



Timber Sale Appraisal
Petersen Heights
Sale AT-341-2017-10-

District: Astoria

Date: April 27, 2017

Cost Summary

	Conifer	Hardwood	Total
Gross Timber Sale Value	\$455,420.04	\$105,387.10	\$560,807.14
		Project Work:	(\$229,411.00)
		Advertised Value:	\$331,396.14



Timber Sale Appraisal Petersen Heights Sale AT-341-2017-10-

District: Astoria

Date: April 27, 2017

Timber Description

Location: Located in portions of Section 6, T8N, R6W, and portions of Sections 30 and 31, T9N, R6W, and portions of Sections 25 and 36, T9N, R7W, W.M., Clatsop County, Oregon.

Stand Stocking: 60%

Specie Name	AvgDBH	Amortization (%)	Recovery (%)
Douglas - Fir	14	0	97
Western Hemlock / Fir	14	0	95
Sitka Spruce	30	0	95
Alder (Red)	14	0	95

Volume by Grade	2S	3S	4S	Camprun	Total
Douglas - Fir	159	237	88	0	484
Western Hemlock / Fir	411	690	263	0	1,364
Sitka Spruce	7	0	0	0	7
Alder (Red)	0	0	0	313	313
Total	577	927	351	313	2,168

Comments: Pond Values Used: 1st Quarter Calendar Year 2017 + Local Pond Values, March, 2017.

Expected Log Markets: Warrenton, Mist, Banks, Clatskanie, Tillamook, Forest Grove, Longview (WA), Chehalis (WA).

Western redcedar Stumpage Price = Pond Value minus Logging Cost:
 $\$981.05/\text{MBF} = \$1,294.21/\text{MBF} - \$313.16/\text{MBF}$

SCALING COST ALLOWANCE = \$5.00/MBF

BRANDING AND PAINTING COST ALLOWANCE = \$2.00/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):

Slash and Landing Piling (includes move-in and piling materials) = \$4,546

TOTAL Other Costs (with Profit & Risk to be added) = \$4,546

Other Costs (No Profit & Risk added):

Machine Washing for Invasive Weed Compliance = \$2,000

TOTAL Other Costs (No Profit & Risk added) = \$2,000

ROAD MAINTENANCE

(See attached Road Maintenance Cost Summary sheet)

TOTAL Road Maintenance: \$ 16,209/2,168 MBF = \$7.48/MBF



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Logging Conditions

Combination#: 1	Douglas - Fir	83.00%
	Western Hemlock / Fir	83.00%
	Sitka Spruce	83.00%
	Alder (Red)	83.00%
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:	7	bd. ft / load: 4200
cost / mbf:	\$224.49	
machines:	Log Loader (A) Tower Yarder (Medium)	
Combination#: 2	Douglas - Fir	10.00%
	Western Hemlock / Fir	10.00%
	Sitka Spruce	10.00%
	Alder (Red)	10.00%
Logging System:	Shovel	Process: Stroke Delimber
yarding distance:	Short (400 ft)	downhill yarding: No
tree size:	Mature / Regen Cut (900 Bft/tree), 3-5 logs/MBF	
loads / day:	15	bd. ft / load: 4000
cost / mbf:	\$52.87	
machines:	Stroke Delimber (B)	
Combination#: 3	Douglas - Fir	7.00%
	Western Hemlock / Fir	7.00%
	Sitka Spruce	7.00%
	Alder (Red)	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:	10	bd. ft / load: 3700
cost / mbf:	\$120.41	
machines:	Log Loader (B) Track Skidder	



"STEWARDSHIP IN FORESTRY"

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Logging Costs

Operating Seasons: 2.00	Profit Risk: 12%
Project Costs: \$229,411.00	Other Costs (P/R): \$4,546.00
Slash Disposal: \$0.00	Other Costs: \$2,000.00

Miles of Road

Road Maintenance: \$7.48

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	3.5
Western Hemlock / Fir	\$0.00	4.0	3.5
Sitka Spruce	\$0.00	3.0	5.0
Alder (Red)	\$0.00	3.0	3.3



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Logging Costs Breakdown

Logging	Road Maint	Fire Protect	Hauling	Other P/R appl	Profit & Risk	Slash Disposal	Scaling / Brand & Paint	Other	Total
Douglas - Fir									
\$200.04	\$7.70	\$4.05	\$76.52	\$2.10	\$34.85	\$0.00	\$7.00	\$0.92	\$333.18
Western Hemlock / Fir									
\$200.04	\$7.85	\$4.05	\$58.50	\$2.10	\$32.70	\$0.00	\$7.00	\$0.92	\$313.16
Sitka Spruce									
\$200.04	\$7.85	\$4.05	\$54.60	\$2.10	\$32.24	\$0.00	\$7.00	\$0.92	\$308.80
Alder (Red)									
\$200.04	\$7.85	\$4.05	\$82.73	\$2.10	\$35.61	\$0.00	\$7.00	\$0.92	\$340.30

Specie	Amortization	Pond Value	Stumpage	Amortized
Douglas - Fir	\$0.00	\$659.34	\$326.16	\$0.00
Western Hemlock / Fir	\$0.00	\$530.71	\$217.55	\$0.00
Sitka Spruce	\$0.00	\$426.00	\$117.20	\$0.00
Alder (Red)	\$0.00	\$677.00	\$336.70	\$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
Sitka Spruce	0	\$0.00	\$0.00
Alder (Red)	0	\$0.00	\$0.00

Unamortized

Specie	MBF	Value	Total
Douglas - Fir	484	\$326.16	\$157,861.44
Western Hemlock / Fir	1,364	\$217.55	\$296,738.20
Sitka Spruce	7	\$117.20	\$820.40
Alder (Red)	313	\$336.70	\$105,387.10

Gross Timber Sale Value

Recovery: \$560,807.14

Prepared By: John Choate

Phone: 503-325-5451

Road Maintenance Cost Summary (Interim and Post Harvest)

Sale: Peterson Heights
Date: January 20,2017
By: John Choate

MBF: 2,168
\$/MBF: \$7.48

Type	Equipment/Rationale	Move-in Rate	Times	Hours	Rate	Cost
Interim Operations and snow Entries: 2	Grader 14G	\$778	2	16	\$100	\$3,156
	Dump Truck 12CY	\$163	1	8	\$79	\$795
	FE Loader C966	\$778	1	2	\$79	\$936
Final Road Maintenance	Grader 14G	\$778	1	33	\$100	\$4,078
	Dump Truck 12CY	\$163	1	16	\$79	\$1,427
	FE Loader C966	\$778	1	6	\$83	\$1,276
	Vibratory Roller	\$778	1	33	\$77	\$3,319
	Water Truck 2,500 gallon	\$190	1	8	\$89	\$902
	Labor			8	\$40	\$320
Total						\$16,209

Interim Operations Road Maintenance

Production Rates	Miles/day	Distance (miles)	Days	Hours
Grader	2.0	6.10	3.1	24

Final Road Maintenance

Production Rates	Miles/day	Distance (miles)	Days	Hours
Process - Grader	1.5	6.1	4.1	33
Vibratory Roller	1.5	6.1	4.1	33

Process and compact: All crushed rock roads.

Windy Ridge to Peterson Road to Columbia View Road:

6.1 Miles

Vegetation Type/Zone	Vegetation Type/Zone Code	Production Rate (hr/ac)	Estimated Piles/Acre
Doug-fir	A	0.5	2.0
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	0.25	0.5

Date: 01/20/2017

Sale Area	Harvest Type	Veg Type/Zone	Ground Based Yarding Acres	Estimated Piling Hours/Area	Cost/Hour C325	Total Cost/Area	
1	MC	B	11	17	\$129.00	\$2,128.50	
					In-unit Piling	Sub Total =	\$2,128.50
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	4	\$220.00	\$880.00	49.5	\$5.00	\$247.50	
					Materials	Sub Total =	\$247.50
					Landing Piling	Sub Total =	\$880.00
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 =							\$4,546.00

SUMMARY OF ALL PROJECT COSTS

SALE NAME: Petersen Heights

ROAD CONSTRUCTION:

<u>Road segment</u>	<u>Length/Sta</u>	<u>Cost</u>
1A-1B, 1C-1D, 1E-1F, 2A-2B, 3A-3B, 3C-3D 3E-3F, 3G-3H 3I-3J, 3K-3L 3M-3N, 3O-3P	82.75	\$143,744
TOTALS	82.75	\$119,156

ROAD IMPROVEMENT:

<u>Road segment</u>	<u>Length/Sta</u>	<u>Cost</u>
I1-I2, I3-I4 I5-I6	322.8	\$94,891
TOTALS		\$91,906

SPECIAL PROJECTS:

<u>Description</u>	<u>Cost</u>
Project Road Maintenance	\$8,026
TOTAL	\$8,594

MOVE IN:

<u>Equipment</u>	<u>Cost</u>
Excavator (C330) X 1.5	\$2,109
Excavator (C315)	\$805
D-8 Cat	\$1,406
Large Grader (14G)	\$778
Front End Loader (C966) X 1.5	\$1,167
10 cy dump trucks X 4	\$652
20 cy dump trucks X 4	\$764
Water Truck (2,500 gal.)	\$190
Vibratory Roller X 1.5	\$1,167
Skidder	\$717
TOTAL	\$9,755.00

GRAND TOTAL **\$229,411.00**

Compiled By: A. Arvin

Date: 01/20/2017

SUMMARY OF CONSTRUCTION COSTS

SALE NAME: Peterson Heights
 ROAD: I1 to I2, I3 to I4, I5 to I6
 POINTS:

NEW CONSTRUCTION: STATIONS
 IMPROVEMENT: 322.80 STATIONS
 MILES
6.11 MILES

CLEARING & GRUBBING

Method	Acres/amount	x	Rate	=	Cost
		x		=	
		x		=	
		x		=	
		x		=	

SUB TOTAL FOR CLEARING & GRUBBING

EXCAVATION

Material	Cy/amount	x	Rate	=	Cost
I1 to I2		x		=	
End-haul bank sloughs, \$/cy	200	x	\$4.00	=	\$800.00
Install ditch filters w/315, \$/hr	2	x	\$101.00	=	\$202.00
I3 to I4		x		=	
Install ditch filters & repair ditchline w/315, \$/hr	3	x	\$101.00	=	\$303.00
Install dissipator w/315, \$/hr	1	x	\$101.00	=	\$101.00
8+25		x		=	**
Fill reconstruction (see cost sheet)		x		=	
		x		=	
		x		=	
		x		=	
		x		=	

SUB TOTAL FOR EXCAVATION

\$1,406

CULVERT MATERIALS AND INSTALLATION

Location	Dia/type	Lineal ft.	Rate	Cost	Location	Dia/type	Lineal ft.	Rate	Cost
I1 to I2									
215+20	18"CPP	30	\$19.53	\$585.90					
222+80	18"CPP	30	\$19.53	\$585.90					
230+30	18"CPP	30	\$19.53	\$585.90					
I3 to I4									
6+10	18"CPP	30	\$19.53	\$585.90					
8+25	24"ASCP	75		**					
8+95	18"CPP	30	\$19.53	\$585.90					
20+85	18"CPP	30	\$19.53	\$585.90					
45+45	18"CPP	30	\$19.53	\$585.90					
73+30	18"CPP	40	\$19.53	\$781.20					

Other/miscellaneous:	Description	Quantity	Rate	Cost
	Bevel culvert inlet	1.00	\$24.00	\$24.00
Culvert stakes & markers:	6' X 2 1/2" white fiberglass posts	8	\$20.00	\$160.00

SUB TOTAL FOR CULVERT MATERIALS & INSTALLATION

\$5,067

Subtotal of Clearing, Exc., Culv.

\$6,473

SURFACING				Stations/ amount		x		Rate/ sta/amt		Cost	
Subgrade prep:				Description							
I3 to I4				Grade, Shape and Ditch 16'		322.80		x		\$24.83 \$8,015.12	
				Scatter ditch waste material w/315 or grader		78.65				\$12.41 \$ 976.05	
				Subgrade Compaction		322.80		x		\$20.19 \$6,517.33	
ROAD SEGMENT I1 to I2				POINT TO POINT		Sta. to Sta.					
				I1 to I2		0+00 to 235+95					
Application				Volume (CY) per		Number of		TOTAL VOLUME (CY)		Rate/ Sta./ amt.	
Rock Size and Type				Depth of Rock (inches)						Cost	
Location											
Subgrade Leveling				4"-0" crushed		load 11		66		\$7.94 \$524	
Base Rock				4"-0" crushed		station 25		1,931		\$10.88 \$21,009	
				130+00, 134+40, 139+35, 141+05, 152+35, 156+95, 160+95, 169+45, 173+55, 180+50, 186+95, 192+45, 198+15,							
Turnouts				4"-0" crushed		TO 11		13		\$10.88 \$1,556	
Turnouts				4"-0" crushed		TO 22		2		\$10.88 \$479	
				147+15, 182+95, 202+30							
Junctions				4"-0" crushed		junction 11		3		\$10.88 \$359	
Curve Widening				4"-0" crushed		curve n/a		55		\$10.88 \$598	
Ditchfilters				6"-4" pit-run		filter 11		2		\$7.49 \$165	
Subgrade Leveling				3/4"-0" crushed		load 11		165		\$7.94 \$1,310	
				52+50 to 56+90, 63+20 to 66+65, 169+45 to 172+00, 174+00 to 177+20, 187+95 to 191+45							
Traction Rock				3/4"-0" crushed		station 13		17.10		\$7.94 \$1,763	
				215+20, 222+80, 230+30							
Culvert Bedding/Backfill				3/4"-0" crushed		culvert 33		99		\$7.94 \$786	
Total Rock for Road Segment:				I1 to I2				2,780			
ROAD SEGMENT I3 to I4				POINT TO POINT		Sta. to Sta.					
				I3 to I4		0+00 to 78+65					
Application				Volume (CY) per		Number of		TOTAL VOLUME (CY)		Rate/ Sta./ amt.	
Rock Size and Type				Depth of Rock (inches)						Cost	
Location											
Base Rock				4"-0" crushed		station n/a		100		** **	
Fill Armor				24"-6" riprap		fill 220		1		220 ** **	
				8+25		see fill spec.instr.		1			
Dissipator				24"-6" riprap		diss. spec.instr.		2		55 \$16.81 \$185**	
Ditchfilters				6"-4" pit-run		filter 33		1		33 \$9.26 \$306	
Subgrade Leveling				1 1/2"-0" crushed		load 11		8		88 \$7.94 \$699	
Surface Rock				1 1/2"-0" crushed		station 13		59.7		776 \$7.94 \$6,162	
Turnouts				1 1/2"-0" crushed		TO 11		8		88 \$7.94 \$699	
				2+50, 12+75, 19+35, 24+15, 34+35, 35+81, 47+10, 59+70							
Culvert Bedding/Backfill				1 1/2"-0" crushed		culvert spec.instr.		5.00		242 \$7.94 \$1,397**	
				6+10, 8+25, 8+95, 20+85, 45+45, 73+30							
Junctions				1 1/2"-0" crushed		junction 11		2		22 \$7.94 \$175	
Total Rock for Road Segment:				I3 to I4				1,624			
ROAD SEGMENT I5 to I6				POINT TO POINT		Sta. to Sta.					
				I5 to I6		0+00 to 8+20					
Application				Volume (CY) per		Number of		TOTAL VOLUME (CY)		Rate/ Sta./ amt.	
Rock Size and Type				Depth of Rock (inches)						Cost	
Location											
Subgrade Leveling				4"-0" crushed		load 11		66		\$7.94 \$524	
Total Rock for Road Segment:				I5 to I6				66			
Processing:				Description		No.sta		Rate/sta		Cost	
				Water, Process & Compact:		322.80		\$56.48		\$18,232	
				Hunt Creek McFarlane Big Noise Hunt Creek Hunt Creek							
				24"-6" rr 6"-4" pr 4"-0" 1 1/2"-0" 3/4"-0"		275 55 2,438 1,216 486		Total		4,470 4,470	
SUB TOTAL FOR SURFACING										4,470 \$72,436	

SPECIAL PROJECTS				Description	Cost
				** Fill Reconstruction (I3-I4, Sta. 8+25)	\$12,855
				Pit-run development (55 cy @ \$2.60/cy)	\$143.00
SUB TOTAL FOR SPECIAL PROJECTS					\$12,998
				Subtotal of Surfacing & Spec. Proj.	\$85,434
				Subtotal of Clearing, Exc., Culv.	\$6,473
GRAND TOTAL					\$91,906

Compiled By: Tillotson

Date: 04/24/2017

SALE NAME:	Petersen Heights
ROAD:	1A-1B, 1C-1D, 1E-1F, 2A-2B, 3A-3B, 3C-
POINTS:	3E-3F, 3G-3H, 3I-3J, 3K-3L, 3M-3N, 3O-3P.

1.57 MILES
MILES

Method	Acres/amount	x	Rate	=	Cost
Scatter outside of R/W	6.15	x	1,337.00	=	\$8,222.55
End Haul Clearing Debris	0.50	x	2,500.00	=	\$1,250.00
		x		=	
		x		=	

\$9,473

	Material	Cy/amount	x	Rate	=	Cost
1A to 1B	Dirft earth up to 200'	1.20	x	190.00	=	\$228.00
	Balanced construction	0.95	x	122.00	=	\$115.90
	Landing construcion	1.00	x	389.00	=	\$389.00
1C to 1D	Dirft earth up to 200'	3.45	x	190.00	=	\$655.50
	Landing construcion	2.00	x	389.00	=	\$778.00
1E to 1F	Dirft earth up to 200'	9.15	x	190.00	=	\$1,738.50
	Landing construction	2.00	x	389.00	=	\$778.00
2A to 2B	Balanced construcion	4.45	x	122.00	=	\$542.90
	Landing construcion	1.00	x	389.00	=	\$389.00
3A to 3B	Balanced construction	11.50	x	122.00	=	\$1,403.00
	Dirft earth up to 200'	2.50	x	190.00	=	\$475.00
	Landing construction	1.00	x	389.00	=	\$389.00
3C to 3D	Balanced construcion	2.05	x	122.00	=	\$250.10
	Landing construcion	1.00	x	389.00	=	\$389.00
3E to 3F	Dirft earth up to 200'	5.30	x	190.00	=	\$1,007.00
	Balanced construction	9.90	x	122.00	=	\$1,207.80
	End-haul excavation	1140.00	x	4.00	=	\$4,560.00
	Waste material compaction	1140.00	x	0.40	=	\$456.00
	Cut slope rounding	2.50	x	43.00	=	\$107.50
	Landing construcion	2.00	x	389.00	=	\$778.00
3G to 3H	Balanced construcion	2.40	x	122.00	=	\$292.80
	Landing construcion	1.00	x	389.00	=	\$389.00
3I to 3J	Balanced construction	4.70	x	122.00	=	\$573.40
	Dirft earth up to 200'	1.95	x	190.00	=	\$370.50
	Landing construcion	1.00	x	389.00	=	\$389.00
3K to 3L	Dirft earth up to 200'	1.65	x	190.00	=	\$313.50
	Landing construction	1.00	x	389.00	=	\$389.00
3M to 3N	Balanced construction	14.00	x	122.00	=	\$1,708.00
	Dirft earth up to 200'	3.50	x	190.00	=	\$665.00
	Landing construcion	2.00	x	389.00	=	\$778.00
3O to 3P	Dirft earth up to 200'	1.60	x	190.00	=	\$304.00
	Landing construction	1.00	x	389.00	=	\$389.00

\$23,198

[illegible]

	Description	Quantity	Rate	Cost
Other/miscellaneous:				
Culvert stakes & markers:	6"x2½" white carsonite post	2	\$20.00	\$40.00

\$1,602

\$34,273

SURFACING					Stations/ amount		Rate/ sta/amt		Cost	
Subgrade prep:				Description		x				
				Grade, Shape and Ditch 16'		x		\$24.83		\$2,054.68
				Subgrade Compaction		x		\$20.19		\$1,670.72

ROAD SEGMENT 1A to 1B				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	1A to 1B		0+00 to 2+15				
				Volume (CY) per	Number of					
Base Rock	4"-0" crushed	0+00-2+15	8	station	50	stations	2.15	108	\$10.88	\$1,170
Subgrade Reinforcement	4"-0" crushed	N/A	N/A	load	11	loads	2	22	\$7.94	\$175
Junctions	4"-0" crushed	0+00	N/A	junction	11	junctions	1	11	\$10.88	\$120
Landings	6"-0" pit run	1B	N/A	Landing	66	Landings	1	66	\$9.26	\$611
Total Rock for Road Segment:				1A to 1B				207		\$2,075

ROAD SEGMENT 1C to 1D				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	1C to 1D		0+00 to 3+45				
				Volume (CY) per	Number of					
Base Rock	4"-0" crushed	0+00-3+45	8	station	50	stations	3.45	173	\$10.88	\$1,877
Subgrade Reinforcement	4"-0" crushed	N/A	N/A	load	11	loads	3	33	\$7.94	\$262
Junctions	4"-0" crushed	0+00	N/A	junction	11	junctions	1	11	\$10.88	\$120
Curve Widening	4"-0" crushed	0+95	8	curve	11	curves	1	11	\$10.88	\$120
Traction Rock	3/4"-0" crushed	0+00-3+45	2	station	13	stations	3.45	45	\$7.94	\$356
Landings	6"-0" pit run	0+80, 1D	N/A	Landing	66	Landings	2	132	\$9.26	\$1,222
Total Rock for Road Segment:				1C to 1D				404		\$3,957

ROAD SEGMENT 1E to 1F				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	1E to 1F		0+00 to 9+15				
				Volume (CY) per	Number of					
Base Rock	4"-0" crushed	0+00-9+15	8	station	50	stations	9.15	458	\$10.88	\$4,978
Subgrade Reinforcement	4"-0" crushed	N/A	N/A	load	11	loads	5	55	\$7.94	\$437
Junctions	4"-0" crushed	0+00	N/A	junction	11	junctions	1	11	\$10.88	\$120
Turnouts	4"-0" crushed	4+80, 6+80	8	turnout	22	turnouts	2	44	\$10.88	\$479
Curve Widening	4"-0" crushed	3+15	8	curve	11	curves	1	11	\$10.88	\$120
Turnarounds	4"-0" crushed	6+80	8	turnaround	11	turnarounds	1	11	\$10.88	\$120
Traction Rock	3/4"-0" crushed	6+80-9+15	2	station	13	stations	2.35	31	\$7.94	\$243
Landings	6"-0" pit run	2+80, 1F	N/A	Landing	66	Landings	2	132	\$9.26	\$1,222
Total Rock for Road Segment:				1E to 1F				752		\$7,717

ROAD SEGMENT 2A to 2B				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	2A to 2B		0+00 to 4+45				
				Volume (CY) per	Number of					
Base Rock	4"-0" crushed	0+00-4+45	8	station	50	stations	4.45	223	\$10.88	\$2,421
Subgrade Reinforcement	4"-0" crushed	N/A	N/A	load	11	loads	4	44	\$7.94	\$349
Junctions	4"-0" crushed	0+00	N/A	junction	11	junctions	1	11	\$10.88	\$120
Landings	6"-0" pit run	2B	N/A	Landing	66	Landings	1	66	\$9.26	\$611
Total Rock for Road Segment:				2A to 2B				344		\$3,501

ROAD SEGMENT 3A to 3B				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	3A to 3B		0+00 to 14+00				
				Volume (CY) per	Number of					
Base Rock	4"-0" crushed	0+00-14+00	8	station	50	stations	14.00	700	\$10.88	\$7,616
Subgrade Reinforcement	4"-0" crushed	N/A	N/A	load	11	loads	6	66	\$7.94	\$524
Junctions	4"-0" crushed	0+00	N/A	junction	11	junctions	1	11	\$10.88	\$120
Traction Rock	3/4"-0" crushed	7+60-14+00	2	station	13	stations	6.40	83	\$7.94	\$661
Turnouts	4"-0" crushed	13+25	8	turnout	22	turnouts	1	22	\$10.88	\$239
Turnarounds	4"-0" crushed	13+25	8	turnaround	11	turnarounds	1	11	\$10.88	\$120
Landings	6"-0" pit run	3B	N/A	Landing	66	Landings	1	66	\$9.26	\$611
Total Rock for Road Segment:				3A to 3B				959		\$9,891

ROAD SEGMENT 3C to 3D				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	3C to 3D		0+00 to 2+05				
				Volume (CY) per	Number of					
Base Rock	4"-0" crushed	0+00-2+05	8	station	50	stations	2.05	103	\$10.88	\$1,115
Subgrade Reinforcement	4"-0" crushed	N/A	N/A	load	11	loads	2	22	\$7.94	\$175
Junctions	4"-0" crushed	0+00	N/A	junction	11	junctions	1	11	\$10.88	\$120
Landings	6"-0" pit run	3D	N/A	Landing	66	Landings	1	66	\$9.26	\$611
Total Rock for Road Segment:				3C to 3D				202		\$2,021

ROAD SEGMENT 3E to 3F				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	3E to 3F		0+00 to 17+70				
				Volume (CY) per	Number of					
Base Rock	4"-0" crushed	0+00-17+70	8	station	50	stations	17.70	885	\$10.88	\$9,629
Subgrade Reinforcement	4"-0" crushed	N/A	N/A	load	11	loads	10	110	\$7.94	\$873
Junctions	4"-0" crushed	0+00	N/A	junction	11	junctions	1	11	\$10.88	\$120
Turnouts	4"-0" crushed	2+33, 7+00, 14+20	8	turnout	22	turnouts	3	66	\$10.88	\$718
Turnarounds	4"-0" crushed	15+85	8	turnaround	11	turnarounds	1	11	\$10.88	\$120
Curve Widening	4"-0" crushed	8+75, 10+75	8	curve	22	curves	2	44	\$10.88	\$479
Traction Rock	3/4"-0" crushed	0+00-5+00, 7+00-15+85	2	station	13	stations	13.85	180	\$7.94	\$1,430
Dissipator	24"-6" rip-rap	5+25, 12+00	N/A	dissipator	11	dissipators	2	22	\$18.62	\$410
Landings	6"-0" pit run	8+60, 16+86, 3F	N/A	Landing	see specific instr.	Landings	3	286	\$9.26	\$2,648
Total Rock for Road Segment:				3E to 3F				1,615		\$16,426

ROAD SEGMENT 3G to 3H				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	3G to 3H		0+00 to 2+40				
				Volume (CY) per	Number of					
Base Rock	4"-0" crushed	0+00-2+40	8	station	50	stations	2.40	120	\$10.88	\$1,306
Subgrade Reinforcement	4"-0" crushed	N/A	N/A	load	11	loads	2	22	\$7.94	\$175
Junctions	4"-0" crushed	0+00	N/A	junction	11	junctions	1	11	\$10.88	\$120
Landings	6"-0" pit run	3H	N/A	Landing	66	Landings	1	66	\$9.26	\$611
Total Rock for Road Segment:				3G to 3H				219		\$2,211

ROAD SEGMENT 3I to 3J				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	3I to 3J		0+00 to 6+65				
				Volume (CY) per	Number of					
Base Rock	4"-0" crushed	0+00-6+65	8	station	50	stations	6.65	333	\$10.88	\$3,618
Subgrade Reinforcement	4"-0" crushed	N/A	N/A	load	11	loads	5	55	\$7.94	\$437
Junctions	4"-0" crushed	0+00	N/A	junction	11	junctions	1	11	\$10.88	\$120

CRUSHED ROCK COST

SALE NAME:	Peterson Heights
PROJECT:	No. 1 and 2
QUARRY:	Big Noise

DATE: 01/19/2017
BY: JT

[illegible]

ROCK HAUL:

Truck type:	<u>D20</u>	No. trucks:	<u>4</u>
Delay min.	<u>8</u>	Efficiency:	<u>85%</u>

Ave haul:	\$8.90	/cy
Load:	\$0.72	/cy
Spread:	\$1.26	/cy

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

Truck type:	<u>D10</u>	No. trucks:	<u>4</u>
Delay min.	<u>5</u>	Efficiency:	<u>85%</u>

Production: cy/day = 643

CRUSHED ROCK HAUL COSTS 6,992 cy @ **\$10.88 /cy**

6,992 cy @ \$10.88 /cy

CRUSHED ROCK COST

SALE NAME:	Peterson Heights
PROJECT:	No. 1 and 2
QUARRY:	Hunt Creek

MATERIAL: $\frac{4''-0", 1 \frac{1}{2}''-0"}{3/4''-0" \text{ Crushed}}$

DATE: 01/19/2017
BY: JT

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	2.15	22	0.50		0.30	3.00	0.85	0.35	0.10	5.10	
1C to 1D	3.45	78	0.50		0.30	3.00	3.25	0.85	0.15	8.05	
1E to 1F	9.15	86	0.50		0.30	3.10	3.90	0.95	0.15	8.90	
2A to 2B	4.45	44	0.50		0.30	3.25	3.00	0.35	0.10	7.50	
3A to 3B	14.00	149	0.50		0.30	3.35	1.15	0.35	0.10	5.75	
3C to 3D	2.05	22	0.50		0.30	3.35	1.15	0.35	0.10	5.75	
3E to 3F	17.70	290	0.50		0.30	3.35	1.05	0.25	0.10	5.55	
3G to 3H	2.40	22	0.50		0.30	3.35	1.05	0.25	0.10	5.55	
3I to 3J	6.65	55	0.50		0.30	3.35	1.15	0.25	0.10	5.65	
3K to 3L	1.65	22	0.50		0.30	3.35	1.05	0.25	0.10	5.55	
3M to 3N	17.50	241	0.50		0.30	3.35	1.05	0.25	0.10	5.55	
3O to 3P	1.60	22	0.50		0.30	3.35	1.00	0.25	0.10	5.50	
I1 to I2	235.95	486	0.5		0.3	3.0	0.9	0.4	0.1	5.10	
I3 to I4	78.65	1,216	0.5		0.3	3.0	3.3	0.9	0.2	8.10	
I5 to I6	8.20	66	2.5	0.6	5.2	1.0	0.8	0.5	0.3	10.90	

ROCK HAUL:

Truck type:	<u>D20</u>	No. trucks:	<u>4</u>
Delay min.	<u>8</u>	Efficiency:	<u>85%</u>

Ave haul: \$6.43 /cy

Load: \$0.54 /cy

Spread: \$0.96 /cy

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

Truck type:	<u>D10</u>	No. trucks:	<u>4</u>
Delay min.	<u>5</u>	Efficiency:	<u>85%</u>

Production: cy/day = 890

CRUSHED ROCK HAUL COSTS

2,821 cy @ **\$7.94 /cy**

RIP RAP ROCK COST

SALE NAME:	Peterson Heights
PROJECT:	No. 1 and 2
QUARRY:	Hunt Creek

DATE: 04/20/2017
BY: JT

[illegible]

ROCK HAUL:

Truck type:	<u>D12</u>	No. trucks:	<u> </u>
Delay min.	<u>6</u>	Efficiency:	<u>85%</u>
Truck type:	<u>D10</u>	No. trucks:	<u>4</u>
Delay min.	<u>5</u>	Efficiency:	<u>85%</u>

Ave haul:	\$9.80	/cy
Load:	\$2.70	/cy
Develop:	<u>\$4.30</u>	/cy

Production: cy/day = 257

RIP RAP ROCK HAUL COSTS

297 cy @ **\$16.81 /cy**

PIT RUN ROCK COST

SALE NAME:	Petersen Heights
PROJECT:	No. 1 and 2
QUARRY:	McFarlane

MATERIAL: 6"-0" and 6"-4"
Pit-Run

DATE: 04/21/2017
BY: JC

[illegible]

ROCK HAUL:

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

Ave haul:	\$7.27	/cy
Load:	\$0.72	/cy
Spread:	\$1.26	/cy

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

Truck type:	<u>D10</u>	No. trucks:	<u>8</u>
Delay min.	<u>5</u>	Efficiency:	<u>85%</u>

Production: cy/day = 695

PIT RUN ROCK HAUL COSTS

1,287 cy @ **\$9.26 /cy**

Projects Road Maintenance Cost Summary

Sale: Peterson Heights
Date: March 16, 2016
By: Ed Holloran

Type	Equipment/Rationale			Hours	Rate	Cost
Final Project Haul Road Maintenance	Grader 14G			36.0	\$100	\$3,600
	Dump Truck 12CY			8.0	\$79	\$632
	FE Loader C966			2.0	\$83	\$166
	Vibratory Roller			36.0	\$77	\$2,772
	Water Truck 2,500 gallon			16.0	\$89	\$1,424
Total						\$8,594

Production Rates

Grader

Vibratory Roller

Miles/day	Distance(miles)	Days	Hours
1.5	7.00	4.7	37.33
1.5	7.00	4.7	37.33

Big Noise Quarry to Highway 30 = 3.9 Miles

Hunt Creek Stockpile to Highway 30 = 2.0

Mcfarlane Rock Source to County Road 1.1 miles

Total Miles = 7.0 Miles

Fill Reconstruction Cost Estimate

Segment: I3 to I4
 Fill: 1

Station: 8+25
 Height: 14

Materials	Quantity		\$	Total
24"x75', 14ga, CMP	75		\$26.17	\$1,962.75
24"-6" Riprap Dissipator	44	cy	\$16.81	\$739.64
24"-6" Riprap Fill Armor	220	cy	\$16.81	\$3,698.20
1 1/2"-0" Crushed Rock for Bedding/Backfill	66	cy	\$7.94	\$524.04
4"-0" Crushed Rock for Road	100	cy	\$7.94	\$794.00
Erosion Control	0.1	ac	\$628.00	\$62.80
Mulch and seed				

\$7,781.43

Excavation	Rate	CY/amount	Total
End-Haul excavation \$/cy			
<i>Excavate Fill & Dev. Stream Channel</i>	\$4.00	400	\$1,600.00
<i>Backfill from barrow site</i>	\$2.00	420	\$840.00
Compaction			
<i>Backfill (barrow & crushed rock)</i>	\$0.70	420	\$294.00
<i>Waste material compaction</i>	\$0.40	400	\$160.00
Misc.			
Fill armor placement w/330, \$/hr	\$155.00	8	\$1,240.00
Prep site w/330, \$/hr	\$155.00	4	\$620.00
Laborer \$/hr	\$40.00	8	\$320.00

\$5,074.00

Compiled By: Kraig Kirkpatrick

Date: 1/19/2017

Project Total	\$12,855
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**PETERSEN HEIGHTS
FY 2017
TIMBER CRUISE REPORT**

1. **Sale Area Location:** Areas 1, 2, 3, and 4 are located in portions of Section 6, T8N, R6W, portions of Sections 30 and 31, T9N, R6W, and portions of Sections 25 and 36, T9N, R7W, W.M., Clatsop County, Oregon.

2. **Fund Distribution:** Fund: BOF 100% CSL 0%
Tax Code: 4-03 100%

3. **Sale Acreage by Area:**

Area	Harvest Type	Gross Acres	Stream Buffer Acres	Non-Thinnable Acres	New R/W Acres	Existing R/W Acres	Net Acreage
1	PC	73	1	7	1	2	62
2	MC	14	0	0	2	1	11
3	PC	186	7	0	4	2	173
4	RW	7	-		-	-	7
TOTALS		280	8	7	7	5	253

4. **Cruisers and Cruise Dates:** Area 1 was cruised by Matt Dimick with John Choate, Jake Hatcher with Cody Valencia, Ed Holloran with Jeff Brown, and Andrew Arvin with Avery Petersen. The cruise was completed in one day on **December 21, 2016**. Area 2 was cruised on **December 22, 2016** by Matt Dimick with John Choate, and Jake Hatcher with Cody Valencia. Area 3 was cruised by Ed Holloran, Avery Petersen with Cody Valencia, John Choate and Andrew Arvin on **January 12, 2017**.
5. **Cruise Method and Computation:** Area 1 is a partial cut unit. A variable plot cruise with a 27.78 BAF was used in the Area. These plots were located on a 5 chain by 3 chain grid, with a count/cruise plot ratio of 1 to 2. A total of 49 plots were sampled. Only 38 were used with 14 measured plots and 24 count plots.

Area 2 is a modified clearcut. A variable plot cruise with a 33.61 BAF was used in the Area. These plots were located on a 3 chain by 2 chain grid, with a count/cruise plot ratio of 1 to 1. A total of 22 plots were sampled, with 11 measured plots and 11 count plots.

Area 3 is a partial cut. A variable plot cruise with a 27.78 BAF was used in the Area. These plots were located on a 10 chain by 4 chain grid, with a count/cruise plot ratio of 1 to 1. A total of 48 plots were sampled with 24 measured plots and 24 count plots.

Area 4 R/W was calculated applying road R/W acreage and using volume per acre from the all sale Areas.

Cruisers used Allegro 2 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.

<u>AREAS</u>	<u>PROJECT</u>	<u>TRACT</u>	<u>CRUISE TYPE</u>
1	PHEIGHTS	A1	OPCX, TAKE, STAY
2	PHEIGHTS	A2	OOMC, TAKE
3	PHEIGHTS	A3	OOPC, TAKE, STAY
4	PHEIGHTS	A1, A2, A3	RW

6. **Timber Description:** Area 1 is approximately a 50 to 65 year old stand of alder, Douglas-fir, with hemlock, some spruce and maple. The average take alder tree size is approximately 15 inches DBH, with an average merchantable tree height of 46 feet. The average take hemlock tree size is approximately 15 inches DBH, with an average merchantable tree height of 49 feet. The average take Douglas-fir tree size for harvest is approximately 16 inches DBH, with an average merchantable tree height of 35 feet. The

average volume per acre to be harvested (net) is approximately 7 MBF. This unit was cruised to a leave basal area of 135 square feet, with an SDI of 33%.

Area 2 is a stand of approximately 50 year old hemlock and Douglas-fir with some alder. The average take Douglas-fir tree size for harvest is approximately 21 inches DBH, with an average merchantable tree height of 78 feet. The average take hemlock tree size is approximately 19 inches DBH, with an average merchantable tree height of 69 feet. The average volume per acre to be harvested (net) is approximately 42 MBF. All trees were cruised to a merchantable top of 6 inch DIB or 40% fp.

Area 3 is approximately 35 to 55 year old Douglas-fir, hemlock with some spruce, maple and alder. The average take Douglas-fir tree size for harvest is approximately 13 inches DBH, with an average merchantable tree height of 37 feet. The average take hemlock tree size is approximately 13 inches DBH, with an average merchantable tree height of 39 feet. The average volume per acre to be harvested (net) is approximately 6 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 135 square feet, with an SDI of 31%.

Area 4 R/W. The volume to be removed from the R/W is based on the cruise volumes from all Areas. The average volume per acre to be harvested (net) is approximately 27 MBF. All trees were cruised to a merchantable top of 6 inch DIB or 40% fp.

Cedar is a reserved species.

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

Area	Target CV	Target SE%	Actual CV	Actual SE%
1	45	9	30.4	4.9
2	50	10	47.1	10.5
3	45	9	36.1	5.2

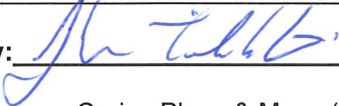
The statistics are for all areas and Take and Leave trees combined based on Net BF/Acre.

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. MBF	2 Saw	3Saw	4 Saw	Camp Run	% Sale
Douglas-fir	13.5	484	159	237	88		22%
W. Hemlock & True Fir	13.5	1364	411	690	263		63%
Sitka Spruce	30.4	7	7		0		<1%
Red alder	13.9	300				300	14%
Bigleaf maple	16.3	13				13	1%
TOTAL NET VOLUME		2,168					100%

9. Prepared by: Edward M. Holloran/John W. Choate

Date: 1/20/17

10. Approved by: 

Date: 1/20/2017

11. Attachments: Cruise Plans & Maps (9)
Species, Sort, Grade Report (7)
Statistics Reports (10)
Stand Table Report (2)
Log Stock Table Report MBF (3)

CRUISE DESIGN ASTORIA DISTRICT

Sale Name: Petersen Heights **Area(s)** 1

Harvest Type: Partial Cut

Approx. Cruise Acres: 71 **Estimated CV%** 45 Net BF **SE% Objective** 9 Net BF

Planned (Unit) Sale Volume: 568 MBF **Estimated Sale Area Value/Acre:** \$2,400

- A. Cruise Goals:** (a) Grade minimum 140 conifer and 20 hardwood trees:
 (b) Sample 44 cruise plots; (c) Other goals (Determine "automark" thinning standards; X Determine log grades for sale value; X Determine snag and leave tree species and sizes; Determine LWD (down wood) cubic feet and decay classes; Determine "diameter limit" harvest parameters;

B. Cruise Design:

- 1. Plot Cruises:** BAF 27.78 Full point
 Fixed Plot Size Plot Radius feet
 Cruise Line Direction(s) 53°/233°
 Cruise Line Spacing 5 chains
 Cruise Plot Spacing 3 chains
 Grade/Count Ratio 1 : 2 (18 measure – 26 count)
Leave 5 leave trees per cruise plot on average.

If plot falls clearly inside a buffer or No Harvest Area drop the plot. Take plots as marked on map. Grade all hardwoods as Camp Run. All Cedar is reserved Timber.

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" 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 16', 32' and 40' lengths, whenever possible. Do not record odd segments just to

maximize grade. Cull segments can be any length. For conifers, minimum merchantable segment length is 12'; for hardwoods, it's 8'. Maximum segment length is 40'. One foot of trim is assumed for each merch. segment. Do not use "double dash" (--) feature on the data recorder except for the top segment of the tree.

6. Species, Sort, and Grade Codes:

A. Species: Record as D (Douglas-fir); H (Western hemlock); S (Sitka Spruce); C (Western red cedar); NF (Noble fir); SF (Silver fir); A (Red alder); M (Bigleaf maple).

For "leave trees" in partial cuts, or for marked "wildlife trees," add an "L" to the species code (such as DL, HL, CL, etc.)

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

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

D. Alder Grades: 12" + = 1 Sawmill; 10"-12" = 2 Sawmill; 10"-8" = 3 Sawmill; and 8"-6" 4 Sawmill, or R = Camp Run; 0 = Cull.

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

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

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

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

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

B. Data Recorder Instructions

C. Other

Cruise Design by: Ed Holloran

Approved by: [Signature]

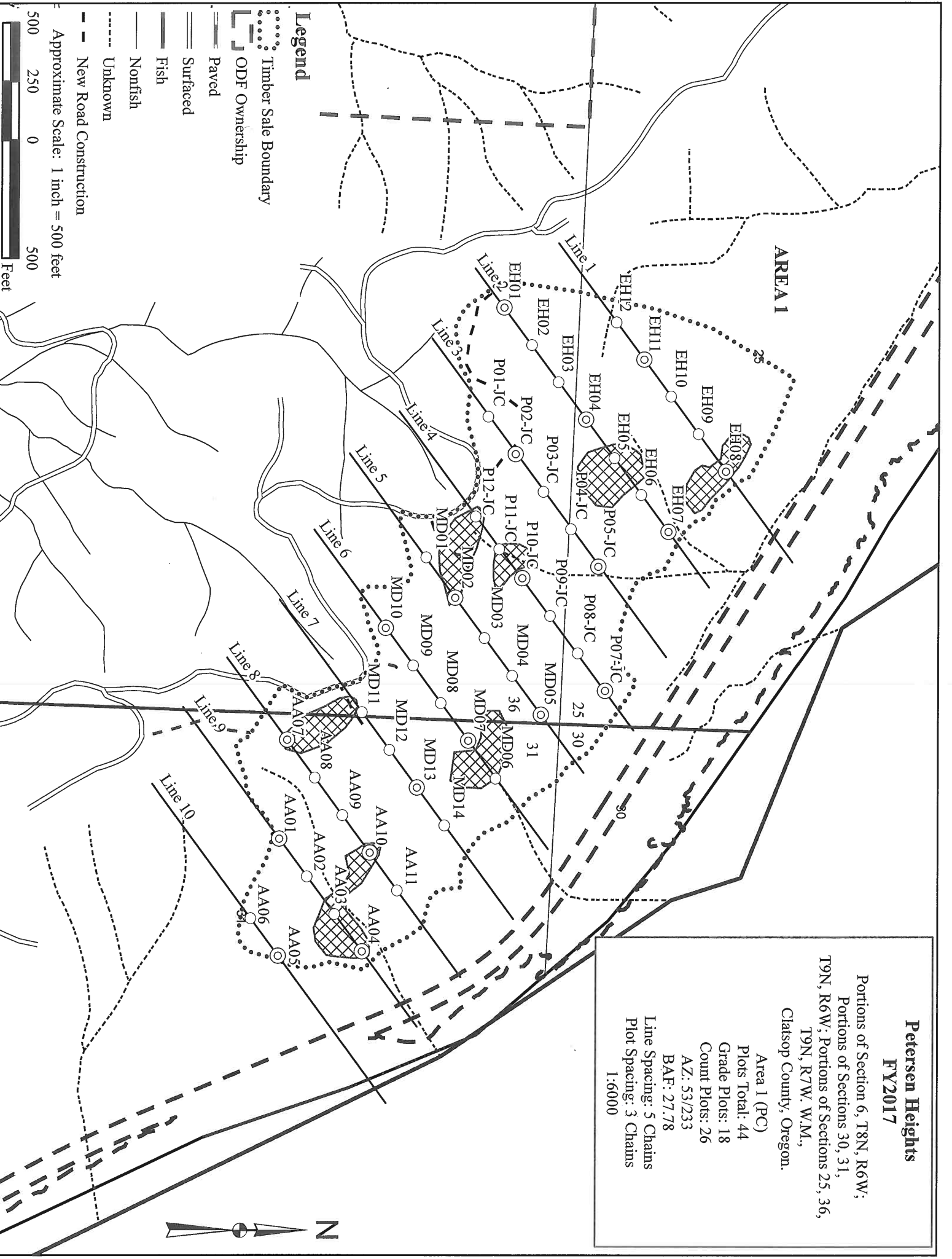
Date: 1/24/17

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Petersen Heights FY2017

Portions of Section 6, T8N, R6W;
Portions of Sections 30, 31,
T9N, R6W; Portions of Sections 25, 36,
T9N, R7W, W.M.,
Clatsop County, Oregon.

Area 1 (PC)
Plots Total: 44
Grade Plots: 18
Count Plots: 26
AZ: 53/233
BAF: 27.78
Line Spacing: 5 Chains
Plot Spacing: 3 Chains
1:6000



CRUISE DESIGN ASTORIA DISTRICT

Sale Name: Petersen Heights Area(s) 2

Harvest Type: Modified Clearcut

Approx. Cruise Acres: 14 Estimated CV% 50 Net BF SE% Objective 10 Net BF

Planned (Unit) Sale Volume: 448 MBF Estimated Sale Area Value/Acre: \$8,900

- A. Cruise Goals:** (a) Grade minimum 60 conifer and 20 hardwood trees:
(b) Sample 22 cruise plots; (c) Other goals (☐ Determine "automark" thinning standards; ☒ Determine log grades for sale value; ☒ Determine snag and leave tree species and sizes; ☐ Determine LWD (down wood) cubic feet and decay classes; ☐ Determine "diameter limit" harvest parameters;

B. Cruise Design:

- 1. Plot Cruises:** BAF 33.61 Full point
Fixed Plot Size _____ Plot Radius _____ feet
Cruise Line Direction(s) 90°/270°
Cruise Line Spacing 3 chains
Cruise Plot Spacing 2 chains
Grade/Count Ratio 1 : 1 (11 measure – 11 count)
Leave X leave trees per cruise plot on average.

If plot falls clearly inside a buffer or No Harvest Area drop the plot. Take plots as marked on map. Grade all hardwoods as Camp Run. All Cedar is reserved Timber.

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" 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 16', 32' and 40' lengths, whenever possible. Do not record odd segments just to

maximize grade. Cull segments can be any length. For conifers, minimum merchantable segment length is 12'; for hardwoods, it's 8'. Maximum segment length is 40'. One foot of trim is assumed for each merch. segment. Do not use "double dash" (--) feature on the data recorder except for the top segment of the tree.

6. Species, Sort, and Grade Codes:

A. Species: Record as D (Douglas-fir); H (Western hemlock); S (Sitka Spruce); C (Western red cedar); NF (Noble fir); SF (Silver fir); A (Red alder); M (Bigleaf maple).

For "leave trees" in partial cuts, or for marked "wildlife trees," add an "L" to the species code (such as DL, HL, CL, etc.)

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

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

D. Alder Grades: 12" + = 1 Sawmill; 10"-12" = 2 Sawmill; 10"-8" = 3 Sawmill; and 8"-6" 4 Sawmill, or R = Camp Run; 0 = Cull.

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

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

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

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

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

B. Data Recorder Instructions

C. Other

Cruise Design by: Ed Holloran

Approved by: [Signature]

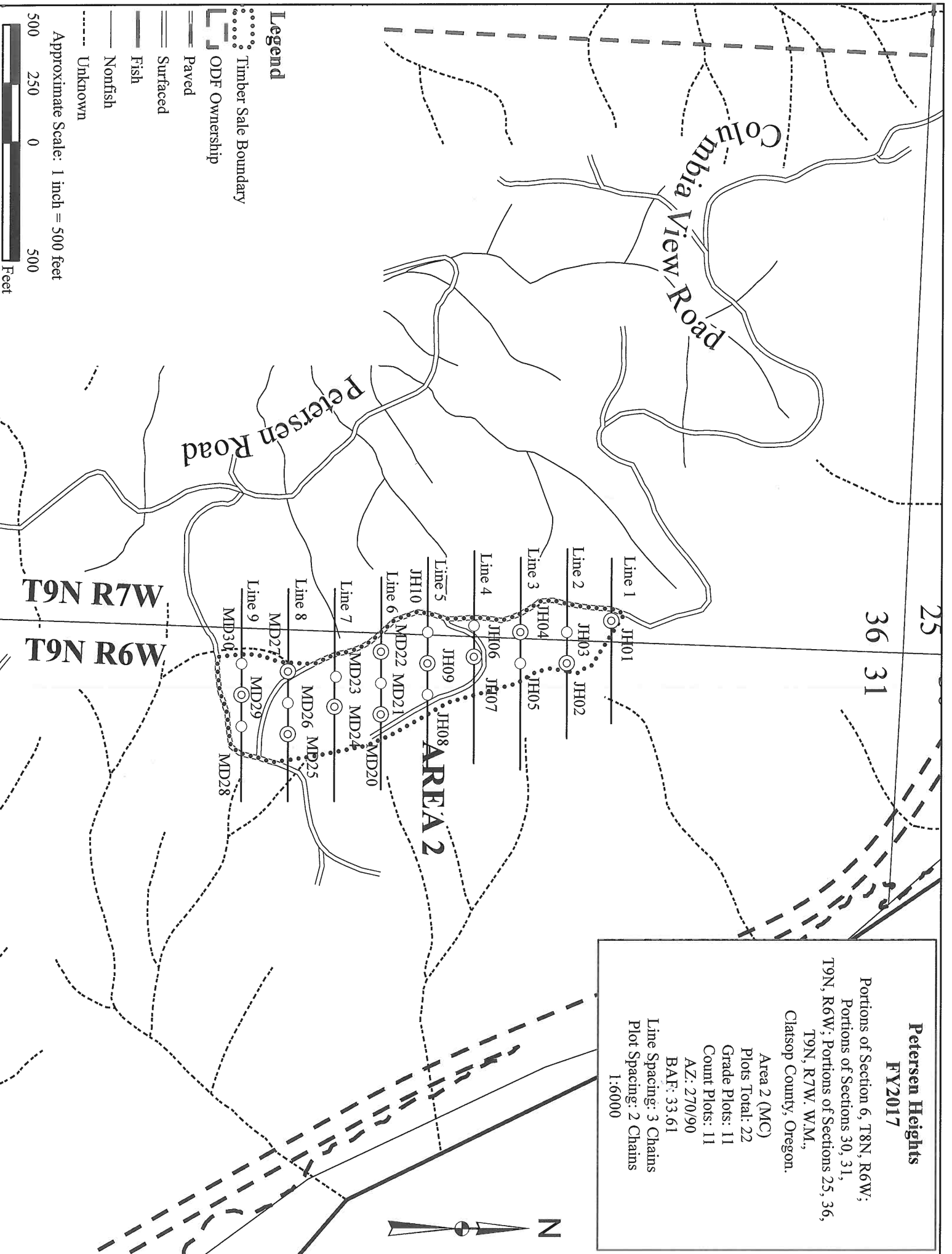
Date: 1/25/2017

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Petersen Heights FY2017

Portions of Section 6, T8N, R6W;
Portions of Sections 30, 31,
T9N, R6W; Portions of Sections 25, 36,
T9N, R7W. W.M.,
Clatsop County, Oregon.

Area 2 (MC)
Plots Total: 22
Grade Plots: 11
Count Plots: 11
AZ: 270/90
BAF: 33.61
Line Spacing: 3 Chains
Plot Spacing: 2 Chains
1:6000



CRUISE DESIGN ASTORIA DISTRICT

Sale Name: Petersen Heights **Area(s)** 3

Harvest Type: Partial Cut

Approx. Cruise Acres: 238 **Estimated CV%** 45 Net BF **SE% Objective** 9 Net BF

Planned (Unit) Sale Volume: 1,666 MBF **Estimated Sale Area Value/Acre:** \$2,100

- A. Cruise Goals:** (a) Grade minimum 140 conifer and 20 hardwood trees:
 (b) Sample 49 cruise plots; (c) Other goals (☐ Determine "automark" thinning standards; ☒ Determine log grades for sale value; ☒ Determine snag and leave tree species and sizes; ☐ Determine LWD (down wood) cubic feet and decay classes; ☐ Determine "diameter limit" harvest parameters;

B. Cruise Design:

- 1. Plot Cruises:** BAF 27.78 Full point
 Fixed Plot Size Plot Radius feet
 Cruise Line Direction(s) 90°/270° - East/West
 Cruise Line Spacing 10 (660 ft.) chains
 Cruise Plot Spacing 4 (264 ft.) chains
 Grade/Count Ratio 1 : 1 (24 measure - 25 count)
Leave 5 leave trees per cruise plot on average.

If plot falls clearly inside a buffer or No Harvest Area drop the plot. Take plots as marked on map. Grade all hardwoods as Camp Run. All Cedar is reserved Timber.

C. Tree Measurements:

- 1. Diameter:** Minimum DBH to cruise is 8" for conifers and 8" for hardwoods. Record DBH to nearest 1/2" for trees < 16", to nearest 1" for trees 16-24", and to nearest 2" for trees > 24". If tree diameters are estimated (only estimate on variable plot cruises), then record to closest estimate.
- 2. Bole Length:** Record bole length to nearest foot at TCD. For trees greater than 100 feet in merchantable height, estimating to the nearest 5 feet is acceptable.
- 3. Top Cruise Diameter (TCD):** Minimum top outside bark is 7" or 40% of DOB at 16' form point. Generally, use 7" outside bark for trees < 18" DBH and 40% of DOB @ FP for trees > 18" DBH.
- 4. Form Factors:** (1) Measure or estimate a 16' form factor for every conifer tree measured/graded; OR (2) Measure a minimum of 20 form factors for each major conifer species on the cruise area, and use these to calculate average FF for the species on the cruise. Hardwood form factors are a Standard 87.
- 5. Tree Segments:** Record log segments in "standard" log lengths in general use, such as 16', 32' and 40' lengths, whenever possible. Do not record odd segments just to

maximize grade. Cull segments can be any length. For conifers, minimum merchantable segment length is 12'; for hardwoods, it's 8'. Maximum segment length is 40'. One foot of trim is assumed for each merch. segment. Do not use "double dash" (--) feature on the data recorder except for the top segment of the tree.

6. Species, Sort, and Grade Codes:

- A. Species: Record as D (Douglas-fir); H (Western hemlock); S (Sitka Spruce); C (Western red cedar); NF (Noble fir); SF (Silver fir); A (Red alder); M (Bigleaf maple).

For "leave trees" in partial cuts, or for marked "wildlife trees," add an "L" to the species code (such as DL, HL, CL, etc.)

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

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

- D. Alder Grades: 12" + = 1 Sawmill; 10"-12" = 2 Sawmill; 10"-8" = 3 Sawmill; and 8"-6" 4 Sawmill, or R = Camp Run; 0 = Cull.

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

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

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

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

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

- B. Data Recorder Instructions

- C. Other

Cruise Design by: Ed Holloran

Approved by: [Signature]

Date: 1/24/2017

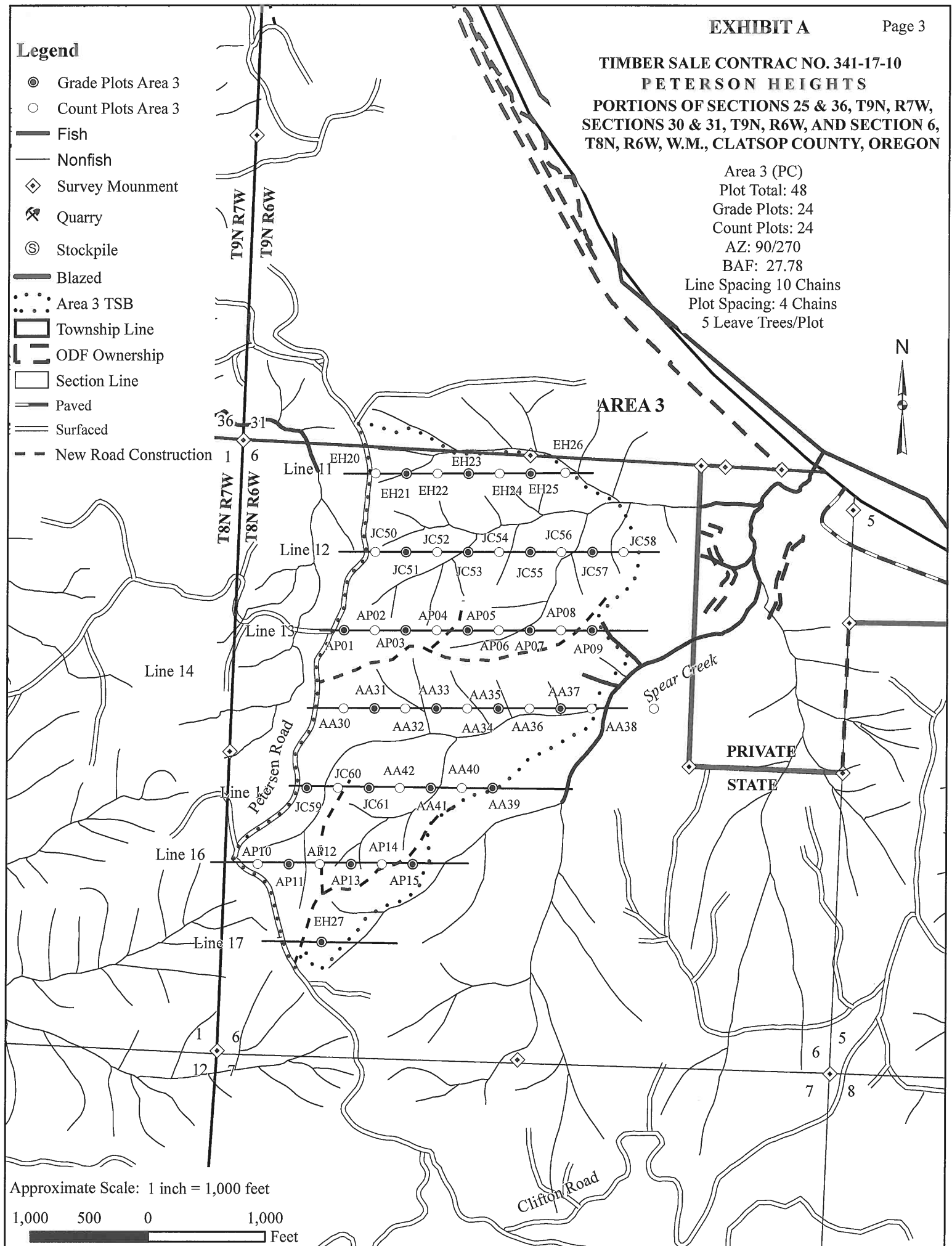
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Legend

- Grade Plots Area 3
- Count Plots Area 3
- Fish
- Nonfish
- ◆ Survey Mounment
- ⌘ Quarry
- ⊙ Stockpile
- Blazed
- ⋯ Area 3 TSB
- ▭ Township Line
- ▭ ODF Ownership
- ▭ Section Line
- Paved
- Surfaced
- - - New Road Construction

TIMBER SALE CONTRAC NO. 341-17-10
PETERSON HEIGHTS
PORTIONS OF SECTIONS 25 & 36, T9N, R7W,
SECTIONS 30 & 31, T9N, R6W, AND SECTION 6,
T8N, R6W, W.M., CLATSOP COUNTY, OREGON

Area 3 (PC)
 Plot Total: 48
 Grade Plots: 24
 Count Plots: 24
 AZ: 90/270
 BAF: 27.78
 Line Spacing 10 Chains
 Plot Spacing: 4 Chains
 5 Leave Trees/Plot



TC		PSPCSTGR													Species, Sort Grade - Board Foot Volumes (Project)												
T08N R06W S06 TyRW THRU T09N R07W S36 TyTAKE						Project:		PHEIGHTS								Page		1									
						Acres		253.00								Date		1/25/2017									
																Time		7:56:01AM									
S Spp	So Gr T rt ad	% Net BdFt	Bd. Ft. per Acre			Total Net MBF	Percent of Net Board Foot Volume								Average Log				Logs Per /Acre								
							Log Scale Dia.				Log Length				Ln Ft	Dia In	Bd Ft	CF/ Lf									
			4-5	6-11	12-16		17+	12-20	21-30	31-35	36-99																
D	DOCU																										
D	DO2S	32	1.6	641	630	159		8	71	21	5	12	23	60	7	12		0.00		.8							
D	DO3S	49	.0	937	937	237		100	0		0	0	56	44	32	13	214	1.62		2.9							
D	DO4S	19		348	348	88	0	100			48	38	0	13	35	7	76	0.68		12.4							
D Totals		22	.5	1,926	1,915	484 485	0	70	23	7	11	11	35	44	23	6	27	0.43		12.9							
D Totals		22	.5	1,926	1,915	484 485	0	70	23	7	11	11	35	44	28	7	66	0.69		29.0							
H	DOCU														18	9		0.00		4.5							
H	DO2S	30	1.7	1,652	1,623	411		3	58	39	1	2	27	71	37	14	292	1.89		5.6							
H	DO3S	50	1.2	2,763	2,729	690	0	94	6		1	4	68	27	33	8	89	0.79		30.6							
H	DO4S	20	1.2	1,051	1,038	263		100			49	26	3	22	22	6	28	0.44		36.8							
H Totals		63	1.4	5,466	5,390	1,364	0	67	21	12	10	8	43	39	27	8	70	0.73		77.4							
A	DOCU														9	14		0.00		3.4							
A	DOCR	100	.0	1,184	1,184	300		90	10	0	14	38	1	47	30	7	60	0.67		19.7							
A Totals		14	.0	1,184	1,184	300		90	10	0	14	38	1	47	27	8	51	0.64		23.2							
M	DOCU														32	6		0.00		.1							
M	DOCR	100	1.5	51	51	13		100			84	16			18	10	47	0.99		1.1							
M Totals		1	1.5	51	51	13		100			84	16			19	9	43	0.84		1.2							
S	DO2S	99	.5	26	26	7			10	90			38	62	35	21	762	4.21		.0							
S	DO4S	1	28.7	0	0	0		100			40		60		26	6	30	0.58		.0							
S Totals		0	.8	27	27	7		1	10	89	0		39	61	33	18	622	3.66		.0							
C	DO3S	100	55.6	0	0	0		100					100		40	8	40	1.28		.0							
C Totals		0	55.6	0	0	0		100					100		40	8	40	1.28		.0							
Totals			1.0	8,654	8,566	2,168 2,167	0	71	20	9	11	13	35	41	27	8	65	0.71		130.8							

T TSPCSTGR		Species, Sort Grade - Board Foot Volumes (Type)												Page 1				
		Project: PHEIGHTS												Date 1/25/2017	Time 7:44:57AM			
T09N R07W S36 TTAKE										T09N R07W S36 TTAKE								
Twp	Rge	Sec	Tract	Type	Acres	Plots	Sample Trees	CuFt	BdFt									
09N	07W	36	A1	TAKE	62.00	38	38	1	W									
S So Gr T rt ad Spp			% Net BdFt	Bd. Ft. per Acre Def% Gross Net			Total Net MBF	Percent Net Board Foot Volume								Average Log		Logs Per /Acre
								Log Scale Dia.				Log Length				Ln	Dia	
A DO CU																		
A DO CR			100		3,078	3,078	191		86	14		15	38		48	10 14 0.00 31 8 71 0.76	11.2 43.5	
A Totals			47		3,078	3,078	191		86	14		15	38		48	26 9 56 0.71	54.7	
H DO CU																	5.7	
H DO 2S			38	6.0	1,008	948	59			56 44				37 63	37 14 258 1.72	3.7		
H DO 3S			47		1,160	1,160	72	100						50 50	36 8 92 0.77	12.7		
H DO 4S			15		354	354	22	100			54 9 37			22 6 29 0.42	12.2			
H Totals			37	2.4	2,523	2,462	153		62	22 17		8 1 43 48			27 9 72 0.74	34.3		
D DO CU																	1.1	
D DO 3S			87		802	802	50	100						49 51	36 6 63 0.60	12.7		
D DO 4S			13		114	114	7	100			100				19 6 22 0.43	5.1		
D Totals			14		916	916	57	100			12		43 45		30 7 48 0.56	18.9		
M DO CU																	.4	
M DO CR			100	2.2	135	132	8	100			75 25				22 8 51 1.05	2.6		
M Totals			2	2.2	135	132	8	100			75 25				23 8 44 0.85	3.0		
Type Totals				1.0	6,653	6,589	409		79 14 6		13 19 22 46			27 9 59 0.69	110.9			

T		TSPCSTGR		Species, Sort Grade - Board Foot Volumes (Type)												Page		1		
				Project: PHEIGHTS												Date		1/25/2017		
																Time		7:44:57AM		
T09N R07W S36 TRW										T09N R07W S36 TRW										
Twp		Rge		Sec		Tract		Type		Acres		Plots		Sample Trees		CuFt		BdFt		
09N		07W		36		A1		RW		1.00		38		111		1		W		
S So Gr T rt ad Spp			%	Bd. Ft. per Acre			Total	Percent Net Board Foot Volume								Average Log				Logs Per /Acre
								Log Scale Dia.				Log Length				Ln Dia Bd CF/				
			Net	Def%	Gross	Net	Net MBF	4-5	6-11	12-16	17+	12-20	21-30	31-35	36-99	Ft	In	Ft	Lf	
A			DO	CU												9	15		0.00	
A			DO	CR	100	1.3	7,315	7,222	7	58	32	11	17	34	22	28	29	9	89	0.98
A Totals			33	1.3	7,315	7,222	7	58	32	11	17	34	22	28	27	9	79	0.94	91.2	
H			DO	CU												12	9		0.00	
H			DO	2S	55	2.9	5,724	5,558	6	4	67	29			26	74	37	14	290	1.84
H			DO	3S	38		3,711	3,711	4	1	93	6	1	1	44	54	35	8	91	0.82
H			DO	4S	7	1.8	678	666	1	100			50	9	41		22	6	31	0.45
H Totals			45	1.8	10,113	9,935	10	0	44	40	16	4	1	34	62	29	9	107	0.98	
D			DO	CU												5	11		0.00	
D			DO	2S	22		1,004	1,004	1	28	58	14	14		55	31	33	12	189	1.41
D			DO	3S	62		2,717	2,717	3	96	4		3	18	38	41	34	8	85	0.78
D			DO	4S	16		672	672	1	2	98		65	21	14		21	6	27	0.46
D Totals			20		4,393	4,393	4	0	81	16	3	15	14	38	33	28	8	68	0.74	
M			DO	CU												32	6		0.00	
M			DO	CR	100	2.2	135	132	0	100			75	25		22	8	51	1.05	
M Totals			1	2.2	135	132	0	100				75	25		23	8	44	0.85	3.0	
S			DO	2S	72	16.6	192	160	0	100				45	55	36	13	196	1.83	
S			DO	4S	28	28.7	87	62	0	100			40	60		26	6	30	0.58	
S Totals			1	20.4	279	222	0	28	72			11		49	40	29	8	77	1.02	
Type Totals					1.5	22,235	21,904	22	0	56	32	12	11	15	31	44	28	9	86	0.90

T		TSPCSTGR		Species, Sort Grade - Board Foot Volumes (Type)										Page 1								
				Project: PHEIGHTS										Date 1/25/2017								
														Time 7:44:57AM								
T09N R07W S36 TTAKE										T09N R07W S36 TTAKE												
Twp	Rge	Sec	Tract	Type	Acres	Plots	Sample Trees	CuFt	BdFt													
09N	07W	36	A2	TAKE	11.00	21	89	1	W													
S So Gr T rt ad Spp		%	Net BdFt	Bd. Ft. per Acre Def% Gross Net			Total Net MBF	Percent Net Board Foot Volume								Average Log		Logs Per /Acre				
								Log Scale Dia.				Log Length				Ln Dia			Bd CF/			
H	DO	CU																18	9		0.00	6.7
H	DO	2S	69	1.2	20,766	20,521	226	4	46	50	1	3	22	75	37	15	342	2.09			60.1	
H	DO	3S	26	1.0	7,606	7,527	83	100	0		5	1	46	48	34	8	90	0.81			83.4	
H	DO	4S	5	1.2	1,366	1,349	15	100			46	32		23	22	6	30	0.41			44.4	
H	Totals		70	1.1	29,737	29,398	323	33	33	35	4	4	27	66	32	10	151	1.19			194.5	
D	DO	2S	68	1.5	8,020	7,901	87		67	33		6	34	60	36	15	309	1.98			25.6	
D	DO	3S	27		3,176	3,176	35	100			2		58	41	33	9	100	0.83			31.9	
D	DO	4S	5		467	467	5	100			56	17		28	23	7	38	0.55			12.4	
D	Totals		28	1.0	11,663	11,544	127	32	46	23	3	5	39	53	32	11	165	1.26			69.8	
A	DO	CR	100		411	411	5	100			100				20	6	20	0.40			20.5	
A	Totals		1		411	411	5	100			100				20	6	20	0.40			20.5	
S	DO	2S	100		500	500	5		8	92		38	62		35	22	820	4.46			.6	
S	Totals		1		500	500	5		8	92		38	62		35	22	820	4.46			.6	
Type Totals				1.1	42,311	41,853	460	33	36	32	4	4	30	61	31	10	147	1.18			285.5	

T		TSPCSTGR		Species, Sort Grade - Board Foot Volumes (Type)										Page		1								
				Project: PHEIGHTS										Date		1/25/2017								
														Time		7:44:57AM								
T09N R07W S36 TRW										T09N R07W S36 TRW														
Twp		Rge		Sec		Tract		Type		Acres		Plots		Sample Trees		CuFt		BdFt						
09N		07W		36		A2		RW		2.00		21		91		1		W						
S So Gr T rt ad Spp		% Net BdFt		Bd. Ft. per Acre Def% Gross Net			Total Net MBF		Percent Net Board Foot Volume								Average Log				Logs Per /Acre			
									Log Scale Dia.				Log Length				Ln Dia Bd CF/ Ft In Ft Lf							
									4-5 6-11 12-16 17+				12-20 21-30 31-35 36-99											
H		DO CU															18 9 0.00				6.7			
H		DO 2S		69			1.2 20,766 20,521		41		4 46 50				1 3 22 75				37 15 342 2.09				60.1	
H		DO 3S		26			1.0 7,606 7,527		15		100 0				5 1 46 48				34 8 90 0.81				83.4	
H		DO 4S		5			1.2 1,366 1,349		3		100				46 32 23				22 6 30 0.41				44.4	
H		Totals		70			1.1 29,737 29,398		59		33 33 35				4 4 27 66				32 10 151 1.19				194.5	
D		DO 2S		68			1.5 8,020 7,901		16		67 33				6 34 60				36 15 309 1.98				25.6	
D		DO 3S		27			3,176 3,176		6		100				2 58 41				33 9 100 0.83				31.9	
D		DO 4S		5			467 467		1		100				56 17 28				23 7 38 0.55				12.4	
D		Totals		28			1.0 11,663 11,544		23		32 46 23				3 5 39 53				32 11 165 1.26				69.8	
A		DO CR		100			411 411		1		100				100				20 6 20 0.40				20.5	
A		Totals		1			411 411		1		100				100				20 6 20 0.40				20.5	
S		DO 2S		100			500 500		1		8 92				38 62				35 22 820 4.46				.6	
S		Totals		1			500 500		1		8 92				38 62				35 22 820 4.46				.6	
Type Totals							1.1 42,311 41,853		84		33 36 32				4 4 30 61				31 10 147 1.18				285.5	

T		Species, Sort Grade - Board Foot Volumes (Type)										Page		1					
TSPCSTGR		Project: PHEIGHTS										Date		1/25/2017					
												Time		7:44:57AM					
T08N R06W S06 TTAKE										T08N R06W S06 TTAKE									
Twp	Rge	Sec	Tract	Type	Acres	Plots	Sample Trees	CuFt	BdFt										
08N	06W	06	A3	TAKE	173.00	48	71	1	W										
S So Gr T rt ad Spp			%	Bd. Ft. per Acre Def% Gross Net			Total Net MBF	Percent Net Board Foot Volume								Average Log		Logs Per /Acre	
			Net BdFt					Log Scale Dia.				Log Length				Ln	Dia		Bd
H DO CU																			
H DO 2S			8		366	366	63	100					35	65	20	8	0.00	3.8	
H DO 3S			64	1.5	2,845	2,803	485	91	9		5	76	19	36	13	211	1.59	1.7	
H DO 4S			28	1.4	1,249	1,232	213	100		48	27		25	32	9	88	0.78	31.7	
H DO 4S			28	1.4	1,249	1,232	213	100		48	27		25	21	6	28	0.44	44.0	
H Totals			69	1.3	4,461	4,401	761	86	14	13	11	52	24	26	7	54	0.63	81.3	
D DO CU																			
D DO 2S			19	2.0	294	288	50	24	76	14	24		62	6	10		0.00	.7	
D DO 3S			52		765	765	132	100				58	42	28	12	133	1.24	2.2	
D DO 4S			29		411	411	71	100		43	44		13	35	7	75	0.67	10.2	
D Totals			23	.4	1,470	1,464	253	85	15	15	17	31	38	23	6	27	0.42	15.3	
D Totals			23											27	7	51	0.60	28.4	
A DO CU																			
A DO CR			100		515	515	89	100		8	39		52	6	13		0.00	.9	
A DO CR			100		515	515	89	100		8	39		52	32	6	49	0.55	10.6	
A Totals			8		515	515	89	100		8	39		52	30	7	45	0.54	11.5	
M DO CR			100		25	25	4	100		100				12	11	40	0.83	.6	
M Totals			0		25	25	4	100		100				12	11	40	0.83	.6	
Type Totals					1.0	6,471	6,405	1,108	87	13	14	14	42	29	27	7	53	0.61	121.9

T		TSPCSTGR		Species, Sort Grade - Board Foot Volumes (Type)										Page		1				
				Project: PHEIGHTS										Date		1/25/2017				
														Time		7:44:57AM				
T08N R06W S06 TRW										T08N R06W S06 TRW										
Twp		Rge		Sec		Tract		Type		Acres		Plots		Sample Trees		CuFt		BdFt		
08N		06W		06		A3		RW		4.00		48		185		1		W		
S So Gr T rt ad Spp			%	Bd. Ft. per Acre			Total	Percent Net Board Foot Volume								Average Log				Logs Per /Acre
								Log Scale Dia.				Log Length				Ln Dia Bd CF/ Ft In Ft Lf				
			Net BdFt	Def%	Gross	Net		4-5	6-11	12-16	17+	12-20	21-30	31-35	36-99					
H DO CU			28	1.4	4,104	4,049	16		96	4		2	2	41	55	14	10		0.00	
H DO 2S			56	1.0	8,089	8,007	32		94	6		0	6	60	34	35	13	207	1.59	
H DO 3S			16	.7	2,313	2,297	9		100			49	33	1	16	21	6	28	0.47	
H Totals			68	1.1	14,507	14,353	57		68	31	1	9	9	45	37	28	8	75	0.80	
D DO CU			29	1.2	1,521	1,502	6		6	94		11	11	17	60	6	10		0.00	
D DO 2S			55	.2	2,741	2,734	11		100					47	53	31	13	178	1.53	
D DO 3S			16		789	789	3		100			45	38		17	23	6	27	0.44	
D Totals			24	.5	5,051	5,026	20		72	28		10	9	31	49	29	8	72	0.76	
A DO CU			100		1,750	1,750	7		93	7		6	57	12	25	6	13		0.00	
A DO CR																30	7	61	0.65	
A Totals			8		1,750	1,750	7		93	7		6	57	12	25	30	8	59	0.65	
C DO 3S			100	55.6	24	11	0		100					100		40	8	40	1.28	
C Totals			0	55.6	24	11	0		100					100		40	8	40	1.28	
M DO CR			100		25	25	0		100			100				12	11	40	0.83	
M Totals			0		25	25	0		100			100				12	11	40	0.83	
Type Totals				.9	21,357	21,164	85		71	28	1	9	13	39	39	28	8	72	0.77	

TC PSTATS		PROJECT STATISTICS								PAGE	1	
		PROJECT PHEIGHTS								DATE	1/25/2017	
TWP	RGE	SC	TRACT	TYPE		ACRES	PLOTS	TREES	CuFt	BdFt		
08N 09N	06 07W	06 36	A3 A2	RW TAKE	THR	253.00	214	1,242	1	W		
			PLOTS	TREES	TREES PER PLOT	ESTIMATED TOTAL TREES	PERCENT SAMPLE TREES					
TOTAL			214	1242	5.8							
CRUISE			95	584	6.1	22,860	2.6					
DBH COUNT												
REFOREST												
COUNT			110	639	5.8							
BLANKS			9									
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	
WHEMLOCK			343	50.8	13.5	43	13.7	50.4	5,466	5,390	1,527	1,527
DOUG FIR			152	21.6	13.5	40	5.8	21.4	1,926	1,915	569	569
R ALDER			68	16.9	13.9	39	4.8	17.8	1,184	1,184	402	402
BL MAPLE			14	1.0	16.3	23	0.4	1.5	51	51	19	19
S SPRUCE			5	.0	30.4	78	0.0	.1	27	27	5	5
SNAG			1	.0	11.0	10	0.0	.0				
WR CEDAR			1	.0	20.0	45	0.0	.0	0	0	0	0
TOTAL			584	90.4	13.6	41	24.7	91.2	8,654	8,566	2,523	2,523
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		
WHEMLOCK		93.8	5.1	291	306	322						
DOUG FIR		123.8	10.0	199	221	243						
R ALDER		91.5	11.1	106	119	132						
BL MAPLE		63.3	17.5	42	51	60						
S SPRUCE		116.5	57.9	455	1,082	1,709						
SNAG												
WR CEDAR												
TOTAL		115.3	4.8	249	262	274		531	133	59		
CL	68.1	COEFF		TREES/ACRE				# OF PLOTS REQ.		INF. POP.		
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH		5	10	15		
WHEMLOCK		209.4	14.3	44	51	58						
DOUG FIR		296.3	20.2	17	22	26						
R ALDER		260.5	17.8	14	17	20						
BL MAPLE		818.2	55.9	0	1	2						
S SPRUCE		866.1	59.2	0	0	0						
SNAG		1032.0	70.5	0	0	0						
WR CEDAR		1462.9	99.9	0	0	0						
TOTAL		161.4	11.0	80	90	100		1,040	260	116		
CL	68.1	COEFF		BASAL AREA/ACRE				# OF PLOTS REQ.		INF. POP.		
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH		5	10	15		
WHEMLOCK		183.9	12.6	44	50	57						
DOUG FIR		253.6	17.3	18	21	25						
R ALDER		248.5	17.0	15	18	21						
BL MAPLE		833.4	56.9	1	1	2						
S SPRUCE		1110.3	75.8	0	0	0						
SNAG		1032.0	70.5	0	0	0						
WR CEDAR		1462.9	99.9	0	0	0						
TOTAL		138.1	9.4	83	91	100		762	191	85		
CL	68.1	COEFF		NET BF/ACRE				# OF PLOTS REQ.		INF. POP.		
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH		5	10	15		

PROJECT STATISTICS

PROJECT PHEIGHTS

TWP	RGE	SC	TRACT	TYPE		ACRES	PLOTS	TREES	CuFt	BdFt
08N	06	06	A3	RW	THR	253.00	214	1,242	1	W
09N	07W	36	A2	TAKE						
WHEMLOCK			173.2	11.8	4,752	5,390	6,027			
DOUG FIR			246.5	16.8	1,593	1,915	2,238			
R ALDER			252.0	17.2	980	1,184	1,388			
BL MAPLE			918.2	62.7	19	51	82			
S SPRUCE			1215.9	83.0	5	27	49			
SNAG										
WR CEDAR			1462.9	99.9	0	0	0			
TOTAL			<i>138.4</i>	<i>9.4</i>	<i>7,757</i>	<i>8,566</i>	<i>9,376</i>	<i>764</i>	<i>191</i>	<i>85</i>

PROJECT STATISTICS								PAGE	1			
PROJECT PHEIGHTS								DATE	1/25/2017			
TWP	RGE	SC	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt			
09N	07	36	A1	TAKE	62.00	38	115	1	W			
			PLOTS	TREES	TREES PER PLOT	ESTIMATED TOTAL TREES	PERCENT SAMPLE TREES					
TOTAL			38	115	3.0							
CRUISE			13	38	2.9	4,427	.9					
DBH COUNT												
REFOREST												
COUNT			24	77	3.2							
BLANKS			1									
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
R ALDER			12	32.7	15.3	46	10.7	41.7	3,078	3,078	1,014	1,014
WHEMLOCK			13	19.6	14.5	49	5.9	22.7	2,523	2,462	688	688
DOUG FIR			7	16.7	13.0	35	4.3	15.4	916	916	314	314
BL MAPLE			6	2.4	18.3	30	1.0	4.4	135	132	59	59
TOTAL			38	71.4	14.7	44	21.9	84.1	6,653	6,589	2,074	2,074
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		
R ALDER			70.5	21.2	78	99	120					
WHEMLOCK			91.7	26.4	149	202	256					
DOUG FIR			70.8	28.8	48	67	86					
BL MAPLE			68.8	30.6	37	53	70					
TOTAL			107.3	17.4	100	121	142	459	115	51		
CL	68.1	COEFF	TREES/ACRE					# OF PLOTS REQ.		INF. POP.		
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH		5	10	15		
R ALDER			102.3	16.6	27	33	38					
WHEMLOCK			168.1	27.2	14	20	25					
DOUG FIR			197.7	32.0	11	17	22					
BL MAPLE			406.3	65.9	1	2	4					
TOTAL			68.5	11.1	63	71	79	187	47	21		
CL	68.1	COEFF	BASAL AREA/ACRE					# OF PLOTS REQ.		INF. POP.		
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH		5	10	15		
R ALDER			100.2	16.2	35	42	48					
WHEMLOCK			160.9	26.1	17	23	29					
DOUG FIR			196.0	31.8	10	15	20					
BL MAPLE			430.0	69.7	1	4	7					
TOTAL			63.6	10.3	75	84	93	161	40	18		
CL	68.1	COEFF	NET BF/ACRE					# OF PLOTS REQ.		INF. POP.		
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH		5	10	15		
R ALDER			109.1	17.7	2,534	3,078	3,623					
WHEMLOCK			159.7	25.9	1,825	2,462	3,100					
DOUG FIR			197.7	32.0	623	916	1,210					
BL MAPLE			506.0	82.0	24	132	241					
TOTAL			69.6	11.3	5,846	6,589	7,333	193	48	21		

TC PSTATS				PROJECT STATISTICS				PAGE	1	
				PROJECT	PHEIGHTS					DATE 1/25/2017
TWP	RGE	SC	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt	
09N	07	36	A1	OPCX	62.00	38	301	1	W	
				TREES	ESTIMATED	PERCENT				
				PER PLOT	TOTAL	SAMPLE				
					TREES	TREES				
TOTAL			38		301		7.9			
CRUISE			15		111		7.4		9,598	1.2
DBH COUNT										
REFOREST										
COUNT			23		178		7.7			
BLANKS										
100 %										
STAND SUMMARY										
	SAMPLE	TREES	AVG	BOLE	REL	BASAL	GROSS	NET	GROSS	NET
	TREES	/ACRE	DBH	LEN	DEN	AREA	BF/AC	BF/AC	CF/AC	CF/AC
HEMLEAV	26	32.1	17.2	58	12.5	51.9	7,670	7,553	1,995	1,995
ALDRLEAV	18	23.8	19.0	48	10.7	46.8	4,144	4,062	1,273	1,273
R ALDER	12	32.7	15.3	46	10.7	41.7	3,078	3,078	1,014	1,014
DOUGLEAV	26	25.4	15.7	51	8.7	34.4	3,302	3,302	988	988
WHEMLOCK	13	19.6	14.5	49	5.9	22.7	2,523	2,462	688	688
DOUG FIR	7	16.7	13.0	35	4.3	15.4	916	916	314	314
BL MAPLE	6	2.4	18.3	30	1.0	4.4	135	132	59	59
SPRUCELV	3	2.1	16.1	42	0.7	2.9	279	222	85	85
TOTAL	111	154.8	16.1	48	54.8	220.0	22,047	21,728	6,416	6,416
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	
HEMLEAV		65.7	13.1	310	357	403				
ALDRLEAV		70.0	17.0	179	216	252				
R ALDER		70.5	21.2	78	99	120				
DOUGLEAV		66.3	13.3	137	158	179				
WHEMLOCK		91.7	26.4	149	202	256				
DOUG FIR		70.8	28.8	48	67	86				
BL MAPLE		68.8	30.6	37	53	70				
SPRUCELV		74.8	51.8	79	163	248				
TOTAL		90.0	8.5	184	201	219	324	81	36	
CL	68.1	COEFF	TREES/ACRE				# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15	
HEMLEAV		92.1	14.9	27	32	37				
ALDRLEAV		118.8	19.2	19	24	28				
R ALDER		102.3	16.6	27	33	38				
DOUGLEAV		118.3	19.2	21	25	30				
WHEMLOCK		168.1	27.2	14	20	25				
DOUG FIR		197.7	32.0	11	17	22				
BL MAPLE		406.3	65.9	1	2	4				
SPRUCELV		483.4	78.3	0	2	4				
TOTAL		34.7	5.6	146	155	164	48	12	5	
CL	68.1	COEFF	BASAL AREA/ACRE				# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15	
HEMLEAV		87.3	14.1	45	52	59				
ALDRLEAV		118.0	19.1	38	47	56				
R ALDER		100.2	16.2	35	42	48				
DOUGLEAV		119.5	19.4	28	34	41				
WHEMLOCK		160.9	26.1	17	23	29				
DOUG FIR		196.0	31.8	10	15	20				
BL MAPLE		430.0	69.7	1	4	7				

TC PSTATS				PROJECT STATISTICS				PAGE	2
				PROJECT	PHEIGHTS				
TWP	RGE	SC	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt
09N	07	36	A1	0PCX	62.00	38	301	1	W
CL	68.1		COEFF		BASAL AREA/ACRE		# OF PLOTS REQ.	INF. POP.	
SD:	1.00		VAR.	S.E.%	LOW	AVG	HIGH	5	10
SPRUCELV			483.4	78.3	1	3	5		
TOTAL			23.7	3.8	212	220	229	22	6
CL	68.1		COEFF		NET BF/ACRE		# OF PLOTS REQ.	INF. POP.	
SD:	1.0		VAR.%	S.E.%	LOW	AVG	HIGH	5	10
HEMLEAV			90.1	14.6	6,450	7,553	8,657		
ALDRLEAV			119.1	19.3	3,278	4,062	4,846		
R ALDER			109.1	17.7	2,534	3,078	3,623		
DOUGLEAV			124.3	20.2	2,636	3,302	3,967		
WHEMLOCK			159.7	25.9	1,825	2,462	3,100		
DOUG FIR			197.7	32.0	623	916	1,210		
BL MAPLE			506.0	82.0	24	132	241		
SPRUCELV			483.4	78.3	48	222	396		
TOTAL			30.4	4.9	20,658	21,728	22,798	37	9

TC PSTATS				PROJECT STATISTICS				PAGE	1		
				PROJECT	PHEIGHTS		DATE 1/25/2017				
TWP	RGE	SC	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt		
09N	07	36	A2	TAKE	11.00	21	162	1	W		
				TREES	ESTIMATED	PERCENT					
				PER PLOT	TOTAL	SAMPLE					
					TREES	TREES					
TOTAL			21	162	7.7						
CRUISE			12	89	7.4	1,577	5.6				
DBH COUNT											
REFOREST											
COUNT			9	70	7.8						
BLANKS											
100 %											
STAND SUMMARY											
SAMPLE			TREES	AVG	BOLE	REL	BASAL	GROSS	NET	GROSS	NET
TREES			/ACRE	DBH	LEN	DEN	AREA	BF/AC	BF/AC	CF/AC	CF/AC
WHEMLOCK			69	92.9	18.7	69	41.1	177.7	29,737	29,398	7,338
DOUG FIR			18	29.7	20.6	78	15.2	68.8	11,663	11,544	2,834
R ALDER			1	20.5	10.0	21	3.5	11.2	411	411	164
S SPRUCE			1	.2	38.0	107	0.3	1.6	500	500	94
TOTAL			89	143.4	18.2	64	60.8	259.3	42,311	41,853	10,430
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		
WHEMLOCK			69.7	8.4	447	488	529				
DOUG FIR			81.1	19.7	414	516	617				
R ALDER											
S SPRUCE											
TOTAL			80.6	8.5	467	511	554	260	65	29	
CL	68.1	COEFF	TREES/ACRE				# OF PLOTS REQ.		INF. POP.		
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15		
WHEMLOCK			72.3	16.2	78	93	108				
DOUG FIR			131.8	29.5	21	30	38				
R ALDER			333.2	74.5	5	21	36				
S SPRUCE			458.3	102.4		0	0				
TOTAL			52.4	11.7	127	143	160	115	29	13	
CL	68.1	COEFF	BASAL AREA/ACRE				# OF PLOTS REQ.		INF. POP.		
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15		
WHEMLOCK			59.9	13.4	154	178	201				
DOUG FIR			121.1	27.1	50	69	87				
R ALDER			333.2	74.5	3	11	20				
S SPRUCE			458.3	102.4		2	3				
TOTAL			34.1	7.6	240	259	279	49	12	5	
CL	68.1	COEFF	NET BF/ACRE				# OF PLOTS REQ.		INF. POP.		
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15		
WHEMLOCK			67.5	15.1	24,962	29,398	33,834				
DOUG FIR			118.9	26.6	8,476	11,544	14,612				
R ALDER			333.2	74.5	105	411	717				
S SPRUCE			458.3	102.4		500	1,012				
TOTAL			47.1	10.5	37,446	41,853	46,259	93	23	10	

TC PSTATS			PROJECT STATISTICS						PAGE	1	
			PROJECT			PHEIGHTS			DATE	1/25/2017	
TWP	RGE	SC	TRACT	TYPE		ACRES		PLOTS	TREES	CuFt	BdFt
09N	07	36	A2	00MC		11.00		21	164	1	W
			PLOTS	TREES	TREES PER PLOT	ESTIMATED TOTAL TREES		PERCENT SAMPLE TREES			
TOTAL			21	164	7.8						
CRUISE			12	90	7.5	1,630		5.5			
DBH COUNT											
REFOREST											
COUNT			9	70	7.8						
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
WHEMLOCK			69	92.9	18.7	69	41.1	177.7	29,737	29,398	7,338
DOUG FIR			18	29.7	20.6	78	15.2	68.8	11,663	11,544	2,834
R ALDER			1	20.5	10.0	21	3.5	11.2	411	411	164
SNAG			1	4.9	11.0	10	1.0	3.2			
S SPRUCE			1	.2	38.0	107	0.3	1.6	500	500	94
TOTAL			90	148.2	18.0	62	61.8	262.5	42,311	41,853	10,430
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	
WHEMLOCK			69.7	8.4	447	488	529				
DOUG FIR			81.1	19.7	414	516	617				
R ALDER											
SNAG											
S SPRUCE											
TOTAL			81.8	8.6	461	505	548	267	67	30	
CL	68.1	COEFF	TREES/ACRE					# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5		10	15	
WHEMLOCK			72.3	16.2	78	93	108				
DOUG FIR			131.8	29.5	21	30	38				
R ALDER			333.2	74.5	5	21	36				
SNAG			315.8	70.6	1	5	8				
S SPRUCE			458.3	102.4		0	0				
TOTAL			50.6	11.3	131	148	165	107	27	12	
CL	68.1	COEFF	BASAL AREA/ACRE					# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5		10	15	
WHEMLOCK			59.9	13.4	154	178	201				
DOUG FIR			121.1	27.1	50	69	87				
R ALDER			333.2	74.5	3	11	20				
SNAG			315.8	70.6	1	3	5				
S SPRUCE			458.3	102.4		2	3				
TOTAL			32.6	7.3	243	262	282	44	11	5	
CL	68.1	COEFF	NET BF/ACRE					# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5		10	15	
WHEMLOCK			67.5	15.1	24,962	29,398	33,834				
DOUG FIR			118.9	26.6	8,476	11,544	14,612				
R ALDER			333.2	74.5	105	411	717				
SNAG											
S SPRUCE			458.3	102.4		500	1,012				
TOTAL			47.1	10.5	37,446	41,853	46,259	93	23	10	

TC PSTATS				PROJECT STATISTICS					PAGE	1
				PROJECT	PHEIGHTS					
TWP	RGE	SC	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt	DATE 1/25/2017
08N	06	06	A3	TAKE	173.00	48	134	1	W	
				TREES	ESTIMATED	PERCENT				
				PER PLOT	TOTAL	SAMPLE				
				TREES	TREES	TREES				
TOTAL			48	134	2.8					
CRUISE			19	71	3.7	15,661	.5			
DBH COUNT										
REFOREST										
COUNT			21	63	3.0					
BLANKS			8							
100 %										
STAND SUMMARY										
			SAMPLE	TREES	AVG	BOLE	REL	BASAL	GROSS	NET
			TREES	/ACRE	DBH	LEN	DEN	AREA	BF/AC	CF/AC
WHEMLOCK			39	57.2	12.5	39	13.8	48.6	4,461	1,322
DOUG FIR			23	22.1	12.6	37	5.4	19.1	1,470	463
R ALDER			8	10.6	12.7	34	2.6	9.3	515	186
BL MAPLE			1	.6	13.0	13	0.2	.6	25	6
TOTAL			71	90.5	12.5	37	21.9	77.6	6,471	1,977
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
WHEMLOCK		79.1	12.7	95	108	122				
DOUG FIR		80.0	17.1	74	89	104				
R ALDER		24.5	9.2	43	48	52				
BL MAPLE										
TOTAL		82.3	9.8	85	94	104		270	68	30
CL	68.1	COEFF	TREES/ACRE					# OF PLOTS REQ.		INF. POP.
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH		5	10	15
WHEMLOCK		96.6	13.9	49	57	65				
DOUG FIR		174.5	25.2	17	22	28				
R ALDER		223.2	32.2	7	11	14				
BL MAPLE		692.8	99.9	0	1	1				
TOTAL		74.1	10.7	81	91	100		219	55	24
CL	68.1	COEFF	BASAL AREA/ACRE					# OF PLOTS REQ.		INF. POP.
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH		5	10	15
WHEMLOCK		98.3	14.2	42	49	56				
DOUG FIR		164.8	23.8	15	19	24				
R ALDER		226.0	32.6	6	9	12				
BL MAPLE		692.8	99.9	0	1	1				
TOTAL		73.9	10.7	69	78	86		218	54	24
CL	68.1	COEFF	NET BF/ACRE					# OF PLOTS REQ.		INF. POP.
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH		5	10	15
WHEMLOCK		104.5	15.1	3,738	4,401	5,065				
DOUG FIR		177.2	25.6	1,090	1,464	1,838				
R ALDER		224.2	32.3	349	515	682				
BL MAPLE		692.8	99.9	0	25	50				
TOTAL		86.9	12.5	5,603	6,405	7,208		301	75	33

TC PSTATS			PROJECT STATISTICS						PAGE	1		
			PROJECT			PHEIGHTS			DATE	1/25/2017		
TWP	RGE	SC	TRACT	TYPE		ACRES		PLOTS	TREES	CuFt	BdFt	
08N	06	06	A3	00PC		173.00		48	366	1	W	
			PLOTS	TREES	TREES PER PLOT	ESTIMATED TOTAL TREES		PERCENT SAMPLE TREES				
TOTAL			48	366	7.6							
CRUISE			24	185	7.7	32,003		.6				
DBH COUNT												
REFOREST												
COUNT			24	181	7.5							
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	
HEMLEAV			75	61.4	16.0	55	21.5	86.2	9,986	9,891	2,917	
WHEMLOCK			39	57.2	12.5	39	13.8	48.6	4,461	4,401	1,322	
DOUGLEAV			30	22.5	17.0	58	8.6	35.3	3,708	3,687	1,123	
DOUG FIR			23	22.1	12.6	37	5.4	19.1	1,470	1,464	463	
ALDRLEAV			8	10.3	14.7	56	3.2	12.2	1,310	1,310	397	
R ALDER			8	10.6	12.7	34	2.6	9.3	515	515	186	
CEDLEAV			1	.3	20.0	45	0.1	.6	24	11	14	
BL MAPLE			1	.6	13.0	13	0.2	.6	25	25	6	
TOTAL			185	185.0	14.5	47	55.6	211.8	21,499	21,305	6,428	
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			
HEMLEAV		52.8	6.1	183	195	207						
WHEMLOCK		79.1	12.7	95	108	122						
DOUGLEAV		62.5	11.6	172	195	218						
DOUG FIR		80.0	17.1	74	89	104						
ALDRLEAV		35.4	13.3	109	126	143						
R ALDER		24.5	9.2	43	48	52						
CEDLEAV												
BL MAPLE												
TOTAL		70.0	5.1	145	153	160	196	49	22			
CL	68.1	COEFF		TREES/ACRE			# OF PLOTS REQ.		INF. POP.			
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15			
HEMLEAV		69.4	10.0	55	61	68						
WHEMLOCK		96.6	13.9	49	57	65						
DOUGLEAV		127.1	18.3	18	22	27						
DOUG FIR		174.5	25.2	17	22	28						
ALDRLEAV		278.6	40.2	6	10	14						
R ALDER		223.2	32.2	7	11	14						
CEDLEAV		692.8	99.9	0	0	1						
BL MAPLE		692.8	99.9	0	1	1						
TOTAL		36.6	5.3	175	185	195	53	13	6			
CL	68.1	COEFF		BASAL AREA/ACRE			# OF PLOTS REQ.		INF. POP.			
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15			
HEMLEAV		60.6	8.7	79	86	94						
WHEMLOCK		98.3	14.2	42	49	56						
DOUGLEAV		121.2	17.5	29	35	41						
DOUG FIR		164.8	23.8	15	19	24						
ALDRLEAV		270.5	39.0	7	12	17						
R ALDER		226.0	32.6	6	9	12						
CEDLEAV		692.8	99.9	0	1	1						

TC PSTATS				PROJECT STATISTICS				PAGE	2	
				PROJECT	PHEIGHTS			DATE	1/25/2017	
TWP	RGE	SC	TRACT	TYPE	ACRES		PLOTS	TREES	CuFt	BdFt
08N	06	06	A3	00PC	173.00		48	366	1	W
CL	68.1		COEFF	BASAL AREA/ACRE				# OF PLOTS REQ.		INF. POP.
SD:	1.00		VAR.	S.E.%	LOW	AVG	HIGH	5	10	15
BL MAPLE			692.8	99.9	0	1	1			
TOTAL			30.7	4.4	202	212	221	38	9	4
CL	68.1		COEFF	NET BF/ACRE				# OF PLOTS REQ.		INF. POP.
SD:	1.0		VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15
HEMLEAV			62.7	9.0	8,997	9,891	10,785			
WHEMLOCK			104.5	15.1	3,738	4,401	5,065			
DOUGLEAV			122.2	17.6	3,038	3,687	4,337			
DOUG FIR			177.2	25.6	1,090	1,464	1,838			
ALDRLEAV			293.6	42.3	755	1,310	1,865			
R ALDER			224.2	32.3	349	515	682			
CEDLEAV			692.8	99.9	0	11	21			
BL MAPLE			692.8	99.9	0	25	50			
TOTAL			36.1	5.2	20,196	21,305	22,414	52	13	6

TC		PSTNDSUM		Stand Table Summary										Page		1	
														Date:		1/25/2017	
T08N R06W S06 TyTAKE				173.00		Project				PHEIGHTS				Time:		9:07:54AM	
T09N R07W S36 TyTAKE				62.00		Acres				246.00				Grown Year:			
T09N R07W S36 TyTAKE				11.00													
S Spc	T	DBH	Sample Trees	FF 16'	Av Ht	Trees/ Acre	BA/ Acre	Logs Acre	Average Log		Tons/ Acre	Net Cu.Ft. Acre	Net Bd.Ft. Acre	Totals			
									Net Cu.Ft.	Net Bd.Ft.				Tons	Cunits	MBF	
H		8	2	86	24	2.841	.99	2.84	5.3	21.2		15	60			37	15
H		9	3	83	41	5.953	2.63	5.95	7.3	23.3		44	139			107	34
H		10	4	84	41	5.714	3.07	4.82	7.7	20.0		37	96			91	24
H		11	3	86	59	2.169	1.43	2.17	16.9	56.9		37	123			90	30
H		12	15	86	56	13.376	10.43	17.58	14.5	45.6		255	801			627	197
H		13	5	86	72	2.629	2.42	5.13	15.1	52.2		78	268			191	66
H		14	8	85	71	3.605	3.85	5.57	20.2	69.2		113	386			277	95
H		15	8	88	79	3.497	4.29	6.47	23.2	82.2		150	532			369	131
H		16	9	87	77	4.014	5.61	8.03	24.3	87.4		195	702			481	173
H		17	4	86	84	1.464	2.31	2.93	29.2	105.9		86	310			210	76
H		18	7	86	83	1.070	1.89	1.96	33.2	110.7		65	217			160	53
H		19	6	88	97	.902	1.78	1.92	39.5	136.6		76	262			186	65
H		20	6	86	100	.465	1.02	1.04	37.8	140.9		39	146			96	36
H		21	1	89	108	.048	.12	.14	39.0	166.7		6	24			14	6
H		22	6	88	100	.262	.69	.61	50.0	196.4		31	120			75	30
H		23	6	89	101	.239	.69	.56	55.4	225.0		31	126			76	31
H		24	2	85	84	.073	.23	.15	60.5	227.5		9	33			22	8
H		25	2	87	102	.068	.23	.17	62.4	256.0		11	43			26	11
H		26	2	89	106	.150	.55	.30	86.2	325.8		26	98			64	24
H		27	7	84	87	.394	1.57	.88	60.8	241.7		53	212			131	52
H		28	3	87	82	.157	.67	.31	63.7	248.4		20	78			49	19
H		29	1	86	79	.025	.12	.05	79.5	325.0		4	16			10	4
H		30	4	88	94	.094	.46	.19	102.7	447.5		19	84			47	21
H		31	3	86	88	.066	.35	.13	103.3	406.7		14	54			34	13
H		32	1	82	65	.021	.12	.04	83.5	320.0		3	13			8	3
H		33	2	88	106	.039	.23	.12	91.0	463.3		11	54			26	13
H		34	1	88	130	.018	.12	.05	116.7	616.7		6	34			16	8
H		Totals	121	86	60	49.354	47.84	70.10	20.4	71.8		1,431	5,030			3,521	1,237
D		9	2	86	51	2.644	1.17	2.64	8.0	25.0		21	66			52	16
D		10	4	85	32	4.225	2.30	4.23	8.0	20.0		34	85			83	21
D		12	4	85	42	2.974	2.34	2.97	14.0	40.0		42	119			102	29
D		13	5	85	55	3.032	2.79	3.03	20.0	56.0		61	170			149	42
D		14	6	86	65	3.248	3.47	4.89	18.3	57.8		89	282			220	69
D		15	5	86	75	2.043	2.51	3.13	22.1	74.4		69	233			170	57
D		16	2	84	74	.541	.75	1.08	20.4	70.2		22	76			54	19
D		17	1	89	92	.370	.58	.74	30.0	105.0		22	78			55	19
D		18	3	88	95	.524	.93	1.05	34.3	121.8		36	128			88	31
D		19	5	86	86	.838	1.65	1.68	32.0	113.7		54	190			132	47
D		20	1	86	82	.078	.17	.16	35.0	120.0		5	19			13	5
D		21	2	87	99	.142	.34	.36	37.4	150.0		13	53			33	13
D		22	2	88	117	.130	.34	.39	40.0	171.7		16	67			38	16
D		23	1	88	115	.059	.17	.18	44.3	190.0		8	34			19	8
D		24	2	87	111	.109	.34	.33	44.5	188.3		15	61			36	15
D		28	1	89	117	.040	.17	.12	65.3	296.7		8	36			19	9
D		31	1	89	117	.033	.17	.10	79.3	393.3		8	38			19	9
D		37	1	85	146	.023	.17	.07	134.3	606.7		9	42			23	10
D		Totals	48	86	57	21.053	20.38	27.13	19.6	65.5		532	1,777			1,308	437
A		10	1	87	29	.918	.50	.92	8.0	20.0		7	18			18	5
A		11	2	87	54	2.467	1.63	2.47	15.5	50.0		38	123			94	30
A		12	2	86	61	2.151	1.69	2.15	22.0	60.0		47	129			116	32
A		13	3	87	49	2.716	2.50	3.67	15.4	47.4		56	174			139	43
A		14	4	86	41	3.160	3.38	3.16	20.3	52.8		64	167			158	41

TC		PSTNDSUM		Stand Table Summary										Page		2	
														Date:		1/25/2017	
				T08N R06W S06 TyTAKE		173.00		Project		PHEIGHTS		Time:		9:07:54AM			
				T09N R07W S36 TyTAKE		62.00		Acres		246.00		Grown Year:					
				T09N R07W S36 TyTAKE		11.00											
S		Tot						Average Log		Net		Net		Totals			
Spc T		Sample		FF	Av	Trees/	BA/	Logs	Net	Net	Tons/	Cu.Ft.	Bd.Ft.	Tons	Cunits	MBF	
		DBH	Trees	16'	Ht	Acre	Acre	Acre	Cu.Ft.	Bd.Ft.	Acre	Acre	Acre				
A		15	4	87	69	2.803	3.44	3.52	22.1	70.6		78	248		191	61	
A		16	1	86	80	.627	.88	1.25	20.5	80.0		26	100		63	25	
A		17	1	86	50	.555	.88	.56	32.0	60.0		18	33		44	8	
A		19	1	87	88	.444	.88	.89	40.5	140.0		36	124		89	31	
A		20	1	87	61	.401	.88	.40	38.0	70.0		15	28		37	7	
A		21	1	86	27	.364	.88	.36	21.0	30.0		8	11		19	3	
A		Totals	21	87	54	16.606	17.52	19.34	20.4	59.8		394	1,156		968	284	
M		13	1	87	17	.442	.41	.44	10.0	40.0		4	18		11	4	
M		15	1	87	54	.150	.18	.30	16.0	50.0		5	15		12	4	
M		16	1	87	26	.132	.18	.13	19.0	50.0		3	7		6	2	
M		18	1	59	45	.104	.18										
M		20	1	87	22	.084	.18	.08	24.0	40.0		2	3		5	1	
M		21	1	86	34	.077	.18	.08	36.0	40.0		3	3		7	1	
M		24	1	86	31	.059	.18	.06	46.0	90.0		3	5		7	1	
M		Totals	7	84	29	1.048	1.51	1.09	17.6	46.6		19	51		47	13	
S		38	1	88	131	.009	.07	.03	154.7	820.0		4	22		10	5	
S		Totals	1	88	131	.009	.07	.03	154.7	820.0		4	22		10	5	
Totals			198	86	58	88.070	87.32	117.70	20.2	68.3		2,380	8,037		5,854	1,977	

Log Stock Table - MBF

T08N R06W S06 TyRW
THRU
T09N R07W S36 TyTAKE

Project: PHEIGHTS
Acres 253.00

Page 3
Date 1/25/2017
Time 7:48:11AM

Spp	S T	So Gr rt de	Log Len	Gross MBF	Def %	Net MBF	% Spc	Net Volume by Scaling Diameter in Inches											
								2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-20	21-25	26-29	30-39	40+
M		Totals		13	1.5	13	.6			2	2	9							
S		DO 2S	32	3		3	38.0						1			2			
S		DO 2S	40	4		4	61.1							0			4		
S		DO 4S	16	0		0	.2			0									
S		DO 4S	20	0		0	.2			0									
S		DO 4S	32	0	40.0	0	.6			0									
S		Totals		7		7	.3			0			1	0		2	4		
C		DO 3S	40	0	55.6	0	100.0				0								
C		Totals		0	55.6	0	.0				0								
Total		All Species		2,190	1.0	2,167	100.0		0	787	277	475	281	108	178	50	11		

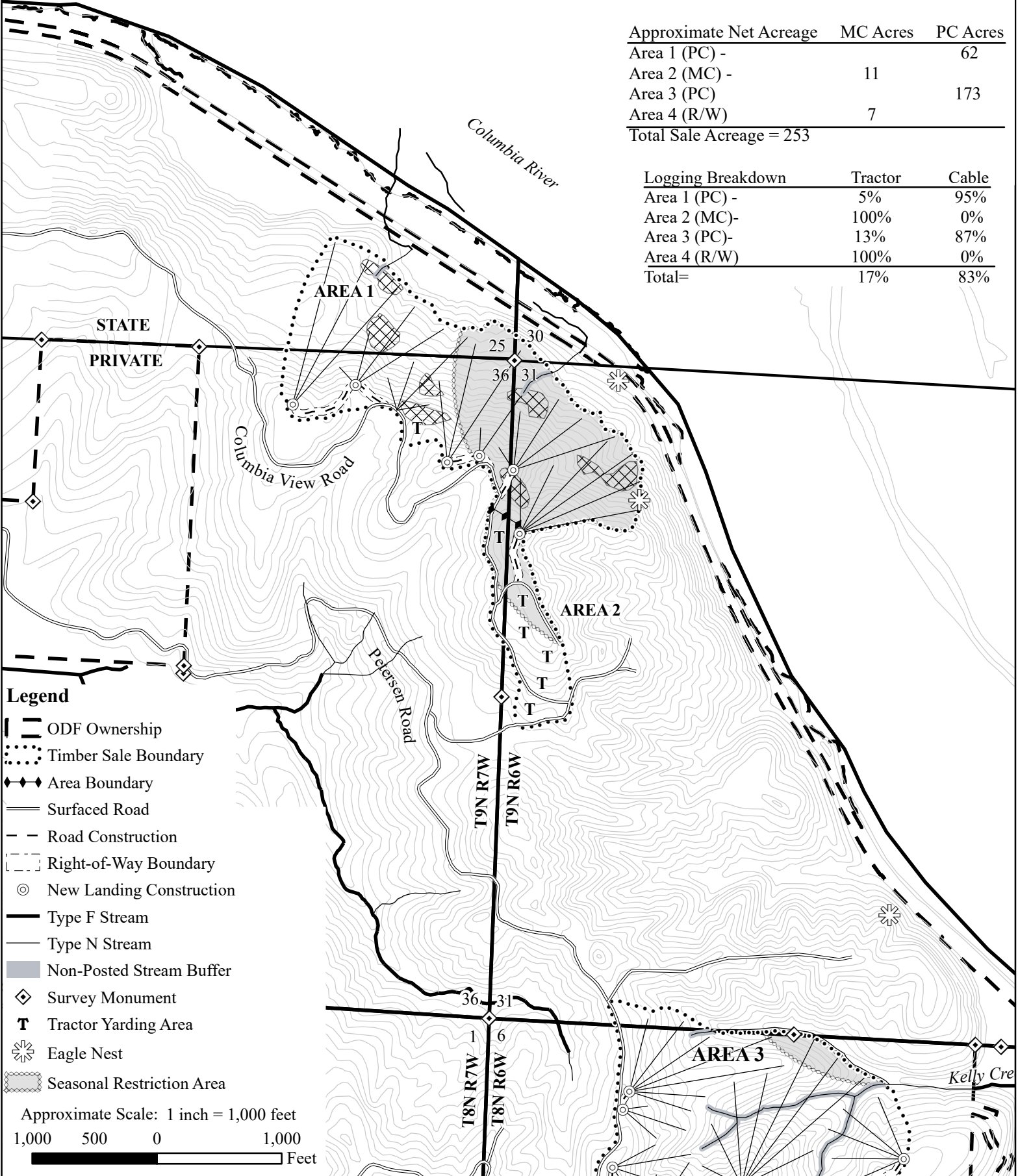
OF TIMBER SALE CONTRACT NO. 341-17-10

PETERSEN HEIGHTS

PORTIONS OF SECTIONS 25 & 36, T9N, R7W,
SECTIONS 30 & 31, T9N, R6W, AND SECTION 6,
T8N, R6W, W.M., CLATSOP COUNTY, OREGON

Approximate Net Acreage	MC Acres	PC Acres
Area 1 (PC) -		62
Area 2 (MC) -	11	
Area 3 (PC)		173
Area 4 (R/W)	7	
Total Sale Acreage = 253		

Logging Breakdown	Tractor	Cable
Area 1 (PC) -	5%	95%
Area 2 (MC)-	100%	0%
Area 3 (PC)-	13%	87%
Area 4 (R/W)	100%	0%
Total=	17%	83%



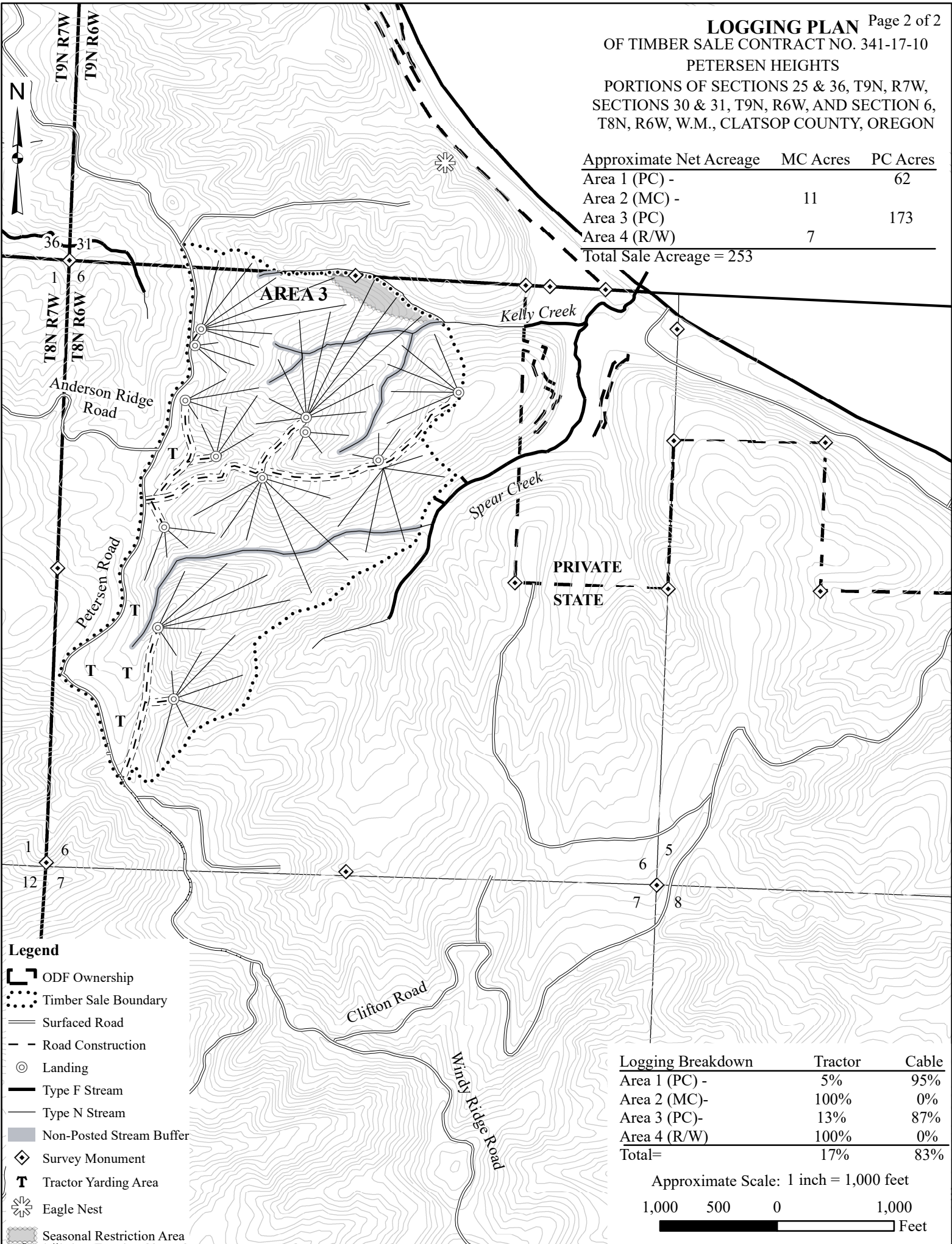
- Legend**
- ODF Ownership
 - Timber Sale Boundary
 - Area Boundary
 - Surfaced Road
 - Road Construction
 - Right-of-Way Boundary
 - New Landing Construction
 - Type F Stream
 - Type N Stream
 - Non-Posted Stream Buffer
 - Survey Monument
 - Tractor Yarding Area
 - Eagle Nest
 - Seasonal Restriction Area

Approximate Scale: 1 inch = 1,000 feet

1,000 500 0 1,000 Feet

LOGGING PLAN Page 2 of 2
 OF TIMBER SALE CONTRACT NO. 341-17-10
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