



# Timber Sale Appraisal Cost Summary Larkin Sale 341-07-38

"STEWARDSHIP IN FORESTRY"

District: Astoria

Date: 10/12/06

	Conifer	Hardwood	Total
<b>Gross Timber Sale Value</b>	\$1,578,621.40	\$17,417.90	\$1,596,039.30
		<b>Project Work</b>	(\$55,233.00)
		<b>Advertised Value</b>	\$1,540,806.30



# Timber Sale Appraisal

## Timber Description

### Larkin

### Sale 341-07-38

"STEWARDSHIP IN FORESTRY"

**District:** Astoria

**Location:** Portions of Sections 19 and 30, T8N, R6W, and Sections 24 and 25, T8N, R7W, W.M., Clatsop County, Oregon.

**Date:** 10/12/06

**Stand Stocking:** 80%

Species	Avg. DBH	Amortized%	Recovery%
Douglas - Fir	30	0	97
Western Hemlock / Fir	22	0	97
Sitka Spruce	24	0	97
Alder (Red)	17	0	100

Volume by Grade	Douglas - Fir	Western Hemlock / Fir	Sitka Spruce	Alder (Red)	Total
<b>SM</b>	68	0	0	0	68
<b>2S</b>	3,244	1,292	32	0	4,568
<b>3S</b>	267	396	0	0	663
<b>4S</b>	27	42	3	0	72
<b>Camprun</b>	0	0	0	46	46
<b>Total</b>	3,606	1,730	35	46	5,417

**Comments:** Pond Values Used: 3rd Quarter Calendar Year 2006.

Log Markets: Mist, Clatskanie, St. Helens, Forest Grove, Rainier.  
Additional Costs for Areas 2 & 3.

Western Red Cedar Stumpage Price = Pond Value minus Logging Cost  
 $\$780/\text{MBF} = \$1,000/\text{MBF} - \$220/\text{MBF}$

**HAULING**

Hauling costs adjusted to make equivalent to \$700 daily truck cost.

$\$700 - \% \text{ Profit \& Risk } (\$700 / 1.14) = \$614 \text{ Daily Truck Cost.}$

Hauling Cost Calculation:

$\$614 \text{ Daily Truck Cost} / (3 \text{ trips per day} \times 4.5 \text{ MBF per load}) = \$45.48/\text{MBF Hauling Cost.}$

**OTHER COSTS (Profit & Risk to be added):**

100% Brand and Paint:  $\$1.00/\text{MBF} \times 5,417 \text{ MBF} = \$5,417$

Line Pulling Area 3:  $10\text{hrs} \times \$25/\text{hr} = \$250$

**TOTAL OTHER COSTS (Profit & Risk to be added) = \$5,667**

**OTHER COSTS (P&R included):**

Snag Creation: Create 45 Snags in Area 1, 2, & 3.  $\$45/\text{Snag} \times 45 \text{ snags} = \$2,025$

Slash Piling in Areas 2 and 3:  $103 \times \$120/\text{hr} = \$12,360$

Move in Excavator for Slash Piling = \$945

**TOTAL OTHER COSTS (P&R included) = \$15,330**



# Timber Sale Appraisal

## Logging Conditions

### Larkin

### Sale 341-07-38

"STEWARDSHIP IN FORESTRY"

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<b>Combination#:</b> 1	Douglas - Fir	100.00%	
	Western Hemlock / Fir	100.00%	
	Sitka Spruce	100.00%	
	Alder (Red)	100.00%	
<b>Yarding Distance:</b>	Short (400 ft)		<b>Downhill Yarding:</b> Yes
<b>Logging System:</b>	Track Skidder		<b>Process:</b> Manual Felling/Delimiting
<b>Tree Size:</b>	Mature / Regen Cut (900 Bft/tree), 3-5 logs/MBF		
<b>Loads/Day:</b>	6		<b>Bd. Ft./Load:</b> 4,000
<b>Cost/MBF:</b>	\$136.06		
<b>Machines:</b>			
	Log Loader (B)		
	Track Skidder		



# Timber Sale Appraisal

## Logging Costs

### Larkin

## Sale 341-07-38

"STEWARDSHIP IN FORESTRY"

Date: 10/12/06

Operating Seasons: 2.0

Profit & Risk: 14%

Project Costs: \$55,233

Other Costs (P/R): \$5,667

Slash Disposal: \$0

Other Costs: \$15,330

Miles of Road			
Dirt	Rock (Contractor)	Rock (State)	Paved
0.0	0.0	0.0	0.0

Road Maintenance: \$1.95

#### Hauling Costs

Species	\$/MBF	Trips/Day	MBF/Load
Douglas - Fir	\$45.48	3.0	4.5
Western Hemlock / Fir	\$45.48	3.0	4.5
Sitka Spruce	\$45.48	3.0	3.5
Alder (Red)	\$45.48	2.0	3.0



# Timber Sale Appraisal Logging Costs Breakdown Larkin Sale 341-07-38

"STEWARDSHIP IN FORESTRY"

Costs	Douglas - Fir	Westem Hemlock / Fir	Sitka Spruce	Alder (Red)
<b>Logging</b>	136.06	136.06	136.06	136.06
<b>Road Maintenance</b>	2.01	2.01	2.01	1.95
<b>Fire Protection</b>	1.00	1.00	1.00	1.00
<b>Hauling</b>	46.89	46.89	46.89	45.48
<b>Other (P/R appl.)</b>	1.05	1.05	1.05	1.05
<b>Profit &amp; Risk</b>	26.18	26.18	26.18	25.98
<b>Slash Disposal</b>	0.00	0.00	0.00	0.00
<b>Scaling</b>	2.00	2.00	2.00	2.00
<b>Other</b>	2.83	2.83	2.83	2.83
<b>Total</b>	218.02	218.02	218.02	216.35

<b>Amortization</b>	0.00	0.00	0.00	0.00
<b>Pond Value</b>	575.72	380.72	426.14	595.00
<b>Stumpage</b>	357.70	162.70	208.12	378.65
<b>Amortized</b>	0.00	0.00	0.00	0.00



# Timber Sale Appraisal Summary Larkin Sale 341-07-38

"STEWARDSHIP IN FORESTRY"

**Amortized**

	Douglas - Fir	Western Hemlock / Fir	Sitka Spruce	Alder (Red)
<b>MBF</b>	0.00	0.00	0.00	0.00
<b>Value</b>	0.00	0.00	0.00	0.00
<b>Total</b>	0.00	0.00	0.00	0.00

**Unamortized**

	Douglas - Fir	Western Hemlock / Fir	Sitka Spruce	Alder (Red)
<b>MBF</b>	3,606.00	1,730.00	35.00	46.00
<b>Value</b>	357.70	162.70	208.12	378.65
<b>Total</b>	1,289,866.20	281,471.00	7,284.20	17,417.90

**Gross Timber Sale Value**

**Recovery \$1,596,039.30**

Prepared by: Bryce Rodgers

Date: 10/12/06

District: Astoria

Phone: (503) 325-5451

**Road Maintenance Cost Summary (Interim and Post Harvest)**

**Sale:** Larkin  
**Date:** July 19, 2006  
**By:** Bryce Rodgers

**MBF:** 5,417  
**\$\$/MBF:** \$1.95

Type	Equipment/Rationale	Move-in Rate	Times	Hours	Rate	Cost
Interim Operations Entries (1) Larkin	Grader 14G	\$570	1	10	\$80	\$1,370
Final Road Maintenance Haul Route	Grader 14G	\$570	1	30	\$84	\$3,090
	Dump Truck 12CY (2 @ \$119)	\$119	2	10	\$59	\$828
	FE Loader C966	\$570	1	10	\$79	\$1,360
	Vibratory Roller	\$570	1	30	\$79	\$2,940
	Vibratory Roller (extra Move)*	\$157	1			\$157
	Water Truck 2,500 gallon Labor	\$139	1	8	\$70	\$699
				8	\$18	\$144
<b>Total</b>						<b>\$10,588</b>

\* Move from Nicolai to Larkingreen - One Hour with roller and Dump Truck.

**Interim Operations Road Maintenance**

Production Rates	Miles/day	Distance(miles)	Days	Hours
Grader	1.5	1.5	1.0	10.0

**Final Road Maintenance**

Production Rates	Miles/day	Distance(miles)	Days	Hours
Grader	1.5	4.3	3.0	30.0
Vibratory Roller	1.5	4.3	3.0	30.0



**SUMMARY OF ALL PROJECT COSTS**

SALE NAME: Larkin

**NEW CONSTRUCTION:**

	<u>Road segment</u>	<u>Length/Sta</u>	<u>Cost</u>
Project No. 1	Pt. A to Pt. B	8.00	\$9,039
<b>TOTALS</b>	0.15 miles	8.00 Stations	\$9,039

**ROAD IMPROVEMENT:**

	<u>Road segment</u>	<u>Length/Sta</u>	<u>Cost</u>
Project No. 2	I1 to I2, I3 to I4, I5 to I6	138.70	\$28,704
<b>TOTALS</b>	2.63 miles	138.70 Stations	\$28,708

**Vacating**

	<u>Description</u>	<u>Cost</u>
Project No. 3	V1 to V2, V3 to V4, Pt. V5	\$5,511
	Project Road Maintenance	\$5,357
<b>TOTALS</b>	0.23 miles	\$10,868

**MOVE IN:**

	<u>Equipment</u>	<u>Cost</u>
	D-8 Dozer	\$1,030
	10cy Dump Trucks (6 @ \$119 each)	\$714
	Front End Loader - Medium (966)	\$945
	Grader (14G)	\$570
	Vibratory Roller	\$570
	Water Truck (2,500 gal.)	\$139
	Excavator - Small (315)	\$590
	Excavator (C330) x2 \$1,030 ea	\$2,060
<b>TOTAL</b>		\$6,618

**GRAND TOTAL** \$55,233

Compiled By: Bryce Rodgers Date: 07/18/2006



SURFACING		Stations/ amount	x	Rate/ sta/amt	Cost
Subgrade prep:	Description				
	Grade, Shape and Ditch 16' (Pt. A to Pt. B)	8.00	x	\$18.20	\$145.60
	Subgrade Compaction (Pt. A to Pt. B)	8.00	x	\$14.80	\$118.40

ROAD SEGMENT	A to B		POINT TO POINT			Sta. to Sta		TOTAL VOLUME (CY)	Rate/ Sta/ amt.	Cost
	Application	Rock Size and Type	Location	A to B		0+00 to 8+00				
				Depth of Rock (inches)	Volume (CY) per	Number of				
Base Rock	4"-0" Crushed	0+00 to 8+00	8	station	50	stations	8.00	400	\$6.04	\$2,416
Junctions	4"-0" Crushed	0+00, 8+00	8	junction	30	junctions	2	60	\$6.04	\$362
Turnouts	4"-0" Crushed	3+40	8	TO	22	TO's	1	22	\$6.04	\$133
Surface Rock	1 1/2" - 0" Crushed	0+00 to 8+00	4	station	25	stations	8	200	\$6.04	\$1,208
Junctions	1 1/2" - 0" Crushed	0+00, 8+00	4	junction	30	junctions	2	60	\$6.04	\$362
Turnouts	1 1/2" - 0" Crushed	3+40	4	TO	22	TO's	1	22	\$6.04	\$133
Total Rock for Road Segment:			A to B					764		\$4,615

Processing:		Description	No. sta	Rate/sta	Cost	
		Water, Process & Compact	2 Lifts 4"-0" crushed rock (Pt. A to Pt. B)	16.00	\$41.40	\$662
			3/4"-0" crushed rock (Pt. A to Pt. B)	8.00	\$41.40	\$331
			4"-0"	1 1/2"-0"	Total	
<b>SUB TOTAL FOR SURFACING</b>			482	282	764	<b>\$5,872</b>

SPECIAL PROJECTS				
Description	Rate	Quantity	Rate	Cost
Load and Haul stumps to block V1, V2, V3, V4 Excavator (C330)	\$\$/hr	2	\$138.00	\$276.00
Dump Truck (12cy)	\$\$/hr	3	\$59.00	\$177.00
<b>SUB TOTAL FOR SPECIAL PROJECTS</b>				<b>\$453</b>

**GRAND TOTAL** **\$9,039**

Compiled By: Bryce Rodgers

Date: 07/18/2006

SUMMARY OF CONSTRUCTION COSTS

SALE NAME: Larkin  
 ROAD: I1 to I2 (48.8) I3 to I4 (74.8) I5 to I6 (15.1)

NEW CONSTRUCTION: \_\_\_\_\_ STATIONS \_\_\_\_\_ MILES \_\_\_\_\_  
 IMPROVEMENT: 138.70 STATIONS \_\_\_\_\_ MILES 2.63

CLEARING & GRUBBING						
	Method	Acres/amount	x	Rate	=	Cost
13 to 14	Realignment: Scatter outside RW (W/excavator)	0.09	x	\$980.00	=	\$88.20
			x		=	
			x		=	
			x		=	
<b>SUB TOTAL FOR CLEARING &amp; GRUBBING</b>						<b>\$88</b>

EXCAVATION						
	Material	Cy/amount	x	Rate	=	Cost
13 to 14	Realignment: Balanced Construction \$\$/sta	1.00	x	\$89.00	=	\$89.00
11 to 12	Ditch Construction: Excavation \$\$/hr	1.00	x	\$89.00	=	\$89.00
11 to 12	End Haul Stumps \$\$/hr	2.00	x	\$59.00	=	\$118.00
11 to 12	Stump Placement \$\$/hr	1.00	x	\$89.00	=	\$89.00
			x		=	
			x		=	
			x		=	
			x		=	
			x		=	
			x		=	
			x		=	
<b>SUB TOTAL FOR EXCAVATION</b>						<b>\$385</b>

CULVERT MATERIALS AND INSTALLATION								
	Location	Dia/type	Lineal ft.	Rate	Cost	No. bands	Rate	Cost
11 to 12	D+65	18" CPP	40'	\$13.80	\$544.00			
13 to 14	49+10	18" CPP	40'	\$13.80	\$544.00			
15 to 16	12+45	18" CPP	30'	\$13.80	\$408.00			
Other/miscellaneous:								
Culvert stakes & markers:								
						4	\$14.10	\$56.40
<b>SUB TOTAL FOR CULVERT MATERIALS &amp; INSTALLATION</b>								<b>\$1,552</b>
Subtotal								<b>\$2,026</b>

SURFACING		Description	Stations/amount	x	Rate/ sta/amt	Cost
Subgrade prep:		Grade, Shape and Ditch 16' (11 to 12, 13 to 14, 15 to 16)	16'	x	\$18.20	\$2,524.34
		Subgrade Compaction (11 to 12, 13 to 14, 15 to 16)		x	\$14.80	\$2,037.96

ROAD SEGMENT 11 to 12		POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	11 to 12 Volume (CY) per station	0+00 to 48+80 Number of stations			
Leveling Rock	1 1/2"-0" Crushed			station	stations	121	\$6.04	\$731
Surface Rock	1 1/2"-0" Crushed	28+15 to 48+80	4	station	25 stations	516	\$6.04	\$3,118
Turnouts	1 1/2"-0" Crushed	1+40, 39+15	4	TO	11 TO's	22	\$6.04	\$133
Junctions	1 1/2"-0" Crushed	5+00, 11+90, 11+90, 22+85, 35+30	N/A	junction	30 junctions	5	\$6.04	\$906
Culvert Bedding/Backfill	1 1/2"-0" Crushed	0+65	N/A	culvert	20 culverts	1	\$6.04	\$121
Curve Widening	4"-0" Crushed	41+50	8	station	22 stations	1	\$6.04	\$133
Curve Widening	1 1/2"-0" Crushed	40+50 to 41+50	4	station	11 stations	1	\$6.04	\$66
Total Rock for Road Segment: 11 to 12						862		\$5,208

ROAD SEGMENT 13 to 14		POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	13 to 14 Volume (CY) per station	0+00 to 74+80 Number of stations			
Leveling Rock	1 1/2"-0" Crushed			station	stations	220	\$6.04	\$1,329
Surface Rock	1 1/2"-0" Crushed	0+00 to 17+10	4	station	25 stations	428	\$6.04	\$2,582
Turnouts	1 1/2"-0" Crushed	2+40, 11+75, 27+05	4	TO	11 TO's	33	\$6.04	\$199
Junctions	1 1/2"-0" Crushed	5+90, 17+10, 18+10, 19+40, 32+80, 41+15, 42+30, 58+15, 60+20, 64+70	N/A	junction	30 junctions	10	\$6.04	\$1,812
Culvert Bedding/Backfill	1 1/2"-0" Crushed	49+10	N/A	culvert	20 culverts	1	\$6.04	\$121
Dissipator Rock	24"-6" Rip Rap	49+10	N/A	dissipator	10 dissipator	1	\$12.80	\$128
Curve Widening	4"-0" Crushed	0+50, 6+50	8	station	11 stations	4	\$6.04	\$268
Curve Widening	1 1/2"-0" Crushed	0+50, 6+50	4	station	11 stations	2	\$6.04	\$133
Road Realignment	4"-0" Crushed	17+10 to 18+10	8	station	50 stations	1	\$6.04	\$302
Road Realignment	1 1/2"-0" Crushed	17+10 to 18+10	4	station	25 stations	1	\$6.04	\$151
Turnout/Turnaround	4"-0" Crushed	73+40	N/A	TO/TA	40 TO/TA	1	\$6.04	\$242
Total Rock for Road Segment: 13 to 14						1,192		\$7,264

ROAD SEGMENT 15 to 16		POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	15 to 16 Volume (CY) per station	0+00 to 15+10 Number of stations			
Base Rock	1 1/2"-0" Crushed	0+00 to 15+10	6	station	38 stations	574	\$6.04	\$3,466
Turnaround	1 1/2"-0" Crushed	6+20, 12+95	N/A	turnaround	22 turnarounds	2	\$6.04	\$266
Culvert Bedding/Backfill	1 1/2"-0" Crushed	12+45	N/A	culvert	22 culverts	1	\$6.04	\$133
Total Rock for Road Segment: 15 to 16						640		\$3,864

Processing:		Description	No. sta	Rate/sta	Cost
		Water, Process & Compact:	138.70	\$41.40	\$5,742
		Water, Process & Compact: Second Lift ( Realignment)	1.00	\$41.40	\$41
		<b>24"-6" 4"-0" 1 1/2"-0" Total</b>	<b>10</b>	<b>156</b>	<b>2,528</b>
<b>SUB TOTAL FOR SURFACING</b>				<b>2,694</b>	<b>\$26,683</b>

SPECIAL PROJECTS		Description	Cost
<b>SUB TOTAL FOR SPECIAL PROJECTS</b>			<b>\$0</b>

**GRAND TOTAL** **\$28,708**

Compiled By: Bryce Rodgers

Date: 07/18/2006





Sale Name: Larkin  
 Project: No. 3  
 Project Type: Type F Stream Crossing Vacating

Prepared by: d.mellison

Date: 05/23/06

Point V 1 to V2 (0+00 to 8+61)

**Phase I: Fill, Culvert Removal and Disposal**

Qty.	Equipment	Qty (Cy)	(\$/Cy)	Hours	(\$/Hr)	Cost (\$)
	Disposal of old culvert (C330)			0.5	\$138.00	\$69.00
	Disposal continued (Dump Truck)			2	\$59.00	\$118.00
	Dress up backslopes			2	\$138.00	\$276.00
	Utilize excavated material to block point V2	60	\$1.15			\$69.00
	Waste (load, haul, dump)	128	\$1.69			\$216.32
						<b>\$748.32</b>

**Phase II: Miscellaneous**

Qty.	Equipment	Qty (Cy)	(\$/Cy)	Unit	(\$/Unit)	Cost (\$)
	Mobilization between V1 and V3(C330)			0.5	\$138.00	\$69.00
	Block Access with stumps			1	\$138.00	\$138.00
	Straw Mulch w/Seed Application EC mix (\$/ac.)			0.05	\$1,315	\$65.75
	No Fertilizer (\$/ac.)			0.05	-\$70	-\$70.00
						<b>\$202.75</b>

**Total Vacating (V1-V2) Cost = \$951.07**

Point V3 to V4 (0+00 to 2+62)

**Phase I: Fill, Culvert Removal and Disposal**

Qty.	Equipment	Qty (Cy)	(\$/Cy)	Hours	(\$/Hr)	Cost (\$)
	Disposal of old culvert (C330)			0.5	\$138.00	\$69.00
	Disposal continued (Dump Truck)			2	\$59.00	\$118.00
	Dress up backslopes			6	\$138.00	\$828.00
	Utilize excavated material to block point V1	60	\$1.15			\$69.00
	Waste (load, haul, dump)	1,990	\$1.69			\$3,363.10
						<b>\$4,447.10</b>

**Phase II: Miscellaneous**

Qty.	Equipment	Qty (Cy)	(\$/Cy)	Unit	(\$/Unit)	Cost (\$)
	Block Access with stumps(C330)			1	\$138.00	\$138.00
	Straw Mulch w/Seed Application EC mix (\$/ac.)			0.10	\$1,315	\$131.50
	No Fertilizer (\$/ac.)			0.10	-\$70	-\$70.00
						<b>\$199.50</b>

**Total Vacating (V3-V4) Cost = \$4,377.10**

Point V5 (N/A)

Qty.	Equipment	Qty (Cy)	(\$/Cy)	Hours	(\$/Hr)	Cost (\$)
1	C315 Excavator w/ 2 cy bucket			1	\$89.00	\$89.00
	Straw Mulch w/Seed Application EC mix (\$/ac.)			1	\$94.00	\$94.00
						<b>\$183.00</b>

**Total Vacating (V5) Cost = \$183.00**

**TOTAL**

**\$5,511**



**Waste Haul Cost**

SALE NAME: Larkin  
 PROJECT: No. 3  
 QUARRY: \_\_\_\_\_

ROCK TYPE: Waste Material

DATE: 04/21/2006  
 BY: d.mellison

		Cubic Yards									
Segment	Stations	Base	Landing	Turnout	Turnaround	Junction	Curves	Waste	Total		
V3 - V4								1,990	1,990		
V1 - V2								128	128		
<b>Grand Total</b>								2,118	2,118		

Road Segment	Stations	Cubic Yards	ONE WAY HAUL IN MILES							Total Haul	
			50 MPH	30 MPH	25 MPH	20 MPH	15 MPH	10 MPH	5 MPH		
V3 - V4		1,990						0.10	0.20	0.20	0.50
V1 - V2		128						0.10	0.20	0.20	0.50
<b>TOTAL</b>		2,118									
<b>CUBIC YARD WEIGHTED HAUL</b>								<b>0.10</b>	<b>0.20</b>	<b>0.20</b>	<b>AVERAGE HAUL 0.50</b>

Average Round Trip Distance (miles) 1.00

**ROCK HAUL:**

Truck type: D20    No. trucks: \_\_\_\_\_  
 Delay min.: 8      Efficiency: 85%

Ave haul: \$1.26 /cy  
 Load: \$0.33 /cy  
 Dump: \$0.10 /cy

Truck type: D12    No. trucks: 2  
 Delay min.: 6      Efficiency: 85%

Truck type: D10    No. trucks: \_\_\_\_\_  
 Delay min.: 5      Efficiency: 75%

Production: cy/day = 747

**WASTE HAUL COSTS                      2,118 cy @            \$1.69 /cy**

Loading Cost = 8hrs. C330 @ \$138/hr / 1120 cy / 3 = \$0.33 Remaining 2/3 time goes for excavation.  
 Dump Cost = 2/60 \* \$59/hr \* 102 trips/2050 cy = \$0.10

### Projects Road Maintenance Cost Summary

**Sale:** Larkin  
**Date:** July 18, 2006  
**By:** Bryce Rodgers

Type	Equipment/Rationale	Hours	Rate	Cost
Post-Projects Road	Grader 14G	20	\$84	\$1,680
	Dump Truck 12CY (2 trucks)	10	\$59	\$590
	FE Loader C966	10	\$79	\$790
	Vibratory Roller	20	\$79	\$1,580
	Water Truck 2500 gallon	8	\$70	\$560
	Vibratory Roller (extra Move)*	1	\$157	\$157
<b>Total</b>				<b>\$5,357</b>

\* Move from Larkin Green Road to Nicolai Mainline - One hour with roller and Dump Truck with trailer.

**Final Road Maintenance**

Production Rates

Grader

Vibratory Roller

Miles/day	Distance(miles)	Days	Hours
1.8	2.2	1.8	20.00
1.5	2.2	1.5	20.00

\*Maintenance calculations were determined as follows:

Maintain from Hunt Creek Quarry to Highway 30.

**Total Miles: 2.2 Miles.**



7. **Statistical Analysis and Stand Summary:** (See also "Statistical Summary-Type Reports", attached.) Evaluated on Net BF/Acre.

Area	Target CV %	Target SE %	Actual CV %	Actual SE %
2,3	48	8	41.6	6.7

The statistics for Area 1 are "Take" and "Leave" stands combined based on Net BF/ACRE.

8. **Volumes by Species and Sale Areas:** (See the Species, Sort, Grade, and the Log Stock Table attached.) Volumes do not include "in-growth". The majority of defect and breakage was culled during the cruise. The total net MBF volumes by species and grade are as follows:

Species	DBH	Net. Vol.	Spec. Mill	2 Saw	3 Saw	4 Saw	Camp Run	% D & B	Sale%
Douglas-fir	30"	3,606	68	3,244	267	27	0	2	66
W. Hemlock/fir	22"	1,730	0	1,292	396	42	0	4	32
Red Alder	17"	46	0	0	0	0	46	1	1
Sitka Spruce	24"	35	0	32	0	3	0	14	1
<b>Totals</b>		<b>5,417</b>							

9. **Approvals:**

Prepared by: Bryce Rodgers

Date: June 30, 2006

Approved by: *Dan Geachy*

Date: 9/28/06

10. **Attachments:**

Species, Sort & Grade (Volume) Reports: 3 pages.

Statistical Reports: 2 pages.

Log Stock Table-MBF (cut): 3 pages.

Leave Tree Statistics: 1 page.

Cruise Designs and Maps: 5 pages.

Plot Tree List: 6 pages.

← TO ASTORIA 17 MILES

Hwy 30

MP 76

Great Creek

Larkin Green Road

T8N R7W  
T8N R6W

Area 2

Area 1

Area 3

PRIVATE  
STATE

PRIVATE  
STATE

24 19  
25 30

19 20  
30 29



**LEGEND**

- Type F Stream
- Type N Stream
- Stream Buffer
- Timber Sale Boundary
- Ownership Boundary
- Reforestation Area
- Surfaced Road
- State Highway
- New Road Construction
- Known Survey Corner
- Overhead Powerline
- Tractor Yarding
- Line Pull Area
- Snag Creation Area

**Logging Plan**

OF TIMBER SALE CONTRACT NO. 341-07-38  
LARKIN  
PORTIONS OF SECTIONS 19 & 30, T8N, R6W,  
PORTIONS OF SECTIONS 24 & 25, T8N, R7W,  
W.M., CLATSOP COUNTY, OREGON  
APPROXIMATE SCALE 1" = 1,000'



Approximate Net Acreage	
Area 1 (Snag Creation)	41.1
Area 2 (MC)	33.2
Area 3 (MC)	61.0
Area 4 (R/W)	0.7
<b>Sale Total Acreage</b>	<b>136.0</b>

**Species, Sort Grade - Board Foot Volumes (Project)**

T08N R06W S19 Ty0001	94.20
T08W R06W S19 Ty0004	.70

**Project: DEMO**  
**Acres 94.90**

**Page 1**  
**Date 8/3/2006**  
**Time 8:36:31AM**

Spp	S T	So rt	Gr ad	% Net BdFt	Bd. Ft. per Acre Def% Gross Net		Total Net MBF	Percent of Net Board Foot Volume								Average Log			Logs Per /Acre		
								Log Scale Dia.				Log Length				Ln Ft	Bd Ft	CF/ Lf			
								4-5	6-11	12-16	17+	12-20	21-30	31-35	36-99						
D		DOCU			100.0	536										8		0.00	2.4		
D		DO2S		89	.7	34,432	34,186	3,244		1	20	79		1	4	9	86	37	536	2.92	63.8
D		DO3S		8	.1	2,820	2,818	267		80	9	11		7	12	17	63	32	114	1.00	24.7
D		DO4S		1		277	277	26		100				76	24			17	31	0.58	9.0
D		DOSM		2		722	722	68				100					100	40	1560	6.96	.5
<b>D Totals</b>				67	2.0	38,786	38,003	3,606		8	19	74		2	5	10	84	33	379	2.37	100.3
H		DOCU			100.0	638												7		0.00	4.6
H		DO2S		74	.9	13,747	13,617	1,292			41	59		3	1	8	88	37	402	2.29	33.9
H		DO3S		23	.3	4,183	4,171	396		86	8	6		5	11	29	55	33	114	0.93	36.6
H		DO4S		3		439	439	42		100				59	41			19	29	0.51	15.3
<b>H Totals</b>				32	4.1	19,008	18,227	1,730		22	32	46		5	4	12	78	31	202	1.48	90.4
A		DO3S		100		480	480	46		28	72			21	21	58		27	121	1.23	4.0
<b>A Totals</b>				1		480	480	46		28	72			21	21	58		27	121	1.23	4.0
S		DOCU			100.0	60												6		0.00	.7
S		DO2S		92	.0	339	339	32			45	55		55		45		24	255	2.10	1.3
S		DO4S		8		27	27	3		100					100			22	40	0.82	.7
<b>S Totals</b>				1	14.1	426	366	35		7	42	51		51	7	42		19	137	1.57	2.7
<b>Totals</b>					2.8	58,700	57,076	5,417		13	24	64		3	5	11	81	32	289	1.95	197.3

T08N R06W S19 T0001	T08N R06W S19 T0001
Twp 08N Rge 06W Sec 19 Tract CUT 2&3 Type 0001 Acres 94.20 Plots Sample Trees CuFt 1	BdFt W

Spp	So T	Gr ad	% Net BdFt	Bd. Ft. per Acre			Total Net MBF	Percent Net Board Foot Volume								Average Log			Logs Per /Acre	
				Def%	Gross	Net		Log Scale Dia.			Log Length				Ln Ft	Bd Ft	CF/Lf			
								4-5	6-11	12-16	17+	12-20	21-30	31-35				36-99		
D	DO	CU		100.0	540												8		0.00	2.4
D	DO	2S	89	.7	34,434	34,188	3,220		1	20	79		1	4	10	86	37	535	2.92	63.8
D	DO	3S	8	.1	2,825	2,822	266		80	9	11		7	12	17	63	32	114	1.00	24.7
D	DO	4S	1		279	279	26		100				76	24			17	31	0.58	9.0
D	DO	SM	2		727	727	68				100				100		40	1560	6.96	.5
<b>D</b>	<b>Totals</b>		66	2.0	38,803	38,016	3,581		8	19	74		2	5	10	84	33	378	2.37	100.4
H	DO	CU		100.0	643												7		0.00	4.6
H	DO	2S	74	.9	13,812	13,681	1,289			41	59		3	1	8	88	37	401	2.28	34.1
H	DO	3S	23	.3	4,213	4,201	396		86	8	6		5	11	29	55	33	114	0.93	36.8
H	DO	4S	3		442	442	42		100				59	41			19	29	0.51	15.5
<b>H</b>	<b>Totals</b>		32	4.1	19,111	18,324	1,726		22	32	46		5	4	12	78	31	201	1.48	91.0
A	DO	3S	100		484	484	46		28	72			21	21	58		27	121	1.23	4.0
<b>A</b>	<b>Totals</b>		1		484	484	46		28	72			21	21	58		27	121	1.23	4.0
S	DO	CU		100.0	60												6		0.00	.7
S	DO	2S	92	.0	342	342	32			45	55		55		45		24	255	2.10	1.3
S	DO	4S	8		27	27	3		100					100			22	40	0.82	.7
<b>S</b>	<b>Totals</b>		1	14.1	429	369	35		7	42	51		51	7	42		19	137	1.57	2.7
<b>Type Totals</b>				2.8	58,827	57,193	5,388		13	24	64		3	5	11	81	32	289	1.95	198.1

<b>T08W R06W S19 T0004</b>								<b>T08W R06W S19 T0004</b>				
Twp	Rge	Sec	Tract	Type	Acres	Plots	Sample Trees	CuFt	BdFt			
08W	06W	19	RW	0004	.70			1	W			

Spp	So	Gr	% Net BdFt	Bd. Ft. per Acre			Total Net MBF	Percent Net Board Foot Volume								Average Log			Logs Per /Acre
				Def%	Gross	Net		Log Scale Dia.				Log Length				Ln Ft	Bd Ft	CF/Lf	
								4-5	6-11	12-16	17+	12-20	21-30	31-35	36-99				
D	DO	2S	93	.6	34,186	33,971	24		16	84		1	4	95	38	610	3.18	55.7	
D	DO	3S	6		2,171	2,171	2	68	32			17	23	14	46	27	109	1.11	20.0
D	DO	4S	1		100	100	0	100				100			13	35	0.81	2.9	
<b>D</b>	<b>Totals</b>		<b>88</b>	<b>.6</b>	<b>36,457</b>	<b>36,243</b>	<b>25</b>	<b>4</b>	<b>17</b>	<b>79</b>	<b>2</b>	<b>1</b>	<b>4</b>	<b>92</b>	<b>34</b>	<b>461</b>	<b>2.73</b>	<b>78.6</b>	
H	DO	2S	96		4,929	4,929	3		19	81			8	92	38	690	3.17	7.1	
H	DO	3S	4		186	186	0	54	46			46	54		22	65	0.95	2.9	
<b>H</b>	<b>Totals</b>		<b>12</b>	<b>.0</b>	<b>5,114</b>	<b>5,114</b>	<b>4</b>	<b>2</b>	<b>20</b>	<b>78</b>	<b>2</b>		<b>10</b>	<b>89</b>	<b>34</b>	<b>511</b>	<b>2.76</b>	<b>10.0</b>	
<b>Type Totals</b>				<b>.5</b>	<b>41,571</b>	<b>41,357</b>	<b>29</b>	<b>4</b>	<b>17</b>	<b>79</b>	<b>2</b>	<b>1</b>	<b>5</b>	<b>92</b>	<b>34</b>	<b>467</b>	<b>2.73</b>	<b>88.6</b>	



TC TSTATS				STATISTICS				PAGE	1	
				PROJECT	DEMO			DATE	8/3/2006	
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt	
08N	06W	19	CUT 2&3	0001	94.20	38	228	1	W	
				TREES	ESTIMATED	PERCENT				
				PER PLOT	TOTAL	SAMPLE				
					TREES	TREES				
TOTAL	38	228	6.0							
CRUISE	21	117	5.6	6,185		1.9				
DBH COUNT										
REFOREST										
COUNT	17	109	6.4							
BLANKS										
100 %										
STAND SUMMARY										
	SAMPLE	TREES	AVG	BOLE	REL	BASAL	GROSS	NET	GROSS	NET
	TREES	/ACRE	DBH	LEN	DEN	AREA	BF/AC	BF/AC	CF/AC	CF/AC
DOUG FIR	72	30.7	29.9	113		149.5	38,803	38,016	8,032	7,951
WHEMLOCK	40	31.6	22.1	92		84.2	19,111	18,324	4,274	4,162
R ALDER	4	2.7	17.0	44		4.2	484	484	135	135
S SPRUCE	1	.7	24.0	79		2.1	429	369	90	80
<b>TOTAL</b>	<b>117</b>	<b>65.7</b>	<b>25.9</b>	<b>100</b>		<b>240.0</b>	<b>58,827</b>	<b>57,193</b>	<b>12,531</b>	<b>12,327</b>
CONFIDENCE LIMITS OF THE SAMPLE										
68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR										
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	79.9	13.0		27	31	35				
WHEMLOCK	128.6	20.9		25	32	38				
R ALDER	536.6	87.0		0	3	5				
S SPRUCE	430.0	69.7		0	1	1				
<b>TOTAL</b>	<b>53.2</b>	<b>8.6</b>		<b>60</b>	<b>66</b>	<b>71</b>	<b>113</b>	<b>28</b>	<b>13</b>	
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	70.3	11.4		132	149	167				
WHEMLOCK	121.9	19.8		68	84	101				
R ALDER	483.4	78.4		1	4	8				
S SPRUCE	430.0	69.7		1	2	4				
<b>TOTAL</b>	<b>40.1</b>	<b>6.5</b>		<b>224</b>	<b>240</b>	<b>256</b>	<b>64</b>	<b>16</b>	<b>7</b>	
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	70.1	11.4		33,692	38,016	42,340				
WHEMLOCK	125.3	20.3		14,601	18,324	22,048				
R ALDER	487.0	79.0		102	484	866				
S SPRUCE	430.0	69.7		111	369	626				
<b>TOTAL</b>	<b>41.6</b>	<b>6.7</b>		<b>53,335</b>	<b>57,193</b>	<b>61,051</b>	<b>69</b>	<b>17</b>	<b>8</b>	

TC TSTATS				STATISTICS				PAGE	1	
				PROJECT	DEMO			DATE	8/9/2006	
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt	
08W	06W	19	RW	0004	0.70	1	17	1	W	
				TREES	ESTIMATED	PERCENT				
				PER PLOT	TOTAL	SAMPLE				
				TREES	TREES	TREES				
TOTAL		1	17	17.0						
CRUISE		1	17	17.0	17		100.0			
DBH COUNT										
REFOREST										
COUNT										
BLANKS										
100 %										
STAND SUMMARY										
	SAMPLE	TREES	AVG	BOLE	REL	BASAL	GROSS	NET	GROSS	NET
	TREES	/ACRE	DBH	LEN	DEN	AREA	BF/AC	BF/AC	CF/AC	CF/AC
DOUG FIR	15	21.4	32.6	130		124.4	36,457	36,243	7,399	7,399
WHEMLOCK	2	2.9	30.4	121		14.4	5,114	5,114	930	930
<b>TOTAL</b>	<b>17</b>	<b>24.3</b>	<b>32.4</b>	<b>129</b>		<b>138.8</b>	<b>41,571</b>	<b>41,357</b>	<b>8,329</b>	<b>8,329</b>
CONFIDENCE LIMITS OF THE SAMPLE										
68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR										

Log Stock Table - MBF

T08N R06W S19 Ty0001 94.20  
 T08W R06W S19 Ty0004 .70

Project: DEMO  
 Acres 94.90

Page 1  
 Date 8/3/2006  
 Time 8:37:16AM

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+
D		DO CU	6	22	100.0														
D		DO CU	8	8	100.0														
D		DO CU	10	5	100.0														
D		DO CU	22	16	100.0														
D		DO 2S	12	1		1	.0						1						
D		DO 2S	17	2		2	.1						2						
D		DO 2S	20	29		29	.8					2	0	8	5	13			
D		DO 2S	22	19		19	.5					3		3				13	
D		DO 2S	24	3		3	.1					3							
D		DO 2S	26	22		22	.6											22	
D		DO 2S	28	19		19	.5						3	15					
D		DO 2S	30	66	3.0	64	1.8					15	7					41	
D		DO 2S	31	4		4	.1					4							
D		DO 2S	32	286		286	7.9						67	28	83	31	77		
D		DO 2S	34	17		17	.5										17		
D		DO 2S	36	15		15	.4					5		10					
D		DO 2S	38	18		18	.5										18		
D		DO 2S	40	2,766		2,745	76.1					10	113	240	650	900	693	138	
D		DO 3S	14	6		6	.2					1	3	2					
D		DO 3S	15	3		3	.1					3							
D		DO 3S	16	8	2.5	8	.2					4	3						
D		DO 3S	18	2		2	.1					2							
D		DO 3S	20	0		0	.0				0	0							
D		DO 3S	21	3		3	.1					3							
D		DO 3S	22	12		12	.3			4	2	5							
D		DO 3S	24	0		0	.0					0	0						
D		DO 3S	26	3		3	.1					3							
D		DO 3S	27	4		4	.1					4							
D		DO 3S	30	11		11	.3					4							
D		DO 3S	32	38		38	1.1			5	20	13							
D		DO 3S	34	4		4	.1					0	4						
D		DO 3S	35	4		4	.1					4							
D		DO 3S	36	0		0	.0					0	0						
D		DO 3S	37	5		5	.1					5							
D		DO 3S	38	0		0	.0					0							
D		DO 3S	40	163		163	4.5				62	59	12	0			29		



Log Stock Table - MBF

T08N R06W S19 Ty0001 94.20  
 T08W R06W S19 Ty0004 .70

Project: DEMO  
 Acres 94.90

Page 3  
 Date 8/3/2006  
 Time 8:37:16AM

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+
H		DO 3S	38	26		26	1.5					26							
H		DO 3S	40	173		173	10.0				47	103		23					
H		DO 4S	12	3		3	.2			2		1							
H		DO 4S	13	1		1	.1				1								
H		DO 4S	14	1		1	.1				1								
H		DO 4S	16	3		3	.2			3									
H		DO 4S	17	6		6	.3			3	2								
H		DO 4S	18	7		7	.4			3	4								
H		DO 4S	20	5		5	.3				5								
H		DO 4S	22	7		7	.4			7									
H		DO 4S	24	7		7	.4			7									
H		DO 4S	27	4		4	.2			4									
H		Totals		1,804	4.1	1,730	31.9			60	92	229	173	195	519	310	151		
A		DO 3S	16	1		1	2.3				1								
A		DO 3S	20	9		9	19.1				5	4							
A		DO 3S	30	10		10	20.9						10						
A		DO 3S	40	26		26	57.8			3			23						
A		Totals		46		46	.8			3	6	4	33						
S		DO CU	6	6	100.0														
S		DO 2S	16	18		18	50.9								18				
S		DO 2S	32	15		15	41.8						15						
S		DO 4S	22	3		3	7.3				3								
S		Totals		40	14.1	35	.6				3		15		18				
Total		All Species		5,571	2.8	5,417	100.0			84	207	388	389	539	1268	1307	1060	174	

TC TSTATS		STATISTICS					PAGE 1			
		PROJECT DEMO		DATE 8/9/2006						
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt	
08N	06W	19	STAY 2&3	0001	94.20	38	26	1	W	
		PLOTS	TREES	TREES PER PLOT	ESTIMATED TOTAL TREES	PERCENT SAMPLE TREES				
TOTAL		38	26	.7						
CRUISE		10	16	1.6	643	2.5				
DBH COUNT										
REFOREST										
COUNT		8	9	1.1						
BLANKS		20								
100 %										
STAND SUMMARY										
	SAMPLE TREES	TREES /ACRE	AVG DBH	BOLE LEN	REL DEN	BASAL AREA	GROSS BF/AC	NET BF/AC	GROSS CF/AC	NET CF/AC
SNAG	7	2.5	30.5	25		12.6	233		45	
DOUGLEAV	7	2.6	27.3	95		10.5	2,175	2,116	450	441
HEMLEAV	2	1.8	20.9	51		4.2	577	577	138	138
<b>TOTAL</b>	<b>16</b>	<b>6.8</b>	<b>27.1</b>	<b>58</b>		<b>27.4</b>	<b>2,984</b>	<b>2,693</b>	<b>633</b>	<b>579</b>
CONFIDENCE LIMITS OF THE SAMPLE										
68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR										
CL: 68.1 %	COEFF	TREES/ACRE				# OF PLOTS REQ.		INF. POP.		
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15		
SNAG	208.0	33.7	2	2	3					
DOUGLEAV	282.7	45.9	1	3	4					
HEMLEAV	296.2	48.1	1	2	3					
<b>TOTAL</b>	<b>136.4</b>	<b>22.1</b>	<b>5</b>	<b>7</b>	<b>8</b>	<b>744</b>	<b>186</b>	<b>83</b>		
CL: 68.1 %	COEFF	BASAL AREA/ACRE				# OF PLOTS REQ.		INF. POP.		
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15		
SNAG	181.9	29.5	9	13	16					
DOUGLEAV	274.9	44.6	6	11	15					
HEMLEAV	295.5	47.9	2	4	6					
<b>TOTAL</b>	<b>132.1</b>	<b>21.4</b>	<b>22</b>	<b>27</b>	<b>33</b>	<b>698</b>	<b>174</b>	<b>78</b>		
CL: 68.1 %	COEFF	NET BF/ACRE				# OF PLOTS REQ.		INF. POP.		
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15		
SNAG										
DOUGLEAV	286.5	46.5	1,133	2,116	3,099					
HEMLEAV	295.5	47.9	300	577	853					
<b>TOTAL</b>	<b>226.4</b>	<b>36.7</b>	<b>1,704</b>	<b>2,693</b>	<b>3,681</b>	<b>2,050</b>	<b>512</b>	<b>228</b>		

FOR LEAVE TREE INFORMATION ONLY!

CRUISE DESIGN  
ASTORIA DISTRICT

Sale Name: Larkin Area(s) 2, 3

Harvest Type: (CC) PC CT "Automark Thinning" (circle one)

Approx. Cruise Acres: 79 Estimated CV% 48 Net BF or SE% Objective 8% Net BF or BA/Acre BA/Acre

Planned Sale Volume: 5.5 MMBF Estimated Sale Area Value/Acre: \$31,000

- A. **Cruise Goals:** (a) Grade minimum 100 conifer and 5 hardwood trees:  
 (b) Sample      cruise plots; (c) Other goals (     Determine "automark" thinning standards;      Determine log grades for sale value;      Determine snag and leave tree species and sizes;      Determine LWD (down wood) cubic feet and decay classes;      Determine "diameter limit" harvest parameters;

(CRUISE GRADE PLOTS AS SHOWN ON MAP. CRUISE "W" TREES CAMPRAV)  
ALL CEDAR IS RESERVE. OTHERWISE ALL SNAGS ≥ 15" DBH.

B. **Cruise Design:**

1. Plot Cruises: BAF 40 (Full point) Half point) (circle one)

Fixed Plot Size      Plot Radius      feet

Cruise Line Direction(s) Area 2 58°AZ Area 3 360°AZ

Cruise Line Spacing 5 (chains) (feet)

Cruise Plot Spacing 4 (chains) (feet)

Grade/Count Ratio 1:2

2. ITS (Sample Tree) Cruises: Measure-grade ratios: D-fir      Hemlock       
Spruce      True Fir      Cedar      Hardwood     

C. **Tree Measurements:**

1. **Diameter:** Minimum DBH to cruise is 8" for conifers and 10" for hardwoods. Record dbh to nearest 1/2" for trees < 16", to nearest 1" for trees 16-24", and to nearest 2" for trees > 24". If tree diameters are estimated (only estimate on variable plot cruises), then record to closest estimate.

2. **Bole Length:** Record bole length to nearest foot at TCD. For trees greater than 100 feet in merchantable height, estimating to the nearest 5 feet is acceptable.

3. **Top Cruise Diameter (TCD):** Minimum top outside bark is 7" or 40% of dob at 16' form point. Generally, use 7" outside bark for trees < 18" dbh and 40% of dob @ FP for trees > 18" dbh.

4. **Form Factors:** (1) Measure or estimate a 16' form factor for every conifer tree measured/graded; OR (2) Measure a minimum of 20 form factors for each major conifer species on the cruise area, and use these to calculate average FF for the species on the cruise. Hardwood form factors are a Standard 87.

5. **Tree Segments:** Record log segments in "standard" log lengths in general use, such as 32' and 40' lengths, whenever possible. Do not record odd segments just to maximize grade. Cull segments can be any length. For conifers, minimum merchantable segment length is 12'; for hardwoods, it's 8'. Maximum segment length is 40'. One foot of trim is assumed for each merch. segment. Do not use "double dash" (--) feature on the data recorder except for the top segment of the tree.

6. **Species, Sort, and Grade Codes:** A. Species: Record as D (Douglas-fir); H (Western hemlock); S (Sitka Spruce); C (Western red cedar); NF (Noble fir); SF (Silver fir); A (Red alder); M (Bigleaf maple). For "leave trees" in partial cuts, or for marked "wildlife trees," add an "L" to the species code (such as DL, HL, CL, etc.)  
B. Sort: Use code "1" (Domestic).  
C. Grade: A = 1 Peeler; B = 2 Peeler; C = 3 Peeler; D = Special Mill; 2 = 2 Sawmill; 3 = 3 Sawmill; 4 = 4 Sawmill; R = Camp Run; 0 = Cull ; 9 = Utility  
Hardwoods: #2 Sawmill = 12" + scaling diameter; #3 Sawmill = 10 and 11"; #4 Sawmill = 8 and 9"

7. **Deductions:** Estimate visible defect or damage as a "length deduction" (most often), or as a "diameter deduction," as applicable. Estimate hidden defect and breakage (usually some breakage is encountered in trees > 100 feet in height) on a "per tree" basis. Steep and broken topography generally results in higher breakage percentages than gentler topography, and hemlock generally breaks more than D-fir and spruce.

8. **Standard Field Procedures:** Plot Type Cruises: Mark cruise line beginning and end points with blue/yellow flagging. Write plot identification numbers and line direction on the ribbon. At each plot, tie yellow flagging above eye level near plot center and another yellow flagging around a sturdy wooden stake marking plot center. On each yellow flagging, write the plot identification number. Between plots, along the cruise line, tie blue flagging at intervisible points, not to exceed 100' apart. On "measure/grade" plots write the tree number and/or tree diameter on at least the first measured tree (clockwise from the line direction) in yellow paint. All trees on the plot may be marked this way, if the cruiser chooses.

ITS and 100% Cruises: Mark cruise "strips" with various colored flagging (not pink). Mark trees measured and graded with yellow paint.

9. **Cruising Equipment:** Relaskop Rangefinder Logger's Tape (with dbh on back) Biltmore Stick, Compass, Cruise Cards in Tatum OR Data Recorder, Cruise Design, Cruise Map, Yellow Flagging, Blue Flagging, Yellow Paint.

10. **Attachments:** A. Cruise Map (showing cruise unit boundaries, roads, streams, approx. acres/unit, cruise lines and plot locations, legal description and section lines, BAF or plot size, measure/count plot ratio, north arrow, and scale.

Cruise Design by: Bruce Rodgers

Approved by: [Signature]

Date: 8/10/86



**CRUISE DESIGN  
ASTORIA DISTRICT**

Sale Name: Larkin Area(s) 4 R/W

Harvest Type: CC PC CT "Automark Thinning" (circle one) (RW)

Approx. Cruise Acres: .7 Estimated CV%      Net BF or SE% Objective      BA/Acre BA/Acre

Planned Sale Volume: 5.5 MMBF Estimated Sale Area Value/Acre: \$31,000

A. **Cruise Goals:** (a) Grade minimum 100% conifer and      hardwood trees:  
(b) Sample      cruise plots; (c) Other goals (     Determine "automark" thinning standards;      Determine log grades for sale value;      Determine snag and leave tree species and sizes;      Determine LWD (down wood) cubic feet and decay classes;      Determine "diameter limit" harvest parameters; )  
Basal Area leave target      sq. ft. Cruiser needs to select or leave trees per plot.

B. **Cruise Design:** 100% OF POSTED R/W

1. **Plot Cruises:** BAF      (Full point; Half point) (circle one)  
Fixed Plot Size      Plot Radius      feet  
Cruise Line Direction(s)       
Cruise Line Spacing      (chains) (feet)  
Cruise Plot Spacing      (chains) (feet)  
Grade/Count Ratio
2. **ITS (Sample Tree) Cruises:** Measure-grade ratios: D-fir      Hemlock       
Spruce      True Fir      Cedar      Hardwood

**C. Tree Measurements:**

1. **Diameter:** Minimum DBH to cruise is 8" for conifers and 10" for hardwoods. Record dbh to nearest 1/2" for trees < 16", to nearest 1" for trees 16-24", and to nearest 2" for trees > 24". If tree diameters are estimated (only estimate on variable plot cruises), then record to closest estimate.
2. **Bole Length:** Record bole length to nearest foot at TCD. For trees greater than 100 feet in merchantable height, estimating to the nearest 5 feet is acceptable.
3. **Top Cruise Diameter (TCD):** Minimum top outside bark for conifer is 7", 40" for hardwoods or 40 % of dob at 16' form point. Generally, use 7" outside bark for trees < 18" dbh and 40% of dob @ FP for trees > 18" dbh.
4. **Form Factors:** (1) Measure or estimate a 16' form factor for every conifer tree measured/graded; OR (2) Measure a minimum of 20 form factors for each major conifer species on the cruise area, and use these to calculate average FF for the species on the cruise. Hardwood form factors are a Standard 87.

5. **Tree Segments:** Record log segments in "standard" log lengths in general use, such as 32' and 40' lengths, whenever possible. Do not record odd segments just to maximize grade. Cull segments can be any length. For conifers, minimum merchantable segment length is 12'; for hardwoods, it's 8'. Maximum segment length is 40'. One foot of trim is assumed for each merch. segment. Do not use "double dash" (--) feature on the data recorder except for the top segment of the tree.

6. **Species, Sort, and Grade Codes:** A. Species: Record as D (Douglas-fir); H (Western hemlock); S (Sitka Spruce); C (Western red cedar); NF (Noble fir); SF (Silver fir); A (Red alder); M (Bigleaf maple). For "leave trees" in partial cuts, or for marked "wildlife trees," add an "L" to the species code (such as DL, HL, CL, etc.)

B. Sort: Use code "1" (Domestic).

C. Grade: A = 1 Peeler; B = 2 Peeler; C = 3 Peeler; D = Special Mill; 2 = 2 Sawmill; 3 = 3 Sawmill; 4 = 4 Sawmill; R = Camp Run; 0 = Cull

7. **Deductions:** Estimate visible defect or damage as a "length deduction" (most often), or as a "diameter deduction," as applicable. Estimate hidden defect and breakage (usually some breakage is encountered in trees > 100 feet in height) on a "per tree" basis. Steep and broken topography generally results in higher breakage percentages than gentler topography, and hemlock generally breaks more than D-fir and spruce.

8. **Standard Field Procedures:** Plot Type Cruises: Mark cruise line beginning and end points with blue/yellow flagging. Write plot identification numbers and line direction on the ribbon. At each plot, tie yellow flagging above eye level near plot center and another yellow flagging around a sturdy wooden stake marking plot center. On each yellow flagging, write the plot identification number. Between plots, along the cruise line, tie blue flagging at intervisible points, not to exceed 100' apart. On "measure/grade" plots write the tree number and/or tree diameter on at least the first measured tree (clockwise from the line direction) in yellow paint. All trees on the plot may be marked this way, if the cruiser chooses.

ITS and 100% Cruises: Mark cruise "strips" with various colored flagging (not pink). Mark trees measured and graded with yellow paint.

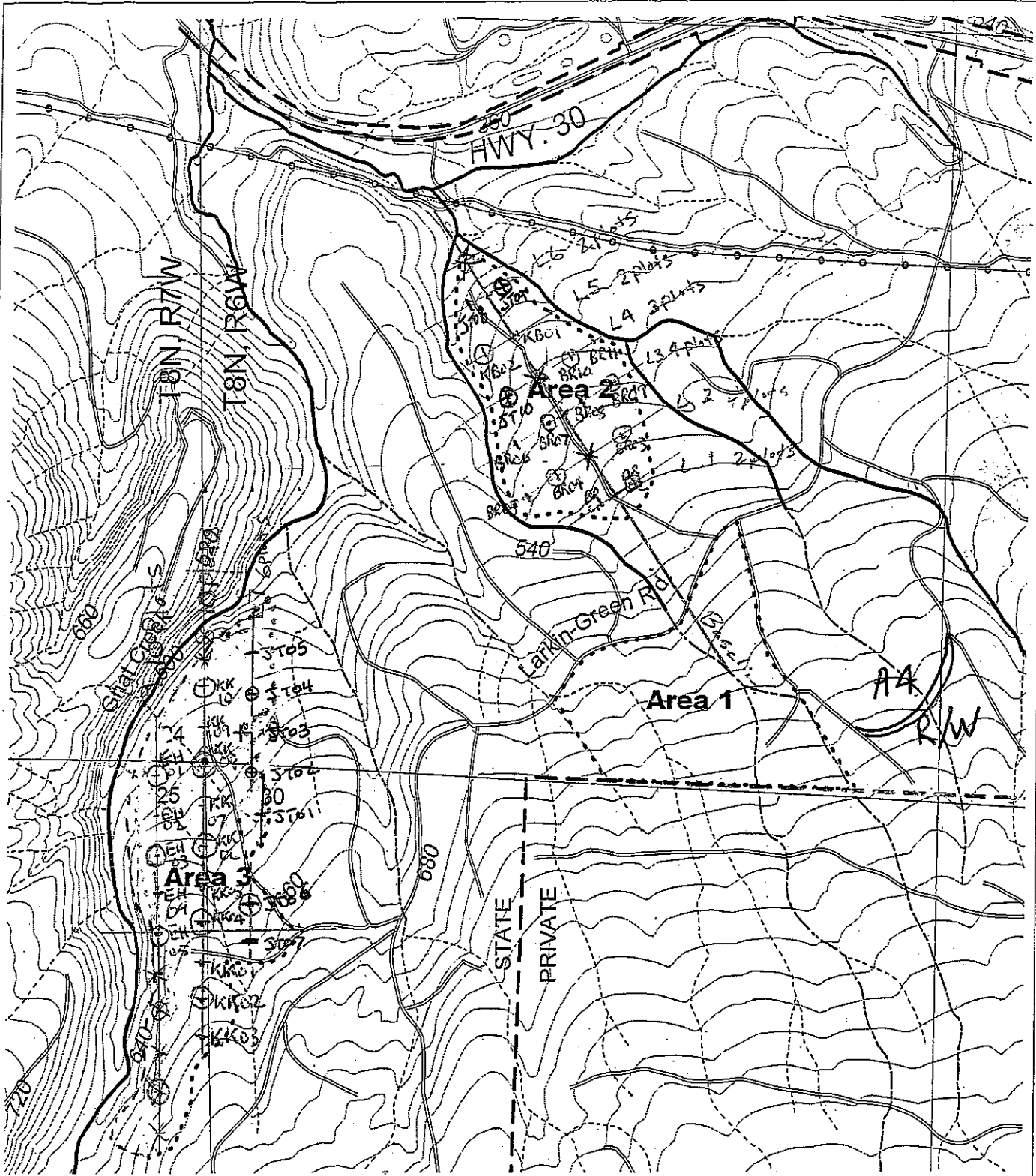
9. **Cruising Equipment:** Relaskop Rangefinder Logger's Tape (with dbh on back)  
Biltmore Stick      Compass      Cruise Cards in Tatum OR Data Recorder  
Cruise Design      Cruise Map      Yellow Flagging      Blue Flagging

10. **Attachments:** A. Cruise Map (showing cruise unit boundaries, roads, streams, approx. acres/unit, cruise lines and plot locations, legal description and section lines, BAF or plot size, measure/count plot ratio, north arrow, and scale.

B. Data Recorder Instructions

C. Other

Cruise Design by: Buysie Rodgers  
Approved by: Diana Grody  
Date: 6/5/06



APPROXIMATE  
NET ACREAGE:

	MC Acres	Snag Acres
Area 1(Snags)		40
Area 2(MC)	36	
Area 3(MC)	43	
TOTALS =	79 Acres	40 Acres
Sale Total Acreage =	119 Acres	



FY2007  
Larkin  
Portions of Sections 19 and 30,  
T8N, R6W, and Sections 24 and 25,  
T8N, R7W, W.M., Clatsop County, Oregon.

*CAUSE MAP*

Map A - Topography

1:12000



LEGEND

- Sale Boundary
- Streams
- Type F Stream
- Type N Stream
- Unknown Stream

38 plots