



"STEWARDSHIP IN FORESTRY"

Timber Sale Appraisal
Petersen Heights
Sale AT-341-2018-72-

District: Astoria

Date: October 09, 2017

Cost Summary

	Conifer	Hardwood	Total
Gross Timber Sale Value	\$207,962.48	\$14,976.45	\$222,938.93
		Project Work:	(\$88,990.00)
		Advertised Value:	\$133,948.93



Timber Sale Appraisal Petersen Heights Sale AT-341-2018-72-

District: Astoria

Date: October 09, 2017

Timber Description

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

Stand Stocking: 60%

Specie Name	AvgDBH	Amortization (%)	Recovery (%)
Douglas - Fir	18	0	97
Western Hemlock / Fir	16	0	95
Sitka Spruce	14	0	95
Alder (Red)	13	0	95

Volume by Grade	2S	3S	4S	Camprun	Total
Douglas - Fir	95	44	10	0	149
Western Hemlock / Fir	258	161	36	0	455
Sitka Spruce	6	0	2	0	8
Alder (Red)	0	0	0	45	45
Total	359	205	48	45	657

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

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

Western redcedar Stumpage Price = Pond Value minus Logging Cost:
 $\$1,315.29/\text{MBF} = \$1,605.36/\text{MBF} - \$290.07/\text{MBF}$

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) = \$4,762
TOTAL Other Costs (with Profit & Risk to be added) = \$4,762

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: \$ 7,013/657 MBF = \$10.67/MBF



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Logging Conditions

Combination#: 1

Douglas - Fir	28.00%
Western Hemlock / Fir	28.00%
Sitka Spruce	28.00%
Alder (Red)	28.00%

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: 9 **bd. ft / load:** 4600
cost / mbf: \$76.62
machines: Stroke Delimber (B)

Combination#: 2

Douglas - Fir	72.00%
Western Hemlock / Fir	72.00%
Sitka Spruce	72.00%
Alder (Red)	72.00%

Logging System: Track Skidder **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:** 3800
cost / mbf: \$146.56
machines: Log Loader (B)
Track Skidder



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Logging Costs

Operating Seasons: 2.00	Profit Risk: 10%
Project Costs: \$88,990.00	Other Costs (P/R): \$4,762.00
Slash Disposal: \$0.00	Other Costs: \$2,000.00

Miles of Road

Road Maintenance: \$10.67

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

Hauling Costs

Species	\$ / MBF	Trips/Day	MBF / Load
Douglas - Fir	\$0.00	2.0	2.9
Western Hemlock / Fir	\$0.00	3.0	2.8
Sitka Spruce	\$0.00	3.0	4.5
Alder (Red)	\$0.00	2.0	3.4



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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									
\$126.98	\$10.99	\$13.35	\$138.51	\$7.25	\$29.71	\$0.00	\$7.00	\$3.04	\$336.83
Western Hemlock / Fir									
\$126.98	\$11.20	\$13.35	\$95.79	\$7.25	\$25.46	\$0.00	\$7.00	\$3.04	\$290.07
Sitka Spruce									
\$126.98	\$11.20	\$13.35	\$60.67	\$7.25	\$21.94	\$0.00	\$7.00	\$3.04	\$251.43
Alder (Red)									
\$126.98	\$11.20	\$13.35	\$120.45	\$7.25	\$27.92	\$0.00	\$7.00	\$3.04	\$317.19

Specie	Amortization	Pond Value	Stumpage	Amortized
Douglas - Fir	\$0.00	\$735.18	\$398.35	\$0.00
Western Hemlock / Fir	\$0.00	\$613.02	\$322.95	\$0.00
Sitka Spruce	\$0.00	\$459.69	\$208.26	\$0.00
Alder (Red)	\$0.00	\$650.00	\$332.81	\$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	149	\$398.35	\$59,354.15
Western Hemlock / Fir	455	\$322.95	\$146,942.25
Sitka Spruce	8	\$208.26	\$1,666.08
Alder (Red)	45	\$332.81	\$14,976.45

Gross Timber Sale Value

Recovery: \$222,938.93

Prepared By: Cody Valencia

Phone: 503-325-5451

Road Maintenance Cost Summary (Interim and Post Harvest)

Sale: Peterson Heights
Date: July 31, 2017
By: Cody Valencia

MBF: 657
\$\$/MBF: \$10.67

Type	Equipment/Rationale	Move-in Rate	Times	Hours	Rate	Cost
Interim Operations						
Entries: 0						
	Grader 14G	\$778	1	16	\$100	\$2,378
	Dump Truck 12CY	\$163	1	6	\$79	\$637
Final	FE Loader C966	\$778	1	2	\$83	\$944
Road	Vibratory Roller	\$778	1	16	\$77	\$2,010
Maintenance	Water Truck 2,500 gallon	\$190	1	6	\$89	\$724
	Labor			8	\$40	\$320
Total						\$7,013

Final Road Maintenance

Production Rates	Miles/day	Distance (miles)	Days	Hours
Process - Grader	3.0	5.9	2.0	16
Vibratory Roller	3.0	5.9	2.0	16

Process and compact: Portions of crushed rock haul route as determined by STATE.

Assuming half of haul route will not need processing and compaction.

Windy Ridge to Peterson Road to Columbia View Road:

5.9 Miles

Sale Number: 341-18-72
Sale Name: Peterson Heights
Date: 07/26/2017

Sale Area	Harvest Type	Veg Type/Zone	Ground Based Yarding Acres	Estimated Piling Hours/Area	Cost/Hour	Total Cost/Area
2	MC	B	12.0	18	\$129.00	\$2,322.00
					In-unit Piling	Sub Total = \$2,322.00
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
2	4	\$220.00	\$880.00	54	\$5.00	\$270.00
*Cost includes separating firewood					Materials	Sub Total = \$270.00
					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 =						\$4,762.00

SUMMARY OF ALL PROJECT COSTS

SALE NAME: Petersen Heights

ROAD CONSTRUCTION:

<u>Road segment</u>	<u>Length/Sta</u>	<u>Cost</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
TOTALS		

ROAD IMPROVEMENT:

<u>Road segment</u>	<u>Length/Sta</u>	<u>Cost</u>
I1-I2, I3-I4	322.8	\$78,520
I5-I6	_____	_____
TOTALS		\$78,520

SPECIAL PROJECTS:

<u>Description</u>	<u>Cost</u>
Project Road Maintenance	\$2,661
_____	_____
_____	_____
_____	_____
TOTAL	\$2,661

MOVE IN:

<u>Equipment</u>	<u>Cost</u>
Excavator (C330)	\$1,406
Excavator (C315)	\$805
Large Grader (14G)	\$778
Front End Loader (C966) X 2	\$1,556
Water Truck (2,500 gal.)	\$190
Vibratory Roller	\$778
Skidder	\$717
10 cy dump trucks X 5	\$815
20 cy dump trucks X 4	\$764
TOTAL	\$7,809.00

GRAND TOTAL \$88,990.00

Compiled By: Kriag Kirkpatrick

Date: 08/23/2017

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	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					

	Description	Quantity	Rate	Cost
Other/miscellaneous:	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		Subgrade prep:		Description	Stations/amount		Rate/sta/amt	Cost	
				Grade, Shape and Ditch 16'	120.00	x	\$24.83	\$2,979.60	
I3 to I4				Scatter ditch waste material w/315 or grader	78.65	x	\$12.41	\$ 976.05	

ROAD SEGMENT I1 to I2				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	I1 to I2		0+00 to 235+95				
Subgrade Leveling	4"-0" crushed		N/A	load	11	loads	6	66	\$8.12	\$536
Base Rock	4"-0" crushed	126+05 to 202+30	4	station	25	stations	77.25	1,931	\$10.29	\$19,870
Turnouts	4"-0" crushed	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,	4	TO	11	TO's	13	143	\$8.12	\$1,161
Turnouts	4"-0" crushed	235+95	8	TO	22	TO's	1	22	\$8.12	\$179
Junctions	4"-0" crushed	147+15, 182+95, 202+30		junction	11	junctions	3	33	\$8.12	\$268
Curve Widening	4"-0" crushed		4	curve	n/a	curve	n/a	55	\$8.12	\$447
Ditchfilters	6"-4" pit-run	224+10, 231+40	N/A	filter	11	filters	2	22	\$10.02	\$220
Subgrade Leveling	3/4"-0" crushed		N/A	load	11	loads	15	165	\$8.12	\$1,340
Traction Rock	3/4"-0" crushed	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	2	station	13	stations	17.10	222	\$8.12	\$1,803
Culvert Bedding/Backfill	3/4"-0" crushed	215+20, 222+80, 230+30	N/A	culvert	33	culverts	3.00	99	\$8.12	\$804
Total Rock for Road Segment:				I1 to I2				2,758		

ROAD SEGMENT I3 to I4				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	I3 to I4		0+00 to 78+65				
Base Rock	4"-0" crushed	8+25	8	station	n/a	stations	n/a	100	**	**
Fill Armor	24"-6" riprap	8+25	N/A	fill	220	fills	1	220	**	**
Dissipator	24"-6" riprap	8+25, 73+30	N/A	diss.	see spec.instr.	diss.	2	55	\$16.19	\$151
Ditchfilters	6"-4" pit-run	64+65	N/A	filter	33	filters	1	33	\$10.02	\$331
Subgrade Leveling	1 1/2"-0" crushed		N/A	load	11	loads	8	88	\$8.12	\$715
Surface Rock	1 1/2"-0" crushed	0+00 to 59+70	2	station	13	stations	59.7	776	\$8.12	\$6,302
Turnouts	1 1/2"-0" crushed	2+50, 12+75, 19+35, 24+15, 34+35, 35+81, 47+10, 59+70	N/A	TO	11	TO's	8	88	\$8.12	\$715
Culvert Bedding/Backfill	1 1/2"-0" crushed	6+10, 8+25, 8+95, 20+85, 45+45, 73+30	N/A	culvert	see spec.instr.	culverts	5.00	242	\$8.12	\$1,441
Junctions	1 1/2"-0" crushed	13+85, 24+95	N/A	junction	11	junctions	2	22	\$8.12	\$179
Total Rock for Road Segment:				I3 to I4				1,624		

ROAD SEGMENT I5 to I6				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	I5 to I6		0+00 to 8+20				
Subgrade Leveling	4"-0" crushed		N/A	load	11	loads	6	66	\$8.12	\$536
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 Hunt Creek Big Noise Hunt Creek Hunt Creek Hunt Creek			
		24"-6" rr 6"-4"pr 4"-0" 4"-0" 1 1/2"-0" 3/4"-0"			
		Total	4,448		

SUB TOTAL FOR SURFACING		275	55	1,931	485	1,216	486	4,448	4,448	\$59,183
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SPECIAL PROJECTS		Description	Cost
		** Fill Reconstruction (I3-I4, Sta. 8+25)	\$12,722
		Pit-run development (55 cy @ \$2.60/cy)	\$143.00
SUB TOTAL FOR SPECIAL PROJECTS			\$12,865

		Subtotal of Surfacing & Spec. Proj.	\$72,048
		Subtotal of Clearing, Exc., Culv.	\$6,473
GRAND TOTAL			\$78,520

Compiled By: Tillotson

Date: 04/24/2017

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	\$16.19	\$712.36
24"-6" Riprap Fill Armor	220	cy	\$16.19	\$3,561.80
1 1/2"-0" Crushed Rock for Bedding/Backfill	66	cy	\$8.12	\$535.92
4"-0" Crushed Rock for Road	100	cy	\$8.12	\$812.00
Erosion Control	0.1	ac	\$628.00	\$62.80
Mulch and seed				

\$7,647.63

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 \$12,722

CRUSHED ROCK COST

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

MATERIAL: $\frac{4''-0''}{3\frac{1}{4}}-0''$ Crushed

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:	\$6.80	/cy
Load:	\$0.48	/cy
Spread:	\$0.84	/cy

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

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

Production: cy/day = 935

CRUSHED ROCK HAUL COSTS 2,187 cy @ \$8.12 /cy

PIT RUN ROCK COST

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

MATERIAL: Pit Run

DATE: _____
BY: JT

[illegible]

ROCK HAUL:

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

Ave haul:	\$5.93	/cy
Load:	\$2.16	/cy
Spread:	\$1.92	/cy

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

Truck type:	<u>D11</u>	No. trucks:	<u>2</u>
Delay min.:	<u>5</u>	Efficiency:	<u>85%</u>

Production: cy/day = 213

PIT RUN ROCK HAUL COSTS

55 cy @ \$10.02 /cy

RIP RAP ROCK COST

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

MATERIAL: Rip Rap

DATE: 04/20/2017
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	
I3 to I4	78.65	275	0.5		0.3	3.0	3.3	0.9	0.2	8.10
TOTAL	78.65	275								AVERAGE HAUL 8.10
	STA./NO.	CU. YD.								
CUBIC YARD WEIGHTED HAUL			0.5		0.3	3.0	3.3	0.9	0.2	
Average Round Trip Distance (miles)										16.20

ROCK HAUL:

Truck type:	D12	No. trucks:	
Delay min.:	6	Efficiency:	85%
Truck type:	D10	No. trucks:	5
Delay min.:	5	Efficiency:	85%

Ave haul:	\$10.08	/cy
Load:	\$1.80	/cy
Develop:	<u>\$4.30</u>	/cy

Production: cy/day = 313

RIP RAP ROCK HAUL COSTS

275 cy @ \$16.19 /cy

CRUSHED ROCK COST

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

MATERIAL: 4"-0" Crushed

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:	\$8.60	/cy
Load:	\$0.60	/cy
Spread:	\$1.08	/cy

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

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

Production: cy/day = 739

CRUSHED ROCK HAUL COSTS 1,931 cy @ \$10.29 /cy

Projects Road Maintenance Cost Summary

Sale: Peterson Heights
Date: August 23, 2017
By: Kraig Kirkpatrick FL

Type	Equipment/Rationale			Hours	Rate	Cost
Final Project Haul Road Maintenance	Grader 14G			16.0	\$100	\$1,600
						\$0
	Vibratory Roller			8.0	\$77	\$616
	Water Truck 2,500 gallon			5.0	\$89	\$445
Total						\$2,661

Production Rates

Grader

Vibratory Roller

Miles/day	Distance(miles)	Days	Hours
1.5	1.50	1.0	8.00
1.5	1.50	1.0	8.00

Big Noise Quarry to Highway 30, spot grade 2.5 miles, full process 1.5 miles = 4 Miles

Hunt Creek Stockpile to Highway 30, spot grade = 1.5

Total Miles = 5.5 Miles

X:\DOCUMENT\STATE_FOREST\UNIT_SUNSET\2017 FY Sales\Peterson Heights\Sale Prep\Project Costing\Project Road
 Maintenance_PH.xls

**PETERSEN HEIGHTS
FY 2017
TIMBER CRUISE REPORT**

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

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

1. **Sale Acreage by Area:**

Area	Harvest Type	Gross Acres	Stream Buffer Acres	New R/W Acres	Existing R/W Acres	Net Acreage
1	PC	5	0	0	.3	5
2	MC	14	0	0	2	12
3	PC	29	.4	0	2.4	26
TOTALS		45	.8	0	4.7	43

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 8 plots were sampled. 3 measured plots and 5 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 12 plots were sampled with 5 measured plots and 7 count plots.

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 and 3	P_HEIGHT	A13	THIN, LV, TK
2	P_HEIGHT	A2	OOMC, TAKE

Timber Description:

Areas 1 and 3 are approximately 35 to 55 year old Douglas-fir, hemlock stand 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 30 feet. The average take hemlock tree size is approximately 13 inches DBH, with an average merchantable tree height of 44 feet. The average volume per acre to be harvested (net) is approximately 5 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 33%.

Area 2 is a stand of approximately 50 year old hemlock and Douglas-fir with some alder. The average take hemlock tree size is approximately 19 inches DBH, with an average merchantable tree height of 69 feet. 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 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.

Cedar is a reserved species.

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

Area	Target CV	Target SE%	Actual CV	Actual SE%
1 and 3	45	9	42.4	9.7
2	50	10	47.1	10.5

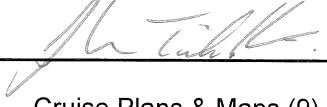
The statistics are for all areas and Take and Leave trees combined based on Net BF/Acre.

7. 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	17.8	149	95	44	10		23%
W. Hemlock & True Fir	16.2	455	258	161	36		69%
Sitka Spruce	14.1	8	6	0	2		1%
Red alder	12.6	45				45	7%
Bigleaf maple	18	0				0	<1%
TOTAL NET VOLUME		657					100%

8. Prepared by: Ella Salkeld

Date: 7/31/17

10. Approved by: 

Date: 8/23/17

11. Attachments: Cruise Plans & Maps (9)
Species, Sort, Grade Report (3)
Statistics Reports (6)
Stand Table Report (2)
Log Stock Table Report MBF (2)

CRUISE DESIGN ASTORIA DISTRICT

Sale Name: Petersen Heights Area(s) 1 and 3

Harvest Type: Partial Cut

Approx. Cruise Acres: 31 Estimated CV% 45 Net BF SE% Objective 9 Net BF

Planned (Unit) Sale Volume: 150MBF Estimated Sale Area Value/Acre: \$2,200

- A. **Cruise Goals:** (a) Grade minimum 140 conifer and 20 hardwood trees:
 (b) Sample 20 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) 53°/233°
 Cruise Line Spacing 5 chains
 Cruise Plot Spacing 3 chains
 Grade/Count Ratio 1 : 2 (measure – 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: _____

Date: _____

C:\My Documents\Doc\Other\Cruise Design Form- Aug02.doc

Petersen Heights FY2017

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

Area 1 (PC)
Plots Total: 8
Grade Plots: 3
Count Plots: 5
AZ: 53/233
BAF: 27.78
Line Spacing: 5 Chains
Plot Spacing: 3 Chains
1:6000



Columbia River

AREA 2

AREA 1

Columbia View Road

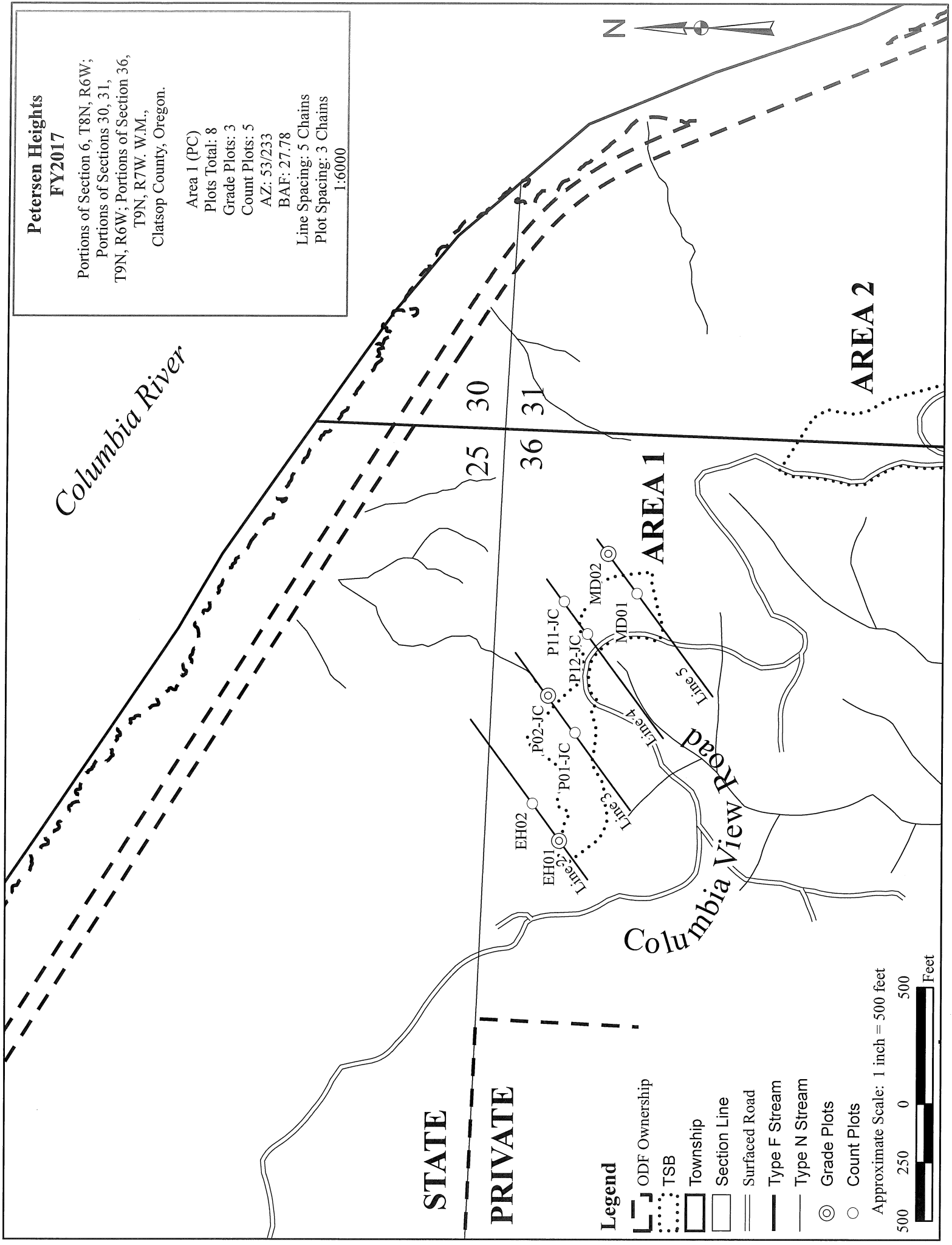
STATE

PRIVATE

Legend

- ODF Ownership
- TSB
- Township
- Section Line
- Surfaced Road
- Type F Stream
- Type N Stream
- Grade Plots
- Count Plots

Approximate Scale: 1 inch = 500 feet



Legend

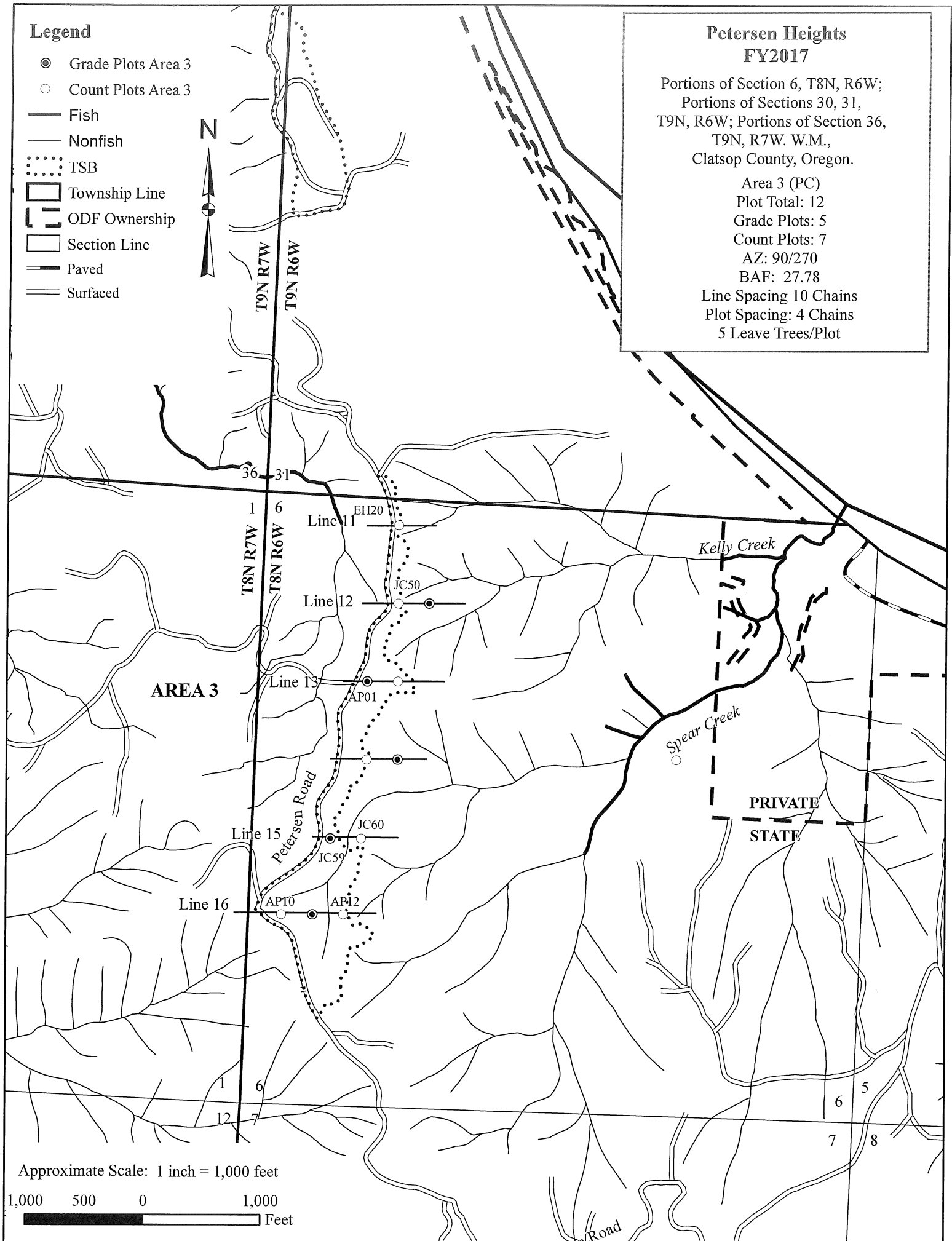
- Grade Plots Area 3
- Count Plots Area 3
- Fish
- Nonfish
- ⋯ TSB
- ▭ Township Line
- ▭ ODF Ownership
- ▭ Section Line
- Paved
- Surfaced



Petersen Heights FY2017

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

Area 3 (PC)
Plot Total: 12
Grade Plots: 5
Count Plots: 7
AZ: 90/270
BAF: 27.78
Line Spacing 10 Chains
Plot Spacing: 4 Chains
5 Leave Trees/Plot



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; 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 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: _____

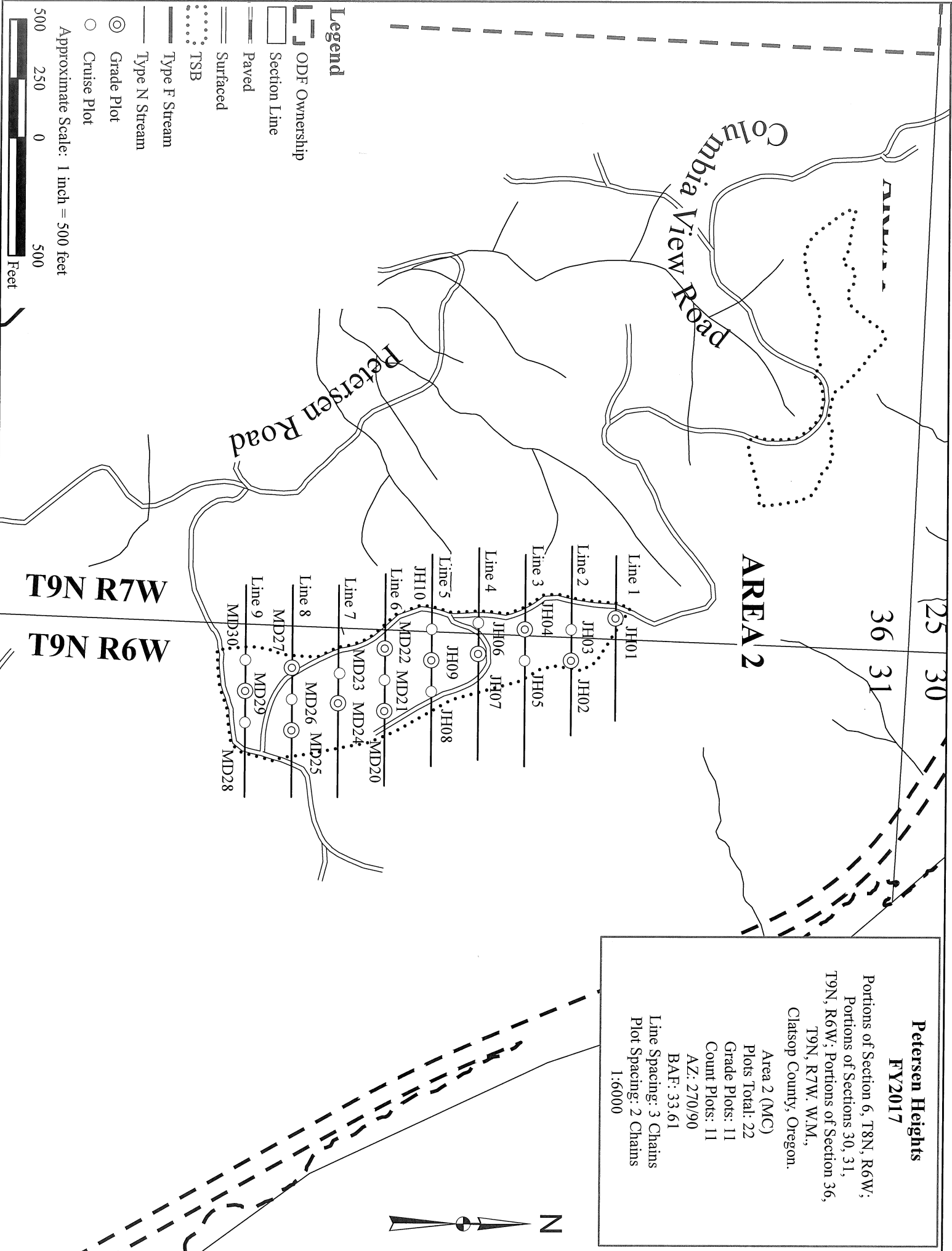
Date: _____

Petersen Heights FY2017

Portions of Section 6, T8N, R6W;
Portions of Sections 30, 31,
T9N, R6W; Portions of Section 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

AREA 2



TC		PSPCSTGR		Species, Sort Grade - Board Foot Volumes (Project)																		
T08N R06W S6 TyTK31.00 T09N R07W S36 TyTAKE12.00				Project: P_HEIGHT Acres43.00														Page1 Date8/8/2017 Time2:03:46PM				
S Spp	So T	Gr rt	ad	% Net BdFt	Bd. Ft. per Acre			Total Net MBF	Percent of Net Board Foot Volume								Average Log				Logs Per /Acre	
					Def%	Gross	Net		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						
H			DOCU															17	8		0.00	5.4
H			DO2S	56	1.5	6,100	6,010	258				53	47	1	3	29	68	36	15	323	2.07	18.6
H			DO3S	36	1.2	3,796	3,753	161			100	0		3	4	56	37	33	9	91	0.81	41.2
H			DO4S	8	.5	837	832	36			100			53	37		10	21	6	27	0.42	30.9
H Totals				69	1.3	10,733	10,595	455456			43	30	27	6	6	36	53	29	9	110	0.99	96.0
S			DO2S	78		140	140	6				8	92			38	62	35	22	820	4.46	.2
S			DO4S	22	40.0	64	38	2			100					100		32	6	30	0.53	1.3
S Totals				1	12.5	203	178	8			22	6	72			52	48	32	8	123	1.03	1.4
D			DO2S	63	1.5	2,238	2,205	95				67	33		6	34	60	36	15	309	1.98	7.1
D			DO3S	30		1,025	1,025	44			100			1		57	42	34	8	90	0.77	11.4
D			DO4S	7		226	226	10			100			32	52		16	23	6	34	0.52	6.6
D Totals				23	1.0	3,489	3,455	149			36	43	21	3	7	39	52	32	9	137	1.11	25.2
A			DOCU															10	17		0.00	2.0
A			DOCR	100		1,058	1,058	45			100			11	24		65	31	6	45	0.56	23.3
A Totals				7		1,058	1,058	45			100			11	24		65	30	7	42	0.54	25.2
M			DOCU															32	6		0.00	.6
M Totals																		32	6		0.00	.6
Totals					1.3	15,483	15,286	657			45	30	24	5	7	34	53	30	9	103	0.93	148.5

T		TSPCSTGR		Species, Sort Grade - Board Foot Volumes (Type)												Page		1					
				Project: P_HEIGHT												Date		8/8/2017					
																Time		2:06:00PM					
T08N R06W S6 TTK												T08N R06W S6 TTK											
Twp		Rge		Sec		Tract		Type		Acres		Plots		Sample Trees		CuFt		BdFt					
08N		06W		6		A13		TK		31.00		20		24		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/					
								4-5	6-11	12-16	17+	12-20	21-30	31-35	36-99	Ft In	Ft Lf						
H DO CU																16 7 0.00				4.8			
H DO 2S			20	4.2 725 695			22	100				100				32 12 153 1.28				4.5			
H DO 3S			60	1.5 2,020 1,989			62	100				8 79 13				32 9 87 0.80				22.8			
H DO 4S			20	632 632			20	100				59 41				21 6 25 0.43				25.7			
H Totals			66	1.8 3,377 3,316			104 103	79 21				11 12 69 8				26 8 57 0.67				57.9			
A DO CU																10 17 0.00				2.7			
A DO CR			100	1,309 1,309			41	100				27 73				35 6 54 0.59				24.3			
A Totals			26	1,309 1,309			41	100				27 73				32 7 48 0.57				27.0			
D DO 3S			59	192 192			6	100				49 51				36 6 55 0.57				3.5			
D DO 4S			41	133 133			4	100				100				24 6 30 0.50				4.4			
D Totals			6	324 324			10	100				41 29 30				29 6 41 0.54				7.9			
M DO CU																32 6 0.00				.8			
M Totals																32 6 0.00				.8			
S DO 4S			100	40.0 88 53			2	100				100				32 6 30 0.53				1.8			
S Totals			1	40.0 88 53			2	100				100				32 6 30 0.53				1.8			
Type Totals				1.9 5,098 5,002			157 155	86 14				7 18 48 26				28 7 52 0.62				95.4			

T		TSPCSTGR		Species, Sort Grade - Board Foot Volumes (Type)												Page		1		
				Project: P_HEIGHT												Date		8/8/2017		
																Time		2:05:48PM		
T09N R07W S36 TTAKE														T09N R07W S36 TTAKE						
Twp		Rge		Sec		Tract		Type		Acres		Plots		Sample Trees		CuFt		BdFt		
09N		07W		36		A2		TAKE		12.00		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/ Ft In Ft Lf				
H DO CU								48 52				1 3 23 74				18 9 0.00				6.7
H DO 2S			67	1.2	19,985	19,741	237	48 52				1 3 23 74				37 16 360 2.22				54.9
H DO 3S			28	.9	8,386	8,307	100	100 0				5 1 41 53				34 8 94 0.81				88.6
H DO 4S			5	1.2	1,366	1,349	16	100				46 32 23				22 6 30 0.41				44.4
H Totals			70	1.1	29,737	29,398	353	33 33 35				4 4 27 66				32 10 151 1.19				194.5
D DO 2S			68	1.5	8,020	7,901	95	67 33				6 34 60				36 15 309 1.98				25.6
D DO 3S			27		3,176	3,176	38	100				2 58 41				33 9 100 0.83				31.9
D DO 4S			5		467	467	6	100				56 17 28				23 7 38 0.55				12.4
D Totals			28	1.0	11,663	11,544	139	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	6	8 92				38 62				35 22 820 4.46				.6
S Totals			1		500	500	6	8 92				38 62				35 22 820 4.46				.6
Type Totals				1.1	42,311	41,853	503	502	33	36	32	4	4	30	61	31	10	147	1.18	285.5

TC PSTATS				PROJECT STATISTICS				PAGE	1			
				PROJECT	P	HEIGHT	DATE 8/8/2017					
TWP	RGE	SC	TRACT	TYPE		ACRES	PLOTS	TREES	CuFt	BdFt		
08N	06	6	A13	TK		43.00	41	210	1	W		
09N	07W	36	A2	TAKE								
				PLOTS	TREES	TREES PER PLOT	ESTIMATED TOTAL TREES	PERCENT SAMPLE TREES				
TOTAL			41	210	5.1							
CRUISE			19	113	5.9	3,886		2.9				
DBH COUNT												
REFOREST												
COUNT			18	94	5.2							
BLANKS			4									
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			83	51.2	16.2	57	18.3	73.6	10,733	10,595	2,763	2,763
DOUG FIR			22	14.0	17.8	59	5.7	24.2	3,489	3,455	880	880
R ALDER			5	23.3	12.6	33	5.7	20.1	1,058	1,058	406	406
S SPRUCE			2	1.3	14.1	36	0.4	1.4	203	178	48	48
BL MAPLE			1	.6	18.0	33	0.2	1.0				
TOTAL			113	90.4	15.6	50	30.5	120.4	15,483	15,286	4,098	4,098
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			79.8	8.8	389	426	464					
DOUG FIR			97.8	21.3	338	430	521					
R ALDER			40.0	19.9	40	50	60					
S SPRUCE			138.0	129.2		1,245	2,854					
BL MAPLE												
TOTAL			96.2	9.0	383	421	459		370	92	41	
CL	68.1		COEFF	SAMPLE TREES - CF					# OF TREES REQ.		INF. POP.	
SD:	1.0		VAR.%	S.E.%	LOW	AVG	HIGH		5	10	15	
WHEMLOCK			67.1	7.4	97	104	112					
DOUG FIR			86.0	18.7	83	103	122					
R ALDER			58.4	29.0	15	22	28					
S SPRUCE			131.4	123.1		241	536					
BL MAPLE												
TOTAL			80.2	7.5	94	102	110		257	64	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			107.0	16.7	43	51	60					
DOUG FIR			199.3	31.1	10	14	18					
R ALDER			204.9	32.0	16	23	31					
S SPRUCE			613.0	95.6	0	1	3					
BL MAPLE			640.3	99.9	0	1	1					
TOTAL			77.6	12.1	79	90	101		240	60	27	
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			92.0	14.4	63	74	84					
DOUG FIR			166.8	26.0	18	24	31					
R ALDER			199.9	31.2	14	20	26					
S SPRUCE			480.3	74.9	0	1	3					
BL MAPLE			640.3	99.9	0	1	2					
TOTAL			57.9	9.0	110	120	131		134	33	15	

PROJECT STATISTICS

PROJECT P HEIGHT

TWP	RGE	SC	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt
08N	06	6	A13	TK	43.00	41	210	1	W
09N	07W	36	A2	TAKE					

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		102.4	16.0	8,901	10,595	12,288			
DOUG FIR		177.1	27.6	2,500	3,455	4,410			
R ALDER		211.7	33.0	709	1,058	1,408			
S SPRUCE		517.7	80.8	34	178	321			
BL MAPLE									
TOTAL		<i>79.4</i>	<i>12.4</i>	<i>13,391</i>	<i>15,286</i>	<i>17,181</i>	<i>252</i>	<i>63</i>	<i>28</i>

CL	68.1	COEFF	NET CUFT FT/ACRE			# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15
WHEMLOCK		98.4	15.4	2,339	2,763	3,188			
DOUG FIR		173.0	27.0	643	880	1,118			
R ALDER		206.2	32.2	276	406	537			
S SPRUCE		449.3	70.1	14	48	82			
BL MAPLE									
TOTAL		<i>69.7</i>	<i>10.9</i>	<i>3,652</i>	<i>4,098</i>	<i>4,544</i>	<i>194</i>	<i>49</i>	<i>22</i>

TC TSTATS				STATISTICS				PAGE	1		
				PROJECT	P HEIGHT			DATE	8/8/2017		
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt		
08N	06W	6	A13	THIN	31.00	20	146	1	W		
				TREES	ESTIMATED	PERCENT					
				PER PLOT	TOTAL	SAMPLE					
					TREES	TREES					
TOTAL		20	146	7.3							
CRUISE		9	68	7.6	4,693		1.4				
DBH COUNT											
REFOREST											
COUNT		11	78	7.1							
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		30	44.1	17.8	63	18.1	76.4	10,337	10,164	2,847	2,847
ALDRLEAV		4	20.2	18.4	43	8.7	37.5	2,285	2,285	847	847
WHEMLOCK		14	35.1	13.2	44	9.2	33.3	3,377	3,316	992	992
R ALDER		4	24.3	13.3	37	6.5	23.6	1,309	1,309	500	500
DOUGLEAV		8	16.0	14.9	49	5.0	19.4	1,796	1,796	545	545
DOUG FIR		4	7.9	12.7	30	2.0	6.9	324	324	124	124
SPRUCELV		2	1.2	20.9	55	0.6	2.8	308	263	91	91
BL MAPLE		1	.8	18.0	33	0.3	1.4				
S SPRUCE		1	1.8	12.0	33	0.4	1.4	88	53	30	30
TOTAL		68	151.4	15.7	48	51.2	202.8	19,825	19,510	5,976	5,976
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		76.0	14.1	249	290	331					
ALDRLEAV		72.3	41.3	73	125	177					
WHEMLOCK		59.7	16.6	102	122	142					
R ALDER		21.9	12.5	50	58	65					
DOUGLEAV		47.9	18.0	109	133	156					
DOUG FIR		35.3	20.2	34	43	51					
SPRUCELV		24.6	23.0	177	230	283					
BL MAPLE											
S SPRUCE											
TOTAL		95.0	11.5	167	189	211	361 90		40		
CL: 68.1 %		COEFF	SAMPLE TREES - CF					# OF TREES REQ.		INF. POP.	
SD: 1.0		VAR.%	S.E.%	LOW	AVG	HIGH	5 10		15		
HEMLEAV		62.2	11.5	70	79	88					
ALDRLEAV		41.9	23.9	35	46	56					
WHEMLOCK		55.6	15.4	30	36	41					
R ALDER		46.3	26.5	19	25	32					
DOUGLEAV		41.6	15.7	34	40	46					
DOUG FIR		34.9	20.0	13	16	19					
SPRUCELV		25.8	24.2	60	80	99					
BL MAPLE											
S SPRUCE											
TOTAL		76.9	9.3	49	55	60	236 59		26		
CL: 68.1 %		COEFF	TREES/ACRE					# OF PLOTS REQ.		INF. POP.	
SD: 1.0		VAR.%	S.E.%	LOW	AVG	HIGH	5 10		15		
HEMLEAV		83.6	19.2	36	44	53					
ALDRLEAV		144.1	33.0	14	20	27					
WHEMLOCK		135.2	31.0	24	35	46					
R ALDER		152.1	34.9	16	24	33					
DOUGLEAV		155.1	35.6	10	16	22					
DOUG FIR		289.5	66.4	3	8	13					
SPRUCELV		447.2	102.5		1	2					

TC TSTATS				STATISTICS				PAGE	2
				PROJECT		P HEIGHT		DATE	8/8/2017
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt
08N	06W	6	A13	THIN	31.00	20	146	1	W
CL: 68.1 %		COEFF		TREES/ACRE			# OF PLOTS REQ.		INF. POP.
SD:	1.0	VAR.	S.E.%	LOW	AVG	HIGH	5	10	15
BL MAPLE		447.2	102.5		1	2			
S SPRUCE		447.2	102.5		2	4			
TOTAL		39.8	9.1	138	151	165	67	17	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
HEMLEAV		80.8	18.5	62	76	91			
ALDRLEAV		144.7	33.2	25	38	50			
WHEMLOCK		142.0	32.6	22	33	44			
R ALDER		144.2	33.1	16	24	31			
DOUGLEAV		147.3	33.8	13	19	26			
DOUG FIR		286.5	65.7	2	7	12			
SPRUCELV		447.2	102.5		3	6			
BL MAPLE		447.2	102.5		1	3			
S SPRUCE		447.2	102.5		1	3			
TOTAL		27.8	6.4	190	203	216	32	8	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		82.8	19.0	8,235	10,164	12,092			
ALDRLEAV		142.8	32.7	1,537	2,285	3,033			
WHEMLOCK		155.7	35.7	2,133	3,316	4,499			
R ALDER		149.9	34.4	859	1,309	1,758			
DOUGLEAV		150.6	34.5	1,176	1,796	2,417			
DOUG FIR		277.7	63.7	118	324	531			
SPRUCELV		447.2	102.5		263	533			
BL MAPLE									
S SPRUCE		447.2	102.5		53	107			
TOTAL		42.4	9.7	17,613	19,510	21,406	76	19	8
CL: 68.1 %		COEFF		NET CUFT FT/ACRE			# OF PLOTS REQ.		INF. POP.
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15
HEMLEAV		82.2	18.8	2,310	2,847	3,383			
ALDRLEAV		143.5	32.9	568	847	1,125			
WHEMLOCK		153.8	35.3	643	992	1,342			
R ALDER		145.5	33.4	333	500	667			
DOUGLEAV		148.9	34.1	359	545	732			
DOUG FIR		284.7	65.3	43	124	205			
SPRUCELV		447.2	102.5		91	184			
BL MAPLE									
S SPRUCE		447.2	102.5		30	61			
TOTAL		34.7	8.0	5,500	5,976	6,452	51	13	6

TC TSTATS				STATISTICS				PAGE 1			
				PROJECT	P HEIGHT			DATE	8/8/2017		
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt		
08N	06W	6	A13	TK	31.00	20	48	1	W		
				TREES	ESTIMATED	PERCENT					
				PER PLOT	TOTAL	SAMPLE					
					TREES	TREES					
TOTAL		20	48	2.4							
CRUISE		7	24	3.4	2,166	1.1					
DBH COUNT											
REFOREST											
COUNT		9	24	2.7							
BLANKS		4									
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		14	35.1	13.2	44	9.2	33.3	3,377	3,316	992	
R ALDER		4	24.3	13.3	37	6.5	23.6	1,309	1,309	500	
DOUG FIR		4	7.9	12.7	30	2.0	6.9	324	324	124	
BL MAPLE		1	.8	18.0	33	0.3	1.4				
S SPRUCE		1	1.8	12.0	33	0.4	1.4	88	53	30	
TOTAL		24	69.9	13.2	40	18.3	66.7	5,098	5,002	1,647	
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		59.7	16.6	102	122	142					
R ALDER		21.9	12.5	50	58	65					
DOUG FIR		35.3	20.2	34	43	51					
BL MAPLE											
S SPRUCE											
TOTAL		77.5	16.1	75	89	104	250	63	28		
CL: 68.1 %	COEFF	SAMPLE TREES - CF					# OF TREES REQ.		INF. POP.		
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5 10		15			
WHEMLOCK		55.6	15.4	30	36	41					
R ALDER		46.3	26.5	19	25	32					
DOUG FIR		34.9	20.0	13	16	19					
BL MAPLE											
S SPRUCE											
TOTAL		65.4	13.6	25	29	32	178	45	20		
CL: 68.1 %	COEFF	TREES/ACRE					# OF PLOTS REQ.		INF. POP.		
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5 10		15			
WHEMLOCK		135.2	31.0	24	35	46					
R ALDER		152.1	34.9	16	24	33					
DOUG FIR		289.5	66.4	3	8	13					
BL MAPLE		447.2	102.5		1	2					
S SPRUCE		447.2	102.5		2	4					
TOTAL		87.9	20.2	56	70	84	325	81	36		
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		142.0	32.6	22	33	44					
R ALDER		144.2	33.1	16	24	31					
DOUG FIR		286.5	65.7	2	7	12					
BL MAPLE		447.2	102.5		1	3					
S SPRUCE		447.2	102.5		1	3					
TOTAL		83.8	19.2	54	67	79	295	74	33		
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		155.7	35.7	2,133	3,316	4,499					
R ALDER		149.9	34.4	859	1,309	1,758					

TC TSTATS				STATISTICS				PAGE	2
				PROJECT	P HEIGHT		DATE	8/8/2017	
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt
08N	06W	6	A13	TK	31.00	20	48	1	W
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		277.7	63.7	118	324	531			
BL MAPLE									
S SPRUCE		447.2	102.5		53	107			
TOTAL		105.6	24.2	3,791	5,002	6,213	469	117	52
CL:	68.1 %	COEFF		NET CUFT FT/ACRE			# OF PLOTS REQ.		INF. POP.
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15
WHEMLOCK		153.8	35.3	643	992	1,342			
R ALDER		145.5	33.4	333	500	667			
DOUG FIR		284.7	65.3	43	124	205			
BL MAPLE									
S SPRUCE		447.2	102.5		30	61			
TOTAL		95.7	21.9	1,285	1,647	2,008	385	96	43

TC TSTATS				STATISTICS				PAGE	1		
				PROJECT	P HEIGHT			DATE	8/8/2017		
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt		
08N	06W	6	A13	LV	31.00	20	98	1	W		
				TREES	ESTIMATED	PERCENT					
				PER PLOT	TOTAL	SAMPLE					
					TREES	TREES					
TOTAL				20	98	4.9					
CRUISE				9	44	4.9		2,527		1.7	
DBH COUNT											
REFOREST											
COUNT				11	54	4.9					
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		30	44.1	17.8	63	18.1	76.4	10,337	10,164	2,847	2,847
ALDRLEAV		4	20.2	18.4	43	8.7	37.5	2,285	2,285	847	847
DOUGLEAV		8	16.0	14.9	49	5.0	19.4	1,796	1,796	545	545
SPRUCELV		2	1.2	20.9	55	0.6	2.8	308	263	91	91
TOTAL		44	81.5	17.5	55	32.5	136.1	14,727	14,508	4,330	4,330
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		76.0	14.1	249	290	331					
ALDRLEAV		72.3	41.3	73	125	177					
DOUGLEAV		47.9	18.0	109	133	156					
SPRUCELV		24.6	23.0	177	230	283					
TOTAL		81.2	12.2	214	244	273		263	66	29	
CL: 68.1 %	COEFF	SAMPLE TREES - CF					# OF TREES REQ.		INF. POP.		
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5 10		15			
HEMLEAV		62.2	11.5	70	79	88					
ALDRLEAV		41.9	23.9	35	46	56					
DOUGLEAV		41.6	15.7	34	40	46					
SPRUCELV		25.8	24.2	60	80	99					
TOTAL		64.7	9.7	62	69	75		167	42	19	
CL: 68.1 %	COEFF	TREES/ACRE					# OF PLOTS REQ.		INF. POP.		
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5 10		15			
HEMLEAV		83.6	19.2	36	44	53					
ALDRLEAV		144.1	33.0	14	20	27					
DOUGLEAV		155.1	35.6	10	16	22					
SPRUCELV		447.2	102.5		1	2					
TOTAL		19.1	4.4	78	82	85		15	4	2	
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		80.8	18.5	62	76	91					
ALDRLEAV		144.7	33.2	25	38	50					
DOUGLEAV		147.3	33.8	13	19	26					
SPRUCELV		447.2	102.5		3	6					
TOTAL		6.3	1.4	134	136	138		2	0	0	
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		82.8	19.0	8,235	10,164	12,092					
ALDRLEAV		142.8	32.7	1,537	2,285	3,033					
DOUGLEAV		150.6	34.5	1,176	1,796	2,417					
SPRUCELV		447.2	102.5		263	533					
TOTAL		31.7	7.3	13,455	14,508	15,561		42	11	5	

SDI %
18.5
8.9
5.1
0.6

33.1

TC TSTATS				STATISTICS				PAGE	2
				PROJECT	P HEIGHT		DATE	8/8/2017	
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt
08N	06W	6	A13	LV	31.00	20	98	1	W
CL:	68.1 %	COEFF		NET CUFT FT/ACRE			# OF PLOTS REQ.		INF. POP.
SD:	1.0	VAR.	S.E.%	LOW	AVG	HIGH	5	10	15
CL:	68.1 %	COEFF		NET CUFT FT/ACRE			# OF PLOTS REQ.		INF. POP.
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15
HEMLEAV		82.2	18.8	2,310	2,847	3,383			
ALDRLEAV		143.5	32.9	568	847	1,125			
DOUGLEAV		148.9	34.1	359	545	732			
SPRUCELV		447.2	102.5		91	184			
TOTAL		22.2	5.1	4,109	4,330	4,550	21	5	2

TC TSTATS				STATISTICS				PAGE 1					
				PROJECT	P HEIGHT			DATE	8/8/2017				
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt				
09N	07W	36	A2	00MC	12.00	21	164	1	W				
				TREES	ESTIMATED TOTAL		PERCENT SAMPLE						
				PER PLOT	TREES		TREES						
TOTAL				21	164		7.8						
CRUISE				12	90		7.5		1,778				
DBH COUNT								5.1					
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	7,338
DOUG FIR				18	29.7	20.6	78	15.2	68.8	11,663	11,544	2,834	2,834
R ALDER				1	20.5	10.0	21	3.5	11.2	411	411	164	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	94
TOTAL				90	148.2	18.0	62	61.8	262.5	42,311	41,853	10,430	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		SAMPLE TREES - CF						# OF TREES REQ.		INF. POP.		
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH			5	10	15			
WHEMLOCK				57.8	7.0	110	118	126					
DOUG FIR				71.0	17.2	101	122	143					
R ALDER													
SNAG													
S SPRUCE													
TOTAL				67.7	7.1	112	120	129	183	46	20		
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					

TC TSTATS				STATISTICS				PAGE	2
				PROJECT	P HEIGHT		DATE	8/8/2017	
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt
09N	07W	36	A2	00MC	12.00	21	164	1	W
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		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
CL:	68.1 %	COEFF		NET CUFT FT/ACRE			# OF PLOTS REQ.		INF. POP.
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15
WHEMLOCK		64.6	14.4	6,279	7,338	8,398			
DOUG FIR		119.9	26.8	2,074	2,834	3,593			
R ALDER		333.2	74.5	42	164	287			
SNAG									
S SPRUCE		458.3	102.4		94	191			
TOTAL		42.3	9.5	9,444	10,430	11,417	75	19	8

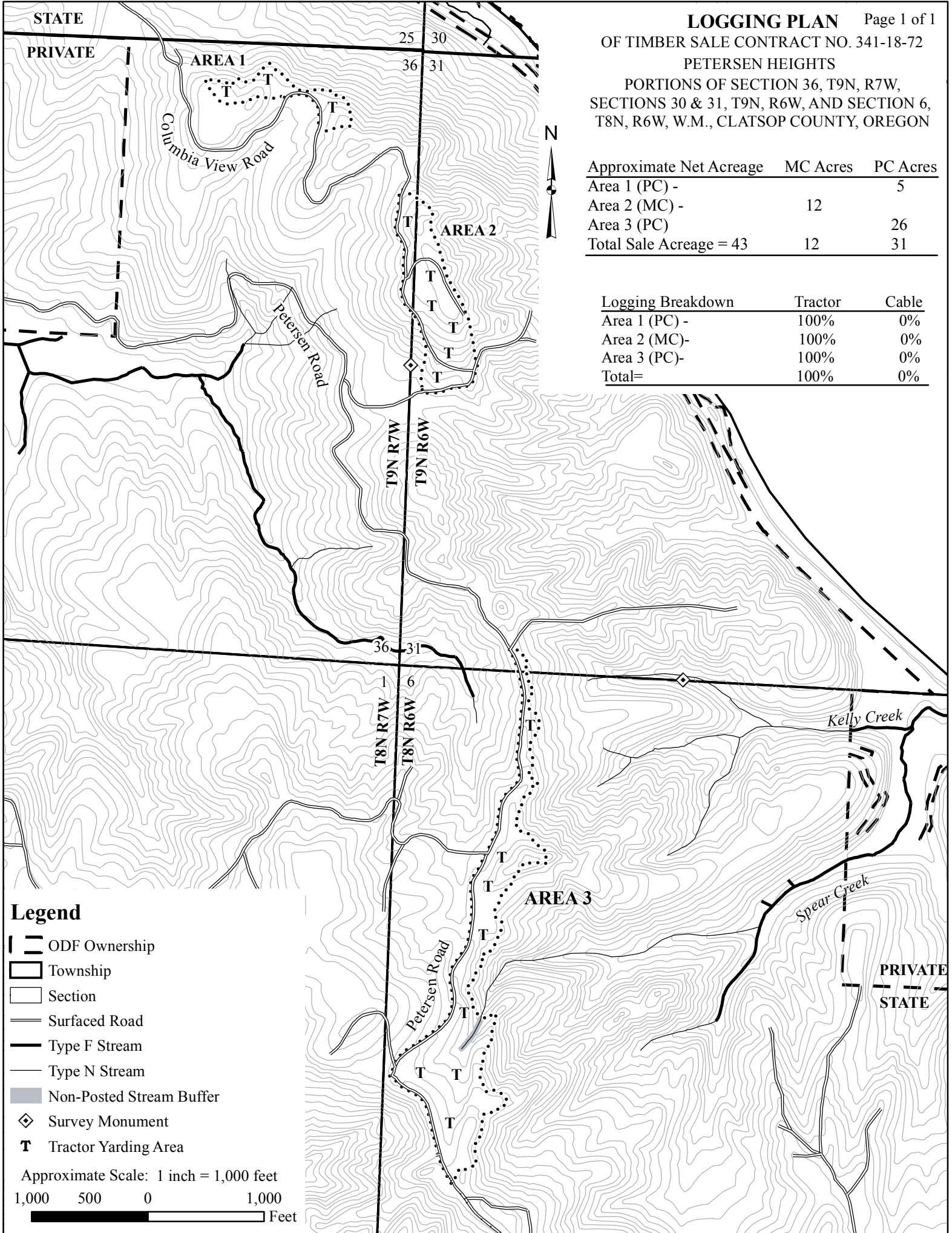
TC TSTATS				STATISTICS				PAGE 1			
				PROJECT	P HEIGHT			DATE	8/8/2017		
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt		
09N	07W	36	A2	TAKE	12.00	21	162	1	W		
				TREES	ESTIMATED	PERCENT					
				PER PLOT	TOTAL	SAMPLE					
					TREES	TREES					
TOTAL				21	162	7.7					
CRUISE				12	89	7.4		1,720		5.2	
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	7,338
DOUG FIR		18	29.7	20.6	78	15.2	68.8	11,663	11,544	2,834	2,834
R ALDER		1	20.5	10.0	21	3.5	11.2	411	411	164	164
S SPRUCE		1	.2	38.0	107	0.3	1.6	500	500	94	94
TOTAL		89	143.4	18.2	64	60.8	259.3	42,311	41,853	10,430	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	SAMPLE TREES - CF					# OF TREES REQ.		INF. POP.		
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5		10	15		
WHEMLOCK		57.8	7.0	110	118	126					
DOUG FIR		71.0	17.2	101	122	143					
R ALDER											
S SPRUCE											
TOTAL		66.5	7.0	113	122	130		177	44	20	
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 TSTATS				STATISTICS				PAGE	2
				PROJECT	P HEIGHT			DATE	8/8/2017
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt
09N	07W	36	A2	TAKE	12.00	21	162	1	W
CL:	68.1 %	COEFF		NET CUFT FT/ACRE			# OF PLOTS REQ.		INF. POP.
SD:	1.0	VAR.	S.E.%	LOW	AVG	HIGH	5	10	15
CL:	68.1 %	COEFF		NET CUFT FT/ACRE			# OF PLOTS REQ.		INF. POP.
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15
WHEMLOCK		64.6	14.4	6,279	7,338	8,398			
DOUG FIR		119.9	26.8	2,074	2,834	3,593			
R ALDER		333.2	74.5	42	164	287			
S SPRUCE		458.3	102.4		94	191			
TOTAL		42.3	9.5	9,444	10,430	11,417	75	19	8

TC		PSTNDSUM		Stand Table Summary										Page		1				
														Date:		8/8/2017				
T08N R06W S6 TyTK31.00T09N R07W S36 TyTAKE12.00						Project		P_HEIGHT		Time:		2:03:46PM								
						Acres		43.00		Grown Year:										
S Spec	T	Sample		Tot		Trees/ Acre		BA/ Acre		Logs Acre		Average Log		Net		Net		T o t a l s		
		DBH	Trees	FF 16'	Av Ht							Net Cu.Ft.	Net Bd.Ft.	Tons/ Acre	Cu.Ft. Acre	Bd.Ft. Acre	Tons	Cunits	MBF	
H		8	1	88	58	2.058	.72	2.06	8.0	30.0		16	62		7	3				
H		10	2	83	24	6.635	3.43	3.15	8.0	20.0		25	63		11	3				
H		11	1	85	69	1.089	.72	1.09	19.0	60.0		21	65		9	3				
H		12	6	87	71	9.302	7.31	15.50	14.0	46.5		217	721		94	31				
H		13	4	87	76	5.284	4.87	9.79	16.0	58.5		156	572		67	25				
H		14	3	87	84	2.016	2.16	4.03	19.2	63.3		77	255		33	11				
H		15	4	89	92	3.155	3.87	7.48	20.5	81.3		154	608		66	26				
H		16	6	86	84	5.232	7.31	10.46	26.3	91.3		275	955		118	41				
H		17	4	87	81	3.723	5.87	7.45	28.4	101.1		212	753		91	32				
H		18	5	89	100	2.033	3.59	4.47	35.7	132.7		160	594		69	26				
H		19	4	89	104	1.460	2.87	3.65	36.3	144.0		132	525		57	23				
H		20	5	87	101	1.647	3.59	3.95	40.3	154.2		159	609		68	26				
H		21	1	89	108	.299	.72	.90	39.0	166.7		35	149		15	6				
H		22	6	88	100	1.633	4.31	3.81	50.0	196.4		191	749		82	32				
H		23	6	89	101	1.494	4.31	3.49	55.4	225.0		193	784		83	34				
H		24	2	85	84	.457	1.44	.91	60.5	227.5		55	208		24	9				
H		25	2	87	102	.422	1.44	1.05	62.4	256.0		66	270		28	12				
H		26	1	89	103	.195	.72	.39	83.0	310.0		32	121		14	5				
H		27	6	87	97	1.084	4.31	2.71	66.2	284.0		179	770		77	33				
H		28	2	84	77	.336	1.44	.67	72.7	255.0		49	171		21	7				
H		29	1	86	79	.157	.72	.31	79.5	325.0		25	102		11	4				
H		30	4	88	94	.585	2.87	1.17	102.7	447.5		120	524		52	23				
H		31	3	86	88	.411	2.16	.82	103.3	406.7		85	334		37	14				
H		32	1	82	65	.129	.72	.26	83.5	320.0		21	82		9	4				
H		33	2	88	106	.242	1.44	.73	91.0	463.3		66	336		28	14				
H		34	1	88	130	.114	.72	.34	116.7	616.7		40	211		17	9				
H		Totals	83	87	76	51.192	73.61	90.65	30.5	116.9		2,763	10,595		1,188	456				
D		12	2	85	34	3.187	2.50	3.19	12.0	30.0		38	96		16	4				
D		13	1	82	48	1.358	1.25	1.36	17.0	50.0		23	68		10	3				
D		14	1	85	57	1.171	1.25	1.17	24.0	60.0		28	70		12	3				
D		15	1	85	94	.869	1.07	1.74	21.5	85.0		37	148		16	6				
D		16	1	89	95	.764	1.07	1.53	27.0	105.0		41	160		18	7				
D		18	2	87	101	1.208	2.13	2.42	34.8	125.0		84	302		36	13				
D		19	3	89	90	1.626	3.20	3.25	36.7	131.7		119	428		51	18				
D		20	1	86	82	.489	1.07	.98	35.0	120.0		34	117		15	5				
D		21	2	87	99	.887	2.13	2.22	37.4	150.0		83	333		36	14				
D		22	2	88	117	.808	2.13	2.43	40.0	171.7		97	416		42	18				
D		23	1	88	115	.370	1.07	1.11	44.3	190.0		49	211		21	9				
D		24	2	87	111	.679	2.13	2.04	44.5	188.3		91	384		39	17				
D		28	1	89	117	.250	1.07	.75	65.3	296.7		49	222		21	10				
D		31	1	89	117	.204	1.07	.61	79.3	393.3		48	240		21	10				
D		37	1	85	146	.143	1.07	.43	134.3	606.7		58	260		25	11				
D		Totals	22	86	77	14.013	24.21	25.21	34.9	137.1		880	3,455		379	149				
A		10	1	87	29	5.732	3.13	5.73	8.0	20.0		46	115		20	5				
A		11	2	87	53	12.897	8.51	12.90	15.5	50.0		200	645		86	28				
A		17	1	86	50	2.700	4.26	2.70	32.0	60.0		86	162		37	7				
A		20	1	86	61	1.951	4.26	1.95	38.0	70.0		74	137		32	6				
A		Totals	5	87	48	23.280	20.15	23.28	17.5	45.4		406	1,058		175	45				
S		12	1	86	47	1.275	1.00	1.27	17.0	30.0		22	38		9	2				
S		38	1	88	131	.057	.45	.17	154.7	820.0		26	140		11	6				

TC		PSTNDSUM		Stand Table Summary								Page		2	
												Date:		8/8/2017	
				T08N R06W S6 TyTK		31.00		Project		P_HEIGHT		Time:		2:03:46PM	
				T09N R07W S36 TyTAKE		12.00		Acres		43.00		Grown Year:			
S				Tot				Average Log							
Sp	T	DBH	Sample	FF	Av	Trees/	BA/	Logs	Net	Net	Tons/	Net	Net	Totals	
			Trees	16'	Ht	Acre	Acre	Acre	Cu.Ft.	Bd.Ft.	Acre	Acre	Acre	Tons	Cunits
															MBF
S		Totals	2	86	51	1.332	1.45	1.45	33.2	123.0	48	178		21	8
M		18	1	60	45	.567	1.00								
M		Totals	1	60	45	.567	1.00								
Totals			113	86	68	90.384	120.42	140.58	29.1	108.7	4,098	15,286		1,762	657

TC PLOGSTVB		Log Stock Table - MBF																			
T08N R06W S6 TyTK		31.00		Project:		P_HEIGHT												Page		2	
T09N R07W S36 TyTAKE		12.00		Acres		43.00												Date		8/8/2017	
																		Time		2:03:47PM	
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	16-19	20-23	24-29	30-39	40+			
D	DO	4S	20	1	1	.8			1	1											
D	DO	4S	24	4	4	2.8			4												
D	DO	4S	30	1	1	.6			1												
D	DO	4S	36	2	2	1.0			2												
D	Totals			150	149	22.6			24	2	28	28	24	31		12					
A	DO	CR	20	5	5	10.8			5												
A	DO	CR	30	11	11	24.4			11												
A	DO	CR	36	17	17	36.6			17												
A	DO	CR	40	13	13	28.2			13												
A	Totals			45	45	6.9			45												
Total	All Species			666	1.3	657	100.0			132	53	112	94	74	109	55	27				



LOGGING PLAN Page 1 of 1
OF TIMBER SALE CONTRACT NO. 341-18-72
PETERSEN HEIGHTS
PORTIONS OF SECTION 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) -		5
Area 2 (MC) -	12	
Area 3 (PC)		26
Total Sale Acreage = 43	12	31

Logging Breakdown	Tractor	Cable
Area 1 (PC) -	100%	0%
Area 2 (MC)-	100%	0%
Area 3 (PC)-	100%	0%
Total=	100%	0%