



"STEWARDSHIP IN FORESTRY"

Timber Sale Appraisal
Mulak Thin
Sale 341-12-50

District: Astoria

Date: May 09, 2012

cost summary

	Conifer	Hardwood	Total
Gross Timber Sale Value	\$73,892.52	\$18,930.38	\$92,822.90
		Project Work:	\$(5,070.00)
		Advertised Value:	\$87,752.90



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timber description

Location: Portions of Section 28, T6N, R6W, W.M., Clatsop County, Oregon.

Stand Stocking: 80%

SpecieName	AvgDBH	Amortization (%)	Recovery (%)
Douglas - Fir	14	0	97
Western Hemlock / Fir	15	0	97
Alder (Red)	14	0	95
Maple	13	0	95

Volume by Grade	2S	3S	4S	Camprur	Total
Douglas - Fir	38	259	59	0	356
Western Hemlock / Fir	7	13	5	0	25
Alder (Red)	0	0	0	71	71
Maple	0	0	0	2	2
Total	45	272	64	73	454



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comments: Pond Values Used: 1st Quarter Calendar Year 2012.

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

Western redcedar and Other Cedars Stumpage Price = Pond Value
minus Logging Cost
 $\$649.32/\text{MBF} = \$945/\text{MBF} - \$295.68/\text{MBF}$
 $\$81.17/\text{Ton} = \$649.32/\text{MBF} / 8$

SCALING COST ALLOWANCE = \$5.00/MBF

FUEL COST ALLOWANCE = \$4.00/Gallon

HAULING COST ALLOWANCE
Hauling costs equivalent to \$780 daily truck cost.

Other Costs (with Profit & Risk to be added):
100% Branding and Painting: $\$1/\text{MBF} \times 454 \text{ MBF} = \$454$
Machine washing for noxious weed compliance = \$2,000
Log Loader Slash & Landing Piling (includes Move-In and Pile
Materials): = \$5,420 (see attached appraisal)
TOTAL Other Costs (with Profit & Risk to be added) = \$7,874

Other Costs (No Profit & Risk added):
Loggers Choice Spur (existing): 8.0 hours with D7 Dozer @
 $\$134/\text{hour} = \$1,072$
Mobilization of D7 Dozer = \$699
Waterbar and block dirt road segments after harvest: $\$13.85/\text{station}$
 $\times 10 \text{ stations} = \$138.50$
TOTAL Other Costs (No Profit & Risk added) = \$1,909.50



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logging conditions

combination#: 1

Douglas - Fir	22.00%
Western Hemlock / Fir	22.00%
Alder (Red)	22.00%
Maple	22.00%

yarding distance: Short (400 ft) **downhill yarding:** No
logging system: Cable: Small Tower <=40 **Process:** Manual Delimbing
tree size: Small / Thinning 10in (90 Bft/tree), 18-20 logs/MBF
loads / day: 4.5 **bd. ft / load:** 3,300
cost / mbf: \$181.89

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

combination#: 2

Douglas - Fir	78.00%
Western Hemlock / Fir	78.00%
Alder (Red)	78.00%
Maple	78.00%

yarding distance: Short (400 ft) **downhill yarding:** No
logging system: Shovel **Process:** Manual Delimbing
tree size: Small / Thinning 10in (90 Bft/tree), 18-20 logs/MBF
loads / day: 6.0 **bd. ft / load:** 3,300
cost / mbf: \$126.50

machines: Shovel Logger



"STEWARDSHIP IN FORESTRY"

Timber Sale Appraisal Mulak Thin Sale 341-12-50

District: Astoria

Date: May 09, 2012

logging costs

Operating Seasons:	2.00	Profit Risk:	14.00%
Project Costs:	\$5,070.00	Other Costs (P/R):	\$7,874.00
Slash Disposal:	\$0.00	Other Costs:	\$1,909.50

Miles of Road

Road Maintenance: \$7.98

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

Hauling Costs

Species	\$ / MBF	Trips/Day	MBF / Load
Douglas - Fir	\$0.00	3.0	3.3
Western Hemlock / Fir	\$0.00	2.0	3.5
Alder (Red)	\$0.00	2.0	3.3
Maple	\$0.00	1.0	3.3



"STEWARDSHIP IN FORESTRY"

Timber Sale Appraisal Mulak Thin Sale 341-12-50

District: Astoria

Date: May 09, 2012

logging costs breakdown

Logging	Road Maint	Fire Protect	Hauling	Other P/R appl	Profit & Risk	Slash Disposal	Scaling	Other	Total
Douglas - Fir									
\$138.69	\$8.22	\$19.32	\$71.18	\$17.34	\$35.66	\$0.00	\$5.00	\$4.21	\$299.62
Western Hemlock / Fir									
\$138.69	\$8.22	\$19.32	\$100.67	\$17.34	\$39.79	\$0.00	\$5.00	\$4.21	\$333.24
Alder (Red)									
\$138.69	\$8.38	\$0.00	\$108.85	\$0.00	\$23.62	\$0.00	\$5.00	\$0.00	\$284.54
Maple									
\$138.69	\$8.38	\$0.00	\$217.71	\$0.00	\$38.86	\$0.00	\$5.00	\$0.00	\$408.64

Specie	Amortization	Pond Value	Stumpage	Amortized
Douglas - Fir	\$0.00	\$501.54	\$201.92	\$0.00
Western Hemlock / Fir	\$0.00	\$413.60	\$80.36	\$0.00
Alder (Red)	\$0.00	\$550.00	\$265.46	\$0.00
Maple	\$0.00	\$450.00	\$41.36	\$0.00



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summary

Amortized

Specie	MBF	Value	Total
Douglas - Fir	0	\$0.00	\$0.00
Western Hemlock / Fir	0	\$0.00	\$0.00
Alder (Red)	0	\$0.00	\$0.00
Maple	0	\$0.00	\$0.00

Unamortized

Specie	MBF	Value	Total
Douglas - Fir	356	\$201.92	\$71,883.52
Western Hemlock / Fir	25	\$80.36	\$2,009.00
Alder (Red)	71	\$265.46	\$18,847.66
Maple	2	\$41.36	\$82.72

Gross Timber Sale Value

Recovery: \$92,822.90

Prepared by: Ty Williams

Phone: 503-325-5451

Mulak Thin

341-12-50

APPRAISAL ATTACHMENT
Conversions from MBF to TONS

Species	MBF	Conversion Factor (TONS per MBF)	Total TONS	Appraised \$/MBF	Converted \$/TON	% Sale	Calculated Avg	Weighted Average \$/Ton Combined	Gross Sale Value
Doug-fir ¹	356	7.8	2,777	\$201.92	\$25.89	0.78	\$20.19		\$71,896.53
Hemlock/ true fir ¹	25	7.0	175	\$80.36	\$11.48	0.06	\$0.69	\$25.04	\$2,009.00
Red Alder ²	71	7.5	533	\$265.46	\$35.39	0.16	\$5.66		\$18,862.87
Maple ²	2	7.5	15	\$41.36	\$5.51	0.00	\$0.00	\$34.57	\$82.65
Total/ Average =	454	7.67	3,484						\$92,851.05

¹ Douglas-fir and Hemlock/true fir volumes were combined in the appraisal to calculate one price.

² Red alder and maple volumes were combined in the appraisal to calculate one price.

Site Prep Appraisal

Sale Number: 341-12-50
Sale Name: Mulak Thin
Date: 02/02/2012

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

Sale Area	Harvest Type	Veg Type/Zone	Ground Based Yarding Acres	Estimated Piling Hours/Area	Cost/Hour	Total Cost/Area
1	MC	E	18	27	\$110.00	\$2,970.00
Sub Total =						\$2,970.00
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	5	\$220.00	\$1,100.00	81	\$5.00	\$405.00
*Cost includes separating firewood						
Sub Total =						\$1,505.00
Move-In Allowance	Number of Move-In's	Total Move-In Allowance				
\$945.00	1	\$945.00	Sub Total =			
						\$945.00
Grand Total =						\$5,420.00

SUMMARY OF ALL PROJECT COSTS

SALE NAME: Mulak Thin

ROAD IMPROVEMENT:

	<u>Road segment</u>	<u>Length/Sta</u>	<u>Cost</u>
Project No. 1	<u>I1-I2</u>	<u>70.00</u>	<u>\$3,159</u>
	TOTALS		\$3,159

	<u>Cost</u>
Project Work Road Maintenance	<u>\$0</u>
	\$0

MOVE IN:	<u>Equipment</u>	<u>Cost</u>
	<u>Dump Trucks (12 cy x 2)</u>	<u>\$282</u>
	<u>Rubber tired backhoe (C580)</u>	<u>\$279</u>
	<u>F E Loader (C966)</u>	<u>\$675</u>
	<u>Grader (14G)</u>	<u>\$675</u>
	<u></u>	<u></u>
	<u></u>	<u></u>
	TOTAL	\$1,911

GRAND TOTAL **\$5,070**

Compiled By: Ty Williams  Date: 03/08/2012

x:\Jewell Unit\timbersales\2012\Mulak ThinProjects\Summary of Construction_Mulak.xls

SALE NAME: Rapid Rewards
ROAD: I1-I2 (70+00)

IMPROVEMENT: 70.00 STATIONS 1.33 MILES

SURFACING		Subgrade prep:		Description		Stations/ amount		Rate/ sta/amt		Cost			
		Grade, Shape and Ditch				70.00		x		\$1,475.60			
						x							
ROAD SEGMENT		I1 to I2		POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)		Rate/ Sta./ amt.		Cost	
Application		Rock Size and Type		Location		Depth of Rock (inches)		I1 to I2 Volume (CY) per		Number of		0+00 to 70+00	
Subgrade Leveling		4"-0" Crushed		I1 to I2		N/A						100	
Landing Rock		4"-0" Crushed		I1 to I2		N/A						50	
Turnaround		4"-0" Crushed		I1 to I2		8		turnaround		1		22	
Total Rock for Road Segment:				I1 to I2								172	
												\$1,539	

CRUSHED ROCK COST

SALE NAME:	Rapid Rewards
PROJECT:	Project No. 1
QUARRY:	Northrup Stockpiles (4"-0")

MATERIAL: Crushed

DATE: _____
BY: _____

[illegible]

ROCK HAUL:

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

Ave haul:	\$5.14	/cy
Load:	\$2.02	/cy
Spread:	\$1.79	/cy

Truck type: D12 No. trucks: 2
 Delay min.: 6 Efficiency: 85%

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

Production: cy/day = 227

CRUSHED ROCK HAUL COSTS

172 cy @ \$8.95 /cy

Road Maintenance (Harvest) Cost Summary

Sale: Mulak Thin
 Date: 02-Feb-12
 By: Ty Williams *rw*

MBF: 454
 \$\$/MBF: \$7.98

Type	Equipment/Rationale	Move-in Rate	Times	Hours	Rate	Cost	Production Rates			
Final Road Maintenance	Grader 14G Dump Truck 12CY x 1 FE Loader C966	\$675 \$141 \$675	1 1 1	10 8 8	\$93 \$73 \$77	\$1,605 \$725 \$1,291	Production Rates	Miles/day	Distance(miles)	Days
							Grader	1.5	1.5	1.0
							Vibratory Roller*	1.5	1.5	1.0
Total							\$3,621			

*Final Road Maintenance Only

Mulak Thin TIMBER CRUISE REPORT FY 2012

1. **Sale Area Location:** Areas 1 and 2 are located in Section 28, T6N, R6W, W.M., Clatsop County, Oregon.

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

3. **Sale Acreage by Area:**

Area	Treatment	Gross Acres	Non-thinnable	Existing R/W	Stream Buffer	Net Acres	Survey Method
1	Partial Cut	18	0	0	0	18	GIS
2	Partial Cut	41	2	2	1	36	GIS
TOTALS		59	2	2	1	54	

4. **Cruisers and Cruise Dates:** Areas 1 and 2 were cruised by Ty Williams, Jasen McCoy, Derek Bangs, Kevin Berry, Erik Burgher, and David Rygell, on February 27, 2012.

5. **Cruise Method and Computation:** Areas 1 and 2 are partial cut thinning units and were variable plot cruised using a 33.61 BAF. Area 1 plots are located on a 2 chain by 2 chain grid, with every third plot measured and graded. A total of 27 plots were sampled, with 15 measured and graded plots, and 12 count plots. The target residual basal area is 80 square feet. Trees with a diameter greater than 32 inches and cedar are reserve species, and were recorded as "leave" trees.

Area 2 plots are located on a 5 chain by 5 chain grid, with every other plot measured and graded. A total of 15 plots were sampled, with 9 measured and graded plots, and 6 count plots. The target residual basal area is 140 square feet. Trees with a diameter greater than 32 inches, red alder, and cedar are reserve species, and were recorded as "leave" trees.

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.

AREA	CRUISE	TRACT	TYPE	ACRES
1	T6NR6W28	AREA 1	TAKE	18
2	T6NR6W28	AREA2	TAKE	36

6. **Timber Description:** Area 1 is a partial cut thinning unit, approximately 47 years old, mixed species stand dominated by red alder and Douglas-fir, with a small component of western hemlock and big leaf maple. The average red alder tree size to be harvested is 14.4 inches DBH, with an average height of 45 feet to a merchantable top (6 inch d.i.b.). The average Douglas-fir tree size to be harvested is 18.0 inches DBH, with an average height of 54 feet to a merchantable top (6 inch d.i.b.). The average hemlock tree size is 13.0 inches DBH and 56 feet to a merchantable top (6 inch d.i.b.). The average volume per acre to be harvested (net) is 8.5 MBF.

Area 2 is a partial cut thinning unit, approximately 35 years old, dominated by Douglas-fir, with a small component of western hemlock. The average Douglas-fir tree size to be harvested is 13.4 inches DBH, with an average height of 49 feet to a merchantable top (6 inch d.i.b.). The average hemlock tree size is 18.3 inches DBH and 58 feet to a merchantable top (6 inch d.i.b.). The average volume per acre to be harvested (net) is 8.4 MBF.

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

Statistics for Stand B.F. volumes

Areas	Estimated CV	Target SE%	Actual CV	Actual SE%
1 (PC)	70%	12%	59.6%	11.7%
2 (PC)	45%	12%	24.5%	6.5%

8. Volumes by Species and Log Grade: (See "Species, Sort, Grade" - Project Report, attached).

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

Species	DBH	Net Vol.	2 Saw	3 Saw	4 Saw	Camp Run	% D & B	% Sale
Douglas-fir	13.8"	356	38	259	59	0	1.4	78
Red alder	14.4"	71	0	0	0	71	2.8	16
Hemlock/True-fir	15.2"	25	7	13	5	0	2.3	6
Maple	13.0"	2	0	0	0	2	<1	<1
TOTALS		454	45	272	64	73		100

9. Approvals:

Prepared by: Ty Williams

Date: 3/1/12

Unit Forester Approval: 

Date: 3/7/12

10. Attachments:

Tonnage Conversion Table – 1 page
Cruise Designs and Maps – 5 pages
Volume Report - 3 pages
Statistics Reports - 2 pages
Log Stock Table - 2 pages
Stand Table Summary – 1 page

X:\Jewell_Unit\Timber Sales\2012\Mulak Thin\Sale_Prep\Cruise_Report_Mulak.docx

**CRUISE DESIGN
ASTORIA DISTRICT**

Sale Name: Mulak Thin **Area(s)** 1

Harvest Type: (PC) "Partial Cut (Heavy)"

Approx. Cruise Acres: 18 **Estimated CV%** 70% Net BF **SE% Objective** 15 Net BF

Planned Sale Volume : 162 MBF **Estimated Sale Area Value/Acre:** \$1,800/Ac
(Area 1) (9 MBF/Ac.)

A. Cruise Goals: (a) Grade minimum 35 conifer and 15 Alder:
(b) Sample 29 cruise plots (10 grade/ 19 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:

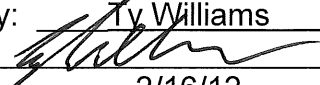
1. Plot Cruises: BAF 33.6 (Full point; Half point) (circle one)
Cruise Line Direction(s) AZ= 180° N-S
Cruise Line Spacing 2 (chains)
Cruise Plot Spacing 2 (chains)
Grade/Count Ratio 1/2

The BA target is 80 sqft. Cruiser will select 2-3 biggest and best leave trees per plot regardless of species. Alder counts toward the prescription. Mark Leave trees with an "L" using yellow paint on graded plots only. Cruise all take and leave trees. Take plots as shown on map. Conifer greater than 32" DBH and all cedar are leave trees and count towards the leave tree basal area. If a cruise line ends up paralleling or within a buffer offset by 1 chain and continue. Type N seasonal stream buffers are non-posted. Record snags as SN and estimate heights and diameters. Grade alder as camprun-sawlogs (30 net BF minimum). A machete is recommended for cruisers in this area.

C. Tree Measurements:

- 1. Diameter:** Minimum DBH to cruise is 8" for conifers and 10" for hardwoods.
Record dbh to nearest $\frac{1}{2}$ " 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: Ty Williams
Approved by: 
Date: 2/16/12

**CRUISE DESIGN
ASTORIA DISTRICT**

Sale Name: Mulak Thin **Area(s)** 2

Harvest Type: (PC) "Partial Cut (Heavy)"

Approx. Cruise Acres: 36 **Estimated CV%** 45% Net BF **SE% Objective** 15 Net BF

Planned Sale Volume : 252 MBF **Estimated Sale Area Value/Acre:** \$1,400/Ac
(Areas 2) (7 MBF/Ac.)

A. Cruise Goals: (a) Grade minimum 56 conifer and 5 Alder:
(b) Sample 15 cruise plots (8 grade/ 7 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:

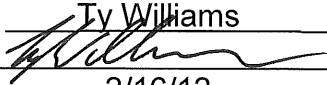
1. Plot Cruises: BAF 33.6 (Full point; Half point) (circle one)
Cruise Line Direction(s) AZ= 180° (North/South)
Cruise Line Spacing 5 (chains)
Cruise Plot Spacing 5 (chains)
Grade/Count Ratio 1/1

The BA target is 140 sqft. Cruiser will select 4-5 biggest and best leave trees per plot. Mark Leave trees with an "L" using yellow paint on graded plots only. Cruise all take and leave trees. Take plots as shown on map. Conifer greater than 32" DBH and all cedar are leave trees and count towards the leave tree basal area. Alder does not count toward the prescription and shall be cruised as leave trees. If a cruise line ends up paralleling or within a buffer offset by 1 chain and continue. Type N seasonal stream buffers are non-posted. Record snags as SN and estimate heights and diameters. Grade alder as camprun-sawlogs (30 net BF minimum).

C. Tree Measurements:

- 1. Diameter:** Minimum DBH to cruise is 8" for conifers and 10" for hardwoods.
Record dbh to nearest ½" for trees < 16", to nearest 1" for trees 16-24", and to nearest 2" for trees > 24". If tree diameters are estimated (only estimate on variable plot cruises), then record to closest estimate.
- 2. Bole Length:** Record bole length to nearest foot at TCD. For trees greater than 100 feet in merchantable height, estimating to the nearest 5 feet is acceptable.
- 3. Top Cruise Diameter (TCD):** Minimum top outside bark is 7" 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.

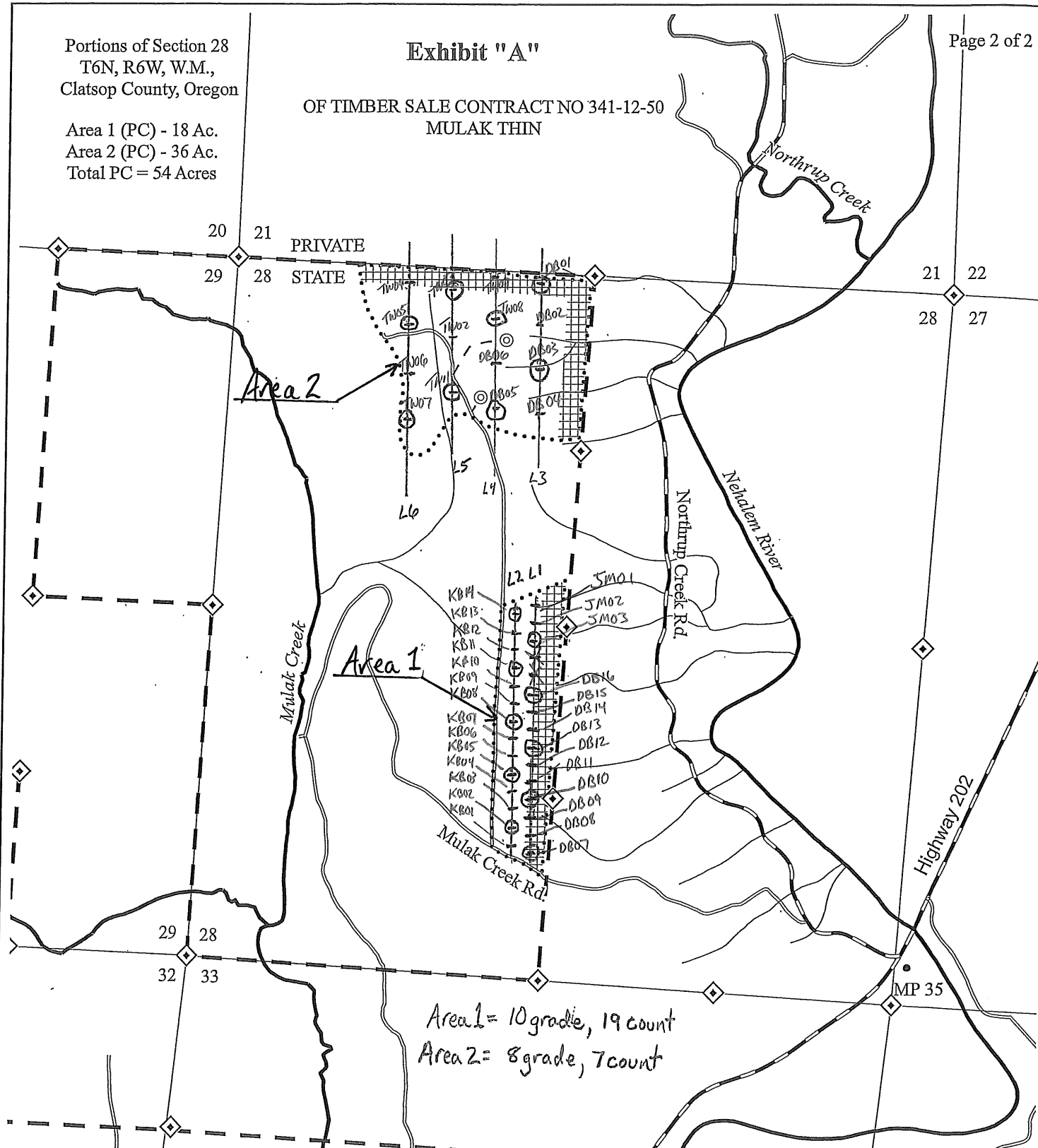
Cruise Design by: Ty Williams
Approved by: 
Date: 2/16/12

Portions of Section 28
T6N, R6W, W.M.,
Clatsop County, Oregon

Area 1 (PC) - 18 Ac.
Area 2 (PC) - 36 Ac.
Total PC = 54 Acres

Exhibit "A"

OF TIMBER SALE CONTRACT NO 341-12-50
MULAK THIN



TC		PSPCSTGR		Species, Sort Grade - Board Foot Volumes (Project)																	
T06N R06W S28 TyTAKE18.00 T06N R06W S28 TyTAKE36.00				Project:		MULAK										Page		1			
				Acres		54.00										Date		2/28/2012			
																Time		8:52:23AM			
Spp	S T	So rt	Gr 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		
					Def%	Gross	Net		4-5	6-11	12-16	17+	12-20	21-30	31-35	36-99					
D		DOCU															8		0.00	2.0	
D		DO2S		10	2.0	715	701	38			30	70			10	90	38	532	2.99	1.3	
D		DO3S		73	1.6	4,884	4,804	259		99	0	1	0	1	33	65	36	87	0.70	55.3	
D		DO4S		17		1,081	1,081	58		100			54	28	18		19	25	0.42	43.4	
D		Totals		78	1.4	6,679	6,585	356		88	4	8	9	6	28	57	29	65	0.66	101.9	
																			0.00		.7
A		DOCU															10		0.00		
A		DOCR		100	2.9	1,345	1,307	71	2	84	13		7	19	47	28	30	72	0.74	18.2	
A		Totals		16	2.9	1,345	1,307	71	2	84	13		7	19	47	28	29	69	0.73	18.9	
																			0.00		1.1
H		DOCU															16		0.00		
H		DO2S		26	8.3	136	124	7			100					100	40	220	1.90	.6	
H		DO3S		52		248	248	13		100					100		32	90	0.78	2.8	
H		DO4S		22		100	100	5		100			17	83			21	30	0.45	3.3	
H		Totals		6	2.3	483	472	25		74	26		4	18	53	26	26	61	0.72	7.7	
																			0.72		.5
M		DOCR		100		40	40	2		100					100		36	80	0.72		
M		Totals		0		40	40	2		100					100		36	80	0.72	.5	
																			0.67		129.0
Totals					1.7	8,548	8,404	454	0	87	6	6	8	8	32	51	29	65	0.67	129.0	

T		TSPCSTGR		Species, Sort Grade - Board Foot Volumes (Type)												Page		1	
				Project: MULAK												Date		2/28/2012	
																Time		8:57:14AM	
T06N R06W S28 TTAKE																T06N R06W S28 TTAKE			
Twp		Rge		Sec		Tract		Type		Acres		Plots		Sample Trees		CuFt		BdFt	
06N		06W		28		AREA1		TAKE		18.00		27		26		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		
A DO CU								2	84	13		7	19	47	28	10		0.00	2.0
A DO CR			100	2.9 4,036 3,920			71	2	84	13		7	19	47	28	30	72	0.74	54.6
A Totals			46	2.9 4,036 3,920			71	2	84	13		7	19	47	28	29	69	0.73	56.6
D DO CU										30	70			10	90	16		0.00	1.1
D DO 2S			61	2.0 2,145 2,102			38			30	70			10	90	38	532	2.99	4.0
D DO 3S			33	1.5 1,142 1,125			20		82	6	12	6	18	25	51	31	97	0.90	11.6
D DO 4S			6	202 202			4		100				100			25	30	0.47	6.7
D Totals			41	1.7 3,489 3,429			62		33	20	47	2	12	14	72	30	147	1.23	23.4
H DO 3S			75	744 744			13	100					100			32	90	0.78	8.3
H DO 4S			25	248 248			4	100					100			22	30	0.41	8.3
H Totals			12	991 991			18	100					25	75		27	60	0.63	16.5
M DO CR			100	121 121			2	100					100			36	80	0.72	1.5
M Totals			1	121 121			2	100					100			36	80	0.72	1.5
Type Totals				2.0 8,637 8,461			152	1	66	14	19	4	16	36	44	29	86	0.83	98.0

T		TSPCSTGR		Species, Sort Grade - Board Foot Volumes (Type)										Page 1				
				Project: MULAK										Date 2/28/2012				
														Time 8:56:05AM				
T06N R06W S28 TTAKE										T06N R06W S28 TTAKE								
Twp	Rge	Sec	Tract	Type	Acres	Plots	Sample Trees	CuFt	BdFt									
06N	06W	28	AREA2	TAKE	36.00	15	24	1	W									
S So Gr T rt ad Spp		% Net BdFt	Bd. Ft. per Acre			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								6		0.00		2.4				
D	DO	3S	81	1.6	6,754	6,643	239	100			34	66	37	86	0.69	77.1		
D	DO	4S	19		1,520	1,520	55	100		58	23	19	19	25	0.41	61.7		
D Totals			97	1.3	8,274	8,163	294	100		11	4	31	54	29	58	0.61	141.2	
H	DO	CU								16		0.00		1.6				
H	DO	2S	88	8.3	204	187	7		100			100	40	220	1.90	.8		
H	DO	4S	12		25	25	1	100		100			16	30	0.69	.8		
H Totals			3	7.4	229	212	8	12	88	12		88	22	64	1.01	3.3		
Type Totals				1.5	8,503	8,375	302	98	2	11	4	30	54	28	58	0.61	144.5	

TC TSTATS				STATISTICS				PAGE 1					
				PROJECT	MULAK	DATE 2/28/2012							
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt				
06N	06W	28	AREA1	TAKE	18.00	27	67	1	W				
				TREES	ESTIMATED	PERCENT							
				PER PLOT	TOTAL	SAMPLE							
					TREES	TREES							
TOTAL				27	67	2.5							
CRUISE				9	26	2.9	1,114	2.3					
DBH COUNT													
REFOREST													
COUNT				14	41	2.9							
BLANKS				4									
100 %													
STAND SUMMARY													
				SAMPLE	TREES	AVG	BOLE	REL	BASAL	GROSS	NET	GROSS	NET
				TREES	/ACRE	DBH	LEN	DEN	AREA	BF/AC	BF/AC	CF/AC	CF/AC
R ALDER				17	38.8	14.4	45		44.1	4,036	3,920	1,212	1,212
DOUG FIR				7	13.4	18.0	54		23.6	3,489	3,429	848	848
WHEMLOCK				1	8.3	13.0	56		7.6	991	991	281	281
BL MAPLE				1	1.5	13.0	36		1.4	121	121	39	39
TOTAL				26	61.9	15.1	48		76.8	8,637	8,461	2,380	2,380
CONFIDENCE LIMITS OF THE SAMPLE													
68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR													
CL:	68.1 %	COEFF	SAMPLE TREES - BF						# OF TREES REQ.		INF. POP.		
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH			5	10	15		
R ALDER				57.2	14.3	97	113	129					
DOUG FIR				147.5	60.0	241	601	962					
WHEMLOCK													
BL MAPLE													
TOTAL				201.5	40.3	145	243	342	1,688	422	188		
CL:	68.1 %	COEFF	TREES/ACRE						# OF PLOTS REQ.		INF. POP.		
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH			5	10	15		
R ALDER				100.5	19.7	31	39	46					
DOUG FIR				156.9	30.7	9	13	17					
WHEMLOCK				282.1	55.3	4	8	13					
BL MAPLE				465.5	91.3	0	2	3					
TOTAL				75.5	14.8	53	62	71	237	59	26		
CL:	68.1 %	COEFF	BASAL AREA/ACRE						# OF PLOTS REQ.		INF. POP.		
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH			5	10	15		
R ALDER				99.7	19.5	36	44	53					
DOUG FIR				151.7	29.7	17	24	31					
WHEMLOCK				282.1	55.3	3	8	12					
BL MAPLE				465.5	91.3	0	1	3					
TOTAL				69.9	13.7	66	77	87	203	51	23		
CL:	68.1 %	COEFF	NET BF/ACRE						# OF PLOTS REQ.		INF. POP.		
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH			5	10	15		
R ALDER				104.5	20.5	3,117	3,920	4,723					
DOUG FIR				173.9	34.1	2,260	3,429	4,598					
WHEMLOCK				282.1	55.3	443	991	1,540					
BL MAPLE				465.5	91.3	11	121	231					
TOTAL				79.4	15.6	7,144	8,461	9,779	262	65	29		

TC TSTATS				STATISTICS				PAGE	1	
				PROJECT	MULAK	DATE 2/28/2012				
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt	
06N	06W	28	AREA2	TAKE	36.00	15	39	1	W	
				TREES	ESTIMATED	PERCENT				
				PER PLOT	TOTAL	SAMPLE				
					TREES	TREES				
TOTAL		15	39	2.6						
CRUISE		8	24	3.0	3,148	.8				
DBH COUNT										
REFOREST										
COUNT		5	15	3.0						
BLANKS		2								
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		22	85.0	13.4	49	82.9	8,274	8,163	2,442	2,442
WHEMLOCK		2	2.5	18.3	58	4.5	229	212	74	74
TOTAL		24	87.4	13.5	49	87.4	8,503	8,375	2,516	2,516
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		42.2	9.2	99	109	119				
WHEMLOCK		141.4	132.4		125	291				
TOTAL		52.2	10.9	98	110	122	113	28	13	
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		60.4	16.1	71	85	99				
WHEMLOCK		387.3	103.4		2	5				
TOTAL		54.6	14.6	75	87	100	128	32	14	
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		62.9	16.8	69	83	97				
WHEMLOCK		387.3	103.4		4	9				
TOTAL		54.0	14.4	75	87	100	125	31	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		60.5	16.2	6,843	8,163	9,483				
WHEMLOCK		387.3	103.4		212	432				
TOTAL		55.2	14.7	7,140	8,375	9,610	130	33	14	

TC		PLOGSTBF		Log Stock Table - Percent Board Feet																	
				Project:		MULAK		Acres		54.00											
T06N R06W S28 TyTAKE18.00 T06N R06W S28 TyTAKE36.00																				Page1	
																				Date2/28/2012	
																				Time8:58:37AM	
Spp	S T	So rt	Log Grd	Len	Gross MBF	Def %	Net MBF	% Sp	Percent 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	2S	32	4	17.4	4	1.0							100.0						
D		DO	2S	40	34		34	9.6							46.4		19.1	34.5			
D		DO	3S	18	1		1	.3			100.0										
D		DO	3S	25	2		2	.7							100.0						
D		DO	3S	26	1		1	.3					100.0								
D		DO	3S	32	91	4.4	87	24.4			31.0	26.3	42.6								
D		DO	3S	40	168		168	47.2			33.3	39.6	27.1								
D		DO	4S	12	1		1	.4			100.0										
D		DO	4S	14	8		8	2.1			100.0										
D		DO	4S	15	8		8	2.4			100.0										
D		DO	4S	16	3		3	.8			100.0										
D		DO	4S	18	5		5	1.4			100.0										
D		DO	4S	19	2		2	.5			100.0										
D		DO	4S	20	4		4	1.3			100.0										
D		DO	4S	22	4		4	1.1			100.0										
D		DO	4S	26	3		3	.7			100.0										
D		DO	4S	27	10		10	2.8			100.0										
D		DO	4S	32	10		10	2.9				100.0									
D		Totals			361	1.4	356	78.4			37.1	28.0	23.2	.3	1.0	5.2	1.8	3.3			
A		DO	CR	16	3		3	4.1			100.0				100.0						
A		DO	CR	18	2		2	2.4													
A		DO	CR	21	1		1	1.6			100.0										
A		DO	CR	24	10		10	14.5			24.1		75.9								
A		DO	CR	26	2		2	2.5			100.0										
A		DO	CR	31	5		5	6.8					100.0								
A		DO	CR	32	12		12	17.6			28.2		37.7	34.1							
A		DO	CR	34	13		13	18.5			56.4		43.6								
A		DO	CR	35	3		3	4.2			100.0										
A		DO	CR	38	3		3	4.7			100.0										
A		DO	CR	40	18	11.4	16	23.0			21.8		64.4		13.7						
A		Totals			73	2.9	71	15.5		2.4	36.9		47.3	6.0	7.3						
H		DO	2S	40	7	8.3	7	26.4					100.0								
H		DO	3S	32	13		13	52.5			100.0										
H		DO	4S	16	1		1	3.6			100.0										
H		DO	4S	22	4		4	17.5			100.0										

TC PLOGSTBF

Log Stock Table - Percent Board Feet

Project: MULAK Acres 54.00

T06N R06W S28 TyTAKE	18.00
T06N R06W S28 TyTAKE	36.00

CuFt: 1

BdFt: W

Page 2
Date 2/28/2012
Time 8:58:37AM

Spp	S T	So rt	Log Grd	Len	Gross MBF	Def %	Net MBF	% Spc	Percent 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+
H			Totals		26	2.3	25	5.6			21.1	52.5	26.4							
M		DO	CR	36	2		2	100.0			100.0									
M			Totals		2		2	.5			100.0									
Total		All Species			462	1.7	454	100.0		.4	36.0	25.4	25.5	2.7	1.9	4.0	1.4	2.6		

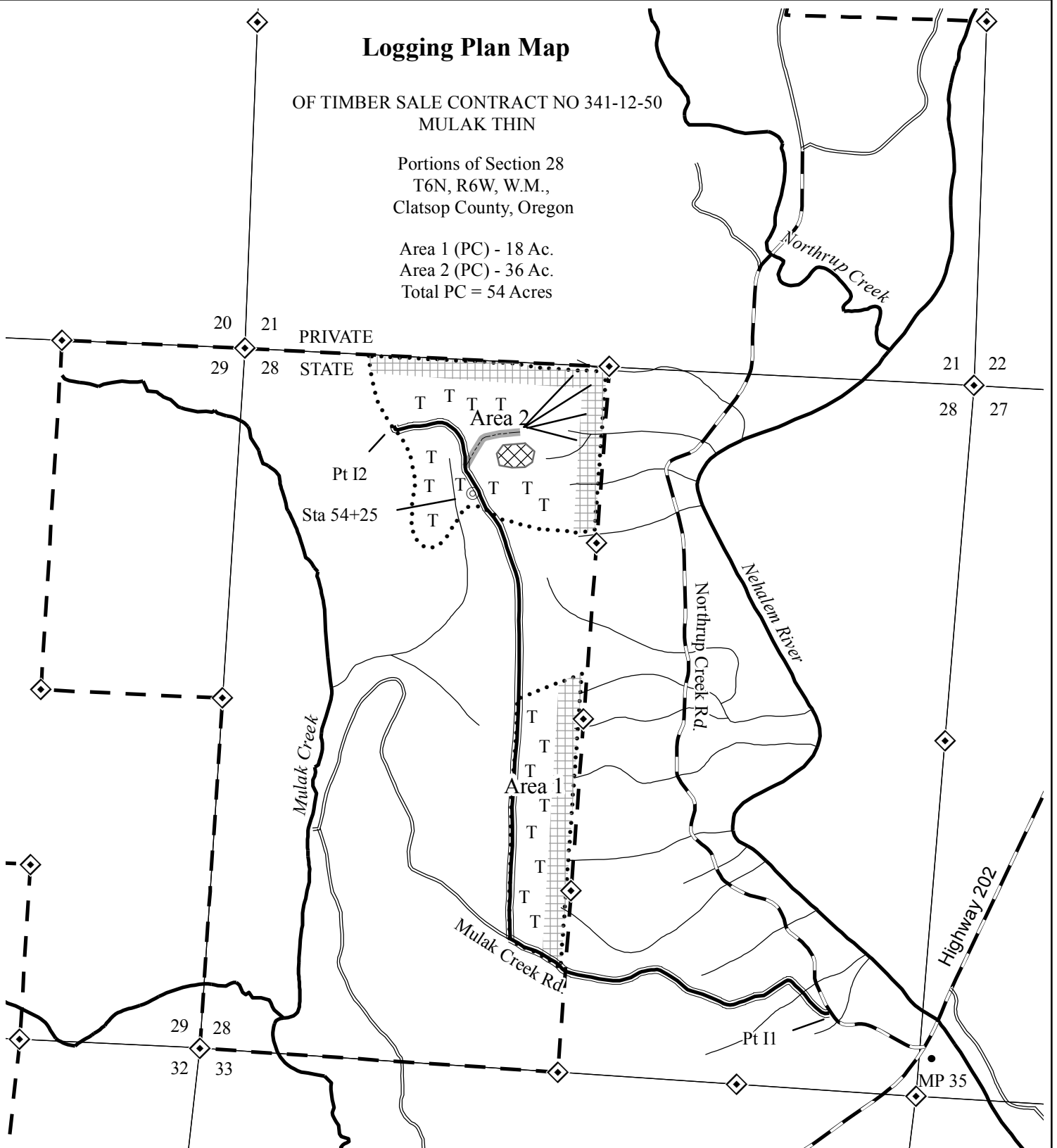
TC PSTNDSUM		Stand Table Summary										Page 1					
												Date: 2/28/2012					
T06N R06W S28 TyTAKE 18.00 T06N R06W S28 TyTAKE 36.00					Project MULAK					Time: 8:58:36AM							
					Acres 54.00					Grown Year:							
S Sp	T	Sample		Tot					Average Log		Net		Net		T o t a l s		
		DBH	Trees	FF 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		10	3	88	66	14.312	7.53	14.31	12.3	46.8		176	670		95	36	
D		12	3	86	91	8.397	6.15	15.36	12.5	43.6		193	670		104	36	
D		13	2	86	78	5.449	5.02	10.90	13.8	42.5		150	463		81	25	
D		14	6	88	70	12.800	13.68	20.90	18.1	53.9		379	1,126		205	61	
D		15	4	86	84	8.186	10.05	16.37	20.5	73.8		336	1,207		181	65	
D		16	4	88	71	6.203	8.66	10.61	23.7	76.4		252	811		136	44	
D		17	2	86	87	3.187	5.02	6.37	25.0	87.5		159	558		86	30	
D		18	1	86	73	1.421	2.51	2.84	26.5	85.0		75	242		41	13	
D		24	2	84	88	.717	2.25	1.08	67.7	236.7		73	254		39	14	
D		27	1	89	105	.283	1.13	.57	81.5	315.0		46	178		25	10	
D		36	1	88	173	.159	1.13	.64	113.0	637.5		72	406		39	22	
D		Totals	29	87	76	61.115	63.13	99.95	19.1	65.9		1,911	6,585		1,032	356	
A		10	1	86	21	1.587	.87	1.59	6.0	20.0		10	32		5	2	
A		12	2	87	51	2.204	1.73	2.20	18.0	50.0		40	110		21	6	
A		13	2	86	57	1.955	1.73	1.95	23.4	64.8		46	127		25	7	
A		14	4	87	76	3.239	3.46	5.67	20.3	72.9		115	413		62	22	
A		15	2	87	76	1.411	1.73	2.82	21.5	77.5		61	219		33	12	
A		16	1	86	78	.620	.87	1.24	25.0	85.0		31	105		17	6	
A		18	3	86	72	1.470	2.60	2.45	31.8	106.0		78	260		42	14	
A		24	1	87	65	.276	.87	.28	89.0	150.0		25	41		13	2	
A		31	1	86	40	.165	.87										
A		Totals	17	87	61	12.927	14.72	18.20	22.2	71.8		404	1,307		218	71	
H		13	1	86	83	2.754	2.54	5.51	17.0	60.0		94	330		51	18	
H		16	1	93	72	1.070	1.49										
H		22	1	86	68	.566	1.49	1.13	43.5	125.0		49	141		27	8	
H		Totals	3	88	78	4.389	5.52	6.64	21.5	71.1		143	472		77	25	
M		13	1	87	67	.504	.46	.50	26.0	80.0		13	40		7	2	
M		Totals	1	87	67	.504	.46	.50	26.0	80.0		13	40		7	2	
Totals			50	87	74	78.934	83.84	125.29	19.7	67.1		2,471	8,404		1,334	454	

Logging Plan Map

OF TIMBER SALE CONTRACT NO 341-12-50
MULAK THIN

Portions of Section 28
T6N, R6W, W.M.,
Clatsop County, Oregon

Area 1 (PC) - 18 Ac.
Area 2 (PC) - 36 Ac.
Total PC = 54 Acres



Legend

..... Timber Sale Area

⊙ New Construction Landings

⊗ Non-Thinnable

— Non Project Road

Controlled Felling

— Paved Roads

— Seasonally Restricted Roads

— Surfaced Roads

— Type F Streams

— Type N Streams

T Tractor Logging

V Cable Logging

0 250 500 1,000
Feet

1 inch equals 1,000 feet

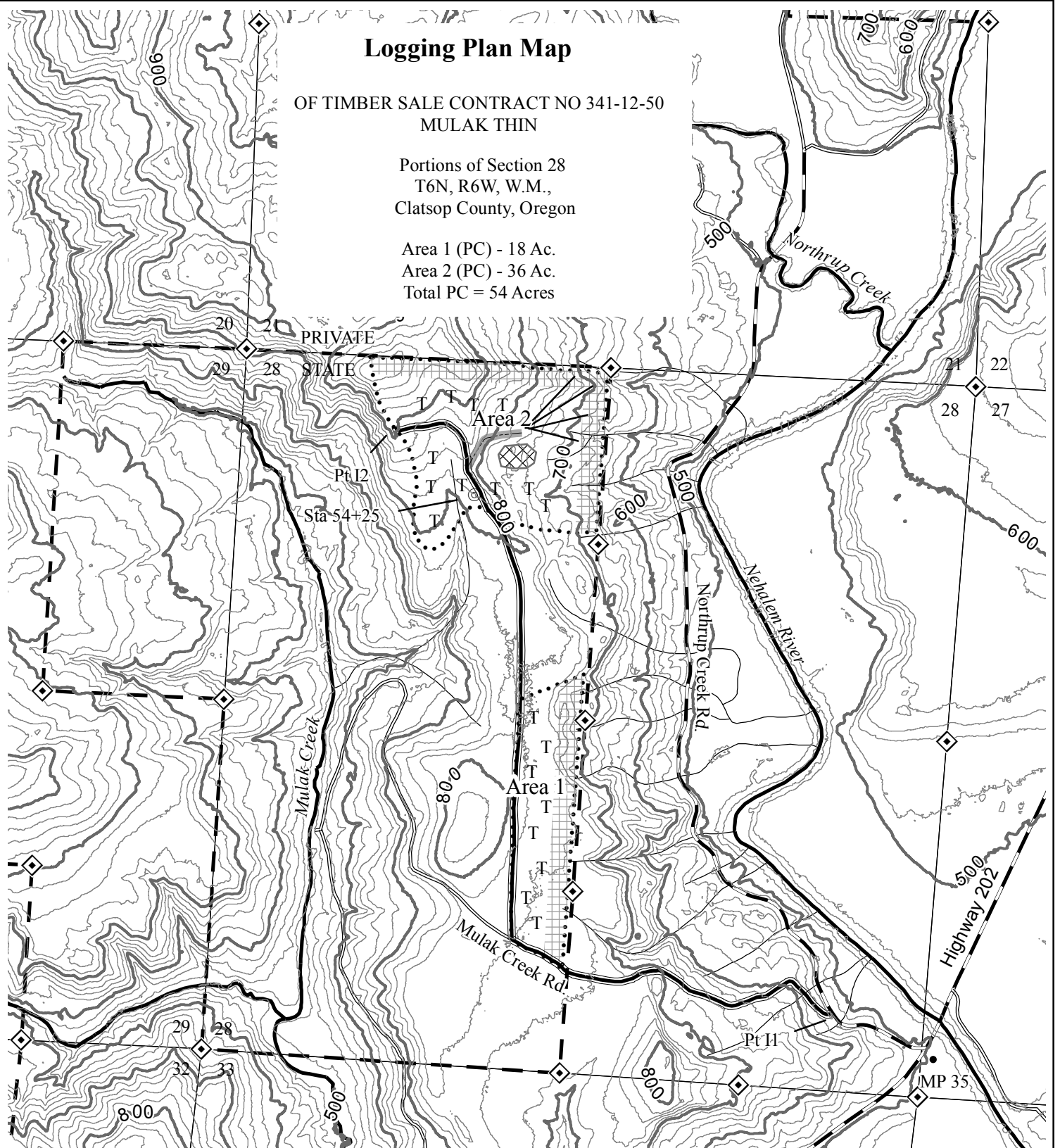


Logging Plan Map

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— 100ft Contours

T Tractor Logging

∧ Cable Logging

0 250 500 1,000
Feet

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