Timber Sale Appraisal
Frosty Shingle
Sale AT-341-2016-27-

District: Astoria **Date: May 10, 2016**

Cost Summary

	Conifer	Hardwood	Total
Gross Timber Sale Value	$768,427.40	$0.00	$768,427.40
		Project Work:	($97,799.00)
		Advertised Value:	$670,628.40

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District: Astoria **Date: May 10, 2016**

Timber Description

Location: Located in portions of Sections 17, 20, and 21, T7N, R6W, W.M., Clatsop County, Oregon.

Stand Stocking: 60%

Specie Name	AvgDBH	Amortization (%)	Recovery (%)
Douglas - Fir	15	0	97
Western Hemlock / Fir	28	0	95

Volume by Grade	2S	3S	4S	Total
Douglas - Fir	734	1,593	253	2,580
Western Hemlock / Fir	7	0	1	8
Total	741	1,593	254	2,588

Comments: Pond Values Used: 1st Quarter Calendar Year 2016 + Local Pond Values.

Expected Log Markets: Warrenton, Tillamook, Forest Grove, Banks, and Mist, OR and Longview, WA.

Western redcedar and Other Cedars Stumpage Price = Pond Value minus Logging Cost:
$856.01/MBF = $1,150.76/MBF - $294.75/MBF

Red Alder and Other Hardwoods Stumpage Price = Pond Value minus Logging Cost:
$133.85/MBF = $428.6/MBF - $294.75/MBF

SCALING COST ALLOWANCE = $5.00/MBF

FUEL COST ALLOWANCE = $3.00/Gallon

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

Other Costs (with Profit & Risk to be added):
Additional Logging Costs:
Branding and Painting: $1/MBF x 2,588 MBF = $2,588
Slash & Landing Piling (includes Move-in and Piling Materials) = $4,429 (see attached appraisal)
Line Pull in Area 1 = $20/MBF x 50 MBF = $1,000
TOTAL Other Costs (with Profit & Risk to be added) = $8,017

Other Costs (No Profit & Risk added):
Recreation Trail Rehab (w/C315).: 20hrs. @ $101/hr = $2,020
C315 Move-In = $805
Water bar and block rocked spur after harvest 4hrs @ $101/hr = $404
Machine Washing for Invasive Weed Compliance = $3,000
TOTAL Other Costs (No Profit & Risk added) = $6,229

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Logging Conditions

Combination#: 1

Douglas - Fir	74.00%
Western Hemlock / Fir	74.00%

Logging System: Cable: Medium Tower >40 - <70 **Process:** Manual Falling/Delimbing

yarding distance: Medium (800 ft) **downhill yarding:** No

tree size: Small / Thinning 12in (130 Bft/tree), 12-17 logs/MBF

loads / day: 8 **bd. ft / load:** 4200

cost / mbf: $196.43

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

Combination#: 2

Douglas - Fir	7.00%
Western Hemlock / Fir	7.00%

Logging System: Track Skidder **Process:** Manual Falling/Delimbing

yarding distance: Short (400 ft) **downhill yarding:** No

tree size: Small / Thinning 12in (130 Bft/tree), 12-17 logs/MBF

loads / day: 8 **bd. ft / load:** 4200

cost / mbf: $132.60

machines: Log Loader (B)
Track Skidder

Combination#: 3

Douglas - Fir	19.00%
Western Hemlock / Fir	19.00%

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: 13 **bd. ft / load:** 4200

cost / mbf: $97.88

machines: Forwarder
Harvester

Timber Sale Appraisal
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District: Astoria **Date: May 10, 2016**

Logging Costs

Operating Seasons:	3.00	**Profit Risk:**	12%
Project Costs:	$97,799.00	**Other Costs (P/R):**	$8,017.00
Slash Disposal:	$0.00	**Other Costs:**	$6,229.00

Miles of Road

Road Maintenance: $12.49

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	3.0	4.3
Western Hemlock / Fir	$0.00	4.0	4.6

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District: Astoria **Date: May 10, 2016**

Logging Costs Breakdown

Logging	Road Maint	Fire Protect	Hauling	Other P/R appl	Profit & Risk	Slash Disposal	Scaling	Other	Total
Douglas - Fir									
$173.24	$12.86	$5.08	$62.28	$3.10	$30.79	$0.00	$5.00	$2.41	$294.76
Western Hemlock / Fir									
$173.24	$13.11	$5.08	$44.51	$3.10	$28.68	$0.00	$5.00	$2.41	$275.13

Specie	Amortization	Pond Value	Stumpage	Amortized
Douglas - Fir	$0.00	$592.01	$297.25	$0.00
Western Hemlock / Fir	$0.00	$465.43	$190.30	$0.00

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Summary

Amortized

Specie	MBF	Value	Total
Douglas - Fir	0	$0.00	$0.00
Western Hemlock / Fir	0	$0.00	$0.00

Unamortized

Specie	MBF	Value	Total
Douglas - Fir	2,580	$297.25	$766,905.00
Western Hemlock / Fir	8	$190.30	$1,522.40

Gross Timber Sale Value

Recovery: $768,427.40

Prepared By: Edward Holloran **Phone:** 503-325-5451

Road Maintenance Cost Summary (Interim and Post Harvest)

Sale: Frosty Shingle (341-16-27)
Date: February 19, 2016
By: Andrew Arvin FL

MBF: 2,588
$$/MBF: $12.49

Type	Equipment/Rationale	Move-in Rate	Times	Hours	Rate	Cost	
Interim Operations Entries: 2	Grader 14G	$778	2	50	$100	$6,556	
	Dump Truck 12CY	$163	1	8	$79	$795	
	FE Loader C966	$778	1	2	$77	$932	
Final Road Maintenance (Crushed)	Grader 14G	$778	1	75	$100	$8,278	
	Dump Truck 12CY	$163	2	40	$79	$3,486	
	FE Loader C966	$778	1	10	$83	$1,608	
	Vibratory Roller	$778	1	75	$77	$6,553	
	Water Truck 2,500 gallon	$190	1	30	$89	$2,860	
	Rubber tired backhoe	$321	1	8	$77	$937	
	Labor			8	$40	$320	
Total							**$32,325**

Interim Operations Road Maintenance and snow removal

Production Rates	Miles/day	Distance (miles)	Days	Hours
Grader	2.0	14.0	7.0	56

Final Road Maintenance

Production Rates	Miles/day	Distance (miles)	Days	Hours
Grader	1.5	14.0	9.3	75
Vibratory Roller	1.5	14.0	9.3	75

*Maintenance calculations were determined as follows:
Sale Area via Nicolai Lookout via Simonsen via Foster ML Via Nicolai ML to Highway 30 = 15.0 Mi.

Pit-run spurs: 1 mile anticipated maintenance. (Patch rock only)

Site Prep Appraisal

Sale Number: 341-16-27
Sale Name: Frosty Shingle
Date: 02/19/2016

Vegetation Type/Zone	Vegetation Type/Zone Code	Production Rate (hr/ac)	Estimated Piles/Acre
Doug-fir	A	1.0	3.0
Hemlock/Fir	B	1.5	4.5
Hemlock/Spruce	C	2.0	6.0
Hemlock	D	2.0	6.0
Conifer/Hardwood	E	1.5	4.5
Whole Tree Yarding	F	0.5	0.5

Sale Area	Harvest Type	Veg Type/Zone	Ground Based Yarding Acres	Estimated Piling Hours/Area	Cost/Hour	Total Cost/Area
1	MC	F	37.0	19	$129.00	$2,386.50

In-unit Piling **Sub Total =** $2,386.50

Sale Area	Number of Landings to be Piled	Cost/Landing Pile	Total Cost/Area	Number of In-Unit Piles	Material Cost/Pile	Total Cost/Area
1	3	$220.00	$660.00	18.5	$5.00	$92.50

*Cost includes separating firewood

Materials **Sub Total =** $92.50

Landing Piling **Sub Total =** $660.00

Move-In Allowance	Number of Move-In's	Total Move-In Allowance
$1,290.00	1	$1,290.00

Move-In **Sub Total =** $1,290.00

Grand Total = **$4,429.00**

SUMMARY OF ALL PROJECT COSTS

SALE NAME: Frosty Shingle

ROAD CONSTRUCTION & IMPROVEMENT:
Project No. 1

	Road segment	Length/Sta		Cost	
New Construcrtion	1A-1B	7.80			
	1C-1D	3.60			
	1E-1F	7.50			
	1G-1H	7.65			
	1I-1J	15.00			
	1K-1L	13.70			
	1M-1N	1.50			
	1O-1P	10.40			
	1Q-1R	1.50			
	TOTAL	**68.65**		$83,256.00	
Road Improvement	I1-I2	92.00			
	I3-I4	12.70			
	TOTAL	**104.70**		$2,215.00	
	TOTALS	**173.35**	stations		$85,471.00
		3.28	miles		

SPECIAL PROJECTS:

Description	Cost
Project Road Maintenance	$4,431
TOTAL	$4,431

MOVE IN:

Equipment	Cost
Excavator - C330	$1,406.00
Dozer - D6	$778.00
Dozer - D8	$1,406.00
Excavator - C315	$805.00
Vibratory Roller	$778.00
Front End Loader - 966	$778.00
10-12 yard Dump Truck (6 @ $163)	$978.00
Large Grader - 14G	$778.00
Water Truck - 2,500 Ga	$190.00
TOTAL	$7,897.00

GRAND TOTAL **$97,799.00**

Compiled By: Bryce Rodgers Date: 02/22/2016

SUMMARY OF CONSTRUCTION COSTS

SALE NAME: Frosty Shingle
ROAD: 1A-1B(7.8)1C-1D(3.6)1E-1F(7.5)1G-1H(7.65
POINTS: 1I-1J(15.0)1K-1L(13.7)1M-1N(1.5)1O-1P(10.4)1Q-1R(1.5)
I1-I2(92)I3-I4(12.7)

NEW CONSTRUCTION: 68.65 **STATIONS** 1.30 **MILES**
IMPROVEMENT: 104.70 **STATIONS** 1.98 **MILES**

CLEARING & GRUBBING

Method	Acres/amount	x	Rate	=	Cost
Scatter outside of R/W	5.6	x	$1,337.00	=	$7,487.20
		x		=	
		x		=	
		x		=	

SUB TOTAL FOR CLEARING & GRUBBING $7,487

EXCAVATION

	Material	Cy/amount	x	Rate	=	Cost
1A to 1B	Balanced Construction Field Design $/sta.	7.8	x	$122.00	=	$951.60
	Landing Construction	1	x	$389.00	=	$389.00
1C to 1D	Balanced Construction Field Design $/sta.	3.6	x	$122.00	=	$439.20
	Landing Construction	1	x	$389.00	=	$389.00
1E to 1F	Balanced Construction Field Design $/sta.	8	x	$122.00	=	$915.00
	Landing Construction	1	x	$389.00	=	$389.00
1G to 1H	Balanced Construction Field Design $/sta.	7.65	x	$122.00	=	$933.30
	Dissipator Rock Placement (315) $/Hr.	2	x	$101.00	=	$202.00
	Excavator time for ditch development $/Hr.	2	x	$155.00	=	$310.00
	Landing Construction	1	x	$389.00	=	$389.00
1I to 1J	Balanced Construction Field Design $/sta.	13	x	$122.00	=	$1,586.00
	Dissipator Rock Placement (315) $/Hr.	2	x	$101.00	=	$202.00
	Balance Construction Drift up to 200' $/sta.	2	x	$190.00	=	$380.00
	Excavator time for ditch development $/Hr.	3	x	$155.00	=	$465.00
	Landing Construction	1	x	$389.00	=	$389.00
1K to 1L	Balanced Construction Field Design $/sta.	13.7	x	$122.00	=	$1,671.40
	Excavator time for ditch development $/Hr.	3	x	$155.00	=	$465.00
	Landing Construction	1	x	$389.00	=	$389.00
1M to 1N	Balanced Construction Field Design $/sta.	1.5	x	$122.00	=	$183.00
	Excavator time for ditch development $/Hr.	1	x	$155.00	=	$155.00
	Landing Construction	1	x	$389.00	=	$389.00
1O to 1P	Balanced Construction Field Design $/sta.	10.4	x	$122.00	=	$1,268.80
	Landing Construction	1	x	$389.00	=	$389.00
1Q to 1R	Balanced Construction Field Design $/sta.	1.5	x	$122.00	=	$183.00
	Landing Construction	1	x	$389.00	=	$389.00
I1 to I2	Clean Culvert Catch basins (315) $/Hr.	5.0	x	$101.00	=	$505.00
	Scatter Ditch Waste Materials $/sta.	15	x	$12.41	=	$188.63

SUB TOTAL FOR EXCAVATION $14,505

CULVERT MATERIALS AND INSTALLATION

Location	Dia/type	Lineal ft.	Rate	Cost	Location	Dia/type	Lineal ft.	Rate	Cost
1G-1H									
3+00	18" ACSP	30	$24.68	$740.40					
7+00	18" ACSP	30	$24.68	$740.40					
1I-1J									
7+60	18" ACSP	30	$24.68	$740.40					
1K-1L									
4+20	18" ACSP	30	$24.68	$740.40					

	Description	Quantity	Rate	Cost
Other/miscellaneous:				
Culvert stakes & markers:	Culvert Markers	4	$20.00	$80.00

SUB TOTAL FOR CULVERT MATERIALS & INSTALLATION $3,042

Subtotal of Clearing, Exc., Culv. ***$25,034***

SURFACING

Subgrade prep:

Description	Stations/ amount	x	Rate/ sta/amt	Cost
Grade, Shape and Ditch 16' Crowned	37.85	x	$24.83	$939.82
Grade, Shape and Ditch 14' outsloped	43.50	x	$18.35	$798.23
Subgrade Compaction	81.35	x	$20.19	$1,642.46

ROAD SEGMENT	1A to 1B			POINT TO POINT		Sta. to Sta.					
				1A to 1B		0+00 to 7+80					
Application	Rock Size and Type	Location	Depth of Rock (inches)	Volume (CY) per		Number of		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost	
Base Rock	6"-0" pit-run	0+00-7+80	8	station	50	stations	7.80	390	$5.75	$2,243	
Junctions	6"-0" pit-run	0+00	N/A	junction	33	junctions	1	33	$5.75	$190	
Turnouts	6"-0" pit-run	4+00	8	TO	22	TO's	1	22	$5.75	$127	
Landing	6"-0" pit-run	7+80	N/A	Landing	60	Landings	1	60	$5.75	$345	
Total Rock for Road Segment:			1A to 1B					505			$2,904

ROAD SEGMENT	1C to 1D			POINT TO POINT		Sta. to Sta.					
				1C to 1D		0+00 to 3+60					
Application	Rock Size and Type	Location	Depth of Rock (inches)	Volume (CY) per		Number of		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost	
Base Rock	6"-0" pit-run	0+00-3+60	8	station	50	stations	3.60	180	$5.75	$1,035	
Junctions	6"-0" pit-run	0+00	8	junction	33	junctions	1	33	$5.75	$190	
Landing	6"-0" pit-run	3+60	N/A	Landing	60	Landings	1	60	$5.75	$345	
Total Rock for Road Segment:			1C to 1D					273			$1,570

ROAD SEGMENT	1E to 1F			POINT TO POINT		Sta. to Sta.					
				1E to 1F		0+00 to 7+50					
Application	Rock Size and Type	Location	Depth of Rock (inches)	Volume (CY) per		Number of		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost	
Base Rock	6"-0" pit-run	0+00-7+50	8	station	50	stations	7.50	375	$5.75	$2,156	
Junctions	6"-0" pit-run	0+00	8	junction	33	junctions	1	33	$5.75	$190	
Turnouts	6"-0" pit-run	3+00	8	TO	22	TO's	1	22	$5.75	$127	
Landing	6"-0" pit-run	7+50	N/A	Landing	60	Landings	1	60	$5.75	$345	
Total Rock for Road Segment:			1E to 1F					490			$2,818

ROAD SEGMENT	1G to 1H			POINT TO POINT		Sta. to Sta.					
				1G to 1H		0+00 to 7+65					
Application	Rock Size and Type	Location	Depth of Rock (inches)	Volume (CY) per		Number of		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost	
Base Rock	6"-0" pit-run	0+00-7+65	8	station	50	stations	7.65	383	$5.75	$2,199	
Turnouts	6"-0" pit-run	3+50	8	TO	22	TO's	1	22	$5.75	$127	
Dissipator	24"-6" rip-rap	7+00	N/A	dissipator	11	dissipator	1	11	$5.96	$66	
Culvert Bedding/Backfill	3/4"-0" Crushed	3+00, 7+00	N/A	culvert	33	culverts	2	66	$5.14	$339	
Traction Rock	3/4"-0" Crushed	0+00-7+65	2	station	13	stations	7.65	99	$5.14	$511	
Landing	6"-0" pit-run	7+65	N/A	Landing	60	landings	1	60	$5.75	$345	
Total Rock for Road Segment:			1G to 1H					641			$3,587

ROAD SEGMENT	1I to 1J			POINT TO POINT		Sta. to Sta.					
				1I to 1J		0+00 to 15+00					
Application	Rock Size and Type	Location	Depth of Rock (inches)	Volume (CY) per		Number of		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost	
Base Rock	6"-0" pit-run	0+00-15+00	8	station	50	stations	15.00	750	$5.75	$4,313	
Junctions	6"-0" pit-run	0+00	8	junction	33	junctions	1	33	$5.75	$190	
Turnouts	6"-0" pit-run	12+30	8	TO	22	TO's	1	22	$5.75	$127	
Turnaround	6"-0" pit-run	12+30	8	TA	13	TA's	1	13	$5.75	$75	
Dissipator	24"-6" rip-rap	7+60	N/A	dissipator	11	dissipator	1	11	$5.96	$66	
Culvert Bedding/Backfill	3/4"-0" Crushed	7+60	N/A	culvert	33	culverts	1	33	$5.14	$170	
Traction Rock	3/4"-0" Crushed	0+00-15+00	2	station	13	stations	15	195	$5.14	$1,002	
Landing	6"-0" pit-run	15+00	N/A	Landing	60	Landings	1	60	$5.75	$345	
Total Rock for Road Segment:			1I to 1J					1,117			$6,286

ROAD SEGMENT	1K to 1L			POINT TO POINT		Sta. to Sta.					
				1K to 1L		0+00 to 13+70					
Application	Rock Size and Type	Location	Depth of Rock (inches)	Volume (CY) per		Number of		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost	
Base Rock	6"-0" pit-run	0+00-13+70	8	station	50	stations	13.70	685	$5.75	$3,939	
Junctions	6"-0" pit-run	0+00	8	junction	33	junctions	1	33	$5.75	$190	
Turnouts	6"-0" pit-run	8+00	8	TO	22	TO's	1	22	$5.75	$127	
Culvert Bedding/Backfill	3/4"-0" Crushed	4+20	N/A	culvert	33	culverrts	1	33	$5.14	$170	
Traction Rock	3/4"-0" Crushed	0+00-11+30	2	station	13	stations	11.3	147	$5.14	$755	
Landing	6"-0" pit-run	13+70	N/A	Landing	60	Landings	1	60	$5.75	$345	
Total Rock for Road Segment:			1K to 1L					980			$5,525

ROAD SEGMENT	1M to 1N			POINT TO POINT		Sta. to Sta.					
				1M to 1N		0+00 to 1+50					
Application	Rock Size and Type	Location	Depth of Rock (inches)	Volume (CY) per		Number of		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost	
Base Rock	6"-0" pit-run	0+00-1+50	8	station	50	stations	1.50	75	$5.75	$431	
Junctions	6"-0" pit-run	0+00	8	junction	33	junctions	1	33	$5.75	$190	
Landing	6"-0" pit-run	1+50	N/A	Landing	60	Landings	1	60	$5.75	$345	
Total Rock for Road Segment:			1M to 1N					168			$966

ROAD SEGMENT	1O to 1P			POINT TO POINT		Sta. to Sta.					
				1O to 1P		0+00 to 10+40					
Application	Rock Size and Type	Location	Depth of Rock (inches)	Volume (CY) per		Number of		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost	
Base Rock	6"-0" pit-run	0+00-10+40	8	station	50	stations	10.40	520	$5.75	$2,990	
Turnouts	6"-0" pit-run	8+00	8	TO	22	TO's	1	22	$5.75	$127	
Turnaround	6"-0" pit-run	8+00	8	TA	13	TA's	1	13	$5.75	$75	
Landing	6"-0" pit-run	10+40	N/A	Landing	60	Landings	1	60	$5.75	$345	
Total Rock for Road Segment:			1O to 1P					615			$3,536

ROAD SEGMENT	1Q to 1R			POINT TO POINT		Sta. to Sta.					
				1Q to 1R		0+00 to 1+50					
Application	Rock Size and Type	Location	Depth of Rock (inches)	Volume (CY) per		Number of		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost	
Base Rock	6"-0" pit-run	0+00-1+50	8	station	50	stations	1.50	75	$5.75	$431	
Landing	6"-0" pit-run	1+50	N/A	Landing	60	Landings	1	60	$5.75	$345	
Total Rock for Road Segment:			1Q to 1R					135			$776

ROAD SEGMENT	I1 to I2			POINT TO POINT		Sta. to Sta.					
				I1 to I2		0+00 to 92+00					
Application	Rock Size and Type	Location	Depth of Rock (inches)	Volume (CY) per		Number of		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost	
Patch Rock	3/4"-0" Crushed	0+00 to 92+00	N/A	load	11	loads	20.00	220	$5.14	$1,131	
Total Rock for Road Segment:			I1 to I2					220			$1,131

ROAD SEGMENT	I3 to I4			POINT TO POINT		Sta. to Sta.					
				I3 to I4		0+00 to 12+70					
Application	Rock Size and Type	Location	Depth of Rock (inches)	Volume (CY) per		Number of		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost	
Base Rock	6"-0" pit-run	0+00-12+70	8	station	50	stations	12.70	635	$5.75	$3,651	

Total Rock for Road Segment:	I3 to I4				635			$3,651	
	Processing:	Description					No.sta	Rate/sta	Cost
		Pit-Run Proccessing (D6 and Roller)					81.35	$51.54	$4,193
		Water, Process & Compact: Traction Rock					33.95	$56.48	$1,917
	Improvement	Water, Process and Compact (I1-I2)					92.00	$56.48	$5,196
			24"-6"	6"-0"	3/4"-0"		Total		
SUB TOTAL FOR SURFACING			22	4,964	793		5,779	5,779	**$47,436**

SPECIAL PROJECTS

	Description	Cost
Rock Development	(pit-run) 4,964 CY x $2.60/CY	$12,906.40
	(rip-rap) 22 CY x $4.30/CY	$94.60

SUB TOTAL FOR SPECIAL PROJECTS $13,001

Subtotal of Surfacing & Spec. Proj. *$60,437*

Subtotal of Clearing, Exc.,Culv. *$25,034*

GRAND TOTAL **$85,471**

Compiled By: B Rodgers Date: 02/11/2016

Projects Road Maintenance Cost Summary

Sale: Frosty Shingle
Date: 2/19/16
By: Ed Holloran EL

Type	Equipment/Rationale			Hours	Rate	Cost	
Final Project Haul Road Maintenance	Grader 14G			16.0	$100	$1,600	
	Dump Truck 12CY			8.0	$79	$632	
	FE Loader C966			2.0	$83	$166	
	Vibratory Roller			16.0	$77	$1,232	
	Water Truck 2,500 gallon			9.0	$89	$801	
Total							$4,431

Production Rates	Miles/day	Distance(miles)	Days	Hours
Grader	1.5	2.90	1.9	15.5
Vibratory Roller	1.5	2.90	1.9	15.5

Knob Point Quarry to Shingle Mill road (0.1 mi.), Shingle Mill road to Simonson road (1.5 mi.), Simonson road to Nicolai Look out road (1.3 mi.),

Total Miles = 2.9

X:\DOCUMENT\STATE_FOREST\UNIT_SUNSET\2016 FY Sales\Frosty Shingle\Sale Prep\Project Costing\Project Road Maintenance_FS.xls

FROSTY SHINGLE
FY 2016
TIMBER CRUISE REPORT

1. **Sale Area Location:** Areas 1, and 2 are located in portions of Sections 17, 20, and 21, T7N, R6W, W.M., Clatsop County, Oregon.

2. **Fund Distribution: Fund:** BOF 100% CSL 0%
   Tax Code: 30-05 100%

3. **Sale Acreage by Area:**

Area	Harvest Type	Gross Acres	Stream Buffer Acres	New R/W Acres	Existing R/W Acres	Non-Stocked Acres	Non-stocked R/W Acres	Net Acreage
1	PC	193	2	1	3	17		170
2	MCC	41	3		1			37
3	R/W	5	0				2	3
TOTALS		**239**	**5**	**1**	**4**	**17**	**2**	**210**

4. **Cruisers and Cruise Dates:** Areas 1 was cruised by Andrew Arvin, John Choate, Nora Young, and Bryce Rodgers. Area 2 was cruised by Andrew Arvin, and Nora Young. The cruise was performed in early February, 2016.

5. **Cruise Method and Computation:** Area 1 is a partial cut unit. A variable plot cruise with a 27.78 BAF used in this Area. These plots were located on a 10 chain by 2 chain grid, with a count/cruise plot ratio of 1 to 2. A total of 81 plots were sampled, with 27 measured plots and 54 count plots.

   Area 2 is a modified clear cut unit. A variable plot cruise with a 40 BAF was used. 17 plots were sampled on a grid of 8 chains by 3 chains, with a count/cruise plot ratio of 1 to 1. There were 9 measured plots and 8 count plots sampled.

   Area 3 R/W. was calculated applying road R/W acreage and using the cruise volume per acre from Area 1.

   Cruisers used Allegro data collectors, and were downloaded to the Atterbury Super A.C.E. program at the Astoria District for computing. See the attached Cruise Design for more details on the cruise method. The cruise calculations were processed in the Astoria District office.

AREAS	PROJECT	TRACT	CRUISE TYPE
1	FROSTYS	AREA1	00PC TAKE, STAY
2	FROSTYS	AREA2	00MC
3 R\W	FROSRYS	AREA3	RW

6. **Timber Description:** **Area 1** is an approximately 58 to 66 year old stand of Douglas-fir. The average take Douglas-fir tree size for harvest is approximately 14 inches DBH, with an average merchantable tree height of 42 feet. The average volume per acre to be harvested (net) is approximately 9 MBF. All trees were cruised to a merchantable top of 6 inch DIB or 40% fp. This unit was cruised to a leave basal area of 140 square feet, with an SDI of 33.

   Area 2 is an approximately 58 to 60 year old stand of Douglas-fir with some western hemlock. The average take Douglas-fir tree size to be harvested is approximately 22 inches DBH, with an average merchantable tree height of 71 feet. The average take hemlock tree size is approximately 28 inches DBH, with an average merchantable tree height of 74 feet. The average volume per acre to be harvested (net) is approximately 25 MBF. All trees were cruised to a merchantable top of 6 inch DIB or 40% fp.

Area 3 R/W. The volume to be removed from the R/W is based on the cruise from Area 1. There is a total of 5 acres of R/W but only 3 acres have merchantable volume. The average take Douglas-fir tree size to be harvested is approximately 16 inches DBH, with an average merchantable tree height of 49 feet. The average volume per acre to be harvested (net) is approximately 23 MBF. All trees were cruised to a merchantable top of 6 inch DIB or 40% fp.

Cedar was a reserved species in Areas 1 and 2.

7. **Statistical Analysis: (See also "Statistics Reports," attached.)**

Area	Target CV	Target SE%	Actual CV	Actual SE%
1	60	8	37.5	4.2
2	40	8	29	7.3

The statistics are for all areas and Take and Leave trees combined based on Net BF/Acre.

8. **Take Volumes by Species and Log Grades for All Sale Areas by MBF:** (See "Species, Sort Grade-Board Feet Volumes (Project)", "Statistics (Project)", and the "Stand Table Summary" attached). Volumes do not include "in-growth." The majority of defect and breakage was taken out during the cruise.

Species	DBH	Net Vol.	2 Saw	3Saw	4 Saw	% D & B	% Sale
Douglas-fir	15	2,580	734	1,593	253	3.5	99.7
W. Hemlock & True Fir	28	8	7	0	1	5.5	0.3
TOTAL NET VOLUME		**2,588**	**741**	**1,593**	**254**		**100**

9. **Prepared by:** Edward M. Holloran **Date:** February 19 , 2016

10. **Approved by:** _____ **Date:** 4/1/2016

11. **Attachments:**
Cruise Plans & Maps – (6 pages)
Species, Sort, Grade Reports – Take – (4 pages)
Statistics Reports – (5 pages)
Stand Table Report – (4 page)
Log Stock Table Report – Take (2 pages)

X:\Sunset\2016FY\Frosty Shingle\Sale Prep\Cruise\Cruise Report FS

Revised August, 2002

CRUISE DESIGN
ASTORIA DISTRICT

Sale Name: Frosty Shingle **Area(s)** 1

Harvest Type: PC

Approx. Cruise Acres: 160 **Estimated CV%** 60 Net BF or BA/Acre **SE% Objective** 8 Net BF or BA/Acre

Planned Sale Volume: 1.120 MMBF **Estimated Sale Area Value/Acre:** $2,100

A. **Cruise Goals:** (a) Grade minimum 60 conifer and 20 hardwood trees: (b) Sample 86 cruise plots; (c) Other goals (X Determine "automark" thinning standards; X Determine log grades for sale value; X Determine snag and leave tree species and sizes.

Basal Area leave target 130 sq. ft. Cruiser needs to select 4 or 5 leave trees per plot.

B. **Cruise Design:**

1. **Plot Cruises:** BAF 27.78 Full point
   Cruise Line Directions 45°/225°
   Cruise Line Spacing 10 chains
   Cruise Plot Spacing 2 chains
   Grade/Count Ratio 1:2

Take plots as marked on cruise map. All cedar will be reserved. Grade all alder as Camprun. Record all snags as SN.

C. **Tree Measurements:**

1. **Diameter:** Minimum DBH to cruise is 8 " for conifers and 8" for hardwoods. Record dbh to nearest ½" 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", 7" 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. log 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
Hardwoods: Alder Grades: 12" + = 1 Sawmill; 10"-12" = 2 Sawmill; 10"-8" = 3 Sawmill; and 8"-6" 4 Sawmill, or R = Camp Run; 0 = Cull.
All Maple Camp Run = R

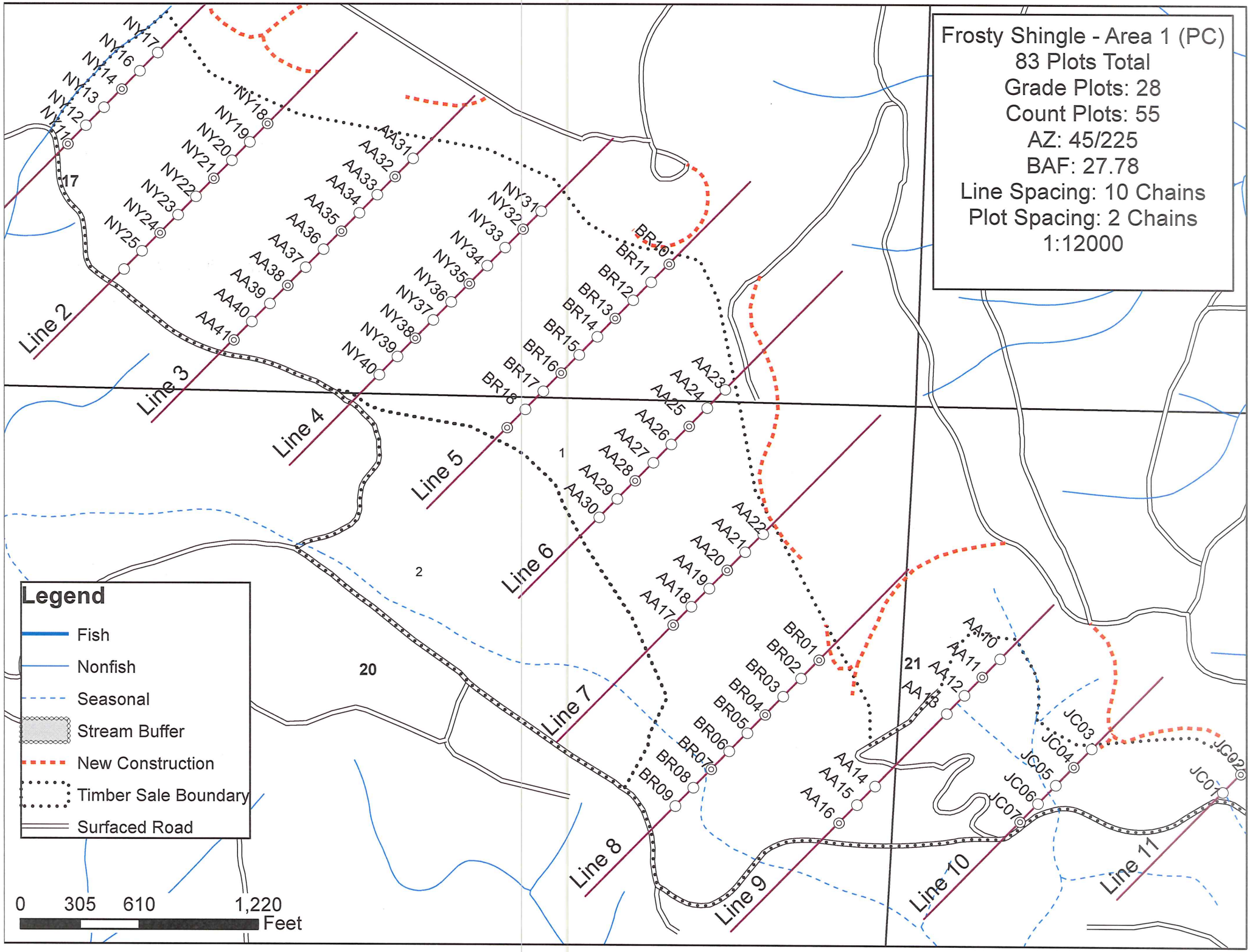
7. **Deductions:** Estimate visible defect or damage as a "length deduction" (most often), or as a "diameter deduction," as applicable. Estimate hidden defect and breakage (usually some breakage is encountered in trees > 100 feet in height) on a "per tree" basis. Steep and broken topography generally 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 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 or Lazer, Logger's Tape (with dbh on back), Biltmore Stick, Compass, Cruise Cards 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: JOHN CHOATE
Approved by: [signature]
Date: 2/1/16


Frosty Shingle - Area 1 (PC)
83 Plots Total
Grade Plots: 28
Count Plots: 55
AZ: 45/225
BAF: 27.78
Line Spacing: 10 Chains
Plot Spacing: 2 Chains
1:12000
Legend
Fish
Nonfish
Seasonal
Stream Buffer
New Construction
Timber Sale Boundary
Surfaced Road
0 305 610 1,220
Feet
Line 2
Line 3
Line 4
Line 5
Line 6
Line 7
Line 8
Line 9
Line 10
Line 11
17
1
2
20
21
NY11 NY12 NY13 NY14 NY16 NY17 NY18 NY19 NY20 NY21 NY22 NY23 NY24 NY25
AA31 AA32 AA33 AA34 AA35 AA36 AA37 AA38 AA39 AA40 AA41
NY31 NY32 NY33 NY34 NY35 NY36 NY37 NY38 NY39 NY40
BR10 BR11 BR12 BR13 BR14 BR15 BR16 BR17 BR18
AA23 AA24 AA25 AA26 AA27 AA28 AA29 AA30
AA22 AA21 AA20 AA19 AA18 AA17
BR01 BR02 BR03 BR04 BR05 BR06 BR07 BR08 BR09
AA10 AA11 AA12 AA13
AA14 AA15 AA16
JC03 JC04 JC05 JC06 JC07 JC02 JC01

Revised August, 2002

CRUISE DESIGN
ASTORIA DISTRICT

Sale Name: Frosty Shingle **Area(s)** Area 2

Harvest Type: CC

Approx. Cruise Acres: 41 Estimated **CV%:** 40 Net BF **SE% Objective:** 8% Net BF

Planned Sale Volume: 1.120 MMBF **Estimated Sale Area Value/Acre:** $9,100

A. Cruise Goals: (a) Grade minimum 100 conifer and 10 hardwood trees: (b) Sample 18 cruise plots; (1 Grade/1 Count); (c) Other X Determine log grades for sale value; X Determine snag and leave tree species and sizes.

B. Cruise Design:

1. **Plot Cruises:** BAF 40 (Full point; Half point) (circle one)
   Cruise Line Direction(s) 0°/180°
   Cruise Line Spacing 8 chains
   Cruise Plot Spacing 3 chains
   Grade/Count Ratio 1:1

   Take plots as marked on cruise map. All cedar will be reserved. Grade all alder as Camprun. Record all snags as SN.

C. Tree Measurements:

1. **Diameter:** Minimum DBH to cruise is 8" for conifers and 8" for hardwoods. Record dbh to nearest ½" 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" for conifers and 7" 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. log 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
Hardwoods: Alder Grades: 12" + = 1 Sawmill; 10"-12" = 2 Sawmill; 10"-8" = 3 Sawmill; and 8"-6" 4 Sawmill, or R = Camp Run; 0 = Cull.
All Maple Camp Run = R

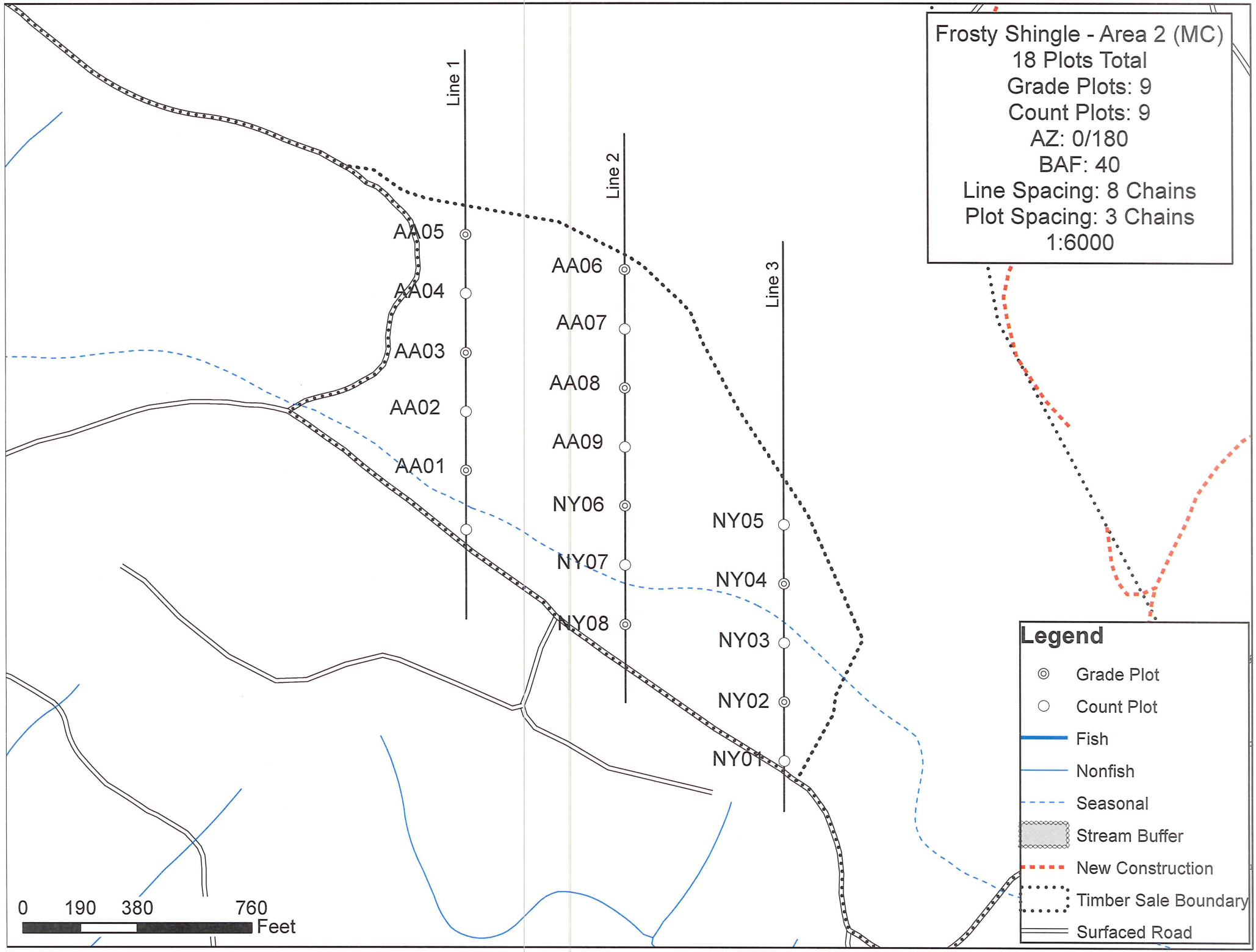
7. **Deductions:** Estimate visible defect or damage as a "length deduction" (most often), or as a "diameter deduction," as applicable. Estimate hidden defect and breakage (usually some breakage is encountered in trees > 100 feet in height) on a "per tree" basis. Steep and broken topography generally 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 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 or Lazer, Logger's Tape (with dbh on back), Biltmore Stick, Compass, Cruise Cards 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: John Choate
Approved by: Jon Tuttle
Date: 2/1/16


Frosty Shingle - Area 2 (MC)
18 Plots Total
Grade Plots: 9
Count Plots: 9
AZ: 0/180
BAF: 40
Line Spacing: 8 Chains
Plot Spacing: 3 Chains
1:6000
Line 1
Line 2
Line 3
AA05
AA04
AA03
AA02
AA01
AA06
AA07
AA08
AA09
NY06
NY07
NY08
NY05
NY04
NY03
NY02
NY01
0 190 380 760
Feet
Legend
Grade Plot
Count Plot
Fish
Nonfish
Seasonal
Stream Buffer
New Construction
Timber Sale Boundary
Surfaced Road

TC PSPCSTGR

Species, Sort Grade - Board Foot Volumes (Project)

T07N R06W S20 TyTAKE	170.00
T07N R06W S20 Ty00MC	37.00
T07N R06W S20 TyRW	3.00

Project: FROSTYS
Acres 210.00

Date 3/31/2016
Time 7:05:33AM

Spp	S T	So Grt ad	% Net BdFt	Bd. Ft. per Acre Def%	Gross	Net	Total Net MBF	Percent of Net Board Foot Volume: Log Scale Dia. 4-5	6-11	12-16	17+	Log Length 12-20	21-30	31-35	36-99	Average Log: Ln Ft	Dia In	Bd Ft	CF/ Lf	Logs Per /Acre
D		DOCU		100.0	93											5	10		0.00	3.1
D		DO2S	28	.2	3,501	3,495	734		5	57	38	3	5	19	73	35	14	279	2.07	12.5
D		DO3S	62	.8	7,648	7,587	1,593	0	97	2	1	1	4	40	55	35	7	80	0.72	95.1
D		DO4S	10	1.1	1,216	1,203	253	2	98			54	46	0	0	21	6	25	0.45	47.7
D	**Totals**		100	1.4	12,458	12,285	2,580	0	71	18	12	7	9	30	55	30	8	78	0.79	158.5
H		DOCU		100.0	24											10	24		0.00	.1
H		DO2S	88	11.1	35	31	7			100					100	40	15	320	2.32	.1
H		DO4S	12		4	4	1		100				100			22	7	40	0.82	.1
H	**Totals**		0	44.6	63	35	~~8~~ 7		11	89			11		89	24	15	120	1.54	.3
SN		DOCU		100.0	1											41	4		0.00	.0
SN	**Totals**			100.0	1											41	4		0.00	.0
Totals				1.6	12,522	12,320	~~2,587~~ 3,588	0	70	18	12	7	9	30	55	30	8	78	0.79	158.8

T TSPCSTGR

Species, Sort Grade - Board Foot Volumes (Type)

Project: FROSTYS

Page 1
Date 3/31/2016
Time 7:03:13AM

T07N R06W S20 TTAKE

Twp	Rge	Sec	Tract	Type	Acres	Plots	Sample Trees	CuFt	BdFt
07N	06W	20	AREA1	TAKE	170.00	81	108	1	W

T07N R06W S20 TTAKE

Spp	ST	Sort	Grad	% Net BdFt	Bd. Ft. per Acre Def%	Gross	Net	Total Net MBF	Percent Net Board Foot Volume: Log Scale Dia. 4-5	6-11	12-16	17+	Log Length 12-20	21-30	31-35	36-99	Average Log Ln Ft	Dia In	Bd Ft	CF/ Lf	Logs Per /Acre
D		DO	CU		100.0	47											4	9		0.00	3.1
D		DO	2S	4	1.1	455	450	76		25	58	16	16	28	56		27	11	122	1.31	3.7
D		DO	3S	83	.8	7,790	7,725	1,313	0	98	1		1	5	43	51	35	7	77	0.69	100.2
D		DO	4S	13	1.3	1,231	1,215	206	2	98			59	41			20	6	24	0.44	49.7
D	**Totals**			100	1.4	9,523	9,390	1,596	0	95	4	1	9	11	38	42	30	7	60	0.65	156.7
Type Totals					1.4	9,523	9,390	1,596	0	95	4	1	9	11	38	42	30	7	60	0.65	156.7

T TSPCSTGR

Species, Sort Grade - Board Foot Volumes (Type)

Project: FROSTYS

Date 3/31/2016

Time 7:03:51AM

T07N R06W S20 T00MC

Twp	Rge	Sec	Tract	Type	Acres	Plots	Sample Trees	CuFt	BdFt
07N	06W	20	AREA2	00MC	37.00	17	43	1	W

T07N R06W S20 T00MC

Spp	ST	Sort	Grad	% Net BdFt	Bd. Ft. per Acre Def%	Gross	Net	Total Net MBF	Percent Net Board Foot Volume: Log Scale Dia. 4-5	6-11	12-16	17+	Log Length 12-20	21-30	31-35	36-99	Average Log Ln Ft	Dia In	Bd Ft	CF/ Lf	Logs Per /Acre
D		DO	CU		100.0	300											9	15		0.00	3.0
D		DO	2S	70	.1	17,357	17,346	642	3	56	42		1	3	15	82	37	15	333	2.27	52.1
D		DO	3S	25	.6	6,382	6,344	235	85	7	8			4	20	77	37	8	97	0.91	65.6
D		DO	4S	5		1,055	1,055	39	100				27	73			25	6	30	0.48	34.8
D	**Totals**			99	1.4	25,093	24,745	916	28	41	31		2	6	16	77	34	10	159	1.33	155.6
H		DO	CU		100.0	138											10	24		0.00	.6
H		DO	2S	88	11.1	198	176	7		100						100	40	15	320	2.32	.6
H		DO	4S	12		22	22	1	100					100			22	7	40	0.82	.6
H	**Totals**			1	44.6	358	198	7	11	89				11		89	24	15	120	1.54	1.7
Type Totals					2.0	25,451	24,943	923	28	41	31		2	6	15	77	34	10	159	1.34	157.2

T TSPCSTGR

Species, Sort Grade - Board Foot Volumes (Type)

Project: FROSTYS

Page 1
Date 3/31/2016
Time 7:04:13AM

T07N R06W S20 TRW

Twp	Rge	Sec	Tract	Type	Acres	Plots	Sample Trees	CuFt	BdFt
07N	06W	20	AREA3	RW	3.00	81	254	1	W

T07N R06W S20 TRW

Spp	ST	Sort	Grad	% Net BdFt	Bd. Ft. per Acre Def%	Gross	Net	Total Net MBF	Percent Net Board Foot Volume: Log Scale Dia. 4-5	6-11	12-16	17+	Log Length 12-20	21-30	31-35	36-99	Average Log: Ln Ft	Dia In	Bd Ft	CF/ Lf	Logs Per /Acre
D		DO	CU		100.0	166											5	11		0.00	7.0
D		DO	2S	22	.5	5,216	5,191	16		2	90	8	4	11	24	60	34	13	201	1.66	25.8
D		DO	3S	67	.8	15,197	15,071	45	0	98	2		1	3	42	54	35	8	90	0.81	167.4
D		DO	4S	11	.6	2,407	2,393	7	3	97			59	33	3	4	20	6	26	0.49	93.6
D	**Totals**			100	1.4	22,986	22,655	68	1	76	22	2	8	8	34	50	30	8	77	0.82	293.8
SN		DO	CU		100.0	69											41	4		0.00	2.8
SN	**Totals**				100.0	69											41	4		0.00	2.8
Type Totals					1.7	23,055	22,655	68	1	76	22	2	8	8	34	50	30	8	76	0.81	296.6

TC PSTATS

PROJECT STATISTICS

PROJECT FROSTYS

DATE 2/19/2016

TWP	RGE	SC	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt
07N	06	20	AREA1	TAKE	210.00	179	1,278	1	W
07N	06W	20	AREA2	00MC					
07N	06W	20	AREA3	RW					

	PLOTS	TREES	TREES PER PLOT	ESTIMATED TOTAL TREES	PERCENT SAMPLE TREES
TOTAL	179	1278	7.1		
CRUISE	60	405	6.8	23,177	1.7
DBH COUNT					
REFOREST					
COUNT	114	873	7.7		
BLANKS	5				
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
DOUG FIR	400	110.2	15.1	46	35.2	136.9	12,458	12,285	3,795	3,775
SNAG	4	.1	13.1	38	0.0	.0	1		1	
WHEMLOCK	1	.1	28.0	74	0.1	.4	63	35	15	11
TOTAL	*405*	*110.4*	*15.1*	*46*	*35.3*	*137.4*	*12,522*	*12,320*	*3,811*	*3,786*

CONFIDENCE LIMITS OF THE SAMPLE

68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR

CL 68.1 SD: 1.0	COEFF VAR.%	S.E.%	SAMPLE TREES - BF LOW	AVG	HIGH	# OF TREES REQ. 5	10	INF. POP. 15
DOUG FIR	90.7	4.5	155	163	170			
SNAG								
WHEMLOCK								
TOTAL	*91.5*	*4.5*	*154*	*162*	*169*	*334*	*84*	*37*

CL 68.1 SD: 1.0	COEFF VAR.%	S.E.%	TREES/ACRE LOW	AVG	HIGH	# OF PLOTS REQ. 5	10	INF. POP. 15
DOUG FIR	117.2	8.7	101	110	120			
SNAG	457.5	34.2	0	0	0			
WHEMLOCK	1337.9	99.9	0	0	0			
TOTAL	*117.0*	*8.7*	*101*	*110*	*120*	*547*	*137*	*61*

CL 68.1 SD: 1.0	COEFF VAR.%	S.E.%	BASAL AREA/ACRE LOW	AVG	HIGH	# OF PLOTS REQ. 5	10	INF. POP. 15
DOUG FIR	112.6	8.4	125	137	148			
SNAG	452.1	33.8	0	0	0			
WHEMLOCK	1337.9	99.9	0	0	1			
TOTAL	*112.9*	*8.4*	*126*	*137*	*149*	*509*	*127*	*57*

CL 68.1 SD: 1.0	COEFF VAR.%	S.E.%	NET BF/ACRE LOW	AVG	HIGH	# OF PLOTS REQ. 5	10	INF. POP. 15
DOUG FIR	126.1	9.4	11,127	12,285	13,442			
SNAG								
WHEMLOCK	1337.9	99.9	0	35	70			
TOTAL	*126.5*	*9.4*	*11,156*	*12,320*	*13,483*	*639*	*160*	*71*

STATISTICS

PROJECT FROSTYS

TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt
07N	06W	20	AREA1	00PC	170.00	81	815	1	W

	PLOTS	TREES	TREES PER PLOT	ESTIMATED TOTAL TREES	PERCENT SAMPLE TREES
TOTAL	81	815	10.1		
CRUISE	27	254	9.4	33,181	.8
DBH COUNT					
REFOREST					
COUNT	54	561	10.4		
BLANKS					
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
DOUGLEAV	142	75.6	18.3	57	32.4	138.8	13,273	13,078	4,151	4,126
DOUG FIR	108	115.9	13.9	42	32.7	122.0	9,523	9,390	3,026	3,014
SNAG	4	3.7	13.1	38	0.9	3.4	69		47	
TOTAL	*254*	*195.2*	*15.8*	*48*	*66.6*	*264.3*	*22,864*	*22,468*	*7,224*	*7,140*

CONFIDENCE LIMITS OF THE SAMPLE

68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR

CL: 68.1 %	COEFF		SAMPLE TREES - BF			# OF TREES REQ.		INF. POP.
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15
DOUGLEAV	49.3	4.1	180	188	196			
DOUG FIR	60.7	5.8	89	94	100			
SNAG								
TOTAL	*64.0*	*4.0*	*139*	*145*	*151*	*164*	*41*	*18*

CL: 68.1 %	COEFF		TREES/ACRE			# OF PLOTS REQ.		INF. POP.
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15
DOUGLEAV	26.7	3.0	73	76	78			
DOUG FIR	60.4	6.7	108	116	124			
SNAG	299.7	33.3	2	4	5			
TOTAL	*44.4*	*4.9*	*186*	*195*	*205*	*79*	*20*	*9*

CL: 68.1 %	COEFF		BASAL AREA/ACRE			# OF PLOTS REQ.		INF. POP.
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15
DOUGLEAV	24.7	2.7	135	139	143			
DOUG FIR	59.5	6.6	114	122	130			
SNAG	296.0	32.9	2	3	5			
TOTAL	*37.3*	*4.1*	*253*	*264*	*275*	*56*	*14*	*6*

CL: 68.1 %	COEFF		NET BF/ACRE			# OF PLOTS REQ.		INF. POP.
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15
DOUGLEAV	30.0	3.3	12,642	13,078	13,514			
DOUG FIR	60.3	6.7	8,762	9,390	10,018			
SNAG								
TOTAL	*37.5*	*4.2*	*21,533*	*22,468*	*23,402*	*56*	*14*	*6*

STATISTICS

PROJECT FROSTYS

TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt
07N	06W	20	AREA1	TAKE	170.00	81	379	1	W

	PLOTS	TREES	TREES PER PLOT	ESTIMATED TOTAL TREES	PERCENT SAMPLE TREES
TOTAL	81	379	4.7		
CRUISE	24	108	4.5	19,707	.5
DBH COUNT					
REFOREST					
COUNT	52	271	5.2		
BLANKS	5				
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
DOUG FIR	108	115.9	13.9	42	32.7	122.0	9,523	9,390	3,026	3,014
TOTAL	*108*	*115.9*	*13.9*	*42*	*32.7*	*122.0*	*9,523*	*9,390*	*3,026*	*3,014*

CONFIDENCE LIMITS OF THE SAMPLE

68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR

CL: 68.1 %	COEFF		**SAMPLE TREES - BF**			# OF TREES REQ.		INF. POP.
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15
DOUG FIR	60.7	5.8	89	94	100			
TOTAL	*60.7*	*5.8*	*89*	*94*	*100*	*147*	*37*	*16*

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	60.4	6.7	108	116	124			
TOTAL	*60.4*	*6.7*	*108*	*116*	*124*	*145*	*36*	*16*

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	59.5	6.6	114	122	130			
TOTAL	*59.5*	*6.6*	*114*	*122*	*130*	*141*	*35*	*16*

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	60.3	6.7	8,762	9,390	10,018			
TOTAL	*60.3*	*6.7*	*8,762*	*9,390*	*10,018*	*145*	*36*	*16*

TC TSTATS

STATISTICS

PAGE 1

PROJECT FROSTYS

DATE 2/19/2016

TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt
07N	06W	20	AREA2	00MC	37.00	17	84	1	W

	PLOTS	TREES	TREES PER PLOT	ESTIMATED TOTAL TREES	PERCENT SAMPLE TREES
TOTAL	17	84	4.9		
CRUISE	9	43	4.8	2,898	1.5
DBH COUNT					
REFOREST					
COUNT	8	41	5.1		
BLANKS					
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
DOUG FIR	42	77.8	21.5	71	42.2	195.3	25,093	24,745	7,052	6,994
WHEMLOCK	1	.6	28.0	74	0.4	2.4	358	198	84	61
TOTAL	*43*	*78.3*	*21.5*	*71*	*42.6*	*197.6*	*25,451*	*24,943*	*7,136*	*7,055*

CONFIDENCE LIMITS OF THE SAMPLE

68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR

CL: 68.1 %	COEFF		**SAMPLE TREES - BF**			# OF TREES REQ.		INF. POP.
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15
DOUG FIR	59.5	9.2	390	429	469			
WHEMLOCK								
TOTAL	*59.1*	*9.0*	*389*	*428*	*466*	*139*	*35*	*15*

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	38.1	9.5	70	78	85			
WHEMLOCK	412.3	103.0		1	1			
TOTAL	*38.3*	*9.6*	*71*	*78*	*86*	*62*	*16*	*7*

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	26.0	6.5	183	195	208			
WHEMLOCK	412.3	103.0		2	5			
TOTAL	*27.2*	*6.8*	*184*	*198*	*211*	*31*	*8*	*3*

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	29.0	7.2	22,954	24,745	26,536			
WHEMLOCK	412.3	103.0		198	402			
TOTAL	*29.0*	*7.3*	*23,134*	*24,943*	*26,753*	*36*	*9*	*4*

TC PLOGSTVB

Log Stock Table - MBF

T07N R06W S20 TyTAKE	170.00
T07N R06W S20 Ty00MC	37.00
T07N R06W S20 TyRW	3.00

Project: FROSTYS
Acres 210.00

Page 1
Date 2/19/2016
Time 7:53:47AM

Spp	ST	Sort	Grade	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	2	0	100.0														
D		DO	CU	4	4	100.0														
D		DO	CU	6	4	100.0														
D		DO	CU	8	1	100.0														
D		DO	CU	12	10	100.0														
D		DO	CU	14	0	100.0														
D		DO	2S	12	13		13	.5									13			
D		DO	2S	20	7		7	.3						7		0				
D		DO	2S	24	22		22	.8			5			16	0					
D		DO	2S	28	17		17	.7						0	17	0				
D		DO	2S	30	0		0	.0						0						
D		DO	2S	32	143		142	5.5					15	56	57	15				
D		DO	2S	34	0		0	.0						0						
D		DO	2S	36	1		1	.0						1						
D		DO	2S	40	532		532	20.6					16	70	161	168	117			
D		DO	3S	20	14		14	.5				3	11	0						
D		DO	3S	24	25	18.4	20	.8			6	3	11							
D		DO	3S	26	2		2	.1	2			0								
D		DO	3S	28	16		16	.6			2	14								
D		DO	3S	30	33		33	1.3			10	0	3		18					
D		DO	3S	32	566	1.2	559	21.7		0	122	121	316	0						
D		DO	3S	34	72		72	2.8			69	4								
D		DO	3S	36	158		158	6.1			157			0						
D		DO	3S	38	64		64	2.5			60	4	0							
D		DO	3S	40	657		655	25.4			244	236	141	16		19				
D		DO	4S	12	8		8	.3		0	0	8								
D		DO	4S	14	10	28.5	7	.3			7	0								
D		DO	4S	16	54		54	2.1		5	44	3	2							
D		DO	4S	18	21		21	.8		0	21									
D		DO	4S	20	47		47	1.8		0	47	0								
D		DO	4S	22	0		0	.0			0									
D		DO	4S	24	36		36	1.4			36									
D		DO	4S	26	5		5	.2			5									
D		DO	4S	28	24		24	.9			24									
D		DO	4S	30	51		51	2.0			51									
D		DO	4S	32	0		0	.0			0									

TC PLOGSTVB

Log Stock Table - MBF

T07N R06W S20 TyTAKE	170.00
T07N R06W S20 Ty00MC	37.00
T07N R06W S20 TyRW	3.00

Project: FROSTYS
Acres 210.00

Date 2/19/2016
Time 7:53:47AM

Spp	ST	Sort	Grade	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	4S	34	0		0	.0			0									
D		DO	4S	40	0		0	.0					0							
D		Totals			2,616	1.4	2,580	99.7	2	5	911	396	515	166	253	202	130			
H		DO	CU	10	5	100.0														
H		DO	2S	40	7	11.1	7	88.9							7					
H		DO	4S	22	1		1	11.1			1									
H		Totals			13	44.6	7	.3			1				7					
SN		DO	CU	30	0	100.0														
SN		Totals			0	100.0														
Total		All Species			2,630	1.6	2,587	100.0	2	5	912	396	515	166	260	202	130			

TC PSTNDSUM

Stand Table Summary

Page 1
Date: 2/19/2016

T07N R06W S20 TyTAKE	170.00
T07N R06W S20 Ty00MC	37.00
T07N R06W S20 TyRW	3.00

Project FROSTYS
Acres 210.00

Time: 7:53:49AM
Grown Year:

Spc	S T	DBH	Sample Trees	FF 16'	Tot Av Ht	Trees/ Acre	BA/ Acre	Logs Acre	Average Log Net Cu.Ft.	Average Log Net Bd.Ft.	Tons/ Acre	Net Cu.Ft. Acre	Net Bd.Ft. Acre	Totals Tons	Totals Cunits	Totals MBF
D		10	10	84	50	7.553	4.12	7.55	11.1	40.2		83	303		175	64
D		11	20	85	63	12.484	8.24	12.48	15.7	51.3		195	641		410	135
D		12	29	86	59	17.984	14.12	19.03	17.3	53.2		328	1,012		690	212
D		13	26	85	60	12.059	11.12	14.09	18.2	54.4		256	767		538	161
D		14	32	86	64	12.511	13.37	17.37	19.3	57.7		335	1,002		704	210
D		15	45	85	74	16.234	19.92	27.75	20.7	65.6		575	1,820		1,207	382
D		16	49	84	64	11.154	15.57	19.35	21.2	67.5		411	1,306		863	274
D		17	43	86	64	5.832	9.19	9.04	26.0	79.6		235	719		494	151
D		18	39	84	64	3.703	6.54	6.80	24.7	73.9		168	503		352	106
D		19	15	85	91	.523	1.03	1.03	35.9	121.2		37	125		78	26
D		20	15	84	84	1.584	3.45	3.16	36.3	110.3		115	348		241	73
D		21	10	82	70	.812	1.95	1.62	33.7	101.2		55	164		115	35
D		22	15	86	94	1.004	2.65	2.31	40.5	146.6		93	338		196	71
D		23	10	84	82	.886	2.56	1.77	47.5	156.5		84	277		177	58
D		24	11	84	81	1.448	4.55	2.89	50.9	171.6		147	496		309	104
D		25	5	82	91	.730	2.49	1.46	61.7	207.3		90	302		189	63
D		26	7	82	76	1.170	4.31	2.06	57.3	186.4		118	385		248	81
D		27	3	84	101	.416	1.65	.83	76.7	284.9		63	236		133	50
D		28	6	84	91	.817	3.49	1.63	72.6	270.1		119	442		249	93
D		29	3	84	108	.361	1.65	.90	75.1	293.1		67	263		141	55
D		30	2	84	112	.334	1.64	.83	82.4	342.0		69	285		144	60
D		31	4	85	109	.472	2.47	1.10	92.0	392.7		101	432		213	91
D		32	1	86	89	.147	.82	.29	99.5	405.0		29	119		61	25
D		Totals	400	85	65	110.216	136.94	155.36	24.3	79.1		3,775	12,285		7,928	2,580
H		28	1	86	83	.097	.41	.19	55.5	180.0		11	35		23	7
H		Totals	1	86	83	.097	.41	.19	55.5	180.0		11	35		23	7
SN		11	2	85	53	.025	.02									
SN		14	1	85	62	.015	.02									
SN		16	1	88	18	.012	.02									
SN		Totals	4	86	48	.052	.05									
Totals			405	85	65	110.365	137.40	155.56	24.3	79.2		3,786	12,320		7,950	2,587

CRUSHED ROCK COST

SALE NAME: Frosty Shingle
PROJECT: Project No. 1
QUARRY: Knob Point Stockpile

MATERIAL: Crushed

DATE: 02/11/2016
BY: B Rodgers

Road Segment	Stations	Cubic Yards	ONE WAY HAUL IN MILES 50 MPH	30 MPH	25 MPH	20 MPH	15 MPH	10 MPH	5 MPH	Total Haul
1G to 1H	7.65	165		1.4	1.0	1.0	0.6	0.3	0.2	4.50
1I to 1J	15.00	228		1.4	0.95	0.8	0.6	0.2	0.1	4.05
1K to 1L	13.70	180		1.1	1.1	0.8	0.3	0.25	0.1	3.65
I1 to I2	92.00	220		1.1	1.1	0.8	0.3	0.25	0.1	3.65

PIT RUN ROCK COST

SALE NAME: Frosty Shingle
PROJECT: Project No. 1
QUARRY: Knob Point

MATERIAL: Pit Run

DATE: 02/11/2016
BY: B Rodgers

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	
1A to 1B	7.80	505		1.4	1.2	1.5	0.7	0.3	0.2	5.30
1C to 1D	3.60	273		1.4	1.2	1.5	0.7	0.3	0.2	5.30
1E to 1F	7.50	490		1.4	1.2	1.4	0.6	0.3	0.2	5.10
1G to 1H	7.65	465		1.4	1.0	1.0	0.6	0.3	0.2	4.50
1I to 1J	15.00	878		1.4	1.0	0.8	0.6	0.2	0.1	4.05
1K to 1L	13.70	800		1.1	1.1	0.8	0.3	0.25	0.1	3.65
1M to 1N	1.50	168		1.1	1.1	0.8	0.3	0.3	0.2	3.75
1O to 1P	10.40	615		1.1	1.1	0.7	0.2	0.2	0.2	3.50
1Q to 1R	1.50	135		1.1	1.1	0.7	0.2	0.3	0.2	3.55
I3 to I4	12.70	635		1.4	1.2	1.4	0.6	0.3	0.2	5.10

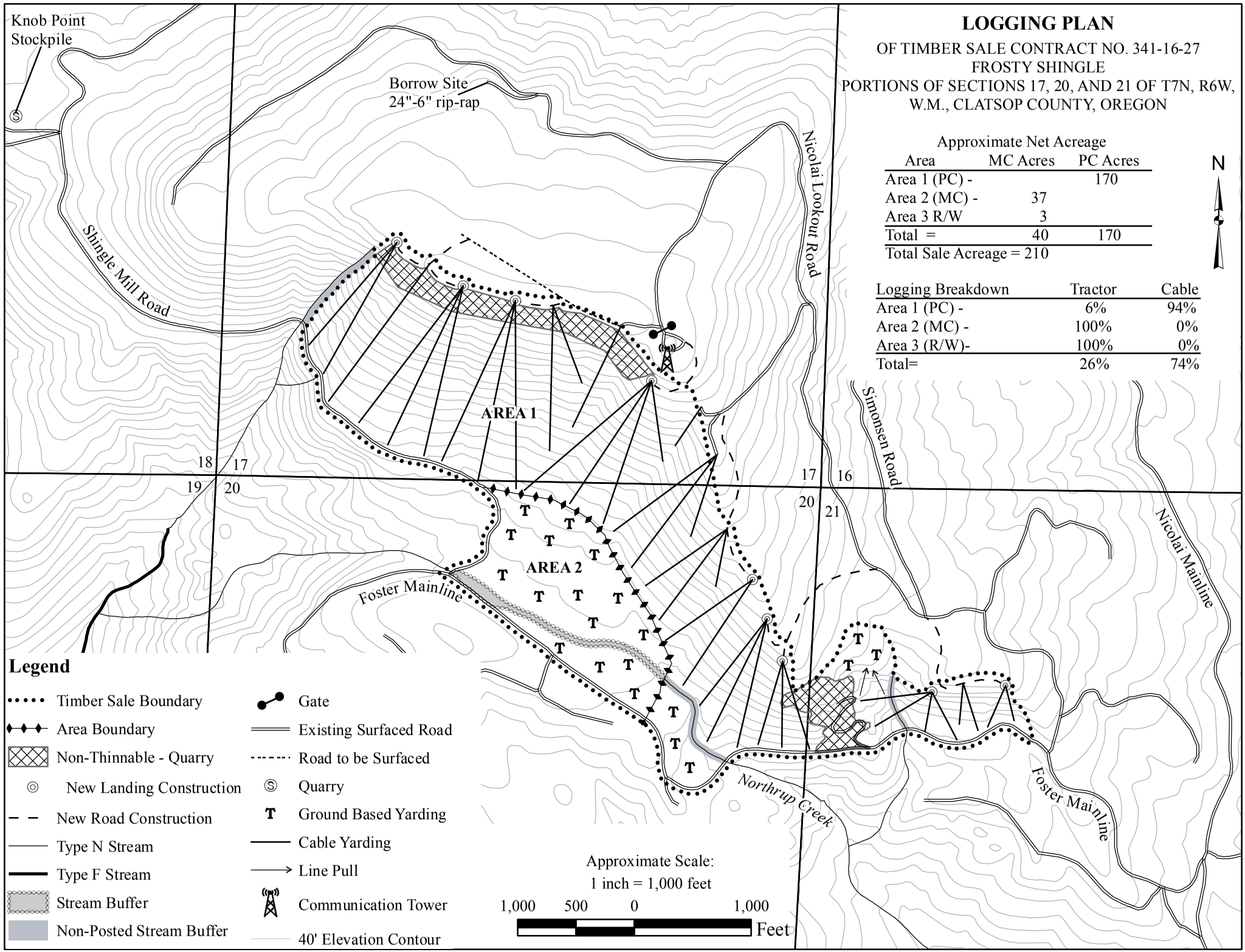
RIP RAP ROCK COST

SALE NAME: Knob Point
PROJECT: Project No. 1
QUARRY: Knob Point

MATERIAL: Rip Rap

DATE: 02/11/2016
BY: B Rodgers

Road Segment	Stations	Cubic Yards	ONE WAY HAUL IN MILES 50 MPH	30 MPH	25 MPH	20 MPH	15 MPH	10 MPH	5 MPH	Total Haul
1G to 1H	7.65	11		1.4	1.0	1.0	0.6	0.3	0.2	4.50
1I to 1J	15.00	11		1.4	0.95	0.8	0.6	0.2	0.1	4.05



LOGGING PLAN

OF TIMBER SALE CONTRACT NO. 341-16-27
FROSTY SHINGLE
PORTIONS OF SECTIONS 17, 20, AND 21 OF T7N, R6W, W.M., CLATSOP COUNTY, OREGON

Approximate Net Acreage

Area	MC Acres	PC Acres
Area 1 (PC) -		170
Area 2 (MC) -	37	
Area 3 R/W	3	
Total =	40	170
Total Sale Acreage = 210		

Logging Breakdown	Tractor	Cable
Area 1 (PC) -	6%	94%
Area 2 (MC) -	100%	0%
Area 3 (R/W)-	100%	0%
Total=	26%	74%