



Timber Sale Appraisal
Quartz Run
Sale AT-341-2019-29-

District: Astoria

Date: October 02, 2018

Cost Summary

	Conifer	Hardwood	Total
Gross Timber Sale Value	\$2,912,590.51	\$18,149.85	\$2,930,740.36
		Project Work:	(\$210,163.00)
		Advertised Value:	\$2,720,577.36



Timber Sale Appraisal Quartz Run Sale AT-341-2019-29-

District: Astoria

Date: October 02, 2018

Timber Description

Location: Portions of Sections 14, 21, 22, and 23, T4N, R7W, W.M., Clatsop County, Oregon.

Stand Stocking: 80%

Specie Name	AvgDBH	Amortization (%)	Recovery (%)
Douglas - Fir	23	0	97
Western Hemlock / Fir	20	0	97
Alder (Red)	11	0	97

Volume by Grade	2S	3S & 4S 6"-11"	6" - 7"	Total
Douglas - Fir	4,031	1,020	0	5,051
Western Hemlock / Fir	3,083	1,210	0	4,293
Alder (Red)	0	0	45	45
Total	7,114	2,230	45	9,389

Comments:

1. SOURCE OF POND VALUES

Pond Values Used: Local Pond Values, November 2018.

2. PRICING

Western redcedar and Other Cedars Stumpage Price = Pond Value minus Logging Cost:
\$1060.89/MBF = \$1,300/MBF - \$239.11/MBF

3. PULP PRICE

Pulp (Conifer and Hardwood) Price = \$3/ton

4. PROFIT & RISK COSTS

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

TOTAL Other Costs (with Profit & Risk to be added) = \$2,000

5. NON-PROFIT & RISK COSTS

6. SLASH DISPOSAL

Slash and Landing Piling (See attached appraisal)= \$38,192

7. ROAD MAINTENANCE COST

\$3.10/mbf (See attached appraisal)



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Logging Conditions

Combination#: 1 Douglas - Fir 22.00%
 Western Hemlock / Fir 22.00%
 Alder (Red) 22.00%

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

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

tree size: Mature / Regen Cut (900 Bft/tree), 3-5 logs/MBF

loads / day: 12 **bd. ft / load:** 4000

cost / mbf: \$137.50

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

Combination#: 2 Douglas - Fir 78.00%
 Western Hemlock / Fir 78.00%
 Alder (Red) 78.00%

Logging System: Shovel **Process:** Manual Falling/Delimbing

yarding distance: Medium (800 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: \$65.62

machines: Shovel Logger



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Logging Costs

Operating Seasons: 2.00	Profit Risk: 12%
Project Costs: \$210,163.00	Other Costs (P/R): \$2,000.00
Slash Disposal: \$38,192.00	Other Costs: \$0.00

Miles of Road

Road Maintenance: \$3.10

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

Hauling Costs

Species	\$ / MBF	Trips/Day	MBF / Load
Douglas - Fir	\$0.00	2.0	4.0
Western Hemlock / Fir	\$0.00	2.0	4.0
Alder (Red)	\$0.00	2.0	3.5



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Logging Costs Breakdown

Logging	Road Maint	Fire Protect	Hauling	Other P/R appl	Profit & Risk	Slash Disposal	Brand & Paint	Other	Total
Douglas - Fir									
\$81.43	\$3.19	\$0.93	\$122.31	\$0.21	\$24.97	\$4.07	\$2.00	\$0.00	\$239.11
Western Hemlock / Fir									
\$81.43	\$3.19	\$0.93	\$122.31	\$0.21	\$24.97	\$4.07	\$2.00	\$0.00	\$239.11
Alder (Red)									
\$81.43	\$3.19	\$0.93	\$139.78	\$0.21	\$27.06	\$4.07	\$2.00	\$0.00	\$258.67

Specie	Amortization	Pond Value	Stumpage	Amortized
Douglas - Fir	\$0.00	\$600.00	\$360.89	\$0.00
Western Hemlock / Fir	\$0.00	\$492.95	\$253.84	\$0.00
Alder (Red)	\$0.00	\$662.00	\$403.33	\$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
Alder (Red)	0	\$0.00	\$0.00

Unamortized

Specie	MBF	Value	Total
Douglas - Fir	5,051	\$360.89	\$1,822,855.39
Western Hemlock / Fir	4,293	\$253.84	\$1,089,735.12
Alder (Red)	45	\$403.33	\$18,149.85

Gross Timber Sale Value

Recovery: \$2,930,740.36

Prepared By: Justin Bush

Phone: 503-325-5451

SUMMARY OF ALL PROJECT COSTS

SALE NAME: Quartz Run

Project No. 1: ROAD CONSTRUCTION:

<u>Road segment</u>	<u>Length/Sta</u>	<u>Cost</u>
1A to 1B	3.00	\$6,682.61
Road Maint.		\$259.29
Move-In		\$316.97
TOTALS	3.00	\$7,259

Project No. 2: ROAD IMPROVEMENT:

<u>Road segment</u>	<u>Length/Sta</u>	<u>Cost</u>
I1 to I2, I3 to I4	260.75	\$186,796.69
I5 to I6, I7 to I8 (0+00 to 5+00)		
I9 to I10, I11 to I12		
I13 to I14, I15 to I16		
I17 to I18		
Road Maint.		\$7,247.71
Move-In		\$8,860.03
TOTALS		\$202,904

SPECIAL PROJECTS (Move-In and Road Maint. are included separately as needed, for each Special Project):

<u>Description</u>	<u>Cost</u>
TOTAL	

GRAND TOTAL **\$210,163**

Compiled By: Justin Bush *FL*

Date: 12/07/2018

Move In and Maintenance Calculator for Construction and Improvement

SALE NAME: Quartz Run

Project No. 1: ROAD CONSTRUCTION:

<u>Road segment</u>	<u>Length/Sta</u>	<u>Cost</u>
<u>1A to 1B</u>	<u>3.00</u>	<u>\$6,683</u>
<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>
TOTALS	3.00	\$6,683

Project No. 2: ROAD IMPROVEMENT:

<u>Road segment</u>	<u>Length/Sta</u>	<u>Cost</u>
<u>I1 to I2, I3 to I4</u>	<u>260.75</u>	<u>\$186,797</u>
<u>I5 to I6, I7 to I8 (0+00 to 5+00)</u>	<u> </u>	<u> </u>
<u>I9 to I10, I11 to I12</u>	<u> </u>	<u> </u>
<u>I13 to I14, I15 to I16</u>	<u> </u>	<u> </u>
<u>I17 to I18</u>	<u> </u>	<u> </u>
TOTALS	 	\$186,797

MOVE IN (Construction & Improvement Only)

<u>Equipment</u>	<u>Cost</u>
<u>Dozer (D8)</u>	<u>\$1,581.00</u>
<u>Excavator (C330)</u>	<u>\$1,581.00</u>
<u>Excavator (C315)</u>	<u>\$905.00</u>
<u>Skidder (C518)</u>	<u>\$806.00</u>
<u>Dump Trucks (12cy x6)</u>	<u>\$1,104.00</u>
<u>Front End Loader (C966)</u>	<u>\$875.00</u>
<u>Backhoe (C580)</u>	<u>\$361.00</u>
<u>Grader (14G)</u>	<u>\$875.00</u>
<u>Vibratory Roller</u>	<u>\$875.00</u>
<u>Water Truck (2,500 gal)</u>	<u>\$214.00</u>
TOTAL	\$9,177.00

ROAD MAINTENANCE (Construction & Improvement Only)

<u>Project road maintenance</u>	<u>\$7,507.00</u>
<u> </u>	<u> </u>
TOTAL	\$7,507.00

0.06 MILES
0.00 MILES

10

6752

10

874

107

1901

527

SURFACING				
Subgrade prep:				
Description	Stations/ amount	x	Rate/ sta/amt	Cost
Grade, Shape and Ditch 16' (1A to 1B)	3.00	x	\$27.91	\$83.73
Subgrade Compaction (1A to 1B)	3.00	x	\$22.69	\$68.07

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 3+00						
				Volume (CY)	per	Number of	stations					
Base Rock	4" - 0" Crushed	0+00 to 3+00	8	station	50	TA's	1	150	\$3.00	\$450		
Turnarounds	4" - 0" Crushed	1+25	8	TA	22	TA's	1	22	\$3.00	\$66		
Traction Rock	3/4" - 0" Crushed	0+00 to 2+10	2	station	13	stations	2.10	27	\$4.55	\$124		
Culvert Bedding and Backfill	3/4" - 0" Crushed	0+50	N/A	culvert	44	culverts	1	44	\$4.55	\$200		
Landings	6" - 0" Pit Run	3+00	N/A	Landing	88	Landings	1	88	\$4.46	\$392		
Total Rock for Road Segment:				1A to 1B				331			\$1,233	

Processing:		Description		No.sta	Rate/sta	Cost
		Water, Process, & Compact (2 lifts, 4" - 0" CR):		3.00	\$126.96	\$380.88
		Water, Process, & Compact (Traction Rock):		2.10	\$63.48	\$133.31

SPECIAL PROJECTS		Description		Cost	
		Develop pit-run		(88cy @ \$2.92/cy)	\$ 256.96
SUB TOTAL FOR SPECIAL PROJECTS					\$257

Subtotal of Surfacing & Spec. Proj.		\$2,156
Subtotal of Clearing, Exc., Culv.		\$4,527
GRAND TOTAL		\$6,683

Compiled By: Justin Bush Date: 10/22/2018

SALE NAME:	Quartz Run	NEW CONSTRUCTION:	STATIONS	0.00 MILES
ROAD:		IMPROVEMENT:	260.75 STATIONS	4.94 MILES
POINTS:	1-12, 13-14, 15-16, 17-18 (0+00 to 5+00), 9-10, 11-12, 13-14, 15-16, 17-18			

CLEARING & GRUBBING			Acres/amount	Rate	Cost
Method					
13 to 14					
24+85	Clear & Grub landing	C315(hrs.)	1	\$114.00	\$114.00
15 to 16					
3+00	Clear & Grub landing	C315(hrs.)	1	\$114.00	\$114.00
SUB TOTAL FOR CLEARING & GRUBBING					\$228

EXCAVATION		Material	Cy/amount		Rate		Cost
I1 to I2		Fill/Culvert Replacement					
11+00		See Fill Reconstruction Cost Estimate Sheet		X		=	\$7,418
62+20		See Fill Reconstruction Cost Estimate Sheet		X		=	\$5,357
64+65		See Fill Reconstruction Cost Estimate Sheet		X		=	\$24,026
75+70		See Fill Reconstruction Cost Estimate Sheet		X		=	\$8,954
88+95		See Fill Reconstruction Cost Estimate Sheet		X		=	\$9,978
99+80		See Fill Reconstruction Cost Estimate Sheet		X		=	\$16,858
130+15		See Fill Reconstruction Cost Estimate Sheet		X		=	\$4,158
		Install rock ditch filters w/3'15, \$/hr	7	X	\$114.00	=	\$798
I3 to I4							
21+25		Construct turnaround	C315/(hrs.) 1.0	X	\$114.00	=	\$114
I11 to I12							
20+25		Clean out culvert catch basin and outlet					
		Labor/(hrs.)	1.0	X	\$45.00	=	\$45
24+65		Clean out culvert catch basin and outlet					
		Labor/(hrs.)	1.0	X	\$45.00	=	\$45
26+90		Install 2 X three rock ditch filters (both sides of road)					
		C315/(hrs.)	2.0	X	\$114.00	=	\$228
28+90		Construct ditchout					
		C315/(hrs.)	1.0	X	\$114.00	=	\$114
38+90		Construct turnaround					
		C315/(hrs.)	1.0	X	\$114.00	=	\$114
I17 to I18							
3+20		Clean out culvert catch basin and outlet					
		Labor/(hrs.)	1.0	X	\$45.00	=	\$45
SUB TOTAL FOR EXCAVATION							\$78,252

CULVERT MATERIALS AND INSTALLATION									
Location	Dia/type	Lineal ft.	Rate	Cost	Location	Dia/type	Lineal ft.	Rate	Cost
I1 to I2					69+15	18"CPP	30	\$21.95	\$658.50
0+00	18"CPP	30	\$21.95	\$658.50	75+70	30"ASCP	65	\$38.70	\$2,515.50
6+70	18"CPP	50	\$21.95	\$1,097.50	88+95	36"ASCP	70	\$43.98	\$3,078.60
9+35	18"CPP	30	\$21.95	\$658.50	89+80	18"CPP	30	\$21.95	\$658.50
11+00	24"ASCP	60	\$29.42	\$1,765.20	97+05	18"CPP	30	\$21.95	\$658.50

14+35	18"CPP	30	\$21.95	\$658.50	99+80	36"ASCP	80	\$42.59	\$3,407.20
37+85	18"CPP	30	\$21.95	\$658.50	101+50	18"CPP	40	\$21.95	\$878.00
55+25	18"CPP	30	\$21.95	\$658.50	121+50	18"CPP	30	\$21.95	\$658.50
60+20	18"CPP	30	\$21.95	\$658.50	127+40	18"CPP	30	\$21.95	\$658.50
62+20	36"ASCP	60	\$47.02	\$2,821.20	130+15	24"ASCP	60	\$29.42	\$1,765.20
64+55	36"ASCP	90	\$41.51	\$3,735.90					
13 to 14									\$0.00
6+65	18"CPP	40	\$21.95	\$878.00					\$0.00
11+65	18"CPP	40	\$21.95	\$878.00					\$0.00
17+75	18"CPP	40	\$21.95	\$878.00					\$0.00
22+90	18"CPP	30	\$21.95	\$658.50					\$0.00
III to 112									\$0.00
28+30	18"CPP	40	\$21.95	\$878.00					\$0.00

	Description	Quantity	Rate	Cost
Other/miscellaneous:	Erosion Control Seed (\$/ac)	1.00	\$706.00	\$706.00
	Erosion Control Straw Mulch (\$/bale)	70.00	\$12.06	\$844.20
Culvert stakes & markers:	6' X 2 1/2" white fiberglass post	18	\$23.00	\$414.00
				\$0.00
SUB TOTAL FOR CULVERT MATERIALS & INSTALLATION				\$34,443
Subtotal of Clearing, Exc., Culv.				\$112,923

SURFACING		Subgrade prep:	Description	Stations/ amount	Rate/ sta/amt	Cost		
Grade, Shape and Ditch 16' (11-12, 13-14, 15-16, 17-18 (0+00 to 5+00), 19-10, 111-112, 113-114, 115-116, 117-118)								
				260.75	x	\$7,277.53		
Subgrade Compaction ± 16' (11-12, 13-14, 15-16, 19-10, 111-112, 113-114, 115-116, 117-118)								
				148.35	x	\$3,366.06		
Sod Removal and Ditch Restoration (19-10, 111-112) (extra Grader time \$/Sta.)								
				25.60	x	\$670.72		
Sod Removal and Ditch Restoration (19-10, 111-112) (extra Backhoe time \$/Sta.)								
				25.60	x	\$298.05		
Sod Removal and Ditch Restoration (19-10, 111-112) (extra Excavator time \$/Sta.)								
				25.60	x	\$436.99		
ROAD SEGMENT								
Application	Rock Size and Type	Location	Depth of Rock (inches)	POINT TO POINT		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
				11 to 12	Sta. to Sta. 0+00 to 145+35			
Leveling Rock	3/4" - 0" crushed	6+70 to 89+30, 99+30 to 100+30, 129+65 to 130+65	N/A	load 11	loads 15	165	\$4.55	\$761
Surfacing	3/4" - 0" crushed		3	station	stations 85.5	1,626	\$4.55	\$7,400
Curve Widening Surface	3/4" - 0" crushed		3	load 11	loads 8	88	\$4.55	\$400
Turnouts	3/4" - 0" crushed	9+35, 16+10, 34+10, 40+15, 52+10, 55+80, 71+70, 79+60, 84+05	3	turnout 11	turnouts 9	99	\$4.55	\$450
Junctions	3/4" - 0" crushed	19+65, 43+70, 69+80, 71+70, 79+60, 84+05, 5+15, 89+30	3	junction 11	junctions 5	55	\$4.55	\$250
Culvert Bedding and Backfill								
	3/4" - 0" crushed	0+00, 6+70, 9+35, 11+40, 0+14+35, 37+85, 59+25, 60+20, 62+20, 84+55, 6 9+15, 75+70, 88+95, 89 9+15, 75+70, 88+95, 89 +80, 97+05, 99+80, 101 +50, 121+60, 127+40, 1 30+15	N/A	culvert	culverts 20	990	\$4.55	\$4,505
Culvert Energy Dissipator								
	24"-6" riprap	0+00, 9+35, 11+40, 14+35, 55+25, 60+20, 62+20, 0, 64+55, 75+70, 88+95, 99+80, 130+15	N/A	dissipator	dissipators 12	198	\$4.20	\$832
Base Rock Replacement @ Fills								
Base Rock	4" - 0" crushed	139+30 to 145+35	8	station	stations	500	\$3.00	\$1,500
Base Rock	4" - 0" crushed	11+00, 81+30, 82+20, 6 4+55, 88+95, 99+80, 13 0+15	4	station	stations 5.45	136	\$3.00	\$409
Rock Ditch Filters								
	6" - 4" pit run	11+00, 62+20, 64+55, 7 5+70, 89+95, 99+80, 13 0+15	N/A	ditch filter	ditch filter 7	121	\$4.46	\$540
Fill Armor								
Fill slope repair	24"-6" riprap	11+00, 62+20, 64+55, 7 5+70, 89+95, 99+80, 13 0+15	N/A	fill	fill 7	1,580	\$4.20	\$6,636
Fill slope repair	24"-6" riprap	53+05	N/A	load 11	loads 6	66	\$4.20	\$277
Total Rock for Road Segment:								
				11 to 12		5,625		\$23,950
ROAD SEGMENT								
Application	Rock Size and Type	Location	Depth of Rock (inches)	POINT TO POINT		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
				13 to 14	Sta. to Sta. 0+00 to 24+85			
Leveling Rock	4" - 0" crushed	0+00 to 17+60	N/A	load 11	loads 5	55	\$3.00	\$165
Surfacing	4" - 0" crushed	17+75 to 18+75	4	station 25	stations 2	50	\$3.00	\$150
Traction Rock	3/4" - 0" crushed	12+75 to 18+75	2	station 13	stations 6	78	\$4.55	\$355
Turnaround	4" - 0" crushed	21+25	N/A	turnaround 22	turnaround 1	22	\$3.00	\$66
Turnouts	3/4" - 0" crushed	12+75, 15+85	2	turnout 11	turnouts 2	22	\$4.55	\$100
Culvert Bedding and Backfill	3/4" - 0" crushed	6+65, 11+65, 17+75	N/A	culvert 44	culverts 3	132	\$4.55	\$601
Culvert Bedding and Backfill	3/4" - 0" crushed	22+90	N/A	culvert 33	culverts 1	33	\$4.55	\$150
Landings	6" - 0" pit run	14	N/A	Landing 100	Landings 1	100	\$4.46	\$446
Total Rock for Road Segment:								
				13 to 14		492		\$2,033
ROAD SEGMENT								
Application	Rock Size and Type	Location	Depth of Rock (inches)	POINT TO POINT		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
				15 to 16	Sta. to Sta. 0+00 to 3+00			
Surfacing	4" - 0" crushed	0+00 to 3+00	4	station 25	stations 3	75	\$3.00	\$225
Landings	6" - 0" pit run	16	N/A	Landing 88	Landings 1	88	\$4.46	\$392
Total Rock for Road Segment:								
				15 to 16		163		\$617

ROAD SEGMENT									
Application	Rock Size and Type	Location	Depth of Rock (inches)	POINT TO POINT		Sta. to Sta. 0+00 to 4+50	TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
				19 to 10	Volume (CY) per station				
Base Rock	4" - 0" crushed	0+00 to 4+50	4	station	25	4.5	113	\$3.00	\$338
Landings	6" - 0" pit run	110	N/A	Landing	22	1	22	\$4.46	\$98
Total Rock for Road Segment: \$436									
ROAD SEGMENT									
Application	Rock Size and Type	Location	Depth of Rock (inches)	POINT TO POINT		Sta. to Sta. 0+00 to 48+40	TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
				11 to 112	Volume (CY) per station				
Surfacing	4" - 0" crushed	27+30 to 48+40	4	station	25	21.1	528	\$3.00	\$1,583
Traction Rock	3/4" - 0" crushed	18+05 to 33+30	2	station	13	15.3	199	\$4.55	\$905
Rock Ditch Filters									
Culvert Bedding and Backfill	3/4" - 0" crushed	28+90	N/A	series	11	2	22	\$4.46	\$98
Turnouts	3/4" - 0" crushed	28+90, 31+55, 44+30	N/A	culverts	44	1	44	\$4.55	\$200
Turnaround	4" - 0" crushed	28+90, 31+55	2	turnout	11	3	33	\$3.00	\$99
Turnaround	4" - 0" crushed	38+90	4	turnaround	44	1	44	\$4.55	\$100
Turnaround	4" - 0" crushed	45+30	4	turnaround	11	1	11	\$3.00	\$33
Landings	6" - 0" pit run	112	N/A	Landing	44	1	44	\$3.00	\$33
Total Rock for Road Segment: \$3,346									
ROAD SEGMENT									
Application	Rock Size and Type	Location	Depth of Rock (inches)	POINT TO POINT		Sta. to Sta. 0+00 to 9+40	TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
				113 to 114	Volume (CY) per station				
Surfacing	4" - 0" crushed	0+00 to 9+40	4	station	25	9.4	235	\$3.00	\$705
Traction Rock	3/4" - 0" crushed	3+20 to 8+25	2	station	13	5.1	66	\$4.55	\$302
Landings	6" - 0" pit run	114	N/A	Landing	33	1	33	\$4.46	\$147
Total Rock for Road Segment: \$1,154									
ROAD SEGMENT									
Application	Rock Size and Type	Location	Depth of Rock (inches)	POINT TO POINT		Sta. to Sta. 0+00 to 8+60	TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
				115 to 116	Volume (CY) per station				
Surfacing	4" - 0" crushed	0+00 to 8+60	4	station	25	8.6	215	\$3.00	\$645
Turnouts	4" - 0" crushed	3+25	4	turnout	11	1	11	\$3.00	\$33
Turnaround	4" - 0" crushed	6+95	4	turnaround	11	1	11	\$3.00	\$33
Total Rock for Road Segment: \$711									
ROAD SEGMENT									
Application	Rock Size and Type	Location	Depth of Rock (inches)	POINT TO POINT		Sta. to Sta. 0+00 to 11+65	TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
				117 to 118	Volume (CY) per station				
Surfacing	4" - 0" crushed	0+00 to 11+65	4	station	25	11.7	293	\$3.00	\$878
Turnaround	4" - 0" crushed	9+65	4	turnaround	11	1	11	\$3.00	\$33
Total Rock for Road Segment: \$911									
SUB TOTAL FOR SURFACING									
				Description		No. Sta.	Rate/sta	Cost	
				Water, Process, & Compact Base Rock @ fill): (11-12)		5.00	\$63.48	\$317	
				Water, Process & Compact (11-12, 13-14, 15-16, 17-18 (0+00 to 5+00), 9+10, 11-12, 113-114, 115-116, 117-118)		260.75	\$63.48	\$16,552	
				Traction Rock Water, Process & Compact (13-14 (6.0 Sta.), 111-112 (16.3 Sta.), 113-114 (5.1 Sta.))		26.40	\$63.48	\$1,676	
				24"-6" r. 1,844		3,620	8,235	\$63,712	
				6"-4" pr. 143		2,342			
				6"-0" pr. 287					
				4"-0" crushed					
SPECIAL PROJECTS									
				Description		Cy/Amount	Rate	Cost	
				pit-run development		430	\$2.92	\$1,256.60	
				rip/rap development		1,844	\$4.83	\$8,906.52	
SUB TOTAL FOR SPECIAL PROJECTS									
Subtotal of Surfacing & Spec. Proj. \$10,162									
Subtotal of Cleaning, Exc. Culv. \$112,923									
GRAND TOTAL \$186,797									

Compiled By: Justin Bush

Date: 12/07/2018

Projects Road Maintenance Cost Summary

Sale: Quartz Run
Date: 30-Oct-18
By: J. Bush

Type	Equipment/Rationale			Hours	Rate	Cost
Project Work	Grader 14G			26	\$113	\$2,938
Final Haul	Dump Truck 12CY			8	\$89	\$712
Road	FE Loader C966			3	\$94	\$282
Maintenance	Vibratory Roller			26	\$87	\$2,262
	Water Truck 2,500 gallon			13	\$101	\$1,313
Total						\$7,507

Production Rates

Grader

Vibratory Roller

Miles/day	Distance(miles)	Days
1.5	4.82	3.2
1.5	4.82	3.2

NOTE:

Quartz Creek Road	1.71	Miles
Sterling Ranch Road and Flat Iron Stockpile Spur	1.08	Miles
Sterling Ridge Tie-Through and Quarry Spur	0.87	Miles
Sterling Ridge Road	1.16	Miles
TOTAL=	4.82	Miles

Fill Reconstruction Cost Estimate

Segment: 11 to 12
 Fill: 1

Station: 11+00
 Height: 11

Materials	Quantity		\$	Total
24"x60", 14ga, CMP	60		\$29.42	\$1,765.20
24"-6" Riprap Dissipator	22	cy	\$9.03	\$198.66
24"-6" Riprap Fill Armor	140	cy	\$9.03	\$1,264.20
3/4"-0" Crushed Rock for Bedding/Backfill	66	cy	\$4.54	\$299.64
4"-0" Crushed Rock for Road	50	cy	\$3.00	\$150.00
Erosion Control Seed	0.1	ac	\$706.00	\$70.60
Erosion Control Straw Mulch (\$/bale)	10		\$12.06	\$120.60

\$3,868.90

Excavation	Rate	CY/amount	Total
End-Haul excavation \$/cy			
Excavate Fill	\$4.50	450	\$2,025.00
Backfill from barrow site	\$4.50	450	\$2,025.00
Compaction			
Backfill (barrow & crushed rock)	\$0.79	450	\$355.50
Waste material compaction	\$0.45	450	\$202.50
Miscellaneous			
Site prep @ fill & Barrow Site, w/330, \$/hr	\$175.00	4	\$700.00
Fill armor placement w/330, \$/hr	\$175.00	8	\$1,400.00
Dissipator placement w/330, \$/hr	\$175.00	2	\$350.00
Laborer \$/hr	\$45.00	8	\$360.00

\$7,418.00

Project Total

\$11,287

Fill Reconstruction Cost Estimate

Segment: 11 to 12 Station: 62+20
 Fill: 2 Height: 10

Materials	Quantity		\$	Total
36"x60', 14ga, CMP	60		\$47.02	\$2,821.20
24"-6" Riprap Dissipator	22	cy	\$9.03	\$198.66
24"-6" Riprap Fill Armor	140	cy	\$9.03	\$1,264.20
3/4"-0" Crushed Rock for Bedding/Backfill	66	cy	\$4.54	\$299.64
4"-0" Crushed Rock for Road	50	cy	\$3.00	\$150.00
Erosion Control Seed	0.1	ac	\$706.00	\$70.60
Erosion Control Straw Mulch (\$/bale)	10		\$12.06	\$120.60

\$4,924.90

Excavation	Rate	CY/amount	Total
End-Haul excavation \$/cy			
Excavate Fill	\$4.50	300	\$1,350.00
Backfill from barrow site	\$4.50	300	\$1,350.00
Compaction			
Backfill (barrow & crushed rock)	\$0.79	300	\$237.00
Waste material compaction	\$0.45	300	\$135.00
Miscellaneous			
Site prep @ fill & Barrow Site, w/330, \$/hr	\$175.00	4	\$700.00
Fill armor placement w/330, \$/hr	\$175.00	5	\$875.00
Dissipator placement w/330, \$/hr	\$175.00	2	\$350.00
Laborer \$/hr	\$45.00	8	\$360.00

\$5,357.00

Project Total

\$10,282

Fill Reconstruction Cost Estimate

Segment: I1 to I2 Station: 64+55
 Fill: 3 Height: 22

Materials	Quantity		\$	Total
36"x90', 14ga, CMP	90		\$41.51	\$3,735.90
24"-6" Riprap Dissipator	22	cy	\$9.03	\$198.66
24"-6" Riprap Fill Armor	520	cy	\$9.03	\$4,695.60
3/4"-0" Crushed Rock for Bedding/Backfill	99	cy	\$4.54	\$449.46
4"-0" Crushed Rock for Road	100	cy	\$3.00	\$300.00
Erosion Control Seed	0.25	ac	\$706.00	\$176.50
Erosion Control Straw Mulch (\$/bale)	10		\$12.06	\$120.60

\$9,676.72

Excavation	Rate	CY/amount	Total
End-Haul excavation \$/cy			
Excavate Fill	\$4.50	1900	\$8,550.00
Backfill from barrow site	\$4.50	1900	\$8,550.00
Compaction			
Backfill (barrow & crushed rock)	\$0.79	1900	\$1,501.00
Waste material compaction	\$0.45	1900	\$855.00
Miscellaneous			
Site prep @ fill & Barrow Site, w/330, \$/hr	\$175.00	4	\$700.00
Fill armor placement w/330, \$/hr	\$175.00	16	\$2,800.00
Dissipator placement w/330, \$/hr	\$175.00	2	\$350.00
Laborer \$/hr	\$45.00	16	\$720.00

\$24,026.00

Project Total

\$33,703

Fill Reconstruction Cost Estimate

Segment: I1 to I2 Station: 75+70
 Fill: 4 Height: 13

Materials	Quantity		\$	Total
30"x65", 14ga, CMP	65		\$38.71	\$2,516.15
24"-6" Riprap Dissipator	22	cy	\$9.03	\$198.66
24"-6" Riprap Fill Armor	210	cy	\$9.03	\$1,896.30
3/4"-0" Crushed Rock for Bedding/Backfill	66	cy	\$4.54	\$299.64
4"-0" Crushed Rock for Road	50	cy	\$3.00	\$150.00
Erosion Control Seed	0.1	ac	\$706.00	\$70.60
Erosion Control Straw Mulch (\$/bale)	10		\$12.06	\$120.60

\$5,251.95

Excavation	Rate	CY/amount	Total
End-Haul excavation \$/cy			
Excavate Fill	\$4.50	600	\$2,700.00
Backfill from barrow site	\$4.50	600	\$2,700.00
Compaction			
Backfill (barrow & crushed rock)	\$0.79	600	\$474.00
Waste material compaction	\$0.45	600	\$270.00
Miscellaneous			
Site prep @ fill & Barrow Site, w/330, \$/hr	\$175.00	4	\$700.00
Fill armor placement w/330, \$/hr	\$175.00	8	\$1,400.00
Dissipator placement w/330, \$/hr	\$175.00	2	\$350.00
Laborer \$/hr	\$45.00	8	\$360.00

\$8,954.00

Project Total

\$14,206

Fill Reconstruction Cost Estimate

Segment: I1 to I2
 Fill: 5

Station: 88+95
 Height: 12

Materials	Quantity		\$	Total
36"x70', 14ga, CMP	70		\$43.98	\$3,078.60
24"-6" Riprap Dissipator	22	cy	\$9.03	\$198.66
24"-6" Riprap Fill Armor	130	cy	\$9.03	\$1,173.90
3/4"-0" Crushed Rock for Bedding/Backfill	77	cy	\$4.54	\$349.58
4"-0" Crushed Rock for Road	100	cy	\$3.00	\$300.00
Erosion Control Seed	0.1	ac	\$706.00	\$70.60
Erosion Control Straw Mulch (\$/bale)	10		\$12.06	\$120.60

\$5,291.94

Excavation	Rate	CY/amount	Total
End-Haul excavation \$/cy			
Excavate Fill	\$4.50	700	\$3,150.00
Backfill from barrow site	\$4.50	700	\$3,150.00
Compaction			
Backfill (barrow & crushed rock)	\$0.79	700	\$553.00
Waste material compaction	\$0.45	700	\$315.00
Miscellaneous			
Site prep @ fill & Barrow Site, w/330, \$/hr	\$175.00	4	\$700.00
Fill armor placement w/330, \$/hr	\$175.00	8	\$1,400.00
Dissipator placement w/330, \$/hr	\$175.00	2	\$350.00
Laborer \$/hr	\$45.00	8	\$360.00

\$9,978.00

Project Total

\$15,270

Fill Reconstruction Cost Estimate

Segment: I1 to I2
 Fill: 6

Station: 99+80
 Height: 18

Materials	Quantity		\$	Total
36"x80', 14ga, CMP	80		\$42.59	\$3,407.20
24"-6" Riprap Dissipator	22	cy	\$9.03	\$198.66
24"-6" Riprap Fill Armor	340	cy	\$9.03	\$3,070.20
3/4"-0" Crushed Rock for Bedding/Backfill	88	cy	\$4.54	\$399.52
4"-0" Crushed Rock for Road	100	cy	\$3.00	\$300.00
Erosion Control Seed	0.25	ac	\$706.00	\$176.50
Erosion Control Straw Mulch (\$/bale)	10		\$12.06	\$120.60

\$7,672.68

Excavation	Rate	CY/amount	Total
End-Haul excavation \$/cy			
Excavate Fill	\$4.50	1200	\$5,400.00
Backfill from barrow site	\$4.50	1200	\$5,400.00
Compaction			
Backfill (barrow & crushed rock)	\$0.79	1200	\$948.00
Waste material compaction	\$0.45	1200	\$540.00
Miscellaneous			
Site prep @ fill & Barrow Site, w/330, \$/hr	\$175.00	4	\$700.00
Fill armor placement w/330, \$/hr	\$175.00	16	\$2,800.00
Dissipator placement w/330, \$/hr	\$175.00	2	\$350.00
Laborer \$/hr	\$45.00	16	\$720.00

\$16,858.00

Project Total

\$24,531

Fill Reconstruction Cost Estimate

Segment: 11 to 12
 Fill: 7

Station: 130+15
 Height: 9

Materials	Quantity		\$	Total
24"x60', 14ga, CMP	60		\$29.42	\$1,765.20
24"-6" Riprap Dissipator	11	cy	\$9.03	\$99.33
24"-6" Riprap Fill Armor	100	cy	\$9.03	\$903.00
3/4"-0" Crushed Rock for Bedding/Backfill	66	cy	\$4.54	\$299.64
4"-0" Crushed Rock for Road	50	cy	\$3.00	\$150.00
Erosion Control Seed	0.1	ac	\$706.00	\$70.60
Erosion Control Straw Mulch (\$/bale)	10		\$12.06	\$120.60

\$3,408.37

Excavation	Rate	CY/amount	Total
End-Haul excavation \$/cy			
Excavate Fill	\$4.50	200	\$900.00
Backfill from barrow site	\$4.50	200	\$900.00
Compaction			
Backfill (barrow & crushed rock)	\$0.79	200	\$158.00
Waste material compaction	\$0.45	200	\$90.00
Miscellaneous			
Site prep @ fill & Barrow Site, w/330, \$/hr	\$175.00	4	\$700.00
Fill armor placement w/330, \$/hr	\$175.00	5	\$875.00
Dissipator placement w/330, \$/hr	\$175.00	1	\$175.00
Laborer \$/hr	\$45.00	8	\$360.00

\$4,158.00

Project Total

\$7,566

Site Prep Appraisal

Sale Number: W00589-01
 Sale Name: Quartz Run
 Date: 10/30/2018

Vegetation Type/Zone	Vegetation Type/Zone Code	Production Rate (hr/ac)	Estimated Piles/Acre
Doug-fir	A	1.0	0.5
Hemlock/Fir	B	1.5	0.8
Hemlock/Spruce	C	2.0	1.0
Hemlock	D	2.0	1.0
Conifer/Hardwood	E	1.0	0.5

Sale Area	Harvest Type	Veg Type/Zone	Ground Based Yarding Acres	Estimated Piling Hours/Area	Cost/Hour	Total Cost/Area
1	MC	B	24.7	37.05	\$145.00	\$5,372.25
2	MC	B	58.2	87.3	\$145.00	\$12,658.50
3	MC	B	69.8	104.7	\$145.00	\$15,181.50
Sub Total =						\$33,212.25

Sale Area	Number of cable Landings	Number of acres to landing	\$ per 20 acres yarded	Cost/Area	Number of Unit Piles	Material Cost/Pile	Material Cost/Area	Total Cost/Area
1	3	16	\$1,160.00	\$928.00	19	\$20.00	\$430.50	\$1,358.50
2	3	28.3	\$1,160.00	\$1,641.40	44	\$20.00	\$933.00	\$2,574.40
3	0	0	\$1,160.00	\$0.00	52	\$20.00	\$1,047.00	\$1,047.00

*Cost includes separating firewood

Sub Total = \$4,979.90

Grand Total = \$38,192.15

Road Maintenance Cost Summary

Sale: Quartz Run
 Date: 31-Oct-18
 By: J. Bush

MBF: 9,389
 \$\$/MBF: \$3.10

Type	Equipment/Rationale	Move In	Times	Hours	Rate	Cost
Progressive Operations 1st Entry	Grader 14G	\$875	1	8	\$113	\$1,779
	Dump Truck 12CY	\$184	1	8	\$89	\$896
	FE Loader C966	\$875	1	8	\$94	\$1,627
	Vibratory Roller	\$875	1	4	\$87	\$1,223
Progressive Operations 2nd Entry	Grader 14G	\$875	1	8	\$113	\$1,779
	Dump Truck 12CY	\$184	1	8	\$89	\$896
	FE Loader C966	\$875	1	8	\$94	\$1,627
Final Haul Maintenance Haul Route	Grader 14G	\$875	1	44	\$113	\$5,847
	Dump Truck 12CY	\$184	2	16	\$89	\$3,216
	Vibratory Roller	\$875	1	44	\$87	\$4,703
	FE Loader C966	\$875	1	8	\$94	\$1,627
	Rubber Tire Backhoe	\$361	1	8	\$87	\$1,057
	Laborer	\$0	1	8	\$45	\$360
Total	Water Truck 2,500 gallon	\$214	1	22	\$101	\$2,436
						\$29,073

Production Rates	Miles/day	Distance(miles)	Days
Grader	1.5	1.5	1.0
Vibratory Roller	0.8	1.5	2.0

Production Rates	Miles/day	Distance(miles)	Days
Grader	1.5	1.5	1.0

Production Rates	Miles/day	Distance(miles)	Days
Grader	1.5	8.2	5.5
Vibratory Roller	1.5	8.2	5.5

**Quartz Run
TIMBER CRUISE REPORT
FY 2019**

1. Sale Area Location: Areas 1,2, and 3 are located in portions of sections 14, 21, 22, and 23 of T4N, R7W, W.M., Clatsop County, OR.

2. Fund Distribution: BOF 100%
Tax Code 8-01 (100%)

3. Sale Acreage by Area:

Area	Treatment	Gross Acres	Stream Buffer	Existing Surface Roads	Net Acres	Survey Method
1	Modified Clearcut	49	3	5	41	GIS
2	Modified Clearcut	106	12	8	86	GIS
3	Modified Clearcut	86	13	3	70	GIS
4	R/W	<1	0	0	<1	GIS
TOTALS		241	28	16	197	

*Area 4 R/W consists of less than one acre right of way.

4. Cruisers and Cruise Dates:

Areas were cruised by Avery Petersen, Kevin Berry, Matt Dimick, and Justin Bush during September of 2018.

5. Cruise Method and Computation:

Area 1: This was a variable plot cruise using a 40 BAF on a Spiegel Relaskop. A total of 23 plots were sampled on a 3 by 6 chain spacing. The count to grade ratio was 2:1, with 15 count plots and eight grade plots.

Areas 2 and 3: This was a variable plot cruise using a 40 BAF on a Spiegel Relaskop. There were 50 plots sampled on a 3 by 10 chain spacing. The count to grade ratio was 2:1, with 32 count plots and 17 grade plots.

Area 4: (R/W) consists of roadside landings and one short spur and equals less than one acre of total clearing. Due to the small area being affected this area was not pulled out of the cruise and is accounted for in the volumes associated with Area 1.

Data was collected on Allegro 2 data collectors and downloaded to the Atterbury SuperACE 2008 program for computing. See the attached Cruise Design for more details on the cruise method. The cruise calculations were processed in the Astoria district office.

AREA	CRUISE	TRACT	TYPE	ACRES
1	QRUN	A1	00MC	41
2, 3	QRUN	A23	00MC	156

6. Timber Description:

Area 1 is a modified clearcut in a 67 year-old non-thinned stand. The structure consists of Douglas-fir, western hemlock, and true fir. Average Douglas-fir is 24 inches DBH and 89 feet to a merchantable top. Average western hemlock is 17 inches DBH and 55 feet to a merchantable top. Average true fir is 28 inches DBH and 104 feet to a merchantable top. Average net volume to be harvested per acre is 49 MBF. All trees were cruised to a merchantable top of 6 inches DIB or 40% of form point.

Areas 2 and 3 are modified clearcuts in approximately 70 year-old timber. Most of the acreage was previously thinned. The structure consists of western hemlock, Douglas-fir, true fir, and a minor component of red alder. Average western hemlock is 18 inches DBH and 66 feet to a merchantable top. Average Douglas-fir is 22

inches DBH and 87 feet to a merchantable top. Average true fir is 34 inches DBH and 115 feet to a merchantable top. Average red alder is 11 inches DBH and 33 feet to a merchantable top. Average net volume to be harvested per acre is 47 MBF. All trees were cruised to a merchantable top of 6 inches DIB or 40% of form point.

Area 4 R/W in sale R/W is similar to the timber description above in Area 1.

7. Statistical Analysis and Stand Summary

Statistics for Stand B.F. volumes

Area	Estimated CV	Target SE%	Actual CV	Actual SE%
1	30.0%	8.0%	21.7%	4.6%
2 and 3	45.0%	8.0%	40.3%	5.7%

8. Volumes by Species and Log Grade:

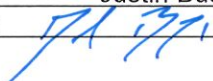
Volumes by Species and Grade for All Sale Areas: (MBF) Volumes do not include "in-growth."

Species	DBH	Net Vol.	2 Saw	3 Saw	4 Saw	8"-9"	6"-7"	% D & B	% Sale
Douglas-fir	23"	5,051	4,031	833	187	0	0	4.8%	54%
western hemlock	18"	3,622	2,471	978	173	0	0	4.7%	39%
true fir	31"	671	612	57	2	0	0	10.8%	7%
red alder	11"	45	0	0	0	0	45	20.1%	<1%
TOTALS		9,389	7,114	1,868	362	0	45		

9. Approvals:

Prepared by: Justin Bush

Date: 10-31-2018

Unit Forester Approval: 

Date: 10-31-18

10. Attachments:

Cruise Designs and Maps – 7 pages
Volume Reports - 3 pages
Statistics Reports - 3 pages
Stand Table Summary – 2 pages
Log Stock Table – 2 pages

X:\STATE_FORESTS\Timber Sales\2019FY\Quartz Run\Sale Prep\Cruise\Quartz Run_cruise report.docx

**CRUISE DESIGN
ASTORIA DISTRICT**

Sale Name: Quartz Run **Area(s)** 1

Harvest Type: Modified Clearcut

Approx. Cruise Acres: 41 **Estimated CV%** 30 **SE% Objective** 8

Planned Sale Volume: 1.52 MMBF **Estimated Sale Area Value/Acre:** \$14,060

A. Cruise Goals: (a) Grade minimum 42 trees:

Determine log grades for sale value; Determine snag and leave tree species and sizes;
Determine "diameter limit" harvest parameters;

B. Cruise Design:

1. Plot Cruises: BAF 40 Full point
Cruise Line Direction(s) N-S
Cruise Line Spacing 6 chains
Cruise Plot Spacing 3 chains
Grade/Count Ratio 1:2

Grade all hardwood in 8' and 10' multiples. Record all cedar as leave. Record all snags as SN and record diameter & total height. If plot lands in buffer then offset at least 1/2 chain outside the buffer.

C. Tree Measurements:

1. Diameter: Minimum DBH to cruise is 8 " for conifers and 10" for hardwoods.
Record dbh to nearest 1" for trees 8"-24", and to nearest 2" for trees > 24".

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'. Use 7" (G) TDF for trees less than 18" DBH. Use 40% of DOB @ 16' FP for trees 18" DBH or greater.

4. Form Factors: (1) Measure or estimate a 16' form factor for every conifer tree measured/graded; Hardwood form factors are a Standard 87.

5. Tree Segments: Record conifer log segments in "standard" 32" and 40' log lengths whenever possible. Record hardwoods in 8' and 10' multiples. Do not record odd segments to maximize grade. The maximum segment length is 40'. The minimum log segment length for conifer is 12' and 8' for hardwoods. The minimum diameter for conifer is 8" DBH and 10" DBH for hardwood. One foot of trim is assumed for each merchantable segment.

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);
- 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; 0 = Cull
- D. Hardwoods: 12" + = 1 Sawmill; 10"-12" = 2 Sawmill; 10"-8" = 3 Sawmill; and 8"-6" = 4 Sawmill; 0 = Cull.

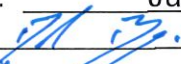
- 7. Deductions:** Estimate visible defect or damage as a "length deduction" (most often), or as a "diameter deduction," as applicable. Estimate hidden defect and breakage (usually some breakage is encountered in trees > 100 feet in height) on a "per tree" basis. Steep and broken topography generally 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. On "measure/grade" plots paint the tree diameter on each tree starting with the first tree right of the cruise line direction and continuing clockwise.

- 9. Cruising Equipment:** Relaskop, Rangefinder, Biltmore Stick, Compass, Data Recorder, Cruise Design, Cruise Map, Yellow Flagging, Blue Flagging.

- 10. Attachments:** Cruise map for Area 1 (showing cruise unit boundaries, cruise lines and plot locations, BAF or plot size, measure/count plot ratio, north arrow, and scale bar).

Cruise Design by: Justin Bush

Approved by: 

Date: 9-13-18

**CRUISE DESIGN
ASTORIA DISTRICT**

Sale Name: Quartz Run **Area(s)** 2 - 3

Harvest Type: Modified Clearcut

Approx. Cruise Acres: 157 **Estimated CV%** 45 **SE% Objective** 8

Planned Sale Volume: 4.48 MMBF **Estimated Sale Area Value/Acre:** \$12,370

A. Cruise Goals: (a) Grade minimum 80 trees:

Determine log grades for sale value; Determine snag and leave tree species and sizes;
Determine "diameter limit" harvest parameters;

B. Cruise Design:

1. Plot Cruises: BAF 40 Full point
Cruise Line Direction(s) N-S
Cruise Line Spacing 10 chains
Cruise Plot Spacing 3 chains
Grade/Count Ratio 1:2

Grade all hardwood in 8' and 10' multiples. Record all cedar as leave. Record all snags as SN and record diameter & total height. If plot lands in buffer then offset at least 1/2 chain outside the buffer.

C. Tree Measurements:

- 1. Diameter:** Minimum DBH to cruise is 8" for conifers and 10" for hardwoods. Record dbh to nearest 1" for trees 8"-24", and to nearest 2" for trees > 24".
- 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'. Use 7" (G) TDF for trees less than 18" DBH. Use 40% of DOB @ 16' FP for trees 18" or greater DBH.
- 4. Form Factors:** (1) Measure or estimate a 16' form factor for every conifer tree measured/graded; Hardwood form factors are a Standard 87.
- 5. Tree Segments:** Record conifer log segments in "standard" 32" and 40' log lengths whenever possible. Record hardwoods in 8' and 10' multiples. Do not record odd segments to maximize grade. The maximum segment length is 40'. The minimum log segment length for conifer is 12' and 8' for hardwoods. The minimum diameter for conifer is 8" DBH and 10" DBH for hardwood. One foot of trim is assumed for each merchantable segment.

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);
- 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; 0 = Cull
- D. Hardwoods: 12" + = 1 Sawmill; 10"-12" = 2 Sawmill; 10"-8" = 3 Sawmill; and 8"-6" = 4 Sawmill; 0 = Cull.

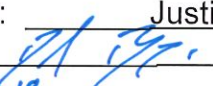
7. Deductions: Estimate visible defect or damage as a "length deduction" (most often), or as a "diameter deduction," as applicable. Estimate hidden defect and breakage (usually some breakage is encountered in trees > 100 feet in height) on a "per tree" basis. Steep and broken topography generally results 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. On "measure/grade" plots paint the tree diameter on each tree starting with the first tree right of the cruise line direction and continuing clockwise.

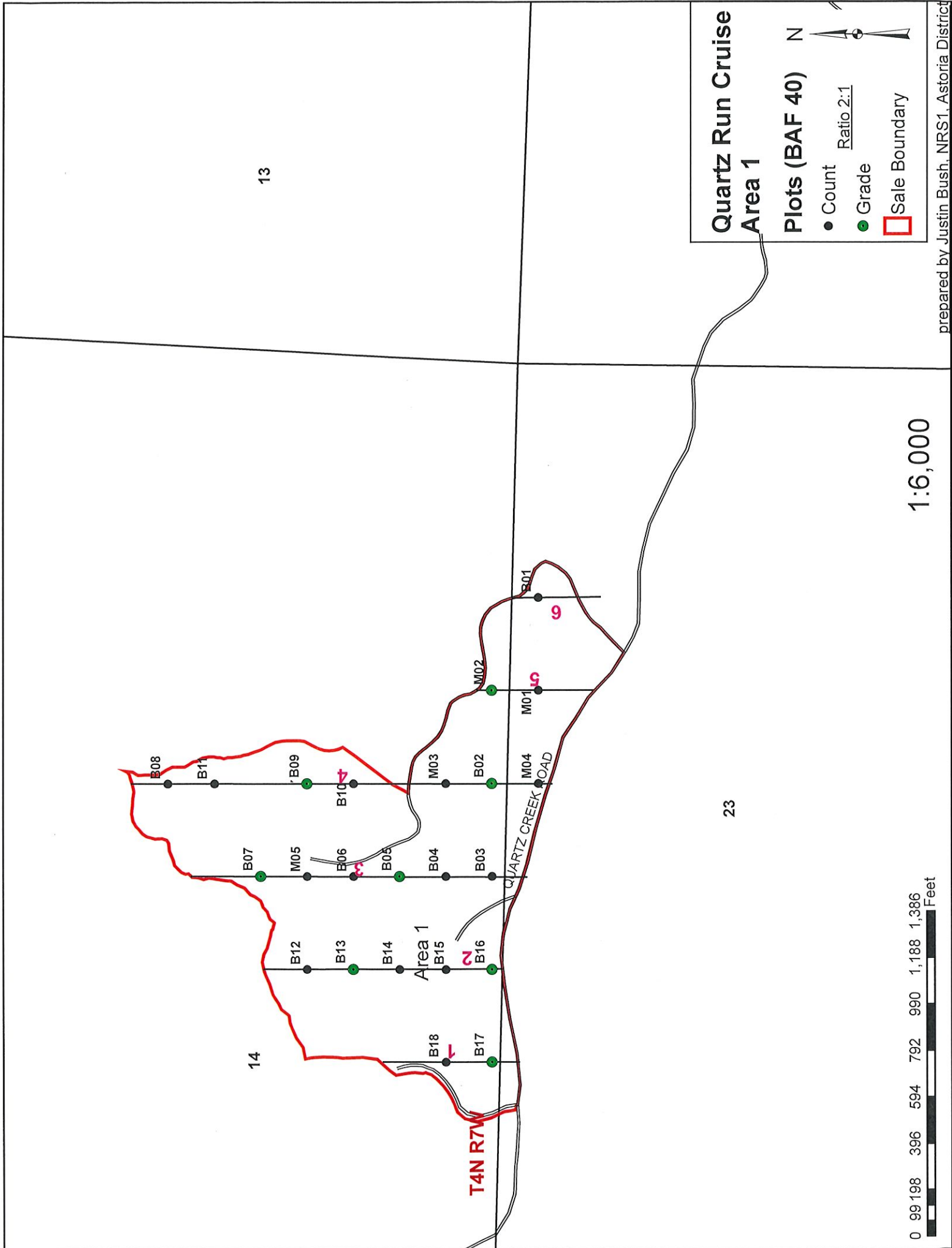
9. Cruising Equipment: Relaskop, Rangefinder, Biltmore Stick, Compass, Data Recorder, Cruise Design, Cruise Map, Yellow Flagging, Blue Flagging.

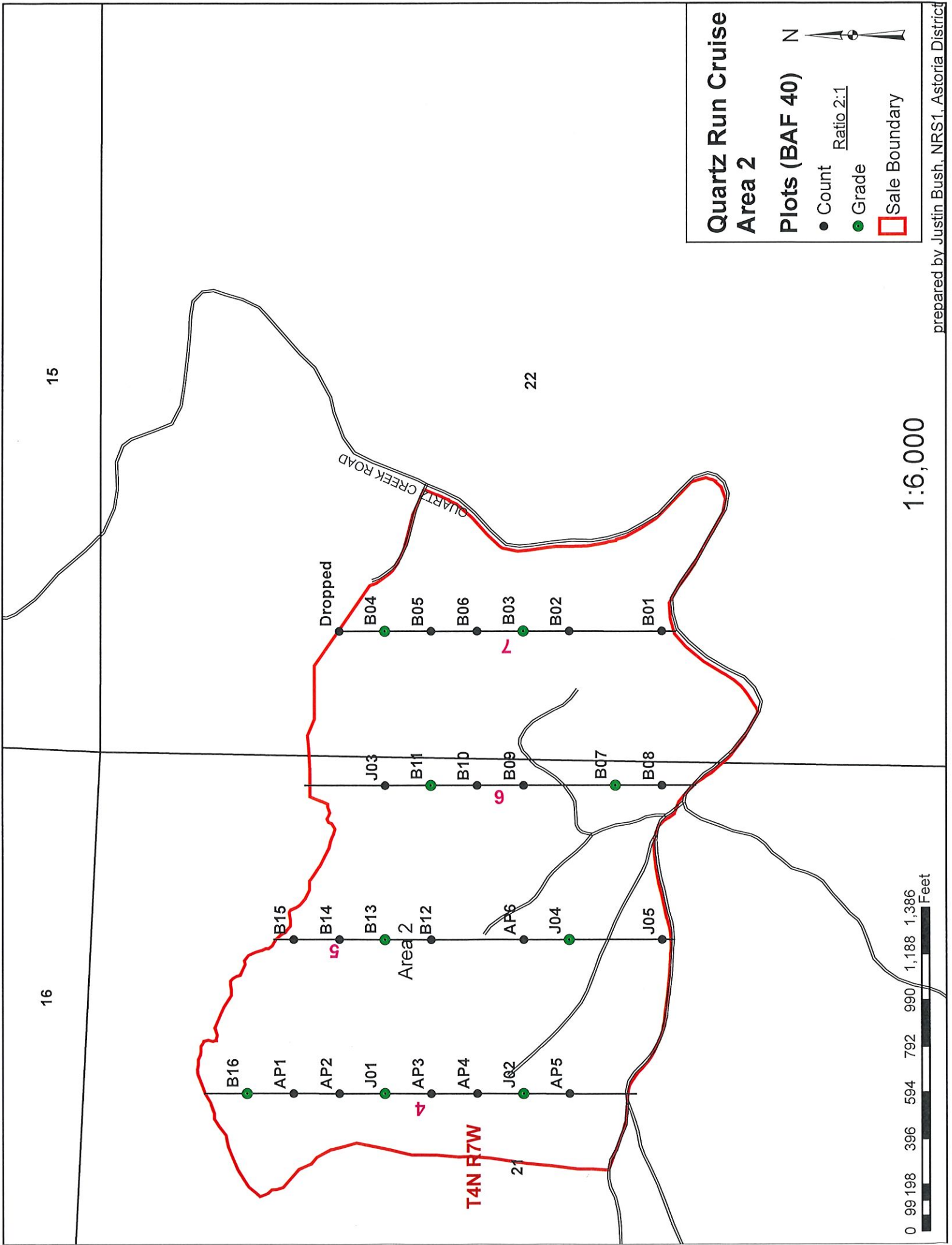
10. Attachments: Cruise maps for Areas 2 & 3 (showing cruise unit boundaries, cruise lines and plot locations, BAF or plot size, measure/count plot ratio, north arrow, and scale bar).

Cruise Design by: Justin Bush

Approved by: 

Date: 9-13-18





**Quartz Run Cruise
Area 2**

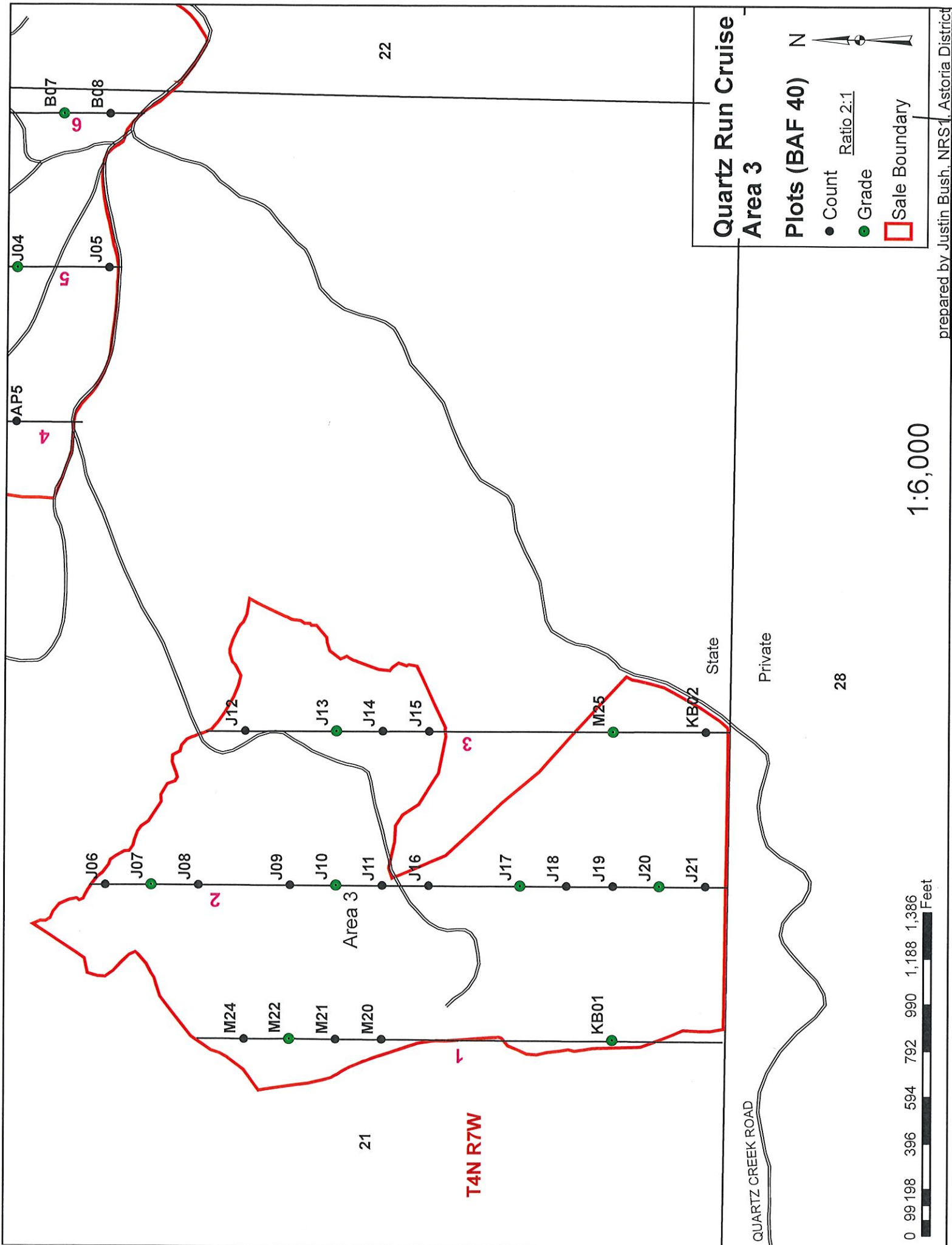
Plots (BAF 40)

- Count
- Grade
- Ratio 2:1
- Sale Boundary

N

1:6,000





TC PSCSTGR		Species, Sort Grade - Board Foot Volumes (Project)																	
T04N R07W S14 Ty00MC 41.00 T04N R07W S21 Ty00MC 156.00					Project: QRUN										Page 1				
					Acres 197.00										Date 10/31/2018				
															Time 10:07:12AM				
Spp	So Gr T rt ad	%	Bd. Ft. per Acre			Total Net MBF	Percent of Net Board Foot Volume								Average Log				Logs Per /Acre
		Net BdFt	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						
NF	DOCU		100.0	354											21	25		0.00	.7
NF	DO2S	91	1.8	3,166	3,108	612			8	92	0		24	75	37	20	653	3.29	4.8
NF	DO3S	8		288	288	57		50	50		4	5	73	18	31	11	139	1.34	2.1
NF	DO4S	1		12	12	2		100			100				16	7	30	0.50	.4
NF	Totals	7	10.8	3,819	3,407	671		5	11	84	1	0	28	70	33	17	431	2.56	7.9
D	DOCU		100.0	466											7	19		0.00	4.0
D	DO2S	79	3.2	21,135	20,460	4,031		2	44	54			9	91	39	16	377	2.32	54.2
D	DO3S	17	1.8	4,305	4,226	833		100			2	2	51	46	34	9	100	0.86	42.3
D	DO4S	4	5.8	1,011	952	187		100			55	9	36		21	7	34	0.52	28.4
D	Totals	54	4.7	26,917	25,638	5,051		21	35	43	2	1	17	80	32	12	199	1.54	129.0
H	DOCU		100.0	466											6	18		0.00	4.0
H	DO2S	68	2.0	12,797	12,546	2,471		2	60	38		0	13	87	38	15	333	1.95	37.6
H	DO3S	27	1.8	5,059	4,965	978		98	2		1	3	45	50	35	8	94	0.74	53.0
H	DO4S	5	9.1	962	874	173		100			54	30	9	7	20	7	30	0.53	29.5
H	Totals	39	4.7	19,284	18,385	3,622		33	41	26	3	2	22	73	31	10	148	1.16	124.1
A	DO4S	100	20.0	288	230	45		100					100		32	6	40	0.44	5.8
A	Totals	0	20.0	288	230	45		100					100		32	6	40	0.44	5.8
Totals			5.3	50,308	47,661	9,389		25	36	39	2	1	20	76	32	11	179	1.37	266.8

T		TSPCSTGR		Species, Sort Grade - Board Foot Volumes (Type)										Page		1					
				Project: QRUN										Date		10/31/2018					
														Time		10:07:12AM					
T04N R07W S14 T00MC										T04N R07W S14 T00MC											
Twp		Rge		Sec		Tract		Type		Acres		Plots		Sample Trees		CuFt		BdFt			
04N		07W		14		A1		00MC		41.00		23		64		1		W			
S So Gr Spp T rt ad				% 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				
D DO CU					00.0 803												9 21 0.00				5.1
D DO 2S				81	4.0 31,923 30,636			1,256	2 46 52				5 95				39 15 361 2.25				85.0
D DO 3S				16	2.7 5,865 5,705			234	100				5 4 53 38				33 9 93 0.88				61.6
D DO 4S				3	4.2 1,106 1,059			43	100				74 8 18				18 8 30 0.55				35.8
D Totals				76	5.8 39,697 37,400			1,533	20 37 42				3 1 13 83				32 12 200 1.59				187.3
H DO 2S				65	5.8 3,693 3,478			143	65 35				6 94				39 15 327 2.10				10.6
H DO 3S				22	3.2 1,226 1,186			49	100				29 71				38 8 100 0.88				11.9
H DO 4S				13	15.1 781 663			27	100				29 47 24				24 7 35 0.50				18.7
H Totals				11	6.5 5,700 5,327			218	35 43 23				4 6 14 77				32 9 129 1.13				41.3
NF DO 2S				90	1.4 5,792 5,709			234	16 84				1 99				39 18 574 2.93				9.9
NF DO 3S				9	547 547			22	81 19				9 12 78				28 10 111 1.09				4.9
NF DO 4S				1	56 56			2	100				100				16 7 30 0.50				1.9
NF Totals				13	1.3 6,395 6,312			259	8 16 76				3 1 7 89				33 15 377 2.33				16.7
Type Totals					5.3 51,792 49,040			2,011	20 35 45				3 1 12 83				32 12 200 1.57				245.4

T TSPCSTGR			Species, Sort Grade - Board Foot Volumes (Type)											Page 1						
Project: QRUN											Date	10/31/2018								
											Time	10:07:12AM								
T04N R07W S21 T00MC											T04N R07W S21 T00MC									
Twp	Rge	Sec	Tract	Type	Acres	Plots	Sample Trees	CuFt	BdFt											
04N	07W	21	A23	00MC	156.00	50	117	1	W											
S So Gr T rt ad Spp			%	Bd. Ft. per Acre			Total Net MBF	Percent Net Board Foot Volume								Average Log			Logs Per /Acre	
			Net BdFt					Def%	Gross	Net	Log Scale Dia.				Log Length					Ln
			4-5	6-11	12-16	17+		12-20	21-30	31-35	36-99	Ft	In	Ft	Lf					
H	DO	CU		00.0	589					6	18		0.00	5.0						
H	DO	2S	68	1.7	15,190	14,929	2,329		2	59	39		0	13	86	38	15	334	1.94	44.7
H	DO	3S	27	1.8	6,066	5,959	930		98	2		1	3	46	49	35	8	93	0.74	63.8
H	DO	4S	5	7.9	1,010	930	145		100			58	26	7	9	19	7	29	0.54	32.4
H	Totals		46	4.5	22,855	21,817	3,403		32	41	26	3	2	22	73	31	10	150	1.16	145.9
D	DO	CU		00.0	378											6	19		0.00	3.8
D	DO	2S	78	2.8	18,299	17,786	2,775		1	43	56			11	89	39	16	385	2.35	46.2
D	DO	3S	17	1.5	3,895	3,838	599		100			1	1	50	48	35	9	103	0.85	37.3
D	DO	4S	5	6.3	986	924	144		100			49	9	41		22	7	35	0.51	26.4
D	Totals		48	4.3	23,558	22,547	3,517		22	34	44	2	1	19	79	32	12	198	1.52	113.6
NF	DO	CU		00.0	447											21	25		0.00	.9
NF	DO	2S	91	2.1	2,475	2,424	378			2	98			39	61	36	21	714	3.59	3.4
NF	DO	3S	9		220	220	34		30	70				70	30	34	12	166	1.54	1.3
NF	Totals		6	15.9	3,142	2,644	412		3	8	89			42	58	33	19	473	2.74	5.6
A	DO	4S	100	20.0	364	291	45		100					100		32	6	40	0.44	7.3
A	Totals		1	20.0	364	291	45		100					100		32	6	40	0.44	7.3
Type Totals				5.2	49,919	47,299	7,379		26	36	38	2	1	22	74	32	11	174	1.32	272.4

TC PSTATS			PROJECT STATISTICS						PAGE	1		
			PROJECT			ORUN			DATE	10/31/2018		
TWP	RGE	SC	TRACT	TYPE		ACRES	PLOTS	TREES	CuFt	BdFt		
04N	07	14	A1	00MC		197.00	73	504	1	W		
04N	07W	21	A23	00MC								
			PLOTS	TREES	TREES PER PLOT	ESTIMATED TOTAL TREES	PERCENT SAMPLE TREES					
TOTAL			73	504	6.9							
CRUISE			25	181	7.2	24,444	.7					
DBH COUNT												
REFOREST												
COUNT			47	323	6.9							
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
DOUG FIR			96	49.9	22.9	88	29.8	142.3	26,917	25,638	6,518	6,427
WHEMLOCK			66	63.2	17.5	65	25.2	105.5	19,284	18,385	4,587	4,508
NOB FIR			10	2.5	31.2	110	2.4	13.3	3,819	3,407	729	672
SNAG			8	2.6	22.8	74	1.6	7.5				
R ALDER			1	5.8	11.0	33	1.1	3.8	288	230	81	81
TOTAL			181	124.1	20.1	74	60.8	272.4	50,308	47,661	11,914	11,688
CONFIDENCE LIMITS OF THE SAMPLE												
68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR												
CL	68.1	COEFF	SAMPLE TREES - BF					# OF TREES REQ.		INF. POP.		
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH		5	10	15		
DOUG FIR			50.4	5.1	632	666	701					
WHEMLOCK			74.5	9.2	423	466	509					
NOB FIR			34.7	11.6	1,268	1,434	1,600					
SNAG												
R ALDER												
TOTAL			70.5	5.2	571	603	634		199	50	22	
CL	68.1	COEFF	TREES/ACRE					# OF PLOTS REQ.		INF. POP.		
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH		5	10	15		
DOUG FIR			70.4	8.2	46	50	54					
WHEMLOCK			102.2	11.9	56	63	71					
NOB FIR			254.1	29.7	2	3	3					
SNAG			268.7	31.4	2	3	3					
R ALDER			442.1	51.7	3	6	9					
TOTAL			59.1	6.9	116	124	133		139	35	15	
CL	68.1	COEFF	BASAL AREA/ACRE					# OF PLOTS REQ.		INF. POP.		
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH		5	10	15		
DOUG FIR			59.8	7.0	132	142	152					
WHEMLOCK			93.4	10.9	94	106	117					
NOB FIR			276.3	32.3	9	13	18					
SNAG			278.3	32.5	5	8	10					
R ALDER			442.1	51.7	2	4	6					
TOTAL			41.2	4.8	259	272	286		68	17	8	
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			62.6	7.3	23,762	25,638	27,515					
WHEMLOCK			97.5	11.4	16,290	18,385	20,481					
NOB FIR			273.4	32.0	2,318	3,407	4,497					
SNAG												
R ALDER			442.1	51.7	111	230	349					
TOTAL			44.7	5.2	45,169	47,661	50,154		80	20	9	

TC TSTATS				STATISTICS				PAGE	1		
				PROJECT ORUN				DATE	10/31/2018		
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt		
04N	07W	14	A1	00MC	41.00	23	168	1	W		
				TREES	ESTIMATED	PERCENT					
				PER PLOT	TOTAL	SAMPLE					
					TREES	TREES					
TOTAL		23	168	7.3							
CRUISE		8	64	8.0	4,445	1.4					
DBH COUNT											
REFOREST											
COUNT		15	104	6.9							
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	
DOUG FIR		44	71.4	23.8	89	45.3	220.9	39,697	37,400	9,757	9,600
WHEMLOCK		9	25.0	16.7	55	9.4	38.3	5,700	5,327	1,489	1,489
NOB FIR		6	5.6	28.3	104	4.6	24.3	6,395	6,312	1,295	1,295
SNAG		5	6.4	15.7	70	2.2	8.7				
TOTAL		64	108.4	22.2	81	62.0	292.2	51,792	49,040	12,541	12,384
CONFIDENCE LIMITS OF THE SAMPLE											
68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR											
CL:	68.1 %	COEFF		SAMPLE TREES - BF				# OF TREES REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5 10		15		
DOUG FIR		44.9	6.8	571	612	653					
WHEMLOCK		75.6	26.7	265	361	457					
NOB FIR		41.3	18.4	1,106	1,355	1,604					
SNAG											
TOTAL		70.3	8.8	546	599	651	197	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		
DOUG FIR		33.8	7.2	66	71	77					
WHEMLOCK		114.0	24.3	19	25	31					
NOB FIR		132.3	28.2	4	6	7					
SNAG		218.7	46.6	3	6	9					
TOTAL		30.1	6.4	101	108	115	38	9	4		
CL:	68.1 %	COEFF		BASAL AREA/ACRE				# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5 10		15		
DOUG FIR		31.3	6.7	206	221	236					
WHEMLOCK		111.3	23.7	29	38	47					
NOB FIR		118.7	25.3	18	24	31					
SNAG		194.0	41.3	5	9	12					
TOTAL		20.4	4.3	279	292	305	17	4	2		
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		35.4	7.5	34,581	37,400	40,220					
WHEMLOCK		110.8	23.6	4,070	5,327	6,584					
NOB FIR		119.1	25.4	4,710	6,312	7,914					
SNAG											
TOTAL		21.7	4.6	46,774	49,040	51,305	20	5	2		

TC TSTATS				STATISTICS				PAGE	1				
				PROJECT	ORUN	DATE				10/31/2018			
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt				
04N	07W	21	A23	00MC	156.00	50	336	1	W				
				TREES	ESTIMATED	PERCENT							
				PER PLOT	TOTAL	SAMPLE							
					TREES	TREES							
TOTAL				50	336	6.7							
CRUISE				17	117	6.9		19,999		.6			
DBH COUNT													
REFOREST													
COUNT				32	219	6.8							
BLANKS				1									
100 %													
STAND SUMMARY													
				SAMPLE	TREES	AVG	BOLE	REL	BASAL	GROSS	NET		
				TREES	/ACRE	DBH	LEN	DEN	AREA	BF/AC	BF/AC		
										GROSS	NET		
										CF/AC	CF/AC		
WHEMLOCK				57	73.3	17.6	66	29.4	123.2	22,855	21,817	5,401	5,302
DOUG FIR				52	44.3	22.4	87	25.7	121.6	23,558	22,547	5,666	5,594
NOB FIR				4	1.7	33.5	115	1.8	10.4	3,142	2,644	580	508
SNAG				3	1.6	28.4	78	1.4	7.2				
R ALDER				1	7.3	11.0	33	1.4	4.8	364	291	102	102
TOTAL				117	128.2	19.5	72	60.4	267.2	49,919	47,299	11,749	11,505
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		74.0		9.8	435		482	530					
DOUG FIR		52.9		7.3	660		713	765					
NOB FIR		28.1		16.0	1,303		1,553	1,802					
SNAG													
R ALDER													
TOTAL		71.0		6.6	565		605	645		201 50 22			
CL: 68.1 %		COEFF		TREES/ACRE					# OF PLOTS REQ.		INF. POP.		
SD: 1.0		VAR.%		S.E.%	LOW	AVG	HIGH	5 10		15			
WHEMLOCK		79.0		11.2	65		73	81					
DOUG FIR		80.5		11.4	39		44	49					
NOB FIR		352.7		49.8	1		2	3					
SNAG		304.1		43.0	1		2	2					
R ALDER		362.7		51.2	4		7	11					
TOTAL		51.4		7.3	119		128	138		105 26 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		68.4		9.7	111		123	135					
DOUG FIR		70.0		9.9	110		122	134					
NOB FIR		354.5		50.1	5		10	16					
SNAG		290.3		41.0	4		7	10					
R ALDER		362.7		51.2	2		5	7					
TOTAL		37.6		5.3	253		267	281		56 14 6			
CL: 68.1 %		COEFF		NET BF/ACRE					# OF PLOTS REQ.		INF. POP.		
SD: 1.0		VAR.%		S.E.%	LOW	AVG	HIGH	5 10		15			
WHEMLOCK		70.2		9.9	19,653		21,817	23,981					
DOUG FIR		71.1		10.0	20,282		22,547	24,812					
NOB FIR		352.4		49.8	1,328		2,644	3,960					
SNAG													
R ALDER		362.7		51.2	142		291	440					
TOTAL		40.3		5.7	44,606		47,299	49,993		65 16 7			

TC		PSTNDSUM		Stand Table Summary										Page		1	
														Date:		10/31/2018	
T04N R07W S14 Ty00MC 41.00 T04N R07W S21 Ty00MC 156.00				Project QRUN										Time:		10:13:42AM	
				Acres 197.00										Grown Year:			
S Spec	T	Sample		Tot		Trees/ Acre	BA/ Acre	Logs Acre	Average Log		Tons/ Acre	Net Cu.Ft. Acre	Net Bd.Ft. Acre	T o t a l s			
		DBH	Trees	FF 16'	Av Ht				Net Cu.Ft.	Net Bd.Ft.				Tons	Cunits	MBF	
D		10	1	82	66	3.395	1.85	3.40	14.0	40.0		48	136		94	27	
D		12	1	88	81	2.358	1.85	4.72	12.0	45.0		57	212		111	42	
D		14	1	83	104	.977	1.04	1.95	19.5	55.0		38	108		75	21	
D		15	4	85	105	6.036	7.41	12.07	23.6	83.7		285	1,011		562	199	
D		16	2	86	90	1.496	2.09	2.99	25.0	92.5		75	277		147	55	
D		17	1	86	95	1.175	1.85	2.35	27.0	100.0		63	235		125	46	
D		18	1	85	147	.591	1.04	1.77	31.3	110.0		56	195		109	38	
D		19	1	85	107	.940	1.85	1.88	39.0	125.0		73	235		145	46	
D		20	1	78	130	.849	1.85	2.55	33.0	100.0		84	255		166	50	
D		22	5	86	116	2.590	6.84	6.58	45.1	164.7		297	1,084		585	214	
D		23	5	84	113	1.810	5.22	4.35	51.7	186.7		224	811		442	160	
D		24	15	85	119	7.043	22.13	19.47	50.0	197.0		974	3,836		1,919	756	
D		25	13	84	121	5.168	17.62	14.96	53.3	204.4		798	3,057		1,572	602	
D		26	4	78	137	1.790	6.60	4.87	54.3	215.3		264	1,048		521	206	
D		27	9	83	136	3.786	15.05	11.36	64.6	262.8		734	2,984		1,445	588	
D		28	11	86	138	3.442	14.72	10.76	70.3	301.8		757	3,248		1,491	640	
D		29	6	82	142	2.070	9.50	6.21	78.2	324.4		486	2,015		957	397	
D		30	7	85	137	2.147	10.54	6.23	83.1	382.0		518	2,379		1,020	469	
D		31	3	87	139	.752	3.94	2.26	91.0	427.4		205	964		404	190	
D		32	2	72	141	.663	3.70	1.99	73.5	255.0		146	507		288	100	
D		34	2	83	106	.587	3.70	1.17	125.3	482.5		147	567		290	112	
D		36	1	82	153	.262	1.85	1.05	93.7	452.5		98	474		194	93	
D		Totals	96	84	116	49.930	142.26	124.93	51.4	205.2		6,427	25,638		12,662	5,051	
H		9	1	82	20	3.874	1.71	3.87	5.0	10.0		19	39		38	8	
H		10	4	82	49	11.037	6.02	11.04	10.9	42.8		120	473		236	93	
H		12	1	82	35	2.179	1.71	2.18	13.0	40.0		28	87		56	17	
H		13	3	92	107	5.571	5.13	11.14	21.2	86.7		236	966		465	190	
H		14	4	90	84	4.857	5.19	8.89	22.0	81.6		195	725		385	143	
H		15	2	92	102	2.789	3.42	5.58	26.5	110.0		148	614		291	121	
H		16	3	89	94	3.677	5.13	7.35	29.3	105.0		216	772		425	152	
H		17	2	89	88	2.172	3.42	4.34	32.0	117.5		139	510		274	101	
H		18	7	90	106	6.780	11.98	14.53	37.3	145.3		541	2,111		1,067	416	
H		19	3	90	114	2.188	4.31	6.11	35.1	145.0		215	887		423	175	
H		20	4	90	105	3.138	6.85	7.85	39.4	157.0		309	1,232		609	243	
H		21	4	89	104	2.503	6.02	5.72	48.9	193.0		279	1,103		550	217	
H		22	4	87	103	2.280	6.02	5.54	49.8	198.7		276	1,102		544	217	
H		23	8	88	108	4.459	12.87	11.29	54.0	222.6		610	2,513		1,202	495	
H		24	1	86	112	.282	.88	.84	51.3	210.0		43	177		85	35	
H		25	1	86	103	.502	1.71	1.00	74.5	280.0		75	281		147	55	
H		26	2	85	109	.928	3.42	2.32	66.6	276.0		155	641		305	126	
H		27	2	92	134	.861	3.42	2.58	77.3	388.3		200	1,003		393	198	
H		28	2	79	96	.801	3.42	1.60	86.0	307.5		138	492		271	97	
H		29	1	86	104	.193	.88	.39	102.0	420.0		39	162		78	32	
H		30	2	87	111	.697	3.42	2.09	79.3	376.7		166	788		327	155	
H		31	1	92	140	.327	1.71	.98	106.0	556.7		104	545		205	107	
H		32	1	86	112	.306	1.71	.92	87.3	366.7		80	337		158	66	
H		33	2	83	113	.576	3.42	1.44	83.2	378.0		120	545		236	107	
H		34	1	89	115	.271	1.71	.54	104.5	515.0		57	280		112	55	
H		Totals	66	87	86	63.249	105.52	120.15	37.5	153.0		4,508	18,385		8,882	3,622	
NF		20	1	88	113	.387	.84	1.16	34.7	146.7		40	170		79	34	
NF		27	1	89	126	.212	.84	.64	68.3	313.3		44	200		86	39	
NF		31	1	93	162	.393	2.06	1.18	86.7	503.3		102	593		201	117	

TC		PSTNDSUM		Stand Table Summary								Page Date:		2 10/31/2018	
T04N R07W S14 Ty00MC 41.00 T04N R07W S21 Ty00MC 156.00				Project QRUN Acres 197.00						Time: 10:13:42AM Grown Year:					
S Spec T	Sample		Tot		Trees/ Acre	BA/ Acre	Logs Acre	Average Log		Tons/ Acre	Net Cu.Ft. Acre	Net Bd.Ft. Acre	Totals		
	DBH	Trees	FF 16'	Av Ht				Net Cu.Ft.	Net Bd.Ft.				Tons	Cunits	MBF
NF	32	2	88	147	.520	2.90	1.56	108.6	556.0		169	867	334	171	
NF	33	1	88	132	.142	.84	.43	105.3	490.0		45	209	89	41	
NF	34	2	90	136	.268	1.69	.80	115.7	615.0		93	494	183	97	
NF	36	2	87	123	.583	4.12	1.46	122.4	600.0		178	874	351	172	
NF	Totals	10	89	135	2.505	13.30	7.22	93.0	471.7		672	3,407	1,323	671	
A	11	1	87	51	5.760	3.80	5.76	14.0	40.0		81	230	159	45	
A	Totals	1	87	51	5.760	3.80	5.76	14.0	40.0		81	230	159	45	
SN	12	1	89	40	.461	.36									
SN	14	1	88	40	.339	.36									
SN	16	1	88	105	.259	.36									
SN	20	1	89	119	.166	.36									
SN	21	1	82	96	.790	1.90									
SN	24	1	89	123	.115	.36									
SN	29	1	89	55	.414	1.90									
SN	61	1	89	32	.094	1.90									
SN	Totals	8	87	74	2.638	7.51									
Totals		181	86	97	124.082	272.40	258.06	45.3	184.7		11,688	47,661	23,025	9,389	

Log Stock Table - MBF

Page 1
Date 10/31/2018
Time 10:14:35AM

T04N R07W S14 Ty00MC 41.00
T04N R07W S21 Ty00MC 156.00

Project: QRUN
Acres 197.00

S T Spp	So rt	Gr 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+	
NF	DO	CU	12	26	100.0															
NF	DO	CU	27	43	100.0															
NF	DO	2S	20	3		3	.4					3								
NF	DO	2S	32	149		149	22.1					9		33		35	71			
NF	DO	2S	40	472	2.4	461	68.7							34	122	73	231			
NF	DO	3S	20	2		2	.3				2									
NF	DO	3S	24	3		3	.4					3								
NF	DO	3S	32	42		42	6.2					13	28							
NF	DO	3S	40	10		10	1.5					10								
NF	DO	4S	16	2		2	.3			2										
NF	Totals			752	10.8	671	7.1			2	2	26	40	34	155	108	302			
D	DO	CU	2	3	100.0															
D	DO	CU	4	14	100.0															
D	DO	CU	6	17	100.0															
D	DO	CU	8	12	100.0															
D	DO	CU	10	19	100.0															
D	DO	CU	14	12	100.0															
D	DO	CU	16	14	100.0															
D	DO	2S	32	375	1.7	369	7.3					32	105	60	143	29				
D	DO	2S	40	3,788	3.3	3,662	72.5					31	405	642	1845	688	51			
D	DO	3S	18	7		7	.1			7										
D	DO	3S	20	8		8	.1			5	3									
D	DO	3S	24	8		8	.2			3	4									
D	DO	3S	26	2		2	.0			2										
D	DO	3S	28	3		3	.1			3										
D	DO	3S	30	5		5	.1			5										
D	DO	3S	32	434	2.9	421	8.3			51	115	254								
D	DO	3S	36	9		9	.2			9										
D	DO	3S	40	373		370	7.3			53	105	211								
D	DO	4S	12	27		27	.5			8	17	2								
D	DO	4S	14	5		5	.1			3	2									
D	DO	4S	16	29		29	.6			9	16	4								
D	DO	4S	18	7		7	.1				7									
D	DO	4S	20	34		34	.7			11	23									

TC PLOGSTVB				Log Stock Table - MBF															
T04N R07W S14 Ty00MC 41.00 T04N R07W S21 Ty00MC 156.00				Project: QRUN Acres 197.00										Page 2 Date 10/31/2018 Time 10:14:35AM					
S T Spp	So rt	Gr 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	24	5		5	.1			5									
D	DO	4S	26	13		13	.2			7	5								
D	DO	4S	32	79	14.7	67	1.3			67									
D	Totals			5,303	4.7	5,051	53.8			211	331	542	510	702	1988	716	51		
H	DO	CU	3	5	100.0														
H	DO	CU	4	8	100.0														
H	DO	CU	6	13	100.0														
H	DO	CU	8	15	100.0														
H	DO	CU	10	19	100.0														
H	DO	CU	16	31	100.0														
H	DO	2S	30	8		8	.2					8							
H	DO	2S	32	332	3.1	322	8.9						98	107	118				
H	DO	2S	40	2,180	1.8	2,141	59.1					39	401	681	525	430	65		
H	DO	3S	16	9		9	.2				5	4							
H	DO	3S	20	5		5	.1			5									
H	DO	3S	26	5		5	.1				5								
H	DO	3S	28	19		19	.5					19							
H	DO	3S	30	6		6	.2				6								
H	DO	3S	32	453	2.1	444	12.3			117	77	230	19						
H	DO	3S	36	37		37	1.0			37									
H	DO	3S	40	462	1.9	453	12.5			114	167	172							
H	DO	4S	12	22		22	.6			19	1	2							
H	DO	4S	14	8		8	.2			5		3							
H	DO	4S	16	38	19.9	31	.8			18	9	4							
H	DO	4S	18	15		15	.4			12	4								
H	DO	4S	20	16		16	.4			6	9								
H	DO	4S	24	25		25	.7			25									
H	DO	4S	26	13		13	.4			13									
H	DO	4S	28	16	20.0	13	.4			13									
H	DO	4S	32	23	28.5	16	.4			16									
H	DO	4S	40	13		13	.3				13								
H	Totals			3,799	4.7	3,622	38.6			400	296	482	518	788	643	430	65		
A	DO	4S	32	57	20.0	45	100.0			45									
A	Totals			57	20.0	45	.5			45									
Total	All Species			9,911	5.3	9,389	100.0			658	629	1051	1068	1524	2787	1255	418		

Logging Map

OF TIMBER SALE CONTRACT NO. 341-19-W00589-01
 QUARTZ RUN
 PORTIONS OF SECTIONS 14, 21, 22, AND 23
 T4N, R7W, W.M.,
 CLATSOP COUNTY, OREGON

Approximate Net Acres

Area 1 (MC) = 41
 Area 2 (MC) = 86
 Area 3 (MC) = 70
 Area 4 (R/W) = <1
 Total Acres = 197

1 inch = 1,000 feet

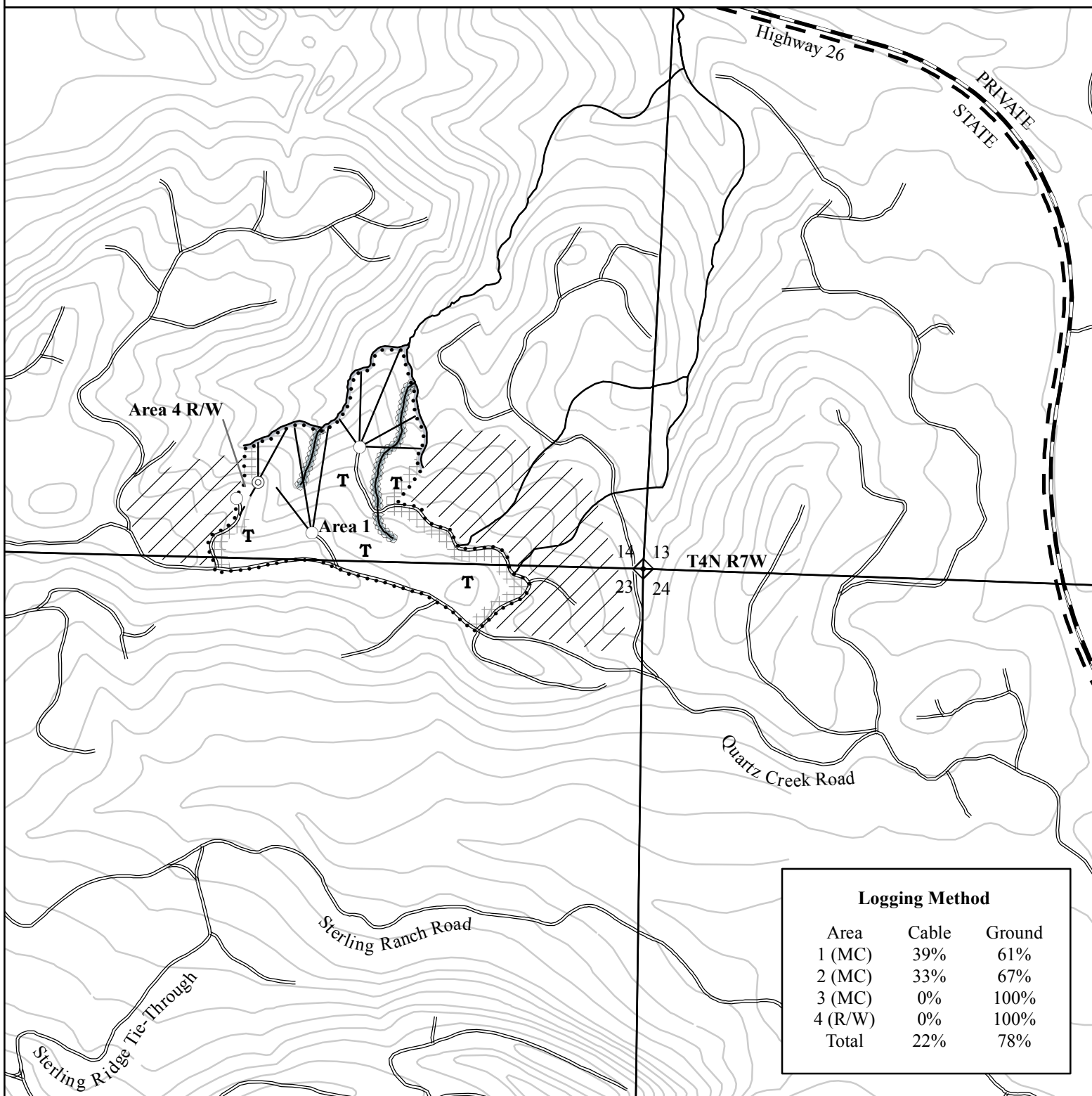
0 500 1,000 Feet

Contour = 40 ft.



Legend

- Timber Sale Boundary
- Existing Landing
- Landing Construction
- Survey Monument
- Type F Stream
- Type N Stream
- T Tractor Area
- Cable Area
- New Road Construction-Surfaced
- Paved Road
- Surfaced Road
- Ownership Boundary
- Buffer Zone
- Posted Buffer
- Reforestation Area
- Controlled Felling Area



Logging Map

OF TIMBER SALE CONTRACT NO. 341-19-W00589-01
 QUARTZ RUN
 PORTIONS OF SECTIONS 14, 21, 22, AND 23
 T4N, R7W, W.M.,
 CLATSOP COUNTY, OREGON

Approximate Net Acres
 Area 1 (MC) = 41
 Area 2 (MC) = 86
 Area 3 (MC) = 70
 Area 4 (R/W) = <1
 Total Acres = 197

1 inch = 1,000 feet
 0 500 1,000 Feet
 Contour = 40 ft.

Legend

- Timber Sale Boundary
- Existing Landing
- Survey Monument
- Type F Stream
- Type N Stream
- Tractor Area
- Cable Area
- Temporary Stream Crossing
- Ownership Boundary
- Seasonally Restricted Road
- Paved Road
- Surfaced Road
- Buffer Zone
- Posted Buffer
- Reforestation Area
- Controlled Felling Area

