



"STEWARDSHIP IN FORESTRY"

Timber Sale Appraisal
Grassland
Sale 341-13-27

District: Astoria

Date: May 14, 2013

cost summary

	Conifer	Hardwood	Total
Gross Timber Sale Value	\$3,069,815.50	\$0.00	\$3,069,815.50
Project Work:			\$(484,321.00)
Advertised Value:			\$2,585,494.50



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timber description

Location: Portions of Sections 15, 16, 17, and 20, T5N, R6W, W.M., Clatsop County, Oregon.

Stand Stocking: 80%

SpecieName	AvgDBH	Amortization (%)	Recovery (%)
Douglas - Fir	17	0	97
Western Hemlock / Fir	13	0	97

Volume by Grade	2S	3S	4S	Total
Douglas - Fir	4,846	2,737	462	8,045
Western Hemlock / Fir	22	3	16	41
Total	4,868	2,740	478	8,086



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comments: Pond Values Used: 1st Quarter Calendar Year 2013.

Expected Log Markets: Mist, OR; Clatskanie, OR; Tillamook, OR;
Forest Grove, OR.

Western redcedar and Other Cedars Stumpage Price = Pond Value
minus Logging Cost:
 $\$805.14/\text{MBF} = \$1,000/\text{MBF} - \$194.86/\text{MBF}$

Red Alder and Other Hardwoods Stumpage Price = Pond Value minus
Logging Cost:
 $\$360.14/\text{MBF} = \$555/\text{MBF} - \$194.86/\text{MBF}$

Pulp (Conifer & Hardwood) Price = $\$25/\text{MBF}$

Other Costs (with Profit & Risk to be added):
100% Branding and Painting: $\$1/\text{MBF} \times 8,086 \text{ MBF} = \$8,086$
Log Loader Slash & Landing Piling (includes Move-In and Pile
Materials) = $\$21,155$ (see attached appraisal)
Machine Washing for Noxious Weed Compliance = $\$2,000$
TOTAL Other Costs (with Profit & Risk to be added) = $\$31,241$

Other Costs (No Profit & Risk added):
Snag Creation: $30 \text{ snags} \times \$25/\text{snag} = \$750$
Waterbar and Block Dirt Road Segments after Harvest:
 $\$15.96/\text{station} \times 21.6 \text{ stations} = \344.74
TOTAL Other Costs (No Profit & Risk added) = $\$1,094.74$



"STEWARDSHIP IN FORESTRY"

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logging conditions

combination#: 1 Douglas - Fir 50.00%
Western Hemlock / Fir 50.00%
yarding distance: Short (400 ft) **downhill yarding:** No
logging system: Cable: Medium Tower >40 - <70 **Process:** Manual Falling/Delimbing
tree size: Mature / Partial Cut (900 Bft/tree), 3-5 logs/MBF
loads / day: 6.0 **bd. ft / load:** 4,500
cost / mbf: \$128.15
machines: Log Loader (A)
Tower Yarder (Medium)

combination#: 2 Douglas - Fir 10.00%
Western Hemlock / Fir 10.00%
yarding distance: Medium (800 ft) **downhill yarding:** No
logging system: Shovel **Process:** Manual Falling/Delimbing
tree size: Mature / Partial Cut (900 Bft/tree), 3-5 logs/MBF
loads / day: 9.0 **bd. ft / load:** 4,500
cost / mbf: \$61.84
machines: Shovel Logger

combination#: 3 Douglas - Fir 40.00%
Western Hemlock / Fir 40.00%
yarding distance: Medium (800 ft) **downhill yarding:** No
logging system: Shovel **Process:** Feller Buncher
tree size: Mature Private Forest / Regen Cut (250 Bft/tree), 6-11 logs/MBF
loads / day: 11.0 **bd. ft / load:** 4,000
cost / mbf: \$32.69
machines: Feller Buncher w/ Delimber



"STEWARDSHIP IN FORESTRY"

Timber Sale Appraisal Grassland Sale 341-13-27

District: Astoria

Date: May 14, 2013

logging costs

Operating Seasons:	2.00	Profit Risk:	10.00%
Project Costs:	\$484,321.00	Other Costs (P/R):	\$31,241.00
Slash Disposal:	\$0.00	Other Costs:	\$1,094.74

Miles of Road

Road Maintenance: \$2.95

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	4.5
Western Hemlock / Fir	\$0.00	2.0	4.5

Local Pond Values

Date	Specie	Grade	Value
5/14/13	Douglas - Fir	2S	\$560.00
5/14/13	Douglas - Fir	3S	\$525.00
5/14/13	Douglas - Fir	4S	\$510.00



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Grassland
Sale 341-13-27

District: Astoria

Date: May 14, 2013

logging costs breakdown

Logging	Road Maint	Fire Protect	Hauling	Other P/R appl	Profit & Risk	Slash Disposal	Scaling	Other	Total
Douglas - Fir									
\$83.34	\$3.04	\$1.08	\$54.11	\$3.86	\$14.54	\$0.00	\$5.00	\$0.14	\$165.11
Western Hemlock / Fir									
\$83.34	\$3.04	\$1.08	\$81.15	\$3.86	\$17.25	\$0.00	\$5.00	\$0.14	\$194.86

Specie	Amortization	Pond Value	Stumpage	Amortized
Douglas - Fir	\$0.00	\$545.22	\$380.11	\$0.00
Western Hemlock / Fir	\$0.00	\$483.41	\$288.55	\$0.00



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summary

Amortized

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

Unamortized

Specie	MBF	Value	Total
Douglas - Fir	8,045	\$380.11	\$3,057,984.95
Western Hemlock / Fir	41	\$288.55	\$11,830.55

Gross Timber Sale Value

Recovery: \$3,069,815.50

Prepared by: Derek Bangs

Phone: 503-325-5451

Site Prep Appraisal

Sale Number: 341-13-27
Sale Name: Grassland
Date: 03/04/2013

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	4.0
Hemlock/Spruce	C	2.0	6.0
Hemlock	D	2.0	6.0
Conifer/Hardwood	E	1.5	3.0

Sale Area	Harvest Type	Veg Type/Zone	Ground Based Yarding Acres	Estimated Piling Hours/Area	Cost/Hour	Total Cost/Area
1	MC	A	27	27	\$110.00	\$2,970.00
2	MC	A	91	136.5	\$110.00	\$15,015.00

Sub Total = \$17,985.00

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	0	\$263.00	\$0.00	81	\$5.00	\$405.00
2	0	\$263.00	\$0.00	364	\$5.00	\$1,820.00

*Cost includes separating firewood

Sub Total = \$2,225.00

Move-In Allowance	Number of Move-In's	Total Move-In Allowance
\$945.00	1	\$945.00

Sub Total = \$945.00

Grand Total = \$21,155.00

SUMMARY OF ALL PROJECT COSTS

SALE NAME: Grassland

ROAD CONSTRUCTION:

<u>Road segment</u>	<u>Length/Sta</u>	<u>Cost</u>
A-B, 1A-1B,1C-1D	56.91	\$46,307
2A-2B, 2C-2D,2E-2F		
3A-3B, and 3C		
TOTALS	56.91	\$46,307

ROAD IMPROVEMENT:

<u>Road segment</u>	<u>Length/Sta</u>	<u>Cost</u>
I1-I2 and I3-I4	177.15	\$125,905
TOTALS		\$125,905

SPECIAL PROJECTS:

	<u>Description</u>	<u>Cost</u>
Project No. 3	Rock Crushing Buster Quarry	\$263,057
Project No. 4	Vacating	\$20,844
Project No. 5	Stream Enhancement	\$10,550
	Project Road Maintenance	\$9,808.00

TOTAL \$304,259

MOVE IN:

<u>Equipment</u>	<u>Cost</u>
Excavator (C330)	\$1,406
Excavator (C315)	\$805
Dozer (D8)	\$1,406
Rubber Tired Skidder	\$717
Vibratory Roller	\$778
10-12 yd dump truck (X 5 @ \$163 each)	\$815
20 yd dump truck (X 5 @ \$191 each)	\$955
Large Grader (14G)	\$778
Water Truck (2,500 gal)	\$190

*Mobilization costs for Quarry work added to Project No. 3 costs

*Mobilization costs for Stream Enhancement work added to Project No. 5 costs

TOTAL \$7,850.00

GRAND TOTAL \$484,321

Compiled By: D. Bangs CB

Date: 03/11/2013

SUMMARY OF CONSTRUCTION COSTS

SALE NAME:	Grasslands	NEW CONSTRUCTION:	54.94 STATIONS	1.04 MILES
ROAD:	A-B (4+24), 1A-1B (2+80), 1C-1D (7+30), 2A-2B (11+40),	IMPROVEMENT:		
POINTS:	2C-2D (7+20), 2E-2F (3+00), 3A-3B (19+00)			

CLEARING & GRUBBING

Method	Acres/amount	x	Rate	=	Cost
Scatter Outside of RAW	5	x	\$1,337.00	=	\$6,685.00
Load and Haul to Burn Area (A-B)				=	
C330 (Hours)	3	x	\$155.00	=	\$465.00
Off Highway Dump (Hours)	3	x	\$127.00	=	\$381.00
Pile for Fall Burn	0.3	x	\$2,702.00	=	\$810.60
Note: Secondary mobilization of the C330 for Fall burning is costed for in the crushing costs.					
SUB TOTAL FOR CLEARING & GRUBBING					\$8,342

EXCAVATION

	Material	Cy/amount	x	Rate	=	Cost
A-B	Excavate and endhaul material to crusher site.	1.740	x	\$1.98	=	\$3,445.20
	Road Prism ripping	1,000	x	\$3.00	=	\$3,000.00
	Construct ditchout at end of road. (C330)	0.25	x	\$155.00	=	\$38.75
	Place dissipator rock (C330)	0.25	x	\$155.00	=	\$38.75
1A-1B	Balanced Construction Field Design \$/sta.	2.8	x	\$122.00	=	\$341.60
	Landing Construction	1.00	x	\$389.00	=	\$389.00
1C-1D	Balanced Construction Field Design \$/sta.	7.30	x	\$122.00	=	\$890.60
	Landing Construction	1.00	x	\$389.00	=	\$389.00
2A-2B	Balanced Construction Field Design \$/sta.	11.40	x	\$122.00	=	\$1,390.80
	Landing Construction	1.00	x	\$389.00	=	\$389.00
2C-2D	Balanced Construction Field Design \$/sta.	7.20	x	\$122.00	=	\$878.40
	Landing Construction	1.00	x	\$389.00	=	\$389.00
2E-2F	Balanced Construction Field Design \$/sta.	3.0	x	\$122.00	=	\$366.00
	Landing Construction	1.00	x	\$389.00	=	\$389.00
3A-3B	Balanced Construction Field Design \$/sta.	19.00	x	\$122.00	=	\$2,318.00
3C	Landing Construction	1.00	x	\$389.00	=	\$389.00
SUB TOTAL FOR EXCAVATION						

\$15,042

CULVERT MATERIALS AND INSTALLATION

CULVERT MATERIALS AND INSTALLATION									
Location	Dia/type	Lineal ft.	Rate	Cost	Location	Dia/type	Lineal ft.	Rate	Cost
A-B									
3+24	18"CPP	40	\$19.53	\$781.20					
1C-1D									
4+10	18"CPP	40	\$19.53	\$781.20					
3A-3B									
0+00	18"CPP	40	\$19.53	\$781.20					
Other/miscellaneous:					Description	Quantity	Rate	Cost	
Culvert stakes & markers:					Fiberglass culvert markers	3.00	\$20.00	\$60.00	
SUB TOTAL FOR CULVERT MATERIALS & INSTALLATION									
							Subtotal of Clearing Excl Culv		\$2 404

SURFACING		Subgrade prep:		Description		Stations/ amount		Rate/ sta/amt		Cost	
				Grade, Shape and Ditch 16' (A-B, 1A-1B, 1C-1D, 3A-3B)		33.34		x		\$827.83	
				Subgrade Compaction (A-B, 1A-1B, 1C-1D, 3A-3B)		33.34		x		\$673.13	
				Outslope 14' (2A-2B, 2C-2D, 2E-2F)		21.60		x		\$396.36	

ROAD SEGMENT		1A to 1B		POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)		Rate/ Sta./ amt.		Cost	
Application	Rock Size and Type	Location	Depth of Rock (inches)	1A to 1B		0+00 to 2+80		TOTAL VOLUME (CY)					
				Volume (CY)	per	Number	of						
Base Rock	4"-0" crushed	0+00 to 2+80	8	station	50	stations	2.8	140		\$7.71		\$1,079	
Turn Arounds	4"-0" crushed		8	turn around	11	turn around	1	11		\$7.71		\$85	
Junctions	4"-0" crushed	1A	8	junction	22	junction	1	22		\$7.71		\$170	
Landings	6"-0" Pit Run	1B	N/A	Landing	50	Landings	1	50		\$10.37		\$519	
Total Rock for Road Segment:		1A to 1B						223				\$1,852	

ROAD SEGMENT		1C to 1D		POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)		Rate/ Sta./ amt.		Cost	
Application	Rock Size and Type	Location	Depth of Rock (inches)	1C to 1D		0+00 to 7+30		TOTAL VOLUME (CY)					
				Volume (CY)	per	Number	of						
Base Rock	4"-0" crushed	0+00 to 7+30	8	station	50	stations	7.30	365		\$7.71		\$2,814	
Junctions	4"-0" crushed	1C	8	junction	22	junction	1	22		\$7.71		\$170	
Turn Arounds	4"-0" crushed		8	turn around	11	turn around	1	11		\$7.71		\$85	
Turnouts	4"-0" crushed	5+50	8	turnout	22	turnout	1	22		\$7.71		\$170	
Landings	6"-0" Pit Run	1D	N/A	Landing	50	Landings	1	50		\$10.37		\$519	
Total Rock for Road Segment:		1C to 1D						470				\$3,757	

ROAD SEGMENT		3A to 3B		POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)		Rate/ Sta./ amt.		Cost	
Application	Rock Size and Type	Location	Depth of Rock (inches)	3A to 3B		0+00 to 19+00		TOTAL VOLUME (CY)					
				Volume (CY)	per	Number	of						
Base Rock	4"-0" crushed	3A to 3B	8	station	50	stations	19.00	950		\$7.71		\$7,325	
Turnouts	4"-0" crushed		8	turnout	22	turnouts	2	44		\$7.71		\$339	
Junctions	4"-0" crushed	3A, 3B	8	junction	22	junction	2	44		\$7.71		\$339	
Total Rock for Road Segment:		3A to 3B						1,038				\$8,003	

ROAD SEGMENT			3C		POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	Volume (CY) per	Landing	Number of					
Landings	6"-0" Pit Run	3D	N/A		50	1			50	\$10.37	\$519
Total Rock for Road Segment:				3C					50		
ROAD SEGMENT			A to B		POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)	Rate/ Sta./ amt.	Cost
Application	Rock Size and Type	Location	Depth of Rock (inches)	Volume (CY) per	A to B	Number of					
Base Rock	4"-0" crushed		8	station	50 stations	4.24			212	\$7.71	\$1,635
Surface Rock	1 1/2"-0" crushed		3	station	19 stations	4.24			81	\$7.71	\$621
Dissipator	24"-6" rip rap	3+24		culvert	11 culverts	1			11	\$10.37	\$114
Total Rock for Road Segment:				A to B					304		\$2,370
Processing:											
				Description				No.sta	Rate/sta	Cost	
				Water, Process & Compact Base Rock:				33.34	\$56.48	\$1,883	
				Water, Process & Compact Surfacing Rock:				4.24	\$56.48	\$239	
				24"-6"	6"-0"pr	4"-0"	1 1/2"-0"	Total			
				11	150	1,843	81				
SUB TOTAL FOR NEW CONSTRUCTION SURFACING											\$20,520

SPECIAL PROJECTS		
Description		Cost
SUB TOTAL FOR SPECIAL PROJECTS		
Subtotal of Surfacing & Spec. Proj.		\$20,520
Subtotal of Clearing, Exc., Culv.		\$25,787
GRAND TOTAL		\$46,307

SUMMARY OF CONSTRUCTION COSTS

SALE NAME: Grasslands
ROAD: I1-I2(138.05), I3-I4(39.10)
POINTS: I1-I2(138.05), I3-I4(39.10)
NEW CONSTRUCTION: STATIONS
IMPROVEMENT: 177.15 STATIONS
MILES 3.36 MILES

CLEARING & GRUBBING			
Method	Acres/amount	Rate	Cost
I1-I2			
39+40			
138+05	0.1	\$1,337.00	\$133.70
I3-I4			
Turnaround	1	\$389.00	\$389.00
	0.10	\$1,337.00	\$133.70
SUB TOTAL FOR CLEARING & GRUBBING			\$656

EXCAVATION			
Material	Cy/amount	Rate	Cost
I1-I2			
scatter ditch waste material (\$/sta.)	138.05	\$12.41	\$1,713.20
ditch reestablishment w/315 exc. (\$/hr)	15.00	\$101.00	\$1,515.00
load and haul ditch waste material (\$/sta.)	15.00	\$22.92	\$343.80
excavate contaminated subgrade w/315 (\$/hr)	5.5	\$101.00	\$555.50
load and haul contaminated sub. (\$/sta.)	5.5	\$22.92	\$126.06
Check Dam installation w/315 (\$/hr)	3.00	\$101.00	\$303.00
Place dissipator rock (C330)	0.75	\$155.00	\$116.25
Junction reconstruction			
End-haul excavation (\$/cy)	200	\$4.00	\$800.00
I3-I4			
Place dissipator rock (C330)	0.25	\$155.00	\$38.75
SUB TOTAL FOR EXCAVATION			\$5,512

CULVERT MATERIALS AND INSTALLATION					
Location	Dialtype	Lineal ft.	Rate	Cost	
I1 to I2					
12+15	18" CPP	45	\$19.53	\$878.85	
29+65	18" CPP	45	\$19.53	\$878.85	
32+65	18" CPP	40	\$19.53	\$781.20	
39+40	18" CPP	45	\$19.53	\$878.85	
45+10	18" CPP	35	\$19.53	\$683.55	
59+40	18" CPP	30	\$19.53	\$585.90	
62+75	18" CPP	35	\$19.53	\$683.55	
67+15	18" CPP	35	\$19.53	\$683.55	
68+75	18" CPP	35	\$19.53	\$683.55	
72+15	18" CPP	35	\$19.53	\$683.55	
76+90	18" CPP	35	\$19.53	\$683.55	
79+60	18" CPP	35	\$19.53	\$683.55	
82+10	18" CPP	35	\$19.53	\$683.55	
88+85	18" CPP	35	\$19.53	\$683.55	
92+20	18" CPP	30	\$19.53	\$585.90	
101+45	18" CPP	30	\$19.53	\$585.90	
104+05	18" CPP	30	\$19.53	\$585.90	
107+45	18" CPP	40	\$19.53	\$781.20	

Other/miscellaneous:			
Description	Quantity	Rate	Cost
Culvert stakes & markers:			
Fiberglass culvert markers	25.00	\$20.00	\$500.00
SUB TOTAL FOR CULVERT MATERIALS & INSTALLATION			\$18,370
			\$24,538

Subtotal of Clearing, Exc., Culv.

SURFACING									
Subgrade prep:					Description				
Grade, Shape and Ditch 16'									
Subgrade Compaction									
					Stations/ amount		Rate/ sta/amt		Cost
					177.15		\$24.83	x	\$4,398.63
					177.15		\$20.19	x	\$3,576.66

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 Volume (CY) per	Sta. to Sta. 0+00 to 138+05 Number of				
Subgrade reinforcement	4'0" Crushed	21+20-24+00, 29+50-32+50, 36+70-39+40, 70+30-82+10, 86+15-89+85	N/A	station	n/a	319	\$7.71	\$2,459	
Culvert Bedding/Backfill	1 1/2"-0" Crushed	12+15, 29+65, 32+65, 39+40, 45+10, 59+40, 62+75, 67+15, 68+75, 72+15, 76+90, 79+60, 82+10, 86+85, 92+20, 101+45, 104+05, 107+45, 111+80, 113+90, 116+25, 118+65, 120+25, 133+60	N/A	culvert	n/a	869	\$7.71	\$6,700	
Check Dam	6'-4" Drain Rock	51+35, 51+85, 52+35, 53+10, 53+60, 54+10	N/A	filter	11	99	\$10.37	\$1,027	
Culvert Dissipator	24"-6" Riprap	31+25, 55+40, 107+45,	N/A	culvert	3.00	33	\$10.37	\$342	
Base Rock	4'0" Crushed	0+00-138+05	8	station	138.05	6,903	\$7.71	\$53,218	
Curve Widening	4'0" Crushed		8			550	\$7.71	\$4,241	
Junction Reconstruction	4'0" Crushed	39+40	8	junction	1	66	\$7.71	\$509	
Turnouts	4'0" Crushed	8+50, 12+95, 14+65, 21+20, 27+50, 33+35, 36+70, 49+00, 56+90, 65+70, 70+30, 84+55, 90+55, 99+90, 105+45, 110+55, 128+10, 131+05	8	TO	22	396	\$7.71	\$3,053	
Turnarounds	4'0" Crushed	14+65, 137+05	8	TA	22	44	\$7.71	\$339	
Traction Rock	1 1/2"-0" Crushed	14+65-21+20, 51+35-54+10	2	station	13	121	\$7.71	\$932	
Landings	6'-0" Pit-run	138+05	N/A	Landing	55	55	\$10.37	\$570	
Total Rock for Road Segment:				11 to 12		9,455		\$73,391	

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 Volume (CY) per	Sta. to Sta. 0+00 to 39+10 Number of				
Base Rock	4'0" Crushed	0+00-29+85	4	station	25	746	\$7.71	\$5,754	
Curve Widening	4'0" Crushed		4			33	\$7.71	\$254	
Traction Rock	1 1/2"-0" Crushed	22+50-29+85	2	station	13	99	\$7.71	\$763	
Curve Widening	1 1/2"-0" Crushed		2			22	\$7.71	\$170	
Culvert Bedding/Backfill	1 1/2"-0" Crushed	17+60	N/A	culvert	n/a	33	\$7.71	\$254	
Culvert Dissipator	24"-6" Riprap	17+60	N/A	culvert	1.00	11	\$10.37	\$114	
Turnouts	4'0" Crushed	5+20, 11+95, 15+45, 18+00, 22+50, 25+30, 30+60	N/A	TO	22	154	\$7.71	\$1,187	
Turnarounds	1 1/2"-0" Crushed	22+50, 25+30,	N/A	TO	11	22	\$7.71	\$170	
Leveling Rock	4'0" Crushed	36+90	8	TA	22	22	\$7.71	\$170	
Total Rock for Road Segment:	1 1/2"-0" Crushed	29+85-39+10	N/A	station	n/a	100	\$7.71	\$771	
				13 to 14		1,242		\$9,607	

SUB TOTAL FOR SURFACING									
				24"-6"	6'-4"	6'-0"pr	4'-0"	1 1/2"-0"	
				44	99	55	9,233	1,266	\$101,367

SPECIAL PROJECTS									
Description								Cost	
Processing:								No. sta	Rate/sta
Water, Process & Compact:								177.15	\$66.48
Compact Traction Rock								16.00	\$24.28
								Total	
								10,697	\$101,367

SUB TOTAL FOR SPECIAL PROJECTS									
								\$0	
								\$101,367	
								\$24,538	

GRAND TOTAL									
								\$125,905	

Compiled By: Kraig Kirkpatrick
 Date: 02/20/2013

CRUSHED ROCK COST

SALE NAME:	Grasslands
PROJECT:	No. 1, 2, and 3
QUARRY:	Buster

MATERIAL: $\frac{4"-0" \text{Crushed}}{1 \frac{1}{2}"-0" \text{Crushed}}$

DATE: 02/20/2013
BY: Kirkpatrick/Bangs

[illegible]

ROCK HAUL:

Truck type: D20 No. trucks: 5
 Delay min.: 8 Efficiency: 85%

Ave haul:	\$6.44	/cy
Load:	\$0.48	/cy
Spread:	\$0.78	/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 = 1,111

CRUSHED ROCK HAUL COSTS 12,423 cy @ \$7.71 /cy

PIT RUN ROCK COST

SALE NAME:	Grasslands
PROJECT:	No. 1, 2, and 3
QUARRY:	Buster

MATERIAL: Pit Run/Rip Rap/Drain Rock

DATE: 02/20/2013
BY: Kirkpatrick/Bangs

[illegible]

ROCK HAUL:

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

Ave haul:	\$7.37	/cy
Load:	\$1.08	/cy
Spread:	\$1.92	/cy

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

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

Production: cy/day = 428

PIT RUN ROCK HAUL COSTS

359 cy @ \$10.37 /cy

DATE: 01/18/13
BY: d.mellison

		Cubic Yards								Total
Segment	Stations	Base	Landing	Turnout	Turnaround	Overburden		Misc		
Rock Source						550			550	
Grand Total						550			550	

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	
Rock Source		550			0.50	0.69	0.10	0.10	0.10	1.49
TOTAL		550								AVERAGE HAUL 1.49
STA./NO.		CU. YD.			0.50	0.69	0.10	0.10	0.10	
CUBIC YARD WEIGHTED HAUL					0.50	0.69	0.10	0.10	0.10	

Average Round Trip Distance (miles) 2.98

ROCK HAUL:

Ave haul:	1.793636	/cy
Load:	\$1.16	/cy
Compaction		/cy

Production: cy/day = 1,070

550 cy @ \$2.95 /cy

$$\text{Load} = \$155/\text{hr} * 8 \text{ hrs.} \setminus 1,070 \text{ cy/day} = \$1.16$$

SUMMARY OF ROCK DEVELOPMENT AND CRUSHING COSTS

PROJECT NO. 3	Timber Sale Name: Grasslands
Quarry: Buster Creek	Swell:
Location: NW 1/4, Sec. 25, T5N, R7W	Shrink: 16%
County: Clatsop	
By: d.mellison	Loading Hopper: No
Date: 02/19/13	

ROCK SIZE	REJECT	GRADATION	STOCKPILE CU. YDS.	TRUCK MEAS CU. YDS.	TOTAL CU. YDS.
3/4"-0"		CR			
1-1/2"-0"	20%	CR	4,000	1,347	5,987
4"-0"	20%	CR	6,000	11,076	18,036
6"-0"		PR		205	205
24"-6"		RR		55	55
6"-4"		DR		99	99
TOTAL CUBIC YARDS OF ROCK:			10,000	12,782	24,382

Note: It is estimated that that there is 150 cy of 4"-0" and 50 cy of 11/2"-0" crushed rock piled where the new crusher site will be constructed. This rock will be used in conjunction with new rock crushed to surface road segment A to B.

1) MOBILIZATION & SET UP:

EQUIPMENT	QUANTITY	RATE	COST	EQUIPMENT	QUANTITY	RATE	COST
Dump Trucks		\$163		Off Highway Dump Truck	1	\$553	\$553
Screening Plants	1	\$553	\$553	Screening Plant		\$553	
D8 Cat		\$1,406		Loading Hopper		\$553	
D6 Cat	1	\$778	\$778	Loader	2	\$805	\$1,610
Drill & Compressor	1	\$1,406	\$1,406				
Powder	1	\$351	\$351	3 Stage Crusher	1	\$2,891	\$2,891
Dump Trucks		\$163					
Excavator	1	\$1,406	\$1,406	Small Excavator	1	\$805	\$805

SUB TOTAL FOR MOBILIZATION

\$10,353

EQUIPMENT SET UP	TIMES	RATE	COST
3 Stage Crusher	1	\$3,439	\$3,439
Screening Plants			
Loading Hopper			
Original Calibration	1	\$544	\$544

SUB TOTAL FOR SET UP COSTS

\$3,983

TOTAL MOBILIZATION & SET UP COSTS

\$14,336

2) CLEARING & GRUBBING

DESCRIPTION	QUANTITY	UNIT	RATE	COST
Rock Source (Pile & Burn)	0.07	acres	\$2,702	\$189
Truck to Burn Area				
C330	2	hours	\$155	\$310
OH Truck	2	hours	\$127	\$254
Crusher Site (Pile & Burn)	0.387	acres	\$2,702	\$1,046
Move debris to burn area				
C330	4	hours	\$155	\$620
OH Truck	2	hours	\$127	\$254
Mobilize C330 for Fall/Winter burn	1	each	\$1,406	\$1,406
Develop Waste Area C330	2	hours	\$155	\$310
OH Truck	1	hour	\$127	\$127

TOTAL CLEARING & GRUBBING COSTS

\$4,516

3) EXCAVATION

MATERIAL DESCRIPTION	QUANTITY	UNIT	RATE	COST
Rock Source Overburden removal	1,100	cubic yards		
Haul to Crusher site	550	cubic yards	\$1.98	\$1,089
Haul to Waste area	550	cubic yards	\$2.95	\$1,623
Crusher Site Construction				
* Spread endhauled material	1,740	cubic yards		
D6 Cat	12	hours	\$113	\$1,356
Common drift from site	248	cubic yards	\$1.80	\$446
Spread overburden material	550	cubic yards		
D6 Cat	4	hours	\$113	\$452
Fill Compaction	2,538	cubic yards	\$0.70	\$1,777

* Material endhauled to the crusher site comes from the construction of road segment (A to B).

TOTAL EXCAVATION COSTS

\$6,743

4) DEVELOP ROCK

ROCK SUMMARY			METHOD	%	QUANTITY	RATE	COST
Type	Cu. yd.	Vol.	Weight	Ripping		\$2.20	
crushed	23,748	99%	Drill & shoot	100%	28,813	\$2.70	\$77,794
pit run	205	1%	Oversize red	3%	719	\$5.80	\$4,168
rip rap	55	0%	Other				
Total	24,008						
reject	4,805	20.0%					

TOTAL ROCK DEVELOPMENT COSTS

\$81,962

5) CALIBRATION & TESTING

DESCRIPTION	NO.	\$/TEST	COST
Calibrate	2	\$507.00	\$1,014
Calibrate			
Test	13	\$57.30	\$745
Test			

TOTAL CALIBRATION & TESTING COSTS

\$1,759

6) FEEDING & LOADING

DESCRIPTION	CU. YD. QUANTITY	COST CU. YD.	TOTAL COST
Dig & Feed Rock	28,553	\$0.81	\$23,051

TOTAL FEEDING & LOADING COSTS

\$23,051

7) ROCK CRUSHING

ROCK SIZE	ROCK TYPE	CU. YD. QUANTITY	CRUSHER TYPE	HOURLY PRODUCTION	RATE CU. YD.	TOTAL COST
3/4"-0"	crushed		3 stage w/s			
1-1/2"-0"	crushed	5,987	3 stage w/s	120	\$3.24	\$19,408
4"-0"	crushed	18,036	3 stage w/s	140	\$2.78	\$50,114
6"-4"	crushed	66	3 stage w/s	140	\$2.78	\$183

TOTAL ROCK CRUSHING COSTS

\$69,706

8) STOCKPILING

STOCKPILE SITE PREPARATION

Equipment	Hours	Rate	Total
Dozer		\$113.00	
Compactor		\$77.00	
Grader	1	\$100.00	\$100.00
Excavator		\$155.00	

Rock for Floor (CY)	\$/CY Haul	Total

\$100.00

SUB TOTAL \$100

HAUL & STOCKPILE		SIZE	# of TRUCKS	CU. YDS.	RATE	COST
STOCKPILE LOCATION						
1.						
2.	Buster Creek	1-1/2"-0"	6	4,640	\$4.83	\$22,419
3.	Buster Creek	4"-0"	6	6,960	\$4.83	\$33,628
4.						
5.			2			
6.						

SUB TOTAL \$56,047

TOTAL STOCKPILING COSTS \$56,147

9) MISCELLANEOUS COSTS

DESCRIPTION	COST
Load, Haul, and Spread the reject material at the waste area.	\$4,036
\$0.84 /CY 4,805 CY	
Waterbar, block roads, and shape quarry floor	
C330 2 hours \$155	\$310
D6 Cat 2 hours \$113	\$226
Seed & Mulch Waste Areas: 10 Straw bales \$10.73	\$107
4 Hr. (Labor) \$40.00	\$160

TOTAL MISCELLANEOUS COSTS \$4,839

10) GRAND TOTAL: \$263,057

\$/Cubic Yard \$11.08

Footnotes:

HAUL and STOCKPILE COST

SALE NAME: Grasslands
 QUARRY: Buster Creek ROCK TYPE: Crushed

Location 1. 0	ONE WAY HAUL IN MILES						
	50 MPH	30 MPH	25 MPH	20 MPH	15 MPH	10 MPH	5 MPH
							0.10
Truck type: <u>D12</u> No. trucks: _____ Delay min.: <u>15</u> Efficiency: <u>75%</u> Ave haul: #DIV/0! /cy Load: #N/A /cy Stockpile: #N/A /cy Truck type: <u>D12</u> No. trucks: _____ Delay min.: <u>12</u> Efficiency: <u>75%</u> Production: cy/day = 0 Truck type: _____ No. trucks: _____ Delay min.: <u>10</u> Efficiency: <u>75%</u>							
Location 1. 0		Haul and Stockpile Cost				#DIV/0! /cy	

Location 2. Buster Creek 1-1/2"-0"	ONE WAY HAUL IN MILES						
	50 MPH	30 MPH	25 MPH	20 MPH	15 MPH	10 MPH	5 MPH
				0.40	1.35	0.10	0.10
Truck type: <u>D20</u> No. trucks: _____ Delay min.: <u>15</u> Efficiency: <u>75%</u> Ave haul: \$3.49 /cy Load: \$0.51 /cy Stockpile: \$0.83 /cy Truck type: <u>D12</u> No. trucks: <u>6</u> Delay min.: <u>12</u> Efficiency: <u>85%</u> Production: cy/day = 1,088 Truck type: <u>D10</u> No. trucks: _____ Delay min.: <u>10</u> Efficiency: <u>75%</u>							
Location 2. Buster Creek		Haul and Stockpile Cost				\$4.83 /cy	

Location 3. Buster Creek 4"-0"	ONE WAY HAUL IN MILES						
	50 MPH	30 MPH	25 MPH	20 MPH	15 MPH	10 MPH	5 MPH
				0.40	1.35	0.10	0.10
Truck type: <u>D20</u> No. trucks: _____ Delay min.: <u>15</u> Efficiency: <u>75%</u> Ave haul: \$3.49 /cy Load: \$0.51 /cy Stockpile: \$0.83 /cy Truck type: <u>D12</u> No. trucks: <u>6</u> Delay min.: <u>12</u> Efficiency: <u>85%</u> Production: cy/day = 1,088 Truck type: <u>D10</u> No. trucks: _____ Delay min.: <u>10</u> Efficiency: <u>75%</u>							
Location 3. Buster Creek		Haul and Stockpile Cost				\$4.83 /cy	

HAUL and STOCKPILE COST

Location 4. 0	ONE WAY HAUL IN MILES						
	50 MPH	30 MPH	25 MPH	20 MPH	15 MPH	10 MPH	5 MPH
				1.00	1.00		
Truck type: <u>D20</u> No. trucks: <u> </u> Delay min.: <u>15</u> Efficiency: <u>75%</u> Truck type: <u>D12</u> No. trucks: <u> </u> Delay min.: <u>12</u> Efficiency: <u>75%</u> Truck type: <u>D10</u> No. trucks: <u> </u> Delay min.: <u>10</u> Efficiency: <u>75%</u>							
				Ave haul: #DIV/0! /cy Load: #N/A /cy Stockpile: #N/A /cy			
				Production: cy/day = 0			
Location 4. 0		Haul & Stockpile Cost			#DIV/0! /cy		

Location 5. 0	ONE WAY HAUL IN MILES						
	50 MPH	30 MPH	25 MPH	20 MPH	15 MPH	10 MPH	5 MPH
							0.10
Truck type: <u>D20</u> No. trucks: <u>2</u> Delay min.: <u>15</u> Efficiency: <u>75%</u> Truck type: <u>D12</u> No. trucks: <u> </u> Delay min.: <u>12</u> Efficiency: <u>75%</u> Truck type: <u>D10</u> No. trucks: <u> </u> Delay min.: <u>10</u> Efficiency: <u>75%</u>							
				Ave haul: \$1.52 /cy Load: \$0.51 /cy Stockpile: \$0.83 /cy			
				Production: cy/day = 1,054			
Location 5. 0		Haul & Stockpile Cost			\$2.86 /cy		

Location 6. 0	ONE WAY HAUL IN MILES						
	50 MPH	30 MPH	25 MPH	20 MPH	15 MPH	10 MPH	5 MPH
				1.00	1.00		
Truck type: <u>D20</u> No. trucks: <u> </u> Delay min.: <u>15</u> Efficiency: <u>75%</u> Truck type: <u>D12</u> No. trucks: <u> </u> Delay min.: <u>12</u> Efficiency: <u>75%</u> Truck type: <u>D10</u> No. trucks: <u> </u> Delay min.: <u>10</u> Efficiency: <u>75%</u>							
				Ave haul: #DIV/0! /cy Load: #N/A /cy Stockpile: #N/A /cy			
				Production: cy/day = 0			
Location 6. 0		Haul & Stockpile Cost			#DIV/0! /cy		

Grasslands

Project No.4 Road Vacating

Location/Description	C330 Excavator	C315 Excavator	C330 Excavator	Truck	Labor	Seeding	Straw Mulch	Total
V1 to V2 0+00-19+10 Fill Removals Waterbar	12 hrs	6 hrs	17 Waterbars	12 hrs				
V3 to V4 0+00-28+55 Fill Removals Waterbar	8 hrs		20 Waterbars					
V5 to V6 0+00-15+70 Remove culverts Waterbar	4 hrs		12 Waterbars					
V7 to V8 0+00-123+70 Fill Removals Remove culverts Waterbar	14 hrs 3 hrs	6 hrs	12 Waterbars					
V9 to V10 0+00-29+25 Fill Removals Waterbar	29 hrs	12 hrs	28 Waterbars	12 hrs				
Total	70 hrs	24 hrs	89	24 hr	2 ac	200 lb	100 Bales	
Rate	\$155 /hr	\$101 /hr	### ea	\$79 /hr	\$628 /ac	\$1.15 /lb	\$10.73 /Bale	
Cost	\$10,850	\$2,424	\$3,115	\$1,896	\$1,256	\$230	\$1,073.00	\$20,844

Prepared by: Kraig Kirkpatrick Date:

02/07/2013

**Grassland
Stream Enhancement**

Location	Site	No. Tops	Number of Logs	\$/Tree*	Number of Straw Bales	\$/Bale	Cost per Site
SE1-SE2	1	5	5	\$250.00	2	\$10.73	\$1,271.46
SE1-SE2	2	5	5	\$250.00	2	\$10.73	\$1,271.46
SE1-SE2	3	5	5	\$250.00	2	\$10.73	\$1,271.46
SE1-SE2	4	5	5	\$250.00	2	\$10.73	\$1,271.46
SE1-SE2	5	5	5	\$250.00	2	\$10.73	\$1,271.46
SE1-SE2	6	5	5	\$250.00	2	\$10.73	\$1,271.46
SE1-SE2	7	5	5	\$250.00	2	\$10.73	\$1,271.46

Grass Seed 25lbs. @\$1.60 lb=\$40.00

8 hrs. @\$40.00 hrs.=320.00

*\$/Tree includes transportation cost of tree up to 1 mile.

Subtotal	\$8,900
Seed	\$40
Labor	\$320
Equipment Move-In	\$1,290
Project Total	<u>\$10,550</u>

Projects Road Maintenance Cost Summary

Sale: Grassland
Date: 11-Mar-13
By: Derek Bangs CB

Type	Equipment/Rationale	Hours	Rate	Cost
Final Haul	Grader 14G	32	\$100	\$3,200
Road	Dump Truck 12CY	8	\$79	\$632
Maintenance	FE Loader C966	8	\$83	\$664
Haul Route	Vibratory Roller	32	\$77	\$2,464
	Water Truck 2,500 gallon	32	\$89	\$2,848
Total				\$9,808

Production Rates	Miles/day	Distance(miles)	Days
Grader	1.5	5.9	3.9
Vibratory Roller	1.5	5.9	3.9

Road Maintenance Cost Summary

Sale: Grassland
 Date: 04-Mar-13
 By: D. Bangs **CB**

MBF: 8.086
 \$\$/MBF: \$2.95

Type	Equipment/Rationale	Move-in Rate	Times	Hours	Rate	Cost	Production Rates			
Progressive Operations 1st Entry	Grader 14G	\$778	1	20	\$100	\$2,778	Production Rates	Miles/day	Distance(miles)	Days
	Dump Truck 12CY x 2	\$163	2	8	\$79	\$1,590	Grader	2.5	5.0	2.0
	FE Loader C966	\$778	1	8	\$83	\$1,442				
Final Road Maintenance	Grader 14G	\$778	1	50	\$100	\$5,778	Production Rates	Miles/day	Distance(miles)	Days
	Dump Truck 12CY x 2	\$163	2	10	\$79	\$1,906	Grader	1.5	7.5	5.0
	FE Loader C966	\$778	1	10	\$83	\$1,608	Vibratory Roller	1.5	7.5	5.0
	Vibratory Roller	\$778	1	50	\$77	\$4,628				
	Water Truck 2,500 gallon	\$190	1	40	\$89	\$3,750				
	Labor			10	\$40	\$400				
Total										\$23,880

**Grassland
TIMBER CRUISE REPORT
FY 2013**

1. Sale Area Location: Areas 1, 2, and 3 are located in portions of Sections 15, 16, 17, and 20, T5N, R6W and W.M., Clatsop County, Oregon.

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

3. Sale Acreage by Area:

Area	Treatment	Gross Acres	Existing R/W	Non-Thinnable	New Road	GTRA	Stream Buffer	Net Acres	Survey Method
1	Modified Clearcut	42	2	0	1	1	11	27	GIS
2	Modified Clearcut	121	5	0	2	1	21	92	GIS
3	Partial Cut	268	13	14	2	0	52	187	GIS
4	Right-of-Way	5	0	0	0	0	0	5	GIS
TOTALS		436	20	14	5	2	84	311	

4. Cruisers and Cruise Dates: Areas 1 and 2 were cruised by Kevin Berry, Derek Bangs, Nick Haile, and David Rygell, January 31, 2013. Area 3 was cruised by Kevin Berry, Nick Haile, and David Rygell, February 1, 2013.

5. Cruise Method and Computation:

Areas 1 and 2 are modified clearcut units and were variable plot cruised using a 40 BAF. These plots are located on a 3 chain by 7 chain grid, with every third plot measured and graded. A total of 56 plots were sampled, with 19 measured and graded plots, and 37 count plots. Cedar is a reserve species, and was recorded as "leave" trees.

Area 3 is an "auto-mark" thinning unit (SDI 32), and was variable plot cruised using a 40 BAF. These plots are located on a 3 chain by 12 chain grid, with every third plot measured and graded. A total of 54 plots were sampled, with 19 measured and graded plots, and 35 count plots. Cedar and Alder are reserve species, and were recorded as "leave" trees. The "biggest and best" trees were recorded as "leave" trees to meet a target residual basal area of 140 ft²/acre. Hardwoods do not count towards the residual basal area.

All cruisers used Corvallis MicroTechnology (CMT) and/or Allegro data collectors, and were 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.

* Statistic reports "cruise" and "count" plot totals vary due to two count plots with a measured and take hemlock trees and one count plot with a measured and graded leave hemlock tree.

AREA	CRUISE	TRACT	TYPE	ACRES
1 and 2	T5NR6W SEC 16	AREA12	00MC	119
3	T5NR6W SEC 17	AREA3	TAKE	187
4	T5NR6W SEC 16	RIGHT-OF-WAY	ROW	5

6. Timber Description:

Areas 1 and 2 are modified clearcut units consisting of a two story stand of approximately 70 year old Douglas fir and scattered western hemlock and approximately 37 year old Douglas fir. The average Douglas-fir tree size is 16.8 inches DBH and 51 feet to a merchantable top (6 inch d.i.b., or 40% of the diameter at 16 ft.). The average volume per acre to be harvested (net) is 26.8 MBF.

Area 3 is an "auto-mark" thinning unit, approximately 70 years old, consisting of Douglas-fir stands mixed with hemlock. This stand will be thinned to a SDI of 32 (145 Sq.Ft.BA), removing approximately 100 trees per acre and 25.5 MBF/acre. The average Douglas-fir tree size to be harvested is 17.2 inches DBH, with an average height of 73 feet to a merchantable top.

Area 4 R/W is similar to the timber description mentioned above for Areas 1 and 2. The average volume (net) is approximately 26.8 MBF/acre.

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

Statistics for Stand B.F. volumes

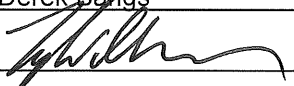
Area	Estimated CV	Target SE%	Actual CV	Actual SE%
1 & 2 (MC)	58%	10%	36.1%	4.8%
3 (PC)	58%	11%	57.3%	7.8%

8. Volumes by Species and Log Grade: (See "Species, Sort, Grade - Type and Project Reports, attached, of individual sale areas and combined areas and two cruise types).

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

Species	DBH	Net Vol.	2 Saw	3Saw	4 Saw	% D & B	% Sale
Douglas-fir	17.1	8,045	4,846	2,737	462	3%	99%
Hemlock/true fir	12.6	41	22	3	16	3%	1%
TOTALS		8,086	4,917	2,766	483		

9. Approvals:

Prepared by: Derek Bangs Date: February 22, 2013
Unit Forester Approval:  Date: 2/22/13

10. **Attachments:**
- Cruise Designs and Maps - 4 pages
 - Volume Reports - 4 pages
 - Statistics Reports - 4 pages
 - Log Stock Tables - 2 pages
 - Stand Table Summary - 1 page

**CRUISE DESIGN
ASTORIA DISTRICT**

Sale Name: Grasslands **Area** 1 & 2

Harvest Type: (MC) "Modified Clearcut"

Approx. Cruise Acres: 121 **Estimated CV%** 58% Net BF **SE% Objective** 10 Net BF

Planned Sale Volume : 8,155 MBF **Estimated Sale Area Value/Acre:** \$12,140/Ac
(Sale Area 1 and 2) (35 MBF/Ac.)

A. Cruise Goals: (a) Grade minimum 100 trees
(b) Sample 50 cruise plots (17 grade/ 33 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 40 Full point
Cruise Line Direction(s): AZ= 45°
Cruise Line Spacing 7 (chains)
Cruise Plot Spacing 3 (chains)
Grade/Count Ratio 1/2

Record Cedar and marked wildlife trees as leave. Record snags as SN and estimate heights and diameters. Grade alder as camprun (30 net BF minimum). If plot lands in buffer or road then offset at least one chain and continue.

C. Tree Measurements:

- 1. Diameter:** Minimum DBH to cruise is 8" for conifers and 10" 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.
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 = Camprun; 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 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: Derek Bangs
Approved by:  12/14/12
Date: 12/14/12

**CRUISE DESIGN
ASTORIA DISTRICT**

Sale Name: Grassland **Area(s)** 3

Harvest Type: (PC) "Partial Cut"

Approx. Cruise Acres: 196 **Estimated CV%** 58% Net BF **SE% Objective** 11 Net BF

Planned Sale Volume : 2,940 MBF **Estimated Sale Area Value/Acre:** \$4,875
(15 mbf acre.)

A. Cruise Goals: (a) Grade minimum 85 conifer
(b) Sample 50 cruise plots (14 grade/ 28 count); (c) Other goals (X 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 40 (Full point; Half point) (circle one)
Cruise Line Direction(s) AZ= 360° (North/South)

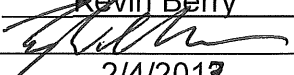
Cruise Line Spacing 12 (chains)
Cruise Plot Spacing 3 (chains)
Grade/Count Ratio 1/2

The BA target is 130 sqft. Alternate leaving 3 to 4 trees every other plot. **Alder DOES NOT count for Basal Area.** Record all hardwood as camp run. Record all cedar as leave trees. Record all snags as SN and record total height and diameter. 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 1/2" 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.
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 = Camprun; 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 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: Kevin Berry
Approved by:  2/4/13
Date: 2/4/2013

Cruise Map

OF TIMBER SALE CONTRACT NO. 341-13-27
GRASSLAND
PORTIONS OF SECTIONS 15, 16, 17, AND 20
T5N,R6W, W.M., CLATSOP COUNTY, OREGON

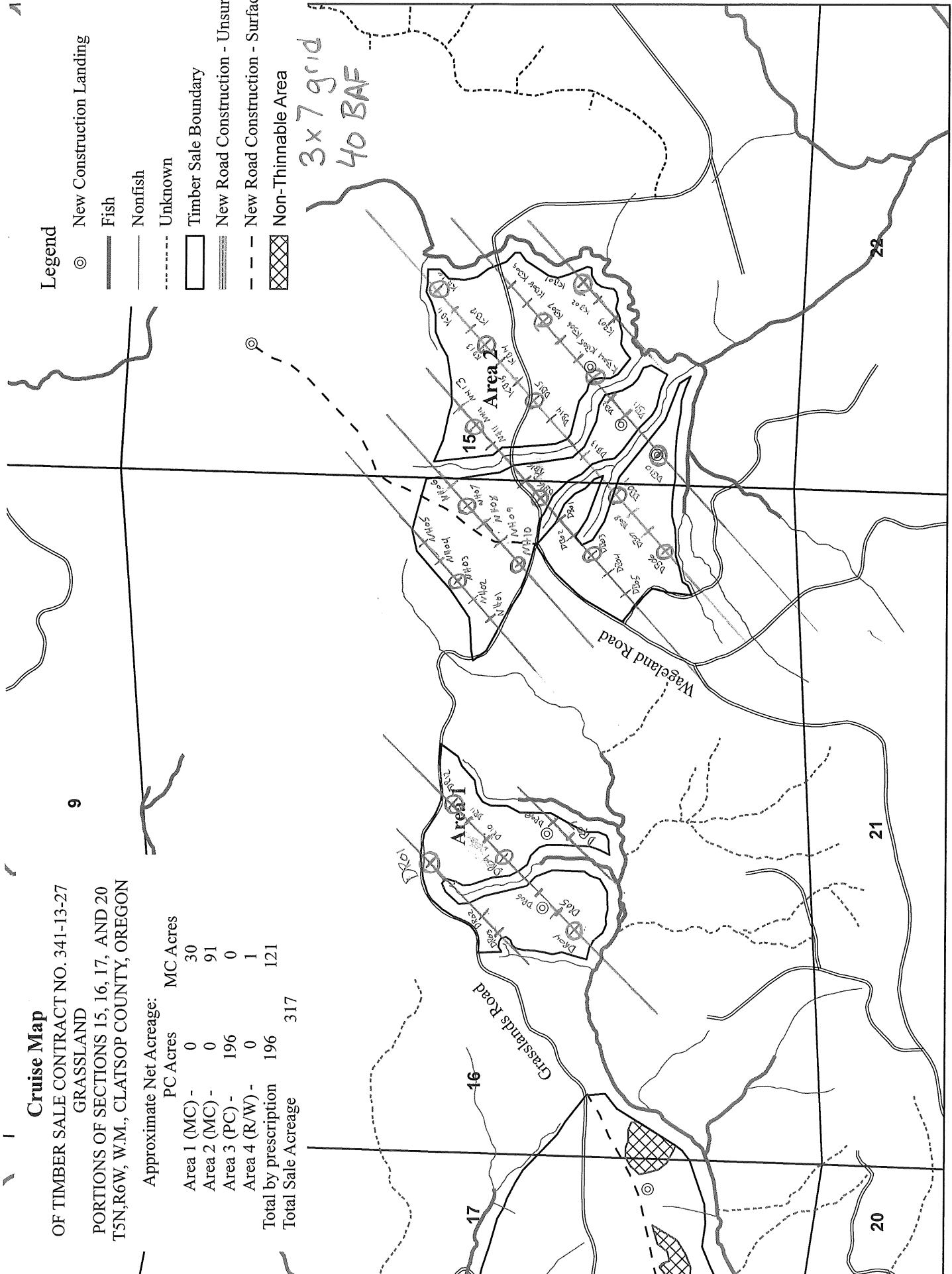
Approximate Net Acreage:

PC Acres	MC Acres
Area 1 (MC) -	0
Area 2 (MC) -	30
Area 3 (PC) -	91
Area 4 (R/W) -	0
Total by prescription	121
Total Sale Acreage	196
	317

Legend

- ⊙ New Construction Landing
- Fish
- Nonfish
- - - Unknown
- ▭ Timber Sale Boundary
- ▨ New Road Construction - Unsurfaced
- - - New Road Construction - Surfaced
- ▩ Non-Thinnable Area

3x7 grid
40 BAF

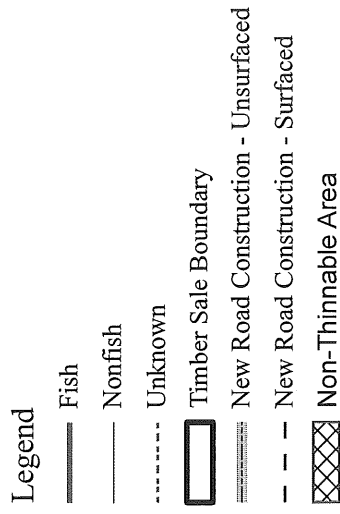


Cruise Map

OF TIMBER SALE CONTRACT NO. 341-13-27
GRASSLAND
PORTIONS OF SECTIONS 15, 16, 17, AND 20
T5N,R6W, W.M., CLATSOP COUNTY, OREGON

Approximate Net Acreage:

	PC Acres	MC Acres
Area 1 (MC) -	0	30
Area 2 (MC) -	0	91
Area 3 (PC) -	196	0
Area 4 (R/W) -	0	1
Total by prescription	196	121
Total Sale Acreage		317



TC		Species, Sort Grade - Board Foot Volumes (Project)																	
PSPCSTGR																			
T05N R06W S16 Ty00MC119.00 T05N R06W S16 TyROW5.00 T05N R06W S17 TyTAKE187.00		Project:		GRASSLAN												Page1			
		Acres		311.00												Date3/12/2013			
																Time7:49:11AM			
S Spp	So T	Gr rt ad	% Net BdFt	Bd. Ft. per Acre			Total Net MBF	Percent of Net Board Foot Volume								Average Log			Logs Per /Acre
								Log Scale Dia.				Log Length				Ln Ft	Bd Ft	CF/ Lf	
				4-5	6-11	12-16		17+	12-20	21-30	31-35	36-99							
D		DOCU		100.0	252										6		0.00	4.5	
D		DO2S	60	1.6	15,838	15,581	4,846		4	54	42	0	2	16	81	38	332	2.02	46.9
D		DO3S	34	1.9	8,969	8,801	2,737		96	4	1	1	4	27	68	36	89	0.72	98.9
D		DO4S	6	.4	1,491	1,485	462	5	95			29	57	5	8	23	29	0.44	50.5
D Totals			99	2.6	26,550	25,867	8,045	0	40	34	26	2	6	19	73	33	129	1.02	200.8
H		DOCU		100.0	4											24		0.00	.1
H		DO2S	54		71	71	22			100			33	67		30	209	1.64	.3
H		DO3S	7		10	10	3		100					100		31	40	0.61	.3
H		DO4S	39		50	50	16		100					100		32	50	0.34	1.0
H Totals			1	2.7	136	132	41		46	54			18	82		31	78	0.63	1.7
Totals				2.6	26,686	25,999	8,086	0	40	34	26	2	6	20	72	33	128	1.02	202.5

T		TSPCSTGR		Species, Sort Grade - Board Foot Volumes (Type)										Page		1			
				Project: GRASSLAN										Date		3/12/2013			
														Time		7:50:01AM			
T05N R06W S16 T00MC										T05N R06W S16 T00MC									
Twp		Rge		Sec		Tract		Type		Acres		Plots		Sample Trees		CuFt		BdFt	
05N		06W		16		AREA12		00MC		119.00		56		86		1		W	
S So Gr T rt ad Spp			% Net BdFt	Bd. Ft. per Acre Def% Gross Net			Total Net MBF	Percent Net Board Foot Volume								Average Log			Logs Per /Acre
								Log Scale Dia.				Log Length				Ln	Bd	CF/ Lf	
								4-5	6-11	12-16	17+	12-20	21-30	31-35	36-99	Ft	Ft		
D DO CU				00.0	632											7		0.00	9.3
D DO 2S			62	2.1	16,981	16,625	1,978		24	76		0	5	9	86	38	537	3.08	31.0
D DO 3S			32	3.1	8,817	8,546	1,017		89	9	2	2	7	33	58	35	88	0.77	97.1
D DO 4S			6		1,602	1,602	191	13	87			31	45	13	11	23	28	0.40	56.4
D Totals			100	4.5	28,031	26,773	3,186	1	34	18	48	3	8	17	72	31	138	1.13	193.7
H DO CU				00.0	9											24		0.00	.2
H DO 2S			100		59	59	7		100			100				26	260	2.46	.2
H Totals			0	13.3	68	59	7		100			100				25	130	1.28	.5
Type Totals				4.5	28,099	26,832	3,193	1	34	18	48	3	8	17	72	31	138	1.13	194.2

T TSPCSTGR		Species, Sort Grade - Board Foot Volumes (Type)												Page 1					
		Project: GRASSLAN												Date	3/12/2013				
														Time	7:50:38AM				
T05N R06W S17 TTAKE												T05N R06W S17 TTAKE							
Twp	Rge	Sec	Tract	Type	Acres	Plots	Sample Trees	CuFt	BdFt										
05N	06W	17	AREA3	TAKE	187.00	54	62	1	W										
S So Gr Spp T rt ad			% Net BdFt	Bd. Ft. per Acre			Total Net MBF	Percent Net Board Foot Volume								Average Log			Logs Per /Acre
			Def%	Gross	Net	Log Scale Dia.				Log Length				Ln Ft	Bd Ft	CF/ Lf			
D	DO	CU															0.00	1.4	
D	DO	2S	58	1.3	15,081	14,888	2,784		6	77	17			22	78	38	259	1.64	57.4
D	DO	3S	36	1.1	9,070	8,970	1,677		100			1	1	23	74	37	90	0.69	100.2
D	DO	4S	6	.7	1,418	1,408	263		100			28	67		6	22	30	0.47	46.6
D Totals			99	1.2	25,569	25,266	4,725		45	45	10	2	4	21	73	34	123	0.95	205.5
H	DO	2S	44		80	80	15			100				100		32	190	1.41	.4
H	DO	3S	9		17	17	3		100					100		31	40	0.61	.4
H	DO	4S	47		84	84	16		100					100		32	50	0.34	1.7
H Totals			1		180	180	34		56	44				100		32	72	0.57	2.5
Type Totals				1.2	25,749	25,447	4,759		45	45	10	2	4	22	72	34	122	0.95	208.0

T TSPCSTGR		Species, Sort Grade - Board Foot Volumes (Type)												Page 1					
		Project: GRASSLAN												Date	3/12/2013				
														Time	7:51:09AM				
T05N R06W S16 TROW										T05N R06W S16 TROW									
Twp	Rge	Sec	Tract	Type	Acres	Plots	Sample Trees	CuFt	BdFt										
05N	06W	16	RIGHT-OF-WAY	ROW	5.00	56	81	1	W										
S So Gr T rt ad Spp			% Net BdFt	Bd. Ft. per Acre Def% Gross Net			Total Net MBF	Percent Net Board Foot Volume								Average Log			Logs Per /Acre
			Log Scale Dia.					Log Length				Ln Ft	Bd Ft	CF/ Lf					
								4-5	6-11	12-16	17+	12-20	21-30	31-35	36-99				
D	DO	CU		00.0	632											7	0.00	9.3	
D	DO	2S	62	2.1	16,981	16,625	83			24	76	0	5	9	86	38	537	3.08	31.0
D	DO	3S	32	3.1	8,817	8,546	43		89	9	2	2	7	33	58	35	88	0.77	97.1
D	DO	4S	6		1,602	1,602	8	13	87			31	45	13	11	23	28	0.40	56.4
D Totals			100	4.5	28,031	26,773	134	1	34	18	48	3	8	17	72	31	138	1.13	193.7
H	DO	CU		00.0	9											24	0.00	.2	
H	DO	2S	100		59	59	0			100			100			26	260	2.46	.2
H Totals			0	13.3	68	59	0			100			100			25	130	1.28	.5
Type Totals				4.5	28,099	26,832	134	1	34	18	48	3	8	17	72	31	138	1.13	194.2

TC PSTATS			PROJECT STATISTICS					PAGE 1				
			PROJECT		GRASSLAN		DATE 3/12/2013					
TWP	RGE	SC	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt			
05N	06	16	AREA12	00MC	311.00	166	768	1	W			
05N	06W	16	RIGHT-OF-WAY	ROW								
05N	06W	17	AREA3	TAKE								
			PLOTS	TREES	TREES PER PLOT	ESTIMATED TOTAL TREES	PERCENT SAMPLE TREES					
TOTAL			166	768	4.6							
CRUISE			57	229	4.0	35,004	.7					
DBH COUNT												
REFOREST												
COUNT			104	520	5.0							
BLANKS			5									
100 %												
STAND SUMMARY												
			SAMPLE TREES	TREES /ACRE	AVG DBH	BOLE LEN	REL DEN	BASAL AREA	GROSS BF/AC	NET BF/AC	GROSS CF/AC	NET CF/AC
DOUG FIR			220	107.8	17.1	63		171.1	26,550	25,867	6,700	6,656
SNAG			5	3.4	16.3	28		4.9				
WHEMLOCK			4	1.4	12.6	39		1.2	136	132	35	33
TOTAL			229	112.6	17.0	62		177.2	26,686	25,999	6,735	6,689
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			128.1	8.6	544	595	647					
SNAG												
WHEMLOCK			50.5	28.9	142	200	258					
TOTAL			131.0	8.7	526	575	625		686	171	76	
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			98.0	7.6	100	108	116					
SNAG			362.6	28.1	2	3	4					
WHEMLOCK			992.6	77.0	0	1	2					
TOTAL			95.3	7.4	104	113	121		362	91	40	
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			94.9	7.4	159	171	184					
SNAG			337.1	26.1	4	5	6					
WHEMLOCK			748.2	58.0	0	1	2					
TOTAL			92.2	7.1	165	177	190		339	85	38	
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			97.7	7.6	23,908	25,867	27,827					
SNAG												
WHEMLOCK			777.9	60.3	52	132	212					
TOTAL			96.7	7.5	24,049	25,999	27,950		374	93	42	

TC TSTATS				STATISTICS				PAGE	1		
				PROJECT	GRASSLAN			DATE	3/12/2013		
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt		
05N	06W	16	AREA12	00MC	119.00	56	284	1	W		
			PLOTS	TREES	TREES PER PLOT	ESTIMATED TOTAL TREES	PERCENT SAMPLE TREES				
TOTAL		56	284	5.1							
CRUISE		19	86	4.5		15,543		.6			
DBH COUNT											
REFOREST											
COUNT		37	194	5.2							
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		80	121.6	16.8	51		187.9	28,031	26,773	6,841	6,730
SNAG		5	8.8	16.3	28		12.9				
WHEMLOCK		1	.2	24.0	52		.7	68	59	20	15
TOTAL		86	130.6	16.8	50		201.4	28,099	26,832	6,861	6,745
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		125.8	14.0	594	691	788					
SNAG											
WHEMLOCK											
TOTAL		132.3	14.3	554	646	738	699 175		78		
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		45.5	6.1	114	122	129					
SNAG		195.3	26.1	7	9	11					
WHEMLOCK		748.3	99.9	0	0	0					
TOTAL		45.3	6.1	123	131	139	82 21		9		
CL:	68.1 %	COEFF	BASAL AREA/ACRE				# OF PLOTS REQ.		INF. POP.		
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5 10		15		
DOUG FIR		36.3	4.8	179	188	197					
SNAG		179.0	23.9	10	13	16					
WHEMLOCK		748.3	99.9	0	1	1					
TOTAL		34.7	4.6	192	201	211	48 12		5		
CL:	68.1 %	COEFF	NET BF/ACRE				# OF PLOTS REQ.		INF. POP.		
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5 10		15		
DOUG FIR		36.8	4.9	25,458	26,773	28,089					
SNAG											
WHEMLOCK		748.3	99.9	0	59	118					
TOTAL		36.1	4.8	25,537	26,832	28,127	52 13		6		

TC TSTATS				STATISTICS				PAGE	1		
				PROJECT	GRASSLAN			DATE	3/12/2013		
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt		
05N	06W	17	AREA3	TAKE	187.00	54	218	1	W		
				TREES	ESTIMATED	PERCENT					
				PER PLOT	TOTAL	SAMPLE					
					TREES	TREES					
TOTAL		54	218	4.0							
CRUISE		19	62	3.3	18,852		.3				
DBH COUNT											
REFOREST											
COUNT		30	145	4.8							
BLANKS		5									
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		60	98.7	17.2	73	160.0	25,569	25,266	6,607	6,607	
WHEMLOCK		2	2.1	11.4	39	1.5	180	180	45	45	
TOTAL		62	100.8	17.1	73	161.5	25,749	25,447	6,652	6,652	
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		61.0	7.9	313	340	366					
WHEMLOCK		90.9	85.1	21	140	259					
TOTAL		62.3	7.9	307	333	360	155	39	17		
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		62.6	8.5	90	99	107					
WHEMLOCK		603.3	82.0	0	2	4					
TOTAL		59.2	8.1	93	101	109	140	35	16		
CL:	68.1 %	COEFF	BASAL AREA/ACRE				# OF PLOTS REQ.		INF. POP.		
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5 10		15		
DOUG FIR		58.9	8.0	147	160	173					
WHEMLOCK		514.7	70.0	0	1	3					
TOTAL		56.9	7.7	149	161	174	129	32	14		
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		58.8	8.0	23,246	25,266	27,287					
WHEMLOCK		516.0	70.2	54	180	307					
TOTAL		57.3	7.8	23,465	25,447	27,429	131	33	15		

TC TSTATS				STATISTICS				PAGE	1		
				PROJECT	GRASSLAN			DATE	3/12/2013		
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt		
05N	06W	17	AREA3	LEAV	187.00	54	241	1	W		
				TREES	ESTIMATED	PERCENT					
				PER PLOT	TOTAL	SAMPLE					
					TREES	TREES					
TOTAL		54	241	4.5							
CRUISE		21	85	4.0	8,986			.9			
DBH COUNT											
REFOREST											
COUNT		33	146	4.4							
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
DOUGLEAV		71	39.2	26.1	105		145.9	34,852	34,220	7,615	7,577
SNAG		12	7.4	27.0	39		29.6				
ALDRLEAV		1	1.1	19.0	55		2.2	248	248	73	73
HEMLEAV		1	.2	24.0	111		.7	193	193	44	44
TOTAL		85	48.1	26.1	94		178.5	35,293	34,662	7,732	7,694
CONFIDENCE LIMITS OF THE SAMPLE											
68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR											
CL:	68.1 %	COEFF	SAMPLE TREES - BF					# OF TREES REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH		5	10	15	
DOUGLEAV		97.5	11.6	1,038	1,173	1,309					
SNAG											
ALDRLEAV											
HEMLEAV											
TOTAL		113.4	12.3	870	992	1,114		513	128	57	
CL:	68.1 %	COEFF	TREES/ACRE					# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH		5	10	15	
DOUGLEAV		27.8	3.8	38	39	41					
SNAG		180.0	24.5	6	7	9					
ALDRLEAV		416.2	56.6	0	1	2					
HEMLEAV		734.8	99.9	0	0	0					
TOTAL		15.8	2.1	47	48	49		10	2	1	
CL:	68.1 %	COEFF	BASAL AREA/ACRE					# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH		5	10	15	
DOUGLEAV		20.0	2.7	142	146	150					
SNAG		136.7	18.6	24	30	35					
ALDRLEAV		416.2	56.6	1	2	3					
HEMLEAV		734.8	99.9	0	1	1					
TOTAL		7.2	1.0	177	179	180		2	1	0	
CL:	68.1 %	COEFF	NET BF/ACRE					# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH		5	10	15	
DOUGLEAV		20.3	2.8	33,275	34,220	35,165					
SNAG											
ALDRLEAV		416.2	56.6	108	248	389					
HEMLEAV		734.8	99.9	0	193	387					
TOTAL		17.0	2.3	33,859	34,662	35,464		12	3	1	

Log Stock Table - MBF

T05N R06W S16 Ty00MC	119.00
T05N R06W S16 TyROW	5.00
T05N R06W S17 TyTAKE	187.00

Project: GRASSLAN
Acres 311.00

Page 2
Date 3/12/2013
Time 7:49:12AM

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	19	19		19	.2			19										
D	DO	4S	20	3		3	.0			3										
D	DO	4S	21	60		60	.7			55	5									
D	DO	4S	23	28		28	.3			28										
D	DO	4S	24	6		6	.1				6									
D	DO	4S	25	21		21	.3			21										
D	DO	4S	26	56		56	.7			56										
D	DO	4S	27	11		11	.1			11										
D	DO	4S	28	18		18	.2			18										
D	DO	4S	30	64		64	.8			64										
D	DO	4S	32	25		25	.3		25											
D	DO	4S	37	22		22	.3			22										
D	DO	4S	40	17	11.1	15	.2				15									
D	Totals			8,257	2.6	8,045	99.5		25	1247	775	1204	1131	1003	1467	543	428	219		
H	DO	CU	24	1	100.0															
H	DO	2S	26	7		7	17.9							7						
H	DO	2S	32	15		15	36.3					15								
H	DO	3S	31	3		3	7.6			3										
H	DO	4S	32	16		16	38.2			16										
H	Totals			42	2.7	41	.5			19		15		7						
Total	All Species			8,299	2.6	8,086	100.0		25	1266	775	1204	1146	1003	1475	543	428	219		

TC		PSTNDSUM		Stand Table Summary										Page		1	
														Date:		3/12/2013	
T05N R06W S16 Ty00MC119.00 T05N R06W S16 TyROW5.00 T05N R06W S17 TyTAKE187.00				ProjectGRASSLAN Acres311.00										Time:7:49:12AM Grown Year:			
S Spec	T	Tot							Average Log		Net		Net		T o t a l s		
		DBH	Sample Trees	FF 16'	Av Ht	Trees/ Acre	BA/ Acre	Logs Acre	Net Cu.Ft.	Net Bd.Ft.	Tons/ Acre	Cu.Ft. Acre	Bd.Ft. Acre	Tons	Cunits	MBF	
D		8	2	85	70	2.682	.94	2.68	8.0	30.0		21	80		67	25	
D		9	4	85	28	4.495	1.87	4.50	5.9	24.7		27	111		83	35	
D		10	6	88	77	9.313	5.08	9.31	13.9	56.3		129	524		402	163	
D		11	2	85	60	1.419	.94	1.42	14.0	50.0		20	71		62	22	
D		12	16	87	77	12.428	9.76	15.66	16.9	57.8		265	906		824	282	
D		13	16	88	75	13.053	12.03	16.82	20.3	63.2		341	1,063		1,062	331	
D		14	5	89	86	3.252	3.48	5.63	20.7	73.8		116	415		362	129	
D		15	16	87	96	9.804	12.03	20.70	21.2	76.0		438	1,573		1,363	489	
D		16	15	86	81	9.095	12.70	17.52	23.0	78.0		403	1,367		1,254	425	
D		17	11	87	105	8.309	13.10	18.65	29.0	105.5		541	1,969		1,683	612	
D		18	15	88	91	7.186	12.70	13.84	33.4	115.5		463	1,598		1,439	497	
D		19	3	91	78	1.290	2.54	2.58	30.8	105.8		80	273		247	85	
D		20	11	89	118	6.003	13.10	15.68	38.2	142.7		598	2,237		1,861	696	
D		21	9	88	116	4.112	9.89	11.28	39.4	157.5		444	1,777		1,382	553	
D		22	6	87	116	3.644	9.62	9.11	46.7	182.7		425	1,664		1,322	518	
D		23	6	88	108	1.760	5.08	3.75	52.9	205.4		198	771		617	240	
D		24	10	86	126	2.936	9.22	8.21	53.2	214.8		437	1,763		1,358	548	
D		25	5	89	121	1.686	5.75	5.06	53.6	230.1		271	1,164		843	362	
D		26	7	88	105	1.197	4.41	2.39	76.8	303.8		184	727		571	226	
D		27	2	88	112	.235	.94	.71	57.7	250.0		41	177		127	55	
D		28	3	83	125	.594	2.54	1.56	67.4	259.2		105	405		328	126	
D		29	2	88	129	.204	.94	.61	68.7	333.3		42	204		131	63	
D		30	2	82	116	.191	.94	.57	69.7	276.7		40	158		124	49	
D		31	4	85	126	.357	1.87	1.07	83.8	368.3		90	395		279	123	
D		32	4	89	132	.335	1.87	1.01	91.8	453.3		92	456		287	142	
D		33	4	85	133	.315	1.87	.95	100.7	473.3		95	448		296	139	
D		34	6	85	120	.445	2.81	1.19	105.4	460.0		125	546		389	170	
D		35	4	83	111	.280	1.87	.70	111.8	474.0		78	332		244	103	
D		36	2	84	129	.132	.94	.40	111.3	483.3		44	192		138	60	
D		37	2	89	128	.125	.94	.38	123.0	623.3		46	234		144	73	
D		39	4	87	129	.226	1.87	.68	134.7	683.3		91	463		284	144	
D		40	4	85	135	.215	1.87	.64	146.2	700.0		94	451		293	140	
D		42	6	85	121	.292	2.81	.78	152.1	737.5		118	574		368	179	
D		47	2	86	155	.078	.94	.23	226.3	1153.3		53	269		164	84	
D		48	2	86	159	.075	.94	.22	241.3	1256.7		54	281		168	87	
D		52	2	89	120	.063	.94	.19	228.3	1203.3		43	229		135	71	
D		Totals	220	87	90	107.825	171.11	196.68	33.8	131.5		6,656	25,867		20,700	8,045	
H		9	1	89	64	1.008	.45	1.01	11.0	50.0		11	50		34	16	
H		18	1	89	80	.252	.45	.50	32.0	115.0		16	58		50	18	
H		24	2	82	61	.091	.28	.09	64.0	260.0		6	24		18	7	
H		Totals	4	89	67	1.351	1.18	1.60	20.6	82.3		33	132		103	41	
SN		10	1	88	22	1.804	.98										
SN		17	1	88	40	.624	.98										
SN		18	1	88	40	.557	.98										
SN		23	1	88	17	.341	.98										
SN		60	1	86	88	.050	.98										
SN		Totals	5	88	29	3.376	4.92										
Totals			229	87	88	112.552	177.20	198.28	33.7	131.1		6,689	25,999		20,803	8,086	

LOGGING PLAN

OF TIMBER SALE CONTRACT NO. 341-13-27
GRASSLAND
PORTIONS OF SECTIONS 15, 16, 17, AND 20
T5N, R6W, W.M., CLATSOP COUNTY, OREGON

Approximate Net Acreage:		
PC Acres	MC Acres	
Area 1 (MC) -	0	27
Area 2 (MC) -	0	92
Area 3 (PC) -	187	0
Area 4 (R/W) -	0	5
Total by prescription	187	124
Total Sale Acreage	311	

LOGGING BREAKDOWN		
	Tractor	Cable
Area 1	100%	0%
Area 2	100%	0%
Area 3	84%	16%

Approximate Scale: 1"=1,000'



- Legend
- ODF Ownership

Timber Sale Boundary

Existing Surfaced Road

Road to Vacate

New Road Construction - Surfaced

New Road Construction - Unsurfaced

Type N Stream

Type F Stream

Posted Stream Buffer

Buffer Zone

Green Tree Area

Non-Thinnable Area

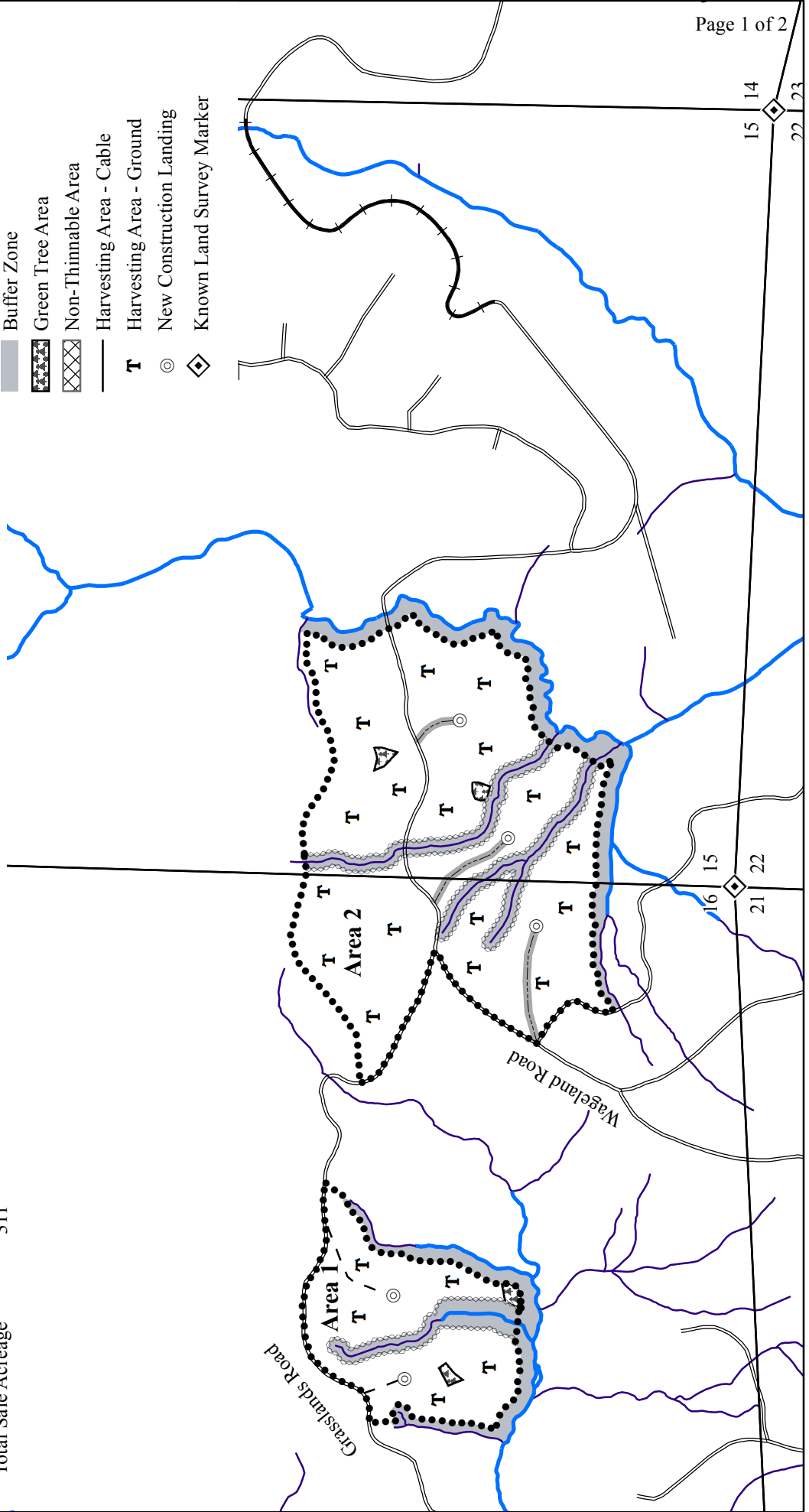
Harvesting Area - Cable

Harvesting Area - Ground

New Construction Landing

New Construction Landing

Known Land Survey Marker



LOGGING PLAN

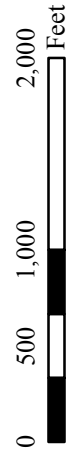
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Legend

- ODF Ownership
- Timber Sale Boundary
- Existing Surfaced Road
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