



"STEWARDSHIP IN FORESTRY"

Timber Sale Appraisal
Williwaw
Sale 341-14-03

District: Forest Grove

Date: September 03, 2013

cost summary

	Conifer	Hardwood	Total
Gross Timber Sale Value	\$1,212,123.60	\$4,195.62	\$1,216,319.22
		Project Work:	\$(112,530.00)
		Advertised Value:	\$1,103,789.22



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timber description

Location: Portions of Sections 3, 4, 9, and 10, T1S, R6W, W.M., Washington County, Oregon.

Stand Stocking: 20%

SpecieName	AvgDBH	Amortization (%)	Recovery (%)
Douglas - Fir	12	0	98
Western Hemlock / Fir	16	0	98
Alder (Red)	12	0	98

Volume by Grade	2S	3S	4S	Camprun	Total
Douglas - Fir	471	2,818	431	0	3,720
Western Hemlock / Fir	116	250	34	0	400
Alder (Red)	0	0	0	11	11
Total	587	3,068	465	11	4,131



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comments: Pond Values Used: 2nd Quarter Calendar Year 2013.

Western redcedar and Other Cedars Stumpage Price = Pond Value
minus Logging Cost:
 $\$690.36/\text{MBF} = \$950/\text{MBF} - \$259.64/\text{MBF}$

SCALING COST ALLOWANCE = $\$5.00/\text{MBF}$

FUEL COST ALLOWANCE = $\$4.00/\text{Gallon}$

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

Other Costs (with Profit & Risk to be added):
Brand and Paint: 4,131 MBF @ $\$1/\text{MBF} = \$4,131$
Truck Assist: \$8,238
TOTAL Other Costs (with Profit & Risk to be added) = \$12,369

Other Costs (No Profit & Risk added):
Block/Waterbar Skid Roads: 15 hours @ $\$110/\text{hour} = \$1,650$
Pile Landing Slash: 10 hours @ $\$110/\text{hour} = \$1,100$
Equipment Cleaning: 4 machines @ $\$1,000/\text{machine} = \$4,000$
Weyerhaeuser Road Use Fee: \$39,492
Stimson Road Use/Reprod Damage Fee: \$5,635
TOTAL Other Costs (No Profit & Risk added) = \$51,877

ROAD MAINTENANCE
Move-in: \$2,000
General Road Maintenance: 10.5 miles x $\$1,000/\text{mile} = \$10,500$
TOTAL: $\$12,500 / 4,131 \text{ MBF} = \$3.03/\text{MBF}$



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logging conditions

combination#: 1 Douglas - Fir 63.56%
 Western Hemlock / Fir 66.50%

yarding distance: Long (1,500 ft) **downhill yarding:** No
logging system: Cable: Medium Tower >40 - <70 **Process:** Stroke Delimber
tree size: Small / Thinning 12in (130 Bft/tree), 12-17 logs/MBF
loads / day: 6.0 **bd. ft / load:** 3,500
cost / mbf: \$159.24

machines: Log Loader (A)
Stroke Delimber (A)
Tower Yarder (Medium)

combination#: 2 Douglas - Fir 36.44%
 Western Hemlock / Fir 33.50%
 Alder (Red) 100.00%

yarding distance: Medium (800 ft) **downhill yarding:** No
logging system: Shovel **Process:** Stroke Delimber
tree size: Small / Thinning 12in (130 Bft/tree), 12-17 logs/MBF
loads / day: 8.0 **bd. ft / load:** 3,500
cost / mbf: \$51.37

machines: Stroke Delimber (B)



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logging costs

Operating Seasons:	2.00	Profit Risk:	15.00%
Project Costs:	\$112,530.00	Other Costs (P/R):	\$12,369.00
Slash Disposal:	\$0.00	Other Costs:	\$51,877.00

Miles of Road

Road Maintenance: \$3.03

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

Hauling Costs

Species	\$ / MBF	Trips/Day	MBF / Load
Douglas - Fir	\$0.00	2.0	4.2
Western Hemlock / Fir	\$0.00	2.0	3.7
Alder (Red)	\$0.00	2.0	3.7



"STEWARDSHIP IN FORESTRY"

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Sale 341-14-03

District: Forest Grove

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logging costs breakdown

Logging	Road Maint	Fire Protect	Hauling	Other P/R appl	Profit & Risk	Slash Disposal	Scaling	Other	Total
Douglas - Fir									
\$119.94	\$3.09	\$2.12	\$82.36	\$2.99	\$31.58	\$0.00	\$5.00	\$12.56	\$259.64
Western Hemlock / Fir									
\$123.10	\$3.09	\$2.12	\$93.49	\$2.99	\$33.72	\$0.00	\$5.00	\$12.56	\$276.07
Alder (Red)									
\$51.37	\$3.09	\$2.12	\$93.49	\$2.99	\$22.96	\$0.00	\$5.00	\$12.56	\$193.58

Specie	Amortization	Pond Value	Stumpage	Amortized
Douglas - Fir	\$0.00	\$562.17	\$302.53	\$0.00
Western Hemlock / Fir	\$0.00	\$492.85	\$216.78	\$0.00
Alder (Red)	\$0.00	\$575.00	\$381.42	\$0.00



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summary

Amortized

Specie	MBF	Value	Total
Douglas - Fir	0	\$0.00	\$0.00
Western Hemlock / Fir	0	\$0.00	\$0.00
Alder (Red)	0	\$0.00	\$0.00

Unamortized

Specie	MBF	Value	Total
Douglas - Fir	3,720	\$302.53	\$1,125,411.60
Western Hemlock / Fir	400	\$216.78	\$86,712.00
Alder (Red)	11	\$381.42	\$4,195.62

Gross Timber Sale Value

Recovery: \$1,216,319.22

Prepared by: Joe Koch

Phone: 503-359-7460

TIMBER SALE SUMMARY

Williwaw

Contract No. 341-14-03

1. **Location:** Portions of Section 3, 4, 9, and 10, T1S, R6W, W.M., Washington County, Oregon.
2. **Type of Sale:** 267 acres of Moderate Partial Cut (PC-M) and 10 acres of Right of Way. The timber will be sold on a recovery basis at a sealed bid auction.
3. **Revenue Distribution:** 100% Washington County.
4. **Sale Acreage:** Acres are net of stream buffers and road prisms. Acreage was determined using ESRI ArcMap GIS software.
5. **Cruise Data:** The Timber Sale was cruised by SLI cruisers in 2005 and 2009. For more information see Cruise Report.
6. **Timber Description:** Timber Sale Area is well stocked with 44 and 55 year old stands of Douglas-fir with minor amounts of western hemlock and hardwoods. The average 'take' volume per acre is approximately 14 MBF. The average 'take' tree DBH is approximately 12 inches.
7. **Topography and Logging Method:** Slopes within the sale vary in aspect and range from 5% to 80%. Area 1 is 29% ground-based yarding and 71% cable-based yarding. Area 2 (R/W) is 100% ground-based yarding. For this sale the average horizontal length of cable yarding corridors is approximately 480 feet and the maximum is approximately 1,250 feet. The average horizontal tractor yarding distance is approximately 350 feet and the maximum is approximately 950 feet.
8. **Access:** From Forest Grove, proceed south on HWY 47 for 15 miles. Turn right onto Pike Road and continue for 4.5 miles. Pike Road then becomes Turner Cr. Road. Continue west on Turner Creek Road for 4.7 miles. Turn right onto North Fork Trask River Road and continue for 6 miles. Turn right onto Williams Road and continue for 6.5 miles to the timber sale. There are gates located on Turner Creek Road, North Fork Trask River Road, and Williams Road that may require keys or combination that can be obtained at the ODF office in Forest Grove.

9. **Projects:**

Project No. 1: Road construction and improvement	\$37,247.51
Project No. 2: Road surfacing	\$50,435.63
Project No. 3: Grass seed, fertilize, and mulch	\$546.79
Project No. 4: Crush and Stockpile 1,500 cy of 1½"-0" rock	\$17,504.40
Move in and equipment cleaning:	\$6,795.30

Total Credit for all Projects (rounded)

\$112,526.63

PROJECT COST SUMMARY SHEETTimber Sale: WilliwawSale Number: 341-14-03**PROJECT NO. 1: ROAD CONSTRUCTION AND IMPROVEMENT****CONSTRUCTION**

Road Segment	Length	Cost
A to B	6+30	\$1,662.77
G to H	3+70	\$1,140.40
Point I		\$755.11
	10+00 stations	
	0.19 miles	

SUBTOTAL CONSTRUCTION \$3,558.28**IMPROVEMENTS**

Road Segment	Length	Cost
C to D	97+00	\$23,478.26
E to F	34+00	\$10,210.97
	131+00 stations	
	2.48 miles	

SUBTOTAL IMPROVEMENTS \$33,689.23**TOTAL PROJECT NO. 1 COST =** \$37,247.51**PROJECT NO. 2: SURFACING**

Road Segment	Amount	Type	Cost
A to B	520	3" - 0	\$6,921.20
C to D	84 cy	1 1/2" - 0	\$1,010.52
C to D	914 cy	6" - 0	\$3,983.95
C to D	72 cy	24" -12"	\$313.92
E to F	24 cy	1 1/2" - 0	\$343.92
	2,062 cy	3" - 0	\$29,548.46
G to H	346 cy	3" - 0	\$4,951.26
Point I	240 cy	3" - 0	\$3,362.40
Total	6,002 cy		
	1,848 cy	1 1/2" - 0	
	3,168 cy	3" - 0	
	914 cy	6" - 0	
	72 cy	24" -12"	

TOTAL PROJECT NO. 2 COST = \$50,435.63**PROJECT NO. 3: GRASS SEED, FERTILIZE, & MULCH**

Grass seed and fertilize areas of disturbed soil. \$543.79

TOTAL PROJECT NO. 3 COST = \$543.79**PROJECT NO. 4: 1-1/2" Stockpile**

1500 cy Stockpile of 1-1/2"-0" \$17,504.40

TOTAL PROJECT NO. 4 COST = \$17,504.40**MOVE IN & EQUIPMENT CLEANING** \$6,795.30**TOTAL ALL PROJECTS** \$112,526.63**TOTAL CREDITS** \$112,530.00

SUMMARY OF CONSTRUCTION COST

Timber Sale: Williwaw
Road Segment: A to B

Timber Sale No. : 341-14-03
Construction: 6+30 stations
0.12 miles

PROJECT NO. 1**EXCAVATION**

Clearing and Grubbing (Scatter)	0.41	acres @	\$980.00	per acre =	\$404.96
Balanced Road Construction	3.80	sta @	\$90.00	per sta =	\$342.00
Drift	2.50	sta @	\$150.00	per sta =	\$375.00
Construct Turnaround	1	ea @	\$75.00	per ea =	\$75.00
Landing	1	ea @	\$285.00	per ea =	\$285.00
Grade, Ditch, and Roll	6.30	sta @	\$28.70	per sta =	\$180.81
TOTAL EXCAVATION COSTS=					\$1,662.77

PROJECT NO. 1 TOTAL COST = \$1,662.77

PROJECT NO. 2:**SURFACING**

	10	" deep =	53 cy/sta		
A to B	334	cy of	3" - 0	@	\$13.31 per cy = \$4,445.54
Turnaround	16	cy of	3" - 0	@	\$13.31 per cy = \$212.96
Junction	20	cy of	3" - 0	@	\$13.31 per cy = \$266.20
Landing	150	cy of	3" - 0	@	\$13.31 per cy = \$1,996.50
Total =	520				
	520	cy of	3" - 0		\$13.31 per cy = \$6,921.20

PROJECT NO. 2 TOTAL COST = \$6,921.20

PROJECT NO. 3:

Grass seed and fertilize areas of disturbed soil. 0.21 acres @ \$220.00 per acre = \$45.45

PROJECT NO. 3 TOTAL COST = \$45.45

TOTAL COST = \$8,629.42

SUMMARY OF CONSTRUCTION COST

Timber Sale: Williwaw
Road Segment: C to D

Timber Sale No. : 341-14-03
Improvement: 97+00 stations
1.84 miles

PROJECT NO. 1

EXCAVATION

Clearing and Grubbing (Scatter)	1.11	acres @	\$980.00	per acre =	\$1,091.14
Drift	4.50	sta @	\$150.00	per sta =	\$675.00
Corner Improvement	5.00	sta @	\$90.00	per sta =	\$450.00
Additional Ripping through Rocky Outcrop	6.00	sta @	\$250.00	per sta =	\$1,500.00
FILL EXCAVATION (Culvert Nos. 4 & 5)					
Excavate existing puncheon and fill	111.11	cy @	\$2.74	per cy =	\$304.44
Endhaul unsuitable fill material	111.11	cy @	\$4.38	per cy =	\$486.67
Haul fill material	111.11	cy @	\$4.38	per cy =	\$486.67
Place fill and rock	111.11	cy @	\$2.12	per cy =	\$235.56
Compact fill	111.11	cy @	\$0.45	per cy =	\$50.00
Compact Waste Areas	111.11	cy @	\$0.25	per cy =	\$27.78
Construct Junction	1	sta @	\$90.00	per sta =	\$90.00
Construct Turnouts	5	ea @	\$60.00	per ea =	\$300.00
Construct Turnaround	1	ea @	\$75.00	per ea =	\$75.00
Landings	8	ea @	\$285.00	per ea =	\$2,280.00
Grade, Ditch, and Roll	56.40	sta @	\$28.70	per sta =	\$1,618.68
Grade and Roll (Outslope)	40.60	sta @	\$27.20	per sta =	\$1,104.32

TOTAL EXCAVATION COSTS= **\$10,775.26**

CULVERTS - MATERIALS & INSTALLATION

Culverts

210	LF of 18"	\$4,200.00	120	LF of 24"	\$3,480.00
30	LF of 30"	<u>\$1,170.00</u>	50	LF of 48"	<u>\$3,600.00</u>

Culvert Markers

14 markers \$140.00

Bands

1 ea of 30" @	\$44.00	per ea =	44.00
1 ea of 48" @	\$69.00	per ea =	69.00

TOTAL CULVERT COSTS = **\$12,703.00**

PROJECT NO. 1 TOTAL COST = \$23,478.26

PROJECT NO. 2:

Culvert Bedding (5)	60	cy of	1 1/2" - 0	@	\$12.03	per cy =	\$721.80
Culvert Bedding No. 13	24	cy of	1 1/2" - 0	@	\$12.03	per cy =	\$288.72
Energy Dissipators (6)	72	cy of	24" - 12"	@	\$4.36	per cy =	\$313.92
Road Subgrade Reinforcement	464	cy of	6" - 0	@	\$4.36	per cy =	\$2,021.95
Landing Subgrade Reinforcement	450	cy of	6" - 0	@	\$4.36	per cy =	\$1,962.00
Total =	1,393						
	84	cy of	1 1/2" - 0		\$12.03	per cy =	\$1,010.52
	914	cy of	6" - 0		\$4.36	per cy =	\$3,983.95
	72	cy of	24" - 12"		\$4.36	per cy =	\$313.92

PROJECT NO. 2 TOTAL COST = \$4,755.98

PROJECT NO. 3:

Grass seed and fertilize areas of disturbed soil.	0.56	acres @	\$220.00	per acre =	\$122.47
Bio-Bags	22.00	each @	\$5.00	per each =	\$110.00
Mulch	18.00	bales @	\$4.50	per bale =	\$81.00

PROJECT NO. 3 TOTAL COST = \$313.47

TOTAL COST = \$28,547.71

SUMMARY OF CONSTRUCTION COST

Timber Sale: Williwaw
 Road Segment: E to F

Timber Sale No. : 341-14-03
 Improvement: 34+00 stations
0.64 miles

PROJECT NO. 1**EXCAVATION**

Clearing and Grubbing (Scatter)	0.78	acres @	\$980.00	per acre =	\$764.92
Road Widening (Drift)	34.00	sta @	\$90.00	per sta =	\$3,060.00
FILL EXCAVATION					
Excavate existing puncheon and fill	89	cy @	\$2.74	per cy =	\$243.56
Place fill and rock	89	cy @	\$2.12	per cy =	\$188.44
Compact fill	89	cy @	\$0.45	per cy =	\$40.00
Construct Turnouts	3	ea @	\$60.00	per ea =	\$180.00
Construct Turnaround	1	ea @	\$75.00	per ea =	\$75.00
Landing	1	ea @	\$285.00	per ea =	\$285.00
Grade, Ditch, and Roll	19.50	sta @	\$28.70	per sta =	\$559.65
Grade and Roll (Outslope)	14.50	sta @	\$27.20	per sta =	\$394.40
TOTAL EXCAVATION COSTS=					\$5,790.97

CULVERTS - MATERIALS & INSTALLATION**Culverts**

160 LF of 18" \$3,200.00

40 LF of 24" \$1,160.00

Culvert Markers6 markers \$60.00**TOTAL CULVERT COSTS = \$4,420.00****PROJECT NO. 1 TOTAL COST = \$10,210.97****PROJECT NO. 2:****SURFACING**

	10	" deep =	53 cy/sta		
E to F	1,802	cy of	3" - 0	@	\$14.33 per cy = \$25,822.66
Turnouts	54	cy of	3" - 0	@	\$14.33 per cy = \$773.82
Turnaround	16	cy of	3" - 0	@	\$14.33 per cy = \$229.28
Junction	40	cy of	3" - 0	@	\$14.33 per cy = \$573.20
Landing	150	cy of	3" - 0	@	\$14.33 per cy = \$2,149.50
Culvert Bedding	24	cy of	1 1/2" - 0	@	\$14.33 per cy = \$343.92
Total =	<u>2,086</u>				
	24	cy of	1 1/2" - 0		\$14.33 per cy = \$343.92
	2,062	cy of	3" - 0		\$14.33 per cy = \$29,548.46

PROJECT NO. 2 TOTAL COST = \$29,892.38**PROJECT NO. 3:**

Grass seed and fertilize areas of disturbed soil.	0.39 acres @	\$220.00	per acre =	\$85.86
Mulch	8.00 bales @	\$4.50	per bale =	\$36.00

PROJECT NO. 3 TOTAL COST = \$121.86**TOTAL COST = \$40,225.21**

SUMMARY OF CONSTRUCTION COST

Timber Sale:	<u>Williwaw</u>	Timber Sale No. :	<u>341-14-03</u>
Road Segment:	<u>G to H</u>	Construction:	<u>3+70 stations</u> <u>0.07 miles</u>

PROJECT NO. 1

EXCAVATION

Clearing and Grubbing (Scatter)	0.42	acres @	\$980.00	per acre =	\$416.21
Balanced Road Construction	3.70	sta @	\$90.00	per sta =	\$333.00
Landing	1	ea @	\$285.00	per ea =	\$285.00
Grade, Ditch, and Roll	3.70	sta @	\$28.70	per sta =	\$106.19

PROJECT NO. 1 TOTAL COST = \$1,140.40

PROJECT NO. 2:

SURFACING

	10	" deep =	53 cy/sta			
G to H	196	cy of	3" - 0	@	\$14.31	per cy = \$2,804.76
Landing	150	cy of	3" - 0	@	\$14.31	per cy = \$2,146.50
Total =	346					
	346	cy of	3" - 0		\$14.31	per cy = \$4,951.26

PROJECT NO. 2 TOTAL COST = \$4,951.26

PROJECT NO. 3:

Grass seed and fertilize areas of disturbed soil.	0.21	acres @	\$220.00	per acre =	\$46.72
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PROJECT NO. 3 TOTAL COST = \$46.72

TOTAL COST = \$6,138.37

SUMMARY OF CONSTRUCTION COST

Timber Sale: Williwaw Timber Sale No. : 341-14-03
Road Segment: Point I Construction

PROJECT NO. 1

EXCAVATION

Clearing and Grubbing (Scatter)	0.15	acres @	\$980.00	per acre =	\$145.11
Construct Truck Turnaround	1	ea @	\$500.00	per ea =	\$500.00
Grade and Roll Truck Turnaround	1	ea @	\$110.00	per ea =	\$110.00
TOTAL EXCAVATION COSTS=					\$755.11

PROJECT NO. 1 TOTAL COST = \$755.11

PROJECT NO. 2:

SURFACING

	10	" deep =	53 cy/sta		
Truck Turnaround	240	cy of	3" - 0	@	\$14.01 per cy = \$3,362.40
Total =	240				
	240	cy of	3" - 0		\$14.01 per cy = \$3,362.40

PROJECT NO. 2 TOTAL COST = \$3,362.40

PROJECT NO. 3:

Grass seed and fertilize areas of disturbed soil.	0.07	acres @	\$220.00	per acre =	\$16.29
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PROJECT NO. 3 TOTAL COST = \$16.29

TOTAL COST = \$4,133.80

Move-In & Equipment Cleaning

Timber Sale:

Williwaw

Sale Number:

314-14-03

LOWBOY HAUL (One-way)		
DIST. (mi)	ROAD	AVE SPEED (mph)
14.5	Main Lines	7
3.0	Steep Grades	2

No.	EQUIPMENT DESCRIPTION	Within					Within				
		Equipment Cleaning	Base Cost	Woods Cost	Pilot Cars	Area Move (\$/mile)	Begin Mileage	End Mileage	Total Miles	Total Area Cost	Total Cost
1	Graders		\$300.00	\$546.43			0.0	0.0	0.0	\$0.00	\$846.43
1	Rollers (smooth/grid) & Compactors		\$308.59	\$442.75			0.0	0.0	0.0	\$0.00	\$751.34
1	Excavators (Large)	\$1,000	\$466.14	\$733.38	1	\$44.80	0.0	0.0	0.0	\$0.00	\$2,199.52
1	Tractor (D8)	\$1,000	\$473.80	\$667.66	2	\$15.10	0.0	0.0	0.0	\$0.00	\$2,141.46
4	Dump Truck (10 cy +)		\$466.67	\$245.00		\$2.85	0.0	0.0	0.0	\$0.00	\$711.67
1	Water Truck (1500 Gal)		\$95.00	\$49.88		\$2.85	0.0	0.0	0.0	\$0.00	\$144.88
TOTAL MOVE-IN COSTS:											\$6,795.30

ROCK PIT DEVELOPMENT AND CRUSHING COST SUMMARY

Timber Sale: Williwaw
Sale Number: 314-14-03
Pit Name: Williams Pit

Swell:	<u>130%</u>	1-1/2"-0 (trk measure)	<u>108 cy</u>
Shrinkage:	<u>116%</u>	3"-0 (trk measure)	<u>3,168 cy</u>
Drill Pct.:	<u>100%</u>	6"-0 (trk measure)	<u>914 cy</u>
		Stockpile (stockpile measurement)	<u>1,500 cy</u>
		Total Truck Yardage:	<u>5,930 cy</u>
		Total In Place Yardage:	<u>4,561 cy</u>

Pit Development & Cleanup including Clearing and grubbing of
Waste Area @ adjacent to pit, place overburden
in Waste Area, spread and compact.

\$1,070.00

Drill & Shoot (Downholes):	<u>\$2.50 /cy x</u>	<u>4,561 cy</u>	=	\$11,403.37
Load Crusher:	<u>\$0.70 /cy x</u>	<u>5,930 cy</u>	=	\$4,150.83
Crushing (1-1/2" - 0):	<u>\$3.00 /cy x</u>	<u>108 cy</u>	=	\$324.00
Crushing (3" - 0):	<u>\$3.00 /cy x</u>	<u>3,168 cy</u>	=	\$9,504.00
Crushing (Stockpile):	<u>\$3.00 /cy x</u>	<u>1,740 cy</u>	=	\$5,220.00
Build and Shape Stockpile:	<u>\$1.00 /cy x</u>	<u>1,500 cy</u>	=	\$1,500.00
Load Dump Truck:	<u>\$0.70 /cy x</u>	<u>5,930 cy</u>	=	\$4,150.83
		Subtotal		\$39,059.14

Equipment Cleaning				\$1,000.00
Move in Crusher (3 Stage)				\$2,987.00
Set up Crusher				\$3,024.00
Move in and set up Drill and Compressor				\$726.67
Move in Excavator				\$1,134.46
Move in Loader				\$981.57
Clean Up Pit				\$300.00
Gradation Tests (\$65/2000 cy)	<u>\$65.00</u>	<u>cy/2000cy x</u>	<u>3</u> tests	\$195.00
Change Gradation				\$210.00
		Subtotal		\$10,558.70

ROCK DEVELOPMENT COST = \$8.37/cy

TOTAL PRODUCTION COST \$49,617.84

CRUISE REPORT
Williwaw
341-14-03

1. LOCATION:

Portions of Sections 3, 4, 9, and 10, T1S, R6W, W.M., Washington County, Oregon.

2. SAMPLING METHOD:

The sale area was inventoried in 2005 and 2009 with 50 variable radius plots using 40 BAF prisms, producing a total sample size of 308 measured trees. Plots were spaced at both three chain and five chain intervals on 5 cruise lines through the sample area. The inventory data was exported to SuperAce 2004 and grown forward to August of 2013.

3. CRUISE RESULTS

The inventory cruise produced a cumulative sampling error on the 'Take' tree basal area of 9.9% and 10.1% on the Board Foot Volume at a 68% confidence level.

4. TREE MEASUREMENT AND GRADING:

All sample trees were measured and graded. Columbia River Log Scale grade rules were used favoring 40 foot segments.

a) **Height Standards:**

Total tree heights were measured to the nearest foot. Bole heights were calculated to a six inch top.

b) **Diameter Standards:** Diameters were measured outside bark at breast height to the nearest inch.

c) **Form Factors** were estimated to be 88% for each grade tree using a form point of 16 feet..

5. DATA PROCESSING

a) **Volumes and Statistics,** Cruise and grown forward volume estimates, and sampling statistics, were derived from Super Ace 2008 cruise software.

b) **Deductions:** Two percent of the volume was subtracted from the computed volumes to account for hidden defect and breakage.

c) **Right of Way:** The volume for the new construction and road improvement rights of way was derived from the average per acre volume by species and grade, multiplied by the right of way acres within the stand.

6. CRUISERS: The sale was cruised by SLI cruisers.

Prepared by:	<u>Joe Koch</u>	<u>8/16/2013</u>
	ODF Forester	Date

Reviewed by:	<u>Eric Foucht</u>	<u>8/16/2013</u>
		Date

TC		PSTNDSUM		Stand Table Summary										Page		1	
														Date:		8/16/2013	
T01_R06_S3 Ty8590267.00				Project				WILLIWAW				Time:		9:57:46AM			
				Acres				267.00				Grown Year:					
S SpC	T	Tot			Trees/ Acre	BA/ Acre	Logs Acre	Average Log		Net		Tons/ Acre	Cu.Ft. Acre	Bd.Ft. Acre	T o t a l s		
		DBH	Sample Trees	FF 16'				Av Ht	Net Cu.Ft.	Net Bd.Ft.	Tons				Cunits	MBF	
DF L		8	1	87	73	2.181	.80	2.18	5.6	30.0	.35	12	65	92	32	17	
DF L		9	1	87	73	2.030	.80	2.03	7.6	30.0	.44	16	61	118	41	16	
DF L		10	3	88	83	4.713	2.40	4.71	12.8	60.0	1.71	60	283	458	161	76	
DF L		11	2	87	85	2.363	1.60	4.73	9.2	40.0	1.24	44	189	332	117	50	
DF L		12	1	88	92	.985	.80	1.97	11.1	45.0	.62	22	89	167	59	24	
DF L		13	7	88	96	6.154	5.60	12.31	14.7	59.8	5.15	181	736	1,375	482	196	
DF L		14	13	87	112	9.849	10.40	19.70	19.3	86.5	10.85	381	1,704	2,898	1,017	455	
DF L		15	5	87	106	3.353	4.00	6.71	21.5	92.8	4.11	144	622	1,096	385	166	
DF L		16	6	88	99	3.492	4.80	6.98	23.4	98.4	4.65	163	687	1,242	436	183	
DF L		17	13	87	105	6.691	10.40	13.38	28.5	119.6	10.87	381	1,601	2,902	1,018	427	
DF L		18	9	88	113	4.093	7.20	11.80	23.8	97.0	8.01	281	1,145	2,138	750	306	
DF L		19	11	88	115	4.481	8.80	13.05	27.5	113.5	10.21	358	1,482	2,727	957	396	
DF L		20	9	88	108	3.269	7.20	9.81	27.7	108.2	7.75	272	1,061	2,069	726	283	
DF L		21	9	87	115	3.001	7.20	9.00	32.4	137.9	8.32	292	1,242	2,220	779	332	
DF L		22	11	87	117	3.354	8.80	10.06	36.8	163.7	10.55	370	1,647	2,818	989	440	
DF L		23	7	88	112	1.932	5.60	5.53	40.8	175.6	6.42	225	971	1,715	602	259	
DF L		24	10	87	131	2.558	8.00	7.67	48.4	218.4	10.59	371	1,676	2,826	992	448	
DF L		25	12	87	114	2.828	9.60	8.48	46.7	205.4	11.29	396	1,743	3,014	1,058	465	
DF L		26	11	88	117	2.409	8.80	7.23	51.9	230.7	10.69	375	1,667	2,855	1,002	445	
DF L		27	3	88	125	.599	2.40	1.80	60.3	274.1	3.09	108	493	825	289	132	
DF L		28	5	88	119	.957	4.00	2.87	60.3	272.7	4.94	173	783	1,318	463	209	
DF L		29	3	88	122	.515	2.40	1.54	68.1	323.3	3.00	105	500	800	281	133	
DF L		30	1	88	114	.159	.80	.48	70.2	340.0	.95	33	162	254	89	43	
DF L		31	2	87	123	.305	1.60	.92	77.3	363.3	2.02	71	333	538	189	89	
DF L		32	1	88	119	.142	.80	.43	80.4	370.0	.98	34	158	261	92	42	
DF L		33	2	87	120	.270	1.60	.81	86.0	406.6	1.99	70	330	530	186	88	
DF L		Totals	158	87	106	72.687	126.40	166.19	29.7	128.9	140.79	4,940	21,428	37,590	13,190	5,721	
DF T		8	8	87	73	18.002	6.40	18.00	5.6	25.9	2.87	101	467	766	269	125	
DF T		9	8	88	82	14.701	6.40	14.70	9.3	49.2	3.91	137	724	1,044	366	193	
DF T		10	7	87	81	10.386	5.60	11.74	11.7	53.1	3.92	137	623	1,045	367	166	
DF T		11	12	87	85	14.710	9.60	26.86	9.3	38.2	7.11	249	1,025	1,898	666	274	
DF T		12	12	87	91	12.276	9.60	24.55	11.6	46.9	8.09	284	1,151	2,161	758	307	
DF T		13	10	88	93	8.804	8.00	17.61	14.2	55.9	7.15	251	985	1,909	670	263	
DF T		14	7	88	106	5.253	5.60	10.51	18.7	82.8	5.60	196	870	1,495	525	232	
DF T		15	16	87	103	10.474	12.80	21.63	21.2	93.7	13.08	459	2,026	3,492	1,225	541	
DF T		16	10	87	103	5.894	8.00	12.38	22.9	96.5	8.10	284	1,195	2,162	758	319	
DF T		17	7	87	105	3.568	5.60	7.14	29.1	120.0	5.92	208	856	1,581	555	229	
DF T		18	8	87	113	3.634	6.40	10.42	23.8	97.5	7.08	248	1,016	1,891	663	271	
DF T		19	3	88	115	1.207	2.40	3.62	27.2	112.3	2.80	98	407	748	263	109	
DF T		20	2	88	107	.715	1.60	2.15	27.1	106.7	1.66	58	229	443	156	61	
DF T		22	4	88	115	1.218	3.20	3.66	36.3	161.7	3.79	133	591	1,011	355	158	
DF T		23	2	88	113	.543	1.60	1.63	40.9	175.0	1.90	67	285	507	178	76	
DF T		24	1	88	113	.266	.80	.80	42.1	176.7	.96	34	141	255	90	38	
DF T		26	2	88	118	.429	1.60	1.29	53.1	246.6	1.95	68	317	520	183	85	
DF T		Totals	119	87	90	112.079	95.20	188.67	16.0	68.4	85.88	3,013	12,908	22,930	8,046	3,446	
WH T		10	1	87	97	1.467	.80	2.93	9.1	40.0	.86	27	117	228	71	31	
WH T		14	1	87	89	.793	.80	1.59	16.8	70.0	.85	27	111	228	71	30	
WH T		15	2	87	84	1.270	1.60	2.54	19.9	70.0	1.62	50	178	431	135	47	
WH T		16	1	87	87	.580	.80	1.16	22.2	90.0	.82	26	104	220	69	28	
WH T		17	1	88	90	.484	.80	.97	27.9	110.0	.87	27	107	231	72	28	
WH T		18	3	87	87	1.359	2.40	2.72	29.7	114.9	2.58	81	312	689	215	83	
WH T		19	1	87	102	.411	.80	.82	40.1	150.0	1.05	33	123	281	88	33	

TC		PSTNDSUM										Stand Table Summary										Page		2	
																						Date:		8/16/2013	
T01_ R06_ S3 Ty8590					267.00					Project					WILLIWAW					Time:		9:57:46AM			
										Acres					267.00					Grown Year:					
S	T	DBH	Sample Trees	Tot FF 16'	Av Ht	Trees/ Acre	BA/ Acre	Logs Acre	Average Log		Tons/ Acre	Net Cu.Ft. Acre	Net Bd.Ft. Acre	T o t a l s											
									Net Cu.Ft.	Net Bd.Ft.				Tons	Cunits	MBF									
WH	T	20	1	88	108	.363	.80	1.09	31.0	130.0	1.08	34	142	289	90	38									
WH	T	21	1	87	99	.349	.80	.70	45.2	175.0	1.01	32	122	269	84	33									
WH	T	22	1	87	101	.309	.80	.93	33.8	146.7	1.00	31	136	268	84	36									
WH	T	Totals	13	87	92	7.385	10.40	15.44	23.8	94.0	11.74	367	1,452	3,134	979	388									
RA	L	10	2	88	69	2.823	1.60	4.18	9.5	40.5	1.10	40	169	293	106	45									
RA	L	12	1	87	82	1.002	.80	2.00	11.9	40.0	.66	24	80	175	64	21									
RA	L	13	2	87	83	1.736	1.60	3.47	14.9	55.0	1.42	52	191	380	138	51									
RA	L	14	1	87	88	.770	.80	1.54	17.1	75.0	.73	26	116	194	71	31									
RA	L	15	1	87	85	.652	.80	1.30	21.8	90.0	.78	28	117	209	76	31									
RA	L	16	1	88	92	.566	.80	1.13	26.6	105.0	.83	30	119	221	80	32									
RA	L	Totals	8	87	79	7.549	6.40	13.63	14.7	58.1	5.51	200	792	1,471	535	212									
WH	L	15	1	88	84	.618	.80	1.24	21.8	90.0	.86	27	111	230	72	30									
WH	L	19	2	88	104	.830	1.60	1.66	39.1	150.0	2.08	65	249	554	173	67									
WH	L	20	1	88	108	.363	.80	1.09	31.0	130.0	1.08	34	142	289	90	38									
WH	L	21	1	88	99	.342	.80	.68	45.2	175.0	.99	31	120	264	83	32									
WH	L	Totals	5	88	98	2.154	4.00	4.67	33.5	133.1	5.01	157	622	1,337	418	166									
BM	L	9	1	87	62	1.696	.80	1.70	10.2	50.0	.46	17	85	123	46	23									
BM	L	12	1	87	75	1.019	.80	2.04	11.8	45.0	.64	24	92	171	64	24									
BM	L	13	1	88	75	.939	.80	1.88	12.4	45.0	.62	23	84	165	62	23									
BM	L	14	1	88	87	.717	.80	1.43	18.6	75.0	.71	27	108	189	71	29									
BM	L	Totals	4	87	72	4.370	3.20	7.05	13.0	52.3	2.42	91	369	647	244	98									
Totals			307	87	95	206.224	245.60	395.64	22.2	95.0	251.35	8,768	37,571	67,110	23,412	10,031									

TC		PSPCSTGR		Species, Sort Grade - Board Foot Volumes (Project)																		
T01_ R06_ S3 Ty8590267.00				Project: WILLIWAW														Page 1				
				Acres 267.00														Date 8/16/2013				
																		Time 9:57:46AM				
S So Gr Spp T rt ad			%	Bd. Ft. per Acre			Total Net MBF	Percent of Net Board Foot Volume								Average Log				Logs Per /Acre		
			Net BdFt					Def%	Gross	Net	Log Scale Dia.				Log Length				Ln Ft		Dia In	Bd Ft
			4-5	6-11	12-16	17+					12-20	21-30	31-35	36-99								
DF	L	2M	49	10,549	10,549	2,817			51	49					100	40	15	378	1.99	27.9		
DF	L	3M	46	9,890	9,890	2,641			85	15			1	14	85	38	8	106	0.70	93.3		
DF	L	4M	5	989	989	264			100				49	35	12	5	18	6	22	0.33	45.0	
DF Totals			57	21,428	21,428	5,721			44	32	24		2	2	7	89	33	9	129	0.91	166.2	
DF	T	2M	10	1,351	1,351	361			83	17					100	40	15	341	1.81	4.0		
DF	T	3M	78	10,021	10,021	2,676			92	8			1	16	82	37	8	89	0.56	112.9		
DF	T	4M	12	1,536	1,536	410			100				50	40	5	6	19	6	21	0.27	71.8	
DF Totals			34	.0	12,908	12,908	3,446			84	15	2		6	6	13	75	30	7	68	0.53	188.7
WH	T	2M	28	416	416	111			100						100	40	14	291	1.61	1.4		
WH	T	3M	63	910	910	243			80	20			2	6	91	38	9	116	0.78	7.8		
WH	T	4M	9	126	126	34			100				57	43		18	6	20	0.35	6.2		
WH Totals			4	1,452	1,452	388			59	41			5	5	4	86	30	8	94	0.78	15.4	
WH	L	2M	48	302	302	81			100						100	40	14	272	1.56	1.1		
WH	L	3M	48	298	298	79			66	34				11	89	39	9	115	0.81	2.6		
WH	L	4M	4	22	22	6			100				16	84		18	6	23	0.36	1.0		
WH Totals			2	622	622	166			35	65			1	3	5	91	35	9	133	0.96	4.7	
RA	L	3M	85	674	674	180			100					10	90	37	8	89	0.60	7.5		
RA	L	4M	15	118	118	31			100				49	51		17	6	19	0.31	6.1		
RA Totals			2	792	792	212			100				7	16		77	28	7	58	0.52	13.6	
BM	L	3M	88	327	327	87			100					26	74	36	7	75	0.52	4.4		
BM	L	4M	12	41	41	11			100				48	52		15	6	15	0.29	2.7		
BM Totals			1	369	369	98			100				5	6	23	66	28	7	52	0.47	7.0	
Totals				0.0	37,571	37,571	10,031			60	26	14		4	4	9	83	31	8	95	0.71	395.6

TC		PLOGSTVB		Log Stock Table - MBF																	
T01_ R06_ S3 Ty8590267.00				Project:		WILLIWAW										Page		1			
				Acres		267.00										Date		8/16/2013			
																Time		9:57:47AM			
Spp	S T	So Gr rt de	Log Len	Gross MBF	Def %	Net MBF	% Spc	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+		
DF	L	2M	40	2,817		2,817	49.2					523	705	1301	287						
DF	L	3M	30	28		28	.5			28											
DF	L	3M	32	338		338	5.9			174	139	15	10								
DF	L	3M	34	18		18	.3			10	9										
DF	L	3M	35	10		10	.2			10											
DF	L	3M	36	110		110	1.9			67	43										
DF	L	3M	38	155		155	2.7			104	26	25									
DF	L	3M	40	1,982		1,982	34.6			120	744	734	384								
DF	L	4M	12	38		38	.7			38											
DF	L	4M	14	32		32	.6			32											
DF	L	4M	16	41		41	.7			40	1										
DF	L	4M	18	6		6	.1			6											
DF	L	4M	20	12		12	.2			12											
DF	L	4M	22	32		32	.6			32											
DF	L	4M	24	35		35	.6			35											
DF	L	4M	26	1		1	.0			1											
DF	L	4M	28	23		23	.4			23											
DF	L	4M	32	31		31	.5			14	17										
DF	L	4M	40	12		12	.2			12											
DF		Totals		5,721		5,721	57.0			729	1007	774	908	715	1301	287					
DF	T	2M	40	361		361	10.5					97	117	147							
DF	T	3M	30	36		36	1.0			36											
DF	T	3M	32	314		314	9.1			221	82	11									
DF	T	3M	34	127		127	3.7			127											
DF	T	3M	36	161		161	4.7			136	25										
DF	T	3M	38	208		208	6.0			200	8										
DF	T	3M	40	1,830		1,830	53.1			291	562	782	195								
DF	T	4M	12	55		55	1.6			55											
DF	T	4M	14	26		26	.8			26											
DF	T	4M	16	62		62	1.8			62											
DF	T	4M	18	36		36	1.0			36											
DF	T	4M	20	26		26	.7			26											
DF	T	4M	22	13		13	.4			13											
DF	T	4M	24	66		66	1.9			66											
DF	T	4M	26	67		67	1.9			67											
DF	T	4M	28	16		16	.5			16											

TC		PLOGSTVB		Log Stock Table - MBF																	
T01_ R06_ S3 Ty8590				267.00		Project:		WILLIWAW										Page		2	
						Acres		267.00										Date		8/16/2013	
																		Time		9:57:47AM	
S T	So Gr rt de	Log Len	Gross MBF	Def %	Net MBF	% Spc	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+			
DF	T	4M 32	19		19	.5			19												
DF	T	4M 40	24		24	.7			24												
DF		Totals	3,446		3,446	34.4			1421	677	782	302	117	147							
WH	T	2M 40	111		111	28.7					26	85									
WH	T	3M 30	6		6	1.5			6												
WH	T	3M 32	15		15	3.8			6	9											
WH	T	3M 38	27		27	7.1			27												
WH	T	3M 40	195		195	50.3			12	66	69	48									
WH	T	4M 12	6		6	1.5			6												
WH	T	4M 16	2		2	.6			2												
WH	T	4M 20	11		11	2.8			11												
WH	T	4M 24	14		14	3.7			14												
WH		Totals	388		388	3.9			79	81	69	74	85								
WH	L	2M 40	81		81	48.6					26	55									
WH	L	3M 32	9		9	5.3			9												
WH	L	3M 40	71		71	42.6			19		25	27									
WH	L	4M 12	1		1	.6			1												
WH	L	4M 22	5		5	3.0			5												
WH		Totals	166		166	1.7			25	9	25	53	55								
RA	L	3M 28	18		18	8.6			18												
RA	L	3M 38	23		23	11.1			23												
RA	L	3M 40	138		138	65.4			19	66	53										
RA	L	4M 12	6		6	3.0			6												
RA	L	4M 16	9		9	4.4			9												
RA	L	4M 22	11		11	5.4			11												
RA	L	4M 28	5		5	2.1			5												
RA		Totals	212		212	2.1			92	66	53										
BM	L	3M 32	23		23	23.0			23												
BM	L	3M 36	22		22	22.1			22												
BM	L	3M 38	20		20	20.4			20												
BM	L	3M 40	23		23	23.4			23												
BM	L	4M 12	5		5	5.3			5												
BM	L	4M 22	6		6	5.8			6												

TC		PLOGSTVB		Log Stock Table - MBF															
T01_ R06_ S3 Ty8590267.00				Project: WILLIWAW										Page 3					
				Acres 267.00										Date 8/16/2013					
														Time 9:57:47AM					
Spp	S T	So Gr rt de	Log Len	Gross MBF	Def %	Net MBF	% Spc	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+
BM		Totals		98		98	1.0			34	65								
Total		All Species		10,031		10,031	100.0			2380	1905	1703	1337	972	1448	287			

TC PSTATS			PROJECT STATISTICS							PAGE	1
			PROJECT		WILLIWAW					DATE	8/16/2013
TWP	RGE	SC	TRACT	TYPE		ACRES	PLOTS	TREES	CuFt	BdFt	
01_	06_	3	0	8590		267.00	50	307	S	W	
					TREES	ESTIMATED	PERCENT				
			PLOTS	TREES	PER PLOT	TREES	SAMPLE				
							TREES				
TOTAL			50	307	6.1						
CRUISE			50	307	6.1	55,062	.6				
DBH COUNT											
REFOREST											
COUNT											
BLANKS											
100 %											
STAND SUMMARY											
			SAMPLE	TREES	AVG	BOLE	REL	BASAL	GROSS	NET	GROSS
			TREES	/ACRE	DBH	LEN	DEN	AREA	BF/AC	BF/AC	CF/AC
DOUG FIR-L			158	72.7	17.9	106	29.9	126.4	21,428	21,428	4,940
DOUG FIR-T			119	112.1	12.5	90	26.9	95.2	12,908	12,908	3,013
WHEMLOCK-L			5	2.2	18.5	98	0.9	4.0	622	622	157
WHEMLOCK-T			13	7.4	16.1	92	2.6	10.4	1,452	1,452	367
R ALDER-L			8	7.5	12.5	79	1.8	6.4	792	792	200
BL MAPLE-L			4	4.4	11.6	72	0.9	3.2	369	369	91
TOTAL			307	206.2	14.8	95	63.9	245.6	37,571	37,571	8,768
CONFIDENCE LIMITS OF THE SAMPLE											
68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR											
CL	68.1	COEFF	SAMPLE TREES - BF					# OF TREES REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5 10		15		
DOUG FIR-L			61.5	4.9	411	433	454				
DOUG FIR-T			79.3	7.3	163	176	189				
WHEMLOCK-L			26.0	12.9	265	304	343				
WHEMLOCK-T			45.6	13.2	205	236	267				
R ALDER-L			46.3	17.5	99	120	141				
BL MAPLE-L			43.4	24.8	71	95	119				
TOTAL			79.6	4.5	296	310	324	253	63	28	
CL	68.1	COEFF	SAMPLE TREES - CF					# OF TREES REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5 10		15		
DOUG FIR-L			57.3	4.6	94	98	103				
DOUG FIR-T			77.3	7.1	38	41	44				
WHEMLOCK-L			25.8	12.8	67	77	86				
WHEMLOCK-T			42.6	12.3	52	60	67				
R ALDER-L			44.6	16.8	25	30	35				
BL MAPLE-L			46.0	26.3	18	24	30				
TOTAL			74.9	4.3	69	72	75	224	56	25	
CL	68.1	COEFF	TREES/ACRE					# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5 10		15		
DOUG FIR-L			63.3	8.9	66	73	79				
DOUG FIR-T			83.9	11.8	99	112	125				
WHEMLOCK-L			311.7	44.0	1	2	3				
WHEMLOCK-T			274.6	38.8	5	7	10				
R ALDER-L			350.7	49.6	4	8	11				
BL MAPLE-L			707.1	99.9	0	4	9				
TOTAL			54.6	7.7	190	206	222	119	30	13	
CL	68.1	COEFF	BASAL AREA/ACRE					# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5 10		15		
DOUG FIR-L			27.4	3.9	122	126	131				
DOUG FIR-T			68.4	9.7	86	95	104				
WHEMLOCK-L			303.0	42.8	2	4	6				
WHEMLOCK-T			255.5	36.1	7	10	14				

TC PSTATS				PROJECT STATISTICS					PAGE	2	
				PROJECT WILLIWAW					DATE	8/16/2013	
TWP	RGE	SC	TRACT	TYPE	ACRES			PLOTS	TREES	CuFt	BdFt
01_	06_	3	0	8590	267.00			50	307	S	W
CL	68.1		COEFF	BASAL AREA/ACRE					# OF PLOTS REQ.		INF. POP.
SD:	1.00		VAR.	S.E.%	LOW	AVG	HIGH		5	10	15
R ALDER-L			365.1	51.6	3	6	10				
BL MAPLE-L			707.1	99.9	0	3	6				
TOTAL			33.9	4.8	234	246	257	46	11	5	
CL	68.1		COEFF	NET BF/ACRE					# OF PLOTS REQ.		INF. POP.
SD:	1.0		VAR.%	S.E.%	LOW	AVG	HIGH		5	10	15
DOUG FIR-L			30.8	4.3	20,497	21,428	22,359				
DOUG FIR-T			70.8	10.0	11,616	12,908	14,200				
WHEMLOCK-L			304.1	43.0	355	622	889				
WHEMLOCK-T			250.5	35.4	938	1,452	1,966				
R ALDER-L			372.5	52.6	375	792	1,209				
BL MAPLE-L			707.1	99.9	0	369	737				
TOTAL			36.5	5.2	35,631	37,571	39,511	53	13	6	
CL	68.1		COEFF	NET CUFT FT/ACRE					# OF PLOTS REQ.		INF. POP.
SD:	1.0		VAR.%	S.E.%	LOW	AVG	HIGH		5	10	15
DOUG FIR-L			29.7	4.2	4,733	4,940	5,147				
DOUG FIR-T			70.3	9.9	2,714	3,013	3,313				
WHEMLOCK-L			304.0	43.0	89	157	224				
WHEMLOCK-T			249.2	35.2	238	367	496				
R ALDER-L			374.9	53.0	94	200	306				
BL MAPLE-L			707.1	99.9	0	91	183				
TOTAL			36.0	5.1	8,323	8,768	9,214	52	13	6	

VOLUME SUMMARY

(Shown in MBF)

Williwaw**341-14-03****August 2013****AREA 1: PC-M (267 ACRES)**

SPECIES		2 SAW	3 SAW	4 SAW	TOTAL
Douglas-fir	Cruise Volume	361	2,676	410	3,447
	Hidden D&B (2%)	(7)	(54)	(8)	(69)
	NET TOTAL	354	2,622	402	3,378
	% of Total	10	78	12	

SPECIES		2 SAW	3 SAW	4 SAW	TOTAL
Western hemlock	Cruise Volume	111	243	34	388
	Hidden D&B (2%)	(2)	(5)	(1)	(8)
	NET TOTAL	109	238	33	380
	% of Total	29	63	9	

AREA 2: RW (10 ACRES)

SPECIES		2 SAW	3 SAW	4 SAW	TOTAL
Douglas-fir	Cruise Volume	119	200	30	349
	Hidden D&B (2%)	(2)	(4)	(1)	(7)
	NET TOTAL	117	196	29	342
	% of Total	34	57	8	

SPECIES		2 SAW	3 SAW	4 SAW	TOTAL
Western hemlock	Cruise Volume	7	12	1	20
	Hidden D&B (2%)	()	()	()	()
	NET TOTAL	7	12	1	20
	% of Total	35	60	5	

SPECIES		Camp Run	TOTAL
Red Alder and Other Hardwoods	Cruise Volume	11	11
	Hidden D&B (2%)	()	()
	NET TOTAL	11	11
	% of Total	100	

SALE TOTAL

SPECIES	Camp Run	2 SAW	3 SAW	4 SAW	TOTAL
Douglas-fir	0	471	2,818	431	3,720
Western hemlock	0	116	250	34	400
Red Alder	11	0	0	0	11

RESIDUAL STAND SPECIFICATIONS

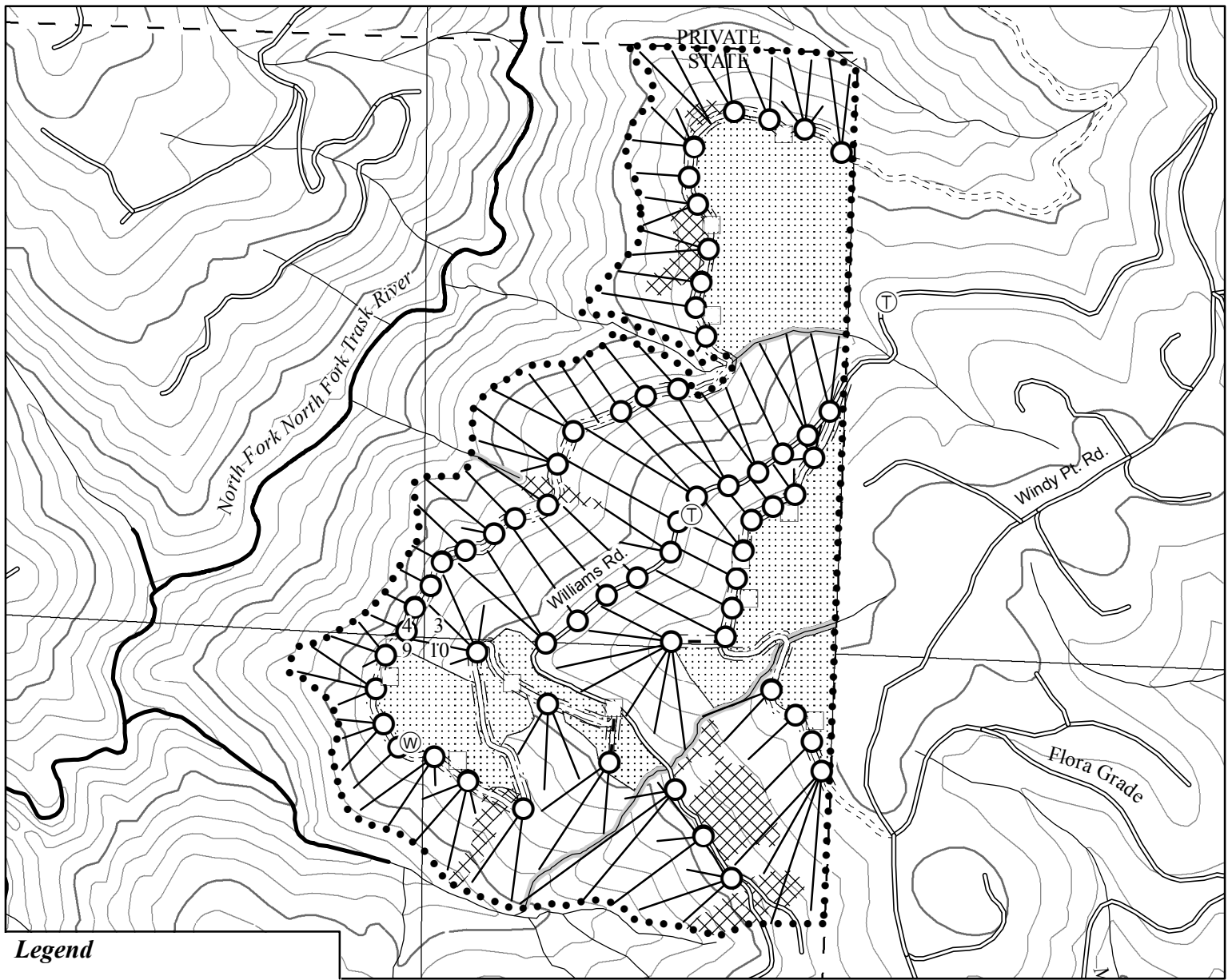
SALE NAME: Williwaw
SALE NUMBER: 341-14-03

AREA 1

Residual QMD assumption (from leave tree cruise information) = 18
Target Relative Density = 31

	Minimum	Target	Maximum
Relative Density	28	31	33
Basal Area	120	130	140
Trees per Acre	68	74	79

$RD = BA / \sqrt{DBH}$
 $BA = \sqrt{DBH} (RD)$
 $TPA = (BA/acre) / (BA/tree)$
 $BA / tree = (\pi r^2) / (144)$



Legend

- Timber Sale Boundary
- Surfacd Roads
- ==== Unsurfaced Road
- ==== Road Improvement
- - - New Construction
- - - Posted Right of Way Boundary
- Type F Stream
- Type N Stream
- Stream Buffer
- Tractor Landing
- Cable Landing
- ▼ Cable Yarding Area
- ▨ Tractor Yarding Area
- ▩ Thinning Optional Area
- Section Lines
- ┌ ─ ─ ─ ┐ ODF Ownership Boundary
- 400 Foot Contour Band
- 80 Foot Contour Band
- Ⓢ Waste Area
- Ⓣ Truck Turnaround

LOGGING PLAN

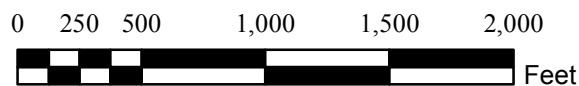
FOR TIMBER SALE CONTRACT # 341-14-03
 WILLIWAW
 PORTIONS OF SECTIONS 3, 4, 9, & 10, T1S, R6W, W.M.
 WASHINGTON COUNTY, OREGON

Forest Grove District GIS
 August 2013

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



1:12,000
 1 inch = 1,000 feet



APPROXIMATE NET ACRES

	TRACTOR	CABLE
AREA 1	73	194
AREA 2 (R/W)	10	0
TOTAL	83	194