

BLT TIMBER SALE
GATE 3 LOGGING FEASIBILITY REPORT

Gold Beach Ranger District
Rogue River Siskiyou National Forest
April 16, 2014



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General Information

BLT Timber Sale is a thinning proposed within the matrix land allocation. The sale area is located in Lost Valley Creek area on the Gold Beach Ranger District ([see Overview Map](#)). The access route to the sale is via Euchre Creek road (FSR – 3402). The NEPA covering the project is the Coastal Healthy Forest Treatments EA (2007) and Plantation Thinning and Fuel Reduction EA (2002). This report describes recommended logging systems for the sale, and what is used for cost analysis and appraisal.

The area is legally described as:
T. 34 S., R. 13 W., Sec. 19, 20, & 21
W.M., Curry County, OR

The BLT Timber Sale consists of 3 Subdivisions totaling 109 acres. These stands are all even-aged Douglas-fir plantations that were clearcut and replanted in the 1960s. Treatments include thinning and gap creation to improve residual tree growth, crown development and stand vigor. All thinning will be applied with a Designation by Description (C2.35# (Option 1) pole spacing, leaving the largest Douglas-fir and hardwoods. All stream courses (intermittent and perennial) are protected with “no-cut” riparian buffer of 25-60 feet.

The timber is to be harvested by using a skyline system in portions of Subdivisions 1, 2, and 3. Ground based skidding will occur in portions of Subdivisions 1 and 2. Shovel logging may occur in many of the units and is specifically identified in several units.

BLT Summary

Subdivision	Acres	Volume CCF	Volume (Tons)	Rx	Skyline Acres	Tractor/Shovel Acres
1	58	2245	6458	Thinning	40	18
2	43	1664	4788	Thinning	19	24
3	8	310	891	Thinning	8	0
Totals	109	4219	12137		67	42

Resource Management Objectives

All of the stands are Matrix designated by the Northwest Forest Plan (USDA-USDI, 1994). The desired future condition is an adequately stocked, variable density forest with enhanced species diversity and increased tree vigor that expedites development of large trees. This stand will supply a sustainable flow of timber over time.

Silvicultural Treatment Objectives Include:

- Density management in plantations to improve individual tree growth, crown development and stand vigor.

- Ensure stand is adequately stocked, and treatments create variable density forest with enhanced species diversity and increased tree vigor that expedites development of large trees.
- Provide suitable amounts of snags and/or replacement habitat for dependant species.
- Reduce stand potential for high intensity wildfires.
- Minimize adverse soil impacts.
- Minimize stand damage during harvest activities.
- Take measures to prevent the spread of Port-Orford-cedar root disease

Critical Elements and Assumptions

1. Maintain the “no cut” buffer zone around all streams. Streams are outside of the units and have no cut buffers that are at a minimum of 25 feet. To facilitate log suspension with skyline operations, corridors for cable rigging would be allowed to pass through the “no cut” riparian buffer zone. A maximum corridor width of 12 feet and full log suspension is required in these areas. Trees felled for facilitation of yarding within the buffer zone are to be retained on site.
2. Dead trees or snags are to be retained. If they interfere with the safety of operation, they can be cut and retained on site.
3. Haul over native surfaced and gravel surfaced roads will cease when the travel way becomes wet and water is observed moving off the running surface of the road and/or to ditches or culverts which would lead to a stream.
4. No temporary roads were identified during layout. If short temporary roads need to be built to facilitate logging, they will be closed after the season of use and winterized by water barring and other suitable measures if not obliterated before the raining season. They will be closed and obliterated by scarification and scattering of slash.
5. Cut trees are determined according to Designation by Description (DxD) specifications (see Sample Contract Provision C2.35# - Option 1)
6. Precautions to minimize the threat of introducing noxious weeds on National Forest lands by requiring washing of all equipment.
7. Landings on the 3402 road will be required to be passable by public during operations with a maximum of 30 minute delays.
8. One end log suspension is required for yarding.
9. Ground based on slopes less than 30 percent. Utilize existing skid trails from previous harvest. Some slopes will exceed 30 percent in ground based areas if pre-existing skid trails are used.
10. Mechanical Harvester on slopes less than 30 percent.
11. Seasonal restrictions apply in units 1, 2, and 3 due to adjacent Marbled Murrelet habitat (see Sample Contract Provision C6.315# for restriction details).
12. Machine piles shall be covered by operator.

Landings

There are 28 landings used for skyline yarding and tractor skidding operations in all Subdivisions. Some landings will be newly constructed and the remaining will either be reconstructed or roadside settings. All landings needing construction and or existing (will need minimal “clean-up” for use) will be “Purchaser Constructed” and have been accounted for in the appraisal. Un-rocked landings on dirt spurs will be scarified to a depth of 8” and covered with slash after use as per C6.6#.

All landings shall meet the Oregon Occupational Safety and Health Code requirements:

437-80-325

- (1) Unless otherwise specified, landing areas shall:
 - a. be large enough to heel and swing logs without striking standing timber, rigging or other equipment or object
 - b. be large and level enough to land and deck logs so that they will not slide or roll in the direction of employees or equipment
 - c. be large enough for safe movement of all machinery
 - d. be kept chunked out and have an even surface; and
 - e. not have material pushed, thrown or dumped over the edge in a manner or at a time that will endanger employees
- (2) Landing chutes shall be long and level enough so that at least 2/3 of the longest bucked log to be yarded shall rest on the ground. This is not intended to restrict the yarding or loading of logs for pole piling or an infrequent long break or tree length, provided the log is secured before unhooking the choker.
- (3) During uphill yarding, the landing chute shall be cleared of logs before the next turn of logs is landed unless:
 - a. the logs are fully contained in the landing chute, or
 - b. there is no possibility of employees working below the landing may be struck by rolling objects coming off the landing.
- 4) Roadside or continuous landings shall be large and wide enough to safely operate and maintain the yarding or loading equipment. Outrigger pads, tracks or wheels shall be on firm, stable ground.
- 5) In logging operations where the yarder is set up in the haul road and logs are landed on the slope below the road, the following shall apply:
 - a) if the landing chute slope is twenty (20) percent or less, logs may be landed and decked in the chute provided the logs can be left in a stable position;
 - b) if the landing chute slope exceeds twenty (20) percent, decking is not permitted in the chute if a chaser is required to unhook the rigging from the logs or if employees are working below the landing chute and are exposed to rolling or sliding logs;
 - c) if logs are to be decked below the road, the logs shall be effectively secured from rolling or sliding down the hill; or
 - d) if the landing process or weather conditions (rain, snow, ice, mud) prevent the required log stability and expose employees to the hazard of rolling or sliding logs, the logs shall be decked at a different location.

Tail Trees

The yarders used in the analysis can hold up to 1 1/8” skyline. In this thinning application, 3/4” would be applicable for the yoder. The following chart displays the recommended minimum diameters for straight, sound Douglas-fir trees.

SKYLINE Size, inches	Rigging height, feet					
	30	40	50	60	70	80
3/4”	14.5	17.0	19.5	22.0	24.5	26.5
7/8”	15.0	18.0	20.5	23.0	25.5	28.0
1”	16.0	19.0	21.5	24.5	27.0	29.0
1 1/8”	16.5	20.0	22.5	25.5	28.0	30.5

Intermediate Supports

Intermediate supports may be used to improve production where low payloads are expected in portions of subdivisions 1 & 2. Variable terrain where the profiles were measured (see Logging Plan Maps) results in low payloads at the lower portions of corridors. Intermediate supports dramatically increased payloads across the entire span.

Recommended rigging guidelines for a double tree intermediate support system:

Dragging Load Size (pounds)	Intermediate Support Minimum Line Size (inches) (or greater)	Rigging Height in Inches in Tree	
		Less than 30 ft.	Between 30 & 40 ft. (dbh)
0 – 5000	7/16	11.0	13.0
5000 – 6000	1/2	12.0	14.0
6000 – 8000	9/16	12.5	14.5
8000 – 10000	5/8	13.0	15.0
10000 – 14000	3/4	14.0	16.0
14000 – 19000	7/8	14.5	17.0
19000 – 25000	1	15.5	18.5
25000 – 32000	1 1/8	16.0	19.5
32000 – 40000	1 1/4	17.0	20.5
40000 – 48000	1 3/8	17.5	21.5

Note: Line sizes are based on IWRC extra-improved plow steel (Cable Logging Systems, p25). Smaller rope of equivalent breaking strength is acceptable. Tree diameters are for firmly rooted, sound, straight Douglas-fir trees. Other conifer trees may be used provided the loads are reduced 25 percent. For example, a 13-inch Western Hemlock support tree rigged at 30 feet can carry a maximum 7500-pound load.

Recommended System

The criteria that were used to determine yarding systems were based on:

1. **Soils** – adherence to Best Management Practices (BMPs) and Forest Plan thresholds for soil disturbance.
2. **Streams and Riparian protection** - Aquatic Conservation Strategy and BMPs
 - a. Soil stability
 - b. Fish presence
 - c. Intermittent vs. perennial streams
 - d. Protection or enhancement of riparian and aquatic ecosystems
3. **Slope** - <30% slopes on skidding in ground-based areas; use of existing skid trails results in some areas in ground-based areas with slopes that exceed 30%. Utilize these existing skid trails and cuts in areas of steeper side slopes.
4. **Access** – No temporary roads were deemed necessary during layout. Utilize existing road system.
5. **Economics**
6. **Local availability**
7. **Sale design efficiency considerations**
 - a. Short corridors
 - b. Small piece size
 - c. Small landings with limited guy opportunities
 - d. Minimize set up time between corridors and landings
8. Yarder w/ 2 drums, with a clamping carriage that can pass shackles and be able to rig in a multispan configuration.
9. All cable yarding (except lateral endlining) requires one-end-suspension. Tractor skidding requires the leading end to be lifted.
10. Critical profile analysis shows that one-end-suspension can be achieved by a standing skyline, single span system in all skyline portions.

Given these criteria listed above, the recommended yarder for units 1, 2, and 3 is a Yoder. A wide variety of ground based logging equipment can feasibly log this sale.

Yarder Specifications used for Analysis:

Yoder Specifications:							
Yarder:		Tower height feet	Yarder horsepower	Max brake torque	Mainline ft-lbs	Haulback ft-lbs	
Yoder, shotgun - 2 drum		40	230	torque			
Operating line	Line Dia inches	Line type	Weight per foot	Design tension lbs	Line length feet	Empty drum dia-inches	Empty drum width-inches
skyline	0.7500	Swaged	1.25	23,100	1,000		
mainline	0.6250	Swaged	0.87	16,133	1,500		
Carriage...							
Carriage:		Weight pounds	Carriage horsepower	Skyline clamp	Slackpull method	Multispan capable	# drums required
Acme 10, motorized		1,000	10	yes	carriage	yes	2
Line	Min dia-in	Max dia-in	Length-ft	Diameter-in	Torque		
skyline	0.5625	1.1250					
mainline	0.4375	0.6250					
dropline				0.6250			

Skyline Yarding Summary:

Subdivision	Acres Skyline	Cruised Volume (CCF)	Cruised Volume (Tons)	Yarder	# of cable landings	Avg External Yarding Distance (ft)	Avg Yarding Distance (ft)
1	40	1548	4454	Yoder	10	504	302
2	19	735	2116	Yoder	5	488	293
3	8	310	891	Yoder	2	489	293
Totals or Avg	67	2,593	7,460		17	494	296

*Avg external yarding distance and average yarding distance measured in slope distance. Profile summaries for each unit list external yarding distance for each profile.

Tractor Summary:

Subdivision	Acres, tractor yarded	Volume cruised (CCF)	Volume cruised (tons)	# landings, for tractor	External Skidding Distance (ft)	Average Skid Distance (ft)
1	18	697	2004	5	544	272
2	24	929	2672	4	491	246
TOTALS	42	1626	4677	9	518	259

Skyline Profiles

Skyline profiles were analyzed for subdivisions 1 & 2. These profiles were placed in areas where a slope break or uneven terrain appeared to create poor deflection. The purpose of these profiles is to determine logging feasibility, and not to figure production rates for the subdivision. The production rates (lbs per turn) for these profiles are low. These are expected to be some of the more challenging settings in the sale, and average production will be higher than those reported from Skyline Excel analysis.

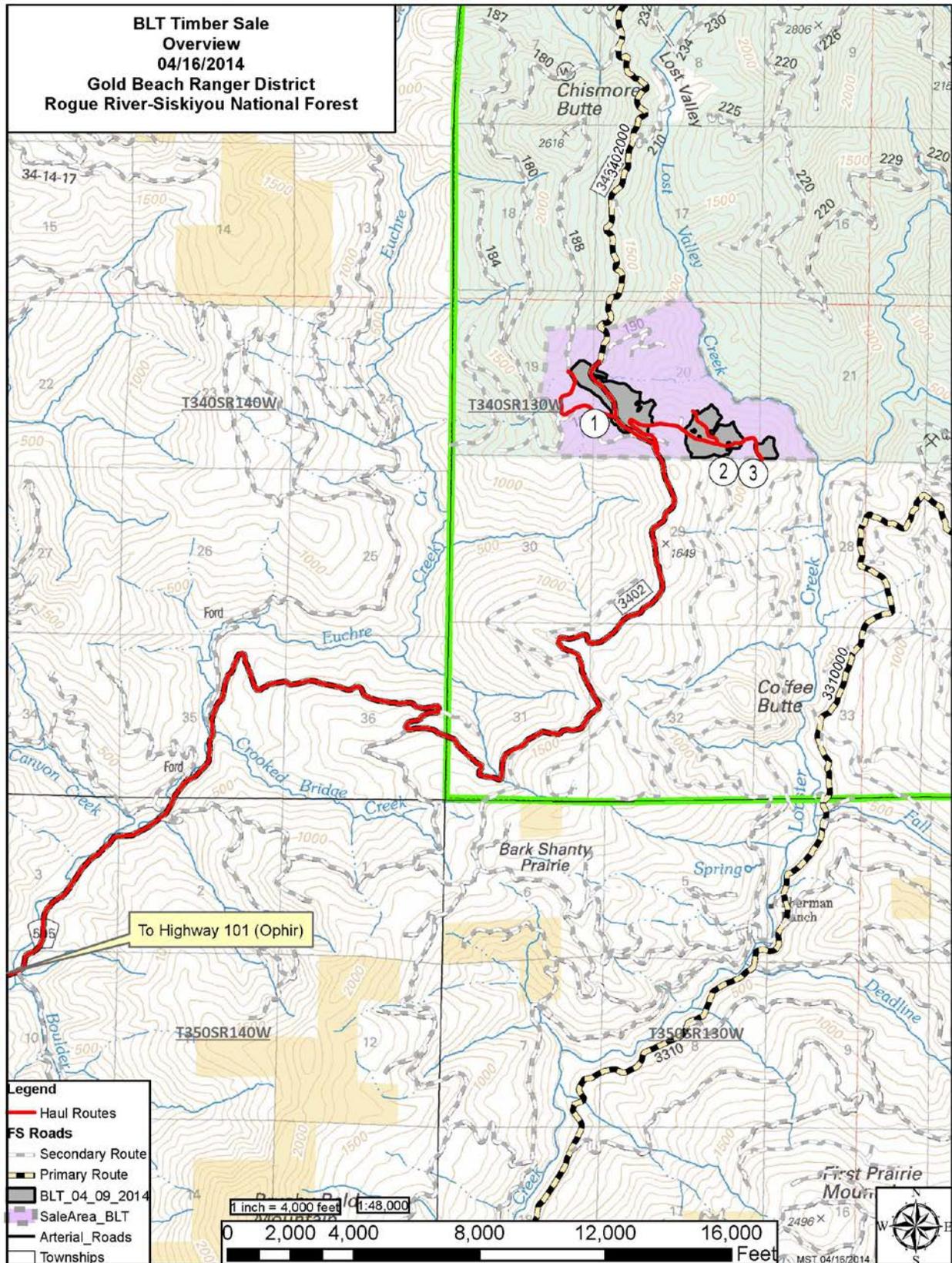
These profiles analysis assumed use of a Yoder with 2 drums, and an ACME 10 motorized carriage. Rigging height for tail trees used values in the Tail Tree table on page 4 of this report. Higher tail tree rigging heights can be achieved to improve payloads by utilizing large (+40") trees at the bottom of the settings in portions of all three subdivisions.

Profile Summary:

Subdivision	Profile	Data Type	Yarder	Intermediate Support	Haulback Required	Minimum Payload (lbs)	Skyline Rigging Length (ft)	Mainline Rigging Length (ft)
1	1-1	Ground	Yoder	No	No	3289	940	770
1	1-2	Ground	Yoder	No	No	2781	920	670
2	2-1	Ground	Yoder	No	No	3493	730	560
2	2-2	Ground	Yoder	No	No	4927	960	800

If settings appeared to be difficult, profiles were measured. Minimum payloads listed are for the most difficult settings. Production expected to be much higher on average across the subdivision.

Sale Overview Map



1964 Air Photo



Subdivision 1

Unit	Logging System	Acres	Equipment	Cruised Volume (CCF)	Cruised Volume (Tons)	Avg External Yarding Distance (ft)	Avg Yarding Distance (ft)
1	Skyline	40	Yoder	1734	5115	504	302
1	Tractor/Shovel	18	Tractor	780	2302	544	272

Logging System Notes:

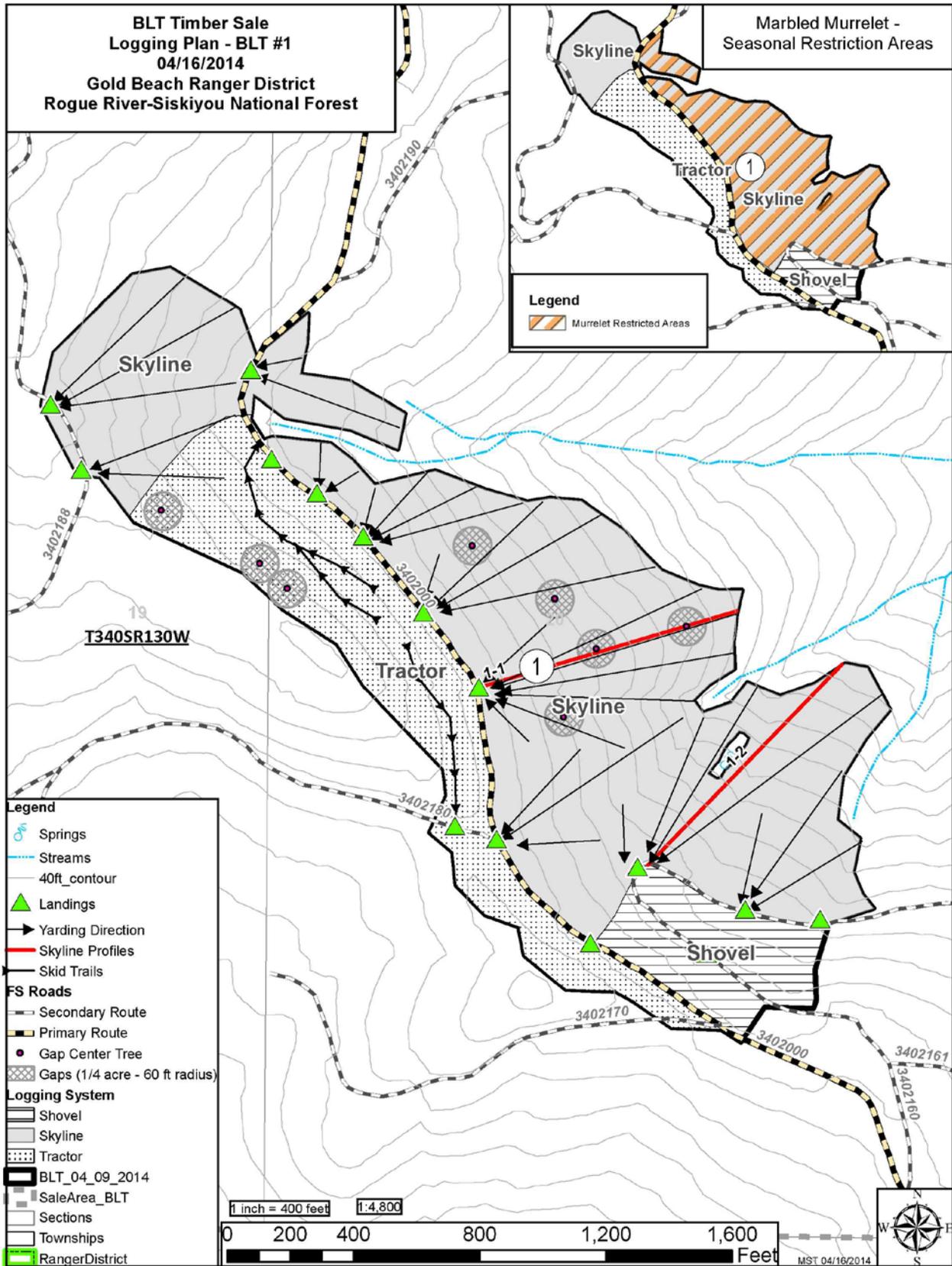
- Felling – minimize damage to residual trees, retain hardwoods where possible
- Yarding
 - One end suspension required for all yarding
 - Yard tops attached (YTA)
- **Tractor Portion** – Utilize directional felling and existing skid trails. There are steep slopes within this unit, and tractors are not to be operating on slopes greater than 30%. A soil scientist reviewed this unit and recommended that if existing skid trails were used that adverse soil impacts could be avoided. Approximate locations of existing skid trails are shown on logging plan map.
- **Tail Trees** – Large tail trees exist at the bottom of many of the skyline settings (along northeast boundary). Utilizing these large old growth trees for tail trees will allow for higher rigging heights and increased payloads in settings with limited payloads due to variable terrain.
- **Keep Open Road** – The Euchre Creek road (FSR – 3402) is a keep open road. Landings on the road will be required to be passable by public during operations with a maximum of 30 minute delays.
- **Mechanical Harvesting** – could be utilized in the tractor portion.

Restrictions and Limitations:

- **Marbled Murrelet: Skyline portion only** - No work activities will occur from April 1 through August 5. During the period August 6 through September 15, operations will have daily restrictions. Operations shall not begin until two hours after sunrise and be curtailed two hours prior to sunset.
- **Ground-based operations** shall be conducted in dry weather conditions.
- **Port-Orford-Cedar (POC)** - Populations of POC exist in the sale area that require operational restrictions. POC root disease is present along the 3402-160 road.
 - **Project scheduling** – schedule hauling during the dry conditions.
 - **Utilize uninfested water** – use uninfested water sources for planned activities such as equipment washing or treat water with Clorox bleach to prevent/reduce the spread of PL.
 - **Washing project equipment** – wash equipment when leaving the infested area to minimize the transportation of infested soil to uninfested areas. Infested areas exist along 3340-160 road. Wash project equipment before moving to other Forest Service sales.

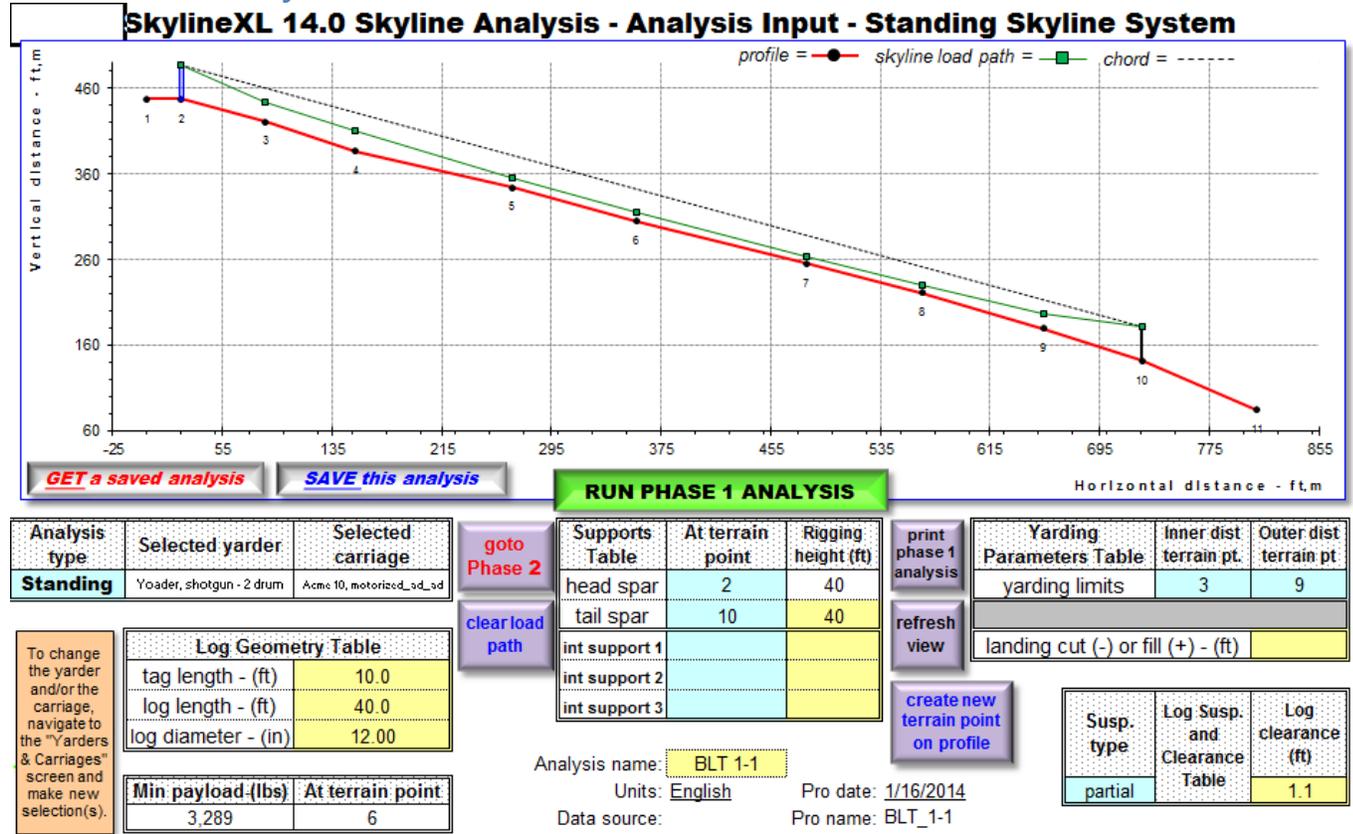
Access and Haul Routes:

- Haul route is down the 3402 towards the Euchre Creek Rd. (County rd. 505). Continue west to Hwy. 101 and travel south 50 miles to the appraisal point in Brookings, OR.



*Map not to scale, for a properly scaled map get the BLT LFR Map Package (PDF).

1-1 - Profile Analysis - Yoder



SkylineXL 14.0 Skyline Analysis - Analysis Results - Standing Skyline System

Profile name: BLT 1-1 Units: English Profile date: 1/16/14
 Analysis name: BLT 1-1 Analyst: cs
 Data source:

STANDING skyline analysis summary table... print tables

Skyline analysis type	Selected yarder	Selected carriage	Minimum payload-(lbs)	At terrain point	Analysis phase
Standing	Yoader, shotgun - 2 drum, 40-ft twr	Acme 10, motorized_ad_ad	3,289	6	1

STANDING skyline rigging lengths table...

Line	Capacity-(ft)	Required-(ft)	Notes	Chord slope span 1	Chord slope span 2	Chord slope span 3	Chord slope span 4	Average slope yarding dist for this analysis-(ft)
skyline	1,000	940	adequate	43.6%				
mainline	1,500	770	adequate					
haulback				Un-stretched skyline line length - (ft)			761.95	383

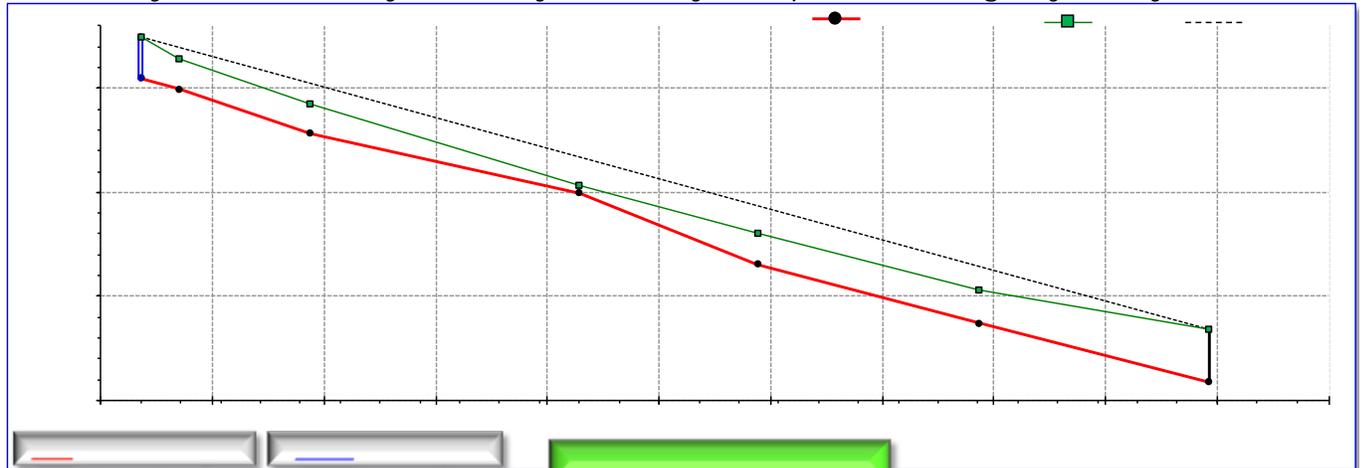
line capacities based on selected yarder

STANDING skyline analysis detail table, PHASE 1 analysis...

TP	Horizontal distance - (ft)	Net payload at TP - (lbs)	Net payload to landing - (lbs)	Skyline tension - (lbs)	Mainline tension - (lbs)	Haulback tension - (lbs)	Skyline clearance - (ft)	Log clearance - (ft)	Full susp. bottom of log above TP-(ft)
3	87	7,096	7,096	23,100	5,667	-	23.7	15.2	-
4	152	4,659	4,659	23,100	3,707	-	23.8	15.1	-
5	267	3,620	3,620	23,100	3,311	-	11.6	4.4	-
6	357	3,289	3,289	23,100	3,035	-	11.0	3.7	-
7	481	3,663	3,289	23,100	3,392	-	8.0	1.1	-
8	565	4,122	3,289	23,100	3,744	-	8.1	1.4	-
9	654	5,532	3,289	23,100	4,160	-	17.6	9.7	-

1-2 - Profile Analysis - Yoder

SkylineXL 14.0 Skyline Analysis - Analysis Input - Standing Skyline System



Analysis type	Selected yarder	Selected carriage
Standing	Yoder, shotgun - 2 drum_ad	Acme 10, motorized_ad

Log Geometry Table	
tag length - (ft)	10.0
log length - (ft)	40.0
log diameter - (in)	12.00

Min payload-(lbs)	At terrain point
2,781	5

Supports Table	At terrain point	Rigging height (ft)
head spar	1	40
tail spar	7	50
int support 1		
int support 2		
int support 3		

Yarding Parameters Table	Inner dist terrain pt.	Outer dist terrain pt
yarding limits	2	6
landing cut (-) or fill (+) - (ft)		

Susp. type	Log Susp. and Clearance Table	Log clearance (ft)
partial		1.1

Analysis name: **BLT 1-2**
 Units: English Pro date: 1/2/2014
 Data source: Ground Pro name: BLT_1-2
 Analysis phase: 1 Analyst: cs

SkylineXL 14.0 Skyline Analysis - Analysis Results - Standing Skyline System

Profile name: **BLT 1-2** Units: English Profile date: 1/2/14
 Analysis name: **BLT 1-2** Analyst: cs
 Data source: Ground

STANDING skyline analysis summary table...

Skyline analysis type	Selected yarder	Selected carriage	Minimum payload-(lbs)	At terrain point	Analysis phase
Standing	Yoder, shotgun - 2 drum_ad, 40-ft twr	Acme 10, motorized_ad	2,781	5	1

STANDING skyline rigging lengths table...

Line	Capacity-(ft)	Required-(ft)	Notes	Chord slope span 1	Chord slope span 2	Chord slope span 3	Chord slope span 4	Average slope yarding dist for this analysis-(ft)
skyline	1,000	920	adequate					
mainline	1,500	670	adequate	42.1%				
haulback				Un-stretched skyline line length - (ft)			724.77	367

line capacities based on selected yarder

STANDING skyline analysis detail table, PHASE 1 analysis...

TP	Horizontal distance - (ft)	Net payload at TP - (lbs)	Net payload to landing - (lbs)	Skyline tension - (lbs)	Mainline tension - (lbs)	Haulback tension - (lbs)	Skyline clearance - (ft)	Log clearance - (ft)	Full susp. bottom of log above TP-(ft)
2	24	13,808	13,808	23,100	10,585	-	29.3	20.3	-
3	106	5,531	5,531	23,100	4,130	-	27.8	18.7	-
4	275	3,568	3,568	23,100	3,430	-	7.6	1.1	-
5	387	2,781	2,781	23,100	2,205	-	28.9	19.8	-
6	525	3,558	2,781	23,100	2,478	-	32.2	22.9	-

Subdivision 2

Unit	Logging System	Acres	Equipment	Cruised Volume (CCF)	Cruised Volume (Tons)	Avg External Yarding Distance (ft)	Avg Yarding Distance (ft)
2	Skyline	19	Yoder	824	2430	488	293
2	Tractor/ Shovel	24	Tractor	1040	3069	491	246

Logging System Notes:

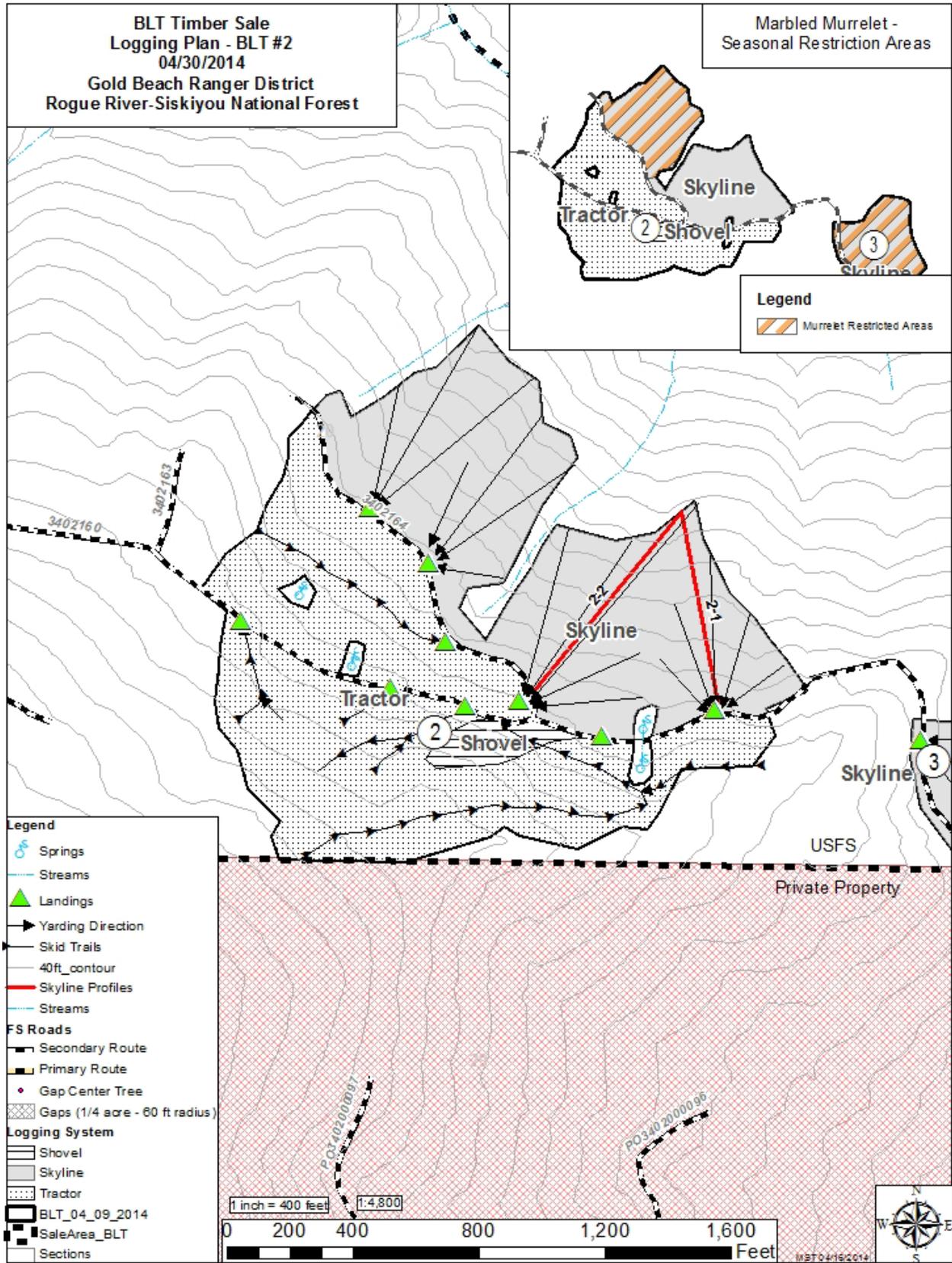
- Felling – minimize damage to residual trees, retain hardwoods where possible
- Yarding
 - One end suspension required for all yarding
 - Yard tops attached (YTA)
- **Tractor Portion** – Utilize directional felling and existing skid trails. There are steep slopes within this unit, and tractors are not to be operating on slopes greater than 30%. Some end-lining (2-3 acres) will be required in steep sections. Also shovel yarding piece is identified in a steep piece right above the junction of the 164 road. A soil scientist reviewed this unit and recommended that if existing skid trails were used that adverse soil impacts could be avoided. Approximate locations of existing skid trails are shown on logging plan map.
- **Tail Trees** – Large tail trees exist at the bottom of the skyline settings in the northern skyline lobe (see photo map). Utilizing these large old growth trees for tail trees will allow for higher rigging heights and increased payloads in settings with limited payloads due to variable terrain.
- **Mechanical Harvesting** – could be utilized in the tractor portion.

Restrictions and Limitations:

- **Marbled Murrelet: Northern ½ of Skyline portion only** - No work activities will occur from April 1 through August 5. During the period August 6 through September 15, operations will have daily restrictions. Operations shall not begin until two hours after sunrise and be curtailed two hours prior to sunset.
- **Ground-based operations** shall be conducted in dry weather conditions.
- **Port-Orford-Cedar (POC)** - Populations of POC exist in the sale area that require operational restrictions. POC root disease is present along the 3402-160 road.
 - **Project scheduling** – schedule hauling during the dry conditions.
 - **Utilize uninfested water** – use uninfested water sources for planned activities such as equipment washing or treat water with Clorox bleach to prevent/reduce the spread of PL.
 - **Washing project equipment** – wash equipment when leaving the infested area to minimize the transportation of infested soil to uninfested areas. Infested areas exist along 3340-160 road. Wash project equipment before moving to other Forest Service sales.

Access and Haul Routes:

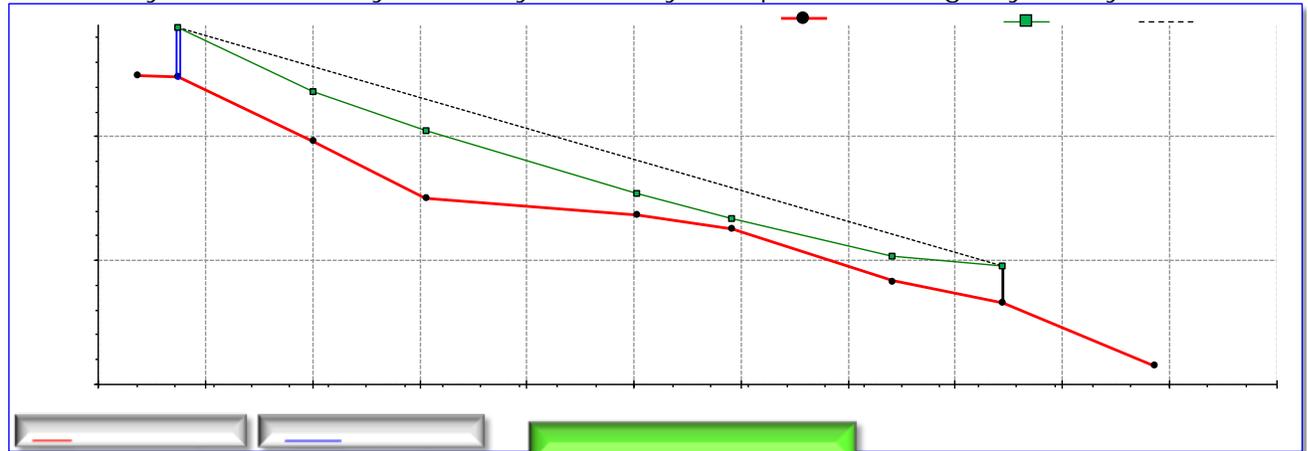
- Haul route is down the 3402 towards the Euchre Creek Rd. (County rd. 505). Continue west to Hwy. 101 and travel south 50 miles to the appraisal point in Brookings, OR.



*Map not to scale, for a properly scaled map get the BLT LFR Map Package (PDF).

2-1 -Profile Analysis - Yoder

SkylineXL 14.0 Skyline Analysis - Analysis Input - Standing Skyline System



Analysis type Standing	Selected yarder Yoder, shotgun - 2 drum_ad	Selected carriage Acme 10, motorized_ad
Log Geometry Table		
tag length - (ft)	10.0	
log length - (ft)	40.0	
log diameter - (in)	12.00	
Min payload-(lbs)	At terrain point	
3,493	4	

Supports Table	At terrain point	Rigging height (ft)
head spar	2	40
tail spar	8	30
int support 1		
int support 2		
int support 3		

Yarding Parameters Table	Inner dist terrain pt.	Outer dist terrain pt.
yarding limits	3	7
landing cut (-) or fill (+) - (ft)		

Analysis name: **BLT 2-1**
 Units: English Pro date: 1/16/2014
 Data source: Ground Pro name: BLT2-1
 Analysis phase: 1 Analyst: Sattler

Susp. type	Log Susp. and Clearance Table	Log clearance (ft)
partial		1.1

SkylineXL 14.0 Skyline Analysis - Analysis Results - Standing Skyline System

Profile name: BLT2-1 Units: English Profile date: 1/16/14
 Analysis name: BLT 2-1 Analyst: Sattler
 Data source: Ground

STANDING skyline analysis summary table...

Skyline analysis type	Selected yarder	Selected carriage	Minimum payload-(lbs)	At terrain point	Analysis phase
Standing	Yoder, shotgun - 2 drum_ad, 40-ft twr	Acme 10, motorized_ad	3,493	4	1

STANDING skyline rigging lengths table...

Line	Capacity-(ft)	Required-(ft)	Notes	Chord slope span 1	Chord slope span 2	Chord slope span 3	Chord slope span 4	Average slope yarding dist for this analysis-(ft)
skyline	1,000	730	adequate					
mainline	1,500	590	adequate	35.7%				
haulback				Un-stretched skyline line length - (ft)			571.36	289

line capacities based on selected yarder

STANDING skyline analysis detail table, PHASE 1 analysis...

TP	Horizontal distance - (ft)	Net payload at TP - (lbs)	Net payload to landing - (lbs)	Skyline tension - (lbs)	Mainline tension - (lbs)	Haulback tension - (lbs)	Skyline clearance - (ft)	Log clearance - (ft)	Full susp. bottom of log above TP-(ft)
3	115	5,556	5,556	23,100	3,441	-	39.6	29.8	-
4	189	3,493	3,493	23,100	1,747	-	54.5	Full	4.5
5	327	6,092	3,493	23,100	4,172	-	17.2	8.7	-
6	389	6,315	3,493	23,100	5,043	-	8.0	1.1	-
7	494	8,679	3,493	23,100	5,254	-	19.8	11.2	-

2-2 -Profile Analysis - Yoder

SkylineXL 14.0 Skyline Analysis - Analysis Input - Standing Skyline System

Analysis type	Selected yarder	Selected carriage
Standing	Yoder, shotgun - 2 drum_ad	Acme 10, motorized_ad

Supports Table	At terrain point	Rigging height (ft)
head spar	1	40
tail spar	11	30
int support 1		
int support 2		
int support 3		

Yarding Parameters Table	Inner dist terrain pt.	Outer dist terrain pt.
yarding limits	2	10
landing cut (-) or fill (+) - (ft)		

Log Geometry Table	
tag length - (ft)	10.0
log length - (ft)	40.0
log diameter - (in)	12.00

Min payload-(lbs)	At terrain point
4,927	7

Analysis name: **BLT 2-2**
 Units: **English** Pro date: **1/16/2014**
 Data source: **Ground** Pro name: **BLT 2-2**
 Analysis phase: **1** Analyst: **Sattler**

Susp. type	Log Susp. and Clearance Table	Log clearance (ft)
partial		1.1

SkylineXL 14.0 Skyline Analysis - Analysis Results - Standing Skyline System

Profile name: **BLT 2-2** Units: **English** Profile date: **1/16/14**
 Analysis name: **BLT 2-2** Analyst: **Sattler**
 Data source: **Ground**

STANDING skyline analysis summary table...

Skyline analysis type	Selected yarder	Selected carriage	Minimum payload-(lbs)	At terrain point	Analysis phase
Standing	Yoder, shotgun - 2 drum_ad, 40-ft twr	Acme 10, motorized_ad	4,927	7	1

STANDING skyline rigging lengths table...

Line	Capacity-(ft)	Required-(ft)	Notes	Chord slope span 1	Chord slope span 2	Chord slope span 3	Chord slope span 4	Average slope yarding dist for this analysis-(ft)
skyline	1,000	960	adequate					
mainline	1,500	800	adequate	35.4%				
haulback								
Un-stretched skyline line length - (ft)							808.38	406

line capacities based on selected yarder

STANDING skyline analysis detail table, PHASE 1 analysis...

TP	Horizontal distance - (ft)	Net payload at TP - (lbs)	Net payload to landing - (lbs)	Skyline tension - (lbs)	Mainline tension - (lbs)	Haulback tension - (lbs)	Skyline clearance - (ft)	Log clearance - (ft)	Full susp. bottom of log above TP-(ft)
2	47	19,332	19,332	19,412	16,133	-	13.1	5.7	-
3	94	12,625	12,625	23,100	10,705	-	10.5	3.5	-
4	166	9,164	9,164	23,100	6,785	-	17.0	8.8	-
5	255	6,459	6,459	23,100	5,614	-	7.6	1.1	-
6	314	5,708	5,708	23,100	4,144	-	20.5	12.1	-
7	410	4,927	4,927	23,100	3,576	-	21.0	12.7	-
8	491	5,324	4,927	23,100	3,166	-	32.4	22.7	-
9	568	6,482	4,927	23,100	4,157	-	22.2	13.5	-
10	665	10,036	4,927	23,100	5,411	-	24.0	14.7	-

Subdivision 3

Unit	Logging System	Acres	Equipment	Cruised Volume (CCF)	Cruised Volume (Tons)	Avg External Yarding Distance (ft)	Avg Yarding Distance (ft)
3	Skyline	8	Yoder	346	1021	489	293

Logging System Notes:

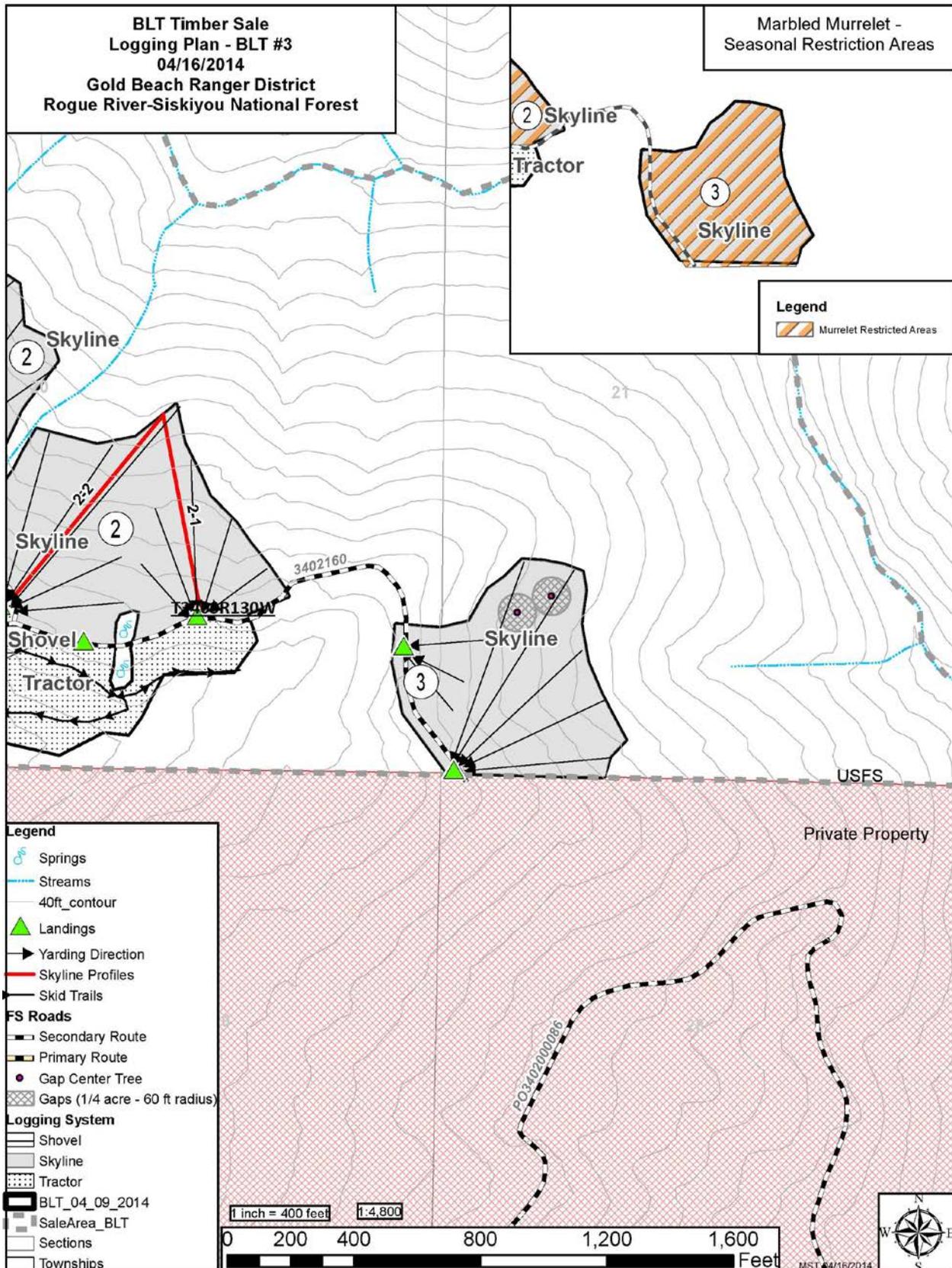
- Felling – minimize damage to residual trees, retain hardwoods where possible
- Yarding
 - One end suspension required for all yarding
 - Yard tops attached (YTA)
- **Tail Trees** – Large tail trees exist at the bottom of the skyline settings in the northern eastern portion of the unit(see photo map). Utilizing these large old growth trees for tail trees will allow for higher rigging heights and increased payloads in settings with limited payloads due to variable terrain.
- **Landings** – Limited landing opportunities exist aside from the landing at the end of the 3402-160 road
- **Private Property** – Menasha property is immediately adjacent to this unit and the primary landing at the end of the 3402-160 road. The property line was surveyed and blazed in 2014. Do not cut any trees across this boundary for landing construction.

Restrictions and Limitations:

- **Marbled Murrelet: Skyline portion only** - No work activities will occur from April 1 through August 5. During the period August 6 through September 15, operations will have daily restrictions. Operations shall not begin until two hours after sunrise and be curtailed two hours prior to sunset.
- **Ground-based operations** shall be conducted in dry weather conditions.
- **Port-Orford-Cedar (POC)** - Populations of POC exist in the sale area that require operational restrictions. POC root disease is present along the 3402-160 road.
 - **Project scheduling** – schedule hauling during the dry conditions.
 - **Utilize uninfested water** – use uninfested water sources for planned activities such as equipment washing or treat water with Clorox bleach to prevent/reduce the spread of PL.
 - **Washing project equipment** – wash equipment when leaving the infested area to minimize the transportation of infested soil to uninfested areas. Infested areas exist along 3340-160 road. Wash project equipment before moving to other Forest Service sales.

Access and Haul Routes:

- Haul route is down the 3402 towards the Euchre Creek Rd. (County rd. 505). Continue west to Hwy. 101 and travel south 50 miles to the appraisal point in Brookings, OR.



*Map not to scale, for a properly scaled map get the BLT LFR Map Package (PDF).