WOODLOT LICENCE # 0046

WOODLOT LICENCE PLAN #2

Second Term
2020 to 2029

Draft for Referral
October 19, 2020

Harper Logging Ltd
1855 Perkins Road
Campbell River, BC, V9W 4S2
E-mail: **grahamda84@hotmail.com**
Phone: **(778) 762-5236**

Authorized Licensee Signature: **David Graham**

Draft for Referral

Signature

Date

DISCLAIMER

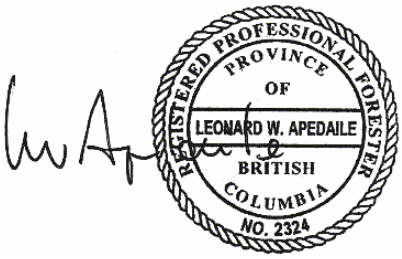
- Recognising the special nature of management on a woodlot licence, this disclaimer forms part of the Woodlot Licence Plan (WLP) for Woodlot Licence Number 0046 and advises that:
  - The decision to operate under one or more of the Default Performance Requirements provided in the Woodlot Licence Planning 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 has been retained to provide advice on the practice of professional forestry with regard to items such as alternative performance requirements, applicable results and strategies and other required measures that do not have a default performance requirement provided in the WLPPR

Signed
Name: Leonard W Apedaile

RPF # 2324

Contact phone number (250) 337-5588
Email: len@econ.ca

Seal:



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I. CONTENT FOR A WOODLOT LICENCE PLAN (WLP)

1.0 PLAN AREA

☒ This plan covers the entire Woodlot Licence area.

Woodlot Licence W0046 occurs within the Sunshine Coast Forest District. The Woodlot Licence is an aggregate of private (Schedule A) and Crown (Schedule B) lands with a total area of 1600.5 hectares. The private lands include District Lots 382, 334, and 771 and total 115.5 hectares. The Crown land portion totals 1485 hectares. W0046 has an approved annual allowable cut (AAC) of 7022 m^3 per year of which 848m3 is contributed by the private lands. DL 162 was formerly included in the Woodlot but was removed in December 2019 and is no longer part of the woodlot.

The operable forest cover is predominantly age class 3-5 second growth, Douglas fir leading stands that were restocked by natural regeneration following logging. Stands of older timber (age class 7-9) also occur. The terrain is generally gently rolling with valley bottom flats and lower slopes, but includes areas of midslopes and ridge tops as well as localised rock outcrops and bluffs.

Access to and from Read Island is by water. The main access route through the Woodlot Licence originates at Evan's Bay within DL162 where the licensee maintains a private log dump and local barge landing. From Evan's Bay a road network provides access west and south towards Rosen Lake and east towards Evening Mountain.

There are about 70 full time residents on Read Island and a small school located in Surge Narrows. The population increases during the summer with seasonal residents and tourism businesses. There is no scheduled ferry service to Read Island therefore, access is somewhat restricted to the general public. The Surge Narrows Forest Advsory Committee (SNFAC) is a community based organisation with an active and long standing interest in forest and resource management on Read Island. SNFAC is engaged in an ecosystem mapping and planning project on Read Island and the Discovery Islands.

This Woodlot Licence 0046 Woodlot Plan #2 replaces the original Woodlot Licence Plan which expired in 2017 and has been prepared to be consistent with objectives established by government and content requirements for the plan. The content of this plan including the objectives and performace requirement is consistent with the original Woodlot Licence Plan approved in 2007 but has been updated according to the new template, and to include new information, commitments, and extended free growing periods.

The broad objectives set by government are found in Section 9 of the Woodlot Licence Planning and Practices Regulation (WLPPR). Additional land use objectives, and any other objectives and designations that apply to the Woodlot licence area, are described in Section 2. Performance requirements specific to the woodlot are found in Section 10.

2.0 MAP AND INFORMATION

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

This Woodlot Licence Plan is intended to identify where harvesting activities will be modified or avoided to protect resource features, manage resource values, sensitive areas and address areas with other special interests. These areas are identified and discussed within the text and mapping components of this plan. Areas subject to constraints are highlighted with the balance of the area subject to forest resource management strategies and performance requirements according to WPPR requirements.

Recent work and updates completed for the submission of this Woodlot Licence Plan included: a general mapping update of blocks, roads, and tenure lines; a review of wildlife tree retention areas within the woodlot area; a review of the recently completed sensitive ecosystem inventory, and a review of updates and status of higher level plans, government notices, actions regulations and other updates and information applicable to the Sunshine Coast Forest District under FRPA.

The Woodlot License Plan Map (Appendix 1) includes the following information:

- Forest cover,
- Topography,
- Location and riparian class of streams and wetlands,
- The location of public utilities (transmission lines),
- Contiguous areas of sensitive soil,
- Domestic water supply intakes (known),
- Existing roads,
- Recreation trails,
- Known scenic areas & established visual quality objectives (per FRPA 181: DM Letter Sunshine Coast Forest District May 16, 1997 letter),

- Private property within and adjacent to the woodlot,

The following legal designations do not apply to the woodlot tenure area and do not appear on the woodlot licence plan map:

- Old growth management areas
- Wildlife habitat areas,
- Ungulate winter ranges,
- Community watersheds, licensed community water intakes and infrastructure,
- Fisheries sensitive watersheds,
- Temporary or permanent barricades to restrict vehicle access.

Other information pertaining to the Woodlot Licence Plan is described as follows:

- Biogeoclimatic Ecosystem Classification
  The woodlot is within the CWH xm biogeoclimatic sub zone where the average rainfall can range from 110 to 270cm/yr. Past fire occurrence and logging have resulted in a forest cover primarily composed of Douglas fir (Fd), accompanied by Western Hemlock (Hw) and minor amounts of Western Red Cedar (Cw). On the wetter and richer sites deciduous species including maple (Mb) and Red Alder (Dr) and Grand Fir (Bg) can be found. Throughout the Woodlot Licence area the majority of sites are zonal. The general terrain of the woodlot is rolling with numerous rock outcrops, some in the form of prominent rock bluffs. Slopes range form flat to vertical (at bluffs), but are generally moderate in the operable forested areas.

- Wildlife - Ungulate Winter Range Notices WLPPR S 9(3) - Ministry of Environment

  Notice: Indicators of the Amount, Distribution, and Attributes of Wildlife Habitat Required for the Winter Survival of Ungulate Species in the Sunshine Coast Timber Supply Area. (Dec 20, 2004):

  Critical Mountain Goat Winter Habitat is not found within this license.

- Wildlife - Species at Risk Notices WLPPR S 9(3) - Ministry of Environment

  Notice: Indicators of the Amount, Distribution, and Attributes of Wildlife Habitat Required for the Survival of Species at Risk in the Sunshine Coast Forest District. (March 2, 2006):

  The Notice includes indicators of amount, distribution and attributes of wildlife habitat required for the survival of the following species at risk:

  A. Marbled Murrelet:

No nest of the Marbled Murrelet is known to exist in the area under this plan.

The Notice amount calls for:

1) *All suitable nesting habitat within the non-contributing land base.*
2) *All suitable nesting habitat located within OGMA consistent with LU planning.*
3) *Suitable nesting habitat to a maximum net of 495 ha of mature timber harvesting landbase MTHLB*.

Spatial delineation of Wildlife Habitat Areas is maintained by government as part of the Order that legally establishes WHA's. Since the Notice was given, 85 WHAs for Marbled Murrelet have been established in the Sunshine Coast Forest District including 1288ha of Mature THLB. None of these are located on Read Island.

In February 2018, the Province published an *Implementation Plan for the Recovery of Marbled Murrelet in British Columbia* to address the federal recovery strategy for the species. The plan commits to retaining at least 85% of 2002 populations by retention of proportionate amounts of 2002 nesting habitat in the Southern Mainland Coast Conservation Region which includes Read Island which occurs within the Cortes Landscape Unit. This 2002 habitat was modelled across the region and has been further refined through low elevation surveys. Some of these polygons occur within W0046.

A proposed Land Use Objectives Regulation (LUOR) Order to maintain sufficient Marbled Murrelet nesting habitat on provincial Crown land to meet the commitments outlined in the Implementation Plan together with a proposed revised Section 7 Notice for Marbled Murrelet under the Woodlot Licence Planning and Practices Regulation (WLPPR) that would guide the future establishment of spatial, mapped reserves is currently out for consultation. Once adopted any impacts on W0046 will be known and implemented accordingly.

C. *Grizzly Bear:*

The Cortes Landscape Unit (and Read Island) is not known to have any Grizzly Bear populations.

D. *Vananda Creek Sticklebacks:*

The Cortes Landscape Unit (and Read Island) is not known to have any Stickleback populations.

E. *"Queen Charlotte" Goshawk*[**]:

The notice identifies the amount distribution and attributes consistent with the habitat required. The Woodlot holder anticipates that the area being set aside be built around active nest sites. There are currently no known active nests within the area managed under this Woodlot License Plan.

F. Coastal Tailed Frog: The Notice amount calls for a maximum of 30ha, not exceeding an impact to the MTHLB of 20 ha.

The SCFD requirement has been met with the creation of a Frog management area located in the Mt Elphinstone geography managed by BC Timber Sales (BCTS).

Higher Level Plans:

- Vancouver Island land Use Plan

- Cortes Landscape Unit Sustainable Resource Management Plan (2012).
  The Cortes Landscape Unit, Sustainable Resource Management Plan approved in 2012 identifies Old Growth Management Areas (OGMA's) within the Landscape Unit. Thirteen OGMA's are designated on Read Island, however, none are within the area of Woodlot 0046.

- Government Actions Regulation
  - ORCS 10285-20-KARST: Order to Identify Karst Resource Features for the Sunshine Coast Forest District (Oct 20, 2010)
  - No karst features are currently known within the area of Woodlot 0046.

- Traplines:
  - Trapline TR0115T914 covers the entirety of Read Island and W0046

Guide Outfitter:

- Guide Area licensed to Peter Klaui Certificate 100623 covers the entirety of Read Island and Woodlot 0046

Letters:

- Visual Quality FRPA 181: DM Letter May 1997
  - Visual Quality Objectives (VQO's) have been set for the Sunshine Coast Forest District applying to all scenic areas in the FSP area.

3.0 AREAS WHERE TIMBER HARVESTING WILL BE AVOIDED

There are no areas in this woodlot licence where timber harvesting will be strictly avoided.

4.0 AREAS WHERE TIMBER HARVESTING WILL BE MODIFIED

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

☒ Riparian reserve zones (RRZs) are not planned for harvesting other than those special circumstances specified by regulation (as outlined in the WLPPR Sect 39) such as tree removal for the purpose of creating trails, carrying out a sanitation treatment or salvaging of a windthrow tree. Streams classifications that contain a RRZs are outlined in Table 1 and are denoted by a red line on the map.

☒ Riparian Management Zones (RMZs). Table 1 below outlines how timber harvesting will be modified based on the stream and wetland classification. Depending on the present stand structure, terrain, windthrow risk and block configuration the retention level will be uniform, grouped or spatially distinct. Harvesting operations are permitted within a RMZ provided they are conducted with the intent of meeting the requirements as outlined in Table 1 and the specific site conditions. This site-specific information will be used to determine the range of retention (all streams except S3 range from 0-100% retention) for the specific RMZ. In general, understory and unmerchantable timber and other conifers of good form and vigour will be maintained as much as possible to provide cover, maintain stream bank stability and natural stream flow.

Road construction within riparian management zones will be avoided where possible, unless alternate locations would result in a higher risk of environmental damage. Where encroachment is unavoidable, impacts will be minimized through the use of narrow right of ways, silt fencing, grass seeding, etc. Riparian management areas will be protected throughout all phases of forestry operations through careful stream assessments and classifications, applying appropriate prescriptions that meet the general objectives as stated above, and through appropriate supervision of operations in the vicinity of these areas. A documented rationale will be placed on file and signed off by a qualified member of the Association of BC Professional Foresters for any areas requiring an encroachment.

☒ Scenic Areas within the Woodlot are shown on the attached map. Harvest areas within the approved scenic area polygons are subject to a variety of Visual Quality Objectives. The layout strategies to meet the objectives will be accomplished by locating and configuring blocks to take advantage of natural screening such as topography and adjacent stands whenever possible. Small opening sizes and utilizing partial harvesting systems such as the retention silvicultural system will also be used

whenever ground conditions permit. Also, at the pre-harvest planning stage, visual concerns can be modelled and remedied prior to harvesting if problems are perceived.

Table 1: Modification of harvesting in RMZ's by riparian classification.

Riparian Class	RMA		Intent of RMZ Management	Species to Retain	RMZ Retention Level Post Harvest (% basal area)
	RRZ Width (m)	RMZ Width (m)			
S3 (Fish bearing) 1.5-5m wide	20	20	• Maintain integrity of the RRZ. • Manage windthrow hazard to the reserve zone • Maintain wildlife attributes within RMA such as wildlife tree cover, nesting and perching habitat and diversity of vertical forest structure.	Fd, Cw, Hw, Pw, Ss, Dr and Mb	25-100%
S4 (Fish bearing) < 1.5m wide	0	30	• Maintain stream bank integrity • Provide shaded cover, LWD and litter, i.e.: Retain under story conifers, and other non-merch species and vegetation where possible.		0-100%
S5 (non-Fish) ≥3m wide	0	30	• Minimize debris transport to lower reaches of stream • Retain under story Cw, and other non-merch species and vegetation where possible.		0-100%
S6 (non-Fish) ≤3m wide	0	20	• Minimize debris transport to lower reaches of stream • Retain under story Cw, and other non-merch species and vegetation where possible.		0-100%
W1 (wetland >5ha)	10	40	• Maintain integrity of the RRZ • Maintain wildlife attributes within RMA such as wildlife tree cover, nesting and perching habitat and diversity of vertical forest structure		0-100%
W3 (wetland 1-5ha)	0	30	• Maintain wildlife attributes within RMA such as wildlife tree cover, nesting and perching habitat and diversity of vertical forest structure		0-100%
W5 (wetland complex)	10	40	• Maintain integrity of the RRZ • Maintain wildlife attributes within RMA such as wildlife tree cover, nesting and perching habitat and diversity of vertical forest structure		0-100%

5.0 CONSERVING AND PROTECTING CULTURAL HERITAGE RESOURCES

There are currently no known Cultural Heritage Resource Features within Woodlot 0046. While planning and implementing proposed activities, potential impacts on archaeological and cultural heritage resources will be minimized. In order to accomplish this, Harper Logging Ltd will endeavour to identify objects, sites, or locations of traditional aboriginal societal practices during field layout and site plan stages. First Nations Bands with Traditional Territory within Woodlot 0046 include the Klahoose, Homelco First Nations and Hamatla Treaty Society. Consultation with these bands occurs during the planning stages to avoid or minimize impacts on archaeological resources. Documentation of all consultation with affected First Nations is included within the supplemental information (Part 2) of the plan.

On an annual basis, commencing the year after the WLP comes into effect, Harper Logging Ltd will attempt to contact the First Nations that have an asserted traditional territory with the defined area to discuss the harvesting and road building activities planned for the upcoming year of operations. In addition, a request will be made to the First Nation for any new information regarding any potentially affected Cultural Heritage Resource not previously identified to Harper Logging Ltd Any new information received will be forwarded to the Ministry of Forests.

The following results and strategies (Table 2) for managing cultural heritage values will apply.

Table 2: Cultural Heritage Values and Associated Results and Strategies

Cultural Heritage Value	**Result and Strategy**
Cedar	*Result:* • Enable ongoing access to red cedar for traditional use by local First Nations *Strategy:* • 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.

Traditionally Used Plants	*Result:* • Enable continued access to traditionally used plants for traditional use by local First Nations. *Strategy:* • 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 that any collections of traditional use plants can be initiated by the local First Nations prior to harvest. • 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. *Strategy:* • The Licensee will share information with local First Nations upon request and be available for field reviews.

If the licensee or any personnel connected with the Woodlot Licence operation finds evidence of tradition use or cultural heritage values, the Ministry of Forests Aboriginal Liaison Officer will be notified and all work will cease within the immediate (20 m) area. The licensee will cooperate fully, as requested by the Ministry of Forests Aboriginal Liaison Officer.

6.0 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 plan.

INDIVIDUAL WILDLIFE TREES

a) Species and Characteristics:

The following table describes the species and characteristics of individual trees that will guide the selection of wildlife trees to be retained.

Table 3: Wildlife Tree Value and 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 infestation • Tree structure suitable for wildlife use (e.g., large nest, hunting perch, bear den, etc.) • Largest trees on site (height and/or diameter) and/or veterans • Locally important wildlife tree species • Should a variety of ecologically suitable species be present on the site the following can be used as a guide to the selection of species for wildlife trees: Douglas Fir, Western Red Cedar, Grand fir as highest priority; Western hemlock, Sitka Spruce and deciduous should be considered a lower priority and only selected as a last resort.	• Large, stable trees that will likely develop two or more of the above attributes for High.	• Trees not covered by High or Medium categories.

Throughout Woodlot W0046 a number of veteran (old growth) trees, mostly Douglas fir are scattered throughout the license area. These trees add structural and biological complexity of the second growth forest and will be retained as wildlife trees (except as itemized in item b) below). In some cases second growth trees will be retained as wildlife trees to supply wildlife and biological diversity values and/or for the recruitment of future vets, to vary the age classes on the Woodlot, to reduce wind fetch in long openings, and/or act as a seed source or visual screen.

WL0046 has an individual wildlife tree management strategy that is predicated on retaining trees that have existing wildlife use and valuable characteristics. There will be many individual trees that are composed of a variety of species, age and form. Within this wildlife tree population there will be an increasing value for wildlife overtime as the majority of the high value trees are Douglas fir and red cedar that are long lived species and will remain structurally strong for long periods even after death. Due to the number of scattered wildlife trees within the Woodlot when one individual tree is lost it will not materially affect the potential wildlife trees available for the wildlife tree users. In fact, even the trees that may fall will continue to provide wildlife habitat and biodiversity values as large woody debris.

Where safe to do so, an average of one (1) wildlife tree per hectare will be retained arranged as singles, clumps or groups either internal or external to the harvest proposal. Where required, these individual trees will count towards the 8% retention target for the WLP. Calculation of the tree's contribution will be determined using basal area (i.e. measuring diameter and heights) as a unit of measurement where $50m^2$ of individual trees will be equal to one (1) hectare of Wildlife Tree Retention area.

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 adjacent openings.

Alternatives to removal of a wildlife tree will be given priority such as the establishment of a 'no work zone' or widening of a riparian width to protect the feature balanced with tree removal farther away from the feature within the RMA. All workers involved with the removal of potential wildlife trees will be informed of developed 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. If possible, retain stems within streamside reserves. Harper Logging Ltd will at all times maintain a minimum of 8% WTR throughout the Woodlot. Individual trees that contribute to the retention target and are required to be replaced will be re-allocated as part of the overall WTR strategy.

WILDLIFE TREE RETENTION AREAS

a) Forest Cover Attributes:

Wildlife tree retention areas (WTRs) are planned preferably in fully constrained areas for long term retention (e.g. riparian reserve zones). Under the WLPPR 52 (1) the amount of WTR's must be no less than 8% of the area of the Woodlot. The regulation also indicates that the WTR does not have to be mapped as the location of good WTR's can change over time based on changing forest management decision making. Wildlife tree patches (WTP's) previously assigned to cut blocks at the stand level, when combined with the future wildlife tree retention areas to be assigned during future operational planning, will supply a significant area of the Woodlots biodiversity and coarse woody debris (CWD) values.

In review of the May 16, 2006 document "*Wildlife Tree Retention: Management Guidance***"** the following sections have been adopted for this WLP. Throughout the WLP the selection of WTR areas will be considered using the following criteria in order of priority:

1. Protect trees with valuable wildlife tree attributes;
2. Where there are few trees with valuable attributes, locate retention in areas most suitable for long-term wildlife tree recruitment; and
3. Where there are no opportunities for current or future valuable wildlife tree attributes, locate wildlife tree retention to be representative of the pre-harvest stand.

Generally, the approach for selecting an area of patch wildlife tree retention is to anchor the patch on ecologically valuable attributes (Table 3 above) such as:

- A high-value wildlife tree (e.g., veteran tree);
- A valuable wildlife habitat feature (e.g., raptor nest),
- An area of high wildlife use (e.g., wetland, riparian management zone, confluence of two small streams); or
- Resource features requiring protection, provided there are also high- or medium-value wildlife trees that will be retained (e.g., culturally modified trees, or habitat for species at risk).

In the absence of ecologically valuable anchors for a wildlife tree patch, the following will be considered (in order of ecological preference):

- Retaining the largest trees possible;
- Retaining trees representative of the pre-harvest stand; and
- Maintaining ecological inter-patch spacing.

Where possible, trees will be selected that have the potential of developing high-value wildlife tree attributes within the rotation period. Characteristics include trees that are more open grown, have current defects (e.g., stem scars, broken tops) or larger branches.

Uncommon tree species or stand characteristics present in the stand will also be considered for retention. In addition, areas that are not operational (e.g., seasonally wetted areas, seepage sites), but contain wildlife tree attributes, will be considered for retention to minimize timber supply impacts. If there are two areas that are equal in terms of wildlife tree and biodiversity benefits, and both are within (or contiguous to) the cutblock, the non-operable area will be selected for retention.

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 WTR's include:

- ✓ Worker safety
- ✓ The significance of forest health risk to surrounding stands including the salvage of windthrow timber
- ✓ The ability to retain other wildlife trees to perform as suitable wildlife habitat, and
- ✓ The availability of wildlife trees in adjacent openings.

Given the stand specific considerations outlined above the salvage of timber is permitted within a WTR area. Should a site-specific condition (such as windthrow or catastrophic events) occur within a RRZ then the conditions for the removed of such timber must follow Sec 39 of the WLPPR.

When assessing the potential to salvage a WTR area the level of impact will be determined. In areas that contain damage up to approx. 50% of the dominant or co-dominant trees the removal would focus on downed timber only, protecting the standing green. If more significant amounts of wildlife trees are lost due to wind-throw or other catastrophic events (exceeds 50% of the dominant or co-dominant trees) in WTR area then salvage of the damaged and remaining stems will be considered. Salvage of the area will be allowed considering other environmental constraints and the replacement strategy below.

The salvage of portions of the WTR either singles, clumps, or impacted areas created for improved safety to people is good forest management. Individual trees may be felled but not removed if considered a safety hazard.

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

No strategy for the specific replacement of individual trees felled as danger trees posing a hazard within a defined distance of a cutting-authority is presented as this will not threaten the long-term function or integrity of WTR's.

Where salvage/harvest is planned and authorized within a wildlife tree retention area, the replacement with another suitable area in size, value and species composition will be selected. When the level of impact on a WTR is <50% (this typically provides for a high level of forest influence within the stand and is considered not to be a clear-cut) then the WTR will continue to contribute to the overall retention target. When the level of impact exceeds 50% then the WTR area should be replaced with other suitable habitat in the nearest possible location.

If a WTR suffers blow down, but is not salvaged, it will not be replaced. Replacement areas must have equal or better wildlife values. For non-riparian WTR's attempts will be made to incorporate important features such as snags, and other significant wildlife features.

7.0 MEASURES TO PREVENT INTRODUCTION OR SPREAD OF INVASIVE PLANTS

One invasive species (Scotch Broom) is of potential concern; although it is not currently a problem on the woodlot. Himalayan Blackberry also occurs on the woodlot and is a minor issue in some places. There is no range use on the woodlot. The introduction or spread of invasive plants, specifically Scotch Broom into the Woodlot is unlikely under current forest management practices. *However,* in order to prevent the introduction of these plant species the main strategy within the WLP will be to regularly monitor for invasive plants and carry out control measures before they reproduce on roads and other areas where primary forest activities have created suitable seedbeds.

In the event that Scotch Broom or another invasive species does become established the strategies listed below will be implemented. The holder of this Woodlot will use three complimentary strategies to counter the introduction or spread of invasive plant species. These include:

1) Prevention and Control

- The holder's foresters and employees will be encouraged to review the MOE's alien species web site and review the identification, control and management of invasive plants.
- The goal of this WLP is to annually identify known sites of invasive plants and sites that are at high risk to invasive plant establishment through their forest practices within the area under this plan
- Preventative measures to minimize the occurrence and spread of invasive plants will include grass seeding of exposed soils following soil disturbance where the introduction or spread of invasive plants is likely. Grass seeding will be done before the end of the first complete growing season immediately following the completion of the relevant activity (e.g. construction of a road or landing or heavy disturbed forest floor displacement). 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 other invasive species. These are typically Canada Common No 1 Forage Mixture or better.
- If moderate to high risk invasive plants are likely to establish in cut blocks harvested during the forest regeneration phase, the Holder of this WLP will through normal reforestation practices:
    i. Establish a stand of coniferous and/or deciduous crop trees consistent with the applicable stocking for the area on or before the regeneration date; and
    ii. Meet Free Growing requirements consistent with the applicable stocking standards on or before the late Free Growing Date so that the stand will form a closed canopy to suppress seed and vegetative production of shade intolerant invasive plants.

2) Detection of Invasive Plant Species

- Invasive plants will be detected through the normal planting surveys, regeneration survival surveys and free-to-grow surveys. Due to the small size of the Woodlot area employees of Harper Logging Ltd will be able to detect any invasion of unwanted species along roadways and disturbed areas outside of the active harvesting and road construction areas.
- Action plans will be developed to combat the spread of invasive plants, if the introduction or spread is likely to be the result of the WLP holder's forest practices. When discovered, invasive plants will be mapped and reported to the Ministry of Forests.

3) Management or Elimination of Invasive Plant Species

- If invasive plants are discovered and if the introduction or spread is likely to be the result of equipment, machinery, or clothing, then: (a) prior to transport the cleaning of tires, tracks, bucket, undercarriage, etc. on machines will be completed and (b) the removal of burrs or plant components from clothing should be normal practice.
- If/where invasive plants become established along roadsides, regular mowing to prevent maturity and seed production (during flowering) is an option.

8.0 MEASURES TO MITIGATE EFFECT OF REMOVING NATURAL RANGE BARRIERS

There are no range tenures on Read Island therefore no measures or activities are required or proposed.

9.0 STOCKING INFORMATION FOR SPECIFIED AREAS

Unless exempted by the District Manager, the stocking standards indicated below apply to areas where the establishment of a free growing stand is not required and harvesting is limited to commercial thinning, removal of individual trees, small pockets of damaged or diseased timber (i.e. windthow) or a similar type of intermediate cutting, and for harvesting special forest products.

☒ For the purposes of section 12 and 34(3) of the WLPPR the Uneven-aged Stocking standards for single-tree selection, as found in the MoF publication "Reference Guide for FDP Stocking Standards", are adopted. 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, commercal 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. For salvage of scattered windthrow or root rot mortality, openings of up to 0.1 ha in size are acceptable, not requiring regeneration. For openings greater than 0.1 ha even-aged stocking standards will apply.

10.0 PERFORMANCE REQUIREMENTS

SOIL DISTURBANCE LIMITS

☒ Default WLPPR s.24(1)(b):

- 8% of Net Area to be Reforested

PERMANENT ACCESS STRUCTURES

☒ Default: WLPPR s.25:

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

1. For Cutblocks ≥ 5 ha – 7% of the total cutblock area
2. For Cutblocks < 5 ha – 10% of the total cutblock area
3. For the Total Woodlot Licence Area – 7% of the total Woodlot Licence area

STOCKING STANDARDS

☒ Alternative WLPPR s. 35(1)(a): The stocking standards, regeneration dates and free growing dates are indicated in Appendix II. In addition, a set of footnotes and rationales are provided for the Alternative Stocking Standards.

WIDTH OF STREAM RIPARIAN AREAS

☒ Default WLPPR s.36(4)(b):

The minimum width of the riparian reserve zone, riparian management zone and riparian management area are as described in WLPPR s.36(4)(b).

WIDTH OF WETLAND RIPARIAN AREAS

☒ Default: WLPPR s.37(3)(b) The minimum width of the riparian reserve zone, riparian management zone and riparian management area are as described in WLPPR s.37(3)(b).

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 described in WLPPR s.38(2)(b).

RESTRICTIONS IN A RIPARIAN RESERVE ZONE

☒ Default: WLPPR s.39. Cutting, modifying or removing trees in a riparian reserve zone is limited to the purposes described in Section 39(1) and 39(2) of the WLPPR.

☒ WLPPR s.39(2.1): Within the Woodlot area there are two fish bearing creeks where road construction is proposed and a crossing may be necessary within a riparian reserve zone: Lanny Creek and/or Ralph Creek.

RESTRICTIONS IN A RIPARIAN MANAGEMENT ZONE

☒ Default: WLPPR s.40(1)(b)(c) or (d) Construction of a road in a riparian management zone is limited to the conditions described is Section 40(1) of the WLPPR without additional conditions to allow road construction being provided in the woodlot licence plan.

WILDLIFE TREE RETENTION

Unless exempted by the district manager, the proportion of the Woodlot Licence area that will be occupied by wildlife tree retention is:

☒ Default WLPPR s.52(1)

- The defaults specified in Section 52(1) of the WLPPR is adopted. It specifies that the proportion of the Woodlot Licence area that is dedicated to wildlife tree retention areas have to be no less than the least of the following:
  - 8% of the Woodlot licence area.

COARSE WOODY DEBRIS

Unless exempted by the district manager or the WLPPR, the minimum amount of coarse woody debris to be left on areas where there is a requirement to establish a free growing stand is

☒ Default: WLPPR s.54(1)(b)

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

RESOURCE FEATURES

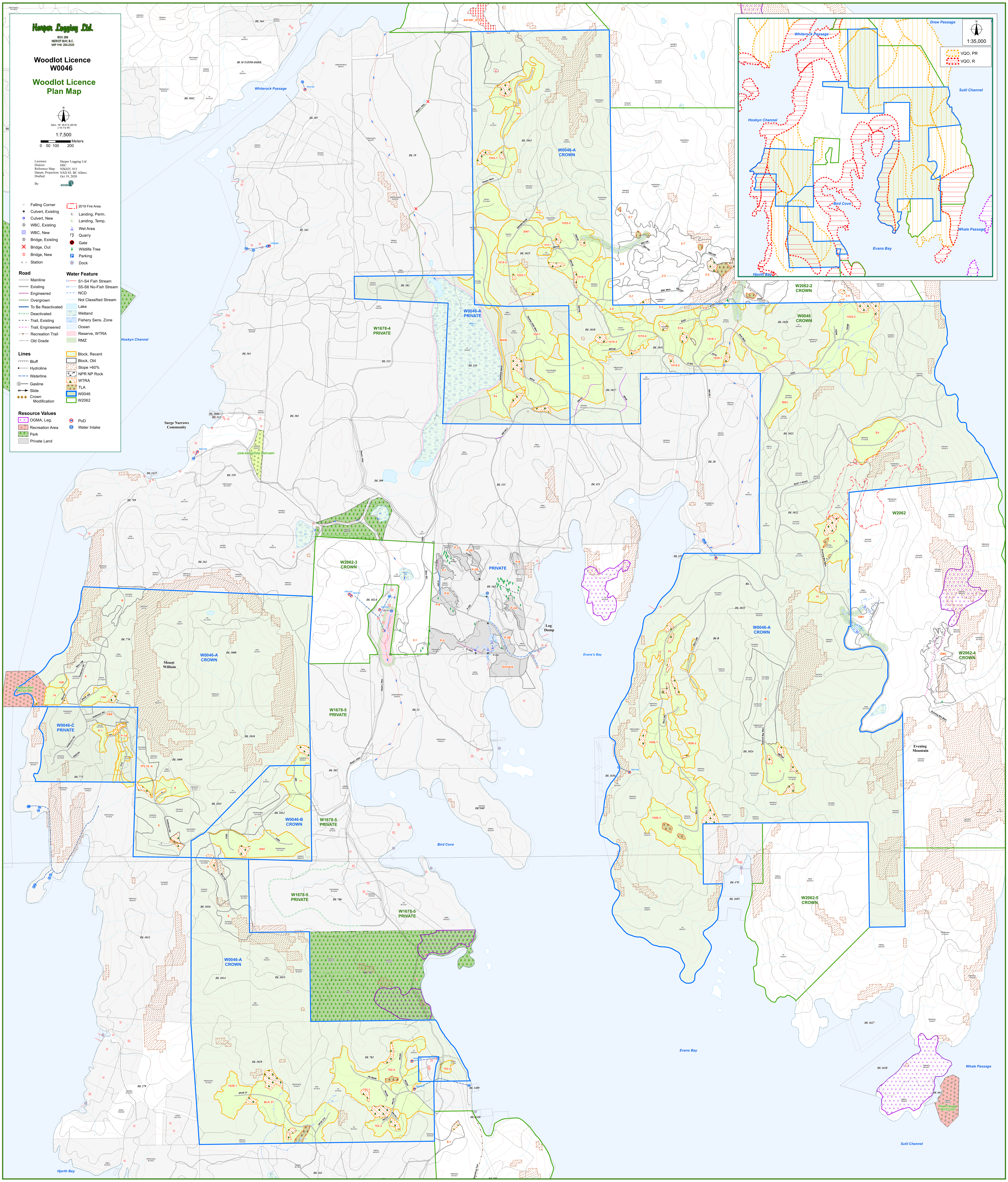
Unless exempted by the district manager, the woodlot licence holder will
☒ Default WLPPR s.56(1)(b): Ensure that forest practices do not damage or render ineffective a resource feature.

****

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 I: The Woodlot Licence Plan Map


Harper Logging Ltd.
BOX 299
HERIOT BAY, B.C.
V0P 1H0 285-2325
Woodlot Licence
W0046
Woodlot Licence
Plan Map
N
Decl.: 16° 35.5' E (2019)
(-10.1'/y W)
1:7,500
Meters
0 50 100 200
Licensee: Harper Logging Ltd
District: DSC
Reference Map: 92K025, 015
Datum, Projection: NAD 83, BC Albers
Drafted: Oct 19, 2020
By:
econ
Falling Corner
Culvert, Existing
Culvert, New
WBC, Existing
WBC, New
Bridge, Existing
Bridge, Out
Bridge, New
Station
2019 Fire Area
Landing, Perm.
Landing, Temp.
Wet Area
Quarry
Gate
Wildlife Tree
Parking
Dock
Road
Mainline
Existing
Engineered
Overgrown
To Be Reactivated
Deactivated
Trail, Existing
Trail, Engineered
Recreation Trail
Old Grade
Water Feature
S1-S4 Fish Stream
S5-S6 No-Fish Stream
NCD
Not Classified Stream
Lake
Wetland
Fishery Sens. Zone
Ocean
Reserve, WTRA
RMZ
Lines
Bluff
Hydroline
Waterline
Gasline
Slide
Crown Modification
Block, Recent
Block, Old
Slope >60%
NPR NP Rock
WTRA
TLA
W0046
W2062
Resource Values
OGMA, Leg.
Recreation Area
Park
Private Land
PoD
Water Intake
1:35,000
VQO, PR
VQO, R
Drew Passage
Whiterock Passage
Sutil Channel
Hoskyn Channel
Bird Cove
Whale Passage
Evans Bay
Hjorth Bay
Whiterock Passage
Hoskyn Channel
IR 10 TATPO-OOSE
DL 364
DL 1042
DL 287
DL 19
DL 363
DL 382
DL 361
DL 333
DL 334
DL 302
DL 1043
DL 1025
DL 1018
DL 1019
DL 1017
DL 1020
DL 1021
DL 1022
DL 20
DL 453
DL 335
DL 309
DL 339
DL 769
DL 362
DL 1425
DL 1606
DL 312
Surge Narrows Community
JOHN KIM NATURE SANTUARY
VIP53702 REGIONAL DISTRICT ConRec-1
W0046-A CROWN
W0046-A PRIVATE
W1678-4 PRIVATE
W2062-2 CROWN
W0046 CROWN
W2062
W2062-3 CROWN
PRIVATE
Log Dump
Evans's Bay
Orchard
W0046-A CROWN
W2062-4 CROWN
Evening Mountain
Mount William
W0046-C PRIVATE
Freedom Point REC231246
W1678-5 PRIVATE
W0046-B CROWN
W2062-5 CROWN
DL 1008
DL 1009
DL 1010
DL 1011
DL 1012
DL 770
DL 771
DL 182A
DL 162
DL 21
DL 301
DL 340
DL 435
DL 1023
DL 1024
DL 1656
DL 470
DL 1695
DL 1627
DL 1628
DL 465
Whale Passage REC231252
DL 1013
DL 1014
DL 1015
DL 1016
DL 1029
DL 780
DL 781
DL 782
DL 279
DL 161
DL 1489
DL 1528
REGIONAL DISTRICT ConRec-1
Harper Main
Swamp Main
SW1
1043-1
1018-1
1018-2
1025-1
1025-2
334-1
P4
C
MAIN
HARPER MAIN
1018-3
1018-4
E1A
1019-1
1019-2
1020-1
1020-2
E3
E4
B&C
East Main
EAST 1 ROAD
Evening Mnt Main
2-1
2-2
2-3
2-4
2-5
2-6
2-7
EBC Main
EBC100
EBC150
EBC200
EBC201
E200
E250
E-300
E410
Road L Hwy
PD31108
PD68591
PD31109
PD31102
PD31101
PD31104
PD31105
PD31106
PD31077
3-1
P-1
P-1A
P-2A
P-2B
P-3
P-3A
P-3B
P-5
P-6
P-7
P-8
P-9
P-100
P-200
P-300
4
4A
15
24
Spur 24
Spur 24B
Spur 24C
1656-1
1656-2
1656-3
Sawmill Bay Main
B
Bk B
3
EM1
EM2
A
10
10A
10B
Spur 10
Spur 10B
SPUR 10A
Anderson Rd
AND100
D&E
TFL15 -A
8
6
7
11
AN2
A200
A300
1
D
E
Spur DE
1029-1
SPUR 27
SPUR 27A
BLK 27
782-1
782-2
782-3
782-4
PK MAIN
PK200
PK270
PK450
6-1
Steamboat Trail
A47297_572-5
SW100-2
SW101
SW100-1
SW110
SW150
SW160
BR10
BR20
1020
1020A
1020B

Appendix II: Stocking Standards, Regeneration Dates and Free Growing Dates for Free Growing Stands

These stocking standards are proposed as an alternative performance requirement for the purposes of section 35(1) (a) of the Woodlot Licence Planning and Practices Regulation to areas harvested under this woodlot licence plan where the establishment of a free growing stand is required under section 29(3) of the *Forest and Range Practices Act.*

Biogeoclimatic Ecosystem Classification			Preferred Species	Acceptable Species	MITD	TSS	MSSpa	MSSp	Regen date	FG Date	Min. FG Ht by Species		Crop Tree to
ID #	Zone & Variant	Site Series			(m)	(sph)	(sph)	(sph)	(yrs)	(yrs)	Species	Ht (m)	Brush %
A	CWH xm	01/04	Fd	Pw[5] Hw[8] Cw	2.0	900	500	400	3	20	Fd Pw Hw Cw	3.0 2.5 2.0 1.5	150
B	CWH xm	02	Pl Fd	Pw[5] Lw[8]	2.0	400	200	200	3	20	Pl Fd Pw Lw	1.25 2.0 2.5 1.5	150
C	CWH xm	03	Fd	Cw Pw[5] Pl[6] Lw[8]	2.0	800	400	400	3	20	Fd Cw Pw Pl Lw	2.0 1.0 2.5 1.25 1.5	150
D	CWH xm	05/07	Cw Fd Bg[10]	Pw[5]	2.0	900	500	400	3	20	Cw Fd Bg Pw	2.0 4.0 3.5 2.5	150
E	CWH xm	06	Fd Cw Hw	Bg[10] Pw[5]	2.0	900	500	400	6	20	Fd Cw Hw Bg Pw	3.0 1.5 2.0 3.0 2.5	150
F	CWH xm	08/09[1]	Cw Bg	Ss[7]	2.0	900	500	400	3	20	Cw Bg Ss	2.0 3.5 4.0	150
G	CWH xm	10	Act		2.0	800	400	400	3	20	Act	4.0	150
H	CWH xm	11[1]	Pl[1] Cw		2.0	400	200	200	3	20	Pl Cw	1.25 1.0	150
I	CWH xm	12[1]	Cw	Hw[1] Pw[5] Ss[7]	2.0	800	400	400	3	20	Cw Hw Pw Ss	1.0 1.5 2.5 1.5	150
J	CWH xm	13/14[1,2]	Bg Cw Fd[1]	Ss	2.0	900	500	400	3	20	Bg Cw	3.5 2.0	150

											Fd Ss	4.0 4.0	
Biogeoclimatic Ecosystem Classification			**Preferred Species**	**Acceptable Species**	**MITD**	**TSS**	**MSSpa**	**MSSp**	**Regen date**	**FG Date**	**Min. FG Ht by Species**		**Crop Tree to**
ID #	**Zone & Variant**	**Site Series**			**(m)**	**(sph)**	**(sph)**	**(sph)**	**(yrs)**	**(yrs)**	**Species**	**Ht (m)**	**Brush %**
K	CWH xm	15[1,2]	Cw	Ss[7,9]	2.0	800	400	400	3	20	Cw	2.0	150
L	CWH xm	01/06[11]	Dr[4] Mb		2.0	1200	1000	800	3	20	Dr Mb	3.0 3.0	150
M	CWH xm	05/07/08/ 09[1]/02/13/ 14[1,2]/15[1,2]	Act Dr[4]Mb		2.0	1200	1000	800	3	20	Act Dr Mb	4.0 4.0 4.0	150

Regen date = Regeneration Date **F G Date = Free Growing Date**	**MITD = Minimum distance between well spaced trees of the preferred and acceptable species**	**Crop Tree to Brush % = the height of free growing trees relative to the competing vegetation within a 1 m radius cylinder around the tree.**
TSS = Target Stocking Standard (sph = healthy well spaced trees / ha)	**MSSpa = Minimum Stocking Standard of well spaced trees of preferred and acceptable species**	**MSSp = Minimum Stocking Standard of well spaced trees of preferred species**

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 Trees are not acceptable within 10 m of second growth stumps, except Cw, Pw, Lw and deciduous species.
4 Dr & Mb are not acceptable on 02 and 04 site series (too dry). Avoid planting in gleyed soils and frost pockets.
5 Pw must be free of blister rust within 60 cm of the stem and be pruned as per ministry guidelines or be blister rust resistant stock (≥ 50% resistance)
6 Restricted to nutrient-very-poor sites and as a minor species only
7 Risk of weevil damage, use resistant stock where available, Ss will not exceed 20% of the free growing stand on 08 & 12 site series or 5% of the free growing stand on 09,13,14,&15 site series on a dispersed basis. Clumps will not to exceed 0.1ha in size.
8 Hw is not acceptable on site series 04. Lw may be used but strictly on a trial basis. The proportion of the free-growing stand comprised of Hw or Lw if established will not exceed 20%. Lw will not exceed 5% of the free growing stand on site series 02.
9 May be planted on prepared mounds.
10 Based on past experience and knowledge Bg performs best on areas that are subject to frost and the slightly wetter/richer areas
11 Establishment of deciduous species is permitted within these site series provided the site contains a sufficient moisture regime to support deciduous species (i.e. limited salal content).

Stocking Standards - General Comments

This alternative stocking standards table has been developed from the Reference Guide for FDP Stocking Standards dated December 11, 2002, 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 most common stocking standards for the Woodlot and will be employed the majority of the time. Sections L&M are the deciduous stocking standards. Rationales for employing these standards are listed below.

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.

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 in all site series contained within the SU.

Higher stocking is noted for the deciduous stands to ensure self-pruning and may include a conifer component (although mixed stand management is not being proposed). 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.

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 sph as “ghost” trees during surveys on all sites. No deciduous within 10m of each other will be accepted for dispersed single stems due to increased competitive density effects. Should one of the “ghost trees” be encountered within a plot during a free growing survey the conifer tree will be deemed to be <u>not</u> free growing following the normal definition of a free growing tree.

Reduction of inter-tree spacing to 1.5 m is acceptable for 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 traveled portion of the road). Reduction of inter-tree spacing to 1.0 m is acceptable on mounded sites only.

Deciduous Management

Deciduous management within W0046 is planned strictly as an option – not as the preferred management regime. The establishment of a deciduous crop will only be considered provided the stocking standards as outlined in ID#s L&M can be met. Past experience with deciduous management indicates that within a cutblock only a portion of the area is suitable for the establishment of deciduous. The number of sites within W0046 that may be suitable are limited; therefore, no more that 1-2 hectares of area per year (to a maximum of 10 hectares within a 5-year cut-control period) may be selected for deciduous management.

When reviewing the W0046 Management Plan it outlines in Section 6.41 the potential for planting deciduous species** on a trial basis provided they are planted on suitable sites. This WLP wishes to continue to operate in the spirit of not wanting to limit the possibility or opportunity to try regenerating alternative species on a very minor basis and to have the ability to grow a viable stand of quality deciduous for potential future markets.

Although available, the amount of operational information available for the establishment of deciduous stands is known only by few local foresters. As part of the trial basis, Harper Logging Ltd and his forester will seek out information from any local sources to ensure a quality plantation. This may include reviewing of the North-West Hardwood (NWH) FSP and/or discussing regimes with their forester. The information listed below in regards to regimes and establishment of deciduous stands is general in nature and not intended to be a comprehensive guide to establishing a new crop of deciduous tree.

Deciduous production and management is supported by the following research:

- L.Sigurdson et al. 2nd draft report on Weyerhauser's Red Alder Management Practices (1998),
- 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).
- P.J. Courtin et al. Forest Research Extension Note 016 - Red Alder management trials in the Vancouver Forest Region (2002).

*** Within the W0046 Management Plan (produced in 1998) references are made to the deciduous species cottonwood. In 1998 cottonwood was considered as being a viable*

deciduous species for the pulp and paper market. Since then cottonwood is no longer considered as a viable deciduous species due to declining interest by the pulp and paper sector – rather red alder and maple are marketable as a high value furniture stock.

Regime:

The product objective is to manage for high quality knot-free sawlogs on a 40 - 50 year rotation. Establish stand 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 ten years to maintain good crown forms and eliminate low quality stems. The minimum free growing height criterion for deciduous species is based on the tallest conifer standard for each site series.

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 behind. 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.

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.