



"STEWARDSHIP IN FORESTRY"

Timber Sale Appraisal  
Tunnel West  
Sale GP-341-2016-58-

District: Southwest

Date: May 04, 2016

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**Cost Summary**

	<b>Conifer</b>	<b>Hardwood</b>	<b>Total</b>
<b>Gross Timber Sale Value</b>	\$89,214.05	\$5,152.40	\$94,366.45
		<b>Project Work:</b>	(\$8,035.00)
		<b>Advertised Value:</b>	\$86,331.45



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**Timber Description**

**Location:** Portions of Section 10, T33S, R6W, W. M., Josephine County, Oregon.

**Stand Stocking:** 40%

Specie Name	AvgDBH	Amortization (%)	Recovery (%)
Douglas - Fir	13	0	90
Incense Cedar	11	0	90
Madrone	12	0	90
Chinkapin	12	0	90

Volume by Grade	2S	3S	4S	Total
Douglas - Fir	80	225	106	411
Incense Cedar	0	3	10	13
Madrone	0	0	147	147
Chinkapin	0	0	8	8
<b>Total</b>	80	228	271	579

**Comments:** Pond Values Used: 1st Quarter Calendar Year 2016 + Local Pond Values.

Removal of madrone/hardwoods is optional in areas I and II. If harvested, removal of hardwoods is required to an 8 inch top diameter.

Grand Fir and Other Conifers Stumpage Price = Pond Value minus Logging Cost:  
\$150/MBF = \$510.09/MBF - \$360.09/MBF

Sugar Pine and Other Pines Stumpage Price = Pond Value minus Logging Cost:  
\$150/MBF = \$510.09/MBF - \$360.09/MBF

SCALING COST ALLOWANCE = \$5.00/MBF

FUEL COST ALLOWANCE = \$3.00/Gallon

HAULING COST ALLOWANCE  
Hauling costs equivalent to \$780 daily truck cost.

Other Costs (with Profit & Risk to be added):  
None.

Other Costs (No Profit & Risk added):  
None.



"SUSTAINABLE FORESTRY"

# Timber Sale Appraisal Tunnel West Sale GP-341-2016-58-

**District: Southwest**

**Date: May 04, 2016**

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## Logging Conditions

**Combination#: 1**

Douglas - Fir	75.96%
Incense Cedar	5.00%
Madrone	100.00%
Chinkapin	40.62%

**Logging System:** Cable: Medium Tower >40 - <70      **Process:** Manual Falling/Delimbing  
**yarding distance:** Long (1,500 ft)      **downhill yarding:** No  
**tree size:** Small / Thinning 12in (130 Bft/tree), 12-17 logs/MBF  
**loads / day:** 8      **bd. ft / load:** 3700  
**cost / mbf:** \$222.97  
**machines:** Log Loader (A)  
Tower Yarder (Medium)

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**Combination#: 2**

Douglas - Fir	24.04%
Incense Cedar	95.00%
Chinkapin	59.38%

**Logging System:** Cable: Small Tower <=40      **Process:** Manual Falling/Delimbing  
**yarding distance:** Medium (800 ft)      **downhill yarding:** No  
**tree size:** Mature / Regen Cut (900 Bft/tree), 3-5 logs/MBF  
**loads / day:** 11.5      **bd. ft / load:** 4600  
**cost / mbf:** \$117.20  
**machines:** Log Loader (A)  
Tower Yarder (Small)

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"PROFESSIONAL FORESTRY"

Timber Sale Appraisal  
Tunnel West  
Sale GP-341-2016-58-

District: Southwest

Date: May 04, 2016

**Logging Costs**

<b>Operating Seasons:</b> 1.00	<b>Profit Risk:</b> 13%
<b>Project Costs:</b> \$8,035.00	<b>Other Costs (P/R):</b> \$0.00
<b>Slash Disposal:</b> \$0.00	<b>Other Costs:</b> \$0.00

**Miles of Road**

**Road Maintenance:** \$0.00

Dirt	Rock (Contractor)	Rock (State)	Paved
3.0	0.0	0.0	0.0

**Hauling Costs**

Species	\$ / MBF	Trips/Day	MBF / Load
Douglas - Fir	\$0.00	3.0	3.5
Incense Cedar	\$0.00	3.0	2.5
Madrone	\$0.00	3.0	2.5
Chinkapin	\$0.00	3.0	2.5



"SUSTAINABILITY IN FORESTRY"

Timber Sale Appraisal  
Tunnel West  
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**Logging Costs Breakdown**

Logging	Road Maint	Fire Protect	Hauling	Other P/R appl	Profit & Risk	Slash Disposal	Scaling	Other	Total
<b>Douglas - Fir</b>									
\$197.54	\$1.98	\$7.57	\$81.72	\$0.00	\$37.55	\$0.00	\$5.00	\$0.00	\$331.36
<b>Incense Cedar</b>									
\$122.49	\$1.98	\$7.57	\$114.40	\$0.00	\$32.04	\$0.00	\$5.00	\$0.00	\$283.48
<b>Madrone</b>									
\$222.97	\$1.98	\$0.00	\$114.40	\$0.00	\$16.85	\$0.00	\$0.00	\$0.00	\$356.20
<b>Chinkapin</b>									
\$160.17	\$1.98	\$0.00	\$114.40	\$0.00	\$16.85	\$0.00	\$0.00	\$0.00	\$293.40

Specie	Amortization	Pond Value	Stumpage	Amortized
Douglas - Fir	\$0.00	\$540.09	\$208.73	\$0.00
Incense Cedar	\$0.00	\$547.02	\$263.54	\$0.00
Madrone	\$0.00	\$386.20	\$30.00	\$0.00
Chinkapin	\$0.00	\$386.20	\$92.80	\$0.00



Timber Sale Appraisal  
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**Summary**

**Amortized**

Specie	MBF	Value	Total
Douglas - Fir	0	\$0.00	\$0.00
Incense Cedar	0	\$0.00	\$0.00
Madrone	0	\$0.00	\$0.00
Chinkapin	0	\$0.00	\$0.00

**Unamortized**

Specie	MBF	Value	Total
Douglas - Fir	411	\$208.73	\$85,788.03
Incense Cedar	13	\$263.54	\$3,426.02
Madrone	147	\$30.00	\$4,410.00
Chinkapin	8	\$92.80	\$742.40

**Gross Timber Sale Value**

Recovery: \$94,366.45

Prepared By: Chris Rudd

Phone: 541-474-3152

## TIMBER SALE SUMMARY

Tunnel West

Contract No. 341-16-58

1. **Type of Sale:** Recovery sale, sealed bid auction: 91 acres of thinning and 8 acres of clear-cut.
2. **Revenue Distribution:** 100% BOF
3. **Sale Acreage:** For the sale, 99 net acres were used for the cruise expansion. The ROW volume was 0.87 acres. Acreage was determined with ArcGIS 10.1 and GPS control points.
4. **Volume:** Take trees are marked in blue in the thinning units (areas I and II). Five trees per acre were marked with red paint in the clear-cut unit (area III) for Green Tree Retention (GTR). Approximately 5 acres of oak were excluded from the sale area for GTR purposes. Area I conifer were marked to a 24 foot spacing and Area II Conifer were marked to a 27 foot spacing. Removal of hardwoods is optional in areas I and II.

SPECIES	2 SAW	3 SAW	4 SAW	NET VOL (MBF)
Douglas-fir	80	225	106	411
Incense Cedar			13	13
Madrone			147	147
Chinkapin			8	8
<b>Total</b>	<b>80</b>	<b>225</b>	<b>274</b>	<b>579</b>

5. **Cruise Data:** The total volume above is measured to 9.60% sampling error, meaning the actual volume will fall between 523 and 635 MBF (68% of the time). The volume of individual species will be more variable due to the smaller sample compared to the total volume sample. See the cruise report for more detail.
6. **Timber Description:** The timber has been marked to remove the smaller trees in suppressed and intermediate canopy positions, and to release dominant and codominant trees. Additionally, dominant trees have been marked for harvest where possible to improve the economics of the sale and improve the quality of the residual stand. The stand age is 58-63 years. The averages for DBH for take trees are: Douglas-fir 13", Incense cedar 11", madrone 12", chinkapin 12". The cruise report gives a breakdown of log lengths and scaling diameters by species for the combined cruise.
7. **Topography and Logging Method:** The sale is designed for a small or medium size yarder and a skidder over a portion of area III. There are roads on the east side of Area I and II and on the west and east sides of Area III. Slopes range from 30% to 75% in the sale area. There are draws in Area I and Area II that will need to be carefully logged around.
8. **Access:** Access from the north is through a mixture of BLM, state, and private ownership. The Purchaser must sign a license agreement with the BLM to haul logs prior to sale operations. The road was improved in February of 2015 through a cooperative agreement between ODF and two other landowners. The appraisal includes road blading and maintenance during the sale. A winter haul option is available for logging with added road

improvement at the purchaser's expense. Details are included in the sale prospectus.

**9. Projects:**

Project 1: New road construction: \$7,275.00

Project 2: Road Improvement: \$760.00

Total Project Costs: \$8,035.00

**10. Road Maintenance:** The appraisal includes \$1.98/MBF for road maintenance (grading, pulling ditches, etc.).

**11. Other Costs:** The appraisal includes \$5/ MBF for Scaling. Costs not accounted for in the appraisal are the responsibility of the Purchaser.

**12. Slash Disposal:** Purchaser will pile slash on landings with an excavator or log loader, sorting out firewood into a separate pile. ODF will burn the slash piles.



Tunnel West  
PROJECT SUMMARY

**Sale Number:** 341-16-58

**Sale Name:** Tunnel West

<b>Project 1</b>	<b>Segment</b>	<b>Miles</b>	<b>Activity</b>	<b>Cost</b>
	A to B	0.179924	Road construction	\$4,275.00
			Mobilization	\$3,000.00
			<b>Subtotal</b>	<b>\$7,275.00</b>

<b>Project 2</b>	<b>Segment</b>	<b>Miles</b>	<b>Activity</b>	<b>Per Unit Cost</b>
	A to C	0.160417	Road Improvement (2 HR * \$95/HR)	\$190.00
	C to D	0.323674	Road Improvement (2 HR * \$95/HR)	\$190.00
	E to C	1.7	Road Improvement (4HR * \$95/HR)	\$380.00
			<b>Subtotal</b>	<b>\$760.00</b>

<b>Total Project Cost</b>	<b>\$8,035.00</b>
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**OREGON DEPARTMENT OF FORESTRY CRUISE REPORT**  
*Tunnel West*

**SALE NAME:** Tunnel West

**SALE NUMBER:** 341-16-58

1. **Type of Sale:** Partial Cut and Regeneration harvest, Recovery.
2. **Fund Distribution:** BOF 100%
3. **Legal Description:** Portions of Section 10, T33S, R6W, W.M.
4. **Sale Objective and Timber Description:** The stand is currently dominated by hardwoods. In area I and II the stand will be opened up for understory development. The remaining overstory will have conifer and hardwoods scattered throughout the unit. About 50% of the current conifer and 10-20 hardwoods per acre will remain after the harvest. The objective is to create a layered stand, reduce the amount of hardwoods, and increase the stocking of the conifer into a conifer dominated stand. Area III will be a regeneration harvest restocked to conifer.
5. **Acreage Calculation:** There are 99 net cruise acres in the sale area determined by a combination of GPS traverse waypoints and ArcGIS 10.2 software. Net acres do not include the riparian management areas, oak pockets within the stand, and non-stocked areas which were not cruised.
6. **Cruising Procedures**
  - A. **Cruise Method:** Tunnel West was cruised by ODF during the Spring of 2015. A variable plot cruise was conducted on three harvest areas, each of which were treated as individual strata. Cruise lines were set up on a 6 X 2 chain line spacing.
  - B. **Plot Size:** All plots use a 33.61 BAF (11 bars).
7. **RIGHT of WAY VOLUMES:** The road right-of-ways in area I were assigned the same per acre volumes as their respective area, and expanded by the area of the right of way to estimate the total volume for removal.  $5,325 \text{ avg. net BF/acre in area I} * 0.87 \text{ ROW acres} = 4,633 \text{ BF}$ . ROW Volume = 4.6 MBF
8. **Sampling Intensity:**

# Plots		63 Total Plots (32 measure, 31 count)
CV (BDFT)	77%	
SE (BDFT)	9.60	

As per ODF standards, total harvest volume of conifers and hardwoods ("take" trees) is estimated to be 579 MBF  $\pm$  56 MBF at the 68% confidence level and a sampling error of 9.60%\*\*. 68 times out of 100 the volume estimate will be within range of error specified.
9. **Computation Procedures:** Volume was computed using the SuperACE cruise program. Volumes reported are based on the Scribner Log Rule (West).
10. **Form Factors:** Form factors (a ratio of diameter at 4 and 16 feet) were sampled across the diameter distribution in all strata. Those form factors which were not measured were estimated by SuperACE.
11. **Height Standards:** Most conifer trees were measured for total height with a laser rangefinder.
12. **Diameter standards:** Diameters were measured outside bark at breast height to the nearest inch.
13. **Grading System:** Trees were graded primarily as 34 foot segments lengths and according to the Official Log Scaling and Grading Rules published by the Northwest Log Rules Advisory Group.

**14. Merchantable top:** Conifer were graded to a merchantable top specified by the official log scaling rules. For all species except pine, 2S segments were graded to a 12" top inside bark, 3S to a 6" top, and 4S to a 5" top (inside bark). Pine 4S logs were graded to a 12" top inside bark, 5S to a 6" top, and 6S to a 5" top (inside bark).

**15. Deductions for Cull, Defect and Breakage:** All visible field cull was removed in the cruise computation. Additional volume was deducted for the anticipated amount of hidden cull and breakage during logging. The total estimated volume reduction used for this anticipated loss to volume was approximately 6%.

**16. Cruisers:** Cruising and compilation were performed by Joanna Delegan in March of 2015.

ODF does not guarantee the volume of this or any other cruise. Prospective purchasers are advised to do their own cruise and sale volume calculations.

**17. Approvals:**

**Prepared by:** Joanna Delegan- Forester

Date \_\_\_\_\_

**Unit Forester Approval:** Chris Rudd

Date \_\_\_\_\_

**18. Attachments:**

Strata Volume Summary with Total Adjusted Volume (pg. 3 of 9)  
Species by Grade: Board Foot Volumes by Project (pg. 4 of 9)  
Project Statistics (pg. 5 of 9)  
Log Stock Tables (pgs. 6 & 7 of 9)  
Cruise Design (pg. 8 of 9)  
Cruise Map (pg. 9 of 9)

<b>STRATA VOLUME SUMMARY (TOTAL NET MBF*)</b>				
<b>Area 1</b>	2 Saw	3 Saw	4 Saw	TOTAL MBF
Douglas-fir	14	163	63	240
Madrone			122	122
Total	14	163	185	362
<b>Area 2</b>				
	2 Saw	3 Saw	4 Saw	TOTAL MBF
Douglas-fir	21	32	30	83
Chinquapin			3	3
Madrone			41	41
Total	21	32	74	127
<b>Area 3</b>				
	2 Saw	3 Saw	4 Saw	TOTAL MBF
Douglas-fir	49	42	18	109
Incense Cedar		3	10	13
Chinquapin			6	6
Total	49	45	34	128
<b>**Not Adjusted</b>			<b>TOTAL: 617 MBF</b>	

<b>Volume Deductions</b>				
		Area I	Area II	Area III
<b>Conifer</b>	Non-thinable	0	0	0
	Hidden Cull	0.025	0.025	0.025
	Breakage	0.025	0.025	0.025
<b>Hardwood</b>	Non-thinable	0	0	0
	Hidden Cull	0.05	0.05	0.05
	Breakage	0.05	0.05	0.05
	Recovery DF	95%	95%	95%
	Recovery HW	90%	90%	90%

<b>STRATA *ADJUSTED* VOLUME SUMMARY (TOTAL NET MBF*)</b>				
<b>Area 1</b>	2 Saw	3 Saw	4 Saw	TOTAL MBF
Douglas-fir	13	155	60	228
Madrone			110	110
Total	13	155	170	338
<b>Area 2</b>				
	2 Saw	3 Saw	4 Saw	TOTAL MBF
Douglas-fir	20	30	29	79
Chinquapin			3	3
Madrone			37	37
Total	20	30	69	119
<b>Area 3</b>				
	2 Saw	3 Saw	4 Saw	TOTAL MBF
Douglas-fir	47	40	17	104
Incense Cedar		3	10	13
Chinquapin			5	5
Total	47	43	32	122
<b>TOTAL ADJUSTED VOLUME:</b>				<b>579 MBF</b>
*Adjusted conifer volume 5% and hardwood volume 10% for hidden cull and breakage				

\*Because of the nature of the stratified sample, area (stratum) volume estimates will be less accurate than the total combined volume estimate.

**Species by Grade: Board Foot Volumes (Project)**

Species by Grade - Board Foot Volumes (Project)																			
SPP	GRADE	%NETBDF	Total Volume	DF%	Gross BF/Ac	Net BF/Ac	Total NetMB	Log Scale Dia					Log Length			Average Log			
								4-5	6-11	12-16	17+	12-20	21-30	31-35	36-99	Fl.	Diam	Bdft	Logs per Ac
DF	2M	19	13%	840	840	840	83	4-5	6-11	12-16	17+	12-20	21-30	31-35	36-99	Fl.	Diam	Bdft	Logs per Ac
DF	3M	55	39%	2,436	2,400	238	1.5	78	79	21	18	9	26	100		34	15	293	3.2
DF	4M	26		1,212	1,122	111		20	22			2	7	59	6	29	5	34	22.9
<b>DF Totals</b>		<b>87</b>	<b>70%</b>	<b>4,398</b>	<b>4,362</b>	<b>432</b>		<b>20</b>	<b>49</b>	<b>27</b>	<b>3</b>	<b>2</b>	<b>7</b>	<b>90</b>	<b>2</b>	<b>31</b>	<b>7</b>	<b>74</b>	<b>59.1</b>
MA	4M	100	26%	1,648	1,648	163		50	50			3	80	12	5	26	6	34	48.1
<b>MA Totals</b>		<b>11</b>	<b>26%</b>	<b>1,648</b>	<b>1,648</b>	<b>163</b>		<b>50</b>	<b>50</b>			<b>3</b>	<b>80</b>	<b>12</b>	<b>5</b>	<b>26</b>	<b>6</b>	<b>34</b>	<b>48.1</b>
CQ	4M	100	1%	92	92	9		43		57			100			22	6	42	2.2
<b>CQ Totals</b>		<b>1</b>	<b>1%</b>	<b>92</b>	<b>92</b>	<b>9</b>		<b>43</b>		<b>57</b>			<b>100</b>			<b>22</b>	<b>6</b>	<b>42</b>	<b>2.2</b>
IC	3M	29	1%	40	40	4		67	19	14	100	43	38	19		34	18	450	0.1
IC	4M	71	2%	96	96	10		48	13	10	29	30	27	43		21	6	30	3.2
<b>IC Totals</b>		<b>1</b>	<b>2%</b>	<b>136</b>	<b>136</b>	<b>13</b>		<b>48</b>	<b>13</b>	<b>10</b>	<b>29</b>	<b>30</b>	<b>27</b>	<b>43</b>		<b>22</b>	<b>6</b>	<b>41</b>	<b>3.3</b>
<b>Totals</b>			<b>100%</b>	<b>6,274</b>	<b>6,238</b>	<b>617</b>													

**Project Statistics: All Statistics are reported at the 68% confidence level.**

	PLOTS	TREES	TREES PER PLOT
CRUISE	32	155	4.8
COUNT	31	152	4.9
TOTAL	63	307	4.9

PROJECT SUMMARY								
Species Status	SAMPLE		BOLE			GROSS	NET	Total MBF
	TREES	TPA	AVG DBH	LEN	BA	BF/AC	BF/AC	
DOUG FIR-T	34	36.5	12.9	75	33.3	4,398	4,360	432
MADRONE-T	22	46.5	12.2	28	37.9	1,648	1,648	163
INC CED- T	5	2.9	11.4	45	2.0	136	136	13
CHINQUAP- T	2	1.8	11.6	27	1.3	92	92	9
<b>TOTAL</b>	<b>63</b>	<b>87.7</b>			<b>74.5</b>	<b>6,274</b>	<b>6,236</b>	<b>617</b>

NET BF/ACRE CONFIDENCE INTERVAL					
Species-Status	CV%	S.E.%	LOW	AVG	HIGH
DOUG FIR-T	116.2	14.6	3,724	4,362	5,000
MADRONE-T	156.1	19.6	1,324	1,648	1,972
INC CED- T	481.6	60.6	54	136	218
CHINQUAP- T	450.9	56.8	40	92	143
<b>Totals</b>			5,142	6,238	7,333

Board Foot Volume Summary by Strata										
Area	Acres	Plots	Avg. Net			Total Net Volume				Net Volume (MBF)
			BF/ac	CV	SE%	SE (BdFt)	Low (BF)	(BF)	High (BF)	
1	68	43	5,325	71%	11.0%	39,379	322,721	362,100	401,479	362
2	23	12	5,515	105%	30.0%	38,613	88,232	126,845	165,458	127
3	8	8	16,069	50%	18.0%	22,775	105,777	128,552	151,327	128
<b>Combined</b>	<b>99</b>	<b>63</b>		<b>77%</b>	<b>9.6%</b>					<b>617</b>

\*Because of the nature of the stratified sample, area (stratum) volume estimates will be less accurate than the total combined volume estimate.

**Log Stock Table - Percent Board Feet (Strata Combined)**

Percent Net Volume by Scaling Diameter in Inches																	
SPP	GRD	LOG LEN	GROSS MBF	NET MBF	% SPC	2-3	4-5	6-7	8-9	10-11	12-13	14- 15	16- 19	20- 23	24- 29	30- 39	40+
DF	2M	34	83	83	19.3						12.3	70.1		17.6			
DF	3M	34	241	238	55			19.3	14.5	45.5	8.5	12.2					
DF	4M	14	1	1	.3		100										
DF	4M	17	1	1	.2		100										
DF	4M	18	1	1	.3			100									
DF	4M	19	6	6	1.4		100										
DF	4M	21	1	1	.3			100									
DF	4M	22	4	4	.9				100								
DF	4M	23	2	2	.4		100										
DF	4M	24	8	8	1.8		50.2			49.8							
DF	4M	25	3	3	.6		100										
DF	4M	27	2	2	.6		100										
DF	4M	28	1	1	.3		100										
DF	4M	30	7	7	1.7		100										
DF	4M	31	19	19	4.5		100										
DF	4M	32	3	3	.7		100										
DF	4M	33	3	3	.8		100										
DF	4M	34	38	38	8.8		61.9	38.1									
DF	4M	35	2	2	.6		100										
DF	4M	39	7	7	1.6		100										
<b>DF Total</b>			<b>435</b>	<b>432</b>													
MA	4M	20	5	5	2.9		100										
MA	4M	22	15	15	9.3		100										
MA	4M	24	53	53	32.3		56.1	26.6	17.2								
MA	4M	25	8	8	5.2		100										
MA	4M	27	11	11	6.9			100									
MA	4M	29	42	42	25.8		43.1	56.9									
MA	4M	31	6	6	3.7			100									
MA	4M	32	5	5	3.2		100										
MA	4M	35	9	9	5.6			100									
MA	4M	39	8	8	5.1			100									
<b>MA Total</b>			<b>163</b>	<b>163</b>													
CQ	4M	21	3	3	32.2		100										
CQ	4M	24	6	6	67.8		16.7			83.3							
<b>CQ Total</b>			<b>9</b>	<b>9</b>													

**Log Stock Table - Percent Board Feet (Strata Combined)**

SPP	GRD	LOG LEN	GROSS MBF	NET MBF	% SPC	Percent Net Volume by Scaling Diameter in Inches											
						2-3	4-5	6-7	8-9	10- 11	12- 13	14- 15	16- 19	20- 23	24- 29	30- 39	40+
IC	3M	34	4	4	29.4								100				
IC	4M	15	2	2	17.2	100											
IC	4M	20	2	2	13.3					100							
IC	4M	21	1	1	11.0	100											
IC	4M	22	1	1	3.8	100											
IC	4M	25	1	1	9.8						100						
IC	4M	26	0	0	2.0	100											
IC	4M	32	2	2	13.6	100											
<b>IC Total</b>			<b>13</b>	<b>13</b>													
<b>Grand Total</b>			<b>620</b>	<b>617</b>													



## Tunnel West Cruise Design

### **Type 5079 and 5081:**

1. Objective: Measure trees in 32 plots and count trees in 31 plots to obtain grade and volume (Measure, Count, Measure, Count).
2. Variable plot cruise
3. All plots use a 33.61 BAF(11 bars)
4. Every other plot is a measure plot. Count-Measure for a total of 63 plots.
5. Measure plots- 33.61 BAF, measure only take trees:
6. Take Trees are:
  - a) Blue-marked conifer
  - b) Hardwood with a DBH between 8 and 18 inches.
    - i. Do not measure any trees with a DBH less than 8 inches.
    - ii. Measure DBH, height, Form Factor, and grade of all trees.
    - iii. Record species and take (T) or leave (L) status.
    - iv. Measure hardwoods the same as conifer.

**Stats-** Estimate of CV=75%, SE% of 10.

**Cruise lines-** 6 X 2 chain line spacing

**Plots-** Measure, Count, Measure, Count- 2 chains apart. Total 63 plots: 32 Measure; 31 Count

**Strata-** The cruise design was broken up into three strata:

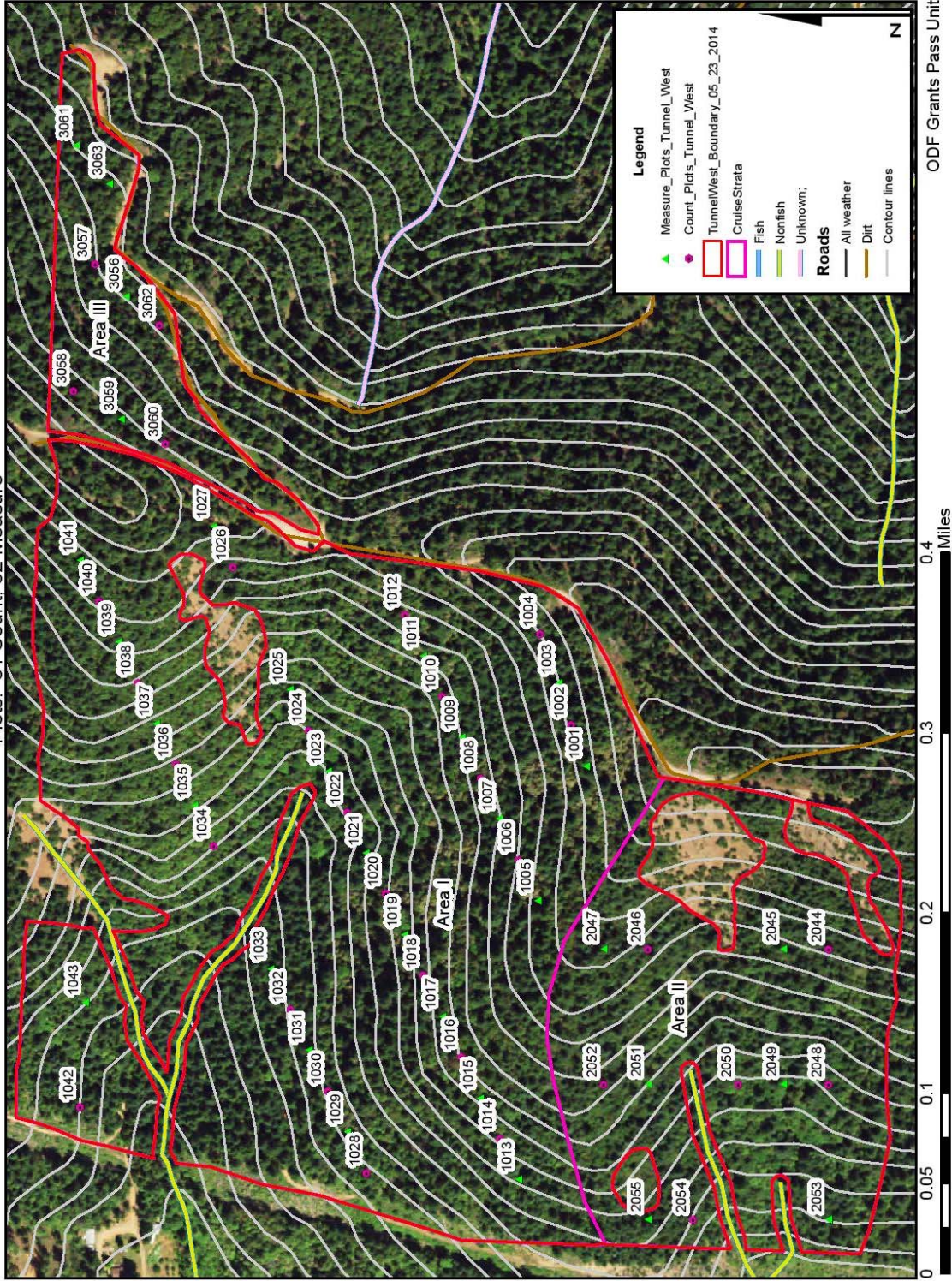
- Area I (Moderate Thin): 68 acres
- Area II (Heavy Thin): 23 acres
- Area III (Clear Cut): 8 acres

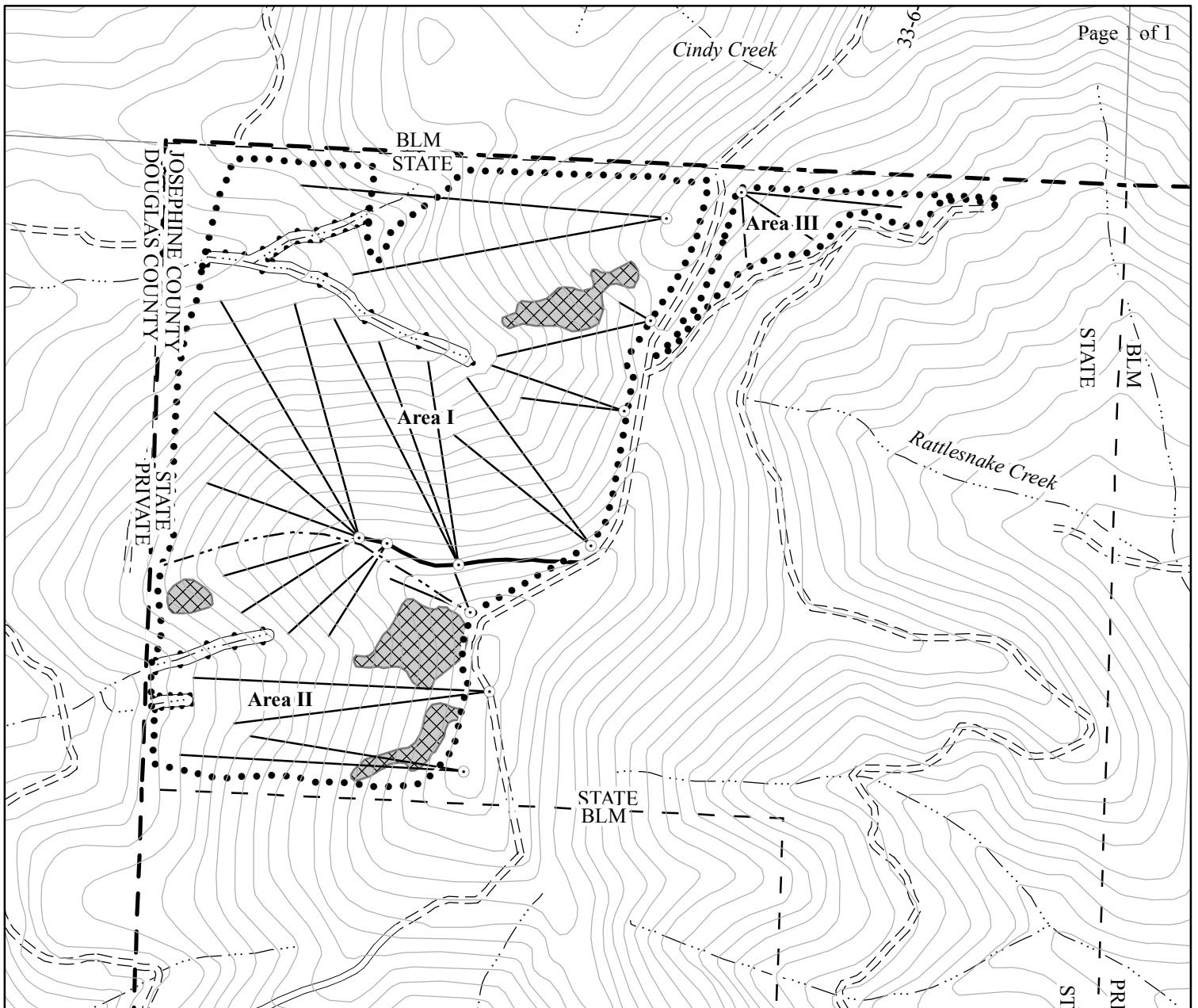
### General Instructions

Measure Standards:

1. View all conifers at DBH.
2. Form point is at 4 feet.
3. Record height to the nearest foot.
4. Diameter taken outside bark at 4.5 feet above stump height.
5. Measure total height of all trees or to 6 or 8 inches outside bark.
6. Cruise to 17, 26, 34, and 40 foot logs. Preferred lengths: When cruising think about the final product. Douglas-fir, White fir, and veneer pine should be graded to the preferred length, 34+10, 17+1-, and 26+10. At Swanson, the largest peeler log is 20" and at Murphy, the cutoff is 25". Boise has a 4 foot lathe, but will accept two foot multiples at the mill, where the extra two feet is chipped. Cruise to a 34+12 or 40+12 for oversize logs. In all cases, two and four foot multiples are acceptable. Cedar is cut to 32+10 or 16+10. Oversize pine is cut to 32+12 or 16+10.

Tunnel West Timber Sale  
2 X 6 chain cruise grid  
Plots: 31 Count, 32 Measure





**Legend**

**Boundaries**

- Timber Sale Boundary
- - - - Area Boundary (Not-Posted)
- - - State Forest Property Boundary
- - - County Lines

**Roads**

- == == Unsurfaced Road
- ==== Surfaced Road
- — New Road Construction
- — Contour Lines

**Streams**

- — Type N Stream
- — Posted Stream Buffer
- ▣ Green Tree Retention Area

**Yarding Method**

- — Tractor Yarding Area
- — CableCorridors
- Landings

## EXHIBIT "A" LOGGING PLAN

OF TIMBER SALE CONTRACT NO. 341-16-58  
TUNNEL WEST  
PORTIONS OF SECTIONS 10, T33S, R6W, W.M.,  
JOSEPHINE COUNTY, OREGON

AREA	NET ACRES TRACTOR	NET ACRES CABLE
1 (PC)	0	68
2 (PC)	0	23
3 (CC)	8	0
<b>TOTAL</b>	<b>8</b>	<b>91</b>

This product is for informational use and may not have been prepared for or be suitable for legal, engineering or survey purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of this information.

Scale 1:6,000  
40' contour interval



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