

**TOOTH RE-OFFER TIMBER SALE  
GATE 3 LOGGING FEASIBILITY REPORT**

September 18, 2013



PREPARED BY \_\_\_\_\_  
Matt Timchak, Forester

REVIEWED BY \_\_\_\_\_  
Veg. Module Leader

Gold Beach Ranger District  
Rogue River - Siskiyou National Forest

**Table of Contents**

General Information..... 3

Resource Management Objectives..... 4

Critical Elements and Assumptions ..... 4

    Landings..... 5

    Tail Trees ..... 6

    Intermediate Supports ..... 6

Recommended System..... 7

Skyline Yarding Summary:..... 9

Tractor Summary: ..... 9

Temporary Road Summary:..... 10

Skyline Profiles ..... 10

    Profile Summary: ..... 11

Sale Overview Map..... 12

Subdivision 2 ..... 13

Subdivision 3 ..... 15

    3-1 – Ground Profile – Medium Yarder Analysis ..... 17

    3-2 – GIS Profile – Yoder Analysis ..... 18

Subdivision 4 ..... 19

    4-1 – GIS Profile– Yoder Analysis..... 21

Subdivision 7 ..... 22

    7-1 – GIS Profile – Yoder Analysis..... 24

    7-2 – GIS Profile – Yoder Analysis..... 25

    7-4 – GIS Profile – Yoder Analysis..... 26

Subdivision 8 ..... 27

    8-1 – GIS Profile – Yoder Analysis..... 29

    8-3 – GIS Profile – Yoder Analysis..... 30

    8-4 – GIS Profile – Yoder Analysis..... 31

Subdivision 9 ..... 32

    9-1 – Ground Profile – Medium Yarder Analysis ..... 34

    9-2 – GIS Profile – Yoder Analysis..... 35

    9-3 – GIS Profile – Yoder Analysis..... 36

Subdivision 10 ..... 37

10-1 – GIS Profile – Yoder Analysis .....	39
10-2 – GIS Profile – Yoder Analysis .....	40
Subdivision 12 .....	41
12-1 – Ground Profile – Yoder Analysis .....	43
12-2 – GIS Profile – Yoder Analysis .....	44
12-3 – Ground Profile – Yoder Analysis .....	45
Subdivision 13 .....	46
13-1 – GIS Profile – Yoder Analysis .....	48
13-2 –GIS Profile – Yoder Analysis .....	49
Subdivision 14 .....	50
14-1 – Ground Profile – Medium Yarder Analysis .....	53
14-2 – Ground Profile – Medium Yarder Analysis .....	54
14-3 – GIS Profile – Medium Yarder Analysis .....	55
14-4 – GIS Profile – Medium Yarder Analysis .....	56
14-5 – GIS Profile – Medium Yarder Analysis .....	57
Subdivision 15 .....	59
15-1 – GIS Profile – Medium Yarder Analysis .....	61
15-2 – GIS Profile Medium Yarder Analysis .....	62
15-3 – GIS Profile – Medium Yarder Analysis .....	63
Subdivision 16 .....	64
16-1 – GIS Profile – Yoder Analysis .....	66

## General Information

Tooth Timber Sale is a thinning proposed within the Late-Successional Reserves (LSR) land allocation. The sale area is located along ridge tops and side slopes in the North Fork Smith, Winchuck and Chetco watersheds on the Gold Beach Ranger District ([see Overview Map](#)). The project was analyzed in for environmental effects in the Coastal Healthy Forest Treatments EA and is being offered for sale in 2013. This report describes logging systems used for cost analysis and appraisal.

The area is legally described as:

T. 40 S., R. 11 W., Sec. 16, 17, 20, 21 & 29

T. 40 S., R. 12 W., Sec. 1, 2, 3, 10 & 11

W.M., Curry County, OR

The Tooth Timber Sale consists of 12 Subdivisions totaling 268 acres. These stands are all even-aged Douglas-fir plantations that were clearcut and replanted from 1963 to 1973. 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 Subdivisions 7, 9, 10, 12, 13, 15 & 16, and also in portions of 2, 3, 4, 8 & 14. Ground based skidding will occur in portions of Subdivisions 2, 3, 4, 8 & 14. Shovel logging may occur in many of the units and is specifically identified in several units.

### Tooth Summary

Subdivision	Acres	Volume CCF	Volume (Tons)	Rx	Skyline Acres	Tractor/Shovel Acres
2	12	344	996	Thinning	5	7
3	19	544	1535	Thinning	11	8
4	12	343	983	Thinning	7	5
7	40	1146	3225	Thinning	40	
8	29	831	2351	Thinning	21	8
9	11	315	856	Thinning	11	
10	12	344	976	Thinning	9	3
12	12	344	969	Thinning	12	
13	6	172	478	Thinning	6	
14	63	1804	5082	Thinning	61	2
15	34	974	2791	Thinning	34	
16	18	516	1462	Thinning	18	
<b>Totals</b>	<b>268</b>	<b>7677</b>	<b>21704</b>		<b>235</b>	<b>33</b>

## Resource Management Objectives

All of the stands are within Late-Successional Reserves (LSR), designated by the Northwest Forest Plan (USDA-USDI, 1994). The desired future condition is a diverse species, variable density forest with enhanced tree vigor that expedites development of large trees. Stands have multi-storied structure from gap creation, release of understory conifer and shrub vegetation, with sufficient snags and down wood to meet wildlife habitat needs.

### Silvicultural Treatment Objectives Include:

- Density management in plantations to improve individual tree growth, crown development and stand vigor.
- Enhance vegetative and structural diversity in LSR through variable density thinning.
- 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 Sudden Oak Death (SOD)

## 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. Temporary roads built 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 re-contouring as close to the natural condition as is feasible and drainage restored upon conclusion of operations.
5. Precautions to minimize the threat of introducing noxious weeds on National Forest lands by requiring washing of all equipment.
6. Intermediate supports may be required to facilitate skyline yarding operations in units 7 & 14.
7. Landings on the 1107 and 1983 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.
10. Mechanical Harvester on slopes less than 35 percent.

11. Seasonal restrictions apply in units 2, 4, 7, 8, 10, 13, and 15 due to adjacent Marbled Murrelet habitat (see C6.315# for restriction details).
12. Machine piles shall be covered by operator.

## Landings

There are 94 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 water barred and will be scarified to a depth of 4” 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 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 necessary in Units 7 & 14. See the profile summaries for suggested locations for intermediate supports. These may be necessary to reach portions of units and in other units may be set up to increase payload capacity.

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 existing skid trails.
4. **Access** - new and existing temp spurs are used to access Units 3, 4, 7, 8, 9, 10, 14, and 15.
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 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 rigging in a multispan configuration in Units 7 & 14.

**Given these criteria listed above, the recommended yarder for units 2, 3, 4, 7, 8, 9, 10, 11, 12, 13 & 16 is a Yoder. Units 14 and 15 were analyzed assuming an average medium sized yarder. A wide variety of ground based logging equipment can feasibly log this sale.**

**Yoder Specifications:**

<b>Yarder:</b>		<b>Tower height feet</b>	<b>Yarder horsepower</b>		<b>Max brake torque</b>	<b>Mainline ft-lbs</b>	<b>Haulback ft-lbs</b>
Yoader, shotgun - 2 drum		40	230		torque		

Operating line	Line Dia inhes	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...**

<b>Carriage:</b>	<b>Weight pounds</b>	<b>Carriage horsepower</b>	<b>Skyline clamp</b>	<b>Slackpull method</b>	<b>Multispan capable</b>	<b># drums required</b>
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	

**Avg Medium Yarder Specs:**

<b>Select a Yarder</b>	<b>Tower height feet</b>	<b>Yarder horsepower</b>	<b>Max brake torque</b>	<b>Mainline ft-lbs</b>	<b>Haulback ft-lbs</b>
Avg medium yarder - 3 drum	43	239	torque		

Operating line	Line Dia inhes	Line type	Weight per foot	Design tension lbs	Line length feet	Empty drum dia-inches	Empty drum width-inches
skyline	0.8750	Swaged	1.70	31,600	1,488		
mainline	0.6250	Swaged	0.87	16,133	1,618		
haulback	0.3750	Swaged	0.26		1,685		
slackpulling							

**Skyline Yarding Summary:****Skyline Yarding Summary**

Subdiv	Acres Skyline	Cruise Vol (CCF)	Cruise Vol (Tons)	Yarder	# of cable landings	Avg External Yarding Distance (ft)*	Avg Yarding Distance (ft)*	Temp Road Construction (ft)
2	5	143	415	Yoder	3	253	152	0
3	11	315	889	Yoder	8	400	240	621
4	7	200	573	Yoder	8	374	224	372
7	40	1146	3225	Yoder	15	550	330	446
8	21	602	1702	Yoder	13	441	265	1229
9	11	315	856	Yoder	5	456	274	1396
10	12	258	732	Yoder	7	478	287	606
12	12	344	969	Yoder	6	519	311	574
13	6	172	478	Yoder	2	897	538	0
14	61	1747	4921	Med Yarder	12	624	374	2750
15	34	974	2791	Med Yarder	9	825	495	319
16	18	516	1462	Yoder	6	503	302	0
<b>Totals or Avg</b>	<b>235</b>	<b>6,732</b>	<b>19,013</b>		<b>94</b>	<b>527</b>	<b>316</b>	<b>8313</b>

\*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:**

Unit	Acres, tractor yarded	Volume cruised (CCF)	Volume cruised (tons)	# landings, for tractor	External Skidding Distance (ft)	Average Skid Distance (ft)
2	7	201	581	2	1211	605
3	8	229	646	3	367	184
4	5	143	410	1	310	155
8	8	229	649	3	233	117
10	3	86	244	2	420	161
14	2	57	161	1	360	180
<b>TOTALS</b>	<b>33</b>	<b>945</b>	<b>2691</b>	<b>12</b>	<b>484</b>	<b>234</b>

### Temporary Road Summary:

Subdivision	Spur Name	Road Prism	Length (ft)
3	3-1	Existing	501
3	3-2	Existing	120
4	4-1	Existing	372
7	7-1	Existing	446
8	8-1	Existing	1229
9	9-1	Existing	221
9	9-2	Existing	1175
10	10-1	Existing	606
12	12-1	Existing	574
14	14-1	Existing	1001
14	14-2	Existing	1013
14	14-3	Existing	119
14	14-4	Existing	148
14	14-5	Existing	260
14	14-5	New	210
15	15-1	Existing	319
<b>Total Temporary Road Construction</b>			<b>8313</b>

### Skyline Profiles

Skyline profiles were analyzed for every unit that has cable based logging systems. This report utilized data that originated from both GIS and ground profiles. Each profile run specifies if the data used for the analysis was ground or GIS. Limited ground profiles were only run in areas of critical concern, where skyline corridors were expected to be multispans, require haulback, or potentially infeasible to yard. There is a high reliability of data and analysis in the ground run profiles.

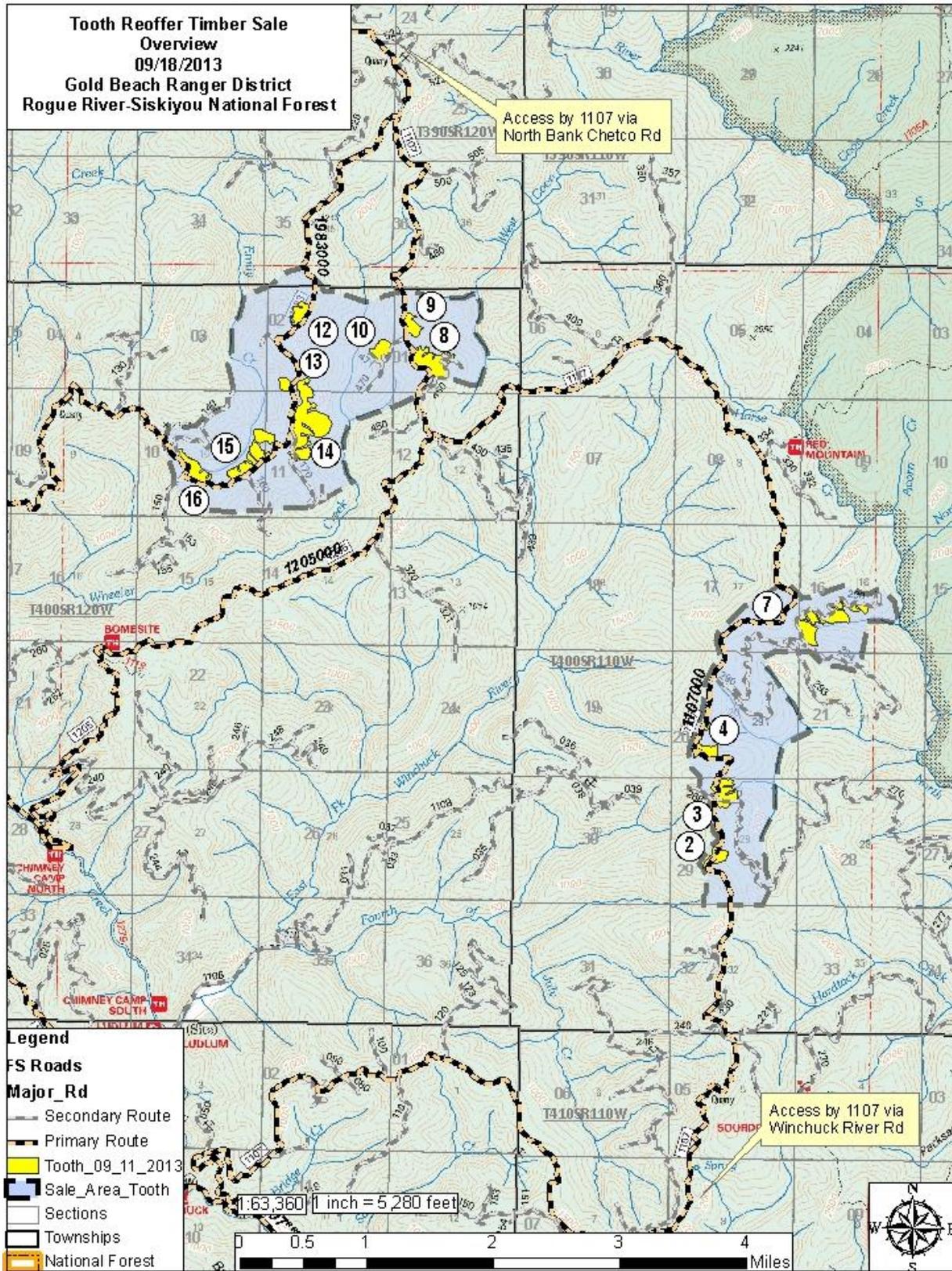
The GIS profiles are derived from data that is derived from a Digital Elevation Model (DEM). This is raster data is GIS that has a 10 meter resolution. Every 10 meters there a point that has elevation data associated with it. In ArcGIS, a tool can derive digital profiles based on this data. There is a high degree of uncertainty with this data and these profiles. The profile analysis are included in this report for reference, however the reliability of the data is low. From experience in the layout of many of these units, these profiles will log, and will likely have higher payloads than some of the calculated payloads from the analysis.

**Profile Summary:**

Unit	Profile	Data Type	Yarder	Intermediate Support	Haulback Required	Minimum Payload (lbs)	Skyline Rigging Length (ft)	Mainline Rigging Length (ft)
3	3-1	Ground	Yoder	No	No	12347	380	300
3	3-2	GIS	Yoder	No	No	9508	780	600
4	4-1	GIS	Yoder	No	No	11178	740	520
7	7-1	GIS	Yoder	Yes	No	5461	1190	1080
7	7-2	GIS	Yoder	No	No	5908	920	770
7	7-4	GIS	Yoder	No	No	4283	680	550
8	8-1	GIS	Yoder	No	No	2698	760	590
8	8-3	GIS	Yoder	No	No	4565	740	590
8	8-4	GIS	Yoder	No	No	5939	550	440
9	9-1	Ground	Yoder	No	No	15136	510	350
9	9-2	GIS	Yoder	No	No	4596	570	310
9	9-3	GIS	Yoder	No	No	13123	470	330
10	10-1	GIS	Yoder	No	No	2473	780	660
10	10-2	GIS	Yoder	No	No	3715	610	450
12	12-1	Ground	Yoder	No	No	5984	940	800
12	12-2	GIS	Yoder	No	No	5604	940	830
12	12-3	Ground	Yoder	No	No	19303	540	420
13	13-1	GIS	Yoder	No	No	5103	730	630
13	13-2	GIS	Yoder	No	No	3143	720	600
14	14-1	Ground	Avg Med Yarder	No	No	6723	860	660
14	14-2	Ground	Avg Med Yarder	Yes	No	5358	1670	1460
14	14-3	GIS	Avg Med Yarder	Yes	No	3657	1020	850
14	14-4	GIS	Avg Med Yarder	Yes	No	12784	640	500
14	14-5	GIS	Avg Med Yarder	No	No	16249	790	650
15	15-1	GIS	Avg Med Yarder	No	No	3971	1430	1030
15	15-2	GIS	Avg Med Yarder	No	No	4801	1260	930
15	15-3	GIS	Avg Med Yarder	No	No	6904	1060	710
16	16-1	GIS	Yoder	No	No	4027	830	530

\*Profiles were based on both on-the-ground data and from GIS analysis using digital elevation models. There is a high degree of uncertainty with GIS profiles. If corridors appeared to be difficult, a Ground profiles were measured.

## Sale Overview Map



## Subdivision 2

Unit	Logging System	Acres	Equipment	Cruised Volume (CCF)	Cruised Volume (Tons)	Avg External Yarding Distance (ft)	Avg Yarding Distance (ft)	Temp Road Construction (ft)
2	Skyline	5	Yoder	143	415	253	152	0
2	Tractor/ Shovel	7	Tractor	201	581	1211	605	

### Logging System Notes:

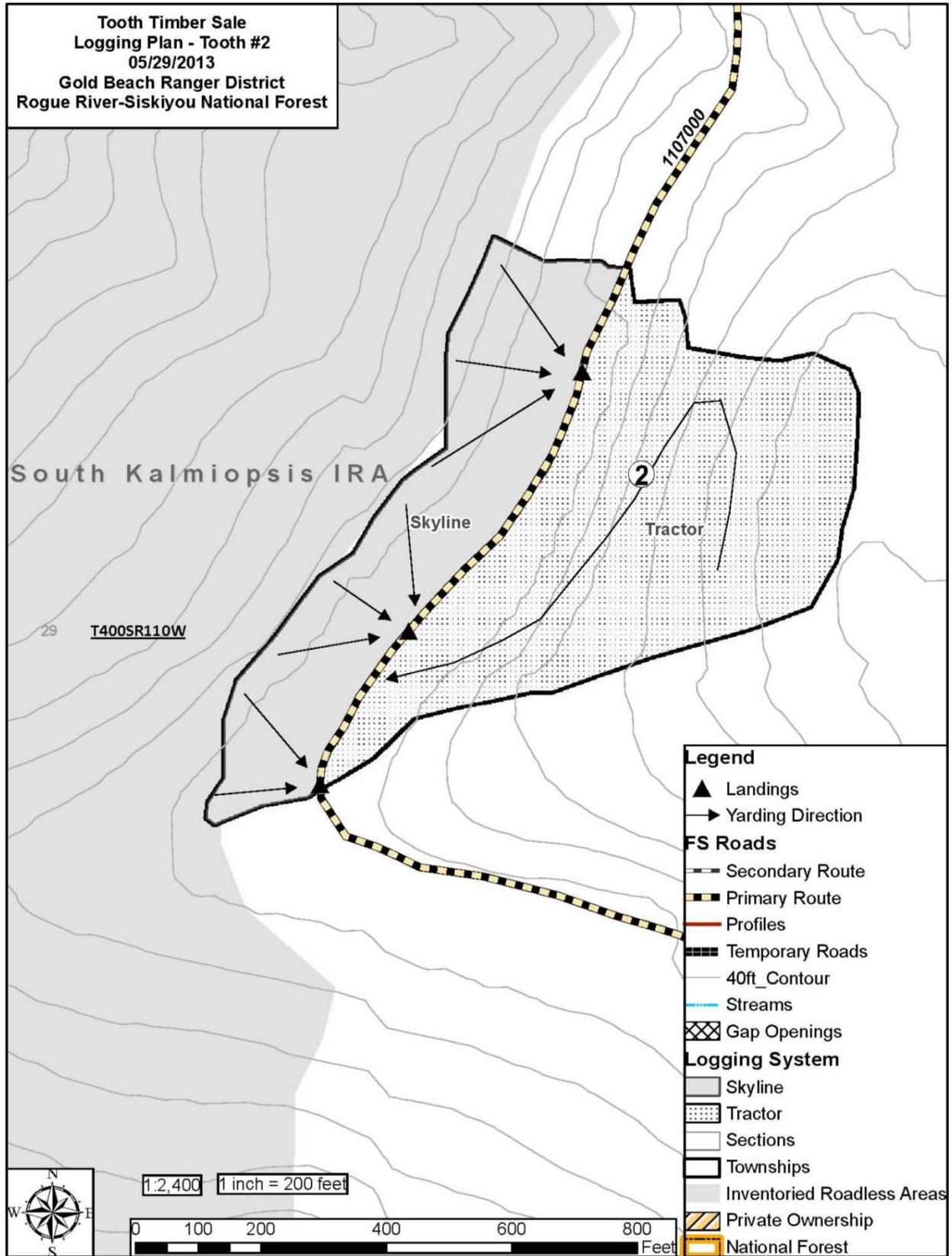
- Felling – minimize damage to residual trees, retain hardwoods where possible
- Yarding
  - One end suspension required for all yarding
  - Yard tops attached (YTA)
- **Tractor Portion** – Utilize directional felling and existing skid trails. There are steep slopes within this unit, and tractors are not to be operating on slopes greater than 35%. A soil scientist reviewed this unit and recommended that if existing skid trails were used that adverse soil impacts could be avoided.
- **Inventoried Roadless Area** - The boundary on the western portion of the unit delineates an Inventoried Roadless Area (IRA). The portion of the stand to the west of this western boundary is not covered under the Coastal Healthy Forest Treatments NEPA decision.
- **Mechanical Harvesting** – could be utilized in the tractor portion.

### Restrictions and Limitations:

- **Marbled Murrelet:** 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.

### Access and Haul Routes:

- Haul route is down the 1107 towards the Winchuck Rd. (Co. rd. 896). Continue west to Hwy. 101 and travel north 7.5 miles to the appraisal point on Carpenterville Rd.



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

### Subdivision 3

Unit	Logging System	Acres	Equipment	Cruised Volume (CCF)	Cruised Volume (Tons)	Avg External Yarding Distance (ft)	Avg Yarding Distance (ft)	Temp Road Construction (ft)
3	Skyline	11	Yoder	315	889	400	240	621
3	Tractor/ Shovel	8	Tractor	229	646	367	184	

#### Logging System Notes:

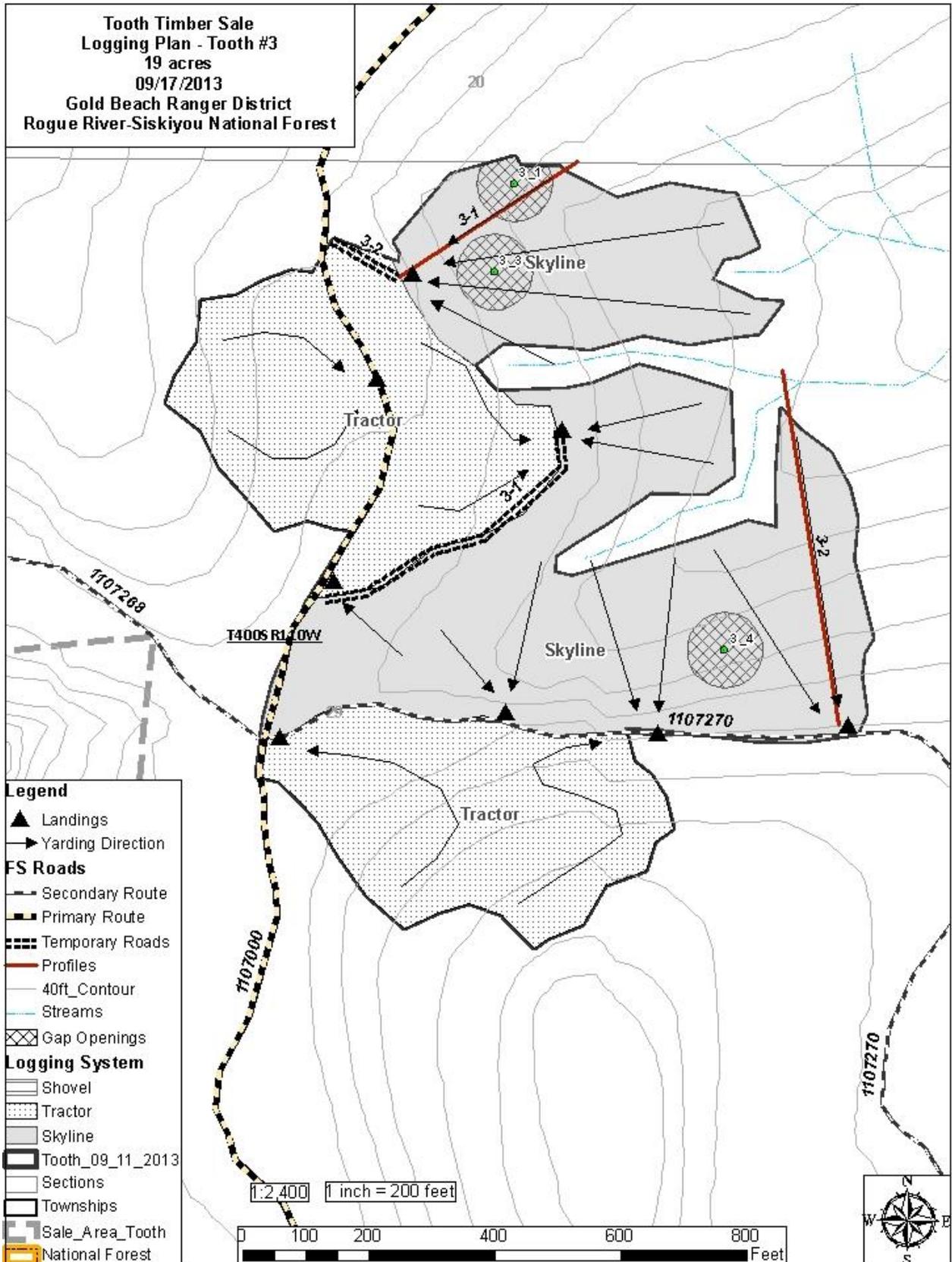
- Felling – minimize damage to residual trees, retain hardwoods where possible
- Yarding
  - One end suspension required for all yarding
  - Yard tops attached (YTA)
- **Profile 3-1** – This profile was cut short from previous version of this sale. The skyline portions of this unit should be easily logged now with a Yoder.
- **Riparian Areas** – When rigging or yarding corridors across a stream consider the following:
  - Limit corridor widths to 12'
  - Full log suspension is required in these areas
  - Trees felled for facilitation of yarding outside the unit (in the stream buffer zone) are to be retained on site
- **Mechanical Harvesting** – could be utilized in the tractor portion and also in the skyline portion with slopes <35% between temporary road 3-1 and the 270 road.

#### Restrictions and Limitations:

- Ground-based operations shall be conducted in dry weather conditions.
- **Marbled Murrelet:** No murrelet restrictions.

#### Access and Haul Routes:

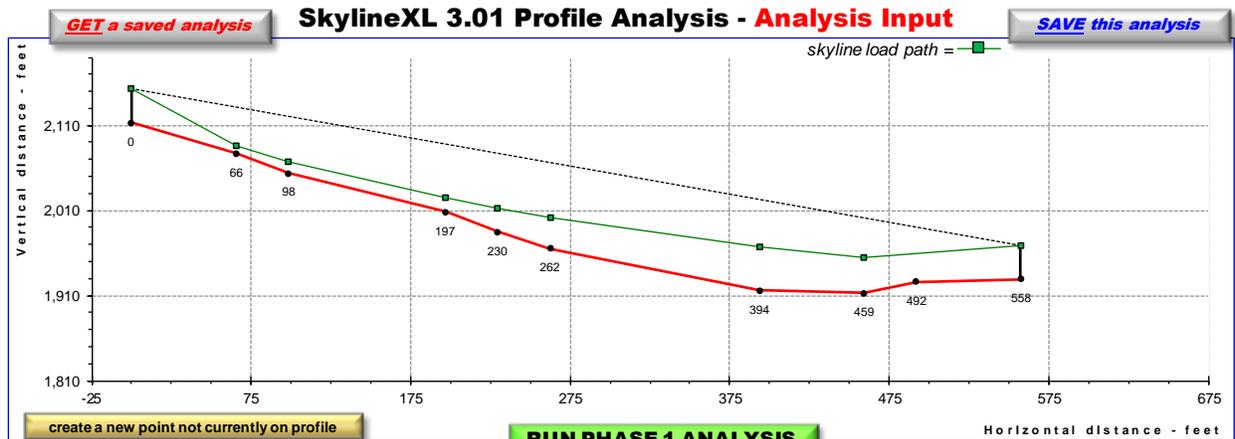
- Haul route is down the 1107 towards the Winchuck Rd. (Co. rd. 896). Continue west to Hwy. 101 and travel north 7.5 miles to the appraisal point on Carpenterville Rd.



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



### 3-2 - GIS Profile - Yoder Analysis



Profile name: 3-2\_GIS Profile date:

Analysis type	Selected yarder	Selected carriage	Supports	Horizontal distance-ft	Rigging height-ft	print	Yarding parameters	Inner distance	Outer distance
Standing	Yoader, shotgun - 2 drum_added	Acme 10, motorized_added	head spar	0	40	refresh view	yarding limits-feet	66	459
			tail spar	558	40		landing cut (-) or fill (+) feet		
			int.support:1						
			int.support:2						
			int.support:3						

Log geometry	Values
tag length - ft	10.0
log length - ft	40.0
log diameter - in	12.0

Min payload - lbs	At horiz dist - ft
9,508	394

Susp type	Log Susp and Clearance Table	Clearance feet
SELECT partial		2.0

Analysis name: 3-2\_GIS\_Yoder

Yarding parameters errors (NONE)...

Current analysis phase = 1

If horizontal distance selection error, then cell shading is red

### SkylineXL 3.01 Profile Analysis - Results

Profile name: 3-2\_GIS Profile date:  
 Analysis name: 3-2\_GIS\_Yoder

STANDING skyline analysis summary...

Skyline analysis type	Selected yarder	Selected carriage	Minimum payload - lbs	At horizontal distance - ft	Analysis phase
Standing	Yoader, shotgun - 2 drum_added, 40-ft twr	Acme 10, motorized_added	9,508	394	1

STANDING skyline rigging lengths...

Line	Capacity-ft <sup>1/</sup>	Required-ft	Notes	Chord slope span 1	Chord slope span 2	Chord slope span 3	Chord slope span 4
skyline	1,000	780	adequate				
mainline	1,500	600	adequate	33.0%			
haulback				Unstretched skyline line length - feet			596.54

<sup>1/</sup> line capacities based on selected yarder

STANDING skyline analysis detail, PHASE 1 analysis...

TP	Horizontal dist - feet	Net payload lbs	Net payload to landing lbs	Skyline tension - lbs	Mainline tension - lbs	Haulback tension - lbs	Skyline clearance feet	Log clearance feet	Full susp bottom of log above TP-feet
2	66	17,227	17,227	9,446	16,133	-	9	2	-
3	98	19,750	17,227	14,754	16,133	-	14	7	-
4	197	14,586	14,586	23,100	10,677	-	17	10	-
5	230	12,443	12,443	23,100	7,690	-	28	19	-
6	262	11,904	11,904	23,100	6,330	-	37	27	-
7	394	9,508	9,508	23,100	2,390	-	51	Full	1
8	459	23,129	9,508	23,100	5,765	-	42	30	-

## Subdivision 4

Unit	Logging System	Acres	Equipment	Cruised Volume (CCF)	Cruised Volume (Tons)	Avg External Yarding Distance (ft)	Avg Yarding Distance (ft)	Temp Road Construction (ft)
4	Skyline	7	Yoder	200	573	374	224	372
4	Tractor/ Shovel	5	Tractor	143	410	310	155	

### Logging System Notes:

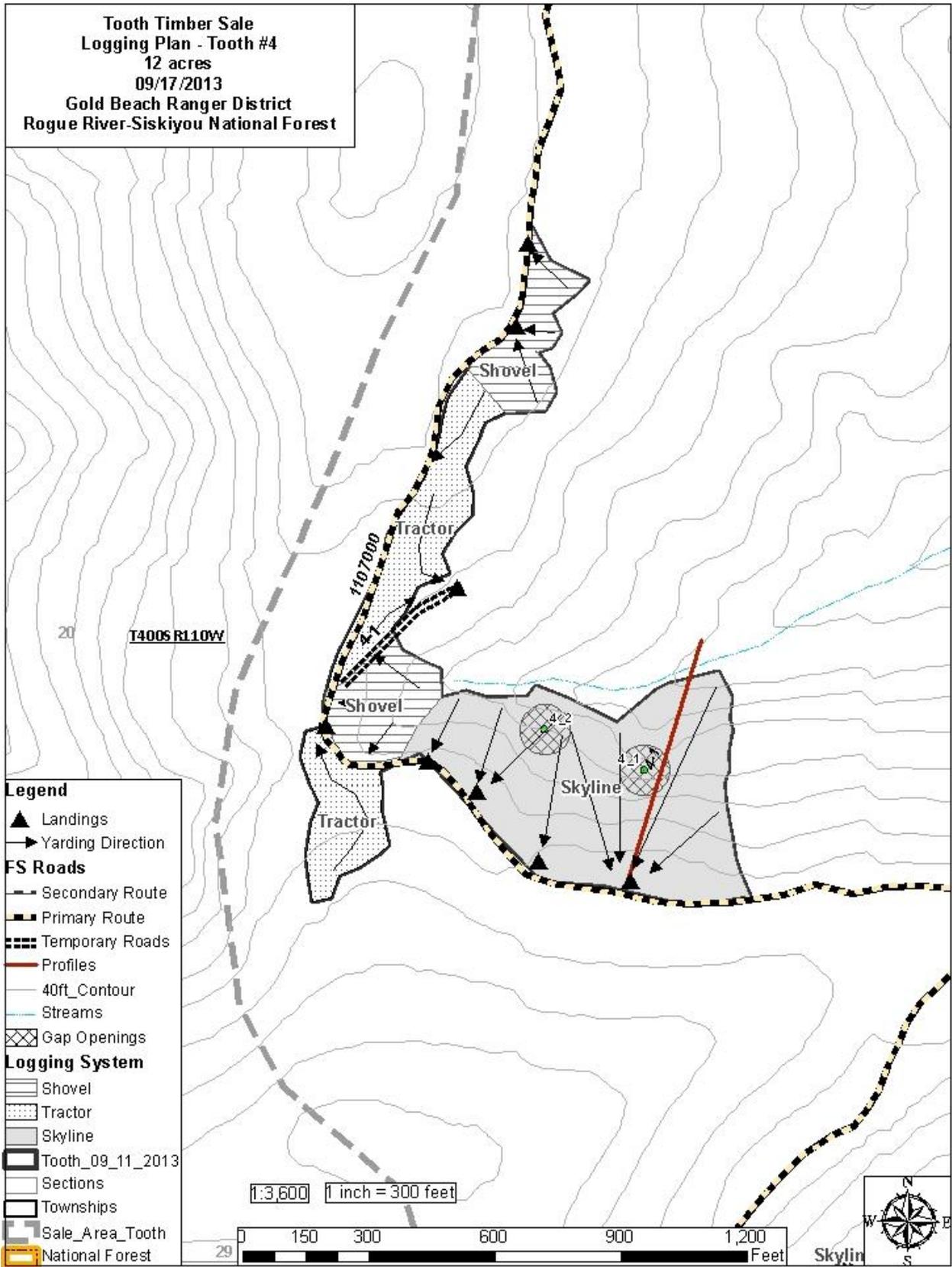
- Felling – minimize damage to residual trees, retain hardwoods where possible
- Yarding
  - One end suspension required for all yarding
  - Yard tops attached (YTA)
- **Profile 4-1** – Hang across the creek. A short temp spur may need to be built to get yarder to a knob just below the road.
- **Good Deflection** should easily be achieved by rigging the skyline across the creek
- **Riparian Areas** – When rigging or yarding corridors across a stream consider the following:
  - Limit corridor widths to 12'
  - Full log suspension is required in these areas
  - Trees felled for facilitation of yarding outside the unit (in the stream buffer zone) are to be retained on site
- **Mechanical Harvesting** – could be utilized in the tractor portion and shovel portions with slopes <35%.

### Restrictions and Limitations:

- **Marbled Murrelet: Only the tractor and shovel portions of the unit are restricted** for Marbled Murrelet nesting. 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. **The entire skyline portion of the unit is unrestricted.**
- **Restrictions-** In this unit all skyline yarding may occur with **no marbled murrelet restrictions**. Restricted portions of the unit can be tractor or shovel logged. This is an attempt is to reduce move in move out costs and restricted areas can be revisited even during IFPL3 because they are ground based operations. See MaMu restriction maps.
- Ground-based operations shall be conducted in dry weather conditions.

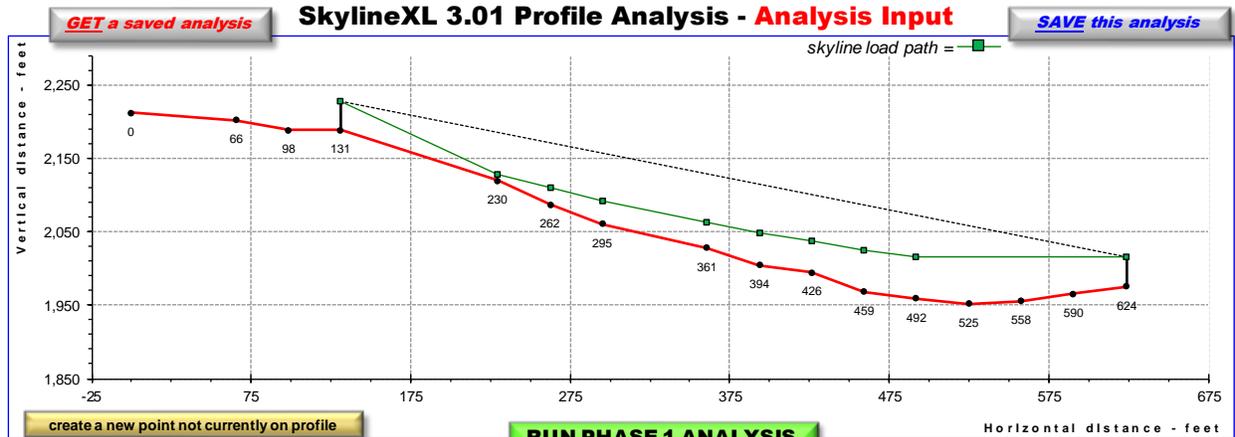
### Access and Haul Routes:

- Haul route is down the 1107 towards the Winchuck Rd. (Co. rd. 896). Continue west to Hwy. 101 and travel north 7.5 miles to the appraisal point on Carpenterville Rd.



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

### 4-1 - GIS Profile- Yoder Analysis



Profile name: 4-1\_GIS Profile date:

Analysis type	Selected yarder	Selected carriage	Supports	Horizontal distance-ft	Rigging height-ft	print	Yarding parameters	Inner distance	Outer distance
Standing	Yoader, shotgun - 2 drum_added	Acme 10, motorized_added	head spar	131	40	refresh view	yarding limits-feet	230	492
			tail spar	624	40		landing cut (-) or fill (+) feet		
			int.support:1						

Log geometry	Values
tag length - ft	10.0
log length - ft	40.0
log diameter - in	12.0

Min payload - lbs	At horiz dist - ft
11,178	459

Analysis name: 4-1\_GIS\_Yoder

Yarding parameters errors (NONE)...

Susp type	Log Susp and Clearance Table	Clearance feet
SELECT partial		2.0

Current analysis phase = 1

If horizontal distance selection error, then cell shading is red

### SkylineXL 3.01 Profile Analysis - Results

Profile name: 4-1\_GIS Profile date:  
 Analysis name: 4-1\_GIS\_Yoder

#### STANDING skyline analysis summary...

Skyline analysis type	Selected yarder	Selected carriage	Minimum payload - lbs	At horizontal distance - ft	Analysis phase
Standing	Yoader, shotgun - 2 drum_added, 40-ft twr	Acme 10, motorized_added	11,178	459	1

#### STANDING skyline rigging lengths...

Line	Capacity-ft <sup>1/2</sup>	Required-ft	Notes	Chord slope span 1	Chord slope span 2	Chord slope span 3	Chord slope span 4
skyline	1,000	740	adequate	43.2%			
mainline	1,500	520	adequate				
haulback				Unstretched skyline line length - feet			547.75

<sup>1/2</sup>line capacities based on selected yarder

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

TP	Horizontal dist - feet	Net payload lbs	Net payload to landing lbs	Skyline tension - lbs	Mainline tension - lbs	Haulback tension - lbs	Skyline clearance feet	Log clearance feet	Full susp bottom of log above TP-feet
5	230	17,152	17,152	14,418	16,133	-	8	2	-
6	262	19,349	17,152	23,100	15,033	-	23	14	-
7	295	17,232	17,152	23,100	11,735	-	32	23	-
8	361	13,379	13,379	23,100	8,172	-	35	25	-
9	394	13,056	13,056	23,100	6,694	-	44	34	-
10	426	11,900	11,900	23,100	5,774	-	42	32	-
11	459	11,178	11,178	23,100	3,919	-	57	Full	7
12	492	11,851	11,178	23,100	3,629	-	57	Full	7

## Subdivision 7

Unit	Logging System	Acres	Equipment	Cruised Volume (CCF)	Cruised Volume (Tons)	Avg External Yarding Distance (ft)	Avg Yarding Distance (ft)	Temp Road Construction (ft)
7	Skyline	40	Yoder	1146	3225	550	330	446

### 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)
- **Profile 7-1** – This profile was run using GIS and a 10m digital elevation model. The GIS model shows this profile as multispans; however my eyes on the ground are skeptical. Hang across the creek for better deflection. There are some slight changes in slope, but it is fairly steep right off the road. Haulback will not be required. GIS also indicates this is a long profile (1190). Tag line may need to be added or alternate landing locations may be able to reach the lower portions of this lobe depending on the yarder reach.
- **Guy Trees** are fairly limited at 3 of the landing locations. It may be workable at these locations, but a yoder would eliminate these concerns.
- **Good Deflection** should easily be achieved at most settings by rigging the skyline across the creek.
- **Riparian Areas** – When rigging or yarding corridors across a stream consider the following:
  - Streams may not be accurately mapped in the western portion of the unit
  - Limit corridor widths to 12'
  - Full log suspension is required in these areas
  - Trees felled for facilitation of yarding outside the unit (in the stream buffer zone) are to be retained on site

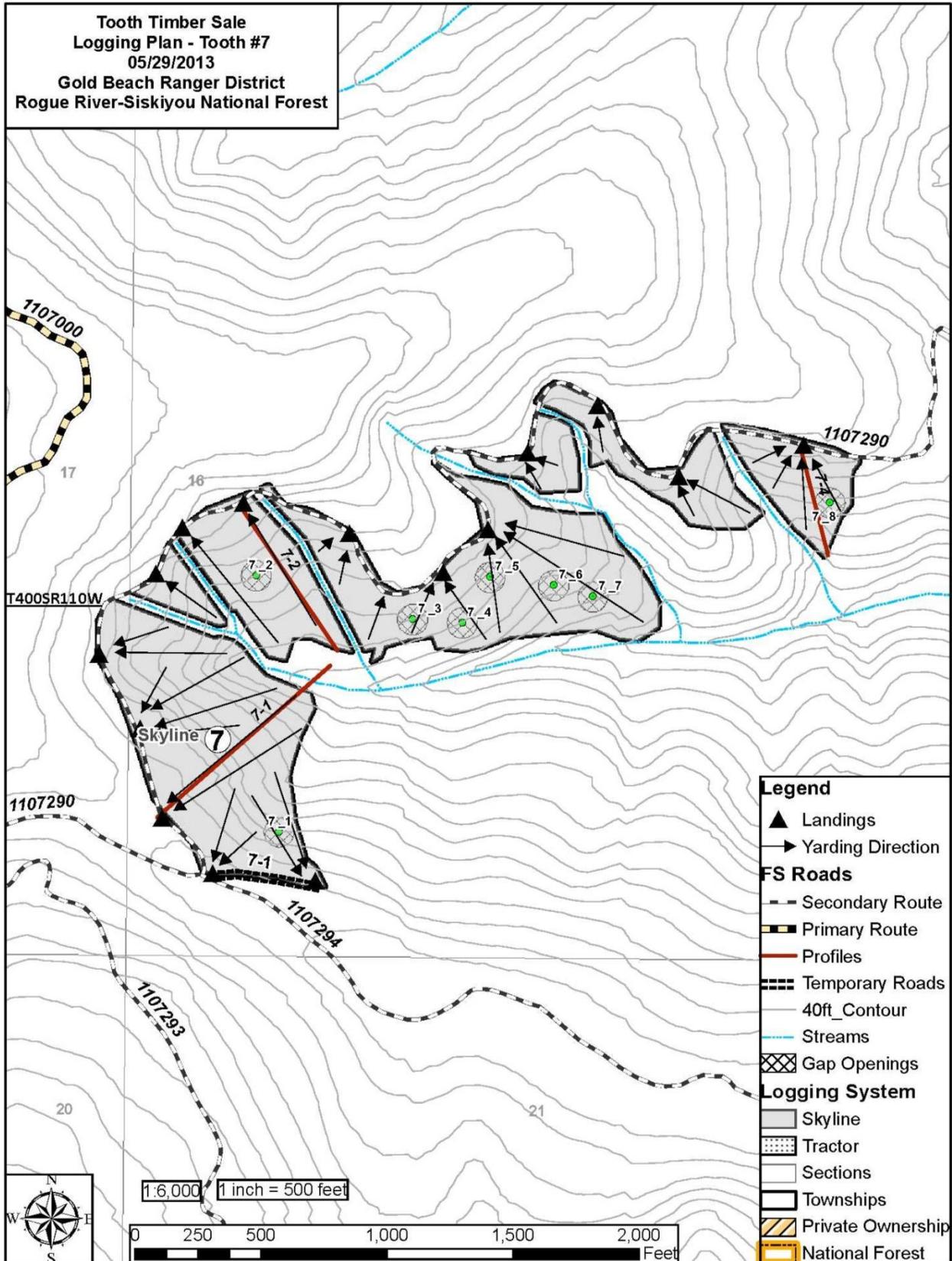
### Restrictions and Limitations:

- **Marbled Murrelet:** Western portions of the unit are restricted for Marbled Murrelet nesting. 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.

### Access and Haul Routes:

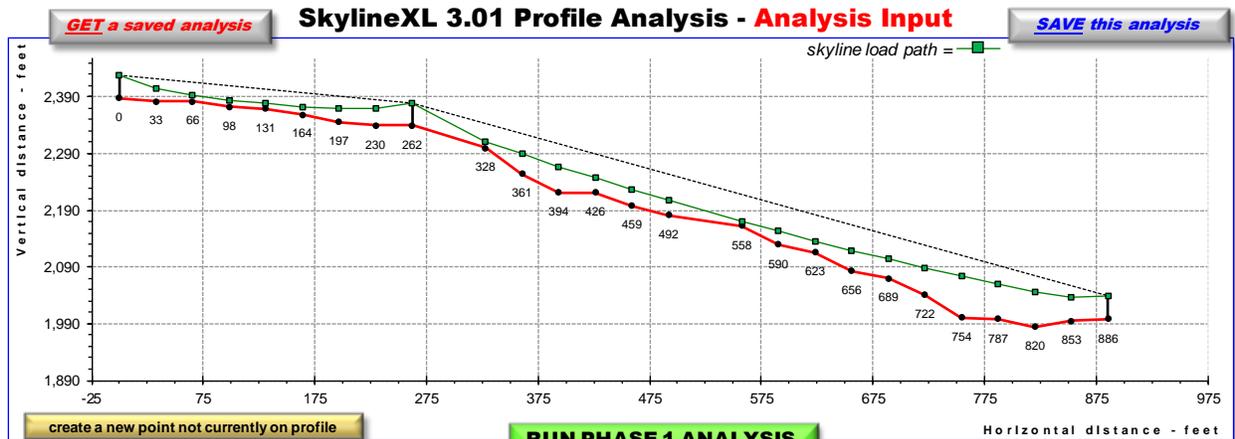
Haul route is out the 1107290 and out the 1107 towards the Winchuck Rd. (Co. rd. 896). Continue west to Hwy. 101 and travel north 7.5 miles to the appraisal point on Carpenterville Rd.

- **1107290** – Towards the eastern end of the unit there are two creek crossings where the culverts have been compromised, resulting in minor erosion of the road surface. This will require some leveling of the road surface to accomplish the logging.



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

## 7-1 - GIS Profile - Yoder Analysis



Profile name: 7-1\_GIS Profile date:

Analysis type	Selected yarder	Selected carriage	phase	Supports	Horizontal distance-ft	Rigging height-ft	print	Yarding parameters	Inner distance	Outer distance
Multi-span	Yoader, shotgun - 2 drum_added	Acme 10, motorized_added	2	head spar	0	40		yarding limits-feet	33	853
			clear load path	tail spar	886	40	refresh view	landing cut (-) or fill (+) feet		
				Int support 1	262	40		Susp type	Log Susp and Clearance Table	Clearance feet
				Int support 2				SELECT		2.0
				Int support 3				partial		

Log geometry Values

tag length - ft	10.0
log length - ft	40.0
log diameter - in	12.0

Min payload - lbs At horiz dist - ft

5,461	722
-------	-----

Analysis name: 7-1\_GIS\_Yoder\_MultiSpan

Yarding parameters errors (NONE)...

**MULTI-SPAN skyline analysis summary...**

Skyline analysis type	Selected yarder	Selected carriage	Minimum payload - lbs	At horizontal distance - ft	Analysis phase
Multi-span	Yoader, shotgun - 2 drum_added, 40-ft twr	Acme 10, motorized_added	5,461	722	1

**MULTI-SPAN skyline rigging lengths...**

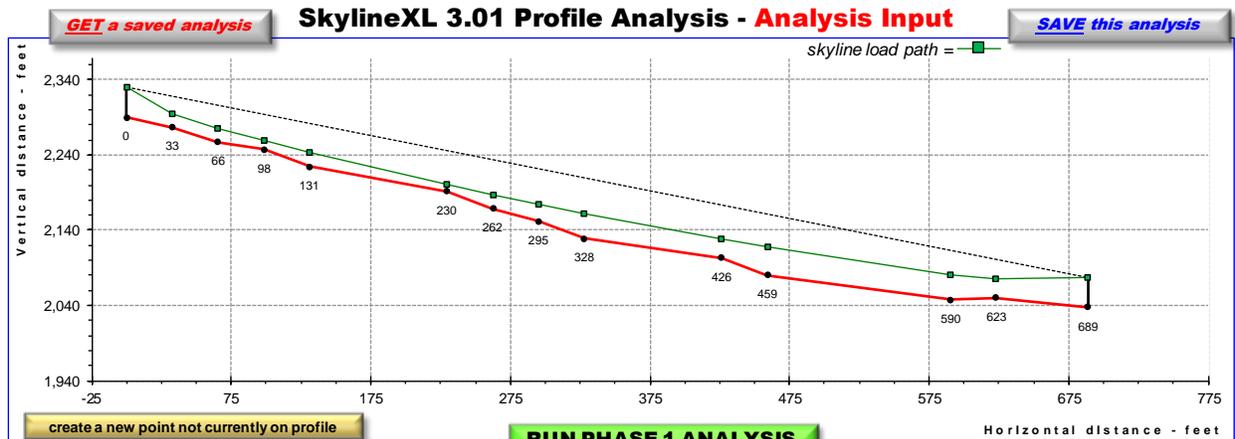
Line	Capacity-ft <sup>1/2</sup>	Required-ft	Notes	Chord slope span 1	Chord slope span 2	Chord slope span 3	Chord slope span 4
skyline	1,000	1,190	not adequate!				
mainline	1,500	1,080	adequate	18.7%	54.7%		
haulback		2,120	not adequate!	Unstretched skyline line length - feet		977.06	

<sup>1/2</sup>line capacities based on selected yarder

**MULTI-SPAN skyline analysis detail, PHASE 1 analysis...**

TP	Horizontal dist - feet	Net payload lbs	Net payload to landing lbs	Skyline tension - lbs	Mainline tension - lbs	Haulback tension - lbs	Skyline clearance feet	Log clearance feet	Full susp bottom of log above TP-feet
2	33	27,797	27,797	17,946	16,133	-	22	13	-
3	66	20,931	20,931	23,100	14,433	-	12	4	-
4	98	20,230	20,230	23,100	11,855	-	13	4	-
5	131	15,831	15,831	23,100	10,267	-	9	2	-
6	164	12,755	12,755	23,100	7,345	-	14	7	-
7	197	14,423	12,755	23,100	6,171	-	24	15	-
8	230	19,335	12,755	23,100	5,578	-	30	20	-
	support loc								
10	328	7,497	7,497	23,100	7,376	-	12	5	-
11	361	6,662	6,662	23,100	5,269	-	35	26	-
12	394	7,465	6,662	23,100	4,968	-	46	36	-
13	426	6,658	6,658	23,100	5,564	-	26	17	-
14	459	6,595	6,595	23,100	5,254	-	29	20	-
15	492	7,639	6,595	23,100	5,899	-	26	17	-
16	558	6,132	6,132	23,100	5,839	-	8	2	-
17	590	7,171	6,132	23,100	5,644	-	24	15	-
18	623	5,547	5,547	23,100	4,637	-	20	12	-
19	656	6,273	5,547	23,100	4,401	-	36	26	-
20	689	5,554	5,547	23,100	3,919	-	33	24	-
21	722	5,461	5,461	23,100	3,089	-	47	36	-
22	754	5,864	5,461	23,100	2,929	-	72	Full	22
23	787	6,758	5,461	23,100	3,085	-	61	Full	11
24	820	8,350	5,461	23,100	3,292	-	62	Full	12
25	853	19,509	5,461	23,100	7,903	-	42	32	-

## 7-2 - GIS Profile - Yoder Analysis



Profile name: 7-2\_GIS Profile date:

Analysis type	Selected yarder	Selected carriage	phase	Supports	Horizontal distance-ft	Rigging height-ft	print	Yarding parameters	Inner distance	Outer distance
Standing	Yoder, shotgun - 2 drum_added	Acme 10, motorized_added	2	head spar	0	40		yarding limits-feet	33	623
			clear load path	tail spar	689	40	refresh view	landing cut (-) or fill (+) feet		
				int.support:1				Susp type	Log Susp and Clearance Table	Clearance feet
				int.support:2				SELECT		2.0
				int.support:3				partial		

Log geometry Values

tag length - ft	10.0
log length - ft	40.0
log diameter - in	12.0

Min payload - lbs At horiz dist - ft

5,908	426
-------	-----

Analysis name: 7-2\_GIS\_Yoder Analysis

Yarding parameters errors (NONE)...

If horizontal distance selection error, then cell shading is red

Current analysis phase = 1

Profile name: 7-2\_GIS  
Analysis name: 7-2\_GIS\_Yoder Analysis

### STANDING skyline analysis summary...

Skyline analysis type	Selected yarder	Selected carriage	Minimum payload - lbs	At horizontal distance - ft	Analysis phase
Standing	Yoder, shotgun - 2 drum_added, 40-ft twr	Acme 10, motorized_added	5,908	426	1

### STANDING skyline rigging lengths...

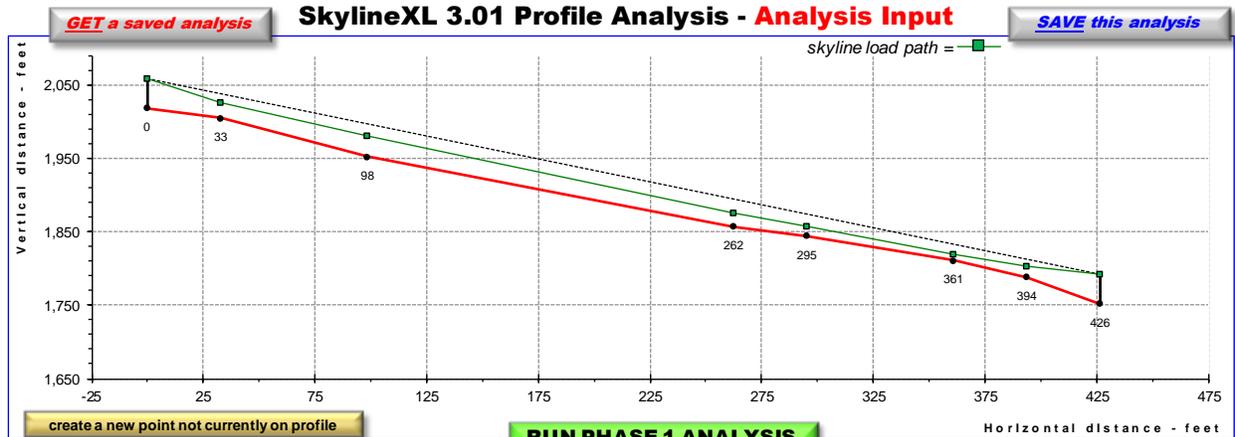
Line	Capacity-ft <sup>1/</sup>	Required-ft	Notes	Chord slope span 1	Chord slope span 2	Chord slope span 3	Chord slope span 4
skyline	1,000	920	adequate				
mainline	1,500	770	adequate	36.7%			
haulback				Unstretched skyline line length - feet			735.25

<sup>1/</sup>line capacities based on selected yarder

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

TP	Horizontal dist - feet	Net payload lbs	Net payload to landing lbs	Skyline tension - lbs	Mainline tension - lbs	Haulback tension - lbs	Skyline clearance feet	Log clearance feet	Full susp bottom of log above TP-feet
2	33	18,691	18,691	13,996	16,133	-	18	10	-
3	66	21,249	18,691	21,180	16,133	-	19	10	-
4	98	13,441	13,441	23,100	11,548	-	11	4	-
5	131	13,108	13,108	23,100	9,753	-	19	10	-
6	230	8,241	8,241	23,100	7,073	-	9	2	-
7	262	7,662	7,662	23,100	5,752	-	18	10	-
8	295	6,189	6,189	23,100	4,466	-	22	14	-
9	328	6,696	6,189	23,100	4,131	-	33	23	-
10	426	5,908	5,908	23,100	3,893	-	25	16	-
11	459	6,537	5,908	23,100	3,565	-	37	28	-
12	590	12,763	5,908	23,100	5,421	-	34	24	-
13	623	14,385	5,908	23,100	7,288	-	24	15	-

## 7-4 - GIS Profile - Yoder Analysis



Profile name: 41459 Profile date:

Analysis type	Selected yarder	Selected carriage	phase <b>2</b> clear load path	Supports	Horizontal distance-ft	Rigging height-ft	print refresh view	Yarding parameters	Inner distance	Outer distance
<b>Standing</b>	Yoader, shotgun - 2 drum	Acme 10, motorized		head spar	0	40		yarding limits-feet	33	394
				tail spar	426	40	landing cut (-) or fill (+) feet			
				Int.support:1			Susp type	Log Susp and Clearance Table	Clearance feet	
				Int.support:2			SELECT		2.0	
				Int.support:3			partial			

Analysis name: 7-4\_GIS\_Yoder

Yarding parameters errors (NONE)...

If horizontal distance selection error, then cell shading is red

Current analysis phase = **1**

Profile name: 41459

Analysis name: 7-4\_GIS\_Yoder

**STANDING skyline analysis summary...**

Skyline analysis type	Selected yarder	Selected carriage	Minimum payload - lbs	At horizontal distance - ft	Analysis phase
<b>Standing</b>	Yoader, shotgun - 2 drum, 40-ft tw r	Acme 10, motorized	4,283	262	<b>1</b>

**STANDING skyline rigging lengths...**

Line	Capacity-ft <sup>1/</sup>	Required-ft	Notes	Chord slope span 1	Chord slope span 2	Chord slope span 3	Chord slope span 4
skyline	1,000	680	adequate				
mainline	1,500	550	adequate	62.3%			
haulback				Unstretched skyline line length - feet			500.82

<sup>1/</sup> line capacities based on selected yarder

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

TP	Horizontal dist - feet	Net payload lbs	Net payload to landing lbs	Skyline tension - lbs	Mainline tension - lbs	Haulback tension - lbs	Skyline clearance feet	Log clearance feet	Full susp bottom of log above TP-feet
2	33	8,908	8,908	23,100	8,074	-	22	14	-
3	98	4,334	4,334	23,100	3,881	-	28	19	-
4	262	4,283	4,283	23,100	3,915	-	19	11	-
5	295	4,868	4,283	23,100	4,642	-	13	5	-
6	361	6,232	4,283	23,100	5,987	-	9	2	-
7	394	6,845	4,283	23,100	5,731	-	15	7	-

## Subdivision 8

Unit	Logging System	Acres	Equipment	Cruised Volume (CCF)	Cruised Volume (Tons)	Avg External Yarding Distance (ft)	Avg Yarding Distance (ft)	Temp Road Construction (ft)
8	Skyline	21	Yoder	602	1702	441	265	1229
8	Tractor/ Shovel	8	Tractor	229	649	233	117	

### Logging System Notes:

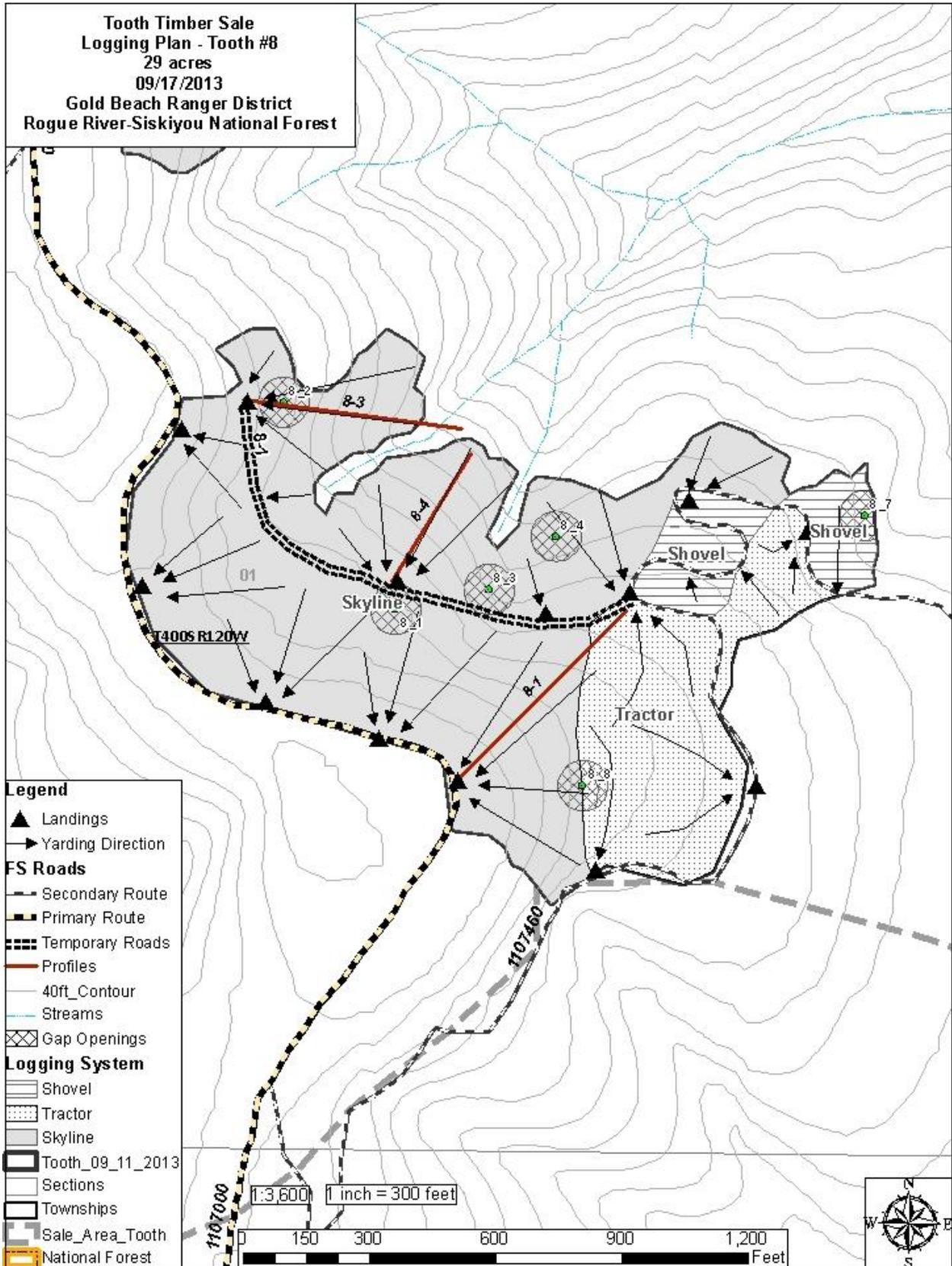
- Felling – minimize damage to residual trees, retain hardwoods where possible
- Yarding
  - One end suspension required for all yarding
  - Yard tops attached (YTA)
- **Profile 8-1** – This profile was run using GIS and a 10m digital elevation model. The GIS model shows this profile having a very low payload of 2700 lbs. This is likely much higher as it is steeper right off the road than the model depicts.
- **Riparian Areas** – When rigging or yarding corridors across a stream consider the following:
  - Streams may not be accurately mapped in the western portion of the unit
  - Limit corridor widths to 12'
  - Full log suspension is required in these areas
  - Trees felled for facilitation of yarding outside the unit (in the stream buffer zone) are to be retained on site
- **Mechanical Harvesting** – could be utilized on in the tractor portion, along with areas along the 8-1 temporary road where there are areas of lower slope angle (<35%).

### Restrictions and Limitations:

- **Marbled Murrelet: Only the tractor and shovel portions of the unit are restricted** for Marbled Murrelet nesting. 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. **The entire skyline portion of the unit is unrestricted.**
- **Restrictions-** In this unit all skyline yarding may occur with **no marbled murrelet restrictions**. Restricted portions of the unit can be tractor or shovel logged. This is an attempt is to reduce move in move out costs and restricted areas can be revisited even during IFPL3 because they are ground based operations. See MaMu restriction maps.
- Ground-based operations shall be conducted in dry weather conditions.

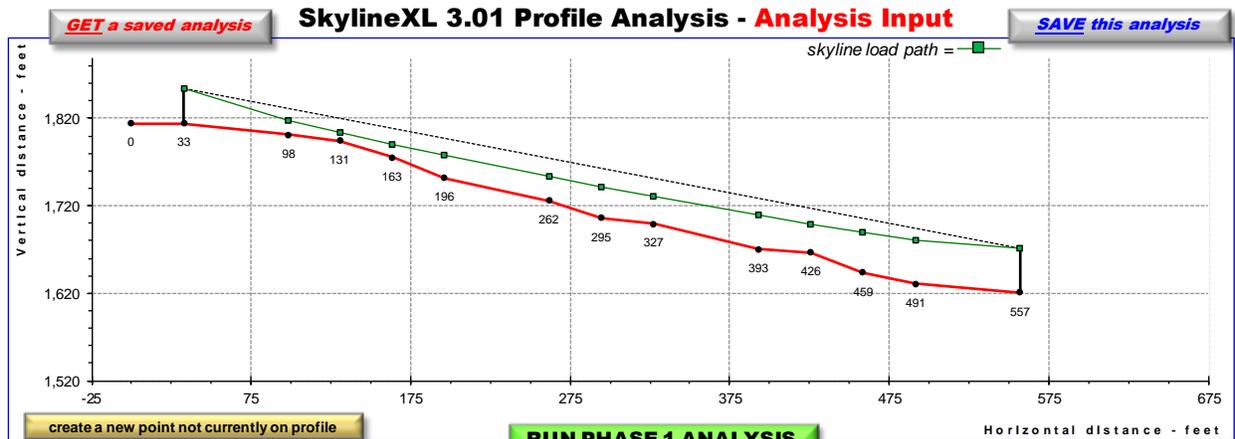
### Access and Haul Routes:

Haul route is north on the 1107 to the 1376. Continue west on County Rd. 784 and to Hwy. 101 and then travel north 3 miles to appraisal point on Carpenterville Rd.



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

## 8-1 - GIS Profile - Yoder Analysis



Profile name: 8-1\_GIS | Profile date:

Analysis type	Selected yarder	Selected carriage
Standing	Yoader, shotgun - 2 drum	Acme 10, motorized

phase 2 | clear load path

Supports	Horizontal distance-ft	Rigging height-ft
head spar	33	40
tail spar	557	50
Int.support 1:		
Int.support 2:		
Int.support 3:		

print | refresh view

Yarding parameters	Inner distance	Outer distance
yarding limits-feet	98	491
landing cut (-) or fill (+) feet		

Analysis name: 8-1\_GIS\_Yoder

Yarding parameters errors (NONE)...

Susp type	Log Susp and Clearance Table	Clearance feet
SELECT partial		2.0

To change the yarder and/or the carriage, navigate to the "Yarders & Carriages" screen and make selection(s)

Log geometry	Values
tag length - ft	10.0
log length - ft	40.0
log diameter - in	12.0

Min payload - lbs	At horiz dist - ft
2,698	262

Current analysis phase = 1

Profile name: 8-1\_GIS | Profile date:

Analysis name: 8-1\_GIS\_Yoder

If horizontal distance selection error, then cell shading is red

### STANDING skyline analysis summary...

Skyline analysis type	Selected yarder	Selected carriage	Minimum payload - lbs	At horizontal distance - ft	Analysis phase
Standing	Yoader, shotgun - 2 drum, 40-ft tw r	Acme 10, motorized	2,698	262	1

### STANDING skyline rigging lengths...

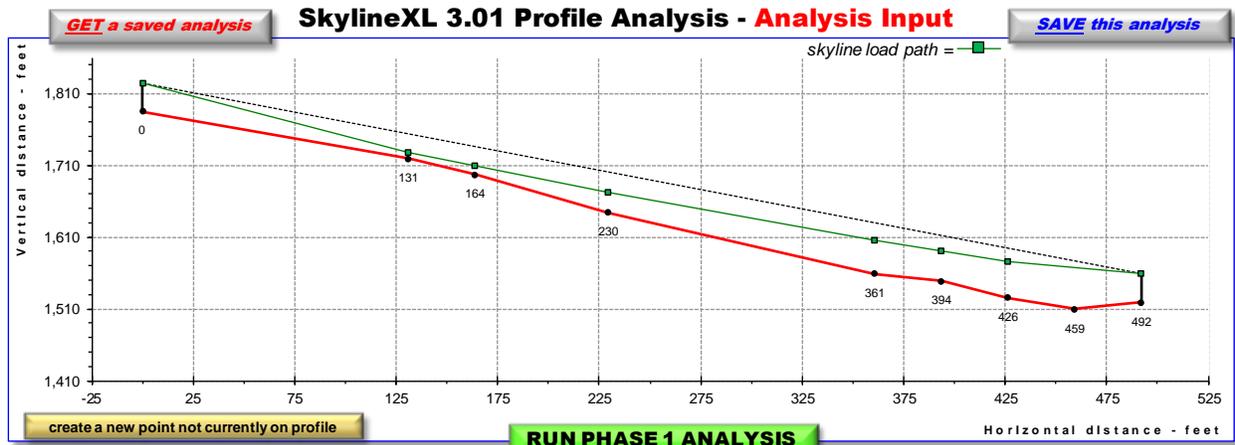
Line	Capacity-ft <sup>1/</sup>	Required-ft	Notes	Chord slope span 1	Chord slope span 2	Chord slope span 3	Chord slope span 4
skyline	1,000	760	adequate				
mainline	1,500	590	adequate	35.0%			
haulback				Unstretched skyline line length - feet			553.85

<sup>1/</sup>line capacities based on selected yarder

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

TP	Horizontal dist - feet	Net payload lbs	Net payload to landing lbs	Skyline tension - lbs	Mainline tension - lbs	Haulback tension - lbs	Skyline clearance feet	Log clearance feet	Full susp bottom of log above TP-feet
3	98	9,305	9,305	23,100	6,680	-	16	7	-
4	131	5,480	5,480	23,100	4,786	-	9	2	-
5	163	3,828	3,828	23,100	3,170	-	15	8	-
6	196	3,555	3,555	23,100	2,603	-	25	17	-
7	262	2,698	2,698	23,100	1,993	-	27	19	-
8	295	2,930	2,698	23,100	1,910	-	36	26	-
9	327	2,702	2,698	23,100	1,886	-	31	22	-
10	393	3,277	2,698	23,100	1,917	-	39	29	-
11	426	2,954	2,698	23,100	1,861	-	32	23	-
12	459	3,266	2,698	23,100	1,575	-	45	35	-
13	491	3,942	2,698	23,100	1,465	-	50	39	-

### 8-3 - GIS Profile - Yoder Analysis



Profile name: 8-3\_GIS      Profile date:

<b>Analysis type</b>	<b>Selected yarder</b>	<b>Selected carriage</b>	<b>phase 2</b>	<b>Supports</b>	<b>Horizontal distance-ft</b>	<b>Rigging height-ft</b>	<b>print</b>	<b>Yarding parameters</b>	<b>Inner distance</b>	<b>Outer distance</b>	
<b>Standing</b>	Yoader, shotgun - 2 drum	Acme 10, motorized		<b>clear load path</b>	head spar	0		40	<b>refresh view</b>	yarding limits-feet	131
To change the yarder and/or the carriage, navigate to the "Yarders & Carriages" screen and make selection(s)	<b>Log geometry</b>		<b>Values</b>		tail spar	492	40	landing cut (-) or fill (+) feet			
	tag length - ft	10.0	Int.support:1		Int.support:2		Int.support:3		<b>Susp type</b>	<b>Log Susp and Clearance Table</b>	<b>Clearance feet</b>
	log length - ft	40.0	Analysis name: 8-3_GIS_Yoder			partial	Table	2.0			
log diameter - in	12.0	Yarding parameters errors (NONE)...			If horizontal distance selection error, then cell shading is red						
<b>Min payload - lbs</b>	<b>At horiz dist - ft</b>	4,565	361	Profile date:							

Current analysis phase = 1  
 Profile name: 8-3\_GIS  
 Analysis name: 8-3\_GIS\_Yoder

**STANDING skyline analysis summary...**

Skyline analysis type	Selected yarder	Selected carriage	Minimum payload - lbs	At horizontal distance - ft	Analysis phase
<b>Standing</b>	Yoader, shotgun - 2 drum, 40-ft tw r	Acme 10, motorized	4,565	361	<b>1</b>

**STANDING skyline rigging lengths...**

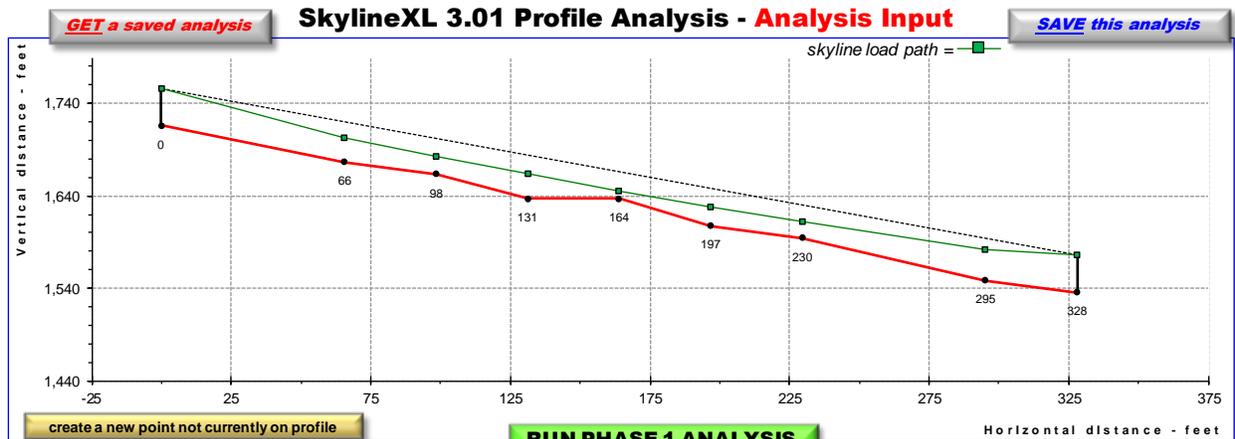
Line	Capacity-ft <sup>1/2</sup>	Required-ft	Notes	Chord slope span 1	Chord slope span 2	Chord slope span 3	Chord slope span 4
skyline	1,000	740	adequate				
mainline	1,500	590	adequate	54.0%			
haulback				Unstretched skyline line length - feet			558.56

<sup>1/2</sup>line capacities based on selected yarder

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

TP	Horizontal dist - feet	Net payload lbs	Net payload to landing lbs	Skyline tension - lbs	Mainline tension - lbs	Haulback tension - lbs	Skyline clearance feet	Log clearance feet	Full susp bottom of log above TP-feet
2	131	8,055	8,055	23,100	7,703	-	9	2	-
3	164	6,079	6,079	23,100	5,692	-	12	5	-
4	230	4,667	4,667	23,100	3,806	-	28	19	-
5	361	4,565	4,565	23,100	2,849	-	47	36	-
6	394	5,134	4,565	23,100	3,227	-	41	31	-
7	426	5,728	4,565	23,100	2,780	-	50	40	-

### 8-4 - GIS Profile - Yoder Analysis



Profile name: 8-4\_GIS      Profile date:

<b>Analysis type</b>	<b>Selected yarder</b>	<b>Selected carriage</b>	<b>phase 2</b>	<b>Supports</b>	<b>Horizontal distance-ft</b>	<b>Rigging height-ft</b>	<b>print</b>	<b>Yarding parameters</b>	<b>Inner distance</b>	<b>Outer distance</b>
<b>Standing</b>	Yoader, shotgun - 2 drum	Acme 10, motorized		head spar	0	40		yarding limits-feet	66	295
To change the yarder and/or the carriage, navigate to the "Yarders & Carriages" screen and make selection(s)	<b>Log geometry</b>		<b>clear load path</b>	tail spar	328	40	<b>refresh view</b>	landing cut (-) or fill (+) feet		
	tag length - ft	10.0	Int.support:1					<b>Susp type</b>	<b>Log Susp and Clearance Table</b>	<b>Clearance feet</b>
	log length - ft	40.0	Int.support:2					partial	Table	2.0
	log diameter - in	12.0	Int.support:3				If horizontal distance selection error, then cell shading is red <span style="background-color: red; color: black;"> </span>			
<b>Min payload - lbs</b>		<b>At horiz dist - ft</b>	Analysis name: 8-4_GIS_Yoder		<b>Yarding parameters errors (NONE)...</b>			Profile date:		
5,939	164									

Current analysis phase = 1  
 Profile name: 8-4\_GIS  
 Analysis name: 8-4\_GIS\_Yoder

**STANDING skyline analysis summary...**

Skyline analysis type	Selected yarder	Selected carriage	Minimum payload - lbs	At horizontal distance - ft	Analysis phase
<b>Standing</b>	Yoader, shotgun - 2 drum, 40-ft tw r	Acme 10, motorized	5,939	164	<b>1</b>

**STANDING skyline rigging lengths...**

Line	Capacity-ft <sup>1/</sup>	Required-ft	Notes	Chord slope span 1	Chord slope span 2	Chord slope span 3	Chord slope span 4
skyline	1,000	550	adequate				
mainline	1,500	440	adequate	55.0%			
haulback				Unstretched skyline line length - feet			373.96

<sup>1/</sup> line capacities based on selected yarder

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

TP	Horizontal dist - feet	Net payload lbs	Net payload to landing lbs	Skyline tension - lbs	Mainline tension - lbs	Haulback tension - lbs	Skyline clearance feet	Log clearance feet	Full susp bottom of log above TP-feet
2	66	9,198	9,198	23,100	7,295	-	27	18	-
3	98	6,372	6,372	23,100	5,564	-	20	12	-
4	131	9,301	6,372	23,100	6,134	-	27	17	-
5	164	5,939	5,939	23,100	5,667	-	8	2	-
6	197	7,000	5,939	23,100	5,593	-	21	12	-
7	230	6,418	5,939	23,100	5,384	-	17	9	-
8	295	9,942	5,939	23,100	6,005	-	34	24	-

## Subdivision 9

Unit	Logging System	Acres	Equipment	Cruised Volume (CCF)	Cruised Volume (Tons)	Avg External Yarding Distance (ft)	Avg Yarding Distance (ft)	Temp Road Construction (ft)
9	Skyline	11	Yoder	315	856	456	274	1396

### Logging System Notes:

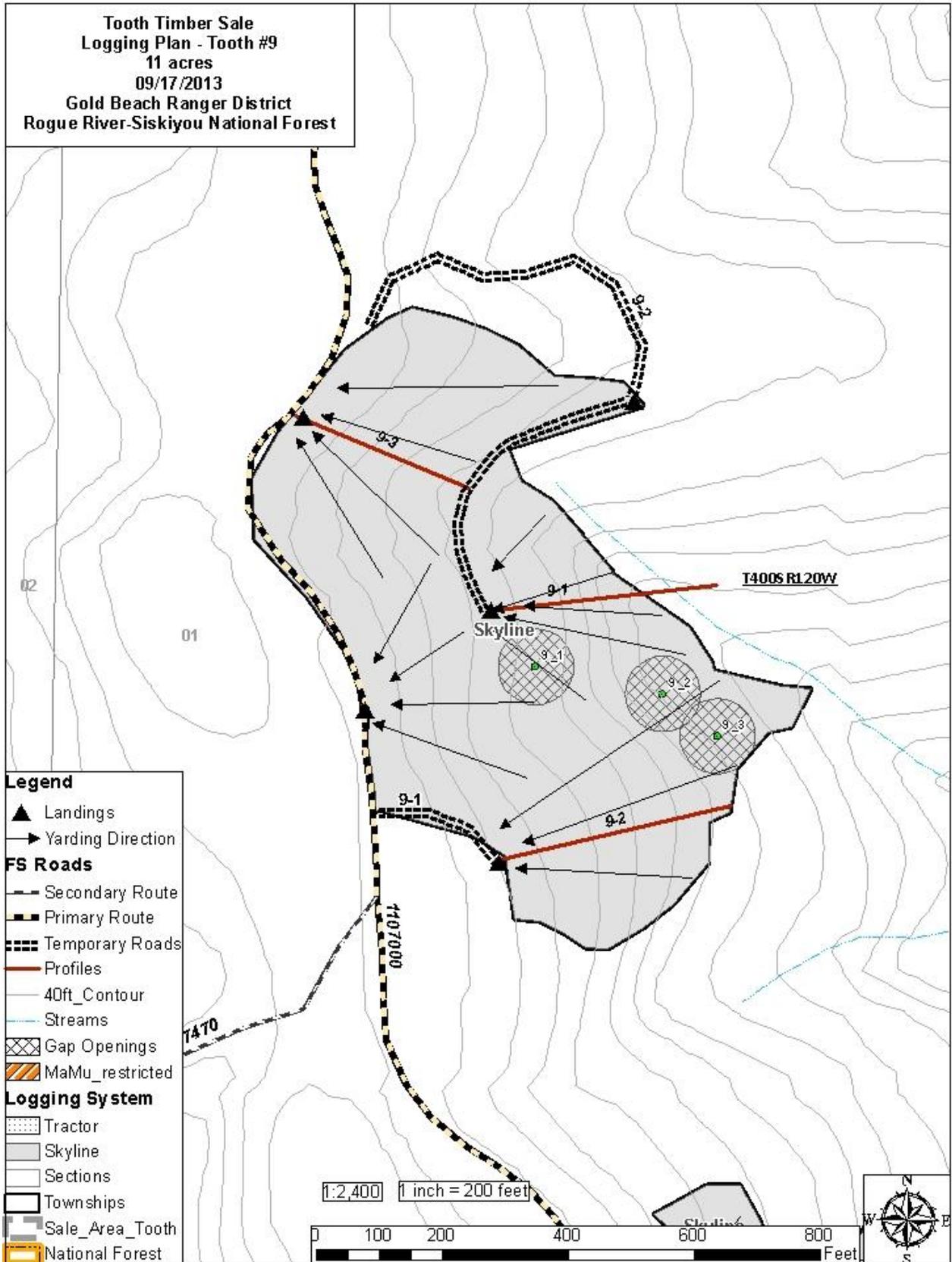
- Felling – minimize damage to residual trees, retain hardwoods where possible
- Yarding
  - One end suspension required for all yarding
  - Yard tops attached (YTA)
- **Profile 9-1** – This profile was shortened from the original logging plan. Long side hill yarding was eliminated. Still analyzed to hang across the creek for better deflection.
- **Temp Road 9-2** – This road is in good shape, travels into young plantation and back into unit to a large landing location.
- **Riparian Areas** – When rigging or yarding corridors across a stream consider the following:
  - Limit corridor widths to 12'
  - Trees felled for facilitation of yarding outside the unit (in the stream buffer zone) are to be retained on site

### Restrictions and Limitations:

- **Marbled Murrelet:** No murrelet restrictions.

### Access and Haul Routes:

Haul route is north on the 1107 to the 1376. Continue west on County Rd. 784 and to Hwy. 101 and then travel north 3 miles to appraisal point on Carpenterville Rd.



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

### 9-1 - Ground Profile - Medium Yarder Analysis

GET a saved analysis

#### SkylineXL 3.01 Profile Analysis - Analysis Input

SAVE this analysis

skyline load path = —■—

create a new point not currently on profile
RUN PHASE 1 ANALYSIS

Profile name: 9-1\_GROUND

Analysis type	Selected yarder	Selected carriage
Standing	Yoder, shotgun - 2 drum_added	Acme 10, motorized

Log geometry	Values
tag length - ft	10.0
log length - ft	40.0
log diameter - in	12.0

Min payload - lbs	At horiz dist - ft
15,136	213

phase 2

clear load path

Supports	Horizontal distance-ft	Rigging height-ft
head spar	0	40
tail spar	322	20
int support 1		
int support 2		
int support 3		

Analysis name: 9-1\_GROUND\_Yoder\_Analysis

Yarding parameters errors (NONE)...

Profile date:

Yarding parameters	Inner distance	Outer distance
yarding limits-feet	117	213
landing cut (-) or fill (+) feet		

Susp type SELECT	Log Susp and Clearance Table	Clearance feet
partial		2.0

If horizontal distance selection error, then cell shading is red

Current analysis phase = 1

SkylineXL 3.01 Profile Analysis - Results

Profile name: 9-1\_GROUND

Profile date:

Analysis name: 9-1\_GROUND\_Yoder\_Analysis

print

**STANDING skyline analysis summary...**

Skyline analysis type	Selected yarder	Selected carriage	Minimum payload - lbs	At horizontal distance - ft	Analysis phase
Standing	Yoder, shotgun - 2 drum_added, 40-ft twr	Acme 10, motorized	15,136	213	1

**STANDING skyline rigging lengths...**

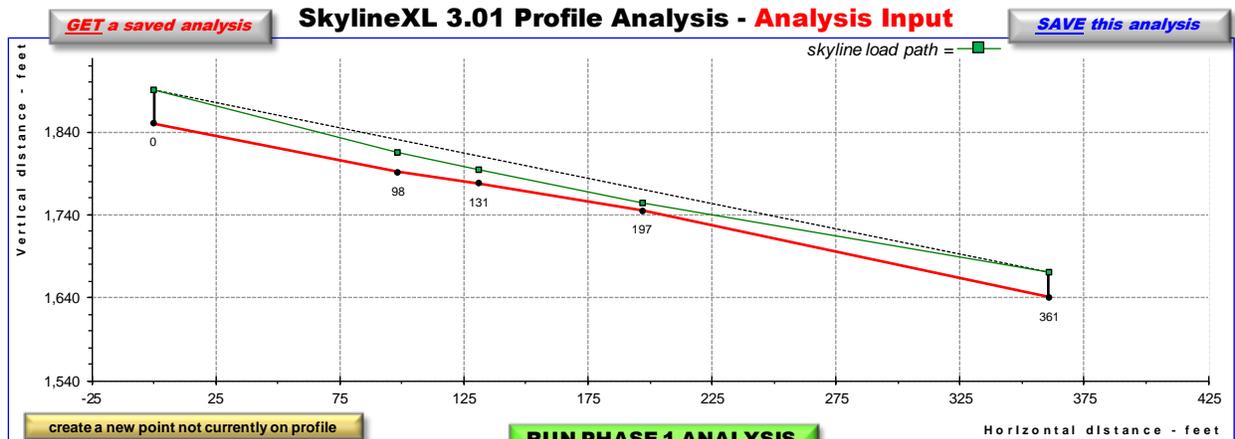
Line	Capacity-ft <sup>1/</sup>	Required-ft	Notes	Chord slope span 1	Chord slope span 2	Chord slope span 3	Chord slope span 4
skyline	1,000	510	adequate	41.6%			
mainline	1,500	350	adequate				
haulback				Unstretched skyline line length - feet			362.02

<sup>1/</sup>line capacities based on selected yarder

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

TP	Horizontal dist - feet	Net payload lbs	Net payload to landing lbs	Skyline tension - lbs	Mainline tension - lbs	Haulback tension - lbs	Skyline clearance feet	Log clearance feet	Full susp bottom of log above TP-feet
2	117	18,175	18,175	12,196	16,133	-	9	2	-
3	175	18,288	18,175	23,100	10,929	-	27	19	-
4	213	15,136	15,136	23,100	4,452	-	52	Full	2

## 9-2 - GIS Profile - Yoder Analysis



Profile name: 9-2\_GIS Profile date:

Analysis type	Selected yarder	Selected carriage	phase 2	Supports	Horizontal distance-ft	Rigging height-ft	print	Yarding parameters	Inner distance	Outer distance
Standing	Yoader, shotgun - 2 drum	Acme 10, motorized	clear load path	head spar	0	40		yarding limits-feet	98	197
				tail spar	361	30	refresh view	landing cut (-) or fill (+) feet		
				Int.support:1						
				Int.support:2						
				Int.support:3						

Log geometry	Values
tag length - ft	10.0
log length - ft	40.0
log diameter - in	12.0

Min payload - lbs	At horiz dist - ft
4,598	197

Analysis name: 9-2\_GIS\_Yoder

Yarding parameters errors (NONE)...

Susp type	Log Susp and Clearance Table	Clearance feet
SELECT partial		2.0

If horizontal distance selection error, then cell shading is red

Current analysis phase = 1  
 Profile name: 9-2\_GIS  
 Analysis name: 9-2\_GIS\_Yoder

STANDING skyline analysis summary...

Skyline analysis type	Selected yarder	Selected carriage	Minimum payload - lbs	At horizontal distance - ft	Analysis phase
Standing	Yoader, shotgun - 2 drum, 40-ft tw r	Acme 10, motorized	4,598	197	1

STANDING skyline rigging lengths...

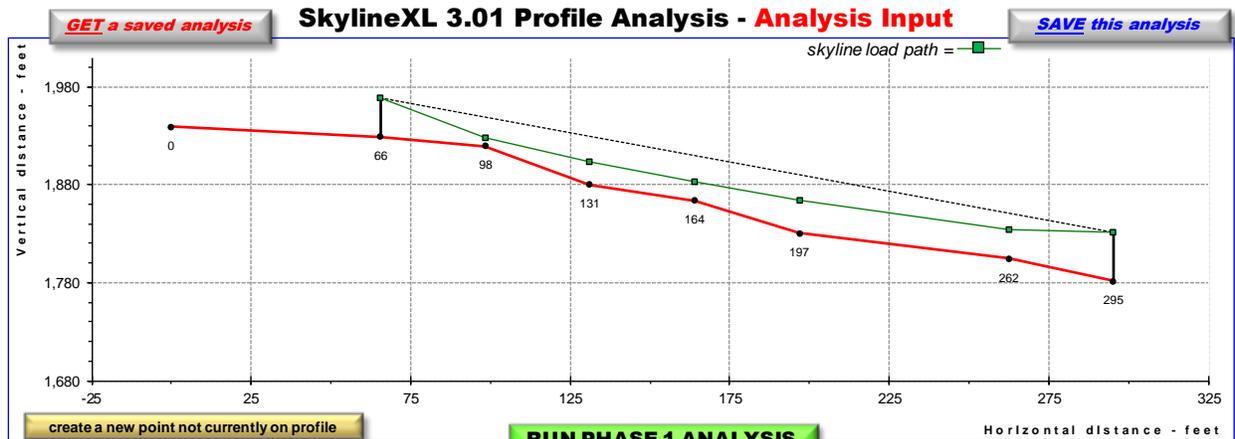
Line	Capacity-ft <sup>1/</sup>	Required-ft	Notes	Chord slope span 1	Chord slope span 2	Chord slope span 3	Chord slope span 4
skyline	1,000	570	adequate				
mainline	1,500	310	adequate	61.0%			
haulback				Unstretched skyline line length - feet			421.31

<sup>1/</sup> line capacities based on selected yarder

STANDING skyline analysis detail, PHASE 1 analysis...

TP	Horizontal dist - feet	Net payload lbs	Net payload to landing lbs	Skyline tension - lbs	Mainline tension - lbs	Haulback tension - lbs	Skyline clearance feet	Log clearance feet	Full susp bottom of log above TP-feet
2	98	5,183	5,183	23,100	4,491	-	24	15	-
3	131	4,893	4,893	23,100	4,567	-	16	8	-
4	197	4,598	4,598	23,100	4,649	-	9	2	-

### 9-3 - GIS Profile - Yoder Analysis



Profile name: 9-3\_GIS Profile date:

Analysis type	Selected yarder	Selected carriage
Standing	Yoader, shotgun - 2 drum	Acme 10, motorized_added

Supports	Horizontal distance-ft	Rigging height-ft
head spar	66	40
tail spar	295	50
Int.support:1		
Int.support:2		
Int.support:3		

Yarding parameters	Inner distance	Outer distance
yarding limits-feet	98	262
landing cut (-) or fill (+) feet		

Susp type	Log Susp and Clearance Table	Clearance feet
SELECT partial		2.0

Analysis name: 9-3\_GIS\_Yoder

Yarding parameters errors (NONE)...

Current analysis phase = 1

Profile name: 9-3\_GIS

Analysis name: 9-3\_GIS\_Yoder

**STANDING skyline analysis summary...**

Skyline analysis type	Selected yarder	Selected carriage	Minimum payload - lbs	At horizontal distance - ft	Analysis phase
Standing	Yoader, shotgun - 2 drum, 40-ft tw r	Acme 10, motorized_added	13,123	164	1

**STANDING skyline rigging lengths...**

Line	Capacity-ft <sup>1/</sup>	Required-ft	Notes	Chord slope span 1	Chord slope span 2	Chord slope span 3	Chord slope span 4
skyline	1,000	470	adequate				
mainline	1,500	330	adequate	59.9%			
haulback				Unstretched skyline line length - feet			270.40

<sup>1/</sup> line capacities based on selected yarder

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

TP	Horizontal dist - feet	Net payload lbs	Net payload to landing lbs	Skyline tension - lbs	Mainline tension - lbs	Haulback tension - lbs	Skyline clearance feet	Log clearance feet	Full susp bottom of log above TP-feet
3	98	15,978	15,978	13,297	16,133	-	9	2	-
4	131	19,766	15,978	22,741	16,133	-	24	15	-
5	164	13,123	13,123	23,100	11,003	-	19	11	-
6	197	13,746	13,123	23,100	9,546	-	33	24	-
7	262	17,118	13,123	23,100	10,198	-	29	20	-

## Subdivision 10

Unit	Logging System	Acre	Equipment	Cruised Volume (CCF)	Cruised Volume (Tons)	Avg External Yarding Distance (ft)	Avg Yarding Distance (ft)	Temp Road Construction (ft)
10	Skyline	9	Yoder	258	732	478	287	606
10	Tractor/ Shovel	3	Tractor	86	244	420	164	

### Logging System Notes:

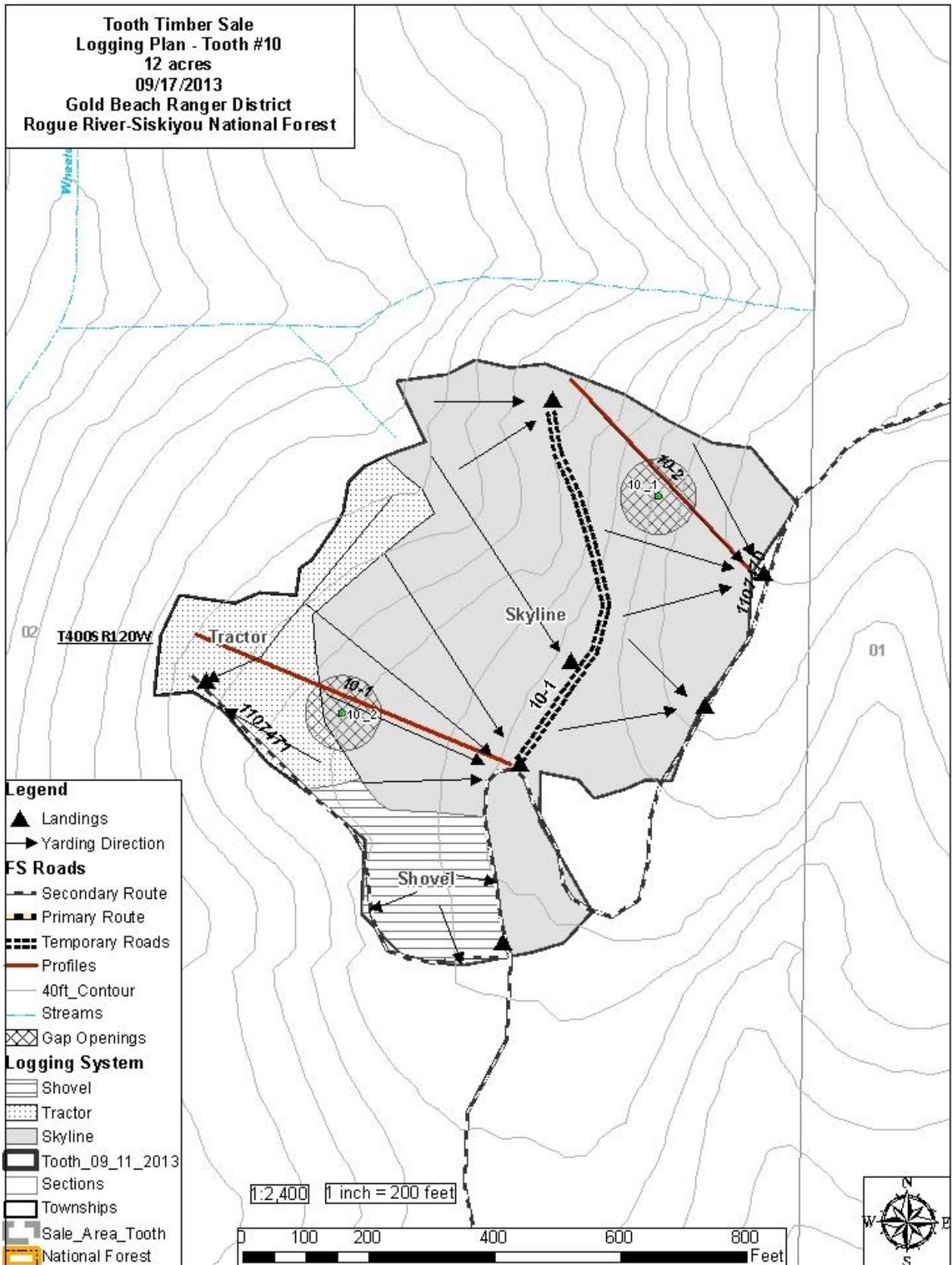
- Felling – minimize damage to residual trees, retain hardwoods where possible
- Yarding
  - One end suspension required for all yarding
  - Yard tops attached (YTA)
- **Profile 10-1 & 10-2**– These profiles were run using GIS and a 10m digital elevation model. From the GIS data, Skyline Excel shows these profiles having a very low payload. These settings will likely see higher payloads, as landing have steeper slopes immediately below.
- **Road Access** – Many areas along the western edge can be easily accessed by tractor/loader and reached from the 1107471 road.
- **Mechanical Harvesting** – could be utilized on slopes <35% in along the western edge and northwestern portions of the unit. An old skid parallels the northwest boundary where a feller-buncher could access some fairly gentle slopes.

### Restrictions and Limitations:

- **Marbled Murrelet: Only the tractor and shovel portions of the unit are restricted** for Marbled Murrelet nesting. 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. **The entire skyline portion of the unit is unrestricted.**
- **Restrictions-** In this unit all skyline yarding may occur with **no marbled murrelet restrictions**. Restricted portions of the unit can be tractor or shovel logged. This is an attempt is to reduce move in move out costs and restricted areas can be revisited even during IFPL3 because they are ground based operations. See MaMu restriction maps.
- Ground-based operations shall be conducted in dry weather conditions.

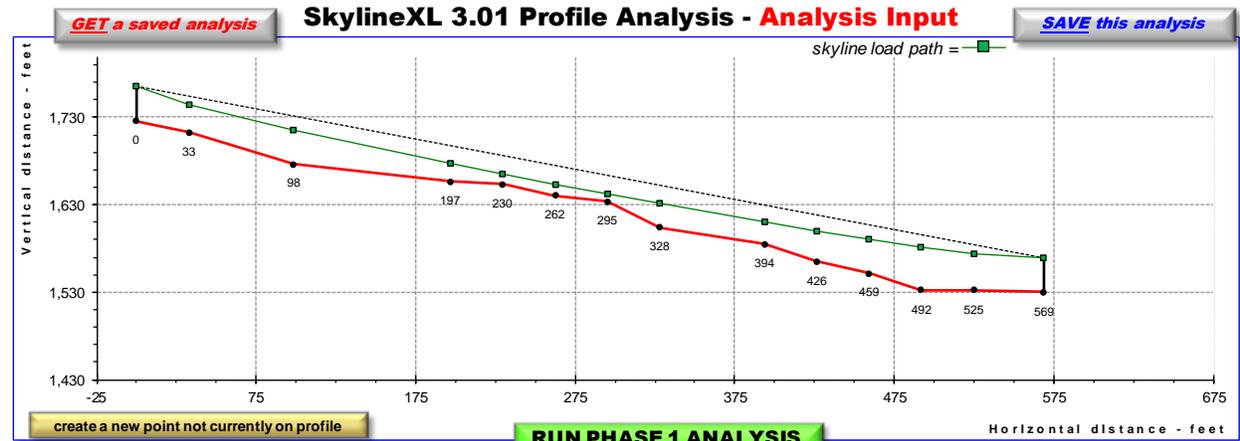
### Access and Haul Routes:

Haul route is north on the 1107 to the 1376. Continue west on County Rd. 784 and to Hwy. 101 and then travel north 3 miles to appraisal point on Carpenterville Rd.



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

### 10-1 - GIS Profile - Yoder Analysis



Profile name: 10-1\_GIS Profile date:

Analysis type	Selected yarder	Selected carriage	Supports	Horizontal distance-ft	Rigging height-ft	print	Yarding parameters	Inner distance	Outer distance
Standing	Yoader, shotgun - 2 drum	Acme 10, motorized, added	head spar	0	40	refresh view	yarding limits-feet	33	525
			tail spar	569	40		landing cut (-) or fill (+) feet		
			Int.support.1						
			Int.support.2						
			Int.support.3						

Analysis name: 10-1\_GIS\_Yoder

Susp type	Log Susp and Clearance Table	Clearance feet
partial	Table	2.0

Yarding parameters errors (NONE)...

If horizontal distance selection error, then cell shading is red

Current analysis phase = 1  
 Profile name: 10-1\_GIS  
 Analysis name: 10-1\_GIS\_Yoder  
 Profile date:

**STANDING skyline analysis summary...**

Skyline analysis type	Selected yarder	Selected carriage	Minimum payload - lbs	At horizontal distance - ft	Analysis phase
Standing	Yoader, shotgun - 2 drum, 40-ft tw r	Acme 10, motorized, added	2,473	295	1

**STANDING skyline rigging lengths...**

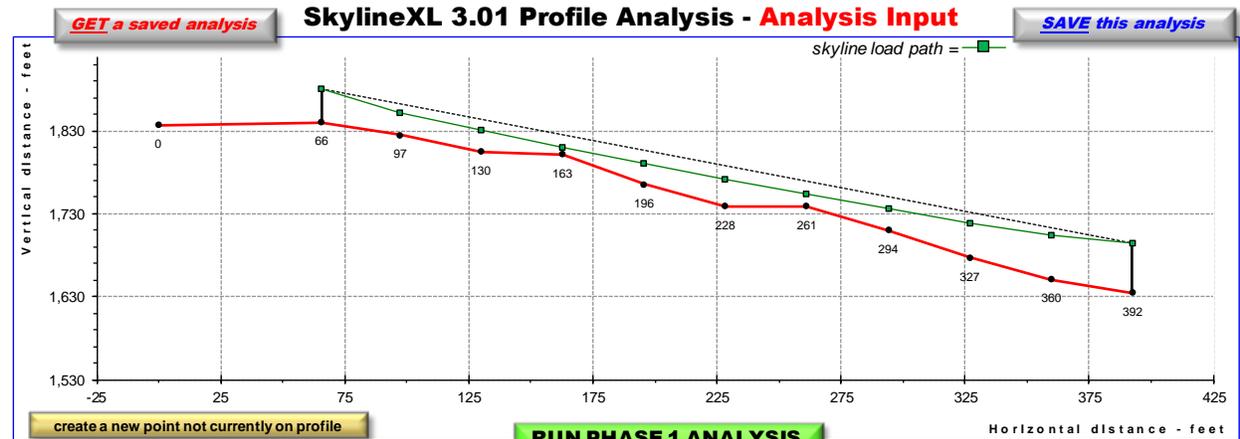
Line	Capacity-ft <sup>1/</sup>	Required-ft	Notes	Chord slope span 1	Chord slope span 2	Chord slope span 3	Chord slope span 4
skyline	1,000	780	adequate	34.4%			
mainline	1,500	660	adequate				
haulback							
Unstretched skyline line length - feet							599.73

<sup>1/</sup> line capacities based on selected yarder

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

TP	Horizontal dist - feet	Net payload lbs	Net payload to landing lbs	Skyline tension - lbs	Mainline tension - lbs	Haulback tension - lbs	Skyline clearance feet	Log clearance feet	Full susp bottom of log above TP-feet
2	33	8,409	8,409	23,100	5,852	-	31	22	-
3	98	4,378	4,378	23,100	2,740	-	38	29	-
4	197	4,340	4,340	23,100	2,952	-	20	11	-
5	230	3,618	3,618	23,100	3,009	-	12	4	-
6	262	4,097	3,618	23,100	3,084	-	13	5	-
7	295	2,473	2,473	23,100	2,251	-	8	2	-
8	328	2,873	2,473	23,100	2,045	-	27	18	-
9	394	2,711	2,473	23,100	1,951	-	26	17	-
10	426	2,955	2,473	23,100	1,828	-	35	26	-
11	459	3,061	2,473	23,100	1,688	-	39	29	-
12	492	3,779	2,473	23,100	1,528	-	50	39	-
13	525	6,628	2,473	23,100	2,832	-	42	31	-

## 10-2 - GIS Profile - Yoder Analysis



Profile name: 10-2\_GIS Profile date:

Analysis type	Selected yarder	Selected carriage	Supports	Horizontal distance-ft	Rigging height-ft	print	Yarding parameters	Inner distance	Outer distance
<b>Standing</b>	Yoader, shotgun - 2 drum	Acme 10, motorized, added	head spar	66	40	refresh view	yarding limits-feet	97	360
			tail spar	392	60		landing cut (-) or fill (+) feet		
			Int.support.1						
			Int.support.2						
			Int.support.3						

Analysis name: 10-2\_GIS\_Yoder

Susp type	Log Susp and Clearance Table	Clearance feet
partial	Table	2.0

Yarding parameters errors (NONE)...

Current analysis phase = 1

Profile name: 10-2\_GIS

Analysis name: 10-2\_GIS\_Yoder

If horizontal distance selection error, then cell shading is red

STANDING skyline analysis summary...

Skyline analysis type	Selected yarder	Selected carriage	Minimum payload - lbs	At horizontal distance - ft	Analysis phase
<b>Standing</b>	Yoader, shotgun - 2 drum, 40-ft tw r	Acme 10, motorized, added	3,715	294	<b>1</b>

STANDING skyline rigging lengths...

Line	Capacity-ft <sup>1/</sup>	Required-ft	Notes	Chord slope span 1	Chord slope span 2	Chord slope span 3	Chord slope span 4
skyline	1,000	610	adequate	56.9%			
mainline	1,500	450	adequate				
haulback							
Unstretched skyline line length - feet							375.09

<sup>1/</sup>line capacities based on selected yarder

STANDING skyline analysis detail, PHASE 1 analysis...

TP	Horizontal dist - feet	Net payload lbs	Net payload to landing lbs	Skyline tension - lbs	Mainline tension - lbs	Haulback tension - lbs	Skyline clearance feet	Log clearance feet	Full susp bottom of log above TP-feet
3	97	9,009	9,009	23,100	7,486	-	28	19	-
4	130	9,159	9,009	23,100	6,640	-	26	16	-
5	163	4,586	4,586	23,100	4,599	-	9	2	-
6	196	3,827	3,827	23,100	3,378	-	25	16	-
7	228	5,494	3,827	23,100	3,793	-	32	22	-
8	261	3,973	3,827	23,100	3,764	-	14	7	-
9	294	3,715	3,715	23,100	3,092	-	26	17	-
10	327	4,082	3,715	23,100	2,735	-	42	32	-
11	360	5,448	3,715	23,100	2,718	-	53	Full	3

## Subdivision 12

Unit	Logging System	Acres	Equipment	Cruised Volume (CCF)	Cruised Volume (Tons)	Avg External Yarding Distance (ft)	Avg Yarding Distance (ft)	Temp Road Construction (ft)
12	Skyline	12	Yoder	344	969	519	311	574

### Logging System Notes:

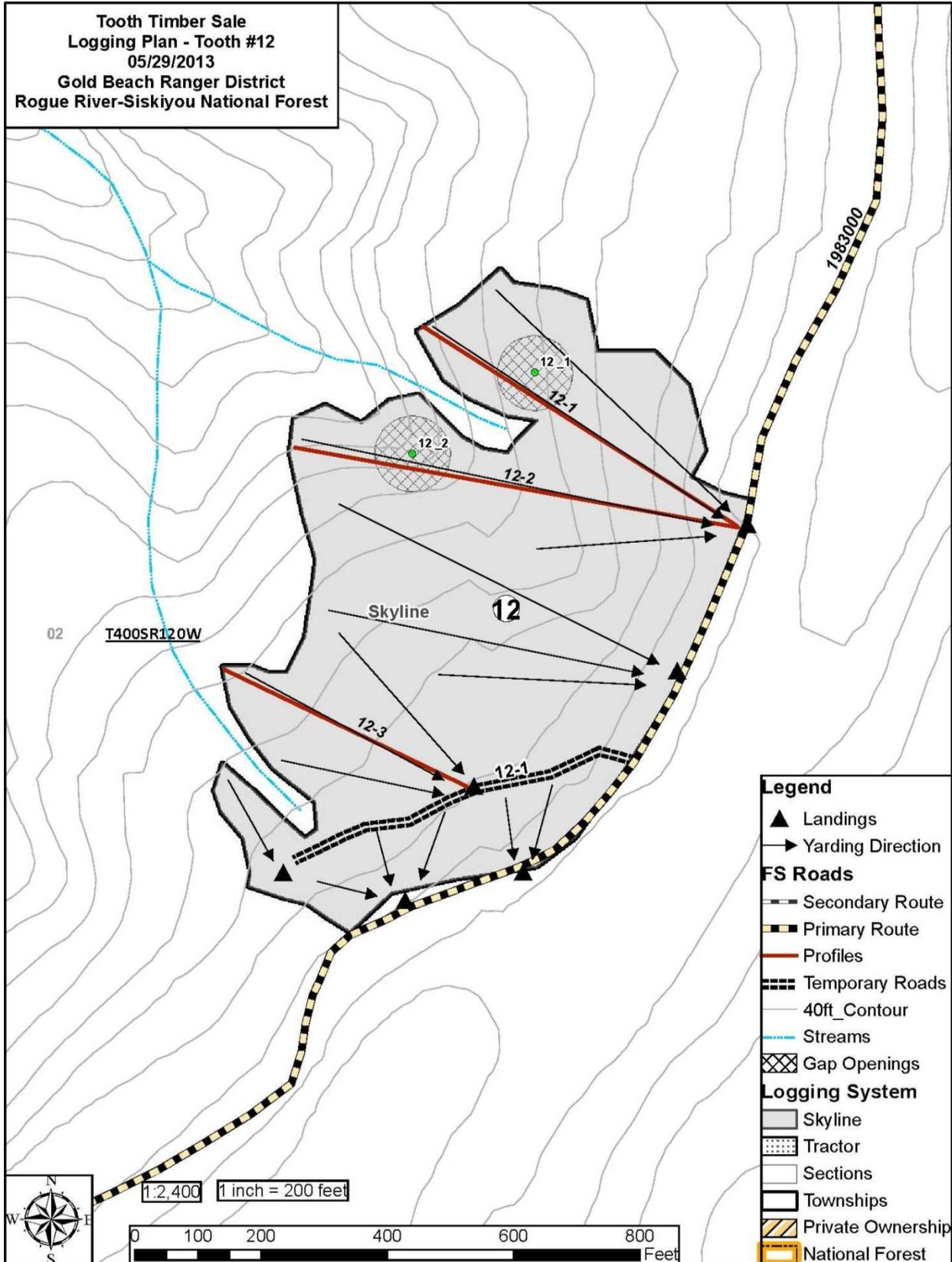
- Felling – minimize damage to residual trees, retain hardwoods where possible
- Yarding
  - One end suspension required for all yarding
  - Yard tops attached (YTA)
- **Mechanical Harvesting** – could be utilized on the gentle slopes (<35%) in the much of the southern portion of the unit

### Restrictions and Limitations:

- **Marbled Murrelet:** No murrelet restrictions.
- Ground-based operations shall be conducted in dry weather conditions.

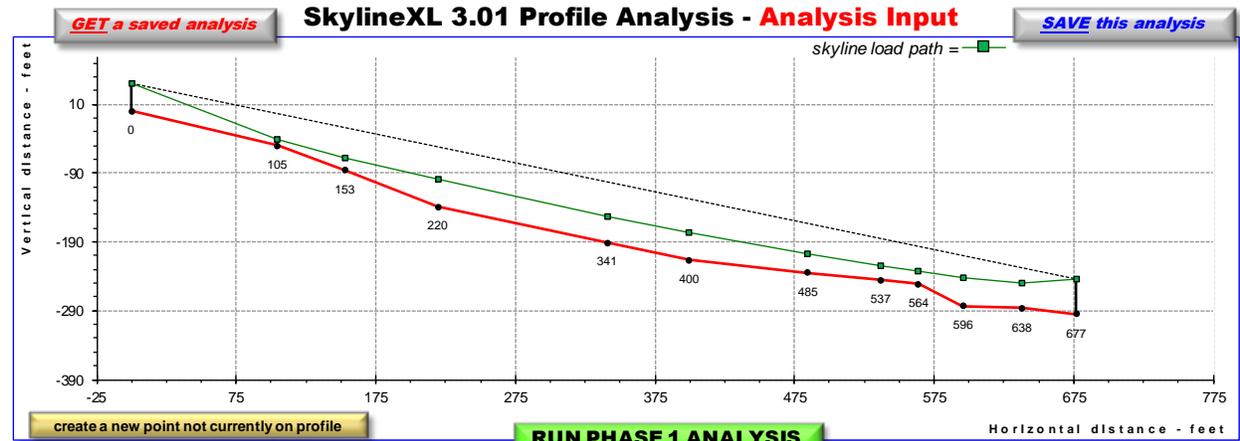
### Access and Haul Routes:

Haul route is east on the 1983 and then north on the 1107 to the 1376. Continue west on County Rd. 784 and to Hwy. 101 and then travel north 3 miles to appraisal point on Carpenterville Rd.



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

## 12-1 - Ground Profile - Yoder Analysis



Profile name: 12-1\_Ground Profile date: 5/8/13

Analysis type	Selected yarder	Selected carriage
<b>Standing</b>	Yoder, shotgun - 2 drum	Acme 10, motorized

**phase 2** clear load path

Supports	Horizontal distance-ft	Rigging height-ft
head spar	0	40
tail spar	677	50
Int.support.1		
Int.support.2		
Int.support.3		

Yarding parameters	Inner distance	Outer distance
yarding limits-feet	105	638
landing cut (-) or fill (+) feet		

Susp type	Log Susp and Clearance Table	Clearance feet
partial	Table	2.0

Analysis name: 12-1.GROUND\_Yoder

Yarding parameters errors (NONE)...

Current analysis phase = 1

Profile name: 12-1\_Ground  
Analysis name: 12-1\_GROUND\_Yoder

If horizontal distance selection error, then cell shading is red

**STANDING skyline analysis summary...**

Skyline analysis type	Selected yarder	Selected carriage	Minimum payload - lbs	At horizontal distance - ft	Analysis phase
<b>Standing</b>	Yoder, shotgun - 2 drum, 40-ft tw r	Acme 10, motorized	5,984	341	<b>1</b>

**STANDING skyline rigging lengths...**

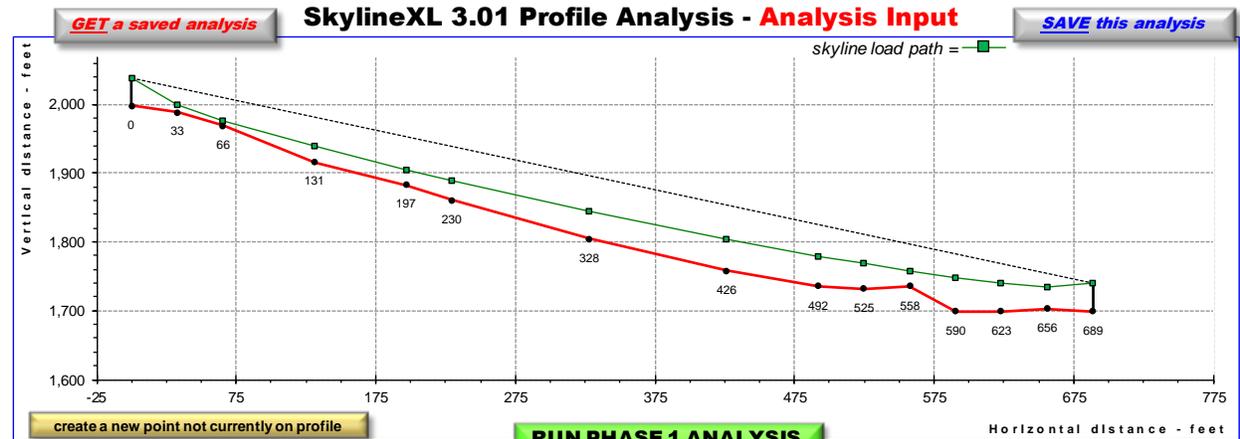
Line	Capacity-ft <sup>1/</sup>	Required-ft	Notes	Chord slope span 1	Chord slope span 2	Chord slope span 3	Chord slope span 4
skyline	1,000	940	adequate				
mainline	1,500	800	adequate	42.1%			
haulback							
<b>Unstretched skyline line length - feet</b>							735.97

<sup>1/</sup>line capacities based on selected yarder

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

TP	Horizontal dist - feet	Net payload lbs	Net payload to landing lbs	Skyline tension - lbs	Mainline tension - lbs	Haulback tension - lbs	Skyline clearance feet	Log clearance feet	Full susp bottom of log above TP-feet
2	105	14,806	14,806	23,100	13,486	-	9	2	-
3	153	9,060	9,060	23,100	7,374	-	18	11	-
4	220	6,685	6,685	23,100	4,296	-	39	30	-
5	341	5,984	5,984	23,100	3,733	-	38	28	-
6	400	6,530	5,984	23,100	3,823	-	40	30	-
7	485	9,093	5,984	23,100	5,602	-	27	18	-
8	537	11,466	5,984	23,100	7,237	-	21	12	-
9	564	8,163	5,984	23,100	5,239	-	19	11	-
10	596	11,199	5,984	23,100	4,861	-	42	32	-
11	638	15,947	5,984	23,100	6,280	-	36	27	-

## 12-2 - GIS Profile - Yoder Analysis



Profile name: 12-2\_GIS      Profile date:

Analysis type	Selected yarder	Selected carriage
<b>Standing</b>	Yoader, shotgun - 2 drum	Acme 10, motorized

**phase 2**      **clear load path**      **print**      **refresh view**

Supports	Horizontal distance-ft	Rigging height-ft
head spar	0	40
tail spar	689	40
Int.support.1		
Int.support.2		
Int.support.3		

Yarding parameters	Inner distance	Outer distance
yarding limits-feet	33	656
landing cut (-) or fill (+) feet		

Log geometry	Values
tag length - ft	10.0
log length - ft	40.0
log diameter - in	12.0

Susp type	Log Susp and Clearance Table	Clearance feet
partial	Table	2.0

Analysis name: 12-2\_GIS\_Yoder

Yarding parameters errors (NONE)...

Min payload - lbs      At horiz dist - ft

5,604	426
-------	-----

To change the yarder and/or the carriage, navigate to the "Yarders & Carriages" screen and make selection(s)

W/ horizontal distance selection error, then cell shading is red

Current analysis phase = 1

Profile name: 12-2\_GIS  
Analysis name: 12-2\_GIS\_Yoder

### STANDING skyline analysis summary...

Skyline analysis type	Selected yarder	Selected carriage	Minimum payload - lbs	At horizontal distance - ft	Analysis phase
<b>Standing</b>	Yoader, shotgun - 2 drum, 40-ft tw r	Acme 10, motorized	5,604	426	<b>1</b>

### STANDING skyline rigging lengths...

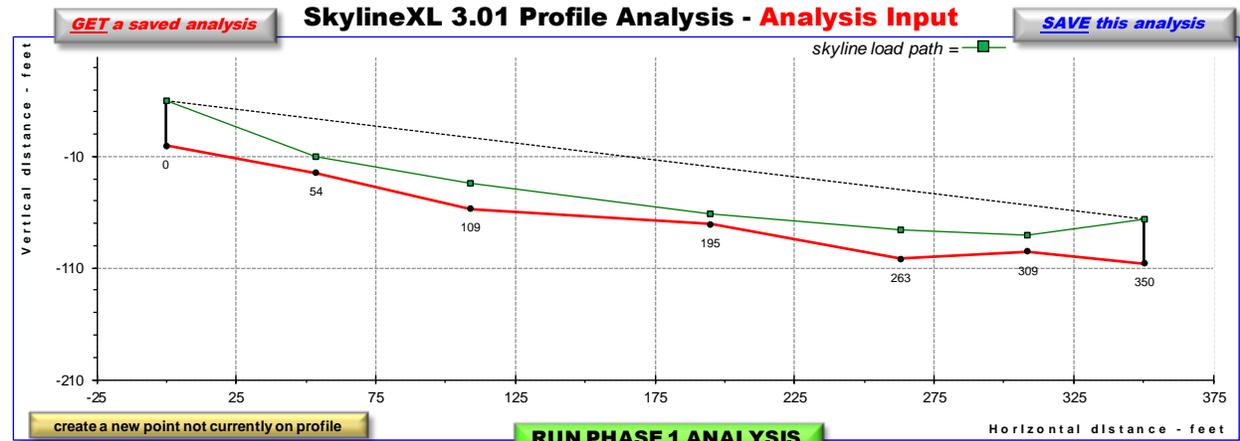
Line	Capacity-ft <sup>1/</sup>	Required-ft	Notes	Chord slope span 1	Chord slope span 2	Chord slope span 3	Chord slope span 4
skyline	1,000	940	adequate				
mainline	1,500	830	adequate	43.4%			
haulback				Unstretched skyline line length - feet			752.61

<sup>1/</sup>line capacities based on selected yarder

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

TP	Horizontal dist - feet	Net payload lbs	Net payload to landing lbs	Skyline tension - lbs	Mainline tension - lbs	Haulback tension - lbs	Skyline clearance feet	Log clearance feet	Full susp bottom of log above TP-feet
2	33	16,857	16,857	7,139	16,133	-	11	4	-
3	66	17,078	16,857	18,600	16,133	-	9	2	-
4	131	11,519	11,519	23,100	8,933	-	23	15	-
5	197	8,112	8,112	23,100	6,346	-	22	14	-
6	230	7,314	7,314	23,100	5,281	-	29	20	-
7	328	5,831	5,831	23,100	3,617	-	40	31	-
8	426	5,604	5,604	23,100	3,028	-	46	36	-
9	492	7,162	5,604	23,100	3,732	-	44	34	-
10	525	10,774	5,604	23,100	5,341	-	36	26	-
11	558	7,440	5,604	23,100	4,647	-	22	14	-
12	590	8,973	5,604	23,100	3,558	-	49	38	-
13	623	15,268	5,604	23,100	6,175	-	40	30	-
14	656	21,319	5,604	23,100	8,884	-	31	21	-

### 12-3 - Ground Profile - Yoder Analysis



Profile name: 12-3 GROUND Profile date: 5/8/13

Analysis type	Selected yarder	Selected carriage
Standing	Yoader, shotgun - 2 drum	Acme 10, motorized

phase 2

Supports	Horizontal distance-ft	Rigging height-ft
head spar	0	40
tail spar	350	40
Int.support.1		
Int.support.2		
Int.support.3		

print refresh view

Yarding parameters	Inner distance	Outer distance
yarding limits-feet	54	309
landing cut (-) or fill (+) feet		

clear load path

Log geometry	Values
tag length - ft	10.0
log length - ft	40.0
log diameter - in	12.0

To change the yarder and/or the carriage, navigate to the "Yarders & Carriages" screen and make selection(s)

Susp type	Log Susp and Clearance Table	Clearance feet
partial		2.0

Analysis name: 12-3.GROUND\_Yoder

Yarding parameters errors (NONE)...

Current analysis phase = 1

Profile name: 12-3 GROUND

Analysis name: 12-3\_GROUND\_Yoder

Profile date: 5/8/13

STANDING skyline analysis summary...

Skyline analysis type	Selected yarder	Selected carriage	Minimum payload - lbs	At horizontal distance - ft	Analysis phase
Standing	Yoader, shotgun - 2 drum, 40-ft tw r	Acme 10, motorized	19,303	54	1

STANDING skyline rigging lengths...

Line	Capacity-ft <sup>1/</sup>	Required-ft	Notes	Chord slope span 1	Chord slope span 2	Chord slope span 3	Chord slope span 4
skyline	1,000	540	adequate				
mainline	1,500	420	adequate	30.2%			
haulback				Unstretched skyline line length - feet			373.29

<sup>1/</sup>line capacities based on selected yarder

STANDING skyline analysis detail, PHASE 1 analysis...

TP	Horizontal dist - feet	Net payload lbs	Net payload to landing lbs	Skyline tension - lbs	Mainline tension - lbs	Haulback tension - lbs	Skyline clearance feet	Log clearance feet	Full susp bottom of log above TP-feet
2	54	19,303	19,303	13,066	16,133	-	15	7	-
3	109	24,843	19,303	23,100	15,589	-	23	13	-
4	195	19,767	19,303	23,100	14,436	-	9	2	-
5	263	25,008	19,303	23,100	9,730	-	26	15	-
6	309	27,374	19,303	23,100	13,262	-	15	7	-

### Subdivision 13

Unit	Logging System	Acres	Equipment	Cruised Volume (CCF)	Cruised Volume (Tons)	Avg External Yarding Distance (ft)	Avg Yarding Distance (ft)	Temp Road Construction (ft)
13	Skyline	6	Yoder	172	478	897	538	0

**Logging System Notes:**

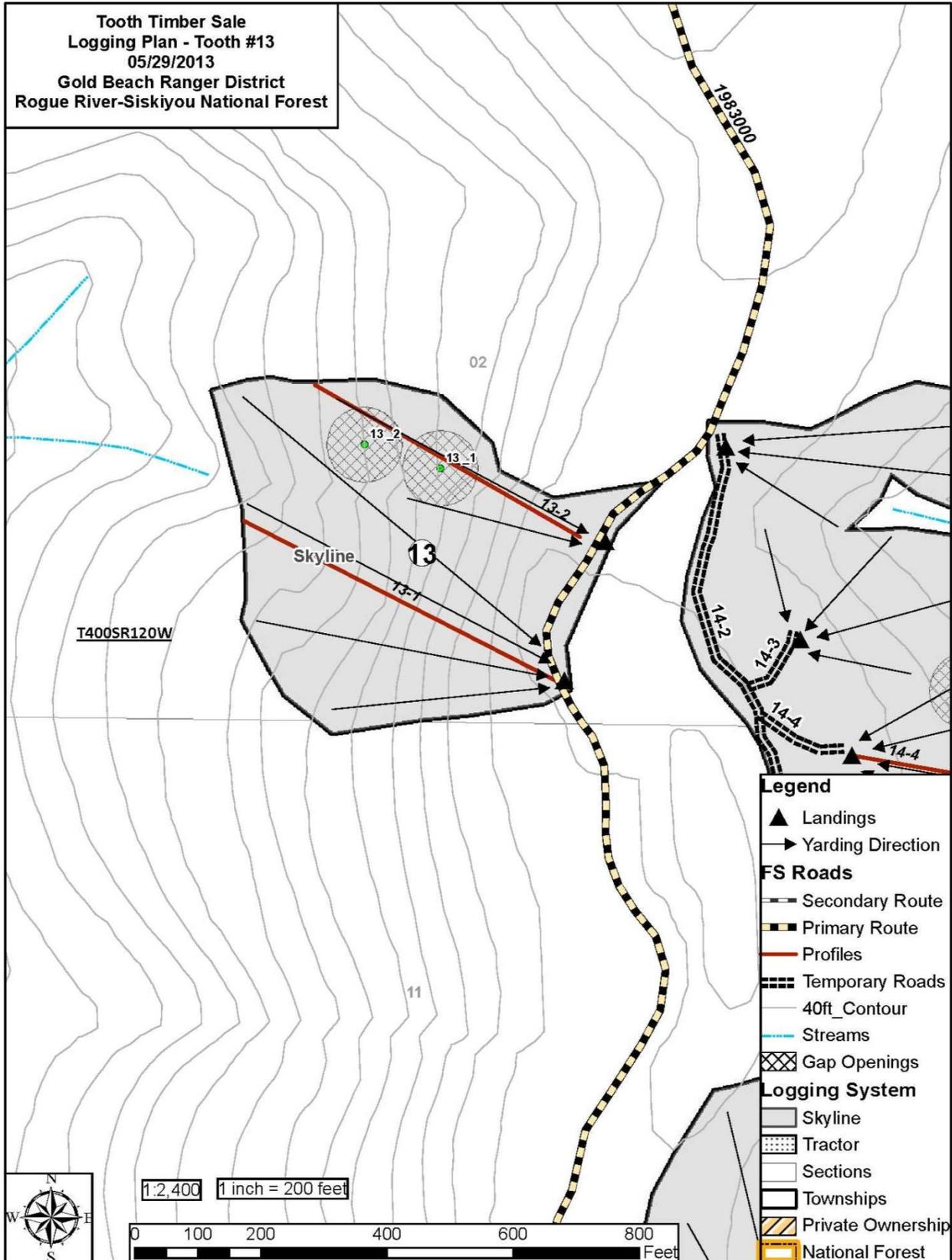
- Felling – minimize damage to residual trees, retain hardwoods where possible
- Yarding
  - One end suspension required for all yarding
  - Yard tops attached (YTA)
- Steep!

**Restrictions and Limitations:**

- **Marbled Murrelet:** No murrelet restrictions.

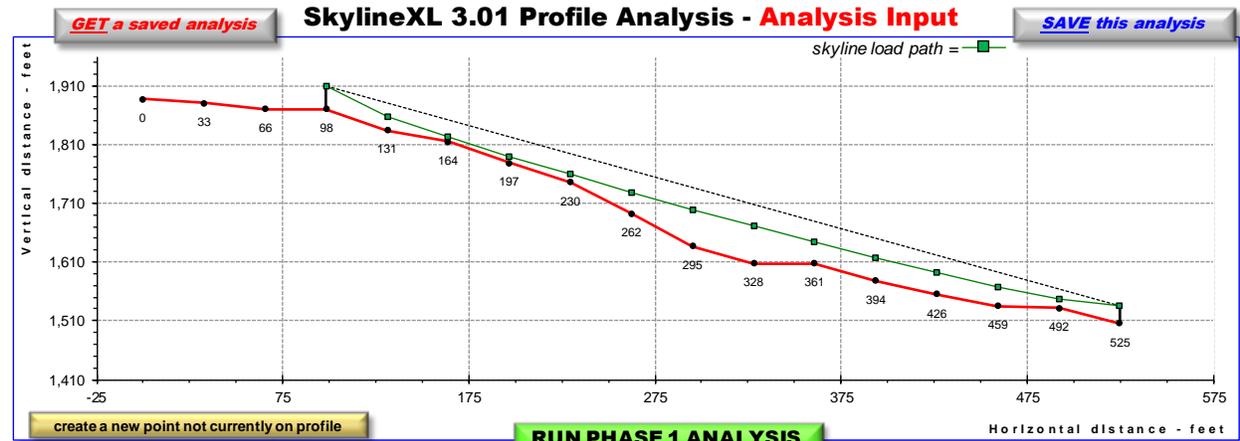
**Access and Haul Routes:**

Haul route is east on the 1983 and then north on the 1107 to the 1376. Continue west on County Rd. 784 and to Hwy. 101 and then travel north 3 miles to appraisal point on Carpenterville Rd.



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

### 13-1 - GIS Profile - Yoder Analysis



Profile name: 13-1\_GIS Profile date:

Analysis type	Selected yarder	Selected carriage	Supports	Horizontal distance-ft	Rigging height-ft	Yarding parameters	Inner distance	Outer distance
Standing	Yoder, shotgun - 2 drum	Acme 10, motorized, added	head spar	98	40	yarding limits-feet	131	492
			tail spar	525	30	landing cut (-) or fill (+) feet		
			Int.support.1					
			Int.support.2					
			Int.support.3					

Log geometry	Values
tag length - ft	10.0
log length - ft	40.0
log diameter - in	12.0

Susp type	Log Susp and Clearance Table	Clearance feet
partial	Table	2.0

Analysis name: 13-1\_GIS\_Yoder

Yarding parameters errors (NONE)...

Current analysis phase = 1

Profile name: 13-1\_GIS

Analysis name: 13-1\_GIS\_Yoder

STANDING skyline analysis summary...

Skyline analysis type	Selected yarder	Selected carriage	Minimum payload - lbs	At horizontal distance - ft	Analysis phase
Standing	Yoder, shotgun - 2 drum, 40-ft tw r	Acme 10, motorized, added	5,103	328	1

STANDING skyline rigging lengths...

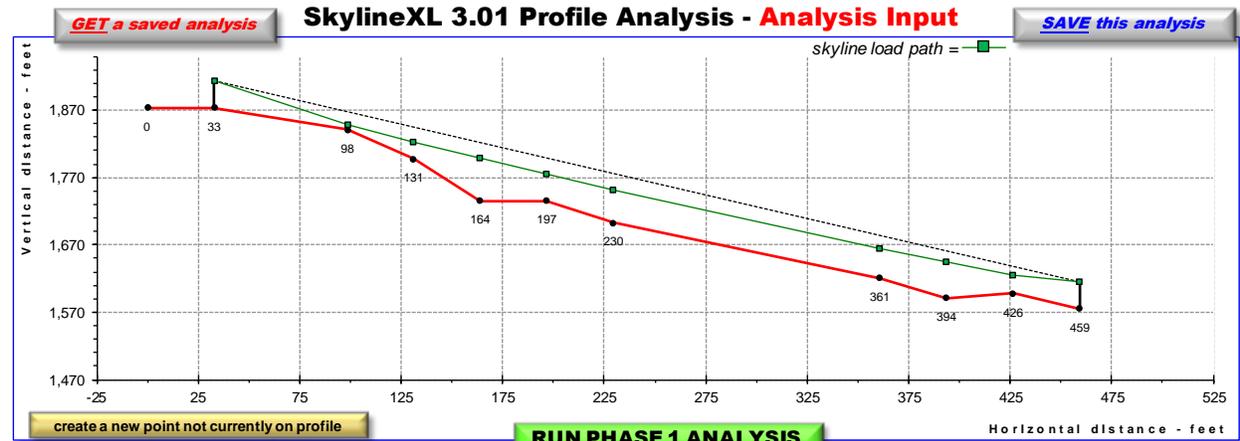
Line	Capacity-ft <sup>1/</sup>	Required-ft	Notes	Chord slope span 1	Chord slope span 2	Chord slope span 3	Chord slope span 4
skyline	1,000	730	adequate	87.8%			
mainline	1,500	630	adequate				
haulback				Unstretched skyline line length - feet			567.20

<sup>1/</sup>line capacities based on selected yarder

STANDING skyline analysis detail, PHASE 1 analysis...

TP	Horizontal dist - feet	Net payload lbs	Net payload to landing lbs	Skyline tension - lbs	Mainline tension - lbs	Haulback tension - lbs	Skyline clearance feet	Log clearance feet	Full susp bottom of log above TP-feet
5	131	16,965	16,965	12,478	16,133	-	24	16	-
6	164	15,133	15,133	19,230	16,133	-	9	2	-
7	197	13,245	13,245	23,100	13,688	-	12	5	-
8	230	7,974	7,974	23,100	8,210	-	13	6	-
9	262	5,922	5,922	23,100	5,370	-	36	26	-
10	295	5,149	5,149	23,100	4,248	-	62	Full	12
11	328	5,103	5,103	23,100	4,166	-	64	Full	14
12	361	6,384	5,103	23,100	5,648	-	36	27	-
13	394	6,849	5,103	23,100	5,786	-	39	30	-
14	426	8,271	5,103	23,100	6,819	-	37	27	-
15	459	16,027	5,103	23,100	11,464	-	33	23	-
16	492	18,385	5,103	21,504	16,133	-	15	7	-

### 13-2 -GIS Profile - Yoder Analysis



Profile name: 13-2\_GIS Profile date:

Analysis type	Selected yarder	Selected carriage	Supports	Horizontal distance-ft	Rigging height-ft	print	Yarding parameters	Inner distance	Outer distance
Standing	Yoader, shotgun - 2 drum	Acme 10, motorized, added	head spar	33	40	refresh view	yarding limits-feet	98	426
			tail spar	459	40		landing cut (-) or fill (+) feet		
			Int.support.1						
			Int.support.2						
			Int.support.3						

Analysis name: 13-2\_GIS\_Yoder

Susp type	Log Susp and Clearance Table	Clearance feet
partial	Table	2.0

Yarding parameters errors (NONE)...

Current analysis phase = 1

Profile name: 13-2\_GIS Analysis name: 13-2\_GIS\_Yoder

To change the yarder and/or the carriage, navigate to the "Yarders & Carriages" screen and make selection(s)

Log geometry Values

tag length - ft	10.0
log length - ft	40.0
log diameter - in	12.0

Min payload - lbs At horiz dist - ft

3,143	230
-------	-----

If horizontal distance selection error, then cell shading is red

STANDING skyline analysis summary...

Skyline analysis type	Selected yarder	Selected carriage	Minimum payload - lbs	At horizontal distance - ft	Analysis phase
Standing	Yoader, shotgun - 2 drum, 40-ft tw r	Acme 10, motorized, added	3,143	230	1

STANDING skyline rigging lengths...

Line	Capacity-ft <sup>1/</sup>	Required-ft	Notes	Chord slope span 1	Chord slope span 2	Chord slope span 3	Chord slope span 4
skyline	1,000	720	adequate				
mainline	1,500	600	adequate	70.0%			
haulback				Unstretched skyline line length - feet			519.27

<sup>1/</sup>line capacities based on selected yarder

STANDING skyline analysis detail, PHASE 1 analysis...

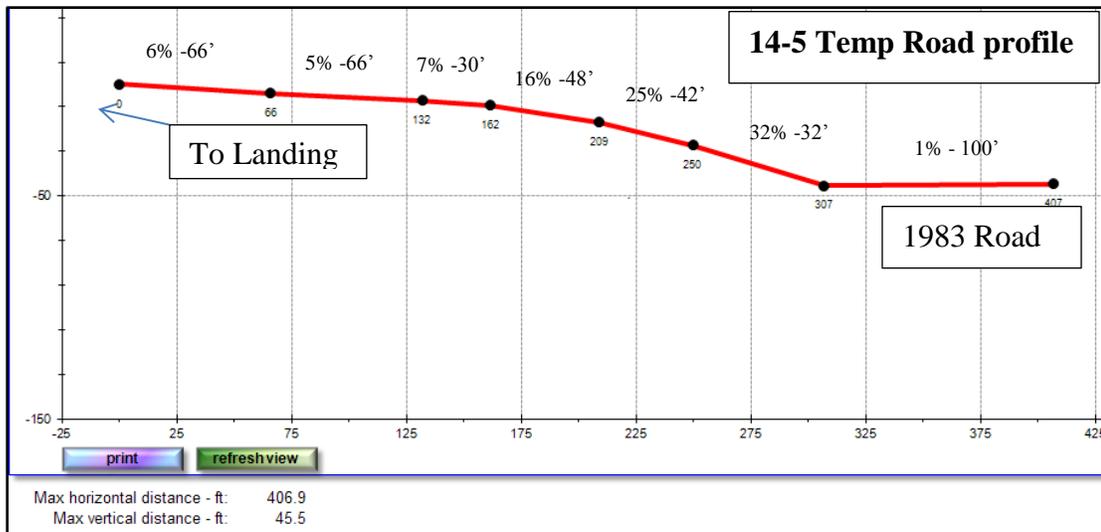
TP	Horizontal dist - feet	Net payload lbs	Net payload to landing lbs	Skyline tension - lbs	Mainline tension - lbs	Haulback tension - lbs	Skyline clearance feet	Log clearance feet	Full susp bottom of log above TP-feet
3	98	7,466	7,466	23,100	7,715	-	9	2	-
4	131	4,429	4,429	23,100	4,071	-	26	17	-
5	164	3,440	3,440	23,100	2,754	-	63	Full	13
6	197	3,536	3,440	23,100	3,112	-	39	29	-
7	230	3,143	3,143	23,100	2,594	-	49	38	-
8	361	4,071	3,143	23,100	3,167	-	43	33	-
9	394	4,671	3,143	23,100	3,090	-	53	Full	3
10	426	9,306	3,143	23,100	6,966	-	28	19	-

## Subdivision 14

Unit	Logging System	Acres	Equipment	Cruised Volume (CCF)	Cruised Volume (Tons)	Avg External Yarding Distance (ft)	Avg Yarding Distance (ft)	Temp Road Construction (ft)
14	Skyline	61	Med Yarder	1747	4921	624	374	2750
14	Tractor/ Shovel	2	Tractor	57	161	360	180	

### 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)
- **Riparian Areas** – When rigging or yarding corridors across a stream consider the following:
  - Streams may not be accurately mapped in the western portion of the unit
  - Limit corridor widths to 12'
  - Full log suspension is required in these areas
  - Trees felled for facilitation of yarding outside the unit (in the stream buffer zone) are to be retained on site
- **Fill failure** – Temporary road 14-1 is on an existing road grade that extends well beyond the landing depicted on the map. This road grade extends into and across the largest lobe in the middle of unit 14. However a significant fill failure just north of the depicted temp road prevented access further down the road. Do not use this road past the fill failure. This resulted in the installation of Temp Road 14-5.
- **Temp Road 14-5** – This temporary road is not ideal, but the landing location is good and necessary to log the largest lobe of Unit 14. The beginning of the temp road is a 75' section of ~30% slope. An engineer suggested that it doesn't seem to be a problem to get 20% grade for haul. If you draw a straight line, starting at point 162, going through point 250 and extend that line on the same grade past 307 you end up with a 20% grade. It's about 2 ft of cut at point 209 and 4 ft of fill at point 307. Two hours with a dozer should take care of it. Extra temporary road construction costs are built into the appraisal for this item. After 250 following the old cat grade, a new road prism will need to be constructed to reach the landing area. This crosses a short section of moderate side slope and reaches a spur ridge where a new landing will need to be constructed.



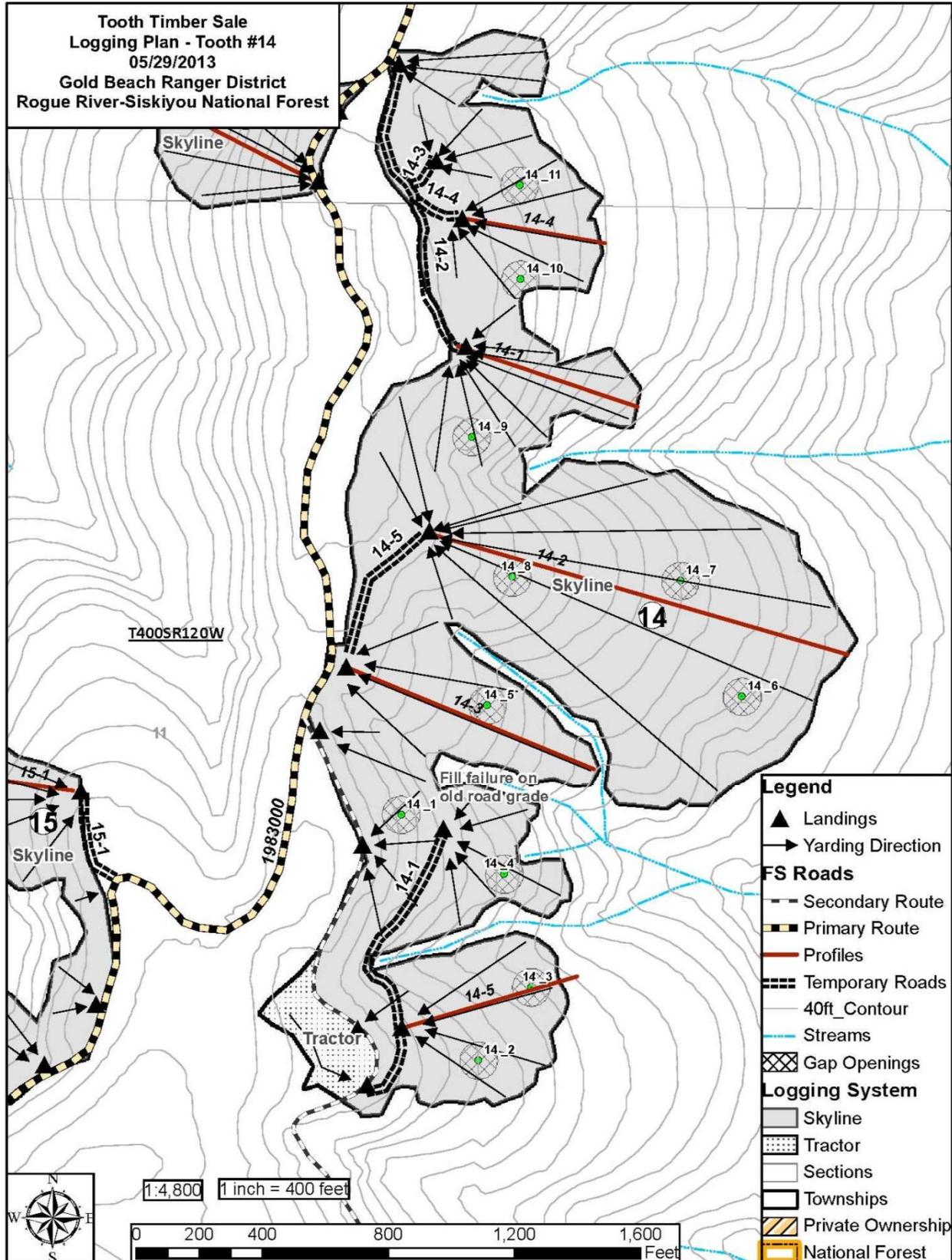
- **Tail Trees** – At the bottom of most of the lobes are 40-50” trees that will make excellent tail trees.
- **Profile 14-2** – This setting will log most of the largest lobe and a good portion of the volume in this subdivision. A profile analyzed with SkylineXL indicated that these corridors are multi-span settings. Some of these settings are very long with 1670 ft of skyline required to reach the lower portions of this lobe. A GIS profile also indicated that Profile 14-3 is a multi-span setting.
- **Mechanical Harvesting** – could be utilized in the tractor portion, as well as skyline portions with lower slope angles (<35%). The largest lobe has fairly gentle slopes and large areas where a mechanical harvester may be feasibly operate. Access routes to this area would be the only tricky part. Various areas on the ridgetop portion of the unit also have fairly gentle slopes.

**Restrictions and Limitations:**

- **Marbled Murrelet:** No murrelet restrictions!
- Ground-based operations shall be conducted in dry weather conditions.
- **Sudden Oak Death** – This subdivision is located within the Sudden Oak Death Quarantine Zone. Only wood and bark (logs) of Douglas-fir can be removed from the quarantine zone. Ensure no vegetative material (needles or small branches still attached to logs) are moved outside the quarantine zone.

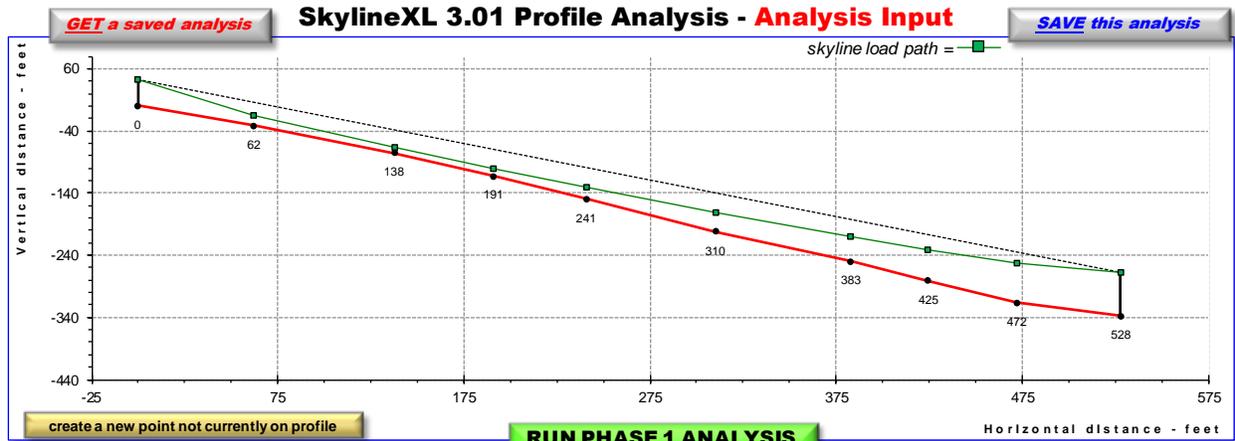
**Access and Haul Routes:**

Haul route is east on the 1983 and then north on the 1107 to the 1376. Continue west on County Rd. 784 and to Hwy. 101 and then travel north 3 miles to appraisal point on Carpenterville Rd.



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

### 14-1 - Ground Profile - Medium Yarder Analysis



Profile name: 14-1\_GROUND Profile date: 5/8/13

Analysis type	Selected yarder	Selected carriage
Standing	Avg medium yarder - 3 drum	Acme 10, motorized

phase 2

Supports	Horizontal distance-ft	Rigging height-ft
head spar	0	43
tail spar	528	70
Int.support.1		
Int.support.2		
Int.support.3		

print refresh view

Yarding parameters	Inner distance	Outer distance
yarding limits-feet	62	472
landing cut (-) or fill (+) feet		

clear load path

Log geometry	Values
tag length - ft	10.0
log length - ft	40.0
log diameter - in	12.0

To change the yarder and/or the carriage, navigate to the "Yarders & Carriages" screen and make selection(s)

Susp type	Log Susp and Clearance Table	Clearance feet
partial		2.0

Analysis name: 14-1\_GROUND\_MedYard

Yarding parameters errors (NONE)...

Current analysis phase = 1

Profile name: 14-1\_GROUND Analysis name: 14-1\_GROUND\_MedYard Profile date: 5/8/13

#### STANDING skyline analysis summary...

Skyline analysis type	Selected yarder	Selected carriage	Minimum payload - lbs	At horizontal distance - ft	Analysis phase
Standing	Avg medium yarder - 3 drum, 43-ft twr	Acme 10, motorized	6,723	383	1

#### STANDING skyline rigging lengths...

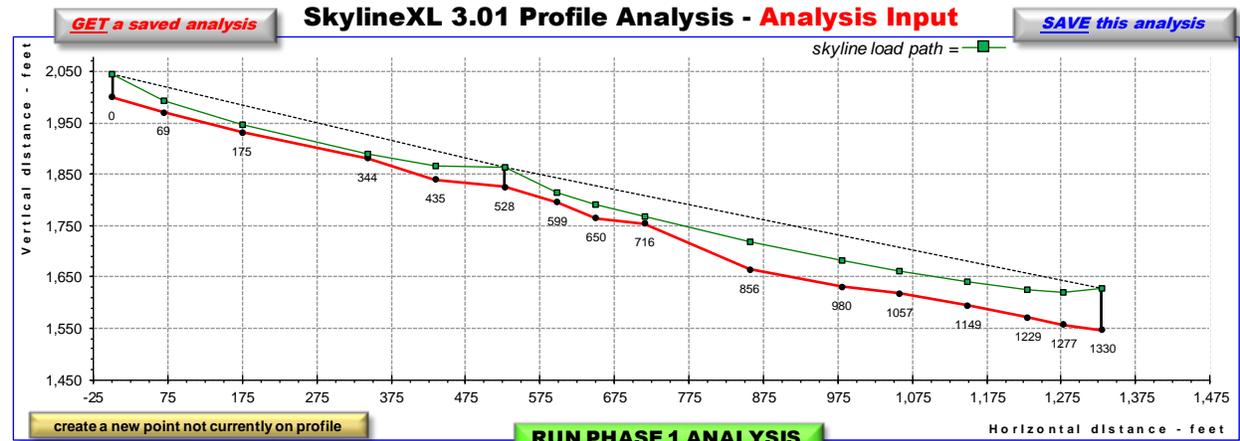
Line	Capacity-ft <sup>1/</sup>	Required-ft	Notes	Chord slope span 1	Chord slope span 2	Chord slope span 3	Chord slope span 4
skyline	1,488	860	adequate				
mainline	1,618	660	adequate	58.9%			
haulback	1,685						
Unstretched skyline line length - feet							611.78

<sup>1/</sup>line capacities based on selected yarder

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

TP	Horizontal dist - feet	Net payload lbs	Net payload to landing lbs	Skyline tension - lbs	Mainline tension - lbs	Haulback tension - lbs	Skyline clearance feet	Log clearance feet	Full susp bottom of log above TP-feet
2	62	18,278	18,278	29,186	16,133	-	17	9	-
3	138	12,698	12,698	31,600	12,077	-	9	2	-
4	191	9,460	9,460	31,600	8,743	-	12	5	-
5	241	7,717	7,717	31,600	6,717	-	19	11	-
6	310	6,765	6,765	31,600	5,184	-	32	22	-
7	383	6,723	6,723	31,600	4,541	-	39	30	-
8	425	6,951	6,723	31,600	3,819	-	50	39	-
9	472	9,354	6,723	31,600	4,322	-	63	Full	13

## 14-2 - Ground Profile - Medium Yarder Analysis



Profile name: Tooth\_U14-2 Profile date: 5/7/13

Analysis type	Selected yarder	Selected carriage
<b>Multi-span</b>	Avg medium yarder - 3 drum_added	Acme 10, motorized_added

**phase 2** **clear load path**

Supports	Horizontal distance-ft	Rigging height-ft
head spar	0	44
tail spar	1,330	80
Int support 1	528	40
Int support 2		
Int support 3		

Analysis name: 14-2 GOUND\_MedYard\_multispan

Yarding parameters errors (NONE)...

Yarding parameters	Inner distance	Outer distance
yarding limits-feet	69	1,277
landing cut (-) or fill (+) feet		

Susp type	Log Susp and Clearance Table	Clearance feet
partial	Table	2.0

Min payload - lbs: 5,358 At horiz dist - ft: 980

Current analysis phase = 1

Profile name: Tooth\_U14-2  
Analysis name: 14-2 GOUND\_MedYard\_multispan

Profile date: 5/7/13

### MULTI-SPAN skyline analysis summary...

Skyline analysis type	Selected yarder	Selected carriage	Minimum payload - lbs	At horizontal distance - ft	Analysis phase
<b>Multi-span</b>	Avg medium yarder - 3 drum_added, 44-ft twr	Acme 10, motorized_added	5,358	980	<b>1</b>

### MULTI-SPAN skyline rigging lengths...

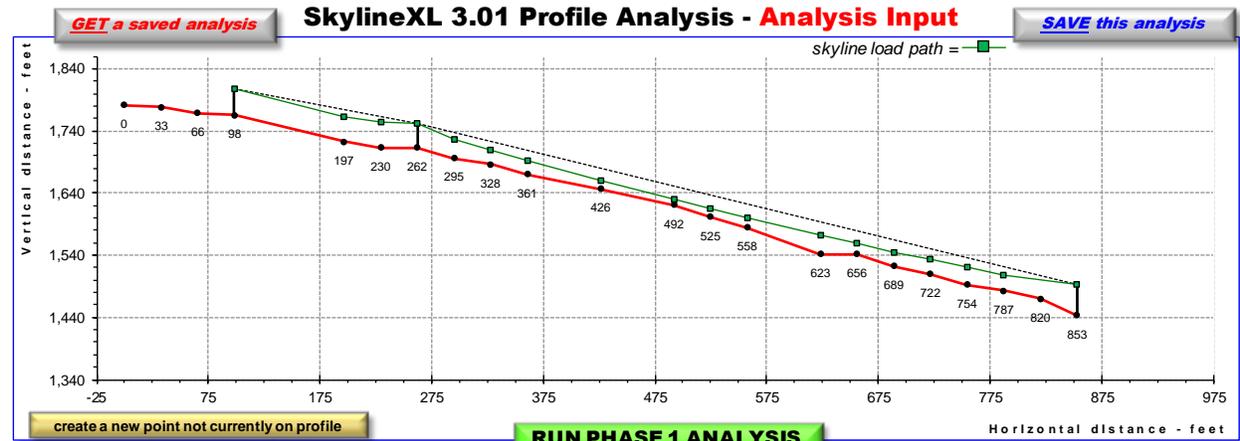
Line	Capacity-ft <sup>1/</sup>	Required-ft	Notes	Chord slope span 1	Chord slope span 2	Chord slope span 3	Chord slope span 4
skyline	1,632	1,670	not adequate!				
mainline	1,653	1,460	adequate	34.0%	29.7%		
haulback	2,181						
<b>Unstretched skyline line length - feet</b>							1,391.46

<sup>1/</sup> line capacities based on selected yarder

### MULTI-SPAN skyline analysis detail, PHASE 1 analysis...

TP	Horizontal dist - feet	Net payload lbs	Net payload to landing lbs	Skyline tension - lbs	Mainline tension - lbs	Haulback tension - lbs	Skyline clearance feet	Log clearance feet	Full susp bottom of log above TP-feet
2	69	22,053	22,053	28,103	16,132	-	21	13	-
3	175	17,651	17,651	31,600	12,557	-	15	7	-
4	344	15,096	15,096	31,600	11,197	-	9	2	-
5	435	17,569	15,096	31,600	8,714	-	27	18	-
<i>support loc</i>									
7	599	11,248	11,248	31,600	8,912	-	20	12	-
8	650	11,719	11,248	31,600	7,328	-	27	18	-
9	716	8,952	8,952	31,600	6,991	-	12	5	-
10	856	5,436	5,436	31,600	2,039	-	55	Full	5
11	980	5,358	5,358	31,600	1,818	-	52	Full	2
12	1,057	6,677	5,358	31,600	2,795	-	44	34	-
13	1,149	7,325	5,358	31,600	2,476	-	47	37	-
14	1,229	8,885	5,358	31,600	1,638	-	55	Full	5
15	1,277	12,353	5,358	31,600	1,196	-	63	Full	13

### 14-3 - GIS Profile - Medium Yarder Analysis



Profile name: 14-3\_GIS Profile date:

Analysis type	Selected yarder	Selected carriage
Multi-span	Avg medium yarder - 3 drum	Acme 10, motorized

phase 2 clear load path

Supports	Horizontal distance-ft	Rigging height-ft
head spar	98	43
tail spar	853	50
Int support 1	262	40
Int support 2		
Int support 3		

print refresh view

Yarding parameters	Inner distance	Outer distance
yarding limits-feet	197	787
landing cut (-) or fill (+) feet		

Analysis name: 14-3\_GIS\_MedYard\_MultiSpan

Yarding parameters errors (NONE)...

Susp type	Log Susp and Clearance Table	Clearance feet
partial	Table	2.0

Min payload - lbs: 3,657 At horiz dist - ft: 558

Current analysis phase = 1

If horizontal distance selection error, then cell shading is red

print

**MULTI-SPAN skyline analysis summary...**

Skyline analysis type	Selected yarder	Selected carriage	Minimum payload - lbs	At horizontal distance - ft	Analysis phase
Multi-span	Avg medium yarder - 3 drum, 43-ft twr	Acme 10, motorized	3,657	558	1

**MULTI-SPAN skyline rigging lengths...**

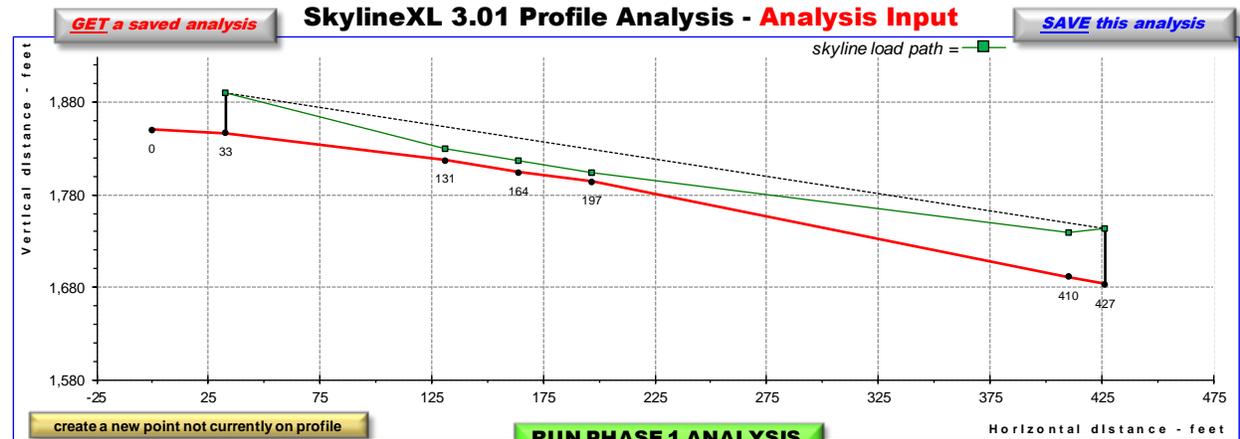
Line	Capacity-ft <sup>1/</sup>	Required-ft	Notes	Chord slope span 1	Chord slope span 2	Chord slope span 3	Chord slope span 4
skyline	1,488	1,020	adequate				
mainline	1,618	850	adequate	33.8%	43.9%		
haulback	1,685			Unstretched skyline line length - feet			814.84

<sup>1/</sup>line capacities based on selected yarder

**MULTI-SPAN skyline analysis detail, PHASE 1 analysis...**

TP	Horizontal dist - feet	Net payload lbs	Net payload to landing lbs	Skyline tension - lbs	Mainline tension - lbs	Haulback tension - lbs	Skyline clearance feet	Log clearance feet	Full susp bottom of log above TP-feet
5	197	9,845	9,845	31,600	4,635	-	41	31	-
6	230	13,624	9,845	31,600	5,413	-	42	32	-
	support loc								
8	295	10,404	9,845	31,600	7,654	-	31	22	-
9	328	5,018	5,018	31,600	4,543	-	22	14	-
10	361	5,376	5,018	31,600	4,394	-	22	13	-
11	426	5,159	5,018	31,600	4,445	-	12	5	-
12	492	4,164	4,164	31,600	3,888	-	9	2	-
13	525	4,197	4,164	31,600	3,664	-	13	6	-
14	558	3,657	3,657	31,600	3,196	-	16	8	-
15	623	5,053	3,657	31,600	3,196	-	30	20	-
16	656	4,083	3,657	31,600	3,401	-	17	9	-
17	689	4,912	3,657	31,600	3,658	-	23	14	-
18	722	4,826	3,657	31,600	3,554	-	23	15	-
19	754	6,403	3,657	31,600	4,215	-	27	18	-
20	787	7,287	3,657	31,600	4,730	-	26	17	-

### 14-4 - GIS Profile - Medium Yarder Analysis



Profile name: 14-4\_GIS Profile date:

Analysis type	Selected yarder	Selected carriage	Supports	Horizontal distance-ft	Rigging height-ft	print	Yarding parameters	Inner distance	Outer distance
<b>Standing</b>	Avg medium yarder - 3 drum	Acme 10, motorized	head spar	33	43	refresh view	yarding limits-feet	131	410
			tail spar	427	60		landing cut (-) or fill (+) feet		
			Int.support.1						
			Int.support.2						
			Int.support.3						

Analysis name: 14-4\_GIS\_MedYard

Susp type	Log Susp and Clearance Table	Clearance feet
partial	Table	2.0

Yarding parameters errors (NONE)...

If horizontal distance selection error, then cell shading is red

Current analysis phase = 1  
 Profile name: 14-4\_GIS  
 Analysis name: 14-4\_GIS\_MedYard  
 Profile date:

**STANDING skyline analysis summary...**

Skyline analysis type	Selected yarder	Selected carriage	Minimum payload - lbs	At horizontal distance - ft	Analysis phase
<b>Standing</b>	Avg medium yarder - 3 drum, 43-ft twr	Acme 10, motorized	12,784	197	<b>1</b>

**STANDING skyline rigging lengths...**

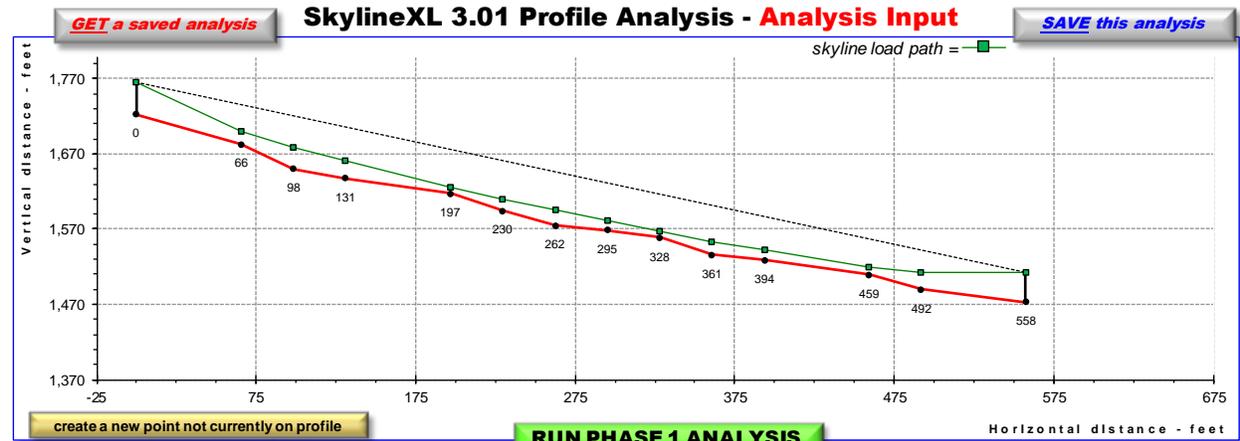
Line	Capacity-ft <sup>1/</sup>	Required-ft	Notes	Chord slope span 1	Chord slope span 2	Chord slope span 3	Chord slope span 4	
skyline	1,488	640	adequate	37.3%				
mainline	1,618	500	adequate					
haulback	1,685							
<b>Unstretched skyline line length - feet</b>							420.71	

<sup>1/</sup>line capacities based on selected yarder

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

TP	Horizontal dist - feet	Net payload lbs	Net payload to landing lbs	Skyline tension - lbs	Mainline tension - lbs	Haulback tension - lbs	Skyline clearance feet	Log clearance feet	Full susp bottom of log above TP-feet
3	131	16,167	16,167	31,600	12,515	-	13	6	-
4	164	15,912	15,912	31,600	11,852	-	12	4	-
5	197	12,784	12,784	31,600	10,320	-	9	2	-
6	410	17,786	12,784	31,600	2,431	-	49	38	-

### 14-5 - GIS Profile - Medium Yarder Analysis



Profile name: 14-5\_GIS      Profile date:

Analysis type	Selected yarder	Selected carriage	Supports	Horizontal distance-ft	Rigging height-ft	Yarding parameters	Inner distance	Outer distance
Standing	Avg medium yarder - 3 drum	Acme 10, motorized	head spar	0	43	yarding limits-feet	66	492
			tail spar	558	40	landing cut (-) or fill (+) feet		
			Int.support.1					
			Int.support.2					
			Int.support.3					

Log geometry	Values
tag length - ft	10.0
log length - ft	40.0
log diameter - in	12.0

Min payload - lbs	At horiz dist - ft
16,249	328

Susp type	Log Susp and Clearance Table	Clearance feet
SELECT	Table	2.0

Analysis name: 14-5\_GIS\_MedYard

Yarding parameters errors (NONE)...

If horizontal distance selection error, then cell shading is red

Current analysis phase = 1  
 Profile name: 14-5\_GIS  
 Analysis name: 14-5\_GIS\_MedYard

STANDING skyline analysis summary...

Skyline analysis type	Selected yarder	Selected carriage	Minimum payload - lbs	At horizontal distance - ft	Analysis phase
Standing	Avg medium yarder - 3 drum, 43-ft twr	Acme 10, motorized	16,249	328	1

STANDING skyline rigging lengths...

Line	Capacity-ft <sup>1/</sup>	Required-ft	Notes	Chord slope span 1	Chord slope span 2	Chord slope span 3	Chord slope span 4
skyline	1,488	790	adequate				
mainline	1,618	650	adequate	45.3%			
haulback	1,685						
Unstretched skyline line length - feet							616.02

<sup>1/</sup> line capacities based on selected yarder

STANDING skyline analysis detail, PHASE 1 analysis...

TP	Horizontal dist - feet	Net payload lbs	Net payload to landing lbs	Skyline tension - lbs	Mainline tension - lbs	Haulback tension - lbs	Skyline clearance feet	Log clearance feet	Full susp bottom of log above TP-feet
2	66	18,339	18,339	21,942	16,133	-	16	9	-
3	98	21,972	18,339	29,803	16,133	-	29	20	-
4	131	22,010	18,339	28,464	16,133	-	23	14	-
5	197	18,429	18,339	30,769	16,133	-	9	2	-
6	230	16,479	16,479	31,600	13,071	-	16	8	-
7	262	20,746	16,479	31,600	14,123	-	20	12	-
8	295	21,543	16,479	29,687	16,133	-	12	5	-
9	328	16,249	16,249	31,600	13,534	-	9	2	-
10	361	21,357	16,249	31,600	14,117	-	19	10	-
11	394	22,591	16,249	30,551	16,133	-	13	5	-
12	459	20,916	16,249	31,600	15,221	-	11	4	-
13	492	26,992	16,249	31,600	15,155	-	22	13	-



## Subdivision 15

Unit	Logging System	Acres	Equipment	Cruised Volume (CCF)	Cruised Volume (Tons)	Avg External Yarding Distance (ft)	Avg Yarding Distance (ft)	Temp Road Construction (ft)
15	Skyline	34	Med Yarder	974	2791	825	495	319

### Logging System Notes:

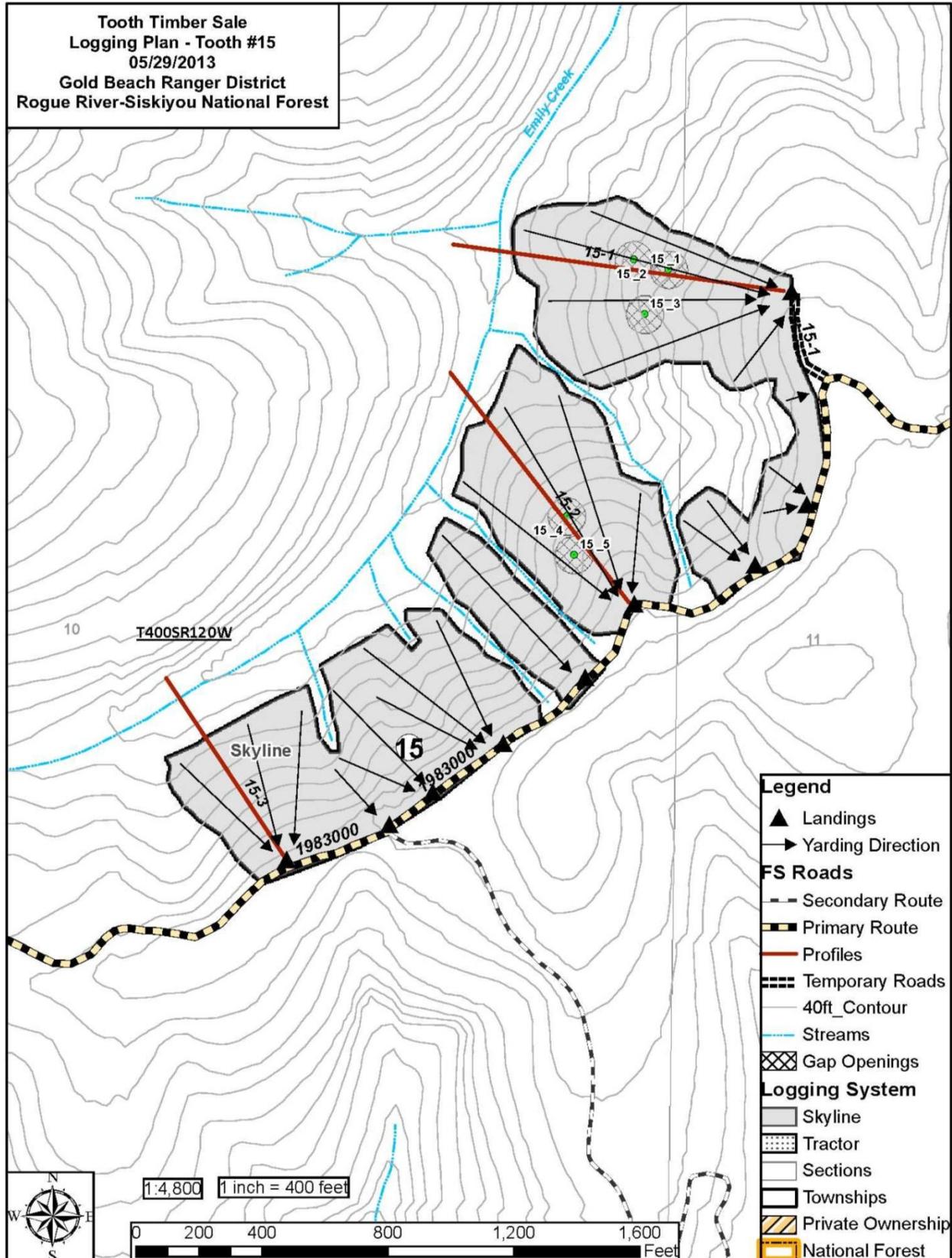
- Felling – minimize damage to residual trees, retain hardwoods where possible
- Yarding
  - One end suspension required for all yarding
  - Yard tops attached (YTA)
- **Deflection** should easily be achieved by rigging the skyline to large old-growth tail trees across Emily Creek.
- **Riparian Areas** – When rigging or yarding corridors across a stream consider the following:
  - Limit corridor widths to 12'
  - Full log suspension is required in these areas
  - Trees felled for facilitation of yarding outside the unit (in the stream buffer zone) are to be retained on site
- **Low volume areas** – exist on the spur ridges within this unit. Some areas right on the ridge have hardly any merchantable trees while closer the riparian areas have 15-18" trees.
- **Steep!**

### Restrictions and Limitations:

- **Marbled Murrelet:** The entire unit is restricted for Marbled Murrelet nesting season. 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.
- **Sudden Oak Death** – This subdivision is located within the Sudden Oak Death Quarantine Zone. Only wood and bark (logs) of Douglas-fir can be removed from the quarantine zone. Ensure no vegetative material (needles or small branches still attached to logs) are moved outside the quarantine zone.

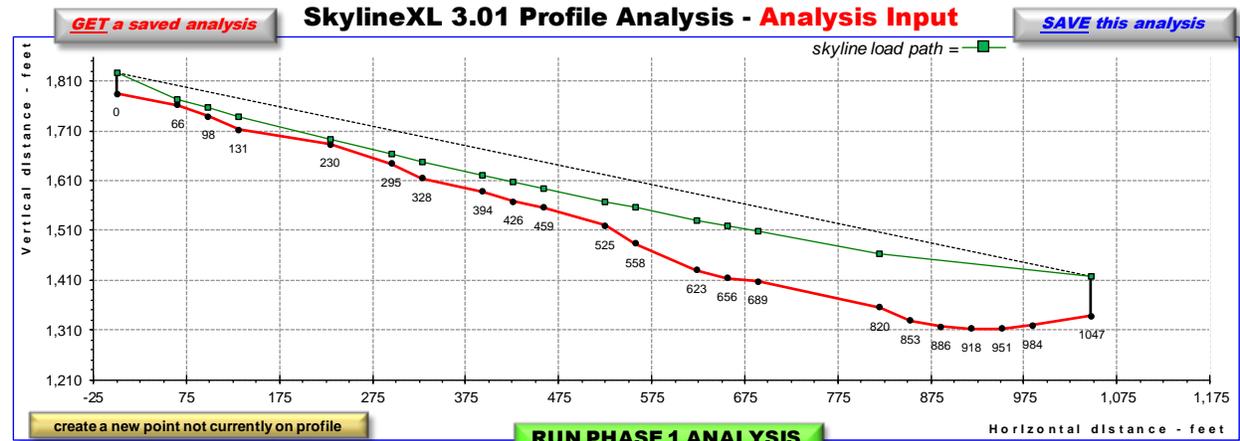
### Access and Haul Routes:

Haul route is east on the 1983 and then north on the 1107 to the 1376. Continue west on County Rd. 784 and to Hwy. 101 and then travel north 3 miles to appraisal point on Carpenterville Rd.



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

### 15-1 - GIS Profile - Medium Yarder Analysis



Profile name: 15-1\_GIS Profile date:

Analysis type	Selected yarder	Selected carriage	Supports	Horizontal distance-ft	Rigging height-ft	Yarding parameters	Inner distance	Outer distance
Standing	Avg medium yarder - 3 drum	Acme 10, motorized	head spar	0	43	yarding limits-feet	66	820
			tail spar	1,047	80	landing cut (-) or fill (+) feet		
			Int.support.1					
			Int.support.2					
			Int.support.3					

Log geometry	Values
tag length - ft	10.0
log length - ft	40.0
log diameter - in	12.0

Min payload - lbs	At horiz dist - ft
3,971	558

Analysis name: 15-1GIS\_MedYard

Yarding parameters errors (NONE)...

Susp type	Log Susp and Clearance Table	Clearance feet
partial	Table	2.0

Current analysis phase = 1

Analysis name: 15-1 GIS\_MedYard

STANDING skyline analysis summary...

Skyline analysis type	Selected yarder	Selected carriage	Minimum payload - lbs	At horizontal distance - ft	Analysis phase
Standing	Avg medium yarder - 3 drum, 43-ft twr	Acme 10, motorized	3,971	558	1

STANDING skyline rigging lengths...

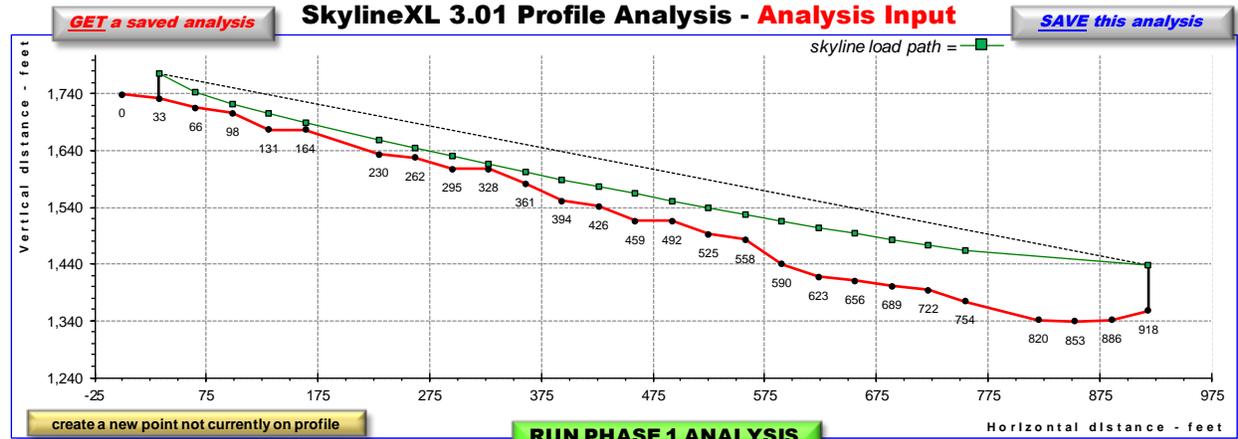
Line	Capacity-ft <sup>1/4</sup>	Required-ft	Notes	Chord slope span 1	Chord slope span 2	Chord slope span 3	Chord slope span 4
skyline	1,488	1,430	adequate	39.2%			
mainline	1,618	1,030	adequate				
haulback	1,685						
Unstretched skyline line length - feet							1,122.93

<sup>1/4</sup> line capacities based on selected yarder

STANDING skyline analysis detail, PHASE 1 analysis...

TP	Horizontal dist - feet	Net payload lbs	Net payload to landing lbs	Skyline tension - lbs	Mainline tension - lbs	Haulback tension - lbs	Skyline clearance feet	Log clearance feet	Full susp bottom of log above TP-feet
2	66	18,280	18,280	26,399	16,133	-	12	5	-
3	98	13,591	13,591	31,600	11,188	-	17	9	-
4	131	13,399	13,399	31,600	9,488	-	26	17	-
5	230	10,131	10,131	31,600	8,848	-	9	2	-
6	295	6,239	6,239	31,600	4,924	-	19	11	-
7	328	6,210	6,210	31,600	4,152	-	34	25	-
8	394	5,311	5,311	31,600	3,626	-	33	23	-
9	426	5,182	5,182	31,600	3,289	-	39	29	-
10	459	4,797	4,797	31,600	3,043	-	39	29	-
11	525	4,022	4,022	31,600	2,124	-	49	38	-
12	558	3,971	3,971	31,600	2,003	-	72	Full	22
13	623	4,036	3,971	31,600	1,985	-	100	Full	50
14	656	4,111	3,971	31,600	1,987	-	105	Full	55
15	689	4,218	3,971	31,600	1,997	-	100	Full	50
16	820	5,133	3,971	31,600	2,125	-	108	Full	58

## 15-2 - GIS Profile Medium Yarder Analysis



Profile name: 15-2\_GIS Profile date:

Analysis type	Selected yarder	Selected carriage	Supports	Horizontal distance-ft	Rigging height-ft	print	Yarding parameters	Inner distance	Outer distance
Standing	Avg medium yarder - 3 drum	Acme 10, motorized	head spar	33	43	refresh view	yarding limits-feet	66	754
			tail spar	918	80		landing cut (-) or fill (+) feet		
			Int.support.1						
			Int.support.2						
			Int.support.3						

Analysis name: 15-2\_GIS\_MedYard

Susp type	Log Susp and Clearance Table	Clearance feet
partial	Table	2.0

Yarding parameters errors (NONE)...

Current analysis phase = 1

Skyline analysis type	Selected yarder	Selected carriage	Minimum payload - lbs	At horizontal distance - ft	Analysis phase
Standing	Avg medium yarder - 3 drum, 43-ft twr	Acme 10, motorized	4,801	590	1

### STANDING skyline rigging lengths...

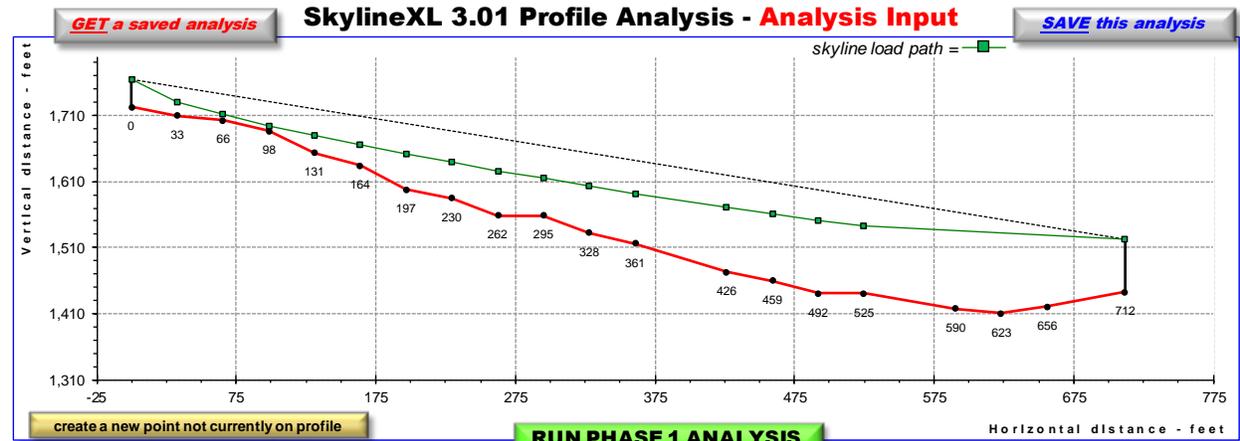
Line	Capacity-ft <sup>1/2</sup>	Required-ft	Notes	Chord slope span 1	Chord slope span 2	Chord slope span 3	Chord slope span 4
skyline	1,488	1,260	adequate				
mainline	1,618	930	adequate	38.1%			
haulback	1,685			Unstretched skyline line length - feet			947.00

<sup>1/2</sup> line capacities based on selected yarder

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

TP	Horizontal dist - feet	Net payload lbs	Net payload to landing lbs	Skyline tension - lbs	Mainline tension - lbs	Haulback tension - lbs	Skyline clearance feet	Log clearance feet	Full susp bottom of log above TP-feet
3	66	21,220	21,220	17,625	16,133	-	26	17	-
4	98	17,131	17,131	31,600	14,176	-	17	9	-
5	131	20,307	17,131	31,600	12,320	-	29	19	-
6	164	13,254	13,254	31,600	11,111	-	12	5	-
7	230	11,722	11,722	31,600	7,899	-	25	16	-
8	262	8,962	8,962	31,600	7,059	-	17	9	-
9	295	12,655	8,962	31,600	7,636	-	22	13	-
10	328	7,748	7,748	31,600	6,705	-	9	2	-
11	361	6,160	6,160	31,600	4,559	-	21	13	-
12	394	6,436	6,160	31,600	3,937	-	38	28	-
13	426	5,397	5,397	31,600	3,390	-	34	25	-
14	459	5,828	5,397	31,600	3,011	-	48	38	-
15	492	5,358	5,358	31,600	3,278	-	36	26	-
16	525	5,199	5,199	31,600	2,691	-	47	36	-
17	558	4,805	4,805	31,600	2,410	-	45	34	-
18	590	4,801	4,801	31,600	2,109	-	76	Full	26
19	623	4,947	4,801	31,600	2,114	-	88	Full	38
20	656	5,156	4,801	31,600	2,131	-	83	Full	33
21	689	5,442	4,801	31,600	2,160	-	82	Full	32
22	722	5,833	4,801	31,600	2,201	-	79	Full	29
23	754	6,375	4,801	31,600	2,255	-	89	Full	39

### 15-3 - GIS Profile - Medium Yarder Analysis



Profile name: 15-3\_GIS      Profile date:

Analysis type	Selected yarder	Selected carriage
<b>Standing</b>	Avg medium yarder - 3 drum	Acme 10, motorized

**phase 2**      **clear load path**      **print**      **refresh view**

Supports	Horizontal distance-ft	Rigging height-ft
head spar	0	43
tail spar	712	80
Int.support.1		
Int.support.2		
Int.support.3		

Yarding parameters	Inner distance	Outer distance
yarding limits-feet	33	525
landing cut (-) or fill (+) feet		

Log geometry	Values
tag length - ft	10.0
log length - ft	40.0
log diameter - in	12.0

Susp type	Log Susp and Clearance Table	Clearance feet
partial		2.0

Analysis name: 15-3\_GIS\_MedYard

Yarding parameters errors (NONE)...

Current analysis phase = 1

**STANDING skyline analysis summary...**

Skyline analysis type	Selected yarder	Selected carriage	Minimum payload - lbs	At horizontal distance - ft	Analysis phase
<b>Standing</b>	Avg medium yarder - 3 drum, 43-ft twr	Acme 10, motorized	6,904	361	<b>1</b>

**STANDING skyline rigging lengths...**

Line	Capacity-ft <sup>1/2</sup>	Required-ft	Notes	Chord slope span 1	Chord slope span 2	Chord slope span 3	Chord slope span 4
skyline	1,488	1,060	adequate				
mainline	1,618	710	adequate	34.1%			
haulback	1,685						
Unstretched skyline line length - feet							754.04

<sup>1/2</sup> line capacities based on selected yarder

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

TP	Horizontal dist - feet	Net payload lbs	Net payload to landing lbs	Skyline tension - lbs	Mainline tension - lbs	Haulback tension - lbs	Skyline clearance feet	Log clearance feet	Full susp bottom of log above TP-feet
2	33	21,267	21,267	9,715	16,133	-	21	12	-
3	66	18,405	18,405	15,439	16,133	-	9	2	-
4	98	17,063	17,063	31,600	14,631	-	9	2	-
5	131	13,825	13,825	31,600	9,580	-	26	18	-
6	164	9,928	9,928	31,600	6,097	-	32	22	-
7	197	8,140	8,140	31,600	3,583	-	54	Full	4
8	230	7,660	7,660	31,600	3,284	-	54	Full	4
9	262	7,324	7,324	31,600	3,060	-	68	Full	18
10	295	7,100	7,100	31,600	2,889	-	56	Full	6
11	328	6,960	6,960	31,600	2,755	-	71	Full	21
12	361	6,904	6,904	31,600	2,651	-	76	Full	26
13	426	7,020	6,904	31,600	2,508	-	98	Full	48
14	459	7,208	6,904	31,600	2,462	-	101	Full	51
15	492	7,500	6,904	31,600	2,427	-	111	Full	61
16	525	7,941	6,904	31,600	2,402	-	103	Full	53

## Subdivision 16

Unit	Logging System	Acres	Equipment	Cruised Volume (CCF)	Cruised Volume (Tons)	Avg External Yarding Distance (ft)	Avg Yarding Distance (ft)	Temp Road Construction (ft)
16	Skyline	18	Yoder	516	1462	503	302	0

### Logging System Notes:

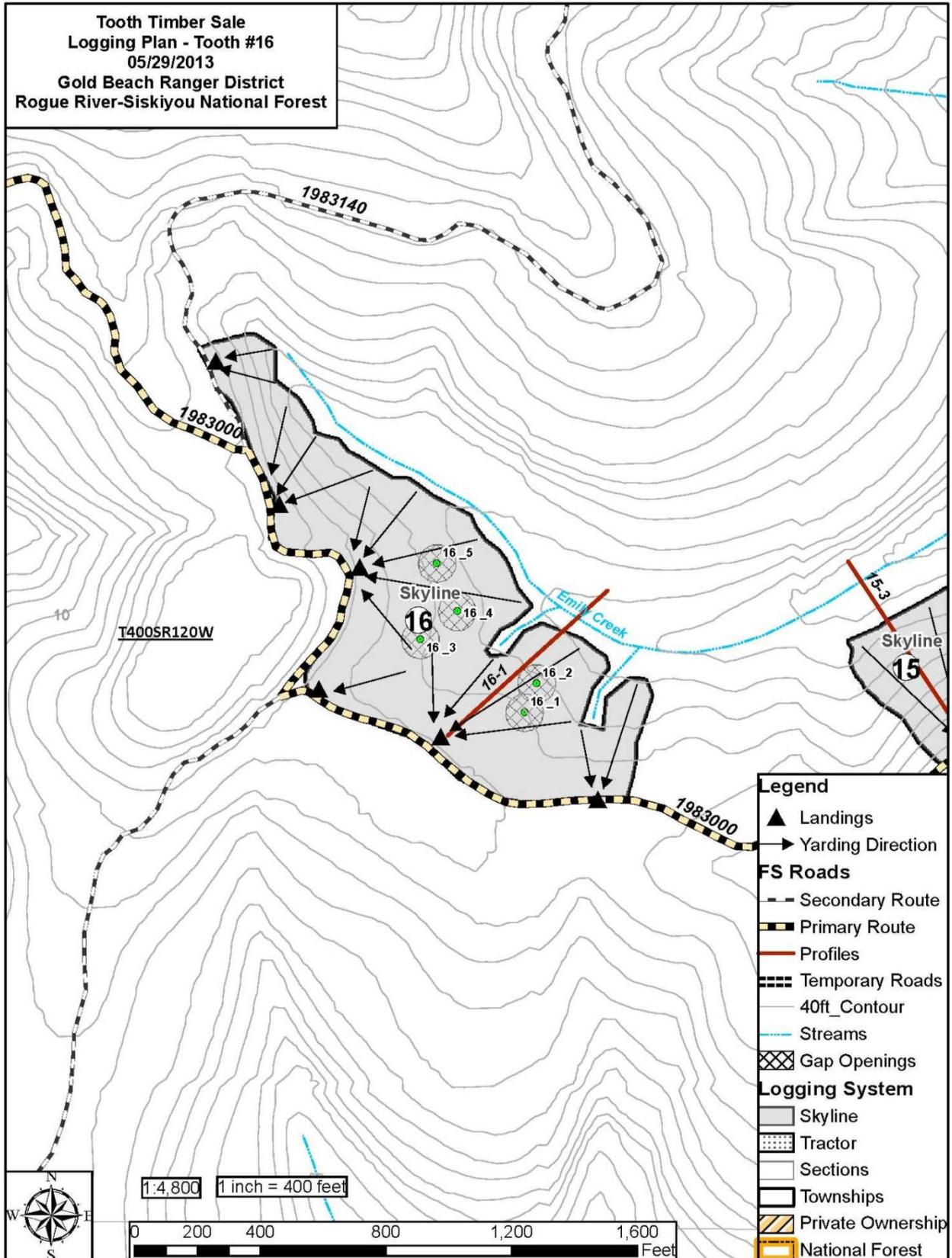
- Felling – minimize damage to residual trees, retain hardwoods where possible
- Yarding
  - One end suspension required for all yarding
  - Yard tops attached (YTA)
- **Deflection** should easily be achieved by rigging the skyline across Emily Creek.
- **Riparian Areas** – When rigging or yarding corridors across a stream consider the following:
  - Limit corridor widths to 12’
  - Full log suspension is required in these areas
  - Trees felled for facilitation of yarding outside the unit (in the stream buffer zone) are to be retained on site
- Haulback – Profile 16-1 indicates that there is haulback required. This is a GIS profile and the data is likely not correct. Haulback is likely not required. This is good landing location and the ground is steeper than indicated from the digital elevation model.
- **Low volume areas** – exist on the spur ridges within this unit. Some areas right on the ridge have hardly any merchantable trees while closer the riparian areas have 15-18” trees.

### Restrictions and Limitations:

- **Marbled Murrelet:** No murrelet restrictions.
- **Sudden Oak Death** – This subdivision is located within the Sudden Oak Death Quarantine Zone. Only wood and bark (logs) of Douglas-fir can be removed from the quarantine zone. Ensure no vegetative material (needles or small branches still attached to logs) are moved outside the quarantine zone.

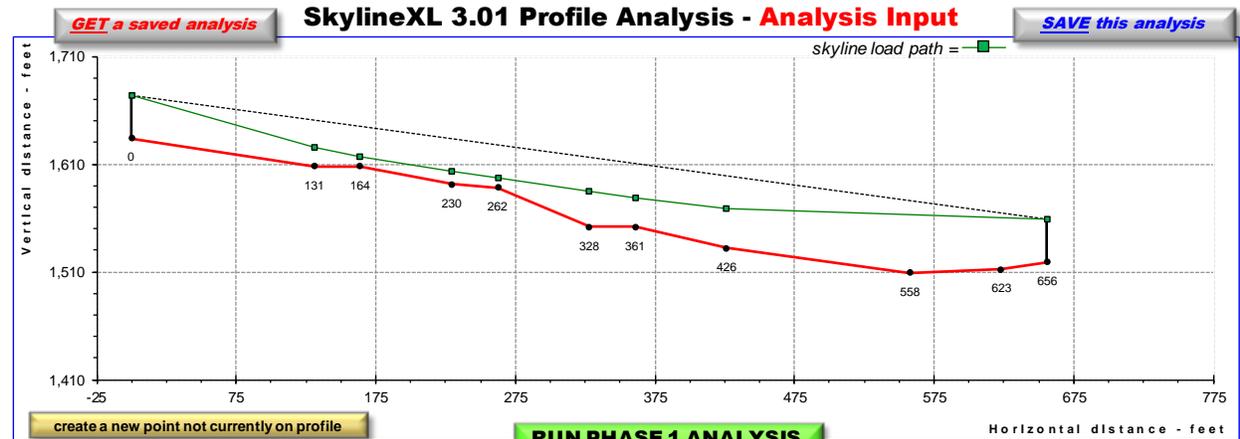
### Access and Haul Routes:

Haul route is east on the 1983 and then north on the 1107 to the 1376. Continue west on County Rd. 784 and to Hwy. 101 and then travel north 3 miles to appraisal point on Carpenterville Rd.



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

### 16-1 - GIS Profile - Yoder Analysis



Profile name: 16-1\_GIS Profile date:

Analysis type	Selected yarder	Selected carriage	Supports	Horizontal distance-ft	Rigging height-ft	print	Yarding parameters	Inner distance	Outer distance
Standing	Yoader, shotgun - 2 drum	Acme 10, motorized	head spar	0	40	refresh view	yarding limits-feet	131	426
			tail spar	656	40		landing cut (-) or fill (+) feet		
			Int.support.1						
			Int.support.2						
			Int.support.3						

Analysis name: 16-1\_GIS\_Yoder

Susp type	Log Susp and Clearance Table	Clearance feet
partial	Table	2.0

Yarding parameters errors (NONE)...

Current analysis phase = 1  
 Profile name: 16-1\_GIS  
 Analysis name: 16-1\_GIS\_Yoder  
 Profile date:

STANDING skyline analysis summary...

Skyline analysis type	Selected yarder	Selected carriage	Minimum payload - lbs	At horizontal distance - ft	Analysis phase
Standing	Yoader, shotgun - 2 drum, 40-ft tw r	Acme 10, motorized	4,027	361	1

STANDING skyline rigging lengths... HB required

Line	Capacity-ft <sup>1/</sup>	Required-ft	Notes	Chord slope span 1	Chord slope span 2	Chord slope span 3	Chord slope span 4
skyline	1,000	850	adequate				
mainline	1,500	530	adequate	17.5%			
haulback		1,030	not adequate!	Unstretched skyline line length - feet			665.42

<sup>1/</sup>line capacities based on selected yarder

STANDING skyline analysis detail, PHASE 1 analysis...

TP	Horizontal dist - feet	Net payload lbs	Net payload to landing lbs	Skyline tension - lbs	Mainline tension - lbs	Haulback tension - lbs	Skyline clearance feet	Log clearance feet	Full susp bottom of log above TP-feet
2	131	9,303	9,303	23,100	5,011	-	17	8	-
3	164	7,482	7,482	23,100	5,065	-	10	2	-
4	230	6,911	6,911	23,100	4,126	-	12	4	-
5	262	4,485	4,485	23,100	3,222	-	9	2	-
6	328	4,682	4,485	23,100	2,081	-	33	23	-
7	361	4,027	4,027	23,100	2,056	-	27	18	-
8	426	4,055	4,027	23,100	1,665	-	37	27	-