Timber Sale Appraisal
Frosty Paw
Sale WO-341-2018-82-

District: West Oregon **Date: December 27, 2017**

Cost Summary

	Conifer	Hardwood	Total
Gross Timber Sale Value	$782,005.88	$2,419.80	$784,425.68
		Project Work:	($37,136.00)
		Advertised Value:	$747,289.68

Timber Sale Appraisal
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District: West Oregon **Date: December 27, 2017**

Timber Description

Location: Portions of Sections 16 and 21, T11S, R7W, W.M., Benton County, Oregon.

Stand Stocking: 60%

Specie Name	AvgDBH	Amortization (%)	Recovery (%)
Douglas - Fir	14	0	97
Maple	13	0	94

Volume by Grade	2S	3S	4S	Camprun	Total
Douglas - Fir	314	1,316	334	0	1,964
Maple	0	0	0	30	30
Total	314	1,316	334	30	1,994

Comments: Pond Values Used: Local Pond Values, October 2017.

Western Hemlock and Other Conifers Stumpage Price = Pond Value minus Logging Cost:
$350/MBF = $620/MBF - $270/MBF

Western redcedar and Other Cedars Stumpage Price = Pond Value minus Logging Cost:
$800/MBF = $1,150/MBF - $350/MBF

Red Alder Stumpage Price = Pond Value minus Logging Cost:
$345/MBF = $615/MBF - $270/MBF

Pulp Logs (Conifer & Hardwoods) = $40/MBF

SCALING COST ALLOWANCE = $5.00/MBF

BRANDING AND PAINTING COST ALLOWANCE = $2.00/MBF

FUEL COST ALLOWANCE = $3.00/Gallon

LOG HAUL:
Costed to Eugene or Toledo.

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

Other Costs (with Profit & Risk to be added):
Intermediate Support/Tail Trees: 9 supports @ $100/support = $900
TOTAL Other Costs (with Profit & Risk to be added) = $900

Other Costs (No Profit & Risk added):
Non-Project Roads and Landings: $750
Invasive Species Equipment Cleaning: $2,000
Water Bar and Block Dirt Roads: 27 stations @ $15.96/station = $430
Firewood Sorting & Landing Piling: 10 landings @ $180/landing = $1,800
Landing Piling Only: 6 landings @ $100/landing = $600
TOTAL Other Costs (No Profit & Risk added) = $5,580

SLASH DISPOSAL COSTS:
Move-in: $1,290
Weed wash: $300
Piling Work: $6,750
TOTAL Slash Disposal = $8,340

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Logging Conditions

Combination#: 1

Douglas - Fir	33.00%
Maple	33.00%

Logging System: Cable: Small Tower <=40 **Process:** Harvester Head Delimbing
yarding distance: Short (400 ft) **downhill yarding:** No
tree size: Mature Private Forest / Regen Cut (250 Bft/tree), 6-11 logs/MBF
loads / day: 12 **bd. ft / load:** 4200
cost / mbf: $146.44
machines: Log Loader (A)
Forwarder
Harvester
Tower Yarder (Small)

Combination#: 2

Douglas - Fir	18.00%
Maple	18.00%

Logging System: Shovel **Process:** Harvester Head Delimbing
yarding distance: Short (400 ft) **downhill yarding:** No
tree size: Mature Private Forest / Regen Cut (250 Bft/tree), 6-11 logs/MBF
loads / day: 12 **bd. ft / load:** 4200
cost / mbf: $106.03
machines: Forwarder
Harvester

Combination#: 3

Douglas - Fir	24.00%
Maple	24.00%

Logging System: Cable: Small Tower <=40 **Process:** Harvester Head Delimbing
yarding distance: Short (400 ft) **downhill yarding:** No
tree size: Small / Thinning 10in (90 Bft/tree), 18-20 logs/MBF
loads / day: 5 **bd. ft / load:** 3800
cost / mbf: $388.44
machines: Log Loader (A)
Forwarder
Harvester
Tower Yarder (Small)

Combination#: 4

Douglas - Fir	25.00%
Maple	25.00%

Logging System: Track Skidder **Process:** Harvester Head Delimbing
yarding distance: Short (400 ft) **downhill yarding:** No
tree size: Small / Thinning 10in (90 Bft/tree), 18-20 logs/MBF
loads / day: 7 **bd. ft / load:** 3800
cost / mbf: $200.90
machines: Forwarder
Harvester

Timber Sale Appraisal
Frosty Paw
Sale WO-341-2018-82-

District: West Oregon **Date: December 27, 2017**

Logging Costs

Operating Seasons:	2.00	**Profit Risk:**	14%
Project Costs:	$37,136.00	**Other Costs (P/R):**	$900.00
Slash Disposal:	$8,340.00	**Other Costs:**	$5,580.00

Miles of Road **Road Maintenance:** $4.32

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

Hauling Costs

Species	$ / MBF	Trips/Day	MBF / Load
Douglas - Fir	$0.00	2.0	4.0
Maple	$0.00	2.0	3.2

Timber Sale Appraisal
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Sale WO-341-2018-82-

District: West Oregon **Date: December 27, 2017**

Logging Costs Breakdown

Logging	Road Maint	Fire Protect	Hauling	Other P/R appl	Profit & Risk	Slash Disposal	Scaling / Brand & Paint	Other	Total
Douglas - Fir									
$210.86	$4.45	$4.40	$100.42	$0.45	$44.88	$4.18	$7.00	$2.80	$379.44
Maple									
$210.86	$4.58	$4.40	$129.18	$0.45	$48.93	$4.18	$7.00	$2.80	$412.38

Specie	Amortization	Pond Value	Stumpage	Amortized
Douglas - Fir	$0.00	$777.61	$398.17	$0.00
Maple	$0.00	$493.04	$80.66	$0.00

Timber Sale Appraisal
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District: West Oregon **Date: December 27, 2017**

Summary

Amortized

Specie	MBF	Value	Total
Douglas - Fir	0	$0.00	$0.00
Maple	0	$0.00	$0.00

Unamortized

Specie	MBF	Value	Total
Douglas - Fir	1,964	$398.17	$782,005.88
Maple	30	$80.66	$2,419.80

Gross Timber Sale Value

Recovery: $784,425.68

Prepared By: Jon Long **Phone:** 541-929-9169

Frosty Paw (341-18-82)
FY 2018

TIMBER CRUISE REPORT

1. **Sale Area Location**: Portions of Sections 16 and 21, T11S, R7W, W.M., Benton County, Oregon.

2. **Fund Distribution:**
   a. **Fund** BOF 100%
   b. **Tax Code**

3. **Sale Acreage by Area:**

Area	Treatment	Gross Acres	Stream Buffers	Existing Roads	Green Tree Retention Areas	Net Sale Acres	Acreage Comp. Method
1	**Modified Clearcut**	86	7	3	1	75	Ortho photo, GIS, GPS
2	**Modified Clearcut**	3	-	-	-	3	Ortho photo, GIS, GPS
3	**Thinning**	82	7	2	-	73	Ortho photo, GIS, GPS
Total		171	14	5	1	151	

4. **Cruisers and Cruise Dates:** The sale area was cruised by Aaron McEwen in October of 2016.

5. **Cruise Method and Computation:** The sale consists of one modified clearcut area that was cruised using variable radius plot sampling. The sale area was cruised using a 20 BAF with plots 2 chains apart taken on transects through the units. In Area 1, 32 cruise plots were taken. 21 cruise plots were taken in Area 3. Cruise plots were measured for DBH and height. Snags were tallied but were not added to the cruise volume. Cruise plot data was entered into a variable plot excel spreadsheet to determine average DBH, TPA and volume per acre. A Hidden defect and breakage of 5% was applied to the resulting volume. A 4% in-growth was added to the volume in Area 1. Volume and grades in Area 2 were estimated at 9 MBF per acre. Grade breakdown was determined by applying the average grade breakdown from several similar sales previously cruised in the area.

   Digital ortho photos, 1991 and 2002 aerial photos, LiDar, and ArcMap 10.4.1 were used to map the boundaries for the sale, and ArcMap 10.4.1 was used to determine gross and net acreage.

6. **Measurement Standards:** Tree heights were measured to the nearest foot to a total height. Diameters were measured to the nearest inch, and a standard form factor of 86 was used. Most trees were graded in 40 foot log segments unless breakage, defect, or length to top of grade cruise diameter warranted otherwise.

7. **Timber Description:** Timber in the sale area consists of 28 to 34 year-old planted Douglas-fir, and minor amounts of red alder and big-leaf maple. An ice storm in November 2014 broke the tops out of approximately two-thirds of the trees. Most breakage was above the merchantable height and trees are still living. The average volume per acre to be harvested (net) is approximately 19.4 MBF in Area 1, 9 MBF in Area 2, and 6.6 MBF in Area 3.

8. Total Volume (MBF) by Species and Grade:

	Species	Gross Cruise Volume	In-Growth (4%)	Hidden D&B (5%)	Net Sale Volume
Area 1	Douglas-fir	1,469	59	73	1,455
	Maple	32	-	2	30
Area 2	Douglas-fir	27	-	1	26
Area 3	Douglas-fir	508	-	25	483
Total		2,036	59	101	1,994

	Species	DBH	Net Vol.	2-Saw	3-Saw	4-Saw	Camp run
Areas 1-3		Grade Percentages		16%	67%	17%	
	Douglas-fir	14	1,964	314	1,316	334	
	Maple	13					30

Attachments: Cruise Plot Spreadsheets

Prepared by: Jon Long Date: 11/13/2017

Unit Forester: _____ Date: _____
Evelyn Hukari

Unit Name: **Frosty Paw, A1**
Date: **10/18/2016**

DBH	DF-Live Tree Cnt	DF-Dead Tree Cnt	BLM Tree Cnt	No. Plots	Trees/Plot Live	Trees/Plot Dead	Trees/Plot BLM	STF	DF-Live Per Acre	DF-Dead Per Acre	BLM Per Acre
8"	1			32	0.03	0.00	0.00	57	1.78	0.00	0.00
9"	5	2		32	0.16	0.06	0.00	46	7.19	2.88	0.00
10"	8	6		32	0.25	0.19	0.00	37	9.25	6.94	0.00
11"	21	4	2	32	0.66	0.13	0.06	30	19.69	3.75	1.88
12"	26	8	3	32	0.81	0.25	0.09	26	21.13	6.50	2.44
13"	34	6	2	32	1.06	0.19	0.06	22	23.38	4.13	1.38
14"	55	1	2	32	1.72	0.03	0.06	19	32.66	0.59	1.19
15"	45	4		32	1.41	0.13	0.00	16	22.50	2.00	0.00
16"	46	1		32	1.44	0.03	0.00	14	20.13	0.44	0.00
17"	17		1	32	0.53	0.00	0.03	13	6.91	0.00	0.41
18"	24	1	1	32	0.75	0.03	0.03	11	8.25	0.34	0.34
19"	12			32	0.38	0.00	0.00	10	3.75	0.00	0.00
20"	6			32	0.19	0.00	0.00	9	1.69	0.00	0.00
21"	3			32	0.09	0.00	0.00	8	0.75	0.00	0.00
22"	2			32	0.06	0.00	0.00	8	0.50	0.00	0.00
23"	1			32	0.03	0.00	0.00	7	0.22	0.00	0.00
24"	3			32	0.09	0.00	0.00	6	0.56	0.00	0.00
Tot.	309	33	11								

Av. Trees/plot	10	1	0	TPA	180	28	8
Trees/Plot Tot.	11.03			TPA Tot.	216		

# Live DF Trees/Ac.	DF Vol./Tree	DF Gross Vol./ Acre	BLM Gross Vol./ Tree	BLM Gross Vol./ Acre
1.78	20	36	0	0
7.19	30	216	20	0
9.25	50	463	30	0
19.69	60	1181	40	75
21.13	70	1479	50	122
23.38	90	2104	60	83
32.66	110	3592	70	83
22.50	130	2925	70	0
20.13	150	3019	80	0
6.91	170	1174	80	33
8.25	190	1568	90	31
3.75	210	788	90	0
1.69	240	405	100	0
0.75	270	203	100	0
0.50	300	150	120	0
0.22	330	72	120	0
0.56	370	208	120	0
	Total Gross	19,580		426
	D&B	0.95	Hidden D&B	0.95
		18,601		405
	in-growth	1.04	in-growth	1.04
	Total Net	19,345	Total Net	421

BA/Acre:	
DF - Live	193
DF - Dead	21
BLM	7
Total	221

BA/Tree:	
DF - Live	1.07
DF - Dead	0.75
BLM	0.90

Av. Stand DBH:	
DF - Live	14.01
DF - Dead	11.71
BLM	12.86
Average	12.90

%SDI:	
DF - Live	0.52
BLM	0.02

Dead Trees = 10% of conifer basal area
4% in-growth for 2017

Unit Name: **Frosty Paw, A2**
Date: **10/18/2016**

DBH	DF-Live Tree Cnt	DF-Dead Tree Cnt	BLM Tree Cnt	No. Plots	Trees/Plot Live	Trees/Plot Dead	Trees/Plot BLM	STF	DF-Live Per Acre	DF-Dead Per Acre	BLM Per Acre
8"				4	0.00	0.00	0.00	57	0.00	0.00	0.00
9"				4	0.00	0.00	0.00	46	0.00	0.00	0.00
10"				4	0.00	0.00	0.00	37	0.00	0.00	0.00
11"				4	0.00	0.00	0.00	30	0.00	0.00	0.00
12"		1		4	0.00	0.25	0.00	26	0.00	6.50	0.00
13"	1	1		4	0.25	0.25	0.00	22	5.50	5.50	0.00
14"	3	2		4	0.75	0.50	0.00	19	14.25	9.50	0.00
15"	1	0		4	0.25	0.00	0.00	16	4.00	0.00	0.00
16"	3	2		4	0.75	0.50	0.00	14	10.50	7.00	0.00
17"	1			4	0.25	0.00	0.00	13	3.25	0.00	0.00
18"	1	1		4	0.25	0.25	0.00	11	2.75	2.75	0.00
19"	1			4	0.25	0.00	0.00	10	2.50	0.00	0.00
20"	2	1		4	0.50	0.25	0.00	9	4.50	2.25	0.00
21"	2			4	0.50	0.00	0.00	8	4.00	0.00	0.00
22"	2			4	0.50	0.00	0.00	8	4.00	0.00	0.00
23"				4	0.00	0.00	0.00	7	0.00	0.00	0.00
24"				4	0.00	0.00	0.00	6	0.00	0.00	0.00
Tot.	17	8	0								

Av. Trees/plot	4	2	0
Trees/Plot Tot.	6.25		

TPA	55
TPA Tot.	89

	34	0	

# Live DF Trees/Ac	DF Vol./Tree	DF Gross Vol./	BLM Gross Vol./ Tree	BLM Gross Vol./ Acre
0.00	20	0	0	0
0.00	30	0	20	0
0.00	50	0	30	0
0.00	60	0	40	0
0.00	70	0	50	0
5.50	90	495	60	0
14.25	110	1568	70	0
4.00	130	520	70	0
10.50	150	1575	80	0
3.25	170	553	80	0
2.75	190	523	90	0
2.50	210	525	90	0
4.50	240	1080	100	0
4.00	270	1080	100	0
4.00	300	1200	120	0
0.00	330	0	120	0
0.00	370	0	120	0
	Total Gross	9,118		-
	D&B	0.95	Hidden D&B	0.95
		8,662		-
	in-growth	1.04	in-growth	1.04
	Total Net	9,008	Total Net	-

BA/Acre:	
DF - Live	85
DF - Dead	40
BLM	0
Total	125

BA/Tree:	
DF - Live	1.54
DF - Dead	1.19
BLM	#DIV/0!

Av. Stand DBH:	
DF - Live	16.80
DF - Dead	14.80
BLM	#DIV/0!
Average	#DIV/0!

%SDI:	
DF - Live	#DIV/0!
BLM	0.00

Dead Trees = 10% of conifer basal area
4% in-growth for 2017

Unit: **Frosty Paw, A3 Thinning**
Date: **08/14/2016**

Current Stand

DIAM. CLASS	# by CLASS	TPA
3		0
4		0
5		0
6		0
7	8	29
8	13	35
9	16	34
10	25	44
11	38	55
12	50	61
13	41	42
14	18	16
15	9	7
16	5	3
17		0
18	2	1
19	1	0
20		0
21		0
22		0
23	1	0
24		0
25		0
26		0
27		0
28		0
Total	227	

SPECIES	D-Fir
BAF	20
# PLOTS	21
TPA	327
BA	216
QMD	11
RD	65
SDI	381

Post - Thin Stand

DIAM. CLASS	# by CLASS	TPA
3		0
4		0
5		0
6		0
7	0	0
8	0	0
9	0	0
10	5	9
11	14	20
12	41	50
13	38	39
14	16	14
15	8	6
16	5	3
17	0	0
18	2	1
19	1	0
20		0
21		0
22		0
23	1	0
24		0
25		0
26		0
27		0
28		0

SPECIES	D-Fir
BAF	20
# PLOTS	21
TPA	142
BA	125
QMD	12.7
RD	35
SDI	208

Diam.	Tree/ac removed	Volume/ tree	Volume/ Acre
8"	35	20	700
9"	34	30	1020
10"	35	50	1750
11"	35	60	2100
12"	11	70	770
13"	3	90	270
14"	2	110	220
15"	1	130	130
16"	0	150	0
	Total/Acre		6960
		D&B	0.95
			6612
		in-growth	1.04
	Net Vol. /Acre		6876

SUMMARY OF ALL PROJECT COSTS

Sale Name: Frosty Paw Date: November 2017
Time: 11:27

Project #1 - New Construction

Road Segment	Length		Cost	
A to B (dirt)	15.4 sta		$4,445	
C to D (dirt)	11.7 sta		$4,521	
E to F (rocked)	3.9 sta		$6,542	
TOTALS	31.0 sta	0.6 Mi		$15,508

Project #2 - Road Improvement

Road Segment	Length		Cost	
1 to 2	119.5 sta		$5,227	
3 to 4	77.6 sta		$6,826	
5 to 6	5.1 sta		$1,130	
7 to 8	6.4 sta		$2,153	
9 to 10	20.8 sta		$2,641	
TOTALS	229.4 sta	4.4 Mi		$17,977

Move in	Cost	
Excavator, C325 or equv.	$1,290	
Dozer, D-7 or equiv.	$805	
Grader, G14 or equiv.	$778	
Vibratory roller	$778	
TOTAL		$3,651

GRAND TOTAL **$37,136**

Compiled by J. Long Date 11/30/2017

SUMMARY OF CONSTRUCTION COST

SALE Frosty Paw Project # 1 LENGTH const 15.4 sta
ROAD A to B (dirt) Unsurfaced, outsloped

CLEARING AND GRUBBING

1.0	acres	@	$1,337.00	/acre	=	$1,337

TOTAL CLEARING AND GRUBBING = $1,337

EXCAVATION With D7 dozer or equivalent

Construct road	15.4	sta	@	$122.00	/sta	=	$1,879
Landing Construction	1	Ldg	@	$389.00	/Ldg	=	$389
Shape/outslope subgrade (with road grader)	15.4	sta	@	$18.35	/sta	=	$283
Compact subgrade (with vibratory roller)	15.4	sta	@	$20.19	/sta	=	$311
Waterbar and block road	15.4	sta	@	$15.96	/sta	=	$246

TOTAL EXCAVATION = $3,108

Compiled by: J.Long
Date: Nov 30, 2017

GRAND TOTAL =====> $4,445

SUMMARY OF CONSTRUCTION COST

SALE	Frosty Paw	Project # 1	LENGTH const	11.7 sta	
ROAD	C to D (dirt)	Unsurfaced, outsloped			

CLEARING AND GRUBBING

0.9	acres	@	$1,337.00	/acre	=	$1,203	
				TOTAL CLEARING AND GRUBBING =			$1,203

EXCAVATION With D7 dozer or equivalent

Construct road	11.7	sta	@	$122.00	/sta	=	$1,427
Landing Construction	2	Ldgs	@	$389.00	/Ldg	=	$778
Shape subgrade (with road grader)	11.7	sta	@	$18.35	/sta	=	$215
Compact subgrade (with vibratory roller)	11.7	sta	@	$20.19	/sta	=	$236
Waterbar and block road	11.7	sta	@	$15.96	/sta	=	$187
					TOTAL EXCAVATION =		$2,843

SURFACING

				Size	Cost/yd		
Junction rock	30	cy of		jaw-run	$15.44	=	$463
Spread/compact rock (with dozer)	0.5	sta	@	$24.28	/sta	=	$12
					TOTAL ROCK COST =		$475

Compiled by: J. Long
Date: Nov 30, 2017

GRAND TOTAL =====> $4,521

SUMMARY OF CONSTRUCTION COST

SALE	Frosty Paw	Project # 1	LENGTH const	3.9 sta	
ROAD	E to F (rocked)	Surfaced, outsloped			

CLEARING AND GRUBBING

0.4	acres	@	$1,337.00	/acre	=	$535	
				TOTAL CLEARING AND GRUBBING =			$535

EXCAVATION	With D7 dozer or equivalent						
Construct road	3.9	sta	@	$122.00	/sta	=	$476
Landing Construction	1	Ldg	@	$389.00	/Ldg	=	$389
Shape subgrade (with road grader)	3.9	sta	@	$18.35	/sta	=	$72
Compact subgrade (with vibratory roller)	3.9	sta	@	$20.19	/sta	=	$79
					TOTAL EXCAVATION =		$1,016

SURFACING			Size	Cost/yd		
Base rock (6" lift)	140	cy of	jaw-run	$15.44	=	$2,162
Surface rock (3" lift)	66	cy of	3-0"	$16.44	=	$1,085
Junction rock	20	cy of	jaw-run	$15.44	=	$309
Junction rock	10	cy of	3-0"	$16.44	=	$164
Turnaround	20	cy of	jaw-run	$15.44	=	$309
Landing Rock	50	cy of	jaw-run	$15.44	=	$772
				TOTAL ROCK COST =		$4,801

Grading						
Grade/process base rock (with vibratory roller)	3.9	sta	@	$24.28	/sta	=	$95
Grade/process surface rock (with vibratory roller)	3.9	sta	@	$24.28	/sta	=	$95
					TOTAL Grading =		$190

Compiled by:	J. Long		
Date:	Nov 30, 2017	**GRAND TOTAL =====>**	**$6,542**

SUMMARY OF CONSTRUCTION COST

SALE	Frosty Paw	Project #	2	LENGTH	improve	119.5 sta
ROAD	1 to 2			Surfaced, outsloped		

IMPROVEMENT

Spot grading surface rock	60.0	sta	@	$13.75	/sta	=	$825
Construct turnaround	0.5	hr	@	$129.00	/hr	=	$65
Construct Landings (Sta. 102+00 & 119+50)	2	Ldgs	@	$324.00	/Ldg	=	$648

TOTAL IMPROVEMENT = $1,538

SURFACING

			Size	Cost/yd		
Turnout rock (3)	30	cy of	1½-0"	$16.36	=	$491
Turnaround (2)	20	cy of	1½-0"	$16.36	=	$327
Spot rock	100	cy of	1½-0"	$16.36	=	$1,636
Landings (2)	80	cy of	jaw-run	$15.44	=	$1,235

TOTAL ROCK COST = $3,689

Compiled by: J. Long
Date: Nov 30, 2017

GRAND TOTAL =====> $5,227

SUMMARY OF CONSTRUCTION COST

SALE	Frosty Paw	Project #	2	LENGTH improve		77.6 sta
ROAD	3 to 4			Surfaced, ditched		

IMPROVEMENT

Remove sod (with road grader)	77.6	sta	@	$18.35	/sta	=	$1,424
Construct turnaround	0.5	hr	@	$129.00	/hr	=	$65
Grade/process surface rock (with vibratory roller)	77.6	sta	@	$24.28	/sta	=	$1,884
					TOTAL IMPROVEMENT =		$3,373

SURFACING

			Size	Cost/yd		
Turnout rock (3)	30	cy of	3-0"	$16.44	=	$493
Landing rock	20	cy of	3-0"	$16.44	=	$329
Turnaround rock	20	cy of	3-0"	$16.44	=	$329
Spot rock	140	cy of	3-0"	$16.44	=	$2,302
				TOTAL ROCK COST =		$3,453

Compiled by: J. Long
Date: Nov 30, 2017

GRAND TOTAL =====> $6,826

SUMMARY OF CONSTRUCTION COST

SALE	Frosty Paw		Project #	2	LENGTH	improve		5.1 sta
ROAD	5 to 6				Surfaced, outsloped			
Remove sod (with road grader)		5.1 sta	@	$18.35	/sta	=	$94	
Grade/process surface rock		5.1 sta	@	$13.75	/sta	=	$70	
					TOTAL IMPROVEMENT =			$164

SURFACING			Size	Cost/yd			
Landing rock	20	cy of	jaw-run	$15.44	=	$309	
Junction rock	10	cy of	3-0"	$16.44	=	$164	
Spot rock	30	cy of	3-0"	$16.44	=	$493	
				TOTAL ROCK COST =			$966

Compiled by:	J. Long		
Date:	Nov 30, 2017	**GRAND TOTAL =====>**	**$1,130**

SUMMARY OF CONSTRUCTION COST

SALE	Frosty Paw		Project #	2	LENGTH	improve		6.4 sta
ROAD	7 to 8				Surfaced, outsloped			
Remove sod (with road grader)	6.4	sta	@	$18.35	/sta	=	$117	
Slough removal (scatter below road)	2.0	hr	@	$129.00	/hr	=	$258	
Widen Landing (with excavator C325)	1.0	hr	@	$129.00	/hr	=	$129	
Construct turnaround	0.5	hr	@	$129.00	/hr	=	$65	
Grade/process surface rock (with vibratory roller)	6.4	sta	@	$24.28	/sta	=	$155	
					TOTAL IMPROVEMENT =			$724

SURFACING			Size	Cost/yd			
Landing rock	30	cy of	jaw-run	$15.44	=	$463	
Junction rock	10	cy of	1½-0"	$16.44	=	$164	
Spot rock	30	cy of	3-0"	$16.44	=	$493	
Turnaround	20	cy of	jaw-run	$15.44	=	$309	
				TOTAL ROCK COST =			$1,429

Compiled by:	J. Long		
Date:	Nov 30, 2017	**GRAND TOTAL =====>**	**$2,153**

SUMMARY OF CONSTRUCTION COST

SALE	Frosty Paw		Project #	2	LENGTH	improve		20.8 sta
ROAD	9 to 10				Surfaced, outsloped			
Remove sod	20.8 sta		@	$18.35	/sta	=	$382	
(with road grader)								
Grade surface rock	20.8 sta		@	$13.75	/sta	=	$286	
					TOTAL IMPROVEMENT =			$668
SURFACING				Size	Cost/yd			
Landing rock	20	cy of		3-0"	$16.44	=	$329	
(Point 10)								
Turnaround	10	cy of		3-0"	$16.44	=	$164	
Spot rock	90	cy of		3-0"	$16.44	=	$1,480	
					TOTAL ROCK COST =			$1,973

Compiled by: J. Long
Date: Nov 30, 2017

GRAND TOTAL =====> **$2,641**

SUMMARY OF MAINTENANCE COST

SALE Frosty Paw - Final Maintenance Cost Estimate

(Costed in appraisal, not in project costs)

Grading/Compaction

Move-in		
Grader	$	778
Roller	$	778
Loader	$	778

Road Segment	Length	Cost/Sta	Cost	Mileage
E to F	3.9	$24.28	$94.69	0.07
1 to 2	119.5	$24.28	$2,901.46	2.26
3 to 4	77.6	$24.28	$1,884.13	1.47
5 to 6	5.1	$24.28	$123.83	0.10
7 to 8	6.4	$24.28	$155.39	0.12
9 to 10	20.8	$24.28	$505.02	0.39
Total	233.3		$5,664.52	4.42

Maintenance Rock:

	Volume	Cost/CY	Cost
1½-0"	250	$2.47	$617.50
Grand Total			$ 8,616.02
TS Volume	1,994 MBF		
Cost / MBF =			$4.32

NOTES:

20 CY of 1½-0" shall be spread and compacted on landing at Point F for use as a helispot.

Maintenance rock may be taken from the 1 1/2-0" stockpile located near Point C.

Rock Haul Cost Computation

SALE NAME: Frosty Paw DATE: Nov 30, 2017
ROAD NAME: Shroyer Ridge Road CLASS: Medium
ROCK SOURCE: Rickard Rock Quarry 10 CY truck
Route: Hwy. 20, Shroyer Ridge Road

C to D
E to F
TIME Computation:
Road speed time factors:

1.	55 MPH	6.0	MRT	6.5	minutes
2.	50 MPH	5.0	MRT	6.0	minutes
3.	45 MPH		MRT	0.0	minutes
4.	40 MPH		MRT	0.0	minutes
5.	35 MPH		MRT	0.0	minutes
6.	30 MPH	2.0	MRT	4.0	minutes
7.	25 MPH		MRT	0.0	minutes
8.	20 MPH	3.5	MRT	10.5	minutes
9.	15 MPH		MRT	0.0	minutes
10.	10 MPH	2.0	MRT	12.0	minutes
11.	05 MPH	0.5	MRT	6.0	minutes

Dump or spread time per RT		0.50	minutes
Total hauling cycle time for this setting (100% efficiency)		45.50	minutes
Operator efficiency correction	0.85	53.53	minutes
Job efficiency correction	0.90	59.48	minutes
Truck capacity (CY)	10.00	5.95	min/CY
Loading time, delay time per CY		0.25	min/CY
TIME (minutes)J. Long		6.20	min/CY

COST per CY computation

Cost of truck and operator per hour	$68.88	/hr.
Cost of truck and operator per minute	$1.15	/min
Cost per CY	$7.13	/CY
Spread and compact Water truck, Grader & Roller	$1.50	/CY

Size	**Cost/Yd (Pit)**	**Cost Delivered w/o processing**	**Cost Delivered with processing**
1½ - 0"	$ 10.97	$18.10	$19.60
3 - 0"	$ 9.31	$16.44	$17.94
Jaw Run	$ 8.31	$15.44	$16.94
Pit-Run	7.65	$14.78	$16.28

Rock Haul Cost Computation

SALE NAME: Frosty Paw DATE: Nov 30, 2017
ROAD NAME: Shroyer Ridge Road CLASS: Medium
ROCK SOURCE: Rickard Rock Quarry 18 CY truck
Route: Hwy. 20, Shroyer Ridge Road
Points: 1 to 2 (Shroyer Ridge Road)

TIME Computation:
Road speed time factors:

1.	55 MPH	6.0	MRT	6.5	minutes
2.	50 MPH	5.0	MRT	6.0	minutes
3.	45 MPH		MRT	0.0	minutes
4.	40 MPH		MRT	0.0	minutes
5.	35 MPH		MRT	0.0	minutes
6.	30 MPH	2.0	MRT	4.0	minutes
7.	25 MPH		MRT	0.0	minutes
8.	20 MPH	3.5	MRT	10.5	minutes
9.	15 MPH		MRT	0.0	minutes
10.	10 MPH	2.0	MRT	12.0	minutes
11.	05 MPH	0.5	MRT	6.0	minutes

Dump or spread time per RT		1.00	minutes
Total hauling cycle time for this setting (100% efficiency)		46.00	minutes
Operator efficiency correction	0.85	54.12	minutes
Job efficiency correction	0.90	60.13	minutes
Truck capacity (CY)	18.00	3.34	min/CY
Loading time, delay time per CY		0.25	min/CY
TIME (minutes)J. Long		3.59	min/CY

COST per CY computation

Cost of truck and operator per hour	$90.22	/hr.
Cost of truck and operator per minute	$1.50	/min
Cost per CY	$5.39	/CY
Spread and compact Water truck, Grader & Roller	$1.50	/CY

Size	Cost/Yd (Pit)	Cost Delivered w/o processing	Cost Delivered with processing
1½ - 0"	$ 10.97	$16.36	$17.86
3 - 0"	$ 9.31	$14.70	$16.20
Jaw Run	$ 8.31	$13.70	$15.20
Pit-Run	7.65	$13.04	$14.54

Rock Haul Cost Computation

SALE NAME: Frosty Paw DATE: Nov 30, 2017
ROAD NAME: Shroyer Ridge Road CLASS: Medium
ROCK SOURCE: Stockpile near Pt. C 10 CY truck
Route: Shroyer Ridge Road

C to D
E to F
TIME Computation:
Road speed time factors:

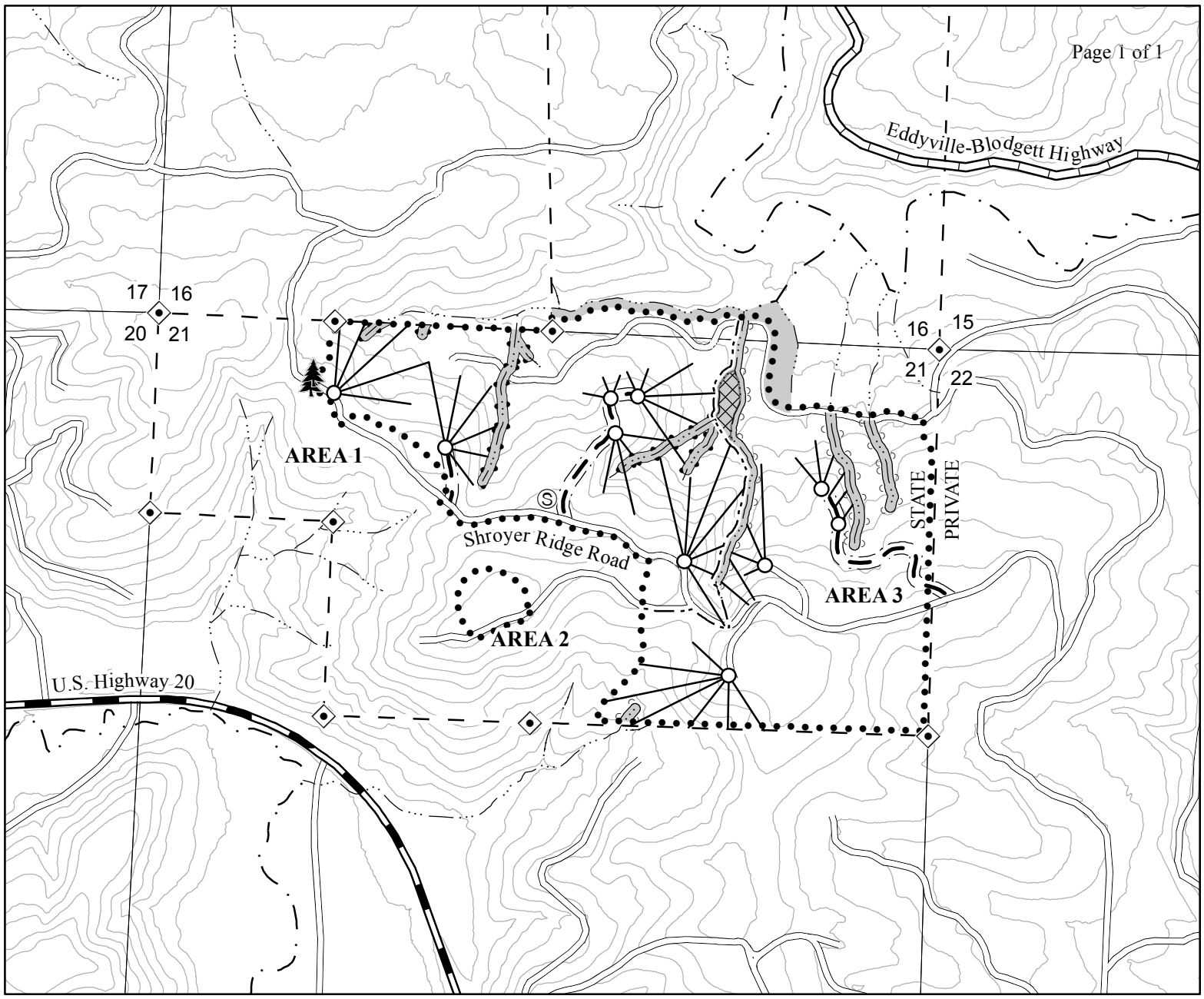
1.	55 MPH		MRT	0.0	minutes
2.	50 MPH		MRT	0.0	minutes
3.	45 MPH		MRT	0.0	minutes
4.	40 MPH		MRT	0.0	minutes
5.	35 MPH		MRT	0.0	minutes
6.	30 MPH		MRT	0.0	minutes
7.	25 MPH		MRT	0.0	minutes
8.	20 MPH		MRT	0.0	minutes
9.	15 MPH	0.5	MRT	2.0	minutes
10.	10 MPH	1.0	MRT	6.0	minutes
11.	05 MPH	0.5	MRT	6.0	minutes

Dump or spread time per RT		0.50	minutes
Total hauling cycle time for this setting (100% efficiency)		14.50	minutes
Operator efficiency correction	0.85	17.06	minutes
Job efficiency correction	0.90	18.96	minutes
Truck capacity (CY)	10.00	1.90	min/CY
Loading time, delay time per CY		0.25	min/CY
TIME (minutes) per cubic yard		2.15	min/CY

COST per CY computation

Cost of truck and operator per hour	$68.88	/hr.
Cost of truck and operator per minute	$1.15	/min
Cost per CY	$2.47	/CY
Spread and compact — Water truck, Grader & Roller	$1.50	/CY

Size	**Cost/Yd (Pit)**	**Cost Delivered w/o processing**	**Cost Delivered with processing**
1½ - 0"	$ -	$2.47	$3.97
3 - 0"	$ 9.31	$11.78	$13.28
Jaw Run	$ 8.31	$10.78	$12.28
Pit-Run	7.65	$10.12	$11.62



Legend

Boundaries
- Timber Sale Boundary
- Area Boundary (Posted)
- State Forest Property Boundary
- Right of Way (Posted)

Roads
- Highway
- Paved Road
- Surfaced Road
- New Construction
- Stockpile
- Type F Stream
- Type N Stream
- Posted Stream Buffer
- Unposted Stream Buffer
- Cable Corridors
- Stream Buffer
- Green Tree Area
- Landings
- Land Survey Monument
- Parent Trees

LOGGING PLAN

OF TIMBER SALE CONTRACT NO. 341-18-082
FROSTY PAW
PORTIONS OF SECTIONS 16 & 21, T11S, R7W, W.M.,
BENTON COUNTY, OREGON

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

Scale
1:12,000

1,000 0 1,000 2,000 Feet

AREA	NET ACRES TRACTOR	NET ACRES CABLE
1 (MC)	25	50
2 (MC)	3	0
3 (PC)	34	39
TOTAL	62	89

N