



"STEWARDSHIP IN FORESTRY"

Timber Sale Appraisal Greasy Hawk

Sale AT-341-2016-28-

District: Astoria

Date: February 11, 2016

Cost Summary

	Conifer	Hardwood	Total
Gross Timber Sale Value	\$2,832,581.21	\$204,553.72	\$3,037,134.93
		Project Work:	(\$284,260.00)
		Advertised Value:	\$2,752,874.93



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Timber Description

Location: Portions of Sections 34, 35, and 36, T7N, R6W, and portions of Sections 1 and 2, T6N, R6W, W.M., Clatsop County, Oregon.

Stand Stocking: 20%

Specie Name	AvgDBH	Amortization (%)	Recovery (%)
Douglas - Fir	22	0	97
Western Hemlock / Fir	11	0	99
Red Cedar	20	0	95
Alder (Red)	14	0	95

Volume by Grade	2S	3S	4S	2S 12"+	3S 10" - 11"	Total
Douglas - Fir	5,510	1,414	245	0	0	7,169
Western Hemlock / Fir	1	0	53	0	0	54
Red Cedar	0	1	0	0	0	1
Alder (Red)	0	0	333	98	98	529
Total	5,511	1,415	631	98	98	7,753

Comments: Pond Values Used: 4th Quarter Calendar Year 2015.

Expected Log Markets: Warrenton, Tillamook, Garibaldi, Forest Grove, Clatskanie, Mist and Springfield, OR;
Elma, Vancouver, Raymond and Longview, WA.

SCALING COST ALLOWANCE = \$5.00/MBF

FUEL COST ALLOWANCE = \$3.00/Gallon

HAULING COST ALLOWANCE

Hauling costs equivalent to \$780 daily truck cost.

Other Costs (with Profit & Risk to be added):

Additional Logging Costs:

Branding and Painting: $\$1/\text{MBF} \times 7,753 \text{ MBF} = \$7,753$

Slash & Landing Piling (includes Move-in and Pile Materials) = \$17,178 (see attached appraisal)

Additional Rigging for Haulback Use in Portions of Area 1: $\$5/\text{MBF} \times 40\text{MBF/acre} \times 10 \text{ acres} = \$2,000$

TOTAL Other Costs (with Profit & Risk to be added) = \$26,931

Other Costs (No Profit & Risk added):

Logger's Choice Spur and 2 Landings on North Side of Area 1 = \$1,365

Rocking Cost for Logger's Choice Spur and Landings on North Side of Area 1: $235 \text{ cy} \times \$8.54/\text{cy} = \$2,007$

Logger's Choice 14' Outsloped Dirt Spur on South Side of Area 1 = \$1,585

Machine Washing for Invasive Weed Compliance = \$3,000

TOTAL Other Costs (No Profit & Risk added) = \$7,957



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Logging Conditions

Combination#: 1	Douglas - Fir	51.00%
	Western Hemlock / Fir	51.00%
	Red Cedar	51.00%
	Alder (Red)	51.00%
Logging System:	Shovel	Process: Stroke Delimber
yarding distance:	Medium (800 ft)	downhill yarding: No
tree size:	Mature / Regen Cut (900 Bft/tree), 3-5 logs/MBF	
loads / day:	8	bd. ft / load: 4400
cost / mbf:	\$90.11	
machines:	Stroke Delimber (B)	

Combination#: 2	Douglas - Fir	49.00%
	Western Hemlock / Fir	49.00%
	Red Cedar	49.00%
	Alder (Red)	49.00%
Logging System:	Cable: Large Tower >=70	Process: Stroke Delimber
yarding distance:	Medium (800 ft)	downhill yarding: No
tree size:	Mature / Partial Cut (900 Bft/tree), 3-5 logs/MBF	
loads / day:	10	bd. ft / load: 4400
cost / mbf:	\$140.91	
machines:	Log Loader (A) Stroke Delimber (A) Tower Yarder (Large)	



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Logging Costs

Operating Seasons: 2.00	Profit Risk: 10%
Project Costs: \$284,260.00	Other Costs (P/R): \$26,931.00
Slash Disposal: \$0.00	Other Costs: \$7,957.00

Miles of Road

Road Maintenance: \$2.61

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

Hauling Costs

Species	\$ / MBF	Trips/Day	MBF / Load
Douglas - Fir	\$0.00	3.0	4.0
Western Hemlock / Fir	\$0.00	6.0	6.0
Red Cedar	\$0.00	2.0	3.5
Alder (Red)	\$0.00	2.0	2.9



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Logging Costs Breakdown

Logging	Road Maint	Fire Protect	Hauling	Other P/R appl	Profit & Risk	Slash Disposal	Scaling	Other	Total
Douglas - Fir									
\$115.00	\$2.69	\$1.13	\$66.95	\$3.47	\$18.92	\$0.00	\$5.00	\$1.03	\$214.19
Western Hemlock / Fir									
\$115.00	\$2.64	\$1.13	\$21.89	\$3.47	\$14.41	\$0.00	\$5.00	\$1.03	\$164.57
Red Cedar									
\$115.00	\$2.74	\$1.13	\$117.00	\$3.47	\$23.93	\$0.00	\$5.00	\$1.03	\$269.30
Alder (Red)									
\$115.00	\$2.74	\$1.13	\$141.20	\$3.47	\$26.35	\$0.00	\$5.00	\$1.03	\$295.92

Specie	Amortization	Pond Value	Stumpage	Amortized
Douglas - Fir	\$0.00	\$607.40	\$393.21	\$0.00
Western Hemlock / Fir	\$0.00	\$401.20	\$236.63	\$0.00
Red Cedar	\$0.00	\$1,150.00	\$880.70	\$0.00
Alder (Red)	\$0.00	\$682.60	\$386.68	\$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
Red Cedar	0	\$0.00	\$0.00
Alder (Red)	0	\$0.00	\$0.00

Unamortized

Specie	MBF	Value	Total
Douglas - Fir	7,169	\$393.21	\$2,818,922.49
Western Hemlock / Fir	54	\$236.63	\$12,778.02
Red Cedar	1	\$880.70	\$880.70
Alder (Red)	529	\$386.68	\$204,553.72

Gross Timber Sale Value

Recovery: \$3,037,134.93

Prepared By: John Choate

Phone: 503-325-5451

Road Maintenance Cost Summary (Interim and Post Harvest)

Sale: Greasy Hawk (341-16-28)
Date: November 6, 2015
By: John Choate

MBF: 7,752
\$/MBF: \$2.61

Type	Equipment/Rationale	Move-in Rate	Times	Hours	Rate	Cost
Interim Operations Entries: 1	Grader 14G	\$778	1	16	\$100	\$2,378
	Dump Truck 12CY	\$163	1	8	\$79	\$795
	FE Loader C966	\$778	1	4	\$77	\$1,086
Final Road Maintenance	Grader 14G	\$778	1	40	\$100	\$4,778
	Dump Truck 12CY	\$163	2	20	\$79	\$1,906
	FE Loader C966	\$778	1	10	\$83	\$1,608
	Vibratory Roller	\$778	1	40	\$77	\$3,858
	Water Truck 2,500 gallon	\$190	1	16	\$89	\$1,614
	Rubber tired backhoe	\$321	1	16	\$77	\$1,553
	Labor			16	\$40	\$640
Total						\$20,216

Interim Operations Road Maintenance

Production Rates	Miles/day	Distance (miles)	Days	Hours
Grader	2.0	4.0	2.0	16

Final Road Maintenance

Production Rates	Miles/day	Distance (miles)	Days	Hours
Grader	1.5	7.5	5.0	40
Vibratory Roller	1.5	7.5	5.0	40

*Maintenance calculations were determined as follows:

Sale Area via Greasy Spoon via Fishhawk Tie-through via Fishhawk Loop to Fishhawk County Road = 7.5 Mi.

Site Prep Appraisal

Sale Number: 341-16-28
Sale Name: Greasy Hawk
Date: 11/06/2015

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

Sale Area	Harvest Type	Veg Type/Zone	Ground Based Yarding Acres	Estimated Piling Hours/Area	Cost/Hour	Total Cost/Area
1	MC	A	32.0	32	\$129.00	\$4,128.00
2	MC	A	36.0	36	\$129.00	\$4,644.00
3	MC	A	24	24	\$129.00	\$3,096.00
In-unit Piling						Sub Total = \$11,868.00

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
1	6	\$220.00	\$1,320.00	96	\$5.00	\$480.00
2	4	\$220.00	\$880.00	108	\$5.00	\$540.00
3	2	\$220.00	\$440.00	72	\$5.00	\$360.00

*Cost includes separating firewood

				Materials	Sub Total =	\$1,380.00
				Landing Piling	Sub Total =	\$2,640.00
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 = \$17,178.00

SUMMARY OF ALL PROJECT COSTS

SALE NAME: Greasy Hawk

ROAD CONSTRUCTION:

Project No. 1

	<u>Road segment</u>	<u>Length/Sta</u>	<u>Cost</u>
Crowned Rock	1A to 1B	25.00	\$41,562
	through		
	2C to 2D		
	TOTAL	25.00	\$41,562

0.47 Miles

ROAD IMPROVEMENT:

Project No. 2

	<u>Road segment</u>	<u>Length/Sta</u>	<u>Cost</u>
	I1 to I2	273.3	\$43,898
	through		
	I19 to I20		
	TOTAL	273.30	\$43,898

5.18 Miles

SPECIAL PROJECTS:

	<u>Description</u>	<u>Cost</u>
Project No. 3	Crushing - Viewpoint Quarry (17,400 cu yds)	\$179,044
	TOTAL	\$179,044

Project Road Maintenance	\$11,072
TOTAL	\$11,072

MOVE IN:

	<u>Equipment</u>	<u>Cost</u>
	Excavator (C330 @ \$1,406x1.5)	\$2,109
	Dozer (D8 @ \$1,406 x 1.5)	\$2,109
	Loader (966 @ \$778)	\$778
	Rubber tired skidder (C518 @ \$717)	\$717
	Excavator (C315 @ \$805)	\$805
	Large Grader (14G @ \$778)	\$778
	10-12 yd ³ dump truck (@ \$163 x 5)	\$815
	20 yd ³ dump truck (@ \$191 x 3)	\$573
	TOTAL	\$8,684

GRAND TOTAL \$284,260

Compiled By: Andrew Arvin

Date: 12/04/2015

SALE NAME:	<u>Greasy Hawk</u>	NEW CONSTRUCTION:	<u>25.00</u>	STATIONS	<u>0.47</u>	MILES
ROAD:	<u>1A-1B (2.0), 2A-2B (17.0), 2C-2D (6.0)</u>	IMPROVEMENT:		STATIONS		MILES

MILES
MILES

CLEARING & GRUBBING

\$3.409

\$9.183

Subtotal of Clearing, Exc., Culv.

\$16,282

SURFACING				Subgrade prep:	Description	Stations/ amount	x	Rate/ sta/amt	Cost
					Grade, Shape and Ditch 16'	25.00	x	\$24.83	\$620.75
					Subgrade Compaction	25.00	x	\$20.19	\$504.75

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 - 2+00			
				Volume (CY) per	Number of			
Base Rock	4"-0" crushed	0+00 - 2+00	8	station	50	stations 2.00	\$6.92	\$692
Landings	6"-0" pit-run	2+00	N/A	Landing	99	Landings 1	\$8.54	\$845
Total Rock for Road Segment:				1A to 1B		199		\$1,537

ROAD SEGMENT 2A to 2B				POINT TO POINT	Sta. to Sta.	TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	2A to 2B	0+00 - 17+00			
				Volume (CY) per	Number of			
Base Rock	4"-0" crushed	0+00-17+00	8	station	50	stations 17.00	\$6.92	\$5,882
Traction Rock	3/4"-0" crushed	0+00 - 2+00	2	station	13	stations 2	\$6.92	\$180
		3+60, 6+80,						
Turnouts	4"-0" crushed	12+30	8	TO	33	TO's 3	\$6.92	\$685
Turnarounds	4"-0" crushed	15+50	8	TA	22	TA's 1	\$6.92	\$152
		0+50, 6+25,						
Curve Widening	4"-0" crushed	7+75	8	curve	N/A	curves 3	\$6.92	\$609
Junctions	4"-0" crushed	0+00, 2C	N/A	junction	11	junctions 2	\$6.92	\$152
Culvert bedding / backfill	1 1/2"-0" crushed	8+25	N/A	culvert	55	culverts 1	\$4.91	\$270
Dissipator	24"-6" Rip-rap	2+65	N/A	dissipator	11	dissipators 1	\$12.58	\$138
Fill Armor	24"-6" Rip-rap	1+00, 8+25	24	Fill	N/A	Fills 2	\$12.58	\$4,403
Landings	6"-0" pit-run	17+00	N/A	Landing	99	Landings 1	\$8.54	\$845
Total Rock for Road Segment:				2A to 2B		1,622		\$13,317

ROAD SEGMENT 2C to 2D				POINT TO POINT	Sta. to Sta.	TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	2C to 2D	0+00 - 6+00			
				Volume (CY) per	Number of			
Base Rock	4"-0" crushed	0+00-31+00	8	station	50	stations 6.00	\$6.92	\$2,076
Turnarounds	4"-0" crushed	4+75	8	TA	22	TA's 1	\$6.92	\$152
Landings	6"-0" pit-run	6+00	N/A	Landing	99	Landings 1	\$8.54	\$845
Total Rock for Road Segment:				2C to 2D		421		\$3,074

Processing:				Description	No. sta	Rate/sta	Cost
				Water, Process and compact base rock	25.00	\$56.48	\$1,412
				Water, Process and compact traction rock	2.00	\$56.48	\$113

				24"-6" rr	6"-0" pr	4"-0"	1 1/2"-0"	3/4"-0"	Total	
SUB TOTAL FOR SURFACING				361	297	1,503	55	26	2,242	\$20,579

SPECIAL PROJECTS				Description	Cost
				Install 6 1/2 oz. woven x 12.5 ft wide Fabric: (2A-2B - 17.0 sta), (2C-2D - 6.0 sta)	\$2,990.00
				Rip, develop pit-run rock (658 cu yds @ \$2.60/cy)	\$1,710.80
SUB TOTAL FOR SPECIAL PROJECTS					\$4,701

				Subtotal of Surfacing & Spec. Proj.	\$25,280
				Subtotal of Clearing, Exc., Culv.	\$16,282
GRAND TOTAL					\$41,562

Compiled By: Andrew Arvin

Date: 11/19/2015

SUMMARY OF CONSTRUCTION COSTS

SALE NAME: Greasy Hawk
 ROAD: I1-I2(57.2),I3-I4(15.0),I5-I6(3.0),I7-I8(72.1),I9-I10(14.25),
 POINTS: I11-I12(41.7),I13-I14(12.6),I15-I16(7.2),I17-I18(25.0),I19-I20(25.25)

NEW CONSTRUCTION: STATIONS
 IMPROVEMENT: 273.30 STATIONS 5.18 MILES

CLEARING & GRUBBING

Method	Acres/amount	x	Rate	=	Cost
Scatter outside right of way	1	x	\$1,337.00	=	\$1,337.00
		x		=	
		x		=	
		x		=	

SUB TOTAL FOR CLEARING & GRUBBING

\$1,337

EXCAVATION

Material	Cy/amount	x	Rate	=	Cost
I1-I2 Ditch reconstruction (hrs)	3.00	x	\$129.00	=	\$387.00
End Haul and waste ditch material (sta.)	10.00	x	\$22.92	=	\$229.20
46+00 Construct Landing	1.00	x	\$389.00	=	\$389.00
I3-I4					
7+00 Construct Landing	1.00	x	\$389.00	=	\$389.00
I7-I8 Ditch reconstruction (hrs)	2.00	x	\$129.00	=	\$258.00
End Haul and waste ditch material (sta.)	3.00	x	\$22.92	=	\$68.76
I11-I12 Ditch reconstruction (hrs)	1.00	x	\$129.00	=	\$129.00
End Haul and waste ditch material (sta.)	2.00	x	\$22.92	=	\$45.84
41+70 Construct Landing	1.00	x	\$389.00	=	\$389.00
2+70 Reconstruct Turnout (hrs)	1.00	x	\$129.00	=	\$129.00
I13-I14					
12+00 Construct Landing	1.00	x	\$389.00	=	\$389.00
I15-I16 Reconstruct Ditchout (hrs)	2.00	x	\$129.00	=	\$258.00
		x		=	
Compact waste material (cyds)	250.00	x	\$0.40	=	\$100.00

SUB TOTAL FOR EXCAVATION

\$3,161

CULVERT MATERIALS AND INSTALLATION

Location	Dia/type	Lineal ft.	Rate	Cost	Location	Dia/type	Lineal ft.	Rate	Cost
I1-I2									
10+05	18"/CPP	30	\$19.53	\$585.90					
I11-I12									
20+45	18"/CPP	30	\$19.53	\$585.90					
38+45	18"/CPP	30	\$19.53	\$585.90					

	Description	Quantity	Rate	Cost
Other/miscellaneous:	Mulch waste areas (ac)	0.15	\$1,794.00	\$269.10
Culvert stakes & markers:	Fiberglass culvert markers	11	\$20.00	\$220.00

SUB TOTAL FOR CULVERT MATERIALS & INSTALLATION

\$2,247

Subtotal of Clearing, Exc., Culv.

\$6,745

SURFACING				Stations/ amount		x	Rate/ sta/amt	Cost		
Subgrade prep:				Description						
				Grade, Shape and Ditch 16'		x	\$24.83	\$6,786.04		
				Subgrade Compaction		x	\$20.19	\$2,429.87		
ROAD SEGMENT I1 to I2				POINT TO POINT I1 to I2		Sta. to Sta. 0+00 to 57+20		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	Volume (CY) per	Number of					
Leveling Rock	3/4"-0" crushed	0+00 to 57+20	N/A	load	11	loads	20.00	220	\$6.92	\$1,522
culvert bedding/backfill	3/4"-0" crushed	10+05	N/A	culvert	11	culverts	1	11	\$6.92	\$76
Landings	6"-0" pit run	46+00	N/A	Landing	66	Landings	1	66	\$8.54	\$564
Total Rock for Road Segment:				I1 to I2				297		\$2,162
ROAD SEGMENT I3 to I4				POINT TO POINT I3 to I4		Sta. to Sta. 0+00 to 15+00		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	Volume (CY) per	Number of					
Leveling Rock	4"-0" crushed	0+00 to 15+00	N/A	load	11	loads	6.00	66	\$6.92	\$457
Landings	6"-0" pit run	7+00	N/A	landing	66	landings	1	66	\$8.54	\$564
Total Rock for Road Segment:				I3 to I4				132		\$1,020
ROAD SEGMENT I5 to I6				POINT TO POINT I5 to I6		Sta. to Sta. 0+00 to 3+00		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	Volume (CY) per	Number of					
Leveling Rock	4"-0" crushed	0+00 to 3+00	N/A	load	11	loads	4.00	44	\$6.92	\$304
Total Rock for Road Segment:				I5 to I6				44		\$304
ROAD SEGMENT I7 to I8				POINT TO POINT I7 to I8		Sta. to Sta. 0+00 to 72+10		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	Volume (CY) per	Number of					
Subgrade Leveling	3/4"-0" crushed	N/A	N/A	load	11	loads	15.00	165	\$6.92	\$1,142
Surface Rock	3/4"-0" crushed	0+00 to 33+50	N/A	station	13	stations	34	436	\$6.92	\$3,014
Curve Widening	3/4"-0" crushed	N/A	N/A	curve	22	curves	6.00	132	\$6.92	\$913
Turnouts	3/4"-0" crushed	5+60,9+50,16+15,18+90,27+50,37+30,43+00,44+90,48+00	N/A	TO	11	TO's	9	99	\$6.92	\$685
Turnarounds	4"-0" crushed	17+40	N/A	TA	33	TA's	1	33	\$6.92	\$228
Turnarounds	3/4"-0" crushed		N/A	TA	11	TA's	1	11	\$6.92	\$76
Fill Armor	24"-6" riprap		N/A	fill	150	fills	1	150	\$12.58	\$1,887
Junctions	3/4"-0" crushed	0+00,52+75	N/A	junction	22	junctions	2	44	\$6.92	\$304
Landings	6"-0" pit run	39+75	N/A	Landing	88	landings	1	88	\$8.54	\$752
Total Rock for Road Segment:				I7 to I8				1,158		\$8,250
ROAD SEGMENT I9 to I10				POINT TO POINT I9 to I10		Sta. to Sta. 0+00 to 14+25		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	Volume (CY) per	Number of					
Leveling Rock	1 1/2"-0" crushed	0+00 to 14+25	N/A	load	11	loads	6.00	66	\$4.77	\$315
Total Rock for Road Segment:				I9 to I10				66		\$315
ROAD SEGMENT I11 to I12				POINT TO POINT I11 to I12		Sta. to Sta. 0+00 to 41+70		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	Volume (CY) per	Number of					
Leveling Rock	4"-0" crushed	0+00 to 14+25	N/A	load	11	loads	20.00	220	\$6.92	\$1,522
culvert bedding/backfill	1 1/2"-0" crushed	23+50,38+45	N/A	culvert	33	culverts	2	66	\$4.91	\$324
culvert dissapator	24"-6" riprap	38+45	N/A	dissipator	11	dissipators	1	11	\$12.58	\$138
Turnouts	4"-0" crushed	2+70	N/A	TA	33	TA's	1	33	\$6.92	\$228
Turnarounds	4"-0" crushed		N/A	TA	22	TA's	2	44	\$6.92	\$304
Landings	6"-0" pit run	41+70	N/A	Landing	88	Landings	1	88	\$8.54	\$752
Total Rock for Road Segment:				I11 to I12				462		\$3,269
ROAD SEGMENT I13 to I14				POINT TO POINT I13 to I14		Sta. to Sta. 0+00 to 12+60		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	Volume (CY) per	Number of					
Leveling Rock	1 1/2"-0" crushed	0+00 to 14+25	N/A	load	11	loads	6.00	66	\$4.91	\$324
Turnarounds	4"-0" crushed	11+55	N/A	TA	22	TA's	1	22	\$6.92	\$152
Landings	6"-0" pit run	12+00	N/A	Landing	88	landings	1	88	\$8.54	\$752
Total Rock for Road Segment:				I13 to I14				176		\$1,228
ROAD SEGMENT I15 to I16				POINT TO POINT I15 to I16		Sta. to Sta. 0+00 to 7+20		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	Volume (CY) per	Number of					
Leveling Rock	4"-0" crushed	N/A	N/A	load	11	loads	3.00	33	\$6.92	\$228
Total Rock for Road Segment:				I15 to I16				33		\$228
ROAD SEGMENT I17 to I18				POINT TO POINT I17 to I18		Sta. to Sta. 0+00 to 25+00		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	Volume (CY) per	Number of					
Leveling Rock	1 1/2"-0" crushed	0+00 to 25+00	N/A	load	11	loads	15.00	165	\$4.91	\$810
Turnouts	4"-0" crushed	13+45	N/A	TO	33	TO's	1	33	\$6.92	\$228
Total Rock for Road Segment:				I17 to I18				198		\$1,039
ROAD SEGMENT I19 to I20				POINT TO POINT I19 to I20		Sta. to Sta. 0+00 to 25+25		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	Volume (CY) per	Number of					
Leveling Rock	1 1/2"-0" crushed	0+00 to 25+25	N/A	load	11	loads	6.00	66	\$4.91	\$324
Total Rock for Road Segment:				I19 to I20				66		\$324
Processing:				Description		No.sta	Rate/sta	Cost		
				Water, Process & Compact:		120.35	\$56.48	\$6,797		
				24"-6" rr	161					
				6"-0"pr	396					
				4"-0"	528					
				1 1/2"-0"	429					
				3/4"-0"	1,118					
				Total	2,632		2,632	\$34,153		
SUB TOTAL FOR SURFACING										

SPECIAL PROJECTS				Amount	Rate	Cost
Description						
Knock down alder along all road improvement segments with grader (hrs)				30.00	\$100.00	\$3,000
SUB TOTAL FOR SPECIAL PROJECTS						\$3,000
				Subtotal of Surfacing & Spec. Proj.		\$37,153
				Subtotal of Clearing, Exc.,Culv.		\$6,745

GRAND TOTAL

\$43,898

Compiled By: Tillotson

Date: 10/22/2015

CRUSHED ROCK COST

SALE NAME:	Greasy Hawk
PROJECT:	No. 1 and 2
QUARRY:	Viewpoint

MATERIAL: Crushed 4"-0", 3/4"-0"

DATE: 10/05/2015
BY: Tillotson

[illegible]

ROCK HAUL:

Truck type: D20 No. trucks: 3
 Delay min.: 8 Efficiency: 85%

Ave haul:	\$5.60	/cy
Load:	\$0.48	/cy
Spread:	\$0.84	/cy

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

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

Production: cy/day = 993

CRUSHED ROCK HAUL COSTS

3,334 cy @ \$6.92 /cy

CRUSHED ROCK COST

SALE NAME:	Greasy Hawk
PROJECT:	No. 1 and 2
QUARRY:	Kerry Stockpile

MATERIAL: Crushed 1.5"-0"

DATE: 10/05/2015
BY: Tillotson

[illegible]

ROCK HAUL:

Truck type:	<u>D20</u>	No. trucks:	<u>2</u>
Delay min.:	<u>8</u>	Efficiency:	<u>85%</u>

Ave haul:	\$3.65	/cy
Load:	\$0.48	/cy
Spread:	\$0.78	/cy

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

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

Production: cy/day = 1,130

CRUSHED ROCK HAUL COSTS

484 cy @ \$4.91 /cy

PIT RUN ROCK COST

SALE NAME:	Greasy Hawk
PROJECT:	No. 1 and 2
QUARRY:	Viewpoint

MATERIAL: Pit Run

DATE: 10/22/2015
BY: Tillotson

Road Segment	Stations	Cubic Yards	ONE WAY HAUL IN MILES							Total Haul
			50 MPH	30 MPH	25 MPH	20 MPH	15 MPH	10 MPH	5 MPH	
1A to 1B	2.00	99		5	2		0.50	0.10	0.05	7.35
1E to 1F	17.00	99		5	2		0.50	0.30	0.05	7.55
2A to 2B	17.00	99		5	3	0.73	0.75	0.46	0.05	9.70
2C to 2D	6.00	99		5	3	0.73	0.35	0.30	0.10	9.19
I1 to I2	57.20	66		5	4	0.97	0.29	0.25	0.05	9.76
I3 to I4	6.00	66		5	4	0.97	0.29	0.15	0.05	9.66
I7 to I8	72.10	88		5	3	0.73	0.36	0.11	0.05	8.96
I11 to I12	41.70	176		5	2		0.97	0.28	0.10	8.05
I13 to I14	12.60	88		5	2		0.60	0.18	0.05	7.53

ROCK HAUL:

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

Ave haul:	\$6.14	/cy
Load:	\$0.84	/cy
Spread:	\$1.56	/cy

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

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

Production: cy/day = 515

PIT RUN ROCK HAUL COSTS

880 cy @ \$8.54 /cy

RIP RAP ROCK COST

SALE NAME:	Greasy Hawk
PROJECT:	No. 1 and 2
QUARRY:	Viewpoint

MATERIAL: Rip Rap

DATE: _____
BY: _____

[illegible]

ROCK HAUL:

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

Ave haul:	\$6.48	/cy
Load:	\$1.80	/cy
Develop:	<u>\$4.30</u>	/cy

Production: cy/day = 390

RIP RAP ROCK HAUL COSTS

522 cy @ \$12.58 /cy

Greasy Hawk TIMBER CRUISE REPORT FY 2016

1. **Sale Area Location:** Areas 1, 2, and 3 are located in portions of Sections 34, 35 & 36, T7N, R6W; and portions of Sections of 1 & 2, T6N, R6W, W.M., Clatsop County, Oregon.

2. **Fund Distribution:** BOF 100%
CSL 0%

Tax Code: 8-01 (96%)
30-05 (04%)

3. **Sale Acreage by Area:**

Area	Treatment	Gross Acres	Posted Buffers	New R/W	Existing R/W	Net Acres	Survey Method
1	Modified Clearcut	114	14	<1	2	98	GIS
2	Modified Clearcut	70	7	2	1	60	GIS
3	Modified Clearcut	25	N/A	N/A	1	24	GIS
4 (R/W)	Right of Way	2	-	-	-	2	Length x Width
TOTALS		211	21	2	4	184	

4. **Cruisers and Cruise Dates:** Area 1 was cruised by Andrew Arvin, John Choate, Bryce Rodgers on 10/01/15. Area 2 was cruised by John Choate, Bryce Rodgers, and Andrew Arvin on 10/01/15 and 10/02/15. Area 3 was cruised by John Tillotson on 10/01/15.

5. **Cruise Method and Computation:** Data was collected on Juniper Allegro data collectors, and downloaded to the Atterbury Super A.C.E. program in District for computing. See the attached Cruise Design for more details on the cruise method. The cruise calculations were processed in the Astoria district office.

Areas 1, 2 and 3 are modified clearcut units and were variable plot cruised using a 54.44 BAF for conifer and hardwoods. These plots are located on a 7 chain by 4 chain grid, with every third plot measured and graded. A total of 69 plots were sampled, with 26 measured and graded plots, and 43 count plots.

Area 4 R/W Right-of-way volume was calculated by multiplying the R/W acreage and the average volume per acre from the plots in Areas 1 and 2. Right-of-way totals 4 acres.

AREA	CRUISE	TRACT	TYPE	ACRES
1, 2 & 3	GREASYH	AREA123	TAKE	182
4	GREASYH	AREA123	R/W	2

6. **Timber Description:**

Areas 1, 2, and 3 are modified clearcut units, approximately 75 to 80 years old, consisting of Douglas-fir, and Red alder. The average Douglas-fir tree size to be harvested is approximately 22 inches DBH, with an average height of 87 feet to a merchantable top (6 inch d.i.b./40% fp). The average red alder tree size to be harvested is approximately 14 inches DBH, with an average height of 39 to a merchantable top (6 inch d.i.b./40% fp). The average volume per acre to be harvested (net) is 42 MBF.

Area 4 R/W is similar to the timber description mentioned above in the timber sale areas. The average volume (net) is 42 MBF/acre.

7. Statistical Analysis and Stand Summary: (See "Statistics" - Type Reports, attached)

Statistics for Stand B.F. volumes

Area	Estimated CV	Target SE%	Actual CV	Actual SE%
1, 2, and 3	55	8	48.3	5.8

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

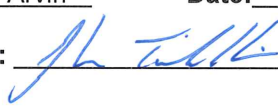
Species	DBH	Net Vol.	2 Saw	3Saw	4 Saw	% D & B	% Sale
Douglas-fir	22"	7,169	5,510	1,414	245	2.4	92
Western Hemlock	11"	54	1	<1	53	1	1
Western red cedar	20"	<1	0	<1	<1	-	<1

Species	DBH	Net Vol.	12"+	10"-11"	8"-9"	6"-7"	% D & B	% Sale
Red Alder	14"	529	98	98	-	333	-	7

TOTAL NET VOLUME	7,753
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9. Approvals:

Prepared by: Andrew Arvin Date: October 30, 2015

Unit Forester Approval:  Date: OCTOBER 30, 2015

- 10. Attachments:**
- Cruise Design and Map - 3 pages
 - Volume Report - 1 pages
 - Statistics Report - 3 pages
 - Log Stock Tables - 2 pages
 - Stand Table Summary - 2 pages

X:\STATE_FORESTS\UNIT_SUNSET\2016 FY Sales\Greasy Hawk\Sale Prep\Cruise

CRUISE DESIGN ASTORIA DISTRICT

Sale Name: Greasy HawkArea(s) 1, 2, and 3

Harvest Type: (MC) Modified Clearcut

Approx. Cruise Acres: 188 Estimated CV% 55 Net BF/Acre SE% Objective 8 Net BF/AcrePlanned Sale Volume : 8.9 MMBF Estimated Sale Area Value/Acre: \$20,000/Ac
(50 MBF/Ac.)

A. Cruise Goals: (a) Grade minimum 100 conifer and 10 hardwood trees
 (b) Sample 45 cruise plots (1 grade/ 2 count); (c) Other goals (Determine "automark" thinning standards; X Determine log grades for sale value; X Determine snag and leave tree species and sizes.

B. Cruise Design:

1. Plot Cruises: BAF 54.44 ((Full point; Half point) (circle one)
 Cruise Line Directions Area 1 & 2: 45°/225°
 Area 3: 0° / 180°
 Cruise Line Spacing 7 (chains)
 Cruise Plot Spacing 4 (chains)
 Grade/Count Ratio 1/2

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

C. Tree Measurements:

- 1. Diameter:** Minimum DBH to cruise is 8" for conifers and 8" for hardwoods.
 Record dbh to nearest 1/2" for trees < 16", to nearest 1" for trees 16-24", and to nearest 2" for trees > 24". If tree diameters are estimated (only estimate on variable plot cruises), then record to closest estimate.
- 2. Bole Length:** Record bole length to nearest foot at TCD. For trees greater than 100 feet in merchantable height, estimating to the nearest 5 feet is acceptable.
- 3. Top Cruise Diameter (TCD):** Minimum top outside bark is 7" for conifers and 7" for hardwoods or 40 % of dob at 16' form point. Generally, use 7" outside bark for trees < 18" dbh and 40% of dob @ FP for trees > 18" dbh.
- 4. Form Factors:** (1) Measure or estimate a 16' form factor for every conifer tree measured/graded; OR (2) Measure a minimum of 20 form factors for each major conifer species on the cruise area, and use these to calculate average FF for the species on the cruise. Hardwood form factors are a Standard 87.
- 5. Tree Segments:** Record log segments in "standard" log lengths in general use, such as 32' and 40' lengths, whenever possible. Do not record odd segments just to maximize grade. Cull segments can be any length. For conifers, minimum merchantable segment length is 12'; for hardwoods, it's 8'. Maximum segment length is 40'. One foot of trim is assumed for each

merch. segment. Do not use "double dash" (--) feature on the data recorder except for the top segment of the tree. Hardwoods shall be recorded in 8' and 10' multiples.

6. Species, Sort, and Grade Codes:

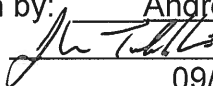
- A. Species: Record as D (Douglas-fir); H (Western hemlock); S (Sitka Spruce); C (Western red cedar); NF (Noble fir); SF (Silver fir); A (Red alder); M (Bigleaf maple). For "leave trees" in partial cuts, or for marked "wildlife trees," add an "L" to the species code (such as DL, HL, CL, etc.)
- B. Sort: Use code "1" (Domestic).
- C. Grade: A = 1 Peeler; B = 2 Peeler; C = 3 Peeler; D = Special Mill; 2 = 2 Sawmill; 3 = 3 Sawmill; 4 = 4 Sawmill; R = Camp Run; 0 = Cull
Hardwoods: Alder Grades: 12" + = 1 Sawmill; 10"-12" = 2 Sawmill; 10"-8" = 3 Sawmill; and 8"-6" 4 Sawmill, or R = Camp Run; 0 = Cull.
All Maple Camp Run = R

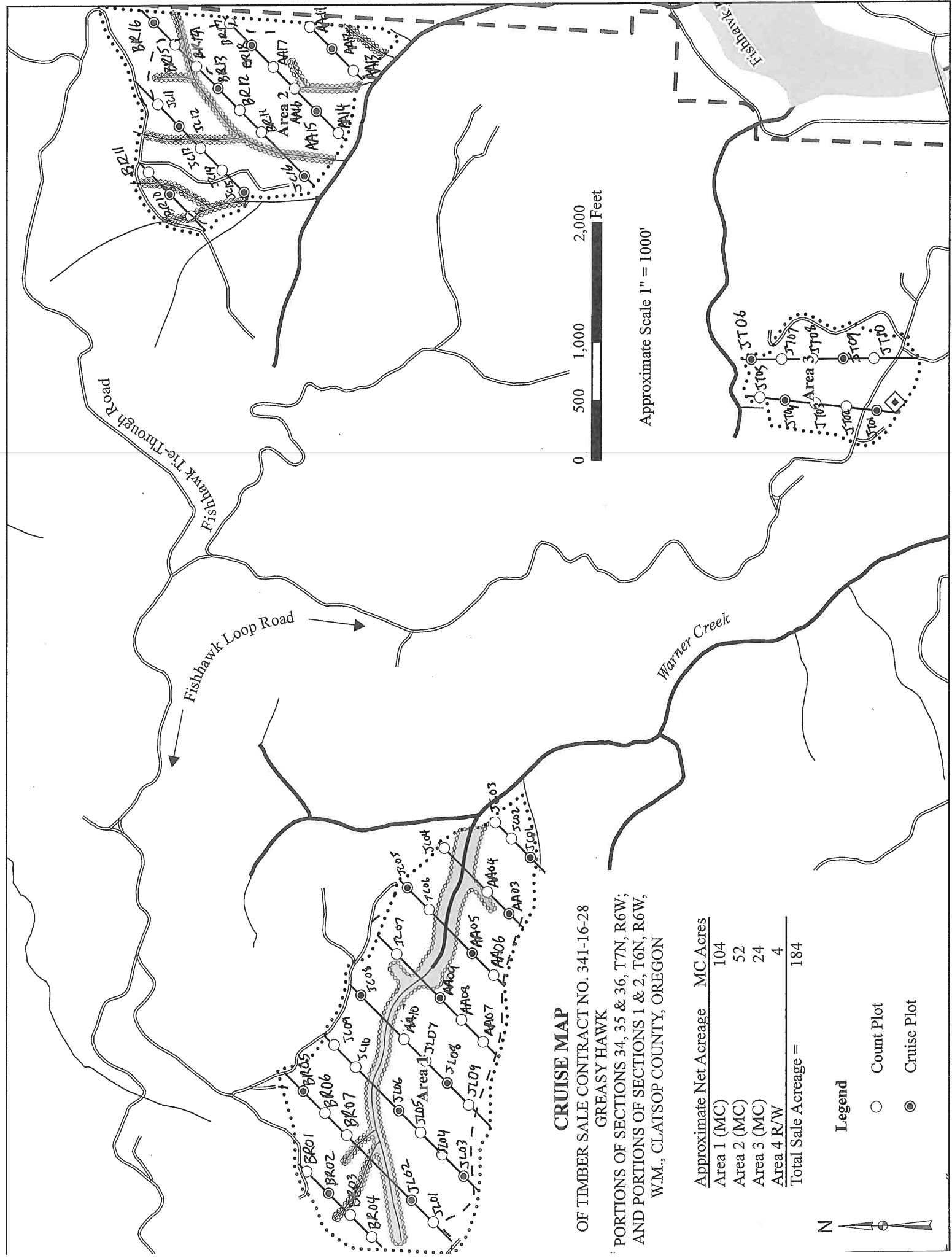
7. **Deductions**: Estimate visible defect or damage as a "length deduction" (most often), or as a "diameter deduction," as applicable. Estimate hidden defect and breakage (usually some breakage is encountered in trees > 100 feet in height) on a "per tree" basis. Steep and broken topography generally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

8. **Standard Field Procedures**: Plot Type Cruises: Mark cruise line beginning and end points with blue/yellow flagging. Write plot identification numbers and line direction on the ribbon. At each plot, tie yellow flagging above eye level near plot center and another yellow flagging around a sturdy wooden stake marking plot center. On each yellow flagging, write the plot identification number. Between plots, along the cruise line, tie blue flagging at inter-visible 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.

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, Yellow Paint.

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

Cruise Design by: Andrew Arvin
Approved by: 
Date: 09/25/15



CRUISE MAP

OF TIMBER SALE CONTRACT NO. 341-16-28
 GREASY HAWK
 PORTIONS OF SECTIONS 34, 35 & 36, T7N, R6W;
 AND PORTIONS OF SECTIONS 1 & 2, T6N, R6W,
 W.M., CLATSOP COUNTY, OREGON

Approximate Net Acreage	MC Acres
Area 1 (MC)	104
Area 2 (MC)	52
Area 3 (MC)	24
Area 4 R/W	4
Total Sale Acreage =	184

- Legend**
- Count Plot
 - Cruise Plot



Approximate Scale 1" = 1000'

TC PSCSTGR		Species, Sort Grade - Board Foot Volumes (Project)																	
T07N R06W S35 TyRW2.00 T07N R06W S35 TyTAKE182.00						Project: GREASYH										Page 1			
						Acres 184.00										Date 12/21/2015			
																Time 10:44:57AM			
Spp	S So Gr T rt ad	% Net BdFt	Bd. Ft. per Acre			Total Net MBF	Percent of Net Board Foot Volume								Average Log				Logs Per /Acre
							Log Scale Dia.				Log Length				Ln Ft	Dia In	Bd Ft	CF/ Lf	
			4-5	6-11	12-16		17+	12-20	21-30	31-35	36-99								
A	DO1S	18		531	531	98	100				46		54		34	12	188	1.59	2.8
A	DO2S	19		530	530	98	100				50		50		34	11	151	1.26	3.5
A	DO4S	63		1,807	1,807	333	100				13	16	15	57	32	6	49	0.60	37.1
A Totals		7		2,868	2,868	529	81	19		8	28	9	55	32	7	66	0.73	43.5	
H	DO2S	1	14.6	4	4	1	100				100				40	30	1400	7.82	.0
H	DO3S	1	13.0	2	2	0	15 85				15		85		31	18	400	3.18	.0
H	DO4S	98		286	286	53	100				100				16	7	30	0.56	9.5
H Totals		1	.3	293	292	54	98	0	2	98	0		2	16	7	31	0.57	9.5	
D	DOCU		100.0	407											10	19		0.00	3.0
D	DO2S	76	1.6	30,449	29,948	5,510		1	41	58			2	98	40	16	432	2.33	69.3
D	DO3S	20	.5	7,722	7,684	1,414		94	6		3	6	14	77	36	9	112	0.86	68.8
D	DO4S	4		1,330	1,330	245	4	96			38	43		18	24	7	33	0.48	40.3
D Totals		92	2.4	39,908	38,962	7,169	0	23	33	44	2	3	4	91	34	11	215	1.45	181.4
C	DO3S	84		1	1	0		50	50				82	18	35	10	139	1.57	.0
C	DO4S	16		0	0	0		100			100				18	6	24	0.81	.0
C Totals		0		2	2	0		57	43		15		70	15	26	8	80	1.31	.0
Totals			2.2	43,071	42,125	7,752	0	27	32	41	3	4	4	88	33	10	180	1.30	234.4

TC PSTATS				PROJECT STATISTICS				PAGE	1			
				PROJECT	GREASYH			DATE	12/21/2015			
TWP	RGE	SC	TRACT	TYPE		ACRES	PLOTS	TREES	CuFt	BdFt		
07N	06	35	AREA123	00MC		184.00	69	327	1	W		
			PLOTS	TREES	TREES PER PLOT	ESTIMATED TOTAL TREES	PERCENT SAMPLE TREES					
TOTAL			69	327	4.7							
CRUISE			31	124	4.0	25,172	.5					
DBH COUNT												
REFOREST												
COUNT			38	181	4.8							
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
DOUG FIR			89	74.3	21.5	87	40.4	187.4	39,907	38,961	9,107	9,035
R ALDER			14	38.6	13.8	39	10.8	40.2	2,868	2,868	1,026	1,026
SNAG			13	12.2	16.9	48	4.6	18.9	588		177	
WHEMLOCK			2	9.6	11.0	17	1.9	6.3	287	287	86	86
CEDLEAV			4	1.4	20.2	38	0.7	3.2	161	161	69	69
DOUGLEAV			1	.6	22.0	90	0.3	1.6	173	173	45	45
HEMLEAV			1	.1	42.0	105	0.1	.8	210	180	42	42
TOTAL			124	136.8	18.6	64	59.9	258.4	44,194	42,631	10,551	10,303
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		70.3	7.4	744	803	863						
R ALDER		76.2	21.1	75	95	115						
SNAG												
WHEMLOCK												
CEDLEAV		104.7	59.8	58	145	232						
DOUGLEAV												
HEMLEAV												
TOTAL		96.3	8.7	568	623	677		370	93	41		
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		68.8	8.3	68	74	80						
R ALDER		190.7	22.9	30	39	47						
SNAG		234.3	28.2	9	12	16						
WHEMLOCK		406.1	48.8	5	10	14						
CEDLEAV		418.8	50.4	1	1	2						
DOUGLEAV		583.0	70.1	0	1	1						
HEMLEAV		830.7	99.9	0	0	0						
TOTAL		51.4	6.2	128	137	145		106	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		
DOUG FIR		59.4	7.1	174	187	201						
R ALDER		186.6	22.4	31	40	49						
SNAG		230.3	27.7	14	19	24						
WHEMLOCK		406.1	48.8	3	6	9						
CEDLEAV		406.1	48.8	2	3	5						
DOUGLEAV		583.0	70.1	0	2	3						
HEMLEAV		830.7	99.9	0	1	2						
TOTAL		28.2	3.4	250	258	267		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		

TWP	RGE	SC	TRACT	TYPE	ACRES		PLOTS	TREES	CuFt	BdFt
07N	06	35	AREA123	00MC	184.00		69	327	1	W
DOUG FIR			59.9	7.2	36,153	38,961	41,769			
R ALDER			189.0	22.7	2,216	2,868	3,521			
SNAG										
WHEMLOCK			406.1	48.8	147	287	427			
CEDLEAV			488.1	58.7	66	161	255			
DOUGLEAV			583.0	70.1	52	173	295			
HEMLEAV			830.7	99.9	0	180	361			
TOTAL			46.3	5.6	40,257	42,631	45,004	86	21	10

TC PSTATS			PROJECT STATISTICS						PAGE	1		
			PROJECT GREASYH						DATE	12/21/2015		
TWP	RGE	SC	TRACT	TYPE		ACRES	PLOTS	TREES	CuFt	BdFt		
07N	06	35	AREA123	RW		184.00	138	601	1	W		
07N	06W	35	AREA123	TAKE								
			PLOTS	TREES	TREES PER PLOT	ESTIMATED TOTAL TREES	PERCENT SAMPLE TREES					
TOTAL			138	601	4.4							
CRUISE			57	218	3.8	22,708	1.0					
DBH COUNT												
REFOREST												
COUNT			80	363	4.5							
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			179	74.3	21.5	87	40.4	187.4	39,908	38,962	9,107	9,035
R ALDER			28	38.6	13.8	39	10.8	40.2	2,868	2,868	1,026	1,026
WHEMLOCK			5	9.5	11.0	17	1.9	6.3	293	292	87	87
WR CEDAR			4	.0	20.2	38	0.0	.0	2	2	1	1
SNAG			2	.9	17.5	57	0.4	1.6				
TOTAL			218	123.4	18.7	66	54.5	235.5	43,071	42,125	10,221	10,150
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			70.3	5.3	758	801	843					
R ALDER			74.8	14.4	81	95	109					
WHEMLOCK			159.7	110.5		773	1,628					
WR CEDAR			104.7	59.8	58	145	232					
SNAG												
TOTAL			85.1	5.8	649	689	729	289	72	32		
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			137.2	11.7	66	74	83					
R ALDER			283.3	24.1	29	39	48					
WHEMLOCK			575.9	49.0	5	10	14					
WR CEDAR			598.6	50.9	0	0	0					
SNAG			1174.7	99.9	0	1	2					
TOTAL			131.1	11.2	110	123	137	687	172	76		
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			128.4	10.9	167	187	208					
R ALDER			278.0	23.6	31	40	50					
WHEMLOCK			573.6	48.8	3	6	9					
WR CEDAR			580.9	49.4	0	0	0					
SNAG			1174.7	99.9	0	2	3					
TOTAL			110.8	9.4	213	236	258	491	123	55		
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			128.9	11.0	34,691	38,962	43,234					
R ALDER			281.1	23.9	2,183	2,868	3,554					
WHEMLOCK			564.3	48.0	152	292	432					
WR CEDAR			695.1	59.1	1	2	3					
SNAG												
TOTAL			118.5	10.1	37,878	42,125	46,371	561	140	62		

Log Stock Table - MBF

T07N R06W S35 TyRW 2.00
T07N R06W S35 TyTAKE 182.00

Project: GREASYH
Acres 184.00

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Date 12/21/2015
Time 10:48:56AM

S T Spp	So rt	Gr de	Log Len	Gross MBF	Def %	Net MBF	% Sp	Net Volume by Scaling Diameter in Inches											
								2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-19	20-22	23-27	28-39	40+
A	DO	1S	30	45		45	8.5					45							
A	DO	1S	40	53		53	10.0					53							
A	DO	2S	30	49		49	9.3					49							
A	DO	2S	40	48		48	9.2					48							
A	DO	4S	20	43		43	8.1			43									
A	DO	4S	30	52		52	9.8			52									
A	DO	4S	32	48		48	9.2			48									
A	DO	4S	40	189		189	35.9			189									
A	Totals			528		528	6.8			333		98	98						
H	DO	2S	40	1	14.6	1	1.3											1	
H	DO	3S	22	0	25.0	0	.1							0					
H	DO	3S	40	0	10.5	0	.6									0			
H	DO	4S	16	53		53	98.0			53									
H	Totals			54		54	.7			53				0		0		1	
D	DO	CU	2	2	100.0														
D	DO	CU	6	32	100.0														
D	DO	CU	8	12	100.0														
D	DO	CU	34	29	100.0														
D	DO	2S	32	87		87	1.2					20		16		51			
D	DO	2S	40	5,516	1.7	5,423	75.7					66	565	1076	1793	1148	648	128	
D	DO	3S	16	4		4	.1					4							
D	DO	3S	18	4		4	.1					4							
D	DO	3S	20	37		37	.5			4	17	12	5						
D	DO	3S	24	12		12	.2				6	7							
D	DO	3S	26	7		7	.1				7								
D	DO	3S	27	10		10	.1					10							
D	DO	3S	28	40		40	.6			11	29								
D	DO	3S	30	15		15	.2					15							
D	DO	3S	32	175	1.9	172	2.4			47	7	110		8					
D	DO	3S	34	27		27	.4			4	15	8							
D	DO	3S	36	49		49	.7			22	17	10							
D	DO	3S	38	18		18	.2					18							
D	DO	3S	40	1,022		1,019	14.2			152	134	662	71						

Log Stock Table - MBF

T07N R06W S35 TyRW 2.00
T07N R06W S35 TyTAKE 182.00

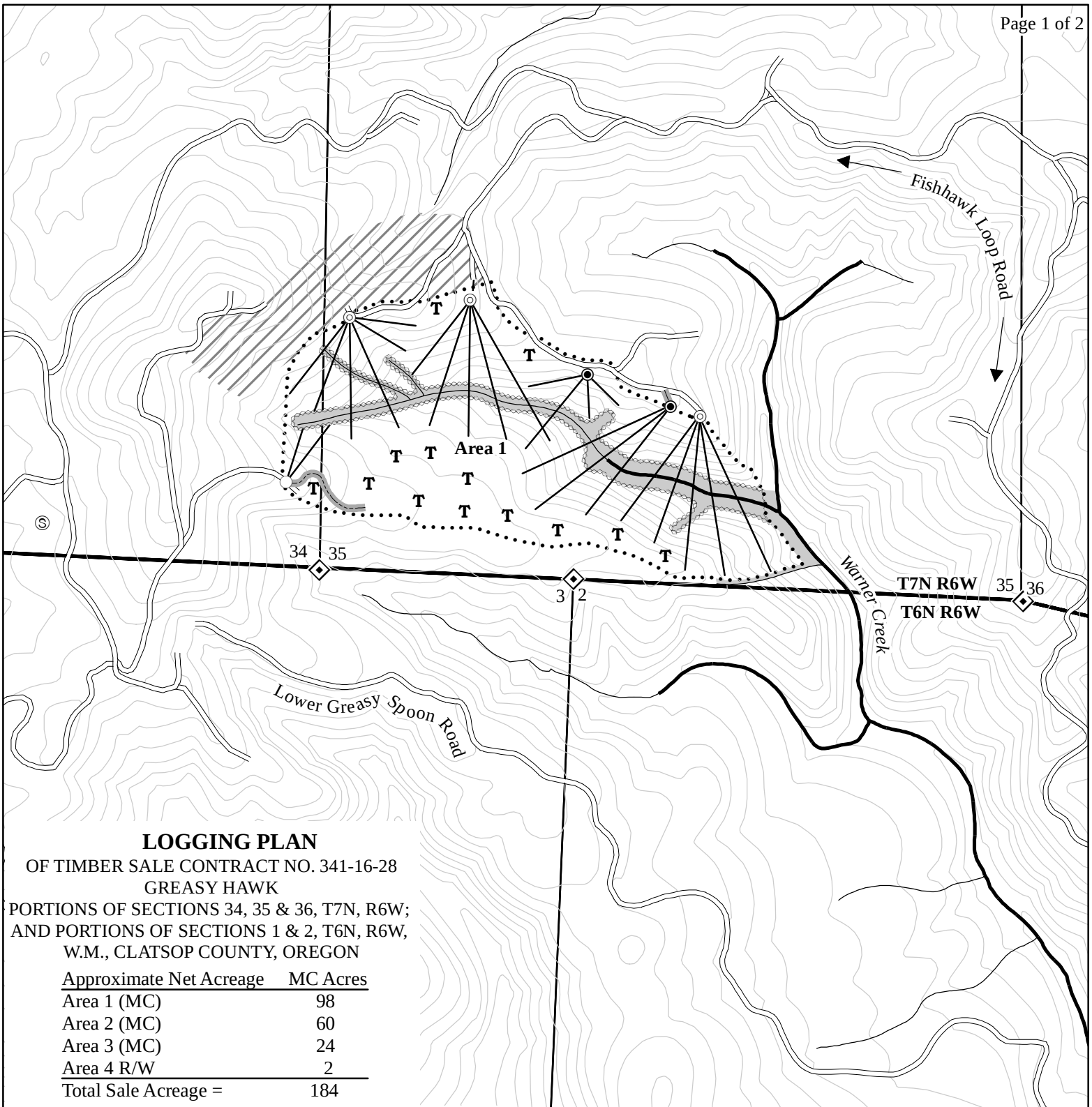
Project: GREASYH
Acres 184.00

Page 2
Date 12/21/2015
Time 10:48:56AM

S T Spp	So Gr rt	Log de 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	20-22	23-27	28-39	40+	
D	DO	4S 12	5		5	.1				2		4							
D	DO	4S 14	3		3	.0			3										
D	DO	4S 16	33		33	.5			11	21									
D	DO	4S 18	8		8	.1			8										
D	DO	4S 20	45		45	.6			30	14									
D	DO	4S 22	12		12	.2			12										
D	DO	4S 24	32		32	.5			28	5									
D	DO	4S 26	27		27	.4			27										
D	DO	4S 28	34		34	.5			34										
D	DO	4S 40	45		45	.6		10	35										
D	Totals		7,343	2.4	7,169	92.5		10	429	273	928	661	1100	1793	1199	648	128		
C	DO	3S 32	0		0	69.6					0		0						
C	DO	3S 40	0		0	15.0			0										
C	DO	4S 16	0		0	4.5			0										
C	DO	4S 18	0		0	5.6			0										
C	DO	4S 20	0		0	5.3				0									
C	Totals		0		0	.0			0	0	0		0						
Total	All Species		7,925	2.2	7,751	100.0		10	814	273	1026	758	1100	1793	1199	648	129		

TC		PSTNDSUM		Stand Table Summary										Page 1		
														Date: 12/21/2015		
T07N R06W S35 TyRW2.00 T07N R06W S35 TyTAKE182.00				Project GREASYH						Time: 10:48:56AM						
				Acres 184.00						Grown Year:						
S Spc	T	Sample		Tot		Trees/ Acre	BA/ Acre	Logs Acre	Average Log		Net		Net		Totals	
		DBH	Trees	FF 16'	Av Ht				Net Cu.Ft.	Net Bd.Ft.	Tons/ Acre	Cu.Ft. Acre	Bd.Ft. Acre	Tons	Cunits	MBF
D		11	4	88	103	6.367	4.20	9.55	14.7	53.3		140	509		258	94
D		12	2	80	27	2.675	2.10	2.68	10.0	20.0		27	54		49	10
D		13	2	83	36	2.279	2.10	2.28	14.0	30.0		32	68		59	13
D		14	4	87	77	3.931	4.20	5.90	21.3	70.0		126	413		231	76
D		15	8	89	90	6.848	8.40	11.98	25.1	92.9		301	1,113		554	205
D		16	2	88	112	1.505	2.10	3.01	30.5	120.0		92	361		169	66
D		17	8	88	106	5.332	8.40	10.66	31.5	115.0		336	1,226		618	226
D		18	4	89	120	2.378	4.20	5.94	33.4	128.0		199	761		365	140
D		19	4	88	119	2.134	4.20	5.34	36.4	138.0		194	736		357	135
D		20	6	88	130	2.889	6.30	8.67	36.8	143.3		319	1,242		587	229
D		21	10	88	123	4.367	10.50	12.23	41.8	172.9		511	2,114		940	389
D		22	15	87	133	5.580	14.73	16.72	45.0	188.1		753	3,146		1,385	579
D		23	10	88	139	3.641	10.50	10.92	51.1	213.3		558	2,330		1,026	429
D		24	18	88	129	6.019	18.91	18.06	51.8	219.3		935	3,959		1,720	728
D		25	10	89	138	3.082	10.50	8.63	63.1	275.7		545	2,379		1,002	438
D		26	8	86	129	2.279	8.40	6.27	64.9	270.9		407	1,698		749	312
D		27	6	89	144	1.585	6.30	4.76	72.1	338.9		343	1,612		631	297
D		28	10	89	138	2.457	10.50	7.86	69.9	320.0		549	2,516		1,011	463
D		29	10	87	140	2.373	10.89	6.66	80.2	369.5		534	2,462		983	453
D		30	6	87	141	1.284	6.30	3.85	86.4	410.0		333	1,579		613	291
D		31	8	89	137	1.603	8.40	4.81	91.2	444.2		439	2,136		808	393
D		32	6	85	142	1.129	6.30	3.76	88.8	399.0		334	1,501		615	276
D		34	6	87	152	1.000	6.30	3.00	118.2	578.9		355	1,736		652	319
D		35	4	85	163	.629	4.20	1.89	129.2	643.3		244	1,214		448	223
D		36	2	85	144	.297	2.10	.89	123.7	603.3		110	538		203	99
D		38	2	83	140	.267	2.10	.80	110.3	473.3		88	379		162	70
D		42	2	82	158	.218	2.10	.66	178.3	866.7		117	568		215	104
D		44	2	88	146	.199	2.10	.60	195.0	1026.7		116	613		214	113
D		Totals	179	87	114	74.345	187.39	178.36	50.7	218.4		9,035	38,962		16,625	7,169
A		10	2	86	61	5.270	2.87	5.27	14.0	50.0		74	263		136	48
A		11	2	86	26	4.355	2.87	4.36	9.0	20.0		39	87		72	16
A		13	10	87	51	15.591	14.37	15.59	21.2	54.0		331	842		608	155
A		15	6	87	54	7.026	8.62	7.03	31.3	66.7		220	468		405	86
A		16	2	86	69	2.058	2.87	4.12	22.5	80.0		93	329		170	61
A		18	2	87	66	1.626	2.87	3.25	27.0	90.0		88	293		162	54
A		19	2	86	66	1.460	2.87	1.46	56.0	180.0		82	263		150	48
A		21	2	87	73	1.195	2.87	2.39	42.0	135.0		100	323		185	59
A		Totals	28	87	53	38.581	40.24	43.46	23.6	66.0		1,026	2,868		1,888	528
H		11	4	77	18	9.538	6.29	9.54	9.0	30.0		86	286		158	53
H		42	1	85	129	.003	.03	.01	170.0	733.3		1	6		3	1
H		Totals	5	77	18	9.541	6.32	9.55	9.1	30.6		87	292		160	54
C		18	1	72	20	.005	.01	.00	18.0	20.0		0	0		0	0
C		19	1	82	52	.004	.01	.00	42.0	60.0		0	0		0	0
C		20	1	71	71	.004	.01	.01	29.5	70.0		0	1		0	0
C		26	1	86	70	.002	.01	.00	52.5	180.0		0	1		0	0
C		Totals	4	77	49	.015	.03	.02	34.4	80.4		1	2		1	0
SN		15	1	89	83	.636	.78									
SN		22	1	88	59	.296	.78									
SN		Totals	2	89	75	.932	1.56									

TC		PSTNDSUM		Stand Table Summary										Page		2	
														Date:		12/21/2015	
T07N R06W S35 TyRW2.00 T07N R06W S35 TyTAKE182.00				Project		GREASYH						Time:		10:48:56AM			
				Acres		184.00						Grown Year:					
S Spc	T	Sample DBH		Tot FF Av 16' Ht		Trees/ BA/ Logs Acre Acre Acre		Average Log Net Net Cu.Ft. Bd.Ft.		Tons/ Acre	Net Cu.Ft. Acre	Net Bd.Ft. Acre	Totals Tons Cunits MBF				
Totals		218		86 87		123.415 235.54 231.39		43.9 182.0		10,150 42,125		18,675 7,751					



LOGGING PLAN

OF TIMBER SALE CONTRACT NO. 341-16-28
GREASY HAWK

PORTIONS OF SECTIONS 34, 35 & 36, T7N, R6W;
AND PORTIONS OF SECTIONS 1 & 2, T6N, R6W,
W.M., CLATSOP COUNTY, OREGON

Approximate Net Acreage	MC Acres
Area 1 (MC)	98
Area 2 (MC)	60
Area 3 (MC)	24
Area 4 R/W	2
Total Sale Acreage =	184

Legend

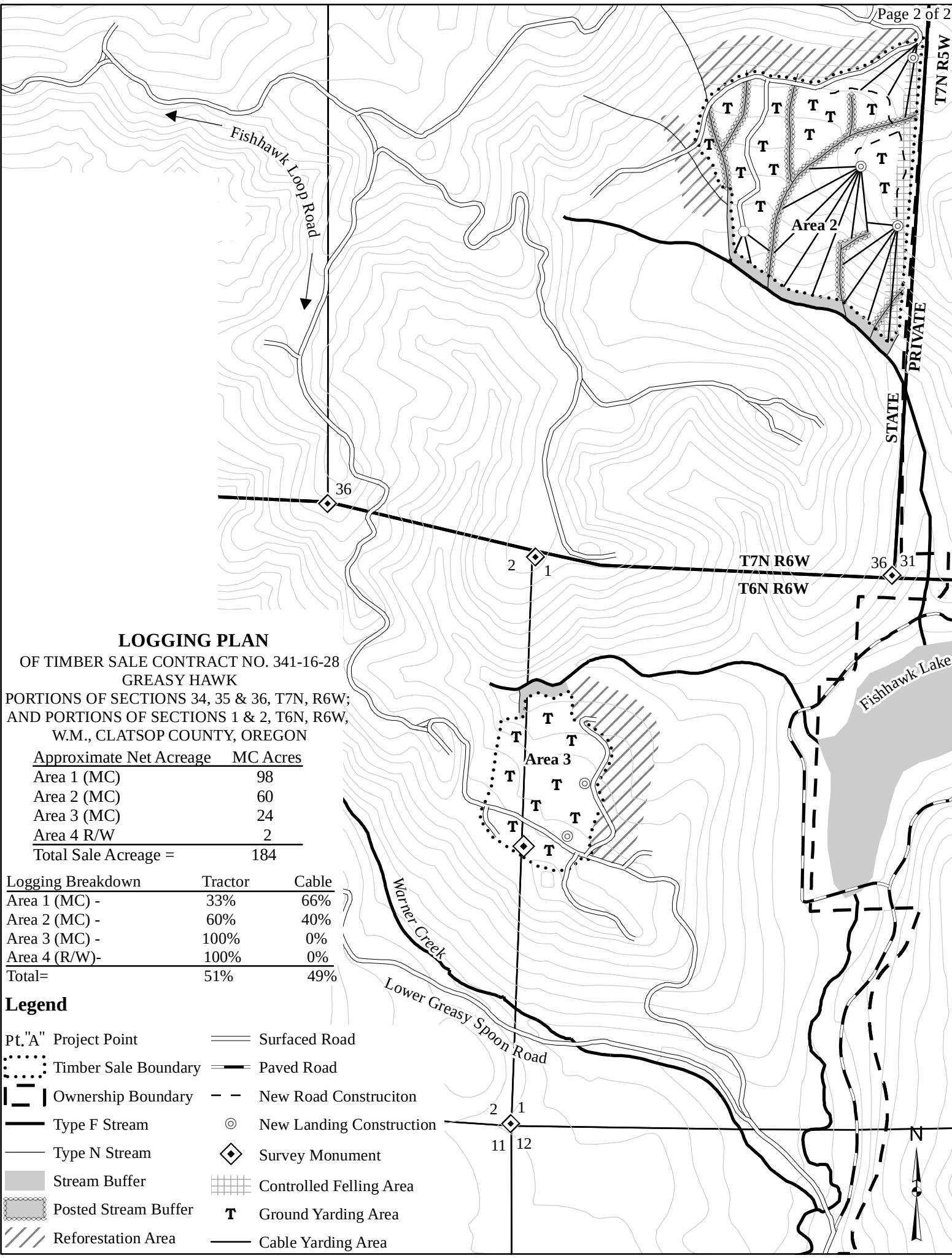
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|-----------------------|----------------------------|
| Pt. "A" Project Point | /// Reforestation Area |
| Timber Sale Boundary | - - New Road Construction |
| Ownership Boundary | ⊙ New Landing Construction |
| Type F Stream | ○ Existing Landing |
| Type N Stream | ◆ Survey Monument |
| Stream Buffer | T Ground Yarding Area |
| Posted Stream Buffer | — Cable Yarding Area |
| Surfaced Road | — Non-Project Road |
| Paved Road | ● Non-Project Landing |

Logging Breakdown	Tractor	Cable
Area 1 (MC) -	33%	66%
Area 2 (MC) -	60%	40%
Area 3 (MC) -	100%	0%
Area 4 (R/W)-	100%	0%
Total=	51%	49%

0 500 1,000 2,000
Feet

Approximate Scale 1" = 1000'





LOGGING PLAN

OF TIMBER SALE CONTRACT NO. 341-16-28
GREASY HAWK
PORTIONS OF SECTIONS 34, 35 & 36, T7N, R6W;
AND PORTIONS OF SECTIONS 1 & 2, T6N, R6W,
W.M., CLATSOP COUNTY, OREGON

Approximate Net Acreage	MC Acres
Area 1 (MC)	98
Area 2 (MC)	60
Area 3 (MC)	24
Area 4 R/W	2
Total Sale Acreage =	184

Logging Breakdown	Tractor	Cable
Area 1 (MC) -	33%	66%
Area 2 (MC) -	60%	40%
Area 3 (MC) -	100%	0%
Area 4 (R/W)-	100%	0%
Total=	51%	49%

Legend

Pt. "A" Project Point	— Surfaced Road
Timber Sale Boundary	— Paved Road
Ownership Boundary	- - New Road Construction
Type F Stream	⊙ New Landing Construction
Type N Stream	◆ Survey Monument
Stream Buffer	Controlled Felling Area
Posted Stream Buffer	T Ground Yarding Area
Reforestation Area	— Cable Yarding Area