



"STEWARDSHIP IN FORESTRY"

# Timber Sale Appraisal Cost Summary Continental Loop Sale 341-02-10

District: Tillamook

Date: 7/2/01

	Conifer	Hardwood	Total
<b>Gross Timber Sale Value</b>	\$390,704.82	\$27,643.41	\$418,348.23
		<b>Project Work</b>	(\$175,754.00)
		<b>Advertised Value</b>	\$242,594.23



"STEWARDSHIP IN FORESTRY"

# Timber Sale Appraisal Timber Description Continental Loop Sale 341-02-10

District: Tillamook

Location: Secs. 2, 3, 11, T1S, R8W, W.M.

Date: 7/2/01

Stand Stocking: 40%

Species	Avg. DBH	Amortized%	Recovery%
Douglas - Fir	14	0	95
Alder (Red)	13	0	95

Volume by Grade	Douglas - Fir	Alder (Red)	Total
2S	151	0	151
3S	1,205	0	1,205
4S	151	0	151
Camprun	0	129	129
<b>Total</b>	<b>1,507</b>	<b>129</b>	<b>1,636</b>

Comments: Pond Values Used: 2nd Quarter 2001.

Other costs (profit and risk included): Total = \$10,820  
Non-Project roads: machine work: 26 stations x \$195/station = \$5,070  
pit-run rock: 200 cubic yards @ \$6.50/cy = \$3,900  
move-in cost: = \$ 650  
Landing at Pt. "G": 100cy rock @ \$10/cy = \$1000  
2 hrs tractor @ \$100/hr = \$200 (\$1200 total)  
Other (profit and risk applied): Brand and paint: \$2.00/MBF X 1636MBF = \$3272

Road Maintenance: Total = \$3.91  
Grading - \$500/mile x 4 miles x 2 times = \$4000/1636MBF = \$2.44  
Surfacing - 50cubic yds @ \$6/cy X 2MMBF x 4 miles/1636MBF = \$1.47

Slash Disposal: \$2.40/MBF X 1636MBF = \$3926



# Timber Sale Appraisal

## Logging Conditions

### Continental Loop

### Sale 341-02-10

"STEWARDSHIP IN FORESTRY"

<b>Combination#: 1</b>	Douglas - Fir Alder (Red)	70.00% 50.00%	
	<b>Yarding Distance:</b> Medium (800 ft)		<b>Downhill Yarding</b> No
	<b>Logging System:</b> Cable: Medium Tower >40 - <70		<b>Process:</b> Manual Delimiting
	<b>Tree Size:</b> Small / Thinning 12in (130 Bft/tree), 12-17 logs/MBF		
	<b>Loads/Day:</b> 6		<b>Bd. Ft./Load:</b> 3,500
	<b>Cost/MBF:</b> \$157.93		
	<b>Machines:</b>		
	Log Loader (A)		
	Tower Yarder (Medium)		
<b>Combination#: 2</b>	Douglas - Fir Alder (Red)	10.00% 10.00%	
	<b>Yarding Distance:</b> Medium (800 ft)		<b>Downhill Yarding</b> Yes
	<b>Logging System:</b> Cable: Medium Tower >40 - <70		<b>Process:</b> Manual Delimiting
	<b>Tree Size:</b> Small / Thinning 12in (130 Bft/tree), 12-17 logs/MBF		
	<b>Loads/Day:</b> 6		<b>Bd. Ft./Load:</b> 3,500
	<b>Cost/MBF:</b> \$197.42		
	<b>Machines:</b>		
	Log Loader (A)		
	Tower Yarder (Medium)		
<b>Combination#: 3</b>	Douglas - Fir Alder (Red)	20.00% 40.00%	
	<b>Yarding Distance:</b> Short (400 ft)		<b>Downhill Yarding</b> No
	<b>Logging System:</b> Track Skidder		<b>Process:</b> Feller Buncher
	<b>Tree Size:</b> Small / Thinning 12in (130 Bft/tree), 12-17 logs/MBF		
	<b>Loads/Day:</b> 8		<b>Bd. Ft./Load:</b> 3,500
	<b>Cost/MBF:</b> \$125.67		
	<b>Machines:</b>		
	Feller Buncher w/ Delimber		
	Log Loader (B)		
	Stroke Delimber (B)		
	Track Skidder		



# Timber Sale Appraisal

## Logging Costs

### Continental Loop

### Sale 341-02-10

"STEWARDSHIP IN FORESTRY"

Date: 7/2/01

Operating Seasons: 1.0

Profit & Risk: 15%

Project Costs: \$175,754

Other Costs (P/R): \$3,272

Slash Disposal: \$3,926

Other Costs: \$10,820

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

Road Maintenance: \$3.91

#### Hauling Costs

Species	\$/MBF	Trips/Day	MBF/Load
Douglas - Fir	\$0.00	2.0	3.5
Alder (Red)	\$0.00	4.0	2.5



# Timber Sale Appraisal Logging Costs Breakdown Continental Loop Sale 341-02-10

"STEWARDSHIP IN FORESTRY"

Costs	Douglas - Fir	Alder (Red)
<b>Logging</b>	155.43	148.98
<b>Road Maintenance</b>	4.12	4.12
<b>Fire Protection</b>	1.66	1.66
<b>Hauling</b>	69.16	40.37
<b>Other (P/R appl.)</b>	2.00	2.00
<b>Profit &amp; Risk</b>	34.86	29.57
<b>Slash Disposal</b>	2.40	2.40
<b>Scaling</b>	2.00	0.00
<b>Other</b>	6.61	6.61
<b>Total</b>	278.24	235.71

<b>Amortization</b>	0.00	0.00
<b>Pond Value</b>	537.50	450.00
<b>Stumpage</b>	259.26	214.29
<b>Amortized</b>	0.00	0.00



"STEWARDSHIP IN FORESTRY"

# Timber Sale Appraisal Summary Continental Loop Sale 341-02-10

## Amortized

	Douglas - Fir	Alder (Red)
MBF	0.00	0.00
Value	0.00	0.00
Total	0.00	0.00

## Unamortized

	Douglas - Fir	Alder (Red)
MBF	1,507.00	129.00
Value	259.26	214.29
Total	390,704.82	27,643.41

## Gross Timber Sale Value

**Recovery \$418,348.23**

Prepared by: Ed Keith

Date: 7/2/01

District: Tillamook

Phone: (503) 842-2545

**PROJECT SUMMARY SHEET**

Sale: Continental Loop

**CONSTRUCTION**

Point	I to J	stations = 2 + 00	\$1,399.62
<b>SUBTOTAL CONSTRUCTION</b>			<b>\$1,399.62</b>

**IMPROVEMENT**

Point	A to B	stations = 27 + 00	\$1,752.30
Point	C to D	stations = 52 + 80	\$9,192.66
Point	E to F	stations = 27 + 30	\$6,431.90
Point	G to H	stations = 34 + 20	\$35,110.44
Point	K to L	stations = 2 + 00	\$393.82
Point	M to N	(Storm Damage Repair) stations = 54 + 50	\$75,719.72
Point	O to P	(Storm Damage Repair) stations = 4 + 75	\$31,102.65
<b>SUBTOTAL IMPROVEMENT</b>			<b>\$159,703.49</b>

**SPECIAL PROJECTS**

<u>Road Brushing -</u>	\$10,300.00
<u>Remove culverts from State land</u>	\$789.00
<b>SUBTOTAL SPECIAL PROJECTS</b>	<b>\$11,089.00</b>

**MOVE IN** \$3,561.76

**GRAND TOTAL** **\$175,753.87**



## SUMMARY OF CONSTRUCTION COST

Sale: Continental Loop

Road: Segment A to B

Construction - \_\_\_\_\_ stations  
 \_\_\_\_\_ miles

Improvement - 27 + 00 stations  
0.51 miles

**CLEARING AND GRUBBING -**

Side cast	0.00 acres @	\$513.00 per acre =	\$0.00
Scattering	0.00 acres @	\$790.00 per acre =	\$0.00
Piling	0.00 acres @	\$877.00 per acre =	\$0.00
Pile-Burn	0.00 acres @	\$1,458.00 per acre =	\$0.00
Endhaul	0.00 acres @	\$1,500.00 per acre =	\$0.00
<b>TOTAL CLEARING AND GRUBBING</b>			<b>\$0.00</b>

**EXCAVATION, ENHAUL & COMPACT**

Ditchline Material	80 cys. @	\$2.60 per c.y. =	\$208.00
	0 cys. @	\$0.00 per c.y. =	\$0.00
	0 cys. @	\$0.00 per c.y. =	\$0.00
	0 cys. @	\$0.00 per c.y. =	\$0.00
<b>TOTAL EXCAVATION</b>			<b>\$208.00</b>

**CULVERTS - MATERIALS & INSTALLATION**

**Culverts**

0 LF of 18" \$0.00	0 LF of 24" \$0.00
0 LF of 30" \$0.00	0 LF of 36" \$0.00
0 LF of 42" \$0.00	0 LF of 48" \$0.00
0 LF of 54" \$0.00	0 LF of 60" \$0.00
\$0.00	\$0.00

**Half Rounds**

0 LF of 21" \$0.00	0 LF of 30" \$0.00
0 LF of 36" \$0.00	0 LF of 42" \$0.00
0 LF of 48" \$0.00	0 LF of 54" \$0.00
0 LF of 60" \$0.00	0 LF of 66" \$0.00
\$0.00	\$0.00

**Culvert Stakes**

0 stakes	\$0.00
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**TOTAL CULVERTS \$0.00**

**SURFACING-**

200 cy. of Crushed @	\$4.50 per c.y. = \$900.00
<b>TOTAL SURFACING \$900.00</b>	

**SPECIAL PROJECTS**

Grade Road - .3 @ \$655/Miles .2 Miles @ \$574/Mile	\$311.30
Roll road - 27 stations @ \$11/Station	\$297.00
Grass seed and fertilize - .2 acres @ \$180/acre	\$36.00
<b>TOTAL SPECIAL PROJECTS \$644.30</b>	

**GRAND TOTAL \$1,752.30**

## SUMMARY OF CONSTRUCTION COST

Sale: Continental Loop

Road: Segment C to D

Construction - \_\_\_\_\_ stations  
 \_\_\_\_\_ miles

Improvement - 52 + 80 stations  
1.00 miles

**CLEARING AND GRUBBING -**

Side cast	0.00 acres @	\$513.00 per acre =	\$0.00
Scattering -	0.00 acres @	\$790.00 per acre =	\$0.00
Piling	0.00 acres @	\$877.00 per acre =	\$0.00
Pile-Burn	0.00 acres @	\$1,458.00 per acre =	\$0.00
Endhaul	0.00 acres @	\$1,500.00 per acre =	\$0.00
<b>TOTAL CLEARING AND GRUBBING</b>			<b>\$0.00</b>

**EXCAVATION, ENDHAUL & COMPACT**

Sidecast Pullback	530 cys. @	\$2.60 per c.y. =	\$1,378.00
Road Widening &	0 cys. @	\$0.00 per c.y. =	\$0.00
Ditchline	0 cys. @	\$0.00 per c.y. =	\$0.00
	0 cys. @	\$0.00 per c.y. =	\$0.00
<b>TOTAL EXCAVATION</b>			<b>\$1,378.00</b>

**CULVERTS - MATERIALS & INSTALLATION**

**Culverts**

136 LF of 18"	\$2,108.00	0 LF of 24"	\$0.00
0 LF of 30"	\$0.00	0 LF of 36"	\$0.00
0 LF of 42"	\$0.00	0 LF of 48"	\$0.00
0 LF of 54"	\$0.00	0 LF of 60"	\$0.00
	<u>\$2,108.00</u>		<u>\$0.00</u>

**Half Rounds**

0 LF of 21"	\$0.00	0 LF of 30"	\$0.00
0 LF of 36"	\$0.00	0 LF of 42"	\$0.00
0 LF of 48"	\$0.00	0 LF of 54"	\$0.00
0 LF of 60"	\$0.00	0 LF of 66"	\$0.00
	<u>\$0.00</u>		<u>\$0.00</u>

**Culvert Stakes**

5 markers \$30.00

**TOTAL CULVERTS \$2,138.00**

**SURFACING-**

220 cy. of Crushed	@	\$5.39 per c.y. =	\$1,185.80
296 cy. of Jaw Run	@	\$10.86 per c.y. =	\$3,214.56
<b>TOTAL SURFACING</b>			<b>\$4,400.36</b>

**SPECIAL PROJECTS**

Grade Road - .7 @ \$655/mile .3 @ \$574	\$630.70	
Roll Road - 52.8 stations @ \$11/station	\$580.80	
Grass seed and fertilize - .36 acres @ \$180/acre	\$64.80	
<b>TOTAL SPECIAL PROJECTS</b>		<b>\$1,276.30</b>

**GRAND TOTAL \$9,192.66**

## SUMMARY OF CONSTRUCTION COST

Sale: Continental Loop

Road: Segment E to F

Construction - \_\_\_\_\_ stations  
 \_\_\_\_\_ miles

Improvement - 27 + 30 stations  
0.52 miles

**CLEARING AND GRUBBING -**

Side cast	0.00 acres @	\$513.00 per acre =	\$0.00
Scattering	0.71 acres @	\$790.00 per acre =	\$560.90
Piling	0.00 acres @	\$877.00 per acre =	\$0.00
Pile-Burn	0.00 acres @	\$1,458.00 per acre =	\$0.00
Endhaul	0.00 acres @	\$1,500.00 per acre =	\$0.00
<b>TOTAL CLEARING AND GRUBBING</b>			<b>\$560.90</b>

**EXCAVATION, ENHAUL & COMPACT**

Sidecast pullback,	1870 cys. @	\$2.80 per c.y. =	\$5,236.00
Road widening &	0 cys. @	\$0.00 per c.y. =	\$0.00
Berm removal	0 cys. @	\$0.00 per c.y. =	\$0.00
	0 cys. @	\$0.00 per c.y. =	\$0.00
<b>TOTAL EXCAVATION</b>			<b>\$5,236.00</b>

**CULVERTS - MATERIALS & INSTALLATION**

Culverts

0 LF of 18"	\$0.00	0 LF of 24"	\$0.00
0 LF of 30"	\$0.00	0 LF of 36"	\$0.00
0 LF of 42"	\$0.00	0 LF of 48"	\$0.00
0 LF of 54"	\$0.00	0 LF of 60"	\$0.00
	<u>\$0.00</u>		<u>\$0.00</u>

Half Rounds

0 LF of 21"	\$0.00	0 LF of 30"	\$0.00
0 LF of 36"	\$0.00	0 LF of 42"	\$0.00
0 LF of 48"	\$0.00	0 LF of 54"	\$0.00
0 LF of 60"	\$0.00	0 LF of 66"	\$0.00
	<u>\$0.00</u>		<u>\$0.00</u>

Culvert Stakes

0 stakes	\$0.00
0 markers	\$0.00
	<u>\$0.00</u>

**TOTAL CULVERTS \$0.00**

**SURFACING-**

0 cy. of	@	\$0.00 per c.y. =	\$0.00
<b>TOTAL SURFACING</b>			<b>\$0.00</b>

**SPECIAL PROJECTS**

Construct water bars -	\$250.00	
Grass seed and fertilize - .75 acres @ \$180/acre	\$135.00	
Mulch sidecast pullback areas & cutslopes - .5 acres @ \$1000/acre	\$500.00	
<b>TOTAL SPECIAL PROJECTS</b>		<b>\$635.00</b>

**GRAND TOTAL \$6,431.90**

## SUMMARY OF CONSTRUCTION COST

Sale: Continental Loop

Road: Segment G to H

Construction -                      stations  
                     miles

Improvement - 50 + 20 stations  
0.95 miles

**CLEARING AND GRUBBING -**

Side cast	0.00 acres @	\$513.00 per acre =	\$0.00
Scattering	3.10 acres @	\$790.00 per acre =	\$2,449.00
Piling	0.00 acres @	\$877.00 per acre =	\$0.00
Pile-Burn	0.00 acres @	\$1,458.00 per acre =	\$0.00
Endhaul	0.00 acres @	\$1,500.00 per acre =	\$0.00
		<b>TOTAL CLEARING AND GRUBBING</b>	<b>\$2,449.00</b>

**EXCAVATION, ENDHAUL & COMPACT**

	16 sta. @	\$65.00 per sta. =	\$1,040.00
Road widening(common)	320 cys. @	\$2.25 per c.y. =	\$720.00
Road widening & subgrade(d&s)	120 cys. @	\$4.94 per c.y. =	\$592.80
Sidecast pullback	330 cys. @	\$2.60 per c.y. =	\$858.00
		<b>TOTAL EXCAVATION</b>	<b>\$3,210.80</b>

**CULVERTS - MATERIALS & INSTALLATION**

Culverts

164 LF of 18"	\$2,542.00	0 LF of 24"	\$0.00
0 LF of 30"	\$0.00	0 LF of 36"	\$0.00
0 LF of 42"	\$0.00	0 LF of 48"	\$0.00
0 LF of 54"	\$0.00	0 LF of 60"	\$0.00
	<u>\$2,542.00</u>		<u>\$0.00</u>

Half Rounds

30 LF of 21"	\$356.10	0 LF of 30"	\$0.00
0 LF of 36"	\$0.00	0 LF of 42"	\$0.00
0 LF of 48"	\$0.00	0 LF of 54"	\$0.00
0 LF of 60"	\$0.00	0 LF of 66"	\$0.00
	<u>\$356.10</u>		<u>\$0.00</u>

Culvert Stakes

10 stakes	\$80.00		
7 markers	\$42.00		
	<u>\$122.00</u>	<b>TOTAL CULVERTS</b>	<b>\$3,020.10</b>

**SURFACING-**

Road & curve	2,297 cy. of	Jaw run @	\$10.32 per c.y. =	\$23,705.04
To's -7	105 cy. of	Jaw run @	\$10.32 per c.y. =	\$1,083.60
Ta -1	15 cy. of	Jaw run @	\$10.32 per c.y. =	\$154.80
			<b>TOTAL SURFACING</b>	<b>\$24,943.44</b>

**SPECIAL PROJECTS**

Grade and shape subgrade - .9 miles @ \$655/mile	\$589.50
Grade and shape subgrade - .1 miles @ \$574/mile	\$57.40
Roll subgrade prior to rocking - 50.2 stations @ \$111/ station	\$552.20
Seed and fertilize - 1.6 acres @ \$180/acre	\$288.00
	<b>TOTAL SPECIAL PROJECTS</b>
	<b>\$1,487.10</b>

**GRAND TOTAL** **\$35,110.44**

## SUMMARY OF CONSTRUCTION COST

Sale: Continental Loop

Road: Segment I to J

Construction - 2 + 00 stations  
0.04 miles

Improvement - \_\_\_\_\_ stations  
\_\_\_\_\_ miles

**CLEARING AND GRUBBING -**

Side cast	0.00 acres @	\$513.00 per acre =	\$0.00
Scattering	0.18 acres @	\$790.00 per acre =	\$142.20
Piling	0.00 acres @	\$877.00 per acre =	\$0.00
Pile-Burn	0.00 acres @	\$1,458.00 per acre =	\$0.00
Endhaul	0.00 acres @	\$1,500.00 per acre =	\$0.00
		<b>TOTAL CLEARING AND GRUBBING</b>	<b>\$142.20</b>

**EXCAVATION, ENHAUL & COMPACT**

	2 sta.. @	\$65.00 per sta. =	\$130.00
	0 cys. @	\$0.00 per c.y. =	\$0.00
	0 cys. @	\$0.00 per c.y. =	\$0.00
	0 cys. @	\$0.00 per c.y. =	\$0.00
		<b>TOTAL EXCAVATION</b>	<b>\$130.00</b>

**CULVERTS - MATERIALS & INSTALLATION**

**Culverts**

0 LF of 18" \$0.00	0 LF of 24" \$0.00
0 LF of 30" \$0.00	0 LF of 36" \$0.00
0 LF of 42" \$0.00	0 LF of 48" \$0.00
0 LF of 54" \$0.00	0 LF of 60" \$0.00
\$0.00	\$0.00

**Half Rounds**

0 LF of 21" \$0.00	0 LF of 30" \$0.00
0 LF of 36" \$0.00	0 LF of 42" \$0.00
0 LF of 48" \$0.00	0 LF of 54" \$0.00
0 LF of 60" \$0.00	0 LF of 66" \$0.00
\$0.00	\$0.00

**Culvert Stakes**

0 stakes	\$0.00
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**TOTAL CULVERTS \$0.00**

**SURFACING-**

103 cy. of Jaw run @	\$10.32 per c.y. =	\$1,062.96
		<b>TOTAL SURFACING \$1,062.96</b>

**SPECIAL PROJECTS**

Roll road -	\$22.00
<u>Grade Road - .04 miles @ \$574/Mile</u>	<u>\$22.96</u>
<u>Grass seed and fertilize -</u>	<u>\$19.50</u>
	<b>TOTAL SPECIAL PROJECTS \$64.46</b>

**GRAND TOTAL \$1,399.62**

## SUMMARY OF CONSTRUCTION COST

Sale: Continental Loop

Road: Segment K to L

Construction - 0 stations  
0.00 miles

Improvement - 2 + 00 stations  
0.04 miles

**CLEARING AND GRUBBING -**

Side cast	0.00	acres @	\$513.00 per acre =	\$0.00	
Scattering	0.00	acres @	\$790.00 per acre =	\$0.00	
Piling	0.00	acres @	\$877.00 per acre =	\$0.00	
Pile-Burn	0.00	acres @	\$1,458.00 per acre =	\$0.00	
Endhaul	0.00	acres @	\$1,500.00 per acre =	\$0.00	
<b>TOTAL CLEARING AND GRUBBING</b>				<b>\$0.00</b>	

**EXCAVATION, ENHAUL & COMPACT**

0 sta.. @			\$0.00 per sta. =	\$0.00	
0 cys. @			\$0.00 per c.y. =	\$0.00	
0 cys. @			\$0.00 per c.y. =	\$0.00	
0 cys. @			\$0.00 per c.y. =	\$0.00	
<b>TOTAL EXCAVATION</b>				<b>\$0.00</b>	

**CULVERTS - MATERIALS & INSTALLATION**

**Culverts**

0	LF of 18"	\$0.00		0	LF of 24"	\$0.00
0	LF of 30"	\$0.00		0	LF of 36"	\$0.00
0	LF of 42"	\$0.00		0	LF of 48"	\$0.00
0	LF of 54"	\$0.00		0	LF of 60"	\$0.00
<u>\$0.00</u>				<u>\$0.00</u>		

**Half Rounds**

0	LF of 21"	\$0.00		0	LF of 30"	\$0.00
0	LF of 36"	\$0.00		0	LF of 42"	\$0.00
0	LF of 48"	\$0.00		0	LF of 54"	\$0.00
0	LF of 60"	\$0.00		0	LF of 66"	\$0.00
<u>\$0.00</u>				<u>\$0.00</u>		

**Culvert Stakes**

0	stakes	\$0.00				
<u>\$0.00</u>						

**TOTAL CULVERTS \$0.00**

**SURFACING-**

66	cy. of	Crushed	@	\$5.57 per c.y. =	\$367.62	
<b>TOTAL SURFACING</b>					<b>\$367.62</b>	

**SPECIAL PROJECTS**

Grade Road - .04 miles @ \$655/Mile				\$26.20	
<b>TOTAL SPECIAL PROJECTS</b>				<b>\$26.20</b>	

**GRAND TOTAL \$393.82**

## SUMMARY OF CONSTRUCTION COST

Sale: Continental Loop Road: Segment M to N / Kansas Creek

Construction - \_\_\_\_\_ stations Storm Damage Repair 54 + 50 stations  
 \_\_\_\_\_ miles 1.03 miles

**CLEARING AND GRUBBING -**

Side cast	0.00 acres @	\$513.00 per acre =	\$0.00
Scattering	0.45 acres @	\$790.00 per acre =	\$355.50
Piling	0.00 acres @	\$877.00 per acre =	\$0.00
Pile-Burn	0.00 acres @	\$1,458.00 per acre =	\$0.00
Endhaul	0.00 acres @	\$1,500.00 per acre =	\$0.00
<b>TOTAL CLEARING AND GRUBBING</b>			<b>\$355.50</b>

**EXCAVATION -**

(See segment O to P cost sheet for fill material cost)

Reconstruct	15 sta. @	\$65.00 per sta. =	\$975.00
C235 - cleanup, rehab & pullback	24 hrs. @	\$115.00 per hr. =	\$2,760.00
53 + 00 to 55 + 00 - c235, D8 & truck	10 hrs. @	\$302.67 per hr. =	\$3,026.70
<b>TOTAL EXCAVATION</b>			<b>\$6,761.70</b>

**CULVERTS - MATERIALS ONLY**

Culverts

34 LF of 18"	\$527.00	80 LF of 90"	\$7,704.80
0 LF of 30"	\$0.00	70 171" x 110"	\$17,168.20
0 LF of 42"	\$0.00	56 LF of 36"	\$1,732.64
0 LF of 54"	\$0.00	0 LF of 60"	\$0.00
	<u>\$527.00</u>		<u>\$26,605.64</u>

Half Rounds

0 LF of 21"	\$0.00	0 LF of 30"	\$0.00
0 LF of 36"	\$0.00	0 LF of 42"	\$0.00
0 LF of 48"	\$0.00	0 LF of 54"	\$0.00
0 LF of 60"	\$0.00	0 LF of 66"	\$0.00
	<u>\$0.00</u>		<u>\$0.00</u>

Culvert Stakes

4 Markers	<u>\$24.00</u>
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**TOTAL CULVERTS \$27,156.64**

**SURFACING-**

Road	1,371 cy. of	Crushed @	\$8.01 per c.y. =	\$10,981.71
Fill armor	750 cy. of	Rip rap @	\$10.62 per c.y. =	\$7,965.00
Bedding rock	126 cy. of	Crushed @	\$6.77 per c.y. =	\$853.02
Bedding rock	190 cy. of	1 1/2"-0" @	\$16.00 per c.y. =	\$3,040.00
Ditchline fill	610 cy. of	Pit run @	\$8.93 per c.y. =	\$5,447.30
<b>TOTAL SURFACING</b>				<b>\$28,287.03</b>

**SPECIAL PROJECTS**

Install culvert @ station 7 + 75	\$2,052.00	
Install culvert @ station 32 + 15	\$6,345.05	
3" trash pumps for water diversion	\$400.00	
Culvert Bands for 96" culvert- 3 @ \$128.80/ea Gaskets- 3 @ \$98.90/ea	\$683.10	
Culvert Bands for 171" culvert- 2 @ \$254.97/ea Gasket- 2 @ \$86.43/ea	\$682.80	
Construct 2 rolling dips @ \$65/ea	\$130.00	
Hand tamper -	\$852.00	
Grade and shape - .38 miles @ \$655/mile	\$248.90	
Roll Subgrade - 21 stations @ \$11/station	\$231.00	
Grass Seed - 1.3 acres @ \$180/acre	\$234.00	
Mulch - 1.3 acres @ \$1000/acre	\$1,300.00	
<b>TOTAL SPECIAL PROJECTS</b>		<b>\$13,158.85</b>

**GRAND TOTAL**

**\$75,719.72**

## SUMMARY OF CONSTRUCTION COST

Sale:	Continental Loop					Road:	Segment O to P
Construction -	_____ stations			Improvement -	4 + 75 stations		
	_____ miles				0.10 miles		
<b>CLEARING AND GRUBBING -</b>							
Side cast	0.00	acres @	\$513.00	per acre =	\$0.00		
Scattering - Incl. Waste & Borrow area	0.80	acres @	\$790.00	per acre =	\$632.00		
Piling	0.00	acres @	\$877.00	per acre =	\$0.00		
Pile-Burn	0.00	acres @	\$1,458.00	per acre =	\$0.00		
Endhaul	0.00	acres @	\$1,500.00	per acre =	\$0.00		
				<b>TOTAL CLEARING AND GRUBBING</b>			<b>\$632.00</b>
<b>EXCAVATION, ENDHAUL &amp; COMPACT</b>							
Waste area (Kansas Crk. Rd. fill)	3650	cys. @	\$4.27	per c.y. =	\$15,585.50		
Waste area (Kansas Crk. Rd. fill)	1311	cys. @	\$3.35	per c.y. =	\$4,391.85		
Waste area #2 (upper Blue Ridge)	1000	cys. @	\$3.40	per c.y. =	\$3,400.00		
Waste area #2 (upper Blue Ridge)	60	cys. @	\$4.90	per c.y. =	\$294.00		
				<b>TOTAL EXCAVATION</b>			<b>\$23,671.35</b>
<b>CULVERTS - MATERIALS &amp; INSTALLATION</b>							
	<b>Culverts</b>						
44	LF of 18"	\$682.00		68	LF of 24"	\$1,251.88	
0	LF of 30"	\$0.00		42	LF of 36"	\$1,299.48	
0	LF of 42"	\$0.00		0	LF of 48"	\$0.00	
0	LF of 54"	\$0.00		0	LF of 60"	\$0.00	
		<u>\$682.00</u>				<u>\$2,551.36</u>	
	<b>Half Rounds</b>						
0	LF of 21"	\$0.00		0	LF of 30"	\$0.00	
0	LF of 36"	\$0.00		0	LF of 42"	\$0.00	
0	LF of 48"	\$0.00		0	LF of 54"	\$0.00	
0	LF of 60"	\$0.00		0	LF of 66"	\$0.00	
		<u>\$0.00</u>				<u>\$0.00</u>	
	<b>Culvert Stakes</b>						
4	markers	<u>\$24.00</u>					
				<b>TOTAL CULVERTS</b>			<b>\$3,257.36</b>
<b>SURFACING-</b>							
9" lift (26 + 30-29 + 50)	160	cy. of	Crushed @	\$8.92	per c.y. =	\$1,427.20	
6" lift (0 + 00-2 + 50)	83	cy. of	Crushed @	\$8.02	per c.y. =	\$665.66	
6" lift (109 + 85-110 + 85)	33	cy. of	Crushed @	\$14.06	per c.y. =	\$463.98	
2 + 50, 26 + 80 & 29 + 40	30	cy. of	Rip rap @	\$11.52	per c.y. =	\$345.60	
				<b>TOTAL SURFACING</b>			<b>\$2,902.44</b>
<b>SPECIAL PROJECTS</b>							
Grade and shape - .1 miles @ \$655/mile						\$65.50	
Roll subgrade - 6 stations @ \$11/ station						\$66.00	
Grass seed and fertilize - .6 acres @ \$180/						\$108.00	
Mulch - .4 acres @ \$1000 acre						\$400.00	
				<b>TOTAL SPECIAL PROJECTS</b>			<b>\$639.50</b>
<b>GRAND TOTAL</b>							<b>\$31,102.65</b>



## JAW RUN ROCK PIT DEVELOPMENT COST SUMMARY

Pit: <u>Lloyds</u>	Location: <u>SE 1/4, NW 1/4, Sec 2 T1S, R8W, W.M.</u>
Sale: <u>Continental Loop</u>	Road: <u>2816 c.y.</u>
Swell: <u>1.30</u>	Stockpile: <u>c.y.</u>
Shrinkage: <u>1.16</u>	Total Truck Loads: <u>2816 c.y.</u>
Drill Pct.: <u>50%</u>	In Place Total: <span style="border: 1px solid black; padding: 2px;"><u>2166 c.y.</u></span>

Clear and grub - .7 acres @ \$790/acre	\$553.00
Access road, clear overburden and develop crushing area: 20 hrs. with D-8 @ \$130.30/hr	
Drill & Shoot: <u>\$2.10 /cu.yd.</u> x <u>1083 cu.yds.</u> =	\$2,274.30
Strip Rock: <u>\$1.50 /cu.yd.</u> x <u>1083 cu.yds.</u> =	\$1,624.50
Push Rock: <u>\$0.60 /cu.yd.</u> x <u>2816 cu.yds.</u> =	\$1,689.60
Load crusher: <u>\$0.60 /cu.yd.</u> x <u>2816 cu.yds.</u> =	\$1,689.60
Crushing Jawrun <u>\$1.85 /cu.yd.</u> x <u>2816 cu.yds.</u> =	\$5,209.60
Load Dump Truck: <u>\$0.60 /cu.yd.</u> x <u>2816 cu.yds.</u> =	\$1,689.60
Subtotal	\$17,336.20

Move in Crusher - Jaw	\$1,351.28
Move in and set up drill and compressor	\$241.90
Move in D-8 (within area)	\$102.12
Move in excavator (within area)	\$146.40
Move in loader	\$224.46
Move in grader	\$139.78
Move in roller	\$139.78
Move in trucks	\$378.24
Subtotal	\$2,723.96

<b>TOTAL PRODUCTION COSTS</b>	<b>\$20,060.16</b>
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Base Cost = \$7.12 Per Cu.Yd.

Road Segment	Haul Cost /cu.yd.	Proc Cost /cu.yd.	Base Cst. /cu.yd.	Cost /cu.yd.	Number Cu. Yds	ROCK COST
C to D	\$3.14	\$0.60	\$7.12	\$10.86	296	\$3,214.56
G to H	\$2.60	\$0.60	\$7.12	\$10.32	2417	\$24,943.44
I to J	\$2.60	\$0.60	\$7.12	\$10.32	103	\$1,062.96
					2816	Subtotal \$29,220.96

<b>TOTAL ROCKING COSTS</b>	<b>\$29,220.96</b>
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## PIT RUN ROCK DEVELOPMENT COST SUMMARY

Pit: <u>Hembre</u>	Location: <u>Section 18, T1S, R7W, W.M.</u>
Sale: <u>Continental Loop</u>	Road: <u>610 c.y.</u>
Swell: <u>1.40</u>	Stockpile Base: <u>c.y.</u>
Shrinkage: <u>1.16</u>	Total Truck Loads: <u>610 c.y.</u>
Drill Pct.: <u>0%</u>	In Place Total: <span style="border: 1px solid black; padding: 2px;"><u>436 c.y.</u></span>

Clear and grub - .3 acres @ \$790/acre	\$237.00
Clear overburden, haul to waste area and compact: 4 hrs. w/c235	
4 hrs. w/truck:	\$690.68
Strip rock: <u>\$1.50 /cu.yd.</u> x <u>436 cu.yds.</u> =	\$654.00
Load Dump Truck: <u>\$0.60 /cu.yd.</u> x <u>610 cu.yds.</u> =	\$366.00
Subtotal	\$1,947.68

Move in excavator - within area	\$256.20
Move in truck	\$83.52
Subtotal	\$339.72

<b>TOTAL PRODUCTION COSTS</b>	<b>\$2,287.40</b>
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Base Cost = \$3.75 Per Cu.Yd.

Road Segment	Haul Cost /cu.yd.	Proc Cost /cu.yd.	Base Cst. /cu.yd.	Cost /cu.yd.	Number Cu. Yds	ROCK COST
M to N	\$4.58	\$0.60	\$3.75	\$8.93	610	\$5,447.30
			Total C.Y.		610	Sub Total
						\$5,447.30

<b>TOTAL ROCKING COSTS</b>	<b>\$5,447.30</b>
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## RIP RAP ROCK COST SUMMARY

Pit: Highway  
 Rock: Rip rap  
 Swell: 1.30  
 Shrinkage: 1.16  
 Drill Pct.: 100%

Location: Section 19,T1N, R7W, W.M.  
 Road: 780 c.y.  
 Stockpile: c.y.  
 Total Truck Loads: 780 c.y.  
 In Place Total: c.y.

Load Rock: \$1.37 /cu.yd. x 780 cu.yds. = \$1,068.60  
 Subtotal \$1,068.60

Move in excavator \$309.14  
 Move in trucks \$334.08  
 Subtotal \$643.22

**TOTAL PRODUCTION COSTS \$1,711.82**

Base Cost \$2.19 Per Cu.Yd.

Road Segment	Haul Cost /cu.yd.	Proc Cost /cu.yd.	Base Cst. /cu.yd.	Cost /cu.yd.	Number Cu. Yds	ROCK COST
M to N	\$7.06	\$1.37	\$2.19	\$10.62	750	\$7,965.00
O to P	\$7.96	\$1.37	\$2.19	\$11.52	30	\$345.60
	Total C.Y.				780	Sub Total \$8,310.60

**TOTAL ROCKING COSTS \$8,310.60**

## CRUSHED ROCK COST SUMMARY

Pit: <u>Highway</u>	Location: <u>Section 19, T1N, R7W, W.M.</u>
Rock: <u>Crushed</u>	Road: <u>1773 c.y.</u>
Swell: <u>1.30</u>	Stockpile: <u>c.y.</u>
Shrinkage: <u>1.16</u>	Total Truck Loads: <u>1773 c.y.</u>
Drill Pct.: <u>100%</u>	In Place Total: <span style="border: 1px solid black; padding: 2px;">c.y.</span>

Load Rock: \$0.60 /cu.yd. x 1,773 cu.yds. = \$1,063.80  
 Subtotal \$1,063.80

Move in Loader	\$224.46
Move in grader	\$139.78
Move in roller	\$139.78
Move in trucks	\$334.08
Subtotal	<u>\$838.10</u>

<b>TOTAL PRODUCTION COSTS</b>	<b>\$1,901.90</b>
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Base Cost \$1.07 Per Cu.Yd.

Road Segment	Haul Cost /cu.yd.	Proc Cost /cu.yd.	Base Cst. /cu.yd.	Cost /cu.yd.	Number Cu. Yds	ROCK COST
M to N	\$5.70	\$1.25	\$1.07	\$8.02	1,371	<u>\$10,995.42</u>
M to N	\$5.70	\$0.00	\$1.07	\$6.77	126	<u>\$853.02</u>
O to P	\$6.60	\$1.25	\$1.07	\$8.92	160	<u>\$1,427.20</u>
O to P	\$5.70	\$1.25	\$1.07	\$8.02	83	<u>\$665.66</u>
O to P	\$12.24	\$0.75	\$1.07	\$14.06	33	<u>\$463.98</u>
Total CY.					1,773	Sub Total <u>\$14,405.28</u>

Commercial Source	Size	Cost/cu.yd.	Cu. Yds.	
M to N	1 1/2"-0"	\$16.00	190	\$3,040.00

<b>TOTAL ROCKING COSTS</b>	<b>\$17,445.28</b>
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## CRUSHED ROCK COST SUMMARY

Pit: Fishermans Access  
 Rock: Crushed  
 Swell: 1.30  
 Shrinkage: 1.16  
 Drill Pct.: 100%

Location: SW 1/4, SW 1/4, 1 S, R8W, W.M.  
 Road: 486 c.y.  
 Stockpile: c.y.  
 Total Truck Loads: 486 c.y.  
 In Place Total: c.y.

Load Rock: \$0.60 /cu.yd. x 486 cu.yds. = \$291.60  
Subtotal \$291.60

Move in Loader (within area) \$40.75  
 Move in grader (within area) \$35.25  
 Move in trucks (within area) \$55.20  
Subtotal \$131.20

**TOTAL PRODUCTION COSTS      \$422.80**

Base Cost \$0.87 Per Cu.Yd.

Road Segment	Haul Cost /cu.yd.	Proc Cost /cu.yd.	Base Cst. /cu.yd.	Cost /cu.yd.	Number Cu. Yds	ROCK COST
A to B	\$3.03	\$0.60	\$0.87	\$4.50	200	<u>\$900.00</u>
C to D	\$3.92	\$0.60	\$0.87	\$5.39	220	<u>\$1,185.80</u>
K to L	\$4.10	\$0.60	\$0.87	\$5.57	66	<u>\$367.62</u>
Total C.Y.					486	Sub Total <u>\$2,453.42</u>

**TOTAL ROCKING COSTS      \$2,453.42**

**MOVE-IN COST SUMMARY**

Sale: Continental Loop

MILEAGE FACTORS			
Distance Factor		Distance Factor	
0-25	0.58	55	1.07
30	0.66	60	1.15
35	0.74	65	1.23
40	0.82	70	1.31
45	0.91	75	1.40
50	1.00	80	1.48

**MILEAGE FACTOR = 0.58**

No.	EQUIPMENT DESCRIPTION	Base Cost	Move in Cost	Within Area Move (\$/mile)	Begin Mileage	End Mileage	Total Miles	Within Area Cost	Total Cost
1	Drill & Compressor	\$241	\$139.78	\$25.53	0	0	4	\$102.12	\$102.12
1	Graders	\$241	\$139.78	\$7.05	0	10	10	\$70.50	\$210.28
0	Loader (1.5 - 2.5 cy)	\$241	\$0.00	\$6.83	0	0	0	\$0.00	\$0.00
0	Loader (3 cy +)	\$387	\$0.00	\$8.15	0	0	0	\$0.00	\$0.00
0	Rollers & Compactors	\$241	\$0.00	\$13.73	0	10	10	\$0.00	\$0.00
2	Excavators	\$533	\$618.28	\$36.60	0	10	10	\$732.00	\$1,350.28
0	Large Backhoes	\$533	\$0.00	\$21.42	0	0	0	\$0.00	\$0.00
0	Small backhoes	\$241	\$0.00	\$3.52	0	0	0	\$0.00	\$0.00
0	Tractors (D5 - D7)	\$385	\$0.00	\$18.47	0	0	0	\$0.00	\$0.00
2	Tractors (D8)	\$533	\$618.28	\$25.53	0	7	7	\$357.42	\$975.70
1	Road Brusher	\$387	\$224.46	\$2.30	0	14	14	\$32.20	\$256.66
6	Dump Truck (10 cy +)	\$144	\$501.12	\$2.76	0	10	10	\$165.60	\$666.72

**TOTAL MOVE-IN COSTS: \$3,561.76**

# REMOVE CULVERTS FROM STATE LANDS COST SHEET

SALE: Continental Loop

<u>Point to Point</u>	<u>Number of Culverts</u>
M to N	6
O to P	4

TOTAL CULVERTS 11

Load culverts @ 0.25 hrs/culvert =	2.75 hrs
Move Backhoe between culverts =	<u>2.75 hrs</u>
Subtotal loading time =	5.50 hrs
Driving and unloading time =	2.00 hrs
Total project time =	<u>7.50 hrs</u>

15.00 hours labor @ \$33.07/hour =	\$496.05
7.50 hours with Dump Truck @ \$24.46/hour =	\$183.45
7.50 hours with trailer @ \$5.00/hour =	\$37.50
5.50 hours with Backhoe @ \$13.09/hour =	\$72.00

**Grand Total**

**\$789.00**

Sale: Continental Loop

Road System:	Name of Road	Miles of Road	Cost Per Mile	Cost Per Segment
Coast Range Road	Powerline Road	1.8	\$1,300.00	\$2,340.00
	Segment A to B	0.5	\$1,000.00	\$500.00
	Segment C to D	1	\$1,300.00	\$1,300.00
	Segment E to F	0.5	\$1,000.00	\$500.00
	Segment G to H	0.65	\$800.00	\$520.00
	Blue Ridge Road	Blue Ridge Road	3	\$800.00
Kansas Creek	Blue Ridge Road	1.4	\$1,000.00	\$1,400.00
	Kansas Creek	1.34	\$1,000.00	\$1,340.00

Total Miles of Road:

10.19

Total Brushing Cost:

\$10,300.00



OREGON DEPARTMENT OF FORESTRY  
CRUISE REPORT



*Continental Loop*

"STEWARDSHIP IN FORESTRY"

1. **Type of Sale:** Clearcut Harvest/ Recovery.
2. **Legal Description:** Portions of Sections 2, 3, and 11, T1S, R8W, W.M., Tillamook County, Oregon.
3. **Sale Acreage:** The sale boundaries were plotted on a digital orthophotograph and the acreage was calculated with GIS.

	Acres
Area I	58
Area II	53
Area III	14
Area IV	11
Area V	18
Total	154

4. **Cruising Procedures:**
  - A. **Cruise Method:** A total of 27 measured plots were taken in Areas I and II. Plots were established on a square grid of 300 X 300 and cruise lines ran in a north south direction. 17 basal area plots were taken in representative portions of Areas III, IV, and V. See attached cruise map for plot location.
  - B. **Plot Size:** A basal area factor of 20 was used. The point observation for conifers and hardwoods was 4.5 feet.
  - C. **Grading System:** Conifers were graded during the cruise in areas I and II. Assignment of grades for area III, IV, and V were based on results from the grade breakdown for areas I and II.
5. **Computation Procedures:** Volume for areas I and II were computed using SuperAce Timberland Appraisal and Planning System from Atterbury Consultants Inc., version 95.02.21. Basal area for areas III, IV and V was calculated from basal area plot data taken. V-BAR (Volume-Basal Area Ratio) for areas III, IV, and V was computed from measurements taken on the sale area (see attached Volume Computation Summary).
6. **Defect and Breakage:** A 5% defect and breakage reduction will be applied to the conifer and hardwood volumes.
7. **Timber Description:** The sale area burned in the 1933 and 1939 fires.

Area I was planted in 1952-1953 and was replanted in 1957-1958. Areas II-V were planted in 1956-1957. Trees range from age 40-50 years across the stand. Alder was sprayed in the early 1970's. This stand is severely infected with Swiss needle cast and has one to two years needle retention and severe discoloration.

8. **Cruiser Names/Dates:** Shaver/Keith, October, 2000.

9. **Revenue Distribution:**

100% FDF

Tax Code: 9-2

Deed Numbers: 168, 169, 186

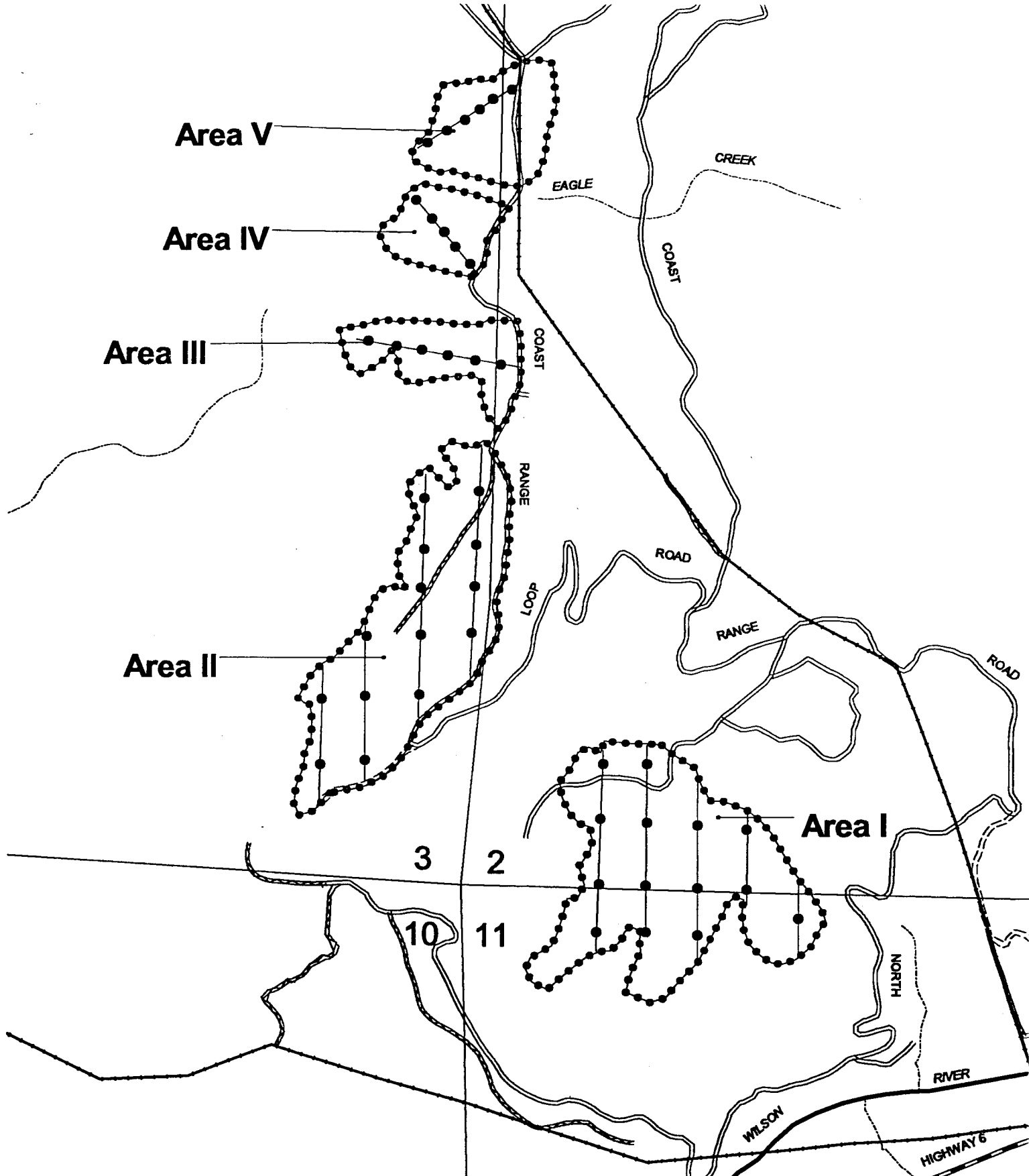
100% Rehabilitation Obligated

10. **Attachments:**

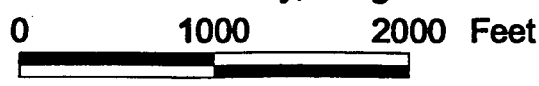
Cruise Map

Volume Summary

Logging Plan



**Cruise Map**  
**Continental Loop**  
 Portions of Sections 2, 3, 11, T1S, R8W, W.M.  
 Tillamook County, Oregon



- Timber sale boundary
- Plot location
- Section line
- Roads**
- ▤ ABANDONED
- ▬ PAVED
- ▬ SURFACED EXISTING
- ▬ UNSURFACED EXISTING
- Streams**
- ▬ Type F
- ▬ Type H
- ▬ PUD transmission line





"STEWARDSHIP IN FORESTRY"

## Continental Loop

### Volume Summary

<b>Area I</b>						
58 acres						
SPECIES	Basal Area Per Acre	V-BAR	Vol/Acre MBF	Volume MBF	D & B	Net Vol MBF
Douglas-fir	103	0	8.2	476	5%	452
Alder	34	0	1.8	104	5%	99
<b>TOTAL</b>				580		551

<b>Area II</b>						
53 acres						
SPECIES	Basal Area Per Acre	V-BAR	Vol/Acre MBF	Volume MBF	D & B	Net Vol MBF
Douglas-fir	133	0	9.4	498	5%	473
Alder	16	0	0.6	32	5%	30
<b>TOTAL</b>				530		504

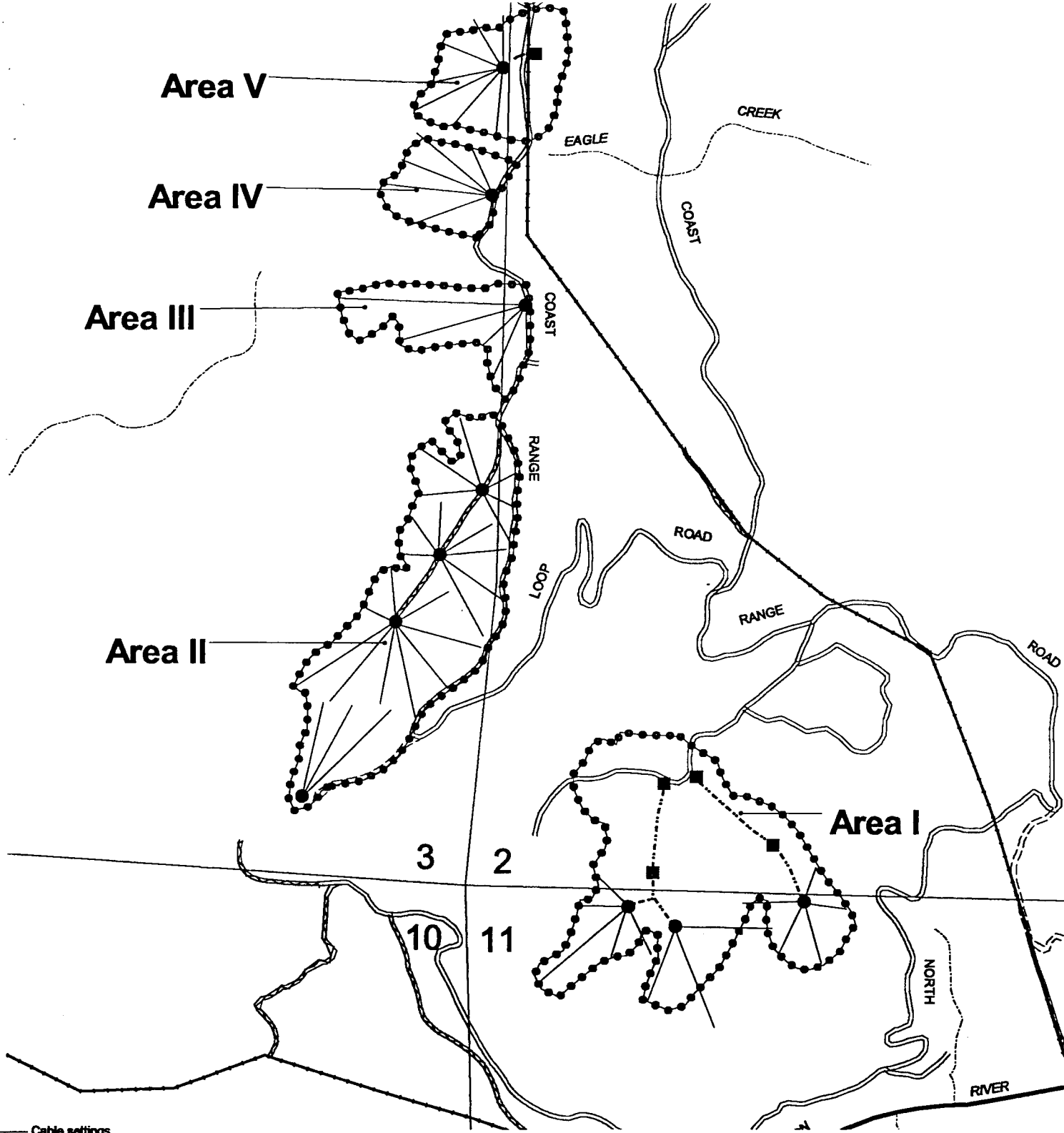
<b>Area III</b>						
14 acres						
SPECIES	Basal Area Per Acre	V-BAR	Vol/Acre MBF	Volume MBF	D & B	Net Vol MBF
Douglas-fir	163	75	12.2	171	5%	163
Alder	0	0	0.0	0	0%	0
<b>TOTAL</b>				171		163

<b>Area IV</b>						
11 acres						
SPECIES	Basal Area Per Acre	V-BAR	Vol/Acre MBF	Volume MBF	D & B	Net Vol MBF
Douglas-fir	180	75	13.5	149	5%	141
Alder	0	0	0.0	0	0%	0
<b>TOTAL</b>				149		141

## Volume Summary

<b>Area V</b>						
18 acres						
SPECIES	Basal Area Per Acre	V-BAR	Vol/Acre MBF	Volume MBF	D & B	Net Vol MBF
Douglas-fir	217	75	16.3	293	5%	278
Alder	0	0	0.0	0	0%	0
<b>TOTAL</b>				293		278

<b>TOTAL SALE VOLUME</b>			
SPECIES	MBF		Net Vol. (MBF)
Douglas-fir	1586		1507
Alder	136		129
<b>TOTAL</b>	1723		1636

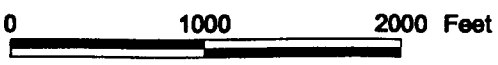


- Cable settings
- Landings
- Tractor
- Cable
- ⋯ timber sale boundary
- Section line
- Roads
- ABANDONED
- - CONSTRUCTION REQUIRED
- ⋯ NON-PROJECT ROADS
- PAVED
- SURFACED EXISTING
- - UNSURFACED EXISTING
- streams
- Type F
- Type N
- PUD TRANSMISSION LINE

**Logging Plan**  
**Continental Loop**  
 Portions of Sections 2, 3, 11, T1S, R8W, W.M.  
 Tillamook County, Oregon



Area	Acres
I	58
II	53
III	14
IV	11
V	18
<b>Total</b>	<b>154</b>



OREGON DEPARTMENT OF FORESTRY

WRITTEN PLAN

Continental Loop Timber Sale

Protected Waters: Kansas Creek, a type F stream.

Location: Sections 10, 14 and 15, T1S, R8W; W.M. Tillamook County.

Activity: Storm damage repair, road rocking, and culvert installation.

Protection Measures: No in stream activity within the tributary stream will be conducted prior to July 1st or after September 15th without prior approval. Work will be performed only during dry weather periods and low water stream flows. Machine activity in the stream will be kept to a minimum. Water will be diverted around the work area to avoid producing stream sediment. Disturbance of existing vegetation will be kept to a minimum. Fill slopes will be constructed at a 1 ½:1 fill width to height ratio. Rip rap rock will be used to armor the inlet and outlet fill slopes to minimize erosion and will be placed using a track mount excavator. Waste material will be end-hauled to stable locations marked in the field. Fill material will be placed and compacted in 8 inch lifts. All disturbed areas will be grass seeded and fertilized to minimize erosion.

Pipe Geometry: The existing stream gradient is at 9.2%. The full bank stream width is 14'. Bed material consists of abundant large cobbles. A 171"x 110" x 70' aluminized steel culvert will be installed at 6.5%. The outlet invert of the culvert will be placed 2.0 feet below existing stream gradient and the inlet invert will be placed 3.87 feet below the existing stream gradient. This will result in a cross sectional area at the inlet of 55.2 square feet. The required 50 year peak flow (by ODF method) for this drainage is 107.3 cubic feet per second with a minimum cross sectional area of 19.6 square feet. The site will be monitored to insure that embedding is achieved. Further information is available in Exhibit "B" of the Continental Loop Timber Sale.

Prepared by: Gary Baker  
Road Specialist

Date: February 12, 2001