

LOGGING PLAN
for
GREEN RIVER LOGGING COMPANY

by
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The Tract:

The Green River Tract is located in Twp. 11 North Range 4 East, Willamette Meridan which is in southwest Washington. The area included in this operation is 3840 acres, sections 28, 29, 30, 31, 32, 33. Approximately 590 acres of this area is in reproduction, burned areas or blow downs where there is no timber to be logged.

Drainage:

The southern and eastern part of the tract is drained by the Green River which is a tributary of the Toutle. Two tributary streams of the Green River drain the western half of the area. These streams extend to the extreme northern limits of the tract.

Altitude:

The maximum elevation is 2750 feet, a peak in the northwest quarter of section 30. The Green River climbs from an elevation of 1400 in the southwest corner to 2100 in the northeast corner. There are two peaks at 2300 and one more at an elevation of 2550 feet.

Weather:

Due consideration will be given all major stream crossings, as past records have shown many bridges have been washed out on the major streams in this watershed. The normal rainfall is fifty inches and with the fairly flat canyons, the lower part is subject to floods. There is very little rainfall during the summer months permit-

ting the construction of dirt spur roads for summer use. The weather will permit a working season of 250 days, allowing for a short shut down during periods of extremely low humidity.

Timber:

A detailed cruise of the area showed the following volumes:

Yellow Fir	(Y.F.)	118,150 M
No. 1 Logs	15%	
No. 2 Logs	45%	
No. 3 Logs	40%	
White Fir	(W.F.)	90,200 M
Hemlock	(H.)	
Red Fir	(R.F.)	9,900 M
Western Red Cedar	(C.)	1,367 M
Total		<hr/> 219,617 M

Topography:

The area runs from 75% slopes along the stream beds to practically flat ground. A large part of the area is suitable to cat logging while it is necessary to high lead that timber which lies on the steeper ground.

General Logging Plan:

Truck transportation will be used throughout to deliver the logs to the log dump which is about two miles from Longview. The year by year development will be so planned as to allow summer logging in the far reaches of

the tract. This will allow the use of dirt and some gravel spur roads reducing the length of main line construction. The roads are to have a favorable maximum grade of 18% with a control grade of ten percent. The maximum adverse grade is 2%. There is one spur with an adverse grade. Mainline road construction will be heavy with the view of using them to develop an adjacent tract of timber. Enough spur roads will be constructed to eliminate costly swinging.

Over half the area is suitable for cat logging. A high lead system will be used on the rougher terrain. Cats will be used in conjunction with the high lead to yard in from the far corners beyond the limits of the cable system.

Settings will be staggered in so far as possible to allow for a silvicultural program of reseeding. Three Douglas Fir seed trees will be left on each acre to encourage Douglas Fir restocking.

YEAR BY YEAR DEVELOPMENT OF THE TRACT

Road construction will start well ahead of the logging so the area will be opened to immediate transportation. A two way road will be built from the junction of Green and Toutle Rivers a distance of eleven miles to reach the southwest corner of the tract. It will be necessary to bridge the Toutle. The first roads built in the area will extend into sections 29 and 30.

The settings are numbered according to the section which they are in. The section number precedes the setting number: 30-1. The roads are designated by the setting number at their terminus.

High Lead Log Assemblage Plan

1943					
Side	Acres	H & WF	DF	RF	Total
29-6	67	935	4250		5185
29-5	55	1540	2295		3835
29-4	67	715	4590		5305
29-3	30		2550		2550
					16875 M
1944					
33-10	48	2640			2640
28-6	45	2475			2475
28-7	54	2365	935		3300
33-11	40	2200			2200
32-7	36	1980			1980
32-8	54	2970			2970
32-9	40	2200			2200

1944 (Cont.)

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Side	Acres	H & WF	DF	RF	Total
33-1	56		4250	270	4520
31-10	40	440	2710		<u>3110</u>
			Total		25385

1945

31-11	52	2860			2860
31-8	67		5695		5695
31-9	70	1925	2975		4900
29-1	76	825	5185		6010
31-7	50	2475	425		2900
31-5	40	1100	1700		2800
31-6	52	2860			2860
31-4	40	1100	1700		<u>2800</u>
					30825

1946

31-3	54	275	4165		4440
31-1	48		4080		4080
31-2	40	1980	340		2320
31-12	55	2145	1360		3505
31-13	66	1815	2805		4620
32-1	76	2090	3230		<u>5320</u>
			Total		24285

The High Lead Logging will be finished
September 28, 1946

High Lead Total 97,370 M

Cat Yarding Log Assemblage Plan

<u>1943</u>					
Side	Acres	H & WF	DF	RF	Total
30-4	40	220	3060		3280
30-3	25	1375			1375
30-2	40	2200			2200
30-6	43		3655		3655
30-5	51	2250	850		3100
30-1	60	3300			3300
				Total	<u>16910</u>

<u>1944</u>					
30-7	83	880	5695		6575
30-8	67	385	5100		5485
30-9	85		7225		7225
30-10	63		5355		5355
29-2	80	2200	3400		5600
32-4	40	1100	1700		2800
				Total	<u>33040</u>

<u>1945</u>					
32-5	48	660	3060		3720
32-6	40	2200			2200
29-7	55	3025			3025
28-1	49	2695			2695
28-2	45	2255	340		2595
28-3	66	3630			3630
28-4	82	4070	680		4750
28-8	80	3960	680		4640

1945 (Cont.)

Side	Acres	H & WF	DF	RF	Total
28-11	35	1925			1925
32-10	60	825	3825		<u>4650</u>
				Total	<u>33830</u>

1946

33-6	53	275	3655	225	4155
33-7	40	2200			2200
33-9	35	1925			1925
33-8	44	2420			2420
28-9	61	330	4675		5005
28-10	43	220	3315		3535
33-2	49	550		1755	2305
33-5	65		425	2700	3125
33-3	61	330		2475	2805
33-4	60		425	2475	2900
32-2	44	1210	1870		<u>3080</u>
				Total	<u>33455</u>

1947

32-3	40		3400		<u>3400</u>
				Total	<u>3400</u>

Cat Logging will be finished
February 8, 1947

Total Cat Logged 120,635 M

Recapitulation of Logging by Years

Year	Acres	Cat	High Lead	Total
1943	478	16,910	16,875	33,785
1944	831	33,040	25,385	58,425
1945	1007	33,830	30,825	64,655
1946	894	33,455	24,285	57,740
1947	<u>40</u>	<u>3,400</u>	<u> </u>	<u>3,400</u>
	3250 A	120,635 M	97,370 M	218,005 M

EMPLOYEES

Woods Operation

Felling & Bucking	17
Yarding	18
Loading	6

Major Transportation

Truck Operation	25
Road Maintenance	4
Road Construction	20
Unloading	1

General Logging

Camp Overhead	5
Fire Protection	2
Shop	3

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INITIAL INVESTMENT

5 Gas Power Saws	2,475
Bucking Equipment	200
200 H.P. Diesel Yarder	21,300
3 D-8 Cats	34,035
2 Fairlead Arches	3,700
2 LeTourneau Dozers	3,870
2 - 125 H.P. Gas Loaders	12,000
Truck Road Construction (first year)	25,000
Camp and Shop	7,500
Electric Power Plant & Wire	1,000
25 - 1½ ton Truck and Trailer	68,500
65 H.P. Gas Loader	3,900
3 Dump Trucks	7,500
Grader - Maintainer	5,000
Cost of Felling & Bucking 5 MM	4,335
Pay - Roll Reserve	10,000
Reserve for UNforseen Expenses	4,000
Total	<u>\$ 207,315</u>

Road Development

Line	Year	Type	Length	Cost/Mile
T-T	1943	2-way-g	11.00	11,600.00
29-3	1943	1-way-g	0.42	3,800.00
28-4	1943	1-way-d	1.18	1,200.00
28-6	1943	1-way-g	2.27	3,800.00
30-4	1943	1-way-d	0.27	1,200.00
30-3	1943	1-way-d	0.38	1,200.00
30-7	1943	1-way-g	0.87	3,800.00
30-8	1943	1-way-d	0.30	1,200.00
28-7	1944	1-way-g	0.27	3,800.00
33-11	1944	1-way-d	0.38	1,200.00
32-8	1944	1-way-d	0.49	1,200.00
32-9	1944	1-way-d	0.23	1,200.00
33-1	1944	1-way-g	0.17	3,800.00
29-1	1944	1-way-g	1.18	3,800.00
30-9	1944	1-way-d	0.34	1,200.00
30-10	1944	1-way-d	0.61	1,200.00
29-2	1944	1-way-g	0.30	3,800.00
31-7	1945	1-way-d	0.32	1,200.00
31-5	1945	1-way-d	0.21	1,200.00
30-1	1945	1-way-g	1.51	3,800.00
31-2	1945	1-way-g	0.49	3,800.00
29-7	1945	1-way-g	0.42	3,800.00
28-3	1945	1-way-d	0.90	1,200.00
28-8	1945	1-way-d	0.53	1,200.00

Road Development (Cont.)

Line	Year	Type	Length	Cost/Mile
28-11	1945	2-way-d	0.26	1,200.00
31-12	1946	1-way-g	0.45	3,800.00
32-1	1946	1-way-d	0.95	1,200.00
28-10	1946	1-way-g	0.95	3,800.00
33-9	1946	1-way-g	0.19	3,800.00
33-5	1946	1-way-d	1-25	1,200.00
33-3	1946	1-way-d	0.15	1,200.00
33-4	1946	1-way-d	0.43	1,200.00
32-3	1946	1-way-g	0.68	3,800.00

Total Miles

2-way-24' gravel road	11.00
1-way-14' gravel road	10.17
1-way-14' dirt road	9.18

Total Cost

2-way-24' gravel road	127,600.00
1-way-14' gravel road	38,646.00
1-way-14' dirt road	<u>11,016.00</u>
	177,362.00

Cost/M - \$ 0.813

Road Costs

Summer - Dirt Spur Roads	1,200.00
Culvert - 400'/Mile @ 1.00/Ft.	400.00
14' bed - 2,200 cu. yds./mi. @ \$1.00/yd	2,200.00
24' bed - gravel main line	
Excavation, grading, labor	7,340.00
6,200 yds pit run rock @ .30	1,860.00
2,000yds crushed rock @ 1.00	2,000.00
Culvert - 400'/Mile @ 1.00/ft.	400.00

Structures - Stream Crossings

Toutle River Truss	10,000.00
Three Stringer Spans on Green River	<u>3,000.00</u>
	13,000.00

Bridges cost/M - \$ 0.059

FALLING AND BUCKING

Cost of Falling (Gas Power Saw)

Initial Investment 865.00

Ave. Ann. Inv. 540.50

Fixed Charges 0.24

Depreciation 1.38

Operating cost

Repair, parts, replacements 3.00

Supplies 1.14

Filing 1.70

Labor

head faller @ 1.20

second faller @ 1.17½

helper @ 1.10

27.80

Overhead 4.60

S & I Insurance 4.54

Total cost/day 44.40-----
Cost/M - \$ 0.355

Falling and Bucking

Cost of Bucking

7 buckers	65.80
1 windfall buck	9.40
1 filer	13.60
1 bull buck	12.60
	<u>101.40</u>
S & I Insurance	10.14
	<u>111.54</u>
Equip.. depreciation @ 7¢/M	<u>17.50</u>
Total cost/day	129.04

Cost/M - \$ 0.516

Yarding and Loading

Cost of Yarding (200 HP Diesel Yarder)

Initial Investment 21,300

Ave. Ann. Investment 12,715

Depreciation 2,130

Fixed charge 807

Operating Costs

repair, parts, replacements 2,337

supplies 1,397

wire rope & rigging 4,835

miscellaneous 200

Labor

1 hooktender 12.60

1 rigging slinger 10.60

1 chaser 9.40

3 choker setters 28.20

1 punk 8.40

1 puncher 11.80

1 fireman 11.80

92.80

S & I Insurance 12.99

cost/day 105.79

cost/season

26,44838,154

cost/M - \$ 1.221

Yarding and Loading

Cost of Yarding (D-8 cat, double drum)

cat	11,345
fairlead arch	1,850
letourneau dozer	<u>1,935</u>
Initial Investment	15,130
Average Annual Investment	9,078

Two Machines Operating

Fixed charges	1,816
Depreciation	6,052
Operating costs	9,884

Labor & Insurance

2 operators	24.00
2 choker setters	18.80
1 chaser	<u>9.40</u>
	52.20
S & NI Ins.	<u>7.31</u>

Cost/day 59.51 cost/seas 14,877

Total cost/season 32,629

Total cost/M - \$ 1.044

Yarding and Loading

Cost of Loading (125 HP Gas Loader)

Initial Investment	6,000
Average Annual Investment	3,300

Two Machines Operating

Fixed charges	660
Depreciation	1,200
Operating charges	

repair, parts, replacements	500
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Gasoline	1,170
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Lub. oil & grease	500
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Wire, ropes, blocks, and rigging	5,000
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Labor

1 head loader	10.60
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1 second loader	9.20
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1 operator	9.60
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	<u>29.40</u>
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S & I Ins	4.12
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cost/day	<u>33.52</u>
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8,380

cost/season

8,380

Total cost/season

25,790

Cost/M - \$ 0.414

Major Transportation

Truck & Trailer (3 ton)

Initial Investment

Chassis, body, cab	2797	
Trailer with brake equipment	<u>2163</u>	4960

Tire value (minus)		<u>1160</u>
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Net investment	3800	
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Fixed expense

Interest on net inv. @ 8%	304	
License and taxes	93	
P.U.C.	180	
Insurance	290	
Storage	30	
Operating overhead and risk 20% of fixed expense/year	<u>179</u>	1076

Fixed expense per day	4.30	
Driver's wage	<u>9.20</u>	
		13.50

Running expenses per mile

Dep. on net inv	.0506
Gas @ 18¢ per gal.	.0212
Oil @ 60¢ per Gal.	.0015
Tires	.0773
Maintenance & repairs	.0100
Sundries, greasing, etc	<u>.0050</u>

Total per mile	.1656
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Average length of haul 25 mi.

Average number of mi. per day - 125

Fixed expenses per day	13.50
Running expenses/ day	<u>20.70</u>
Total cost per day	34.20

Cost per M - 34.20/12.5M - \$ 2.736

Major Transportation

Cost of Unloading (65 HP Gas Loader)

Initial Investment 3,900

Ave Ann Inv 2,200

Fixed charges 220

Depreciation 390

Operating costs

repair, parts, replacements 200

supplies 500

wire rope, blocks, rigging 1,500

Labor

Operator 8.60

S & I Ins 1.20

9.80Total cost per season 2,450
5,260

Cost per/M - \$ 0.084

Road Maintenance

1 dump truck	2,500
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Ave Ann Inv	1,500
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Fixed cost	150
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Depreciation	500
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Labor	
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1 truck driver	8.20
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2 road monkeys	16.00
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S & I Ins	3.39
	<u>27.59</u>

	<u>6,897</u>
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Total cost per year	7,547
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Cost per M - \$ 0.121

Maintainer	5,000
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Ave Ann Inv	2,750
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Fixed cost	275
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Depreciation	500
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Operating costs	750
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Labor	<u>2,400</u>
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Total cost/year	3,925
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Cost per M - \$ 0.063

Rigging Ahead

The cost for rigging is included in the individual cost accounts for the various equipment. However, to insure an even output an allowance for rigging ahead will be made. This will be handled by the D-8 cat which is equipped with double drums.

Allowance for rigging ahead - \$ 0.050

Booming - Rafting - Towing

Since water transportation is much cheaper than truck transportation, the logs will be dumped into the Cowlitz river about a mile from Kelso to be rafted and towed to the Portland market.

Booming and Rafting cost per M \$ 0.55

Towing cost per M \$ 1.65

General Logging Expenses

FIRE INSURANCE

Insurance covers camp, bridges, and other structures - Cost per M \$ 0.010

SLASH DISPOSAL

Cost per M \$ 0.075

General Logging Expense (Cont.)

FIRE PROTECTION

Fire protection will require two guards during the fire season. A cache of fire tools will be kept neat the logging crew, preferably beside the yarder.

Cost per M - \$ 0.025

WEST COAST LUMBERMAN'S DUES

Cost per M - \$ 0.015

STUMPAGE COST

Approximately 220 million board feet of stumpage was acquired in July, 1937, for \$ 800,00. This stumpage averages \$ 3.65 for all species. With the accrued interest charge the stumpage now amounts to

\$ 4.891

 Camp Overhead

Cost of camp	
Building and Maintenance	6,000
Shop cost and Maintenance	2,250
Electric Power Plant and Wire	<u>1,500</u>
	9,750

Cost per M \$ 0.156

 Labor

Logging Boss	3,600
1 field man (Eng)	2,500
Clerk and Bookkeeper	2,000
Bull Cook	1,500
S & I Ins	<u>1,344</u>
	10,944

Cost per M \$ 0.175

Value of Logs at the Market

This stand of timber contains 218,005 M bd ft which
cruises as follows:

Douglas Fir	117,630 M
Hemlock & WF	90,525
Red Fir	9,900

The Douglas Fir will grade:

No. 1 logs	15%
No. 2 logs	45%
No. 3 logs	40%

The Hemlock and White Fir is above average

The Red Fir will grade

No. 2	50%
No. 3	50%

Douglas Fir		
#1 (15%)	17,644 M @ \$28/M	494,032
#2 (45%)	52,934 M @ \$21/M	1,111,614
#3 (40%)	47,052 M @ \$ 16/M	752,832
Hemlock	90525 M @ \$21/M	1,901,025
Red Fir	9,900 M @ \$18/M	178,200
	<u>218,005 M</u>	<u>4,437,703</u>

Average Selling Price Per M - \$ 20.356

SUMMARY OF COSTS

Woods Costs

Falling	0.355	
Bucking	0.516	
Yarding	1.133	
Loading	<u>6.414</u>	2.418

Transportation

Truck operation	2.736	
Unloading	0.084	
Booming & rafting	0.550	
Towing	1.650	
Road Construction	0.813	
Bridges	0.059	
Road Maintenance	0.121	
Maintainer	0.063	
Rigging ahead	<u>0.050</u>	6.126

Camp Overhead

Cost of Camp	0.156	
Labor	<u>0.175</u>	0.331

General Logging Expense

Fire Insurance	0.010	
Slash Disposal	0.075	
Fire Protection	0.025	
Association Dues	0.015	
Stumpage & Int.	<u>4.891</u>	<u>5.016</u>

Total Cost per M 13.891

Average Selling Price Per MM - \$ 20.356

Average Profit Per M \$6.465