These activities are subject to seasonal timing restrictions per ODF policy and should avoid disturbance to nesting murrelets (ODF 2013).

Trash Removal

Trash policing and removal from all harvest units, landing and roadways must be done daily. Store all food items and food waste inside appropriate containers or vehicles. Avian predators such as jays and ravens eat a wide variety of foods, and the presence of human food and food waste can attract and increase jay and raven numbers. Do not feed wildlife in the sale areas. Failure to adhere to these guidelines will result in a temporary suspension of activities until all trash is removed.

Tailhold and Guyline Use Restrictions

The use of tailholds and guyline anchors are not seasonally restricted; however, the use of heavy equipment or chainsaws to install these features are prohibited within the MMMA (occupied habitat and 100-m buffer) from April 1 through August 5. From August 6 through September 15, activities are allowed with daily timing restrictions. Daily timing restrictions prohibit the use of heavy machinery and chainsaws within 2 hours of sunrise and 2 hours of sunset. From September 16 to March 31, activities are unrestricted. If tailholds are installed from April 1 through August 5, non-mechanized methods such as an ax should be used and follow the guidelines as discussed in #5, below.

Specific criteria will be required for all tailholds and guylines to protect platform trees and associated cover or recruitment trees in the MMMA from damage. The criteria are as follows:

1. The following trees in DOH will **not** be selected for guylines or tailhold anchors:
 - a. Trees with potential nest platforms **or** immediately surrounding trees that provide cover to potential nest platforms.
 - b. When feasible, the largest trees in areas where the number of large trees is limited.
 - c. When feasible, minor conifer tree species that are not commonly found in the stand.
2. An ODF Area Biologist or a designee familiar with murrelet habitat and biology will inspect and approve all trees before each is used. A lead time of at least two weeks for all reviews or meetings with ODF representatives is required. No trees that are potential habitat or surrounding trees that provide cover to platform trees, as determined by an ODF Area Biologist or designee will be damaged or harvested.
3. Guylines or skylines will not be placed where they have the potential to damage platforms or platform trees.
4. No conifer trees will be felled within the DOH of the MMMA.
5. To protect trees used as guyline anchors, it is preferred that plates, nylon straps, or other approved devices be utilized to prevent damage to trees. If this is not feasible, notching of the trees to prevent cable slippage will be limited to less than $\frac{1}{4}$ the circumference of the tree.
6. If no suitable guyline or tailhold trees exist, operational equipment such as a Yoder, which does not require guylines, or a dozer, which may serve as a tailhold or guyline, may be used provided no DOH is removed or destroyed when using such equipment.

Restrictions and Requirements for Construction and Improvement of Roads and Landings in Buffers

No construction of landings will occur within the DOH of each MMMA. Construction of roads, improvement of roads and landings, and yarding activities in buffers and at landings in buffers are seasonally restricted (from April 1 through August 5, then with daily timing restriction from August 6 through September 15) to prevent disturbance to nesting murrelets in DOH. Tree removal should be done only to the extent necessary for the specific operation. To prevent damage to platform trees and associated cover trees in each MMMA, the following trees will **not** be selected for removal for road construction, road improvement, landing areas or cable corridors in buffers:

1. Trees with potential nest platforms or immediately surrounding trees that provide cover to potential nest platforms as determined by an Area Biologist or designee.
2. When feasible, the largest trees in areas where the number of large trees is limited.
3. When feasible, minor tree species (not commonly found in the stand).

The following additional criteria apply to landings in buffers:

1. Seek to move landings out of buffers.
2. Utilize single, parallel corridor-type landings when landings must be in buffers.
3. If single, parallel corridor-type landings are not feasible and a spoke landing must be used, reduce the number of spoked corridors, and keep away from dominant trees. An ODF Area Biologist or a designee familiar with murrelet habitat and biology will inspect and approve all proposed road and landing locations. Lead time of at least two weeks for all reviews or meetings with ODF representatives is required. No trees that are potential habitat or surrounding trees that provide cover to platform trees, as determined by an ODF Area Biologist or designee will be damaged or harvested.
4. Landing improvement in buffers will be restricted to not greater than 0.25 acres in size.
5. To the extent practical, spoked landings constructed in buffers will be decommissioned and re-vegetated where appropriate. Decommissioning may include gates, tank traps, or boulder/stump placement. Revegetation for spoked landings will be addressed on a case-by-case basis.
6. Yard to the road with minimal road widening or extra brush clearing than already exists.

7. No conifer trees will be felled within the DOH of the MMMA.

If the protection measures cannot be met or the harvest operations within the affected MMMA's increase in scope or scale, then the low-risk determination may not be accurate.

RISK ASSESSMENT AND CONCLUSIONS

Millers Woods Thin harvest prescription is a first-entry commercial thin in young, closed-canopy stands with poorly developed limb structure, low tree species diversity, and suppressed understory. In my opinion, by conducting harvest activities outside the murrelet nesting season within the MMMA's, utilizing the protection and avoidance measures for tree selection, and exercising extreme prudence within the buffer and DOH of each MMMA, the risk of incidental take of marbled murrelets is **low**. If the protection avoidance measures cannot be followed, the risk of incidental take of marbled murrelets will likely be elevated and sale area-related activities will require re-assessment directed towards modification and mitigation to reduce risk.

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Table 1. Spatial impacts at MMMA's from proposed timber harvest operations of the Millers Woods Thin Timber Sale, West Oregon District.

MMMA Name	Total DOH ¹ Acreage	Total MMMA Buffer Acreage	Sale Acreage Within DOH	Sale Acreage Within Buffer	% DOH Affected	% Buffer Affected
North Miller Creek	35.7	75.3	0.0	12.1	0.0	16.1
Wolf Creek West	68.9	73.3	0.0	8.7	0.0	11.9
Salmon Creek East	82.5	115.8	0.0	5.6	0.0	4.8
Salmon Creek	154.6	124.4	0.0	6.2	0.0	4.9

¹ DOH = designated occupied habitat