Gross Area: 26.0 ha

HU 1: Cable Harvest - 22.0 ha NET

WTRA - 2.0 ha NET

PAS - 2.0 ha

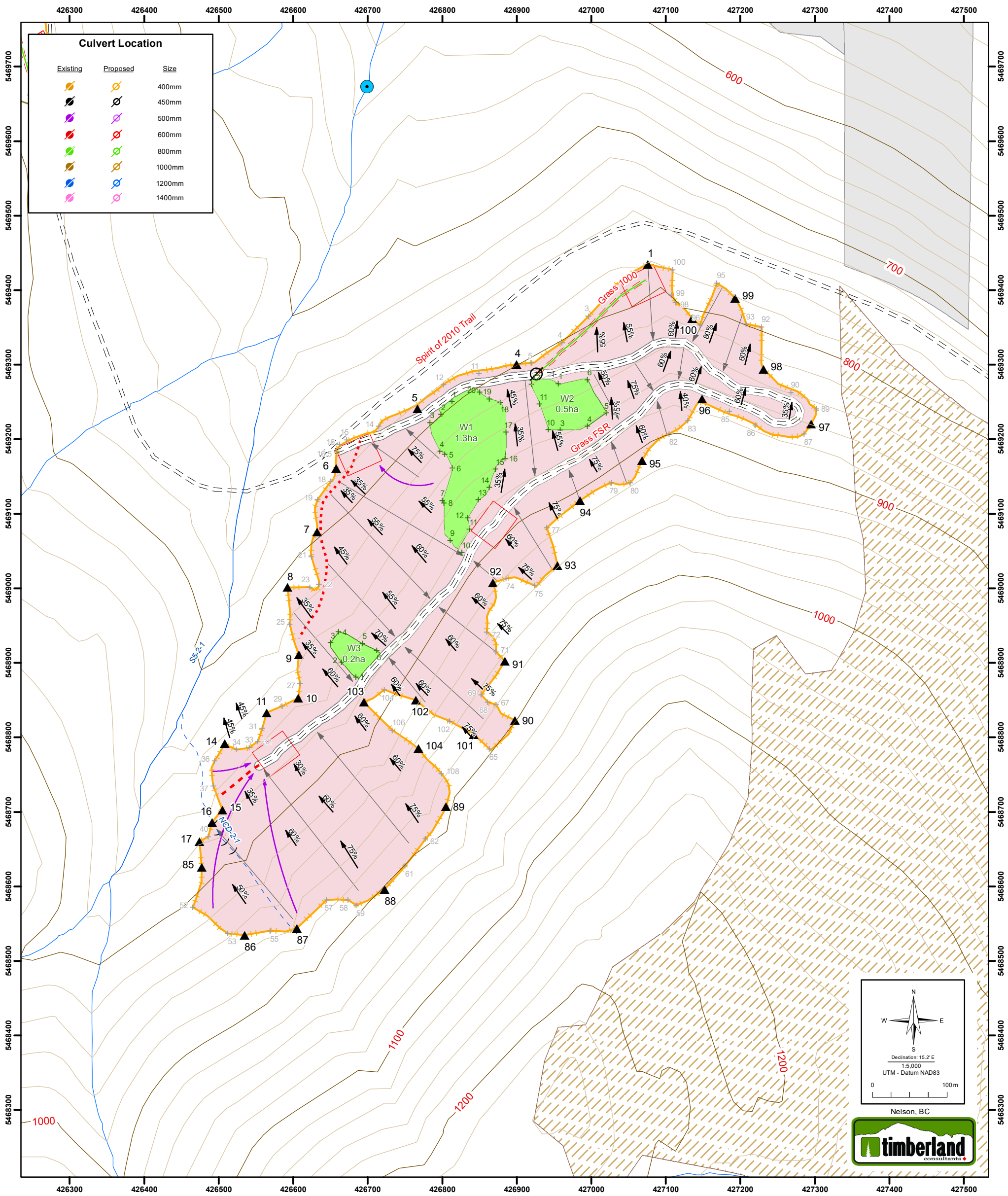
Harvest Plan Map

A95559-2

Pup Rail

1:5,000

BCTS
BC Timber Sales
Kootenay



Date: 3/15/2021 Drawn By: AT	Elevation (min / max): 915-1050m	Lat/Long: 49° 22' 17" / 118° 03' 29" Boulder
Mapsheet: 82E 040	Ridge Cliff Slope Break Rock #	Reach Break Wet Area Fish Barrier
Existing Cutblock	Existing Road Proposed Road	Existing Landing Perm. Landing
Wildlife Tree Retention Area	Existing Trail Proposed Skid Trail	Steep Slopes >35% Temp. Landing
OGMA Non-Merch	Prop. Backspar Trail Prop. Yarder Trail	SP Plot Cable Stick Nest
Cutblock Boundary	MFZ RMZ Skid Direction	Creek Intermittent Creek
Bench Draw	Yarding Direction Intermediate Structure	Slope and Direction 25% Prop. Skid Crossing
Station +12 Falling Corner FC2	Perm./Temp Access Licensee Construct /	Path: G:\PROJ\T16011_BCTS\A95559_PupRail\Maps\HP\A95559_i4_Map_HP_BK2.mxd

1.5 RIPARIAN ASSESSMENT

Block	Riparian I.D. and Class	RMA	SU	Width (m)	SPH Retained	Comments (Indicate if in a Community Watershed)
2	S5-2-1	RMZ	N/A	30	-	S5-2-1 and all of its RMZ are located out of block. This development is not located in a Community Watershed.
2	NCD-2-1	N/A	1	N/A	-	NCD-2-1 is located within the harvest area of the block; however, the whole block is cable harvest; therefore, no MFZ.

Safety Highlights:

In addition to the standard safety hazards and risks associated with all aspects of forest management, the following safety hazard(s) apply to this block and must be enforced and practiced:

1. Public Traffic on mainlines from hunters, campers, other recreationalists and local residents.
2. Exposed cobbles and boulders.
3. Downhill Cable harvest areas.

Remedial Action

1. Personnel will be informed of this hazard and signage will be posted near the proposed development when harvesting and road-building activities are being conducted.
2. Personnel will be informed of this hazard.
3. Personnel will be informed of this hazard. These areas are displayed on the HP map.

Leave Tree Specifications:

Table 1. - Layer 1 Reserved Timber[1]

Block	HU	Selection Priority	Species	Size	Stems per Hectare			Distribution[2]			
					Target	Minimum	Maximum	S	G	I	R
2	1	-	-	-	-	-	-				

Additional Requirements/Notes: **Note: Some areas of HU1 may have little or no potential reserve trees. The target value should be an average over the HU area.**

[1] Refer to *Appendix I* for *Table of Reserve Timber Abbreviations and Definitions* [2] *Distribution Types: S: Single Trees, G: Groups of Trees, I: Irregularly Distributed, R: Regularly Distributed*

Note: Safety is a priority when conducting operations near reserved timber. Refer to TSL Schedule "A", Section 2.00 regarding Dangerous Trees.

Table2. – Other Reserved Timber[1]

Non-Merchantable

Block	HU	Location(s)	Species	Size	Stems per Hectare	
					Target	Minimum
2	1	-	-	-	-	-

Dead Trees to be Stubbed (where Mechanical Falling is utilized)

Block	HU	Species	Size	Stubbing Height	Stems per Hectare			Distribution[2]			
					Target	Minimum	Maximum	S	G	I	R
2	1	All *	>/=35cmdbh	3-5m	7	5	10	√	√	√	

Additional Requirements: 1. Stub trees must not pose a hazard to worker safety. 2. In selecting dead trees for stubbing, give selection priority to trees with signs of wildlife use (e.g. cavity nests, holes, and dens). *Avoid Douglas-fir and Spruce, where practicable.

Coarse Woody Debris

Block	HU	Species	Size	M^3 per Hectare		Distribution[2]			
				Target	Minimum	S	G	I	R
2	1	All **	Retain CWD and wildlife trees that are representative (spp, age and size) of pre-harvest levels/conditions.	15	10	√	√	√	

[1] Refer to *Appendix I* for *Table of Reserve Timber Abbreviations and Definitions* [2] *Distribution Types: S: Single Stems/Logs, G: Groups of Stems/Logs, I: Irregularly Distributed, R: Regularly Distributed*

Note: Manage CWD levels to pre-harvest levels, except in areas where concentrations are too high for effective planting and/or successful regeneration. Safety is a priority when conducting operations near reserved timber. Refer to TSL Schedule "A", Section 2.00 regarding Dangerous Trees. As a reference 1 large telephone pole roughly equals 1m3. **Select dead and dry material over green material; Retain material from species other than Douglas-fir and spruce; and Leave Douglas-fir and spruce stump heights as low to the ground as possible.

Harvest / Operational Constraints:

-Ground skidding across natural drainage paths should be avoided where practical. If this cannot be avoided, harvesting should be conducted during the drier months of the year, on a compressed snowpack, or effort made to ensure timber is skidded butt-first to minimize potential ground disturbance within such drainage features

-Bladed or Excavated trails may be required, for safety, in areas with steep slopes and in areas that may require adverse skidding.

-**Fall and yard away from the Spirit of 2010 Trail. Ensure the trail is kept free of harvest debris at all times.**

TSA Recommendations

Road Construction Recommendations

Recommendations related to road construction, maintenance, and deactivation are included in the Road Construction Summary Tables presented in Appendix B.

General Harvesting Recommendations

1. Operations should be modified or suspended when there is abundant hill slope runoff occurring at the site, which is likely to occur during times such as spring breakup or from prolonged heavy precipitation. This is intended to reduce the likelihood of concentrated or redirected drainage as well as erosion and sediment delivery.
2. Machine use should be limited to areas where excessive scour, rutting, or compaction is avoidable. This would generally restrict machine use from areas of moderately steep or steeper slopes as well as areas of wet, soft, or very loose soils. Some modified machine use (e.g. hoe-chucking) may be possible in these areas if excessive disturbance is avoidable.
3. All natural drainage patterns (including all NCDs and S6 streams as well as dry swales and gullies) should be maintained and left free of excess debris (slash or soil) that could result in a redirection of seasonal surface runoff.
4. Excavated or bladed trail construction should be minimized as practical, and avoided in areas of seepage or where shallow subsurface runoff is likely to be intercepted.
5. Trail drainage systems should be in place to prevent the concentration or redirection of runoff during use or prior to full rehabilitation. Trail drainage systems can be enhanced by frequent dips and skid culverts to prevent water concentration and drainage diversions.
6. All trails should be fully rehabilitated upon completion of use and concurrent with operations, ideally prior to the next spring freshet. If any trails are to overwinter then additional precautions should be taken including pulling back all watercourse crossings and any potentially unstable fill slopes, and installing frequent cross-ditches in order to limit the potential for redirected runoff.
7. If stumping is prescribed, the additional machine use should follow the recommendations above with the intent of limiting the potential for disturbance that could result in shallow subsurface or surface runoff interception, concentration, diversion, or acceleration. Stumping should be avoided in machine free zones.

Site Specific Harvesting Recommendations

BLOCK A95559-2 (refer to Figure 3):

1. It is recommended that the harvest area be amended by removing ~0.3 ha from the THB between FCs 11 to 14 following along the slope break (refer to Section 3.4).
2. The concrete "doghouse" arch crossing of Grass Creek under the Rail Trail should be assessed by a professional engineer to determine appropriate mitigation measures to reduce the likelihood of failure. This crossing appears at risk of failure, which could result in a temporary damming of Grass Creek and subsequent dam failure and related flood or debris flood with damaging impacts to private property on the Grass Creek fan. A suitable mitigation measure for reducing likelihood of blockage would be to install a trash rack just upstream of the arch crossing inlet, but additional assessment by a professional engineer is warranted due to the size and type of crossing with various potential failure mechanisms relating to the concrete arch, inlet, and wing walls. This recommendation is consistent with Mr. Deverney's (P.Eng.) Nov. 2018 assessment and field review summary.

Spur 2-1: Conventional sidecast fill construction is considered appropriate for Spur 2-1, with additional cutting and filling as required to meet alignment constraints. Overall there are poor opportunities for wood-supported fills. Keyed rock support may be used where practical to avoid blasting in rocky sections; however, some blasting may be required particularly near Hubs 10-11. SCL recommends these additional culverts to improve drainage control and reduce the potential for concentrated and diverted runoff.

- Hub 6.1: Install 450 mm culvert approximately 7 m town side (west) of Hub 7 at shallow swale, no visible channel (NVC), dry.
- Hub 12: Install 450 mm culvert for ditch relief prior to proposed landing; no discernible drainage feature (NDDF).

All new culverts were flagged in the field by SCL (orange ribbon labelled "culvert"); however culverts recommended to be dropped were not removed from the field flagging. Refer to Figure 3.

Field Reviews

If site conditions encountered vary significantly from those described in this report (e.g. unexpected and significant seepage, unexpected material textures encountered in excavations, etc.), or if any stability or erosional concerns become apparent during operations, then a qualified registered professional should be consulted to determine if an immediate field review is warranted. Timely mitigation of problem sites can significantly reduce potential adverse effects. Sufficient development supervision should be carried out by an experienced and qualified harvesting supervisor to ensure generally accepted good development practices are implemented along with all recommendations presented in this report.

Maintenance and Deactivation Recommendations - General

Refer to the 'Other Resource Features' Result and Strategy in the Site Plan for information on Road Maintenance, Deactivation and Revegetation following Road Construction and Deactivation.

Kootenay Business Area Field Marking Standards

	Ribbon	Paint
Harvest Boundary	BCTS Block Boundary	
Falling Corners		FC#
WTRA Boundary	Reserve	
Reserve Boundary	Reserve	
Riparian Reserve Zone	Reserve	
Riparian Management Zone	Riparian Mgmt. Zone	
Management Zone	Management Zone	
Treatment Unit Boundary	Treatment Unit Boundary	
Reserve Trees		
Machine Free Zone	//// Machine Free Zone ////	
Cruising	Cruise Line	Plot Trees
Traverse Stations		
SP Plot Location		

	Ribbon	Paint
NCD & Stream Centers	Water Course	
Road P-Line		
Road Center Line	Road Centerline	
Landings	Landing	
Road Right of Way	R/W Boundary	
Road RP		
Culverts	Culvert	
Designated Crossing	Crossing	
Culvert RP Outside Right of Way		
Tail Holds / Guyline / Intermediate Supports		
Skid Trail / Back Spar Trail / Forwarding Trail	/ / / / / / Trail / / / / / /	
Recce Ribbon / D-Line / Skyline Roads	/ / / / / / / / / / / / / / /	

I certify that the work described herein fulfills standards expected of a member of the Association of British Columbia Forest Professionals, and that I did personally supervise the work.

RPF PRINTED NAME

Stefano De Vuono

DATE SIGNED

March 19, 2021

RPF'S SIGNATURE and SEAL