WOODLOT LICENCE PLAN #1

WOODLOT LICENCE # W1678

2007 to 2017

321360 BC Ltd.

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Disclaimer

Recognizing the special nature of management on a woodlot licence, this disclaimer forms part of the Woodlot Licence Plan (WLP) for Woodlot Licence Number W1678 and advises that:

- the decision to operate under one or more of the Default Performance Requirements provided in the Woodlot Licence Planning and Practices Regulation (WLPPR) is the sole responsibility of the woodlot licence holder, and involved no detailed oversight or advice from the prescribing registered professional forester,
- this disclaimer is signed on the explicit understanding and information provided by government that the use and achievement of a Default Performance Requirement meets the expectations of government with respect to the management of woodlot licences,
- the undersigned Registered Professional Forester certifies that this Woodlot Licence Plan and the supplemental information fulfills the standards expected of a member of the Association of British Columbia Forest Professionals and that I did personally supervise the work.

Signed _____ Seal:

Name (Print) Wolfram Wollenheit

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I. MANDATORY CONTENT FOR A WOODLOT LICENCE PLAN (WLP)

PLAN AREA

This plan covers the entire 477.1 ha included in the Woodlot Licence.

The Crown portion of Woodlot Licence W1678 comprises one contiguous area totalling 400 ha. This portion of the woodlot is located west of Campbell River and borders the southeastern area of Lower Quinsam Lake. The area is accessed via Branch ER 11S-1 (Old Tom Brown Rd) off the Elk River Mainline at the 12.5 km mark.

The private land contribution to this Woodlot Licence consists of 77.1 ha located on the north shore of Lower Campbell Lake adjacent to the Ladore Dam. The area is accessed via Big Bay Main in the Snowden Forest.

MAP AND INFORMATION

Table 1: Map and Information Content

Information Item	Map	Text	N/A
Forest cover	√		
Topography; (unless exempted by DM)	√		
Location of streams, wetlands and lakes as shown on forest cover maps, terrain resource inventory maps and fish and fish habitat inventory maps.	√		
Riparian classification of streams, wetlands and lakes if shown on maps	√		
Identification of fish streams	√		
Biogeoclimatic zones and subzones (unless exempted by DM)		√	
Public utilities (transmission lines, gas & oil pipelines, and railways)	√		
Existing roads	√		
Special Situations that may not Apply to the WL area			
Resource Management Zones, Landscape Units or Sensitive Areas	√	√	
Wildlife Habitat Areas (unless exempted by DM)			√
Scenic Areas	√	√	
Ungulate Winter Ranges			√
Community Watersheds	√	√	
Fisheries Sensitive Watersheds			√
Community and domestic water supply intakes that are licensed under the Water Act and any related water supply infrastructures	√	√	
Contiguous areas of sensitive soils			√
Temporary or permanent barricades to restrict vehicle access	√	√	
Private property within or adjacent to the woodlot licence area	√	√	
Resource features other than wildlife habitat features and archaeological sites (unless the location of the resource feature is not to be disclosed)			√

All of the applicable information required to be addressed under section 8(1) of the Woodlot Licence Planning and Practices Regulation (WLPPR), and checked above, is discussed in the follwing text of this section and/or is identified on the WLP maps in Appendix I & II.

The Crown portion of the Woodlot Licence area is not covered under the Vancouver Island Land Use Plan (VILUP), due to its isolated nature. However, this higher-level plan does include the private portion. The Crown portion / Quinsam Block, that also includes an adjacent woodlot licence, is considered isolated as it is encircled by private forestlands and is a considerable distance from other Crown blocks. As a result this area has been excluded from the planning process. In consultation, the Ministry of Forests and the licensee have adopted general timber and non-timber objectives with specific opportunities for enhanced timber harvesting (partial cutting, commercial thinning).

The Sayward Landscape Unit Plan does not cover the Crown portion of the Woodlot Licence area. However, the plan includes the private portion. The objectives that pertain to the private portion are those related to the management and protection of water quality within the John Hart Lake Community Watershed and District of Campbell River Risk Zones A, B and B1.

The private portion is located within Risk Zone A, B and B1 as designated by the District of Campbell River Watershed Management Plan. As a community watershed, all streams within the private portion of the woodlot licence are defaulted to stream classes S1 through S4 and are provided protection through the combination of riparian reserves and/or riparian management zones. No harvesting buffer is required next to the water licence located at Ladore Dam and shown on the WLP map, as it is not registered for human use.

The entire Woodlot Licence is within the Coastal Western Hemlock Very Dry Maritime Variant (CWH xm1) biogeoclimatic zone where the average rainfall can range from 1100 to 2721 mm/year. Much of the Woodlot Licence's original forest cover was either burnt in the 1938 Sayward fire or harvested via rail and cat around this period. Portions of the woodlot have been fertilized and spaced prior to the establishment of the woodlot licence. The disturbance history has resulted in continuous areas of even aged Douglas fir with a scattered hemlock / cedar component.

Recent harvest activities carried out by the licensee can be characterized as group selection and clear-cut silvicultural systems. The objectives of the group selection system are to manage for diverse conifer and hardwoods stands while maintaining visual quality and biodiversity and improving stand stability and forest health. The first pass of this silviculture system has focused on extensive patches of root disease common in the Quinsam block.

The general terrain of the Woodlot Licence is variable. It includes subdued areas adjacent to wetlands with steeper slopes adjacent to both Quinsam Lake and Lower Campbell Lake. The interior of the Crown portion is broken by numerous rock bluffs.

Recreational activity in the area includes fishing on Quinsam Lake, the harvesting of non-timber forest products and seasonal hunting throughout the Woodlot Licence area. Permanent barricades to restrict vehicle access to both the private and Crown portions have been established at the main entrance to the Woodlot Licence areas as indicated on the WLP maps. The purpose of the installations is to deter illegal activities, reduce the fire hazard, minimize firewood theft and prevent garbage dumping. The gate erected at the entrance to the private portion also protects further property rights as it accesses additional private land not included within the woodlot licence.

The Ministry of Forests' recreation inventory information pertaining to the WLP area is summarized in the following table and the polygons numbers are shown on the WLP map. No recreation polygons or attributes are included for the private portion of the woodlot.

Table 2: Recreational Resource Inventory for the Woodlot Licence W1678

Mapsheet / Polygon	Prominent Feature	Significance	Mgmt. Class	Impact Management
92F 014 / 13030	Second growth timber, numerous creeks and marshes. Old rail grades.	D (Low)	1	Area requires special management consideration to protect or maintain recreational values.
92F 014 / 13031	Recreation and wildlife values unknown. Coniferous forest with small rock outcrops. Field assessment required.	D (Low)	2	Normal forest management practices are adequate to maintain recreational values.
92F 014 / 13032	Eastern shoreline of lower Quinsam Lake. Gently sloping coniferous forest. Old rail grades. Field assessment required.	C (Moderate)	1	Area requires special management consideration to protect or maintain recreational values.
92F 014 / 13033	Small beaches. Gently sloping coniferous forest. Field assessment required.	C (Moderate)	1	Area requires special management consideration to protect or maintain recreational values.
92F 014 / 13034	Gently sloping coniferous forest. Field assessment required.	C (Moderate)	1	Area requires special management consideration to protect or maintain recreational values.
92F 014 / 13035	Large marshy area	C (Moderate)	1	Area requires special management consideration to protect or maintain recreational values.

A main BC Hydro Right of Way runs through the private portion of the Woodlot Licence area and eventually connects to the Myra Falls mine site in Strathcona Park.

Other features and resource values relevant to the management of the Woodlot Licence not mentioned specifically in the text above are indicated on the attached maps (See appendix I &II).

AREAS WHERE TIMBER HARVESTING WILL BE AVOIDED

There are no areas in this Woodlot Licence where timber harvesting will be strictly avoided.

AREAS WHERE TIMBER HARVESTING WILL BE MODIFIED

Areas in this Woodlot Licence where timber harvesting will be modified to protect and manage resource are shown on the map by shading, hatching or lines.

☒ Riparian reserve zones (RRZs) and wildlife tree patches (WTPs) are not planned for regular harvesting other than those specified by regulation, such as tree removal for the purpose of creating trails or for carrying out a sanitation treatment. These areas include zones allocated to streams and wetlands and those areas designated or projected as WTPs. RRZs, including WTPs are denoted in light red shading on the map.

- An extended reserve zone located north of the Quinsam River that drains Quinsam Lake in the southwest corner of the woodlot. The extended reserve consists of a 50 m buffer on the north side of the wetland area and headwaters to Quinsam River.
- The riparian reserve zone (RRZ) located around Quinsam Lake (L1) will be avoided. The RRZ for the lakeshore will consist of a 10 m buffer from the high-water mark.
- The riparian reserve zone (RRZ) located around all S3 classified creeks located throughout the Crown portion of the woodlot. The RRZs for these S3 creeks will consist of a 20 m buffer on both sides of the creeks.
- The riparian reserve zone (RRZ) located around both class W1 wetlands. One is located south of Quinsam Lake (wetland 10) and the other on the eastern boundary of the Crown portion (wetland 4). The RRZs will consist of a 10 m buffer around the perimeter of the wetlands.
- The riparian reserve zone (RRZ) located around the class W2 wetland. It is located in the eastern-most portion of the Crown portion (wetland 4). The RRZ will consist of a 10 m buffer around the perimeter of the wetland.

☒ Riparian Management Zones (RMZs = light green diagonal hatching)
The table below outlines how timber harvesting will be modified based on the stream and lake classification. Depending on the present stand structure, terrain, windthrow risk and block configuration the retention level will be uniform, grouped or spatially distinct. In general understory and unmerchantable cedar and other conifers of good form and vigour will be maintained wherever possible to meet the intent of management for all stream and wetland classifications.

Table 3: Modification of Harvesting in RMZs by Riparian Classification

RIPARIAN CLASS	INTENT OF MANAGEMENT	SPECIES TO RETAIN	RETENTION LEVEL POST HARVEST (stems/ha)
S3 (Fish bearing or Community Watershed) S3 =1.5 - 5.0m)	• Maintain the integrity of the RRZ • Assist in maintaining wildlife attributes within the RMA, such as wildlife tree cover, nesting and perching habitat and diversity of vertical forest structure.	**Fd, Cw, Hw, Pl, Dr and Ac**	**25 - 100%**
S4 (Fish bearing or Community Watershed) up to 1.5m)	• Maintain stream bank integrity • Provide shaded cover, LWD and litter		**25 - 100%**
S6 (non-fish =3m) Crown portion only	• Minimize debris transport to lower reaches of stream		**0 - 100%**
Lake and Wetlands	• Maintain the integrity of the RRZ • Assist in maintaining wildlife attributes within the RMA, such as wildlife tree cover, nesting and perching habitat and diversity of vertical forest structure.		**25 - 100%**

Fd = Douglas fir, Cw = western red cedar, Hw = western hemlock, Pl = lodgepole pine, Dr = red alder, Ac = cottonwood

☒ Partial Retention Recommended Visual Quality Class. Harvesting will be modified on the private portion to maintain the intended visual quality as viewed from Lower Campbell Lake.

The following process will be used to ensure harvest areas are managed consistent with the Partial Retention (PR) objective such that activities remain subordinate. Designed openings will follow the line and form of the landscape. The assessment procedures outlined in the Visual Impact Assessment (VIA) guidebook 2001 may be used to direct design and assist in evaluation.

☒ For the protection of drinking water, management of woodlot activities on the private portion will follow Best Management Practices as outlined in table 4 of the District of Campbell River Community Watershed Document: "Proposed Development Regulations and Guidelines for Watershed Protection". Existing roads may require minor clearing and upgrading to ensure the safety of industrial users and the adequacy of drainage structures. Efforts will be directed to limit turbidity resulting from woodlot activities. See Appendix II-4 for guidelines to limit erosion and sediment transport.

Before commencement of road construction or deactivation in a community watershed the licensee will provide at least 48 hours notice to the District of Campbell River as per S. 73 of the Woodlot Licence Planning and Practice Regulation.

When logging is carried out on the private portion of the woodlot the required pre-harvest mapping will be accompanied by an access management plan consistent with Objective 14 of the Sayward LUP. Road deactivation within Risk Zone A will be used to discourage over-night camping, recreational use and associated garbage and human waste.

PROTECTING AND CONSERVING CULTURAL HERITAGE RESOURCES

The woodlot lies within the traditional territories of three First Nations. A list of these First Nations and their contact information is provided within Part II - review and comments. In addition to the information sharing process that is implemented for the approval of this plan, First Nations and other interested parties are welcome during the term of this plan to review planned developments upon their own initiative. Documentation of all consultation with First Nations is to be included within the supplemental information (Part II) of the final submission of the plan.

An Archaeological Overview Assessment (AOA) has been completed for the area of the Woodlot Licence. The completed study assessed the lakeshore areas (50 m) as having moderate to high potential for archeological sites other than CMT sites, and low potential for CMTs. The inland portions are reported to contain a low potential for archeological sites of any type. It was recommended that an archeological impact assessment be conducted if there is ground disturbance, such as road building, within 50 m of the historic shoreline of inland lakes. For inland areas no archeological field reconnaissance or archeological impact assessment was recommended.

If the licensee or any personnel connected with the Woodlot Licence operation finds evidence of traditional use or cultural heritage values, the Ministry of Forests Aboriginal Liaison Officer will be notified and all work will cease within the immediate (30 m) area. The licensee will cooperate fully, as requested by the Ministry of Forests Aboriginal Liaison Officer.

The following results and strategies (Table 4) for managing cultural heritage values will apply. These are based on known cultural heritage issues of interest to First Nations in the Campbell River Forest District. No specific issues were identified or provided by First Nations during the WLP consultation process.

Table 4: Results and Strategies for Cultural Heritage Resources

Cultural Heritage Value	***Results & Strategies***
Cedar:	***Result:*** • Enable continued access to red cedar for traditional use by local First Nations.
	Strategies: • Based on availability of stock and ecological suitability (e.g. Cw listed as preferred species), a component of Cedar will continue to be planted in the woodlot to ensure a long-term supply. • Naturally occurring young cedar trees (including poles) will be retained where operationally feasible. • Access will be allowed to monumental cedar trees for traditional use by local First Nations. There are currently no known monumental cedar trees within the woodlot but the aforementioned recruitment strategies will enable opportunities for future generations.
Traditionally Used Plants:	***Result:*** • Enable continued access to traditionally used plants for traditional use by local First Nations.
	Strategies: • When local First Nations have indicated specific interest in traditional use plants, the licensee will identify the presence of such plants in planned harvest areas and communicate this to the interested First Nations prior to cutting permit submission. This is to allow for review by the local First Nations and for the collection of traditional use plants by local First Nations prior to harvest. Interested local First Nations will also be notified of traditionally used plants, particularly those indicated to the licensee as not abundant or scarce, if identified on the woodlot outside of planned harvest areas. • A no-pesticide use policy is implemented in this Woodlot Licence. Manual brushing and early planting of large stock is the preferred method to overcome brush problems.
Cultural Heritage Resources	***Result:*** • Harvest plans will consider identified cultural heritage resources.
	Strategies: • The Licensee will share information with local First Nations upon request and be available for field reviews.

WILDLIFE TREE RETENTION STRATEGY

Note: The proportion of the Woodlot Licence area that is occupied by wildlife tree retention areas is specified in the "PERFORMANCE REQUIREMENTS" section of this Woodlot Licence plan.

INDIVIDUAL WILDLIFE TREES

a) Species and Characteristics:

Desired species are (in order of preference): Fd, Cw, Hw, Dr, Mb with a minimum dbh of 50cm. The following table describes the species and characteristics of individual trees that will guide the selection of wildlife tree to be retained from harvesting.

Table 5: Wildlife Tree Value and Characteristics for All Species

CHARACTERISTICS	HIGH (at least two of the listed characteristics)	MEDIUM	LOW
	• Internal decay (heartrot or natural/excavated cavities present) • Crevices present (loose bark or cracks suitable for bats) • Large brooms present • Active or recent wildlife use • Current insect infestations • Tree structure suitable for wildlife use (e.g. large nest, hunting perch, bear den, etc.) • Largest tree on site (height and/or diameter) and/or veterans • Locally important wildlife tree species	• Large, stable trees that will likely develop two or more of the characteristics listed under HIGH	• Trees not covered by HIGH or MEDIUM categories

From: Wildlife Tree Committee recommendations available at - http://www.for.gov.bc.ca/hfp/wlt/wlt-policy-02.htm

Given the nature of the historic logging and the thrifty second-growth stands present in the Woodlot Licence area few trees in a given stand may have 'high' value attributes. As such, a minimum of one tree per hectare will be used as a minimum threshold for retention where the highest value attained is medium. Trees may be left as dispersed individuals or as a groups either internally or externally to harvest areas.

Additionally, cottonwood will be retained when worker safety permits.

b) Conditions under which Individual Wildlife Trees may be Removed:

Specific conditions that influence the decision of where individual wildlife trees may be removed include:

- worker safety;
- the significance of forest health risk to surrounding stands;
- the ability to retain other wildlife trees to perform as suitable wildlife habitat; and
- the availability of wildlife trees and CWD in adjacent areas.

All workers involved with the removal of potential wildlife trees will be informed of applicable standards prior to fieldwork to help mitigate unnecessary removals.

c) Replacement of Individual Wildlife Trees:

Individual trees will be replaced if they are of 'high' wildlife value. Replacement trees will be selected using criteria outlined above with a preference for selecting trees that have two or more high wildlife tree value characteristics. Additionally, the main goal for wildlife tree retention is to retain all-stems within streamside reserves (WTPs).

WILDLIFE TREE RETENTION AREAS

a) Forest Cover Attributes:

Wildlife tree patches (WTPs) are planned preferably in fully constrained areas for long-term retention (e.g. riparian reserve zones (RRZs)). The presently allocated WTPs in RRZs for W1678 are shown on the 1:5000 WLP maps and occupy 38.43 ha or approximately 8.1% of the Woodlot Licence area. Given the shape of the Woodlot Licence and the presence of the natural features, the distribution and characteristics of the wildlife tree patches correlate with the FPC biodiversity guidebook recommendations (Sept 1995) and the Ecological Guiding Principles proposed by the Wildlife Tree Committee. The WTPs include some representative larger trees (DBH > average operational cruise) with moderate to high value to wildlife and regenerating stands with future wildlife potential. A list of presently allocated WTPs and their attributes are outlined in the table below.

Table 6: Forest Cover Attributes of Existing Wildlife Tree Patches (WTPs) and Riparian Reserve Zones (RRZs)

Wildlife tree patch ID	Size (ha)	Forest Cover Attributes	Productive Ground	Comments:
WTP 4	1.90	85 F 3201-18 88 F(HC) 3506-40	70%	Upland reserve with exposed rock
WTP 5	1.03	58 F(CH) 3406-31 124 F 3405-29	85%	Productive Forest around small wetlands
Wetland 9	3.54	61 CHS(F) 5407-28	100%	Extended riparian buffer to include productive mixed stand adjacent to high wildlife use area
WTP 1	2.25	16 F(C) 4307-21	100%	Steep forested ground adjacent to the Ladore Dam site
WTP 2	0.86	14 HC(F) 2105-18	70%	Younger forests surrounding a small wetland feature adjacent to the BC Hydro R/W
WTP 3	2.28	9 F 3307-23	100%	Mature forest adjacent to the lakeshore will also acted as visual screen.
All riparian reserve areas (RRZs)	26.52	Various species composition – generally age class 3 on medium or better sites	100%	Extensive riparian corridors punctuated by small non-classified wetlands. Strong signs of elk and bear use in numerous locations.
	38.38			

The size, shape and location of the presently shown WTPs is subject to change upon further engineering work. Creek classification for the Crown portion of the woodlot has been completed. Final mapping and location of WTPs adjacent to cutblocks will be shown with the submission of pre-harvest mapping required by Section 33 of the Woodlot Licence Planning and Practices Regulation (WLPPR).

The minimum proportion of the Woodlot Licence area for long-term WTPs retention is 38.17 ha (8.0%) as per Section 52(1) of the WLPPR.

Through on-going observation, there will be potential for identifying and locating nesting trees, and other important habitat trees for retention and additional wildlife tree patches. No nesting sites or bear dens requiring specific habitat or tree retention have been identified to date.

b) Conditions Under which Trees may be Removed from Wildlife Tree Retention Areas:

Stand-specific issues that influence the decision of where salvage may be appropriate for WTPs include:

- worker safety;
- the significance of forest health risk to surrounding stands;
- the ability of the retained wildlife trees to perform as suitable wildlife habitat; and
- the availability of wildlife trees and CWD in adjacent harvest areas.

Salvage of windthrown timber is permitted within WTPs where it is not within the RRZ and where windthrow impacts 25% to 50% of the dominant or co-dominant stems. Salvage of windthrown timber and harvesting of remaining standing stems is permitted within WTPs where windthrow exceeds 50% of the dominant or co-dominant stems; or where forest health issues pose a significant threat to areas outside the WTP.

Individual trees may be felled but not removed if considered a safety hazard. Unsafe wildlife trees will be protected by no-work zones or re-design of cutblock configuration, if they exhibit exceptional high wildlife tree values combining the following characteristics: wildlife tree value category HIGH applicable, DBH > 50 cm, wildlife tree class 2 – 8, > 20 m high, conks or decay present, wildlife use present (nesting, cavities, recent feeding, denning), species Fd, Cw, Hw, Ba, Ss, Ac or Dr.

c) Replacement of Trees Removed from Wildlife Tree Retention Areas:

Given the nature of the adjacent stands and existing WTPs, the felling of danger trees within a distance from harvest edges defined in the specific cutting authority will not be a common occurrence or threaten the long-term integrity and usefulness of the WTPs. As such, no strategy for the specific replacement of individual trees within WTPs is presented.

Where salvage/harvesting is planned and authorized within a non-RRZ wildlife tree patch, a suitable replacement WTP of at least equivalent quality will be identified concurrently to achieve the retention target. Where all or part of a WTP is salvaged, the salvaged area should be replaced with other suitable habitat in the nearest possible location. If a WTP suffers windthrow, but is not salvaged, it need not be replaced. Replacement areas must have equal or better wildlife values. For non-riparian WTPs, attempts will be made to incorporate important features such as snags, marking, perch and nesting trees, dens, and other significant wildlife features.

MEASURES TO PREVENT INTRODUCTION OR SPREAD OF INVASIVE PLANTS

The introduction or spread of invasive plants, specifically Scotch Broom, into the Woodlot Licence area through the use of standard practices is possible. It should be noted that there are areas of the woodlot where serious Broom problems already exist and have been inherited by, or are beyond the influence of the licensee. This area is the BC Hydro Right of Way that transects the private portion of the woodlot.

In the event that Broom becomes established outside of the BC Hydro Right of Way it will be brushed repeatedly and the area re-vegetated. Vehicle access is restricted via gates on both the private and Crown portions. Where it is known or reasonably expected that machinery will be transported from a contaminated site, on or off the woodlot, cleaning of tires, tracks, bucket, undercarriage, etc. will be completed prior to transportation. All newly constructed roads will be grass seeded if Broom establishment becomes a concern. Seed mixtures used for the above purposes or for those under Section 29 of the WLPPR will be assessed to ensure that their use does not introduce additional invasive species. Additional species listed in the Invasive Plants Regulation (reg. 18/2004) if identified and located on the woodlot will be managed accordingly.

MEASURES TO MITIGATE EFFECT OF REMOVING NATURAL RANGE BARRIERS

There are no rangelands present on or adjacent to the Woodlot Licence and no measures or activities are proposed.

STOCKING INFORMATION FOR SPECIFIED AREAS

☒ The stocking standards for specified areas are found in Appendix 3 – Alternative Stocking Standards.

Specified areas include:

- areas subject to commercial thinning,
- the removal of individual trees, or
- areas subject to single/group tree selection or
- other types of intermediate cutting and /or
- areas subject to the harvest of special forest products.

For the purposes of this plan, commercial thinning, the removal of individual trees, single/group selection, intermediate cutting or the harvest of special forest products may take place anywhere within the woodlot except in designated areas where harvesting will be avoided. The delineation of specific areas will be conducted in conjunction with the pre-harvest mapping as per Section 33 of the WLPPR.

PERFORMANCE REQUIREMENTS

SOIL DISTURBANCE LIMITS

☒ Alternative - WLPPR s.24(1)(a):

a) up to a maximum of 30% in localised areas (standard unit basis) dominated by heavy salal or salmonberry where light soil raking using an excavator mounted brush rake will be prescribed to disturb and stir up the salal/salmonberry roots to create planting spots to facilitate seedling establishment and achieve early brush control. While this treatment may create dispersed wide to very wide scalps (thus the increased limit), the objective is a mixed substrate of soil and forest floor and not a complete removal of the forest floor.

b) up to a maximum of 15% in wet site units with fluctuating water tables or prolonged periods of standing water in the winter (CWHxm 12, 13, 14, 15). In these areas 400-600 mounds per ha may be created (where prescribed) using an excavator bucket to create suitable micro sites. This will result in dispersed deep gouges.

Rationale: These site preparation treatments would be conducted concurrent with or immediately following harvesting resulting in soil disturbance and they may meet the assessment criteria for scalps and gouges. The increased limits are maximums only and are included to increase flexibility on these sites. These site conditions will normally constitute a small proportion of an applicable harvest area. Prescription and application of these treatments will consider critical site factors including soil sensitivity and erosion potential.

PERMANENT ACCESS STRUCTURES

☒ Default: WLPPR s.25:

the maximum area occupied by permanent access structures is as follows:

- Cutblocks ≥ 5 ha – 7% of cutblock area
- Cutblocks < 5 ha – 10% of cutblock area
- Total Woodlot Licence Area – 7% of Woodlot Licence area

USE OF SEED

☒ Default - WLPPR s.32:

Adoption of Chief Forester's Standards for Seed Use.

STOCKING STANDARDS

☒ Alternative - WLPPR s. 35(1)(a):

The stocking standards, regeneration dates and free growing dates are indicated in Appendix 3. Clarification and rationale is provided in the supplementary information included with the plan. See Section II - 4.

WIDTH OF STREAM RIPARIAN AREAS

☒ Alternative - WLPPR s.36(4)(a):

The width of stream riparian areas will be as specified in Section 36(4) of the WLPPR except for three variations along the northern portions of Tom Brown Rd (ER 11S-1). The variation will limit the width of the Riparian Management Zones (RMZs) between Creek 14, Creek 3 and Tom Brown Rd to the distance between the stream bank / wetland edge and the road right of way (foot of fill slope) on the creek/wetland side. Clarification and rationale is provided in the supplementary information included with the plan. See Section II - 4.

WIDTH OF WETLAND RIPARIAN AREAS

☒ Alternative - WLPPR s.37(3)(b):

The width of wetland riparian areas will be as specified in Section 36(4) of the WLPPR except for three variations along the northern portions of Tom Brown Rd (ER 11S-1). The variation will limit the width of the Riparian Management Zones (RMZs) between Wetland 2 and Tom Brown Rd to the distance between the stream bank / wetland edge and the road right of way (foot of fill slope) on the creek/wetland side. Clarification and rationale is provided in the supplementary information included with the plan. See Section II - 4.

WIDTH OF LAKE RIPARIAN AREAS

☒ Default - WLPPR s.38(2)(b):

The minimum width of the riparian reserve zone, riparian management zone and riparian management area are as specified in WLPPR s.38(2)(b).

RESTRICTIONS IN A RIPARIAN RESERVE ZONE

☒ Alternative - WLPPR s.39:

Cutting, modifying or removing trees in a riparian reserve zone is limited to the purposes described in Section 39(1) of the WLPPR.
For the purposes of Section 39 (2.1) of the WLPPR, the following areas within riparian reserve zones are planned for road construction:

- A crossing of Creek 5 as an extension to rd Q101 using an old rail grade.
- A crossing near the confluence of Creek 12 and 15A as an extension to rd Q101 using an old rail grade. The crossing will be used to access wood in the far SE corner and may be used by the adjacent woodlot licensee (W1679 – Evansdale Farms Ltd.).
- A crossing of stream Trib F in case the present main access (Tom Brown Road) has been closed by the removal of the bridge north of the woodlot licence.

RESTRICTIONS IN A RIPARIAN MANAGEMENT ZONE

☒ Default - WLPPR s.40:

Construction of a road in a riparian management zone is limited to the conditions described is Section 40(1) of the WLPPR.
Restrictions and conditions on road construction, maintenance and deactivation activities, and on cutting, modifying or removing trees in a riparian management zone are as described in Section 40.

WILDLIFE TREE RETENTION

☒ Default - WLPPR s.52(1):

The proportion of the Woodlot Licence area that is occupied by wildlife tree retention areas is no less than the least of the following:

- The proportion specified for the area in a land use objective, or
- The proportion specified in the WLP, or
- 8%

Note: The proportion of the Woodlot Licence area that is presently occupied by projected wildlife tree retention areas is currently at 38.38 ha (8.0%).

COARSE WOODY DEBRIS

☒ Default - WLPPR s.54(1):

Area on Coast – minimum retention of 4 logs per ha = 5 m in length and =30 cm in diameter at one end.

RESOURCE FEATURES

☒ Default - WLPPR s.56(1):

Ensure that forest practices do not damage or render ineffective a resource feature.

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Note: Only the performance requirements in Part 3 (Practice Requirements) of the WLPPR for which an alternative can be proposed are shown in this Woodlot Licence Plan. The remaining performance requirements in Part 3 are not shown, nor are the performance requirements in Part 4 (Roads).

APPENDICES

Appendix 1: Map of Crown Portion of Woodlot W1678

Appendix 2: Map of Private Portion of Woodlot W1678

Appendix 3: Alternative Stocking Standards for Woodlot W1678

Appendix 1: Woodlot Licence Plan Map (Crown Portion)

MAP 1 of 2

Woodot Licence W1678

Quinsam Lake West Crown Portion

Ministry of Forests Campbell River

Woodlot Licence Plan

Licensee:	321360BC Ltd.
Ref. Map:	92F094
Datum, UTM Zone:	NAD83, 10
UTM:	331 000E, 5535 000N
TSA:	37 Strathcona
TSB:	A Sayward
FIZ:	B
P.S.Y.U.:	235
Inv. Reg.:	7
Comp.:	2A
Air Photo:	BCB91039 #51-53
Drafted:	ECON
By:	November 17, 2006

Decl.: 19°03' E (2006)
Ann. Change: 12.5' W

0 25 50 100 150 200 Meters

1:5,000

Legend

- Legal Point
- Falling Corner
- Permanent Landing
- Temporary Landing
- Station
- Culvert
- Bridge
- Wildlife Tree
- Swamp
- RP
- Legal Monument
- Blow Down
- Water Intake
- Quarry
- Gate/Barrier
- Non Fish Stream
- Fish Stream
- NCD
- Not Classified Stream
- Road, existing
- Trail, existing
- Road, engineered
- Trail, engineered
- Railroad
- Recreation Inventory
- Wetland
- Lake
- Riparian Management Zone
- Riparian Reserve Zone / WTP
- Block
- Treatment Unit
- Patch / Clear Cut
- Comm Thinning
- Pole Harvesting
- Woodlot Boundary

Timber West Private

Quinsam Lake L1

W1679

Signature / Seal

Date

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ECON consulting
250-337-5588

Appendix 2: Woodlot Licence Plan Map (Private Portion)

MAP 2 of 2

WOODLOT LICENCE W 1678 Quinsam Lake West Private Portion

Ministry of Forests
Campbell River

Woodlot Licence Plan

Licensee:	Corp. #321360BC Ltd.
Area:	77.10ha
Ref. Map:	92K003/004
Datum, UTM Zone:	NAD 83, 10
UTM:	328 000E, 5542 700N
Drafted:	Oct 12, 2006
By:	ECON

N

50 0 50 Meters
1:5000

Nelson Drive

RP 3
1+460

PP Connector
0+449
RP 1

1+651

0+536

no VQO

W4
2

PR

1
F(Mb)
1100-21

3
F(CH)
2102-22

4
FH(C)
3307-26

5
F(P)
2209-22

WTP #3

9
F
3307-23

S4

S4

no VQO

7
F(C)
3204-14

11

12
F(CH)
3406-30

S4

13
F(C)
4308-21

6
F(C)
2102-21

14
HC(F)
2105-18

WTP #2

18

BC HYDRO R/W

16
F(C)
4307-21

Ladore Dam

PD30865

PD30864

WTP #1

10
F(P)
3207-19

8
F(P)
2209-22

S1

Lower
Campbell Lake
(L1)

John Hart Lake Comm. Watershed

Risk Zone A

Risk Zone B

19

17
HCF
3206-19

Risk Zone B1

PD62692

LEGEND

- Falling Corner
- Landing
- Station
- Culvert
- Bridge
- Wildlife Tree
- Swamp
- RP
- Old Iron Post
- Blow Down
- Water Intake
- Quarry
- Gate
- Existing Road
- Engineered Road
- Existing Trail
- Creek
- Forest Cover
- Hydro Line

Comm. Watershed
- Risk Class A&B
- Risk Class B1

- Wetland / Lake
- WTP
- Riparian Management Zone
- Woodlot Area

Signature / Seal

Date

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APPENDIX 3: ALTERNATIVE STOCKING STANDARDS

Table: A

ADMINISTRATION			
Vancouver Forest Region	**Campbell River Forest District**	**Licensee: 321360 BC Ltd.**	**Woodlot Licence #W1678**	**7. November, 2006**

ID #	BEC		Preferred Species						Acceptable Species								Stocking (w/s)			Min Inter Tree Dist (m)	Regen Delay	FG Date	Tree Ht > Brush (min %)	Post Spacing Density		Comments:
	Zone & variant	Site Series	1	Ht (min)	2	Ht (min)	3	Ht (min)	1	Ht (min)	2	Ht (min)	3	Ht (min)	4	Ht (min)	Target P&A (sph)	Min P&A (sph)	Min P (sph)	MITD (m)	Max (yrs)	Late (yrs)		Min	Max	
A	CWHxm	01/04	Fd	3.0					Pw[5]	2.5	Hw[8]	2.0	Cw	1.5	Lw[9]		900	500	400	2.0	3	12	150	500	1500	None – Zonal site
B	CWHxm	02	Fd	2.0					Pl	1.25	Pw[5]	2.5					400	200	200	2.0	3	12	150	200	800	Avoid logging – xeric site, shallow soils
C	CWHxm	03	Fd	2.0					Cw	1.0	Pw[5]	2.5	Lw[9]	1.5	Pl[6]	1.25	800	400	400	2.0	3	12	150	400	1200	None
D	CWHxm	05/07	Cw	2.0	Fd	4.0			Bg	3.5	Pw[5]	2.5					900	500	400	2.0	3	12	150	500	1500	None
E	CWHxm	06	Fd	3.0	Cw	1.5	Hw	2.0	Pw[5]	2.5							900	500	400	2.0	6	14	150	500	1500	None
F	CWHxm	08/09[1]	Cw	2.0	Bg	3.5			Ss[7]	4.0							900	500	400	1.5	3	12	150	500	1500	Floodplain - medium/high bench
G	CWHxm	10	Act	4.0	Dr[4]	4.0	Mb[4]	4.0									800	400	400	1.5	3	12	150	400	1200	Floodplain - low bench
H	CWHxm	11[1]	Cw	1.0					Pl[1]	1.25							400	200	200	1.5	3	12	150	200	800	Avoid logging – wet and very poor
I	CWHxm	12[1]	Cw	1.0					Hw[4]	1.5	Pw[5]	2.5	Ss[7]	1.5			800	400	400	1.5	3	12	150	400	1200	Organic soils - avoid ground based equipment
J	CWHxm	13/14[1,2]	Bg	3.5	Cw	2.0	Fd[1]	4.0	Ss[7, 9]								900	500	400	1.5	3	12	150	500	1500	Fluctuating water table
K	CWHxm	15[1,2]	Cw	2.0					Ss[7, 9]								800	400	400	1.5	3	12	150	400	1200	Fluctuating water table
L	CWHxm	01/06	Dr[4]	3.0	Mb	3.0											1200	1000	800	1.5	3	12	150	800	1500	High density deciduous management
M	CWHxm	05/07/08/ 09[1]/02/13/ 14[1,2]/15[1,2]	Act	4.0	Dr[4]	4.0	Mb	4.0									1200	1000	800	1.5	3	12	150	800	1500	High density deciduous management
O	CWHxm	01/04/06	Cw	1.5	Pw[5]	2.5			Fd[3]	3.0	Hw[8]	2.0	Lw[9]				900	500	400	2.0	3	12	150	500	1500	Alternate species root rot treatment
P	CWHxm	03	Cw	1.0	Pw[5]	2.5			Fd[3]	2.0	Pl	1.25	Lw[9]	1.5			800	400	400	2.0	3	12	150	400	1200	Alternate species root rot treatment
Q	CWHxm	02	Pw[5]	2.5					Pl[6]	1.25	Fd[3]	2.0					400	200	200	2.0	3	12	150	200	800	Avoid logging – xeric site, shallow soils
R	CWHxm	05/07	Cw	2.0	Pw[5]	2.5			Fd[3]	4.0	Bg[3]	3.5					900	500	400	2.0	3	12	150	500	1500	Alternate species root rot treatment
S	CWHxm	08/09	Cw	2.0					Bg[3]	3.5	Ss[3, 7]	4.0					900	500	400	1.5	3	12	150	500	1500	Alternate species root rot treatment
T	CWHxm	11	Cw	1.0					Pl[3, 6]	1.25							400	200	200	1.5	3	12	150	200	800	Alternate species root rot treatment
U	CWHxm	12	Cw	1.0	Pw[5]	2.5			Hw[3]	1.5	Ss[7]	1.5					800	400	400	1.5	3	12	150	400	1200	Alternate species root rot treatment
V	CWHxm	13/14[2]	Cw	2.0					Bg[3]	3.5	Fd[3]	4.0	Ss[7]				900	500	400	1.5	3	12	150	500	1500	Alternate species root rot treatment

Foot Notes

1 Elevated microsites are preferred
2 These sites represent areas with strongly fluctuating water tables. They are often found as mosaics in combination with other sites. Elevated microsites are preferred, either mechanical or natural
3 Bg and Fd are not acceptable within 10 m of Fd/Bg second growth stumps,
4 Avoid gleyed soils and in frost pockets
5 Pw must be free of blister rust within 10 cm of the stem and be pruned as per ministry guidelines or be blister rust resistant stock (≥ 50% resistance). Pw may occupy 5% on all sites except sites 04 & 05 where 20% will be the upper limit of the Free-Growing composition. When used for root rot treatment no limit on percent composition is set.
6 Restricted to nutrient-very-poor sites
7 Risk of weevil damage, use resistant stock where possible. Ss will not exceed 20% of the free growing stand on site series or 5% of the free growing stand on 13, 14, & 15 site series on a dispersed basis. Clumps not to exceed 0.1ha in size.
8 Hw is not acceptable on site series 04. The proportion of the free-growing stand comprised of Hw will not exceed 20%.
9 Larch (Lw) will be used as an alternative species in W1678 in site series 03 and 04 only with approval from CRFD as more field data becomes available or as MOFR policy provides clearance.

Stocking Standards - General Comments

This table has been developed from the *Reference Guide for FDP Stocking Standards* dated December 11, 2002 and the standards established in the Woodlot Licence Forest Management Regulations (January 31, 2004) Division 2 of Part 6, Schedule A, Table A as well as the correlated guidelines and site interpretation for the Vancouver Forest Region (VFR). Where site series have similar stocking standards, they have been combined. Sections A-K are the general stocking standards. Sections L & M are the deciduous stocking standards. Sections O-V apply to sites affected by root rot.

'Biogeoclimatic unit' or 'BEC' means the zone, subzone, variant and site series described in the most recent field guide published by the Ministry of Forests for the identification and interpretation of ecosystems, as applicable to a harvested area.

Site series with the comment of 'avoid logging'; floodplain site series or sites with strongly fluctuating water tables have been included. However, management on these sites will be limited and will generally be included within a mosaic of better sites. In some cases where there are fluctuating water tables, mounding may be prescribed to create better microsites.

Where standards units (SUs) are comprised of an un-mappable mosaic of site series, the practice will be to manage for the stocking standards, noted by the ID#, of the dominant site series provided that the tree species are suitable (i.e. preferred and acceptable) in all site series contained within the SU.

A limited number of scattered deciduous trees will be tolerated on all conifer plantations, to provide a nurse crop, promote nutrient cycling or for general biodiversity objectives. Allow up to 50 spha as deciduous ghost trees during surveys on all sites such that these stems have no impact on the free growing status of sampled trees. Where deciduous trees

are within 10m of each other they will not be accepted as dispersed single stems due to increased competitive density effects. As such the deciduous stems in question will impact the free growing status of sample trees.

The minimum inter-tree spacing is generally reduced to 1.5 m under the following site-specific conditions: frequent bedrock, large blocky colluvium, hygric sites, and disturbed roadside areas amongst slash accumulations (up to 10 m from the travelled portion of the road). On machine mounded sites the minimum inter-tree spacing is reduced to 1.0 m.

Deciduous Management

Recommended Regime: The product objective is to manage for high quality knot-free sawlogs on a 40 - 50 year rotation. Stand-establishment with high densities (1500 sph) is required to achieve a target of 1200 stems/ha at free-growing. At approximately age 10 but not before stand height 12 to 16 m space to 900 stems/ha. Dead branch prune the crop trees early and continue density regulation treatments approx. every 10 years to maintain good crown forms and eliminate low quality stems.

The establishment of a second crop conifer layer (Cw, Ss) before or after density treatment is optional. If a cedar or Sitka spruce understory is planted in addition, then the natural pruning of the alder would be enhanced. The removal of the alder at harvest age is operationally possible, while leaving a fully stocked, semi-mature conifer pole stand remaining.

Where conifers are established underneath a designated deciduous stand, the stand's regeneration and free to grow status will be measured using the deciduous standards only. The minimum free growing height criterion for deciduous species is based on the tallest conifer standard for each site series. Damage criteria for deciduous species have not been formally established. General free-growing criteria will be adopted, such that well spaced stems will be of good form, health and vigour.

Stocking Standards – Specified Areas

For salvage of scattered windthrow or root rot mortality, openings of up to 0.1 ha in size are acceptable, not requiring pre-harvest mapping, associated regeneration and requirements to establish a Free Growing stand. No long-term impact on timber yield is expected as the subject areas are likely to regenerate naturally or will be planted concurrent with harvest in adjacent areas

Table B: Stocking Information for Specified Areas

Target from Table A standards	Layer*	Stocking**		
		Target pa	MIN pa	MIN p
(stems/ha)		(well-spaced/ha)		
900 - 1200	1	400	200	200
	2	500	300	250
	3	700	400	300
	4	900	500	400
800	1	300	150	150
	2	400	200	200
	3	600	300	300
	4	800	400	400

*Stand Layer definition

Tree Layer 1	Mature	trees >= 12.5 cm dbh
Tree Layer 2	Pole	trees 7.5 cm to 12.4 cm dbh
Tree Layer 3	Sapling	trees >= 1.3 m height to 7.4 cm dbh
Tree Layer 4	Regeneration	trees < 1.3 m height

** pa - preferred and acceptable species p - preferred species
Preferred and acceptable species and "Target from Table A standards' are as specified in Table A by biogeoclimatic ecosystem classification (BEC) site series. Preferred and acceptable species and "Target from Table A standards' are as specified in Table A by biogeoclimatic ecosystem classification (BEC) site series

II. SUPPLEMENTAL INFORMATION REQUIRED TO BE SUBMITTED IN SUPPORT OF THE PROPOSED WOODLOT LICENCE PLAN

1. REVIEW AND COMMENT

ADVERTISING

A copy of the advertisement placed in the Campbell River Mirror on November 10th 2006 will be included in the final submission.

REFERRALS

This plan will be referred to the following agencies and/or groups either directly or via the Ministry of Forests and Range (contact Aaron Smeeth ALO):

Hamatla Treaty Society 1441-A Island Highway Campbell River, B.C. V9W 2E3 Ph: 287-9460, Fax: 287-9469	**Cape Mudge First Nation** PO Box 220 Quathiaski Cove, BC V0P 1N0 Ph: 285-3316, Fax: 285-2400
Campbell River First Nation 1400 Weiwaikum Road Campbell River, BC V9W 5W8 Ph: 286-6949, Fax: 287-8838	**Comox First Nation** 3320 Comox Road Courtenay, BC V9N 3P8 Ph: 339-4545, Fax: 339-7053

Maps will be forwarded by MoFR to:
Guide-Outfitter certificate holder #100572 and
Trapline holder TR0110T604 (private only)

COPY OF WRITTEN COMMENTS RECEIVED

The licensee, and Wolfram Wollenheit RPF, will review all comments. The written comments received and revisions made will be included in the final submission.

REVISIONS MADE AS A RESULT OF COMMENTS RECEIVED

All revisions made will be added in the final submission.

2. CONSULTATION WITH FIRST NATIONS

Included within the final submission will be a copy of the 'First Nations Information Sharing Checklist' a consultation checklist provided by the Campbell River forest district. Included with the checklist will be all letters, minutes and correspondence.

3. EXEMPTIONS

N/A

4. RATIONALE IN SUPPORT OF PROPOSED ALTERNATIVE PERFORMANCE REQUIREMENTS

STOCKING STANDARDS

Alternative stocking standards are proposed given the location and the licensee's full intent to facilitate intensive forest management and to improve site productivity and species/product diversity. Additionally, existing standards with respect to the use of broadleaf species lack measurable and enforceable standards for implementation and are therefore defined further within the alternative stocking standards. Full details and listing of the stocking standards are provided in Appendix 3.

All areas of harvest will undergo pre-harvest mapping as per Section 33 of the Woodlot Licence Planning and Practices Regulation. At that stage the fundamental decision will be made if either conifer or a broadleaf standard will apply and the Standard Unit ID will be assigned.

Forest health concerns raises additional issues as to the appropriateness of the defaults in areas where root rot (e.g. *Phellinus weirii)* impacts the regeneration and long-term health and productivity of the preferred species. The proposed alternative stocking standards promote healthy stands that protect adjacent resources and values For example on infected zonal sites (01) adjacent to a S4 creek or recreational trail where stumping is not appropriate to control sediment or to maintain visual appearance. In these cases the establishment of Douglas-fir (preferred) may prove difficult and unsuited in the long-term due to re-infection.

The Chief Forester's stocking standards indicate black cottonwood (Act), red alder (Dr) and bigleaf maple (Mb) as being a productive, reliable and feasible regeneration option on several site series within the CWH xm1. The attached Alternative Stocking Standards will be used and includes the standards for both pure broadleaf stands and mixed woods regeneration. The use of broadleaf is proposed in consideration of the Chief Foresters memorandum dated August 22nd, 2000 and the supporting note 'Common Principles for the Management of Red Alder within the Coast Forest Region' dated August, 2004. The management for broadleaf species is proposed on a limited scale and is consistent with the management assumptions adopted in the last Annual Allowable Cut (AAC) calculation (see Management Plan dated: 15. December 1997).

The broadleaf standards are also supported by the following research literature:

- Hibbs *et al.* The Biology and Management of Red Alder (1994),
- E.B. Petersons *et al.* FRDA Report 250 – Black Cottonwood and Balsam poplar manager's handbook for British Columbia (1996).
- L. Sigurdson *et al.* 2nd draft report on Weyerhaeuser's Red Alder Management Practices (1998),
- P.J. Courting *et al.* Forest Research Extension Note 016 - Red Alder management trials in the Vancouver Forest Region (2002).

The minimum density post-spacing shown corresponds to the values recommended in the Establishment to Free-growing Guidebook for the VFR– i.e. the same as the minimum-stocking standard for conifer stands.

Higher stocking is noted for the deciduous stands to ensure self-pruning and may include a conifer component. The maximum density post-spacing has been increased to allow for two-stage spacing entries in order to manage snow press, blow-down risks and provide the opportunity to capture the small-diameter resource.

The minimum height criterion is based on the tallest conifer standard of the particular site series since the listed hardwoods are at least as rapid growing as their conifer counterpart. If a cedar or Sitka spruce understory is planted in addition to the full hardwood stocking, then the natural pruning of the alder would be enhanced. However, the stand's status will only be measured using the broadleaf standards. The removal of the alder at harvest age is operationally possible, while leaving a fully stocked, semi-mature conifer pole stand behind.

Damage criteria for broadleaf species have not been established. No significant insect or disease outbreaks have been recorded for existing alder trials to date. General free-growing criteria will be adopted and damage assessed by the survey technician at the time of the survey. Well-spaced stems will be of good form, health and vigour. Species-specific damage criteria will be used upon development.

The stocking standards for specified areas are consistent with the default, with one exception. In the case of deciduous stands established under this WLP where initial stocking densities will be 1000-1200 sph (see appendix 3 alternative stocking standards), and where these stands may be in the future subject to commercial thinning.

These represent a reduction in the targets and minimums for tree layer 1 as compared to the default standards. The reason for this is that the default standards have been developed for conifer stands, which have different crown characteristics from deciduous species. Under deciduous management regimes, while initial densities will be higher to promote self-pruning and encourage stem development, lower target thinning densities in managed stands may be applied during later stages of the rotation.

WIDTH OF STREAM RIPARIAN AREAS

Alternative widths for stream riparian management areas are proposed to manage the forested area adjacent to Tom Brown Rd, an existing road grade that is constructed within the riparian management zones of three water features. Where the road is constructed in close proximity to Creek 14, Wetland 2, and Creek 3 the default RMZ extends across the road grade. In these situations, the portion of the RMZ that is no longer contiguous with portion of the RMZ adjacent to the water feature in question is unable to contribute to the role of protecting streamside riparian structure and vegetation. The alternative proposed reduces the width of the RMZ to that of the distance between the foot of the fill slope of the road and the stream bank or wetland edge.

This alternative considers that the road is already established and in good condition and that its relocation would result in additional permanent access structures. Given the road location, efforts will be made to protect water quality and quantity within the said water features by limiting brushing and clearing on the creek side of the road beyond the minimum required for user safety.

5. Sediment Drainage Guidelines for the Private Portion of Woodlot W1678

The following sediment drainage guidelines are developed in response to the recommendation for a Sediment Drainage Management Plan for road clearing in the Best Management Practices outlined in the District of Campbell River Community Watershed Document: "Proposed Development Regulations and Guidelines for Watershed Protection".

The guidelines are related to erosion and sediment control techniques and shutdown procedures and should be followed to minimize erosion, sediment transfer and their potential adverse impacts on water quality. These guidelines are intended to complement the applicable regulation and practice requirements, such as those for the maintenance of natural drainage patterns, found in the Woodlot Licence Planning and Practice Requirements and in this Woodlot Licence Plan.

Erosion and Sediment Control

Maintaining water quality during road construction requires limiting the amount of soil erosion, and, secondly, limiting the transport of sediment from these sites. Revegetation is the best way to prevent erosion and grass seed should be applied to all exposed soils that will support vegetation as work is completed on them. In addition to prompt re-vegetation, the following guidelines and techniques should be employed to limit erosion and the transfer of sediment:

- Conduct sensitive operations during periods of dry weather.
- Select equipment that will create the least amount of disturbance.
- Use a temporary diversion and/or impoundment of stream flow to reduce exposure of disturbed soil to flowing water during stream-crossing structure construction (**obtain all necessary agency approval prior to in-stream work**).
- Install silt fencing in ditches and wherever necessary to temporarily reduce runoff velocity and to prevent sediment from entering channelized flows. After work is completed silt fence structures should be removed carefully to prevent retained sediment from entering channelized flows or being remobilised during the next rain event.
- Use straw bales to for temporary, relatively minor, sediment control. Straw bales may be effective in intercepting sheet flow runoff at the base of an exposed cutbank, fillslope or swale or in acting as a check dam in the ditch-line or a road. Straw bales should not be stacked and care should be taken to ensure that noxious weeds and non-native grasses are not spread as a result of the use of straw or, in particular, hay bales.

- Install sediment catchment basins to catch coarse sediments where silt fencing and/or straw bales are insufficient to retain sediment. Sediment basins need to be cleaned frequently to remain effective.
- Place rip rap at the outlet of cross drains where ditch water is being diverted from an approach ditch line and discharged onto erodable soils or fills.

Shutdown

Road construction work should cease before soils are visibly soft or muddy and associated silty waters or sediments are flowing towards streams, lakes or wetlands. The equipment operator is usually in the position to first recognize these signs of erosion. Before shutdown, drainage should be controlled to ensure that no subsequent adverse impacts occur and the following general requirements should be adhered to:

- Minimize sediment delivery from stockpiled erodable soils.
- Leave drainage systems functional.
- Add water control measures such as cross-ditches and water-bars, where appropriate.

The following road construction activities may normally be conducted in areas of saturated soils:

- Hand falling.
- Blasting in low landslide hazard terrain.
- Placement of shot rock surfacing.
- Bridge construction (excluding in-stream works).

Only in emergencies should road maintenance be carried out during saturated soil conditions.

For more information contact:

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