



"STEWARDSHIP IN FORESTRY"

Timber Sale Appraisal  
More Cow Bell  
Sale FG-341-2019-W00542-01

District: Forest Grove

Date: January 24, 2019

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**Cost Summary**

	Conifer	Hardwood	Total
Gross Timber Sale Value	\$2,048,273.85	\$10,164.42	\$2,058,438.27
		Project Work:	(\$100,965.00)
		Advertised Value:	\$1,957,473.27



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**District: Forest Grove**

**Date: January 24, 2019**

## Timber Description

**Location:** Portions of Section 35, T3N, R6W, and Portions of Section 2, T2N, R6W, W.M. Washington County, Oregon.

**Stand Stocking:** 20%

Specie Name	AvgDBH	Amortization (%)	Recovery (%)
Douglas - Fir	20	0	98
Western Hemlock / Fir	17	0	98
Alder (Red)	20	0	95

Volume by Grade	2S	3S & 4S 6"-11"	Camprun	Total
Douglas - Fir	2,961	1,134	0	4,095
Western Hemlock / Fir	132	153	0	285
Alder (Red)	0	0	27	27
<b>Total</b>	3,093	1,287	27	4,407

**Comments:** Pond Values Used: Local Pond Values, December 2018.

Western redcedar and Other Cedars Stumpage Price = Pond Value minus Logging Cost:  
\$717.57/MBF = \$968.00/MBF - \$250.43/MBF

BRANDING AND PAINTING COST ALLOWANCE = \$2.00/MBF

FUEL COST ALLOWANCE = \$3.00/Gallon

HAULING COST ALLOWANCE  
Hauling costs equivalent to \$950 daily truck cost.

Other Costs (with Profit & Risk to be added): None

Other Costs (No Profit & Risk added):  
Machine Time to Block/Waterbar Roads, and Skid Trails:  
10 hours x \$150/hour = \$1,500  
Machine Time to Pile Landing Slash and Sort Firewood:  
20 hours x \$150/hour = \$3,000  
Equipment Cleaning: 3 pieces x \$1,000/Piece = \$3,000  
Slash Disposal: 20 acres x \$200/acre = \$4,000  
TOTAL Other Costs (No Profit & Risk added) = \$11,500

ROAD MAINTENANCE  
Move-in: \$4,000  
General Road Maintenance: 8.7 miles x \$1,200/mile = \$10,440  
TOTAL Road Maintenance: \$14,440/4,407 MBF = \$3.28/MBF



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**Logging Conditions**

**Combination#: 1**

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

**Logging System:** Shovel **Process:** Harvester Head Delimbing  
**yarding distance:** Short (400 ft) **downhill yarding:** No  
**tree size:** Mature / Regen Cut (900 Bft/tree), 3-5 logs/MBF  
**loads / day:** 12 **bd. ft / load:** 4600  
**cost / mbf:** \$96.81  
**machines:** Forwarder  
Harvester

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**Combination#: 2**

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

**Logging System:** Cable: Medium Tower >40 - <70 **Process:** Stroke Delimber  
**yarding distance:** Medium (800 ft) **downhill yarding:** No  
**tree size:** Mature / Regen Cut (900 Bft/tree), 3-5 logs/MBF  
**loads / day:** 11 **bd. ft / load:** 4600  
**cost / mbf:** \$118.58  
**machines:** Log Loader (A)  
Stroke Delimber (A)  
Tower Yarder (Medium)

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"STEWARDSHIP IN FORESTRY"

# Timber Sale Appraisal More Cow Bell Sale FG-341-2019-W00542-01

**District: Forest Grove**

**Date: January 24, 2019**

## Logging Costs

<b>Operating Seasons:</b> 1.00	<b>Profit Risk:</b> 10%
<b>Project Costs:</b> \$100,965.00	<b>Other Costs (P/R):</b> \$0.00
<b>Slash Disposal:</b> \$0.00	<b>Other Costs:</b> \$11,500.00

**Miles of Road**

**Road Maintenance:** \$3.28

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

**Hauling Costs**

Species	\$ / MBF	Trips/Day	MBF / Load
Douglas - Fir	\$0.00	2.0	4.6
Western Hemlock / Fir	\$0.00	2.0	3.9
Alder (Red)	\$0.00	2.0	3.0



"STEWARDSHIP IN FORESTRY"

# Timber Sale Appraisal More Cow Bell Sale FG-341-2019-W00542-01

District: Forest Grove

Date: January 24, 2019

## Logging Costs Breakdown

Logging	Road Maint	Fire Protect	Hauling	Other P/R appl	Profit & Risk	Slash Disposal	Brand & Paint	Other	Total
<b>Douglas - Fir</b>									
\$113.79	\$3.35	\$1.00	\$105.33	\$0.00	\$22.35	\$0.00	\$2.00	\$2.61	\$250.43
<b>Western Hemlock / Fir</b>									
\$113.79	\$3.35	\$1.00	\$124.23	\$0.00	\$24.24	\$0.00	\$2.00	\$2.61	\$271.22
<b>Alder (Red)</b>									
\$113.79	\$3.44	\$1.00	\$166.25	\$0.00	\$28.45	\$0.00	\$2.00	\$2.61	\$317.54

Specie	Amortization	Pond Value	Stumpage	Amortized
Douglas - Fir	\$0.00	\$728.92	\$478.49	\$0.00
Western Hemlock / Fir	\$0.00	\$583.00	\$311.78	\$0.00
Alder (Red)	\$0.00	\$694.00	\$376.46	\$0.00



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### Summary

#### Amortized

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

#### Unamortized

Specie	MBF	Value	Total
Douglas - Fir	4,095	\$478.49	\$1,959,416.55
Western Hemlock / Fir	285	\$311.78	\$88,857.30
Alder (Red)	27	\$376.46	\$10,164.42

#### Gross Timber Sale Value

Recovery: \$2,058,438.27

Prepared By: Kenton Burns

Phone: 503-359-7477

**TIMBER SALE SUMMARY**  
**More Cow Bell**  
**Contract No. FG-341-2019-W00542-01**

1. **Location:** Portions of Section 35, T3N, R6W, and Portions of Section 2, T2N, R6W, W.M., Washington County, Oregon.
2. **Type of Sale:** This timber sale is 96 net acres of Modified Clearcut, and 2 acres of Right-of-Way. The timber will be sold on a recovery basis at a sealed bid auction.
3. **Revenue Distribution:** 100% BOF, Washington County.
4. **Sale Acreage:** Acres are net of stream buffers and road prisms. Acreage was determined using ESRI ArcMap GIS software.
5. **Cruise:** The Timber Sale was cruised by ODF Cruisers in November of 2018. For more information see Cruise Report.
6. **Timber Description:** The Timber Sale Area consists of an well-stocked 75 year old Douglas-fir stand with minor amounts of western hemlock, western redcedar, true firs, and hardwoods. The stand has an average of 239 ft<sup>2</sup> of basal area for all species, an average Douglas-fir DBH of 20 inches, and an estimated average net Douglas-fir volume of approximately 41.8 MBF per acre.
7. **Topography and Logging Method:** Slopes within the sale areas range from 5% to 70%, and northern in aspect. The timber sale is 22% ground-based yarding and 78% cable yarding. The average cable corridor length is 600 feet and the maximum length is approximately 1,450 feet. The average horizontal skid trail length is approximately 250 feet and the maximum length is approximately 550 feet.
8. **Access:** All access to the Timber Sale Area is on surfaced all-weather roads. From Forest Grove, travel north on Highway 8 to its junction with Highway 6. Turn left and travel west approximately 3.5 miles to Timber Road. Turn right, proceed north on Timber Road approximately 6.5 miles, and turn left onto Cochran Road. Continue west on Cochran Road for 3.8 miles to the Round Top Road and turn left. Continue an additional 3.5 miles and bear right onto Bell Camp Road. Continue west on Bell Camp Road for 1.5 miles and turn right to arrive at Area 1 of the Timber Sale Area.

**9. Projects:**

Project No. 1: Rocked Road Construction	\$93,457.83
Move in and equipment cleaning:	\$7,507.17

Total Credit for all Projects (rounded)	\$100,965.00
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## PROJECT COST SUMMARY SHEET

Timber Sale: More Cow Bell  
Sale Number: FG-341-2019-W00542-01

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### PROJECT NO. 1: ROCKED ROAD CONSTRUCTION

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<u>Road Segment</u>	<u>Length</u>	<u>Cost</u>
A to B	2+95	\$3,408.58
A to C	6+25	\$5,600.19
D to E	24+50	\$23,854.22
F to G	26+00	\$47,759.84
H to I	5+80	\$8,130.42
J to K	1+75	\$4,704.58
67+25 stations		
1.27 miles		

1 1/2" - 0	163 cy
Pit Run	5,460 cy
36" - 24"	40 cy

Total Rock = 5,663 cy

Move-in = \$7,507.17

**TOTAL PROJECT NO. 1 COST = \$100,965.00**

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**TOTAL CREDITS \$100,965.00**



# SUMMARY OF CONSTRUCTION COST

Timber Sale: More Cow Bell  
Road Segment: A to B

Sale Number: FG-341-2019-W00542-01  
Construction: 2+95 stations  
0.06 miles

## PROJECT NO. 1

### CONSTRUCTION

Clearing & grubbing (scatter)	0.21	ac @	\$1,078.00	per ac =	\$226.38
Balanced road construction	2.95	sta @	\$110.00	per sta =	\$324.50
50' Landing	1	ea @	\$220.00	per ea =	\$220.00
Grade, ditch, & roll	2.95	sta @	\$36.00	per sta =	\$106.20

**TOTAL CONSTRUCTION COSTS = \$877.08**

### ROCK

	Rock Size	Base Cost \$/cy	Haul Cost \$/cy	Placement/ Processing Cost \$/cy	Total CY	Rock Cost
<b>Surfacing rock</b>						
Base rock	Pit-run	\$4.14	\$2.16	\$1.10	192	\$1,420.80
Junction	Pit-run	\$4.14	\$2.16	\$1.10	48	\$355.20
50' Landing	Pit-run	\$4.14	\$2.16	\$1.10	95	\$703.00
Subtotal =					335	\$2,479.00

Totals

All Rock =	335
Pit-run =	335

**TOTAL ROCK COSTS = \$2,479.00**

### EROSION CONTROL

Grass seed & fertilizer	0.11	ac @	\$500.00	per ac =	\$52.50
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**TOTAL EROSION CONTROL COSTS = \$52.50**

**PROJECT NO. 1 TOTAL COST = \$3,408.58**

# SUMMARY OF CONSTRUCTION COST

Timber Sale: More Cow Bell  
 Road Segment: A to C

Sale Number: FG-341-2019-W00542-01  
 Construction: 6+25 stations  
0.12 miles

## PROJECT NO. 1

### CONSTRUCTION

Clearing & grubbing (scatter)	0.44	ac @	\$1,078.00	per ac =	\$474.32
Balanced road construction	6.25	sta @	\$55.00	per sta =	\$343.75
Turnouts	1	ea @	\$66.00	per ea =	\$66.00
Turnarounds	1	ea @	\$82.50	per ea =	\$82.50
50' Landing	1	ea @	\$220.00	per ea =	\$220.00
Grade, ditch, & roll	6.25	sta @	\$36.00	per sta =	\$225.00

TOTAL CONSTRUCTION COSTS = \$1,411.57

### ROCK

	Rock Size	Base Cost \$/cy	Haul Cost \$/cy	Placement/ Processing Cost \$/cy	Total CY	Rock Cost
<b>Surfacing rock</b>						
Base rock	Pit-run	\$4.14	\$2.23	\$1.10	407	\$3,040.29
Junction	Pit-run	\$4.14	\$2.23	\$1.10	24	\$179.28
Turnaround	Pit-run	\$4.14	\$2.23	\$1.10	20	\$149.40
50' Landing	Pit-run	\$4.14	\$2.23	\$1.10	95	\$709.65
Subtotal =					546	\$4,078.62

Totals

All Rock =	546
Pit-run =	546

TOTAL ROCK COSTS = \$4,078.62

### EROSION CONTROL

Grass seed & fertilizer	0.22	ac @	\$500.00	per ac =	\$110.00
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TOTAL EROSION CONTROL COSTS = \$110.00

**PROJECT NO. 1 TOTAL COST = \$5,600.19**

# SUMMARY OF CONSTRUCTION COST

Timber Sale: More Cow Bell  
Road Segment: D to E

Sale Number: FG-341-2019-W00542-01  
Construction: 24+50 stations  
0.46 miles

## PROJECT NO. 1

### CONSTRUCTION

Clearing & grubbing (scatter)	2.25	ac @	\$1,078.00	per ac =	\$2,425.50
Balanced road construction	24.50	sta @	\$110.00	per sta =	\$2,695.00
Turnouts	3	ea @	\$66.00	per ea =	\$198.00
Turnarounds	1	ea @	\$82.50	per ea =	\$82.50
50' Landing	1	ea @	\$220.00	per ea =	\$220.00
Grade, ditch, & roll	24.50	sta @	\$36.00	per sta =	\$882.00

TOTAL CONSTRUCTION COSTS = \$6,503.00

### CULVERTS

Culverts and Bands					
18" Diameter	130	LF @	\$20.00	per LF =	\$2,600.00
Markers & Stakes					
Culvert markers	4	ea @	\$10.00	per ea =	\$40.00

TOTAL CULVERT COSTS = \$2,640.00

### ROCK

	Rock Size	Base Cost \$/cy	Haul Cost \$/cy	Placement/ Processing Cost \$/cy	Total CY	Rock Cost
<b>Surfacing rock</b>						
Base rock	Pit-run	\$4.14	\$2.50	\$1.10	1,593	\$12,329.82
Junction	Pit-run	\$4.14	\$2.50	\$1.10	30	\$232.20
Turnouts	Pit-run	\$4.14	\$2.50	\$1.10	90	\$696.60
Turnaround	Pit-run	\$4.14	\$2.50	\$1.10	20	\$154.80
50' Landing	Pit-run	\$4.14	\$2.50	\$1.10	95	\$735.30
Subtotal =					1,828	\$14,148.72

Totals

All Rock =	1,828
Pit-run =	1,828

TOTAL ROCK COSTS = \$14,148.72

### EROSION CONTROL

Grass seed & fertilizer	1.13	ac @	\$500.00	per ac =	\$562.50
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TOTAL EROSION CONTROL COSTS = \$562.50

**PROJECT NO. 1 TOTAL COST = \$23,854.22**

# SUMMARY OF CONSTRUCTION COST

Timber Sale: More Cow Bell Sale Number: FG-341-2019-W00542-01  
Road Segment: F to G Construction: 26+00 stations  
0.49 miles

## PROJECT NO. 1

### CONSTRUCTION

Clearing & grubbing (scatter)	2.36	ac @	\$1,078.00	per ac =	\$2,544.08
Clearing & grubbing (end-haul)					\$407.00
Balanced road construction	22.00	sta @	\$110.00	per sta =	\$2,420.00
Drift	4.00	sta @	\$180.00	per sta =	\$720.00
End-haul (6+50 to 12+00)					
Excavate & load	1,334	cy @	\$1.64	per cy =	\$2,187.76
Haul	1,735	cy @	\$0.91	per cy =	\$1,578.85
Compact waste area	1,735	cy @	\$0.30	per cy =	\$520.50
Fill Construction (8+20)					
Drift & compact fill	1,000	cy @	\$3.80	per cy =	\$3,800.00
Pump culvert installation	2	day @	\$150.00	per day =	\$300.00
Turnouts	3	ea @	\$66.00	per ea =	\$198.00
Turnarounds	1	ea @	\$82.50	per ea =	\$82.50
50' Landing	1	ea @	\$220.00	per ea =	\$220.00
Grade, ditch, & roll	26.00	sta @	\$36.00	per sta =	\$936.00

**TOTAL CONSTRUCTION COSTS = \$15,914.69**

### CULVERTS

Culverts and Bands					
60" Diameter	60	LF @	\$114.40	per LF =	\$6,864.00
60" Bands	2	ea @	\$160.00	per ea =	\$320.00
Additional Installation Cost					\$520.00

**TOTAL CULVERT COSTS = \$7,704.00**

### ROCK

	Rock Size	Base/ Loading Cost \$/cy	Haul Cost \$/cy	Placement/ Processing Cost \$/cy	Total CY	Rock Cost
<b>Subgrade rock</b>						
Culvert bedding	1½" - 0	\$0.80	\$10.90	\$0.50	48	\$585.60
Energy dissipator	36" - 24"	\$1.60	\$9.32	\$1.60	24	\$300.48
Fill armor	36" - 24"	\$1.60	\$9.32	\$1.60	16	\$200.32
Subtotal =					88	\$1,086.40
<b>Surfacing rock</b>						
Base rock	Pit-run	\$4.14	\$6.21	\$1.10	1,690	\$19,350.50
Turnout	Pit-run	\$4.14	\$6.21	\$1.10	90	\$1,030.50
Turnaround	Pit-run	\$4.14	\$6.21	\$1.10	20	\$229.00
Curve widening	Pit-run	\$4.14	\$6.21	\$1.10	60	\$687.00
50' Landing	Pit-run	\$4.14	\$6.21	\$1.10	95	\$1,087.75
Subtotal =					1,955	\$22,384.75

Totals	All Rock =	2,043
	1½" - 0 =	48
	Pit-run =	1,955
	36" - 24" =	40

**TOTAL ROCK COSTS = \$23,471.15**

### EROSION CONTROL

Grass seed & fertilizer	1.18	ac @	\$500.00	per ac =	\$590.00
Straw mulch (bale)	8	ea @	\$10.00	per ea =	\$80.00

**TOTAL EROSION CONTROL COSTS = \$670.00**

**PROJECT NO. 1 TOTAL COST = \$47,759.84**

# SUMMARY OF CONSTRUCTION COST

Timber Sale: More Cow Bell  
Road Segment: H to I

Sale Number: FG-341-2019-W00542-01  
Construction: 5+80 stations  
0.11 miles

## PROJECT NO. 1

### CONSTRUCTION

Clearing & grubbing (scatter)	0.54	ac @	\$1,078.00	per ac =	\$582.12
Balanced road construction	5.80	sta @	\$110.00	per sta =	\$638.00
Turnarounds	1	ea @	\$82.50	per ea =	\$82.50
50' Landing	1	ea @	\$220.00	per ea =	\$220.00
Grade, ditch, & roll	5.80	sta @	\$36.00	per sta =	\$208.80

**TOTAL CONSTRUCTION COSTS = \$1,731.42**

### ROCK

	Rock Size	Base Cost \$/cy	Haul Cost \$/cy	Placement/ Processing Cost \$/cy	Total CY	Rock Cost
<b>Surfacing rock</b>						
Base rock	Pit-run	\$4.14	\$6.76	\$1.10	377	\$4,524.00
Junction	Pit-run	\$4.14	\$6.76	\$1.10	30	\$360.00
Turnaround	Pit-run	\$4.14	\$6.76	\$1.10	20	\$240.00
50' Landing	Pit-run	\$4.14	\$6.76	\$1.10	95	\$1,140.00
Subtotal =					522	\$6,264.00

Totals

All Rock =	522
Pit-run =	522

**TOTAL ROCK COSTS = \$6,264.00**

### EROSION CONTROL

Grass seed & fertilizer	0.27	ac @	\$500.00	per ac =	\$135.00
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**TOTAL EROSION CONTROL COSTS = \$135.00**

**PROJECT NO. 1 TOTAL COST = \$8,130.42**

# SUMMARY OF CONSTRUCTION COST

Timber Sale: More Cow Bell  
Road Segment: J to K

Sale Number: FG-341-2019-W00542-01  
Construction: 1+75 stations  
0.03 miles

## PROJECT NO. 1

### CONSTRUCTION

Clearing & grubbing (scatter)	0.13	ac @	\$1,078.00	per ac =	\$140.14
Balanced road construction	1.75	sta @	\$110.00	per sta =	\$192.50
70' Landing	1	ea @	\$314.00	per ea =	\$314.00
Grade, ditch, & roll	1.75	sta @	\$36.00	per sta =	\$63.00

**TOTAL CONSTRUCTION COSTS = \$709.64**

### ROCK

	Rock Size	Base/ Loading Cost \$/cy	Haul Cost \$/cy	Placement/ Processing Cost \$/cy	Total CY	Rock Cost
<b>Surfacing rock</b>						
Base rock	Pit-run	\$4.14	\$2.12	\$1.10	114	\$839.04
Junction	Pit-run	\$4.14	\$2.12	\$1.10	40	\$294.40
70' Landing	Pit-run	\$4.14	\$2.12	\$1.10	120	\$883.20
Surfacing rock	1 1/2" - 0	\$0.80	\$14.90	\$1.22	35	\$592.20
Junction	1 1/2" - 0	\$0.80	\$14.90	\$1.22	20	\$338.40
70' Landing	1 1/2" - 0	\$0.80	\$14.90	\$1.22	60	\$1,015.20
Subtotal =					389	\$3,962.44

Totals

All Rock =	389
Pit-run =	274
1 1/2" - 0 =	115

**TOTAL ROCK COSTS = \$3,962.44**

### EROSION CONTROL

Grass seed & fertilizer	0.07	ac @	\$500.00	per ac =	\$32.50
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**TOTAL EROSION CONTROL COSTS = \$32.50**

**PROJECT NO. 1 TOTAL COST = \$4,704.58**

**MOVE-IN, WITHIN AREA MOVE, & EQUIPMENT CLEANING COSTS**

Timber Sale: More Cow Bell Sale Number: FG-341-2019-W00542-01

**Equipment**

**Total**

Grader	\$1,123.15
Loader (Med. & Large) into Stockpile Site	\$739.45
Roller (smooth/grid) & Compactor	\$673.70
Excavator (Large) - Equipment Cleaning	\$2,190.21
Dozer (Large) - Equipment Cleaning	\$2,234.79
Dump Trucks (10cy +)	\$545.87

**TOTAL MOVE-IN COSTS = \$7,507.17**

## QUARRY DEVELOPMENT & CRUSHING COST SUMMARY

Timber Sale: More Cow Bell  
Sale Number: FG-341-2019-W00542-01  
Quarry Name: Bell Grade Quarry

Pit-run: 5,460 cy (truck measure)  
Total truck yardage: 5,460 cy  
Total in place yardage: 4,200 cy  
Swell: 130%

### Move-in & Other Base Cost

Quarry development & overburden removal	\$5,325.42
Within area move - Excavator	\$175.00
Clean up quarry	\$700.00
Subtotal =	<u>\$6,200.42</u>
Per CY =	<u>\$1.14</u>

### Pit-run Base Cost

Rip Rock	<u>\$2.10</u>	/ cy x	<u>4,200</u>	cy =	\$8,820.00
Load dump truck	<u>\$0.80</u>	/ cy x	<u>5,460</u>	cy =	<u>\$4,368.00</u>
Subtotal =					<u>\$13,188.00</u>
Per CY =					<u>\$3.00</u>
Total =					<u><u>\$19,388.42</u></u>

Pit-run Base Cost = **\$4.14/cy**



**CRUISE REPORT**  
**More Cow Bell**  
**FG-341-2019-W00542-01**

**1. LOCATION:** Portions of Section 35, T3N, R6W, and Portions of Section 2, T2N, R6W, W.M. Washington County, Oregon.

**2. CRUISE DESIGN:**

Pre-cruise evaluation indicated that the stand's average DBH is approximately 20 inches with a Coefficient of Variation of about 52%. For sales of this size and approximate value, ODF cruise standards require a Sampling Error of 9% at a 68% confidence level, and a minimum sample size of 100 graded trees. Statistical analysis indicated that 33 variable radius plots utilizing a 40 BAF prism would produce an adequate sample size.

**3. SAMPLING METHOD:**

The Timber Sale Area was cruised in November, 2018. The Timber Sale Area was sampled with 33 variable radius grade plots laid out on a 6 chain x 5 chain grid. Plots falling on or near existing roads or no-harvest areas were offset 1 chain.

**4. CRUISE RESULTS**

197 trees were measured and graded producing a cumulative Sampling Error of 6.9% on the Basal Area and 8.3% on the Board Foot Volume.

**5. TREE MEASUREMENT AND GRADING:**

All sample trees were measured and graded following Columbia River Log Scale grade rules and favored 40 foot segments.

- a) **Height Standards:** Total tree heights were measured to the nearest foot. Bole heights were calculated to a six inch top.
- b) **Diameter Standards:** Diameters were measured outside bark at breast height to the nearest inch.
- c) **Form Factors:** Measured for each grade tree using a form point of 16 feet.

**5. DATA PROCESSING**

- a) **Volumes and Statistics:** Cruise estimates and sampling statistics, were derived from Super Ace 2008 cruise software
- b) **Deductions:** For conifers two percent of the volume was subtracted from the computed volumes to account for hidden defect and breakage. For red alder five percent of the volume was subtracted from the computed volumes to account for hidden defect and breakage.

**6. Cruisers:** The sale was cruised by ODF cruisers Kenton Burns, Adrian Torres, and Mark Savage.

Prepared by:

 1-23-19  
Name Date

Reviewed by:

 1-23-19  
Name Date

TC PSTATS			PROJECT STATISTICS							PAGE	1	
			PROJECT MORCOW							DATE	11/28/2018	
TWP	RGE	SC	TRACT	TYPE		ACRES		PLOTS	TREES	CuFt	BdFt	
03N	06	35	00A1	00MC		96.00		33	197	S	W	
			PLOTS		TREES	TREES ESTIMATED TOTAL TREES		PERCENT SAMPLE TREES				
TOTAL			33	197	6.0							
CRUISE			33	197	6.0		10,553		1.9			
DBH COUNT												
REFOREST												
COUNT												
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			180	97.6	20.2	117	48.5	218.2	42,872	42,629	9,439	
WHEMLOCK			11	7.9	17.6	103	3.2	13.3	2,148	2,148	532	
NOB FIR			4	3.3	16.4	119	1.2	4.8	886	886	203	
R ALDER			2	1.1	20.3	85	0.5	2.4	302	296	80	
TOTAL			197	109.9	20.0	116	53.5	238.8	46,208	45,959	10,254	
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			61.6	4.6	608	637	666					
WHEMLOCK			52.1	16.5	299	358	417					
NOB FIR			58.8	33.6	222	335	448					
R ALDER			32.3	30.2	199	285	371					
TOTAL			63.3	4.5	584	611	639	160	40	18		
CL	68.1	COEFF	SAMPLE TREES - CF				# OF TREES REQ.		INF. POP.			
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15			
DOUG FIR			54.2	4.0	132	138	143					
WHEMLOCK			48.8	15.4	74	88	101					
NOB FIR			55.3	31.6	52	75	99					
R ALDER			36.7	34.3	51	77	103					
TOTAL			55.5	4.0	128	133	138	123	31	14		
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			59.7	10.4	88	98	108					
WHEMLOCK			255.9	44.5	4	8	11					
NOB FIR			296.9	51.6	2	3	5					
R ALDER			404.3	70.3	0	1	2					
TOTAL			54.4	9.5	100	110	120	118	30	13		
CL	68.1	COEFF	BASAL AREA/ACRE				# OF PLOTS REQ.		INF. POP.			
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15			
DOUG FIR			44.0	7.6	201	218	235					
WHEMLOCK			220.8	38.4	8	13	18					
NOB FIR			273.4	47.6	3	5	7					
R ALDER			399.8	69.5	1	2	4					
TOTAL			39.6	6.9	222	239	255	63	16	7		
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			52.9	9.2	38,706	42,629	46,551					
WHEMLOCK			214.0	37.2	1,349	2,148	2,948					
NOB FIR			278.7	48.5	457	886	1,315					
R ALDER			401.4	69.8	89	296	503					

TC PSTATS				PROJECT STATISTICS				PAGE	2	
				PROJECT MORCOW				DATE	11/28/2018	
TWP	RGE	SC	TRACT	TYPE		ACRES	PLOTS	TREES	CuFt	BdFt
03N	06	35	00A1	00MC		96.00	33	197	S	W
CL	68.1		COEFF	NET BF/ACRE				# OF PLOTS REQ.	INF. POP.	
SD:	1.00		VAR.	S.E.%	LOW	AVG	HIGH	5	10	15
TOTAL			47.7	8.3	42,148	45,959	49,770	91	23	10
CL	68.1		COEFF	NET CUFT FT/ACRE				# OF PLOTS REQ.	INF. POP.	
SD:	1.0		VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15
DOUG FIR			50.7	8.8	8,606	9,439	10,272			
WHEMLOCK			216.2	37.6	332	532	732			
NOB FIR			275.9	48.0	105	203	300			
R ALDER			402.8	70.1	24	80	135			
TOTAL			45.7	7.9	9,439	10,254	11,068	83	21	9

TC		PSPCSTGR		Species, Sort Grade - Board Foot Volumes (Project)																	
<div>T03N R06W S35 Ty00MC96.00</div>				Project: MORCOW														Page 1			
				Acres 96.00														Date 11/28/2018 Time 1:12:41PM			
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	Dia In	Bd Ft	CF/ Lf	
					4-5	6-11	12-16		17+	12-20	21-30	31-35	36-99								
WH			CU														18	5		0.00	.6
WH			2M	49		1,073	1,073	103			68	32				100	40	15	323	1.86	3.3
WH			3M	49		1,042	1,042	100		100					8	92	38	8	97	0.67	10.7
WH			4M	2		34	34	3		100			100				14	6	15	0.34	2.2
WH Totals				5		2,148	2,148	206		50	34	16	2		4	95	35	9	128	0.91	16.8
DF			CU														15	10		0.00	9.8
DF			2M	72	.7	31,056	30,830	2,960			51	49	0	1	1	98	40	15	381	1.98	80.8
DF			3M	24	.2	10,335	10,318	991		99		1	1	1	5	93	39	8	104	0.70	99.3
DF			4M	4		1,480	1,480	142		100			47	53			20	6	24	0.33	61.3
DF Totals				93	.6	42,872	42,629	4,092		27	37	36	2	3	2	94	34	10	170	1.12	251.1
NF			2M	37		333	333	32			100					100	40	14	301	1.54	1.1
NF			3M	54		481	481	46		100						100	40	9	116	0.71	4.2
NF			4M	9		73	73	7		100				100			23	6	30	0.30	2.4
NF Totals				2		886	886	85		62	38			8		92	35	9	115	0.76	7.7
RA			CU														13	5		0.00	.6
RA			R	100	2.0	302	296	28		18	82		8	37	9	45	30	11	138	1.23	2.1
RA Totals				1	2.0	302	296	28		18	82		8	37	9	45	26	9	107	1.09	2.8
Totals					0.5	46,208	45,959	4,412		29	37	34	2	3	2	93	34	10	165	1.10	278.4

TC		PSTNDSUM											Stand Table Summary											Page		1				
																								Date:		11/28/2018				
T03N R06W S35 Ty00MC 96.00					Project											MORCOW											Time:		1:12:43PM	
					Acres											96.00											Grown Year:			
S	Spec	T	Sample		Tot		Trees/			Average Log			Net		Net		Totals													
			DBH	Trees	FF 16'	Av Ht	BA/ Acre	Logs Acre	Net Cu.Ft.	Net Bd.Ft.	Tons/ Acre	Cu.Ft. Acre	Bd.Ft. Acre	Tons	Cunits	MBF														
DF			8	1	83	51	3.472	1.21	3.47	3.7	20.0	.37	13	69	35	12	7													
DF			9	1	87	74	2.744	1.21	2.74	8.2	40.0	.64	22	110	61	22	11													
DF			10	1	82	53	2.222	1.21	2.22	8.9	30.0	.57	20	67	54	19	6													
DF			11	2	89	110	3.673	2.42	7.35	10.4	47.5	2.19	77	349	210	74	34													
DF			12	2	86	94	3.087	2.42	6.17	11.7	47.5	2.07	72	293	198	70	28													
DF			13	3	89	95	3.945	3.64	7.89	14.8	63.3	3.33	117	500	319	112	48													
DF			14	4	86	91	4.535	4.85	9.07	15.9	60.0	4.11	144	544	395	139	52													
DF			15	4	87	106	3.951	4.85	8.89	18.1	75.6	4.57	160	672	439	154	64													
DF			16	8	88	116	6.945	9.70	16.49	22.5	98.9	10.56	371	1,632	1,014	356	157													
DF			17	7	88	117	5.383	8.48	12.30	27.0	113.1	9.45	332	1,392	908	318	134													
DF			18	9	87	115	6.173	10.91	14.40	28.9	112.9	11.84	416	1,626	1,137	399	156													
DF			19	8	89	118	4.925	9.70	12.93	30.4	126.7	11.20	393	1,638	1,075	377	157													
DF			20	10	88	128	5.556	12.12	16.11	33.1	142.8	15.20	533	2,300	1,459	512	221													
DF			21	10	87	128	5.039	12.12	14.11	37.9	161.8	15.22	534	2,283	1,461	513	219													
DF			22	12	89	136	5.510	14.55	16.53	42.3	198.3	19.91	699	3,278	1,912	671	315													
DF			23	9	86	126	3.781	10.91	10.08	45.9	201.7	13.20	463	2,033	1,267	445	195													
DF			24	13	86	131	5.016	15.76	14.66	48.4	214.7	20.23	710	3,148	1,942	681	302													
DF			25	9	86	134	3.200	10.91	9.60	51.7	230.0	14.14	496	2,208	1,357	476	212													
DF			26	14	87	140	4.603	16.97	13.81	59.3	273.1	23.33	819	3,771	2,240	786	362													
DF			27	11	87	141	3.353	13.33	9.45	61.1	291.6	16.47	578	2,756	1,581	555	265													
DF			28	12	86	141	3.402	14.55	11.06	64.1	305.1	20.21	709	3,373	1,940	681	324													
DF			29	6	88	140	1.586	7.27	4.49	78.4	385.3	10.03	352	1,731	963	338	166													
DF			30	11	84	139	2.716	13.33	8.15	77.8	359.4	18.07	634	2,929	1,735	609	281													
DF			31	5	87	147	1.156	6.06	3.70	82.8	408.1	8.73	306	1,510	838	294	145													
DF			32	4	87	160	.868	4.85	3.04	86.4	447.9	7.49	263	1,361	719	252	131													
DF			33	3	86	153	.612	3.64	2.24	80.7	423.6	5.16	181	951	496	174	91													
DF			35	1	69	119	.181	1.21	.36	70.0	290.0	.72	25	105	70	24	10													
DF			Totals	180	87	117	97.636	218.18	241.34	39.1	176.6	269.02	9,439	42,629	25,826	9,062	4,092													
WH			11	1	84	78	1.837	1.21	1.84	17.1	60.0	1.01	31	110	97	30	11													
WH			14	1	86	105	1.134	1.21	2.27	20.2	85.0	1.47	46	193	141	44	19													
WH			16	1	88	111	.868	1.21	1.74	29.1	120.0	1.62	51	208	155	49	20													
WH			17	1	87	106	.769	1.21	1.54	30.9	120.0	1.52	48	185	146	46	18													
WH			19	2	87	118	1.231	2.42	3.08	33.4	132.0	3.29	103	406	316	99	39													
WH			21	1	93	89	.504	1.21	1.01	42.6	170.0	1.37	43	171	132	41	16													
WH			23	2	84	114	.840	2.42	2.52	40.0	161.7	3.23	101	408	310	97	39													
WH			24	1	89	117	.386	1.21	1.16	47.8	210.0	1.77	55	243	170	53	23													
WH			25	1	84	118	.356	1.21	1.07	51.2	210.0	1.75	55	224	168	52	22													
WH			Totals	11	86	102	7.924	13.33	16.21	32.8	132.5	17.03	532	2,148	1,635	511	206													
NF			13	1	85	100	1.315	1.21	2.63	15.7	60.0	.99	41	158	95	40	15													
NF			16	1	88	123	.868	1.21	1.74	28.1	125.0	1.17	49	217	113	47	21													
NF			18	1	89	143	.686	1.21	2.06	28.5	130.0	1.41	59	268	135	56	26													
NF			23	1	87	130	.420	1.21	1.26	42.8	193.3	1.30	54	244	124	52	23													
NF			Totals	4	87	119	3.289	4.85	7.68	26.4	115.3	4.87	203	886	467	195	85													
RA			19	1	84	77	.616	1.21	1.23	28.5	110.0	.96	35	135	93	34	13													
RA			22	1	84	96	.459	1.21	.92	48.4	175.0	1.22	44	161	117	43	15													
RA			Totals	2	84	85	1.075	2.42	2.15	37.0	137.8	2.19	80	296	210	76	28													
Totals			197	87	116	109.924	238.79	267.38	38.3	171.9	293.10	10,254	45,959	28,138	9,844	4,412														

TC		PLOGSTVB		Log Stock Table - MBF															
T03N R06W S35 Ty00MC				96.00		Project:		MORCOW								Page		1	
						Acres		96.00								Date		11/28/2018	
																Time		1:12:41PM	
S T	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+
WH		2M	40	103		103	49.9					28	26	49					
WH		3M	32	8		8	3.8			8									
WH		3M	36	9		9	4.2			9									
WH		3M	40	83		83	40.4			20	18	45							
WH		4M	12	1		1	.5			1									
WH		4M	14	1		1	.4			1									
WH		4M	16	1		1	.3			1									
WH		4M	18	1		1	.4			1									
WH		Totals		206		206	4.7			31	27	45	28	26	49				
DF		2M	16	8		8	.2									8			
DF		2M	22	12		12	.3									12			
DF		2M	24	10	37.5	6	.1							6					
DF		2M	28	6		6	.2						6						
DF		2M	34	15		15	.4							15					
DF		2M	36	12	6.2	11	.3						11						
DF		2M	40	2,918		2,901	70.9					536	560	1290	516				
DF		3M	14	8		8	.2								8				
DF		3M	22	4		4	.1			4									
DF		3M	28	2		2	.1			2									
DF		3M	30	8		8	.2			2	5								
DF		3M	32	10		10	.3			10									
DF		3M	34	37		37	.9			35	1								
DF		3M	36	36		36	.9			33	3								
DF		3M	38	25		25	.6			11	14								
DF		3M	40	861		860	21.0			134	255	471							
DF		4M	12	9		9	.2			8	0								
DF		4M	14	10		10	.3			10									
DF		4M	16	14		14	.3			14									
DF		4M	18	21		21	.5			21									
DF		4M	20	14		14	.3			14									
DF		4M	22	12		12	.3			12									
DF		4M	24	8		8	.2			8									
DF		4M	26	11		11	.3			11									
DF		4M	28	12		12	.3			12									
DF		4M	30	32		32	.8			32									

TC PLOGSTVB		Log Stock Table - MBF																				
T03N R06W S35 Ty00MC 96.00					Project: MORCOW										Page 2							
					Acres 96.00										Date 11/28/2018							
					Time 1:12:41PM																	
S T  Spp	Gr rt  So	Log de  Len	Gross MBF	Def %	Net MBF	% Spc	Net Volume by Scaling Diameter in Inches															
							2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-19	20-23	24-29	30-39	40+				
DF		Totals	4,116		4,092	92.8			371	283	471	536	577	1311	524	20						
NF		2M 40	32		32	37.5					16		16									
NF		3M 40	46		46	54.3			6	19	21											
NF		4M 22	4		4	4.5			4													
NF		4M 24	1		1	1.4			1													
NF		4M 26	2		2	2.3			2													
NF		Totals	85		85	1.9			13	19	21	16	16									
RA		R 20	3	20.0	2	8.3			2													
RA		R 30	11		11	37.4					11											
RA		R 34	3		3	9.3			3													
RA		R 40	13		13	45.0							13									
RA		Totals	29	2.0	28	.6			3	2	11	13										
Total		All Species	4,436		4,412	100.0			418	332	537	591	616	1376	524	20						

## VOLUME SUMMARY

**More Cow Bell  
FG-341-2019-W00542-01**

**January 2019**

(Volumes in MBF)

### **AREA 1: MC (96 Acres)**

SPECIES		2 SAW	3 SAW	4 SAW	CR	TOTAL
Douglas-fir	Cruise Volume	2,960	991	142	0	4,093
	Hidden D&B (2%)	(59)	(20)	(3)	(0)	(82)
	<b>NET TOTAL</b>	2,901	971	139	0	4,011
	% of Total	72	24	4	0	
Western hemlock	Cruise Volume	103	100	3	0	206
	Hidden D&B (2%)	(2)	(2)	(0)		(4)
	<b>NET TOTAL</b>	101	98	3	0	202
	% of Total	50	49	1	0	
Noble fir	Cruise Volume	32	46	7	0	85
	Hidden D&B (2%)	(1)	(1)	(0)	(0)	(2)
	<b>NET TOTAL</b>	31	45	7	0	83
	% of Total	37	54	9	0	
Red alder	Cruise Volume	0	0	0	28	28
	Hidden D&B (5%)	(0)	(0)	(0)	(1)	(1)
	<b>NET TOTAL</b>	0	0	0	27	27
	% of Total	0	0	0	100	

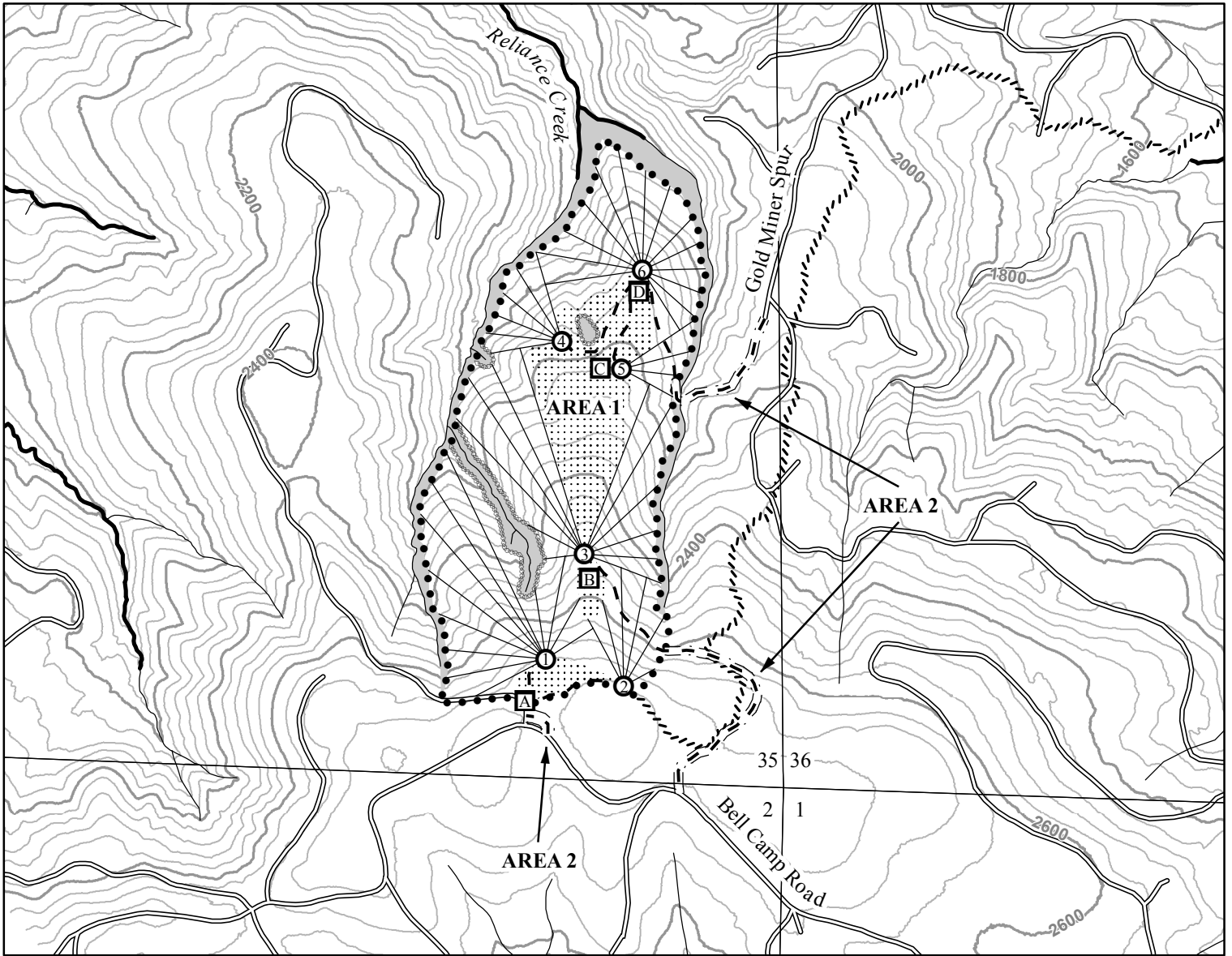
### **AREA 2: R/W (2 Acres)**

SPECIES		2 SAW	3 SAW	4 SAW	CR	TOTAL
Douglas-fir	Cruise Volume	61	20	4	0	85
	Hidden D&B (2%)	(1)	(0)	(0)	(0)	(1)
	<b>NET TOTAL</b>	60	20	4	0	84
	% of Total	71	24	4	0	

### **SALE TOTAL**

SPECIES	2 SAW	3 SAW	4 SAW	CR	TOTAL
Douglas-fir	2,961	991	143	0	4,095
Western hemlock	101	98	3	0	202
Noble fir	31	45	7	0	83
Red alder	0	0	0	27	27
<b>TOTAL</b>	3,093	1,134	153	27	4,407





## Legend

- Timber Sale Boundary
- Stream Buffer Boundary
- == Right-of-Way Boundary
- ODF Ownership Boundary
- Surfaced Roads
- - - New Road Construction
- //// Recreation Trail
- Type-F Stream
- Type-N Stream
- Stream Buffer
- Cable Yarding Area
- Tractor Yarding Area
- Cable Landing
- Tractor Landing
- 40 ft Contour Band
- 200 ft Contour Band
- Section Line

## LOGGING PLAN

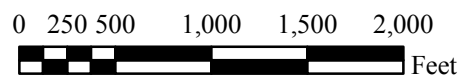
FOR TIMBER SALE CONTRACT FG-341-W00542-01  
 MORE COW BELL  
 PORTIONS OF SECTION 35, T3N, R6W, W.M.,  
 & PORTIONS OF SECTION 2, T2N, R6W, W.M.,  
 WASHINGTON COUNTY, OREGON

Forest Grove District GIS  
 January, 2019

This product is for informational use and may not be  
 suitable for legal, engineering, or surveying purposes.

1:12,000

1 inch = 1,000 feet



## APPROXIMATE NET ACRES

	TRACTOR	CABLE
AREA 1	21	75
AREA 2 R/W	2	0
TOTAL	23	75