

ZEBALLOS

FOREST STEWARDSHIP PLAN

Material Accompanying the FSP

But Is Not Part of the FSP

**Information Provided in Anticipation of Request from
Minister (FRPA s.16(2.1) and FPPR s.24)**



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1.0 Introduction

The intent of this document is to provide clarification of results or strategies contained in the Forest Stewardship Plan. Information provided is based on discussions with agency personnel leading up to and following review and comment and was provided in the spirit of section 16(2.1) of the Forest and Range Practices Act and section 24 (2) of the Forest Planning and Practices Regulation.

2.0 Order Establishing Provincial Non-Spatial Old Growth Objectives (FSP Sect 6.1.1)

Objective: Refer to the Old Growth Order effective June 30, 2004 (<http://srmwww.gov.bc.ca/rmd/oldgrowth/pdf/Old%20Growth%20Order%20May18th%20FINAL%2004%20.pdf>) for details. The following summary of the objective is for convenience only and is not to be relied upon:

“To contribute to the conservation of biodiversity, maintain old forest by biogeoclimatic (BEC) variant within each landscape unit according to forest age and the percentage of old forest retention specified below by BEC Zone:

Biogeoclimatic Zone	Age of Old Forest	% Old Forest Retention in Low BEO	% Old Forest Retention in Intermediate BEO	% Old Forest Retention in High BEO
CWH	>250yrs	>13	>13	>19
MH	>250yrs	>19	>19	>28

and, subject to:

- draw down by up to 2/3 in low emphasis landscape units, and*
- in intermediate and high emphasis landscape units by permitting stands less than the age of old specified in the tables to contribute up to 20% of the old forest target.”*

For Landscape Units or portions thereof where wind disturbance history warrants, old forest is defined as >140 years and retention targets are varied within BEC zones to 11, 11, and 16% for Low, Intermediate, and High Biodiversity Emphasis respectively. Where applicable, the results specified in the result or strategies table may be modified accordingly based on the revised percentages applied to the Landscape Unit or portions thereof. This change has not been applied for the purposes of the above Table and will only be made via an approved amendment of this Plan.

Wind disturbance history is easily discernable where the most recent disturbance occurred in the last century or two and a more or less even-aged stand was

initiated. These stands - typically hemlock-balsam dominated - occurred commonly on northern Vancouver Island and an example can be observed along the Zeballos FSR. As older catastrophic wind disturbances are not easily identified, determining the disturbance interval reliably is impossible. It is not known if the stands of recent windthrow origin are likely to be windthrown again before developing old growth structural characteristics. It is not known if old growth hemlock/balsam stands have merely escaped disturbance through chance and are thus overdue for a catastrophic event. On the other hand, cedar trees are long lived and it is clear that stands with old structural characteristics have been free of catastrophic disturbances for centuries. Old cedar stands are following an NDT1 regime, young hemlock/balsam stands of natural origin were most likely on an NDT3 path, and old hemlock/balsam stands may represent either disturbance regime.

These stands often form a mosaic, suggesting that disturbance regimes are more appropriately considered a stand level, not a landscape level, phenomenon. It follows then that parts of the CWH zone may be dominated by NDT1 and other parts may be dominated by NDT3 processes. It is also conceivable that the apparent dominant process in any particular landscape unit or portion thereof may change over time. Overlaying topographic considerations, it is conceivable that one side of a valley may be observed to be dominated by NDT1 and the other by NDT3. Given that a significant portion of a landscape unit may be in second growth of logging origin, there is no real way to say what their disturbance regime may have been.

In the case of the Zeballos FSP, this discussion is largely moot as for the most part there is sufficient constrained old forest to meet the higher percentages associated with NDT1. However, the Order does not specify at what scale disturbance type is to be inferred and in some situations sub-landscape analyses, perhaps even to the stand level, may be appropriate. In some situations it may be reasonable to derive a target percentage that represents a proportional blending of the NDT1 and NDT3 targets.

Result or Strategy

Applies to all FDUs

The Regional Land Use Plan database (RLUPS version 2.0 March 13, 2002) was the basis of calculations to determine if old forest from within the THLB was likely to be needed to attain the result. Results are stated for the BEC variant-Landscape Unit combinations occurring within the FSP area.

During the term of this FSP and to the degree possible due to circumstances within the control of the Licensees, minimum percentages of old forest (plus mature recruitment where applicable) will be maintained [611a]. Where a Landscape Unit is not entirely within the FSP area, the results stated apply only to that portion of the Landscape Unit within the FSP area until the amount of contributing old growth to be retained is apportioned by government among FSPs and/or Licensees.

Landscape Unit or portion	FDUs within	Biodiversity Emphasis	Lead Licensee	BEC Variant	Old Growth Target (%)	Draw Down to Maintain Timber Supply	RESULT: Min. % Old Growth Retention + Suitable Recruitment	THLB old forest retention required if no recruitment?
Zeballos (low)	I,L, X,O	L	WFP	CWHvm1	>13%	-	13.0%	-
				CWHvm2	>13%	-	13.0%	-
				MHmm1	>19%	-	19.0%	-
				MHmp1	>19%	-	19.0%	-
Kaouk (intermediate)	m,n	I	WFP	CWHvh1	>13%	-	13.0%	yes
				CWHvm1	>13%	-	13.0%	-
				CWHvm2	>13%	-	13.0%	-
				MHmm1	>19%	-	19.0%	-
Artlish (intermediate)	p,o	I	WFP	CWHvh1	>13%	-	13.0%	yes
				CWHvm1	>13%	-	13.0%	-
				CWHvm2	>13%	-	13.0%	-
				MHmm1	>19%	-	19.0%	-
Eliza (low)	Z,k,h	L	WFP	CWHvh1	>13%	-	13.0%	-
				CWHvm1	>13%	-	13.0%	-
				CWHvm2	>13%	-	13.0%	-
				MHmm1	>19%	-	19.0%	-

Annually, all Licensees signatory to this FSP are to agree in writing to a total harvest area attributable to each Licensee prior to harvesting any block in a BEC variant-Landscape Unit combination where old growth retention in the THLB is indicated in the table above. A Licensee harvesting without or contrary to an all Licensee agreement assumes responsibility

Result or Strategy**Applies to all FDUs**

for this result irrespective of the later harvesting activities of the other signatory and agreeing Licensees. Otherwise, where all Licensee written agreement is documented and with respect to this result only, the Lead Licensee assumes responsibility for the legally authorized and agreed to harvesting of all signatory Licensees, provided total harvest area by BEC variant - Landscape Unit attributable to each Licensee remains as agreed.

These result calculations and responsibilities are based on the non-spatial RLUPS database. As inventories are updated the calculations may change; hence the Lead Licensee will maintain area accounting to ensure that the stated percentage result for any BEC variant-Landscape Unit is attained. Where a Licensee completes or becomes aware of an inventory update, that Licensee is to promptly share the revised information with the other Licensees. Where a calculated result for a BEC variant – Landscape Unit is potentially compromised by an updated inventory or other information, all Licensees are to agree in writing to a revised strategy to attain the stated non-spatial result.

This result remains in effect until draft OGMA's have been established. At such time these spatially defined areas will be amended to this plan [611b] replacing this non-spatial result.

The following table demonstrates where current old growth areas within the non-contributing land base are in relation to old growth targets within individual landscape units.

Table 1: Old Growth in Non-Contributing Land Base by Landscape Unit

Landscape Unit	FDUs within	Biodiversity Emphasis	Productive Forest (ha)	Old Forest (ha)	Old Target (ha)	Non-Contributing Old (ha)	Contributing Old to be retained before 2/3 or 20% drawdown (ha)	drawdown applies?	Lead Licensee	BEC Variant	Old Growth Target (%)	Draw Down to Maintain Timber Supply	Recruitment of "Less than Old"	RESULT: Min. % Old Growth Retention	THLB old forest potentially required?
Zeballos (low)	I, L, X, O	L	7,171.0	3,395.9	932.2	1346.9		-	WFP	CWHvm1	>13%	-	-	13.0%	-
			4,915.5	4,075.2	639.0	2254.6		-		CWHvm2	>13%	-	-	13.0%	-
			1,534.5	1,504.3	291.6	1087.9		-		MHm1	>19%	-	-	19.0%	-
			26.0	26.0	4.9	23.5		-		MHmmp1	>19%	-	-	19.0%	-
Kaouk (intermediate)	m,n	I	3,352.0	541.4	435.8	270.3	165.5	-	WFP	CWHvh1	>13%	-	-	13.0%	yes
			14,157.4	5,281.5	1,840.5	2390.7		-		CWHvm1	>13%	-	-	13.0%	-
			4,218.4	2,977.4	548.4	2372		-		CWHvm2	>13%	-	-	13.0%	-
			605.6	528.0	115.1	505.6		-		MHm1	>19%	-	-	19.0%	-
Artlish (intermediate)	p,o	I	1218	262.5	158.3	43.2	115.1	-	WFP	CWHvh1	>13%	-	-	13.0%	yes
			8456.7	4267	1,099.4	2294.2		-		CWHvm1	>13%	-	-	13.0%	-
			3939.3	3225.9	512.1	2545.2		-		CWHvm2	>13%	-	-	13.0%	-
			551.1	551.1	104.7	523.7		-		MHm1	>19%	-	-	19.0%	-
Eliza (low)	Z,k,h	L	6,462.6	2,684.5	840.1	1970.9		-	WFP	CWHvh1	>13%	-	-	13.0%	-
			22,591.4	8,407.4	2,936.9	4982.6		-		CWHvm1	>13%	-	-	13.0%	-
			3,792.4	2,390.1	493.0	1771.2		-		CWHvm2	>13%	-	-	13.0%	-
			98.8	91.6	18.8	87.1		-		MHm1	>19%	-	-	19.0%	-

The table indicates that only in the CWHvh1 portions of the Kaouk and Artlish landscape units is old growth in the THLB (contributing) needed to attain the minimum percentage.

The table also shows that the contributing old growth requirement is <10% of the available contributing old growth [Col 8 total / (Col 5 total – Col 7 total)]. It is unlikely that Licensees within or outside of the FSP area could in the normal course of development (e.g. green-up constraint) harvest anywhere near 90% of the contributing CWHvh1 in the up to 8 years from the development of the RLUPs database to the completion of Land Use Planning or FSP expiry.

For any harvesting proposed in the CWHvh1 in the Artlish or Kaouk Landscape Units, Licensee development planners will request a GIS overlay of the Landscape Unit/FSP overlap area to ensure that at least the area indicated in the “Contributing Old to be Retained” remains within the overlap area. Where this is not the case the Licensee will undertake further investigation and due diligence to show:

1. in consultation with adjacent FSP holders, that sufficient non-contributing old growth remains outside the FSP area.
2. that a recruitment is viable and appropriate, or
3. that an alternate natural disturbance regime is applicable

such that the target percentages are attained.

Within the FSP area, signatory Licensees must agree on annual harvesting area for those BEC variant / landscape unit combinations where there is a shortage of old growth to ensure that target percentages for old growth retention are attained. The agreement between Licensees must be the basis for Compliance and Enforcement as it is not reasonable to punish Licensee B for compromising the old growth retention target if it was due to earlier cutting by Licensee A contrary to agreement between Licensees. Within the Zeballos FSP this is currently moot, as WFP will be handling planning for NSEDC, but may become important should a third Licensee wish to join this FSP.

The Licensees cannot foresee or control many events or factors that may affect the amount of or measurement of old growth in a Landscape Unit. These may include, but are not limited to: perturbations by natural events, harvesting under authority of an overlapping FSP, clearing for other industries or infrastructures, public use of forests, and/or shortcomings within the RLUPS database. The signatory Licensees cannot be accountable for such events or factors and nor can the Licensee be accountable for such things that may occur after the expiry of this FSP.

Of course much of the discussion above is to manage old growth retention in the interim period leading up to completion of Land Use Plans. Once this is accomplished, this result and supporting strategy will be unnecessary.

3.0 Vancouver Island Land Use Plan Higher Level Plan Order (FSP Sect 6.1.2)

Enhanced Forestry Zones

Objective 7: *To increase the short-term availability of timber,*

- (a) *a cutblock may be larger than 40 ha pursuant to section 11(2)(a) of the OPR; and*
- (b) *pursuant to section 68(4) of the OPR, a cutblock is greened-up if it is adequately stocked and the average height of those trees that are*
 - i. the tallest tree in each 0.01 ha plot included in a representative sample, and*
 - ii. commercially valuable species or other species acceptable to the district manager*

is at least 1.3 meters;

unless the district manager determines that a cutblock referred to under (a) or (b) would significantly impact specific hydrological, wildlife, biodiversity, scenic or recreation values.

Maximum Cutblock Size

Result or Strategy	Applies to FDUs “Z”, “k”, and “h” only
<p>Individual blocks or multiple blocks may form a <u>contiguous not greened up area larger than 40 hectares</u> [612b] in size where:</p> <ol style="list-style-type: none"> 1. significant impacts to wildlife, biodiversity, or recreation values are unlikely, 2. scenic values are addressed as per Section 6.2.8.1 and 3. monitoring confirms that watershed equivalent clearcut areas are: <ol style="list-style-type: none"> a. below 30%, b. between 30% and 40% with no significant indications of watershed instability, or c. greater than or equal to 40% only where supporting hydrological information confirms that significant cumulative impacts over and above known channel impacts related to historic forest development are unlikely. 	

Additional Information and Rationale:

In Enhanced Zones, timber was recognized as the primary resource objective and larger cutblocks were to be permitted to facilitate timber production in the short term, provided that specific non-timber values could be accommodated without significant impact. In some instances, larger cutblocks could enhance biodiversity values by providing spatially and temporally for a wider range of patch sizes.

The concern with this objective under FRPA is that the District Manager may not have the opportunity of seeing specific cutblock details on size and location until late in the planning process when an area is declared or a cutting permit or road permit has been submitted. Should the District Manager choose to make a determination about the significance of specific hydrological, wildlife, biodiversity, scenic or recreation values at the time a cutblock is declared or prior to issuing a harvest authorization, Licensee professionals could provide supportive reasoning if requested. Professional accountability should provide comfort that significant impacts to these (and other) values have been avoided. If the District Manager recognizes a need for a determination, but not until late in the cutting permit application stage, delays may reduce operational flexibility and increase delivered wood costs.

4.0 Timber (FSP Sect 6.2.2)

The land available for growing, tending, and harvesting trees has been shrinking on Vancouver Island as hundreds of thousands of hectares have been set aside from commercial forest use for parks, ecological reserves, riparian reserves, ungulate and other wildlife reserves, recreation sites, or old growth management areas. Additional areas have been removed for other higher uses such as roads, lodges, urban expansion, hydroelectric infrastructures, and mines. The land remaining for timber production is subject to an abundance of constraints for wildlife, biodiversity, cultural heritage, visual quality, soil, hydrological, water quality, and fisheries concerns that further restrict timber supply, competitiveness, and ability to exercise harvesting rights. In the case of TFL 19, less than half of the total land area is suitable and available for timber production such that the current AAC is estimated to be 282,000 m³/year less than its unconstrained potential. This volume represents a reduction in the value of wood product shipments¹ of about \$88,000,000 annually and therefore a significant loss to the local, regional, and Provincial economies.

¹ based on value of shipments(\$)/harvest (m3) = \$312/m³; see http://www.nrcan.gc.ca/cfs-scf/national/what-quoi/sof/sof02/profilesBC_e.html

Recognizing the socio-economic importance of the forest industry to the Province of B.C., the government created three objectives under FPPR (Section 6) to:

- (a) *maintain or enhance an economically valuable supply of commercial timber from British Columbia's forests, and*
- (b) *ensure that delivered wood costs, generally, after taking into account the effect on them of the relevant provisions of this regulation and of the Act, are competitive in relation to equivalent costs in relation to regulated primary forest activities in other jurisdictions, and*
- (c) *ensure that the provisions of this regulation and of the Act that pertain to primary forest activities do not unduly constrain the ability of a holder of an agreement under the Forest Act to exercise the holder's rights under the agreement.*

Government legislators also recognized the importance of not unnecessarily eroding the forest industry further when attempting to meet objectives for wildlife and biodiversity; water, fish, wildlife and biodiversity in riparian areas; fish in sensitive watersheds; ensuring the survival of wildlife; and conserving soils. Specifically (FPPR Sections 5, 7, 8, 8.1, 9, 9.1) objectives for these values include an integral provision that these objectives are to be implemented “without unduly reducing the supply of timber”.

Many of the land use and operating constraint decisions that have affected the supply of timber, delivered wood costs, and Licensee rights to date may not have been fully informed of the economic impacts on individual licensees, the social impacts on direct and indirect forest workers, their dependents, and the communities in which they live, nor by science-based estimates of biological carrying capacity. With time it has become apparent that some of the assumptions on which such decisions were based may have been flawed to varying degrees. These strategies were developed to ensure that proposed or future removals of THLB or additions of operating constraints are duly considered for their local as well as regional and Provincial socio-economic repercussions, and are based on a thorough vetting of the latest biological and ecological information.

As impacts to the forest industry can come from two sources – THLB re-designations or operating constraints on activities occurring in the THLB – two separate strategies are needed.

The strategies proposed are outlined on the following pages.

The first strategy is:

Result or Strategy	Applies to all FDUs
<p>Should the <u>current TSR THLB of 22,125.3 ha be reduced or constrained</u> to effectively reduce the THLB, for the management of biodiversity or wildlife values, to 22,014.7 ha or less (-0.5%) then otherwise operable map units associated with one or a combination of the following values:</p> <ul style="list-style-type: none"> • Species at risk, regionally important wildlife, specified ungulate species • Riparian area • Biodiversity – wildlife tree retention areas • Wildlife habitat <p>and occupying an area equivalent to at least twice the reduction area may be identified by the Licensee as candidate rollback areas. Candidate areas are then to be evaluated and numerically ranked by qualified professionals with respect to their utility:</p> <ul style="list-style-type: none"> • for maintaining or conserving the intended biological value(s) from lowest to highest utility (1 to X), and • for maintaining timber supply, economic activity, and associated human communities from highest to lowest utility (1 to X). <p>Within 90 days of notification by the Licensee, the Ministry of Water, Land and Air Protection is requested to review the biological rankings of the polygons and confirm the ranking, or provide a replacement ranking.</p> <p>Within 120 days of original notification of the Ministry, the Licensee is to submit <u>an amendment application</u> to the Delegated Decision Maker proposing, to the extent that the THLB is reduced below 22,125.3 hectares, specific rollbacks of THLB withdrawals that were designated for one or more of the values above and <u>requesting a balancing of objectives</u> [622a] under section 27 of FPPR. The sum of the nominal timber and biological rankings will provide a numerical ranking for potential release of candidate areas to the THLB. Candidate areas will be proposed for release to the THLB starting with those of lowest sum rank and adding additional units in order until the estimated operable and merchantable timber volume of the map units released is equivalent to the estimated operable and merchantable timber volume of the original THLB reduction.</p>	

Additional Information and Rationale:

The first strategy addresses changes in the amount of THLB and uses the existing THLB as a benchmark. Recognizing that small changes are inevitable as land uses change, the obligations on the licensee under this strategy do not become active until a threshold is reached and the Licensee identifies that alternatives may be feasible. This threshold is arbitrarily set at a 0.5% downward change in the total THLB within the FSP area. Recognizing that changes due to operability, soils, or reclassification of non-fish streams to fish streams are likely to be small and to avoid superfluous requests, such changes are not triggers.

On the other hand changes brought on by biodiversity or wildlife requirements have and are expected to continue to put considerable strain on the value and supply of commercial timber locally and provincially, and thus are the trigger mechanism for the requirements of the strategy.

The THLB figure is the combined area from the spatially defined THLB occurring in TFL 19 and the Strathcona TSA and overlapping the FSP area.

It is also recognized that the amount of THLB could change with future timber supply reviews that could occur during the term of the FSP. To avoid confounding this analysis with new timber supply data that may become available at different times and for different portions of the FSP area over time, the analysis is based on the THLB known at the time this plan was prepared.

When the strategy is triggered, the Licensee is required to select reserved areas that would otherwise be suitable for timber production. In the past reserves may have been selected based on scant or no non-timber resource inventory information. In these cases these reserves may be less effective or ineffective for their designated purposes and could be candidates for return to the working forest. The Licensee must select reserved polygons in sufficient quantity to allow decision makers the flexibility to chose among the selected polygons and thus achieve balance of socio-economic and ecological objectives. In this strategy we have specified a minimum area equal to at least twice the size of the THLB reduction area to provide this flexibility.

The types of polygons that the Licensee may propose are restricted to wildlife and biodiversity related ones that occur within the FSP area. Parks and other external reserves would not be selected for consideration as these are outside the Licensee's tenured area. It is noted, however, that in some instances use of these areas would increase flexibility and options and thus likely achieve a better balancing of objectives.

Once the Licensee selects candidate areas as set out above, the Licensee will engage a professional forester to rank the candidate areas with respect to their utility for producing timber, generating economic activity, and for sustaining local communities from highest (rank #1) to lowest utility. A professional biologist will be engaged to rank the candidate areas with respect to their utility for meeting the originally intended purpose of the reserve from highest to lowest utility (rank #1). The Ministry of Water, Land and Air Protection will be provided an opportunity of 90 days to agree with the latter ranking or to provide a replacement ranking.

The following table outlines an example to demonstrate how the economic and biological rankings would be combined to produce a ranking of polygons for release to the THLB.

Table 2: Timber Objective #1 Example

Volume of Reduction = 120 ha @ 730 m3/ha = 87,600 m3

Polygon	BIOLOGICAL		ECONOMIC		RANK SUM	RELEASE RANK	Potential Volume (m3)	Recommended Release (m3)
	Value	Numeric Rank	Value	Numeric Rank				
A	M	3	VL	5	8	4th	36,000	
B	VL	1	VH	1	2	1st	26,000	26,000
C	VH	5	L	4	9	5th	47,000	
D	L	2	H	2	4	2nd	38,000	38,000
E	H	4	M	3	7	3rd	28,000	23,600
							175,000	87,600

In this example, polygons B, D and part of E would be released to compensate for ecological withdrawals of THLB elsewhere and polygons A, C, and part of E would be retained for their original purpose.

The amendment request is to include a combined ranking of timber and biological ranks such that on balance the areas with the highest biological value and the lowest timber value remain reserved and the areas with the highest timber value and lowest biological value are proposed for release back into the working forest.

To be in compliance, the Licensee has 120 days after notification of agencies to submit an application for amendment of the FSP. The amendment is to request that the designated decision maker consider re-designating some of the reserved polygons to restore the THLB to, or as near as possible to, its original timber potential, under the balancing provisions (section 27) of FPPR and the government's objectives for timber (section 6). The designated decision maker may determine to do nothing at all, or to require changes to results or strategies that increase constraints on, and withdrawals from, the THLB if he determines such changes are necessary to achieve or maintain a balance of competing values and interests. If rejecting the Licensee's proposal the delegated decision maker will provide reasons according to the requirements of FRPA Section 16(3).

The second strategy is as follows:

Result or Strategy – Applies to all FDUs

Should, for the purposes of managing non-timber values, the current TSR THLB of 22,125.3 ha be reduced or constrained to in effect reduce the THLB such that the timber supply flow (current TSR base case) would be reduced, then modification of provisions for one or a combination of the following values may be proposed:

- Maximum cutblock size
- Reducing green up requirements
- Visual quality
- Water quality
- Fisheries sensitivity

To the extent that the THLB is reduced below 22,125.3 hectares or the modeled timber supply flow is reduced, within 90 days of notification by the Licensee, the Ministry of Sustainable Resource Management, in consultation with other affected agencies, is requested to recommend for relaxation one or a combination of the above provisions to the extent necessary to maintain short and long term timber flows. Verification of timber supply flow impacts is to be by modeling the TSR base case with original input assumptions modified to reflect relaxation of the non-timber provisions, but with base case harvest flow requests intact.

The Licensee is to submit an amendment application to the Delegated Decision Maker within 120 days of original notification requesting a balancing of objectives [622b] under section 27 of FPPR and proposing modifications to one or a combination of provisions for the values above based on recommendations of the Ministry, or where recommendations are not received or are found insufficient to restore timber supply, based on the Licensee's analysis of each provision's impact on timber supply and the other resource value.

The second strategy addresses changes in the constraints affecting the THLB or effective reductions to the THLB for reasons not directly related to wildlife or biodiversity reserve designations. These "soft" constraints or reductions may include - but are not limited to - visual quality, community watersheds, rate of cut restrictions, seral stage management, green-up provisions, and block-size restrictions. The principle is that if a new restriction or THLB reduction is introduced that reduces the short, mid or long term timber supply, then to compensate, other constraints should be considered for relaxation to ensure that an appropriate balance is maintained.

In this case the Ministry of Sustainable Resource Management is, if initiated by the Licensee, requested to suggest a constraint or constraints that might be considered for relaxation. The Licensee is to model the effect of the relaxed constraint(s) to see if the impact to the base case is nullified. The Licensee's obligation is to, within 120 days of notifying the Ministry, submit a request to the

designated decision maker to amend the FSP. The amendment will identify the constraint suggested by the Ministry and its ameliorating effect on timber supply, or another constraint, and an associated addition, modification or deletion of an appropriate FSP result or strategy to implement the change. The designated decision maker will be asked to consider the FPPR objectives for timber (Section 6) and the balancing provisions of Section 27, and as per the first strategy may reject or modify, the suggested adjustment of a constraint.

The third proposed strategy is as follows:

FDU	Result or Strategy
Entire FSP	Where funding is provided through government sources and subject to efficacy, environmental concerns and other restrictions, the Licensee will undertake forest fertilization projects on Crown land to increase the future supply of timber.

Additional Information and Rationale:

The Licensee is willing to implement, on the government's behalf, silviculture programs that will improve the supply of timber, but given the insecurity of tenure and continuing erosion of the working forest, is unable to fund these activities. With the exception of fertilization, there are few silviculture activities which could significantly increase the short or mid term supply of timber given current age class structures.

The fourth proposed strategy is as follows:

FDU	Result or Strategy
Entire FSP	Areas of timber damaged by wind or other agents and greater than 0.5 ha in continuous extent, if within TFL 19 will be assessed by the agreement holder or if within the TSA will be assessed by the holder of the nearest Cutting Permit within the FSP area. Where the assessment indicates that damaged timber can be feasibly and profitably recovered [622d], the Licensee completing the assessment will do so before the damaged timber degrades to the point where recovery becomes unprofitable.

Additional Information and Rationale:

Damaged timber, if not salvaged, becomes an important un-recovered loss, that may put downward pressure on the timber supply in future. The Licensees commit to salvage damaged timber provided the salvage operation can be carried out profitably. The Licensee's obligation is to assess damaged timber near their operations, and to expedite recovery of it where feasible and profitable.

5.0 Wildlife (FSP Sect 6.2.3)

5.1 Ungulates

In TFL 19, Ungulate Winter Ranges established December, 2004 by the Deputy Minister of Water, Land and Air Protection replace the Section 7 Notice issued July 27, 2004 and thus exempt the Licensee of the need to specify a result or strategy in the FSP.

In the Strathcona Timber Supply Area, Ungulate Winter Ranges remain in draft form and thus have not been officially designated. Therefore the July 27, 2004 notice specifying indicators of the amount, distribution and attributes of ungulate winter habitat applies. Negotiations have been ongoing for several years and the location of the majority of the old seral reserves in the FSP area have been agreed to. The proposed UWRs indicated on the FSP map are sufficient in amount of area, appropriate distribution, and have characteristics sufficient to provide winter habitat. The proposed strategy follows the requirements set out in typical Orders establishing UWRs.

5.2 Marbled Murrelet

The proposed strategy is:

Marbled Murrelet – Applies to all FDUs

WHA's for Marbled Murrelet have yet to be established within the area covered by this FSP. Preliminary habitat modeling based on the criteria specified in the Identified Wildlife Management Strategy Version 2004 has been completed for the FSP area and potentially suitable habitat in the non-contributing landbase has been identified.

The following strategy will be implemented by the Licensee over the term of this FSP to refine suitable Marbled Murrelet nesting habitat and establish appropriate WHAs that are consistent with government policy:

- Air photo interpretation and low-level aerial surveys using helicopters will be used to map and rank potentially suitable marbled murrelet habitat (these techniques are used to refine the habitat modeling). Ranking will be based on:
 - the size (area), integrity, and location of the area, relative to other areas of suitable habitat that are being considered;
 - distance to known or likely foraging areas at sea (patches of suitable habitat that are increasingly distant from foraging sites are less likely to be used by nesting murrelets);
 - other evidence of the use of the proposed area, such as radar counts, distribution of known nest sites in the area, and audio-visual survey results;
 - the role of the proposed WHA or maintained area within the entire murrelet conservation region (e.g., maintaining the spatial distribution of breeding murrelets across the region);

- the likely future of surrounding areas which might affect the suitability of the proposed area to be maintained as nesting habitat;
- the contribution that the proposed area might make to maintaining other wildlife or biodiversity attributes;
- economic and social implications of selecting the area as a WHA.
- Areas identified as having Moderate to Very High habitat values will be recommended and submitted to MWLAP for designation as WHAs.

Until WHAs are designated, the Licensees may submit new CP applications for harvesting in areas of Moderate to Very High habitat value within areas identified as inoperable in the last TSR, provided that an area equivalent in habitat value within the timber harvesting landbase, in addition to 143.1 ha, is retained. Once WHAs are approved the Licensees are exempt from this result or strategy.

Additional Information and Rationale:

At least 143.1 ha is to be deferred from harvesting in the timber harvesting land base during the term of the FSP or until WHAs are approved. This area represents 10% of the District THLB requirement of 1,431 ha. As the FSP area represents about 2-3% of the total District landbase, this provides a disproportionate buffer to ensure that enough habitat is retained over the period of the FSP to allow flexibility in the establishment of future WHAs, and also recognizes that the Zeballos area may contain a higher proportion of MaMu habitat than management units elsewhere in the District.

Our understanding of the intent of the Section 7 Notice is that there is a yet-to-be-determined amount of suitable habitat in portions of the land base that are inoperable or unavailable for timber production. This amount, plus the THLB budget, will be the basis of future WHA designations. It is widely recognized that operability lines drawn for the purposes of timber supply review are inexact. At operational scales harvesting may occur outside the operable classification; likewise significant portions of the operable classification are actually inoperable due to site level operational difficulties. The strategy recognizes the uncertainty around the actual amount of habitat in the non-THLB, as well as the operational reality of harvesting outside the operability line, by requiring that any loss of habitat to harvesting in the inoperable be compensated for by ensuring that a similar amount of additional habitat remains available within the THLB. This is an interim bridging strategy until more habitat inventories can be completed and WHAs, OGMA's, or other habitat reserves are drafted or designated.

5.3 Queen Charlotte Goshawk

No result or strategy is provided for “Queen Charlotte” Goshawk as the Order establishing Wildlife Habitat Areas for this species specifies that Licensees are exempt from this requirement in the Campbell River Forest District.

5.4 Other Species

For those species for which critical habitats have not been identified in the FSP area, strategies are general in nature. These commit the Licensees to following the intent of the Section 7 notice and/or the applicable 2004 Identified Wildlife Management Strategy, in the event that critical habitat is found during the term of this FSP.

This may include notification of government biologists or other interested parties and consultations with one or more experts in the biology and habitat requirements of the species as needed to determine the importance of identified habitat(s), the size, extent, likely distribution, or other attributes of the habitat, and the potential for establishment of a Wildlife Habitat Area. The Licensee(s) could:

- a. establish a new or expanded Wildlife Tree Patch,
- b. propose the establishment of a WHA to the Minister responsible including an estimate of timber supply impacts, if any; and/or
- c. submit a request to the Minister responsible for an amendment of the applicable result or strategy to ensure that indicators for the species are unlikely to be adversely affected during the term of the plan.

As the amount of additional or new habitat required for these species overall is relatively modest, it is anticipated that existing reserves (riparian areas, WTPs, and others) will be able to accommodate the majority of their critical habitat requirements.

Tailed frogs are not known and have not been documented within the FSP area nor on Vancouver Island generally, hence no result or strategy is necessary for this species.

References to FPPR Sections 6 and 7 do not in any way fetter or constrain Ministerial decision making and serve only as a reminder of the important inter-relationship between these two FRPA objectives, among others.

6.0 Riparian (FSP Sect 6.2.4)

Objective set by government for water, fish, wildlife and biodiversity within riparian areas (FPPR Section 8).

The objective set by government for water, fish, wildlife and biodiversity within riparian areas is, without unduly reducing the supply of timber from British Columbia's forests, to conserve, at the landscape level, the water quality, fish habitat, wildlife habitat and biodiversity associated with those riparian areas.

6.1 Restrictions within a Riparian Reserve Zone (RRZ)

Result or Strategy for conditional exemption under FPPR Section 12.3(5)	Applies to all FDUs
<p>The legislated exceptions set out in <u>FPPR section 51(1,2) (December, 2004) continue to apply</u> [6241] and in addition within the RRZ of streams (S3 only) and wetlands (W1, W5):</p> <ul style="list-style-type: none">a. <u>a tree or trees having a high likelihood of being windthrown and of creating a material adverse effect on the aquatic system or RRZ may be felled</u> [6241a],b. <u>removal of the felled tree(s)</u> [6241b] may occur only if the removal will not have a material adverse effect on the aquatic system or RRZ, andc. at plan expiry, a tree or trees containing substitute <u>wildlife and biodiversity attributes of similar or better ecological value and that would have been otherwise harvestable, will have been reserved from harvest within or adjacent to a RMA elsewhere</u> [6241c] within the FDU. The reserved tree(s) will be:<ul style="list-style-type: none">i. incorporated into wildlife tree retention,ii. representative of the tree species removed, andiii. in a location of similar ecological characteristics	
<p>The Licensee is exempt from the legislated practice requirement stated under FPPR 51(3) and instead may carry out <u>spacing or thinning in second growth riparian reserve zones</u> [6241d] to:</p> <ul style="list-style-type: none">a. enhance wildlife values,b. enhance fisheries values,c. create old growth characteristics, or <p>reduce future windthrow potential.</p>	

Additional Information and Rationale:

In coastal British Columbia, windthrow presents a significant risk to post-harvest maintenance of riparian management areas and their associated values, particularly stream bank stability. Windthrow affects riparian areas through the introduction of large woody debris and sediment, and may initiate destabilizing processes in some stream channels; thereby compromising some or all of the objectives listed above. Management practices in riparian zones with higher windthrow hazards will quite often focus on edge manipulation techniques to minimize these effects. Layout personnel often attempt to establish boundaries and RMA's in timber types that have a low windthrow hazard. However, in some situations it will not be possible to prevent windthrow or reduce it to acceptable levels.

Along those S3 streams or W1 or W5 wetlands where there is a high likelihood of windthrow, the consequence of windthrow would create a material adverse effect on the values of the riparian reserve, and reservation of the riparian management zone is unlikely to adequately buffer the reserve zone individual trees or groups of trees within the RRZ could be felled. Felling of trees would be done to reduce the potential for damage created through windthrow. Felled trees may be removed if doing so would not create a material adverse effect on the riparian reserve zone.

Provisions in FPPR Section 51(1) recognize that windthrow is an issue in riparian reserve zones. FPPR Section 51(1)(b) authorizes the “topping or pruning of a tree that is not windfirm”, while FPPR Section 51(1)(g) authorizes the “felling or modifying of a tree that has been windthrown . . .” in a riparian reserve zone. Authorization of these activities within the FPPR suggests consistency with the objective set by government for water, fish, wildlife, and biodiversity in riparian areas.

The FPPR only allows windthrow to be dealt with after occurrence. Damage to streambanks and both aquatic and terrestrial habitats may have already occurred, and be difficult to remediate. The above alternative presents a proactive approach to managing catastrophic and/or damaging – as opposed to endemic or incidental – windthrow. The intention is to reduce streambank disturbance and short term overloading of streams with coarse woody debris, while still ensuring that wildlife habitat and biodiversity values that may have been compromised by preventative tree felling are maintained in more windfirm locations.

In order to meet this objective, water quality, fish habitat, wildlife habitat and biodiversity must be conserved at the landscape level. When felling a portion of a RRZ is prescribed to protect water quality or fish habitat, associated biodiversity and/or wildlife habitat values could be compromised. To compensate, a reasonably representative area having attributes similar to those affected would be designated as a reserve in order to maintain biodiversity and/or wildlife habitat values across the landscape. These alternate reserves would be established within or adjacent to (i.e add-ons to) riparian management zones in the general vicinity (within the FDU for ease of definition). Maintaining substitute reserves adjacent to existing riparian habitat and/or RMA reserves ensures that the biodiversity and habitat values substituted are likely to be riparian-associated, and thus similar in character. Maintaining substitute reserves in the same FDU (often with natural and topographic boundaries) promotes general consistency with the landscape aspect of the objective (FPPR s. 8)

As single or small groups of trees may be removed (if likely to disrupt aquatic functions when uprooted), the Licensee believes it more practical to accumulate these removals over the term of the plan. These small removals would be amalgamated into a few or even a single, reserve within the FDU that is more

functional in an ecological sense and easier to track into the future using GIS. Internal corporate strategy may be to identify in advance reserve areas totalling perhaps 2-5 ha for each FDU, and to thereafter maintain an accounting of the cutblock-by-cutblock drawdown from this reserve “budget”.

Second growth silviculture treatments to enhance wildlife and fisheries values, create old growth characteristics and reduce windthrow potential may be done within RRZ's. This work involves stand conversion and conifer release, treatment of individual trees, juvenile spacing, pre-commercial thinning, gap creation and felling of individual trees and groups of trees across streams to provide LWD in streams where LWD is lacking. These activities would be done to improve the natural characteristics of coastal streams that have been disturbed by harvesting and/or other human-induced or natural events. In doing so these activities are consistent with the objective set by government for water, fish, wildlife, and biodiversity in riparian areas.

6.2 Forest Practices in a Riparian Management Zone (RMZ)

Result or Strategy	Applies to all FDUs
<p><u>S1-3, W1, W5 RMZs (FPPR Section 12(3))</u></p> <p>Unless specific wildlife and/or biodiversity values are identified in the RMA <u>retention of trees within the RMZ will be based on consideration of the likelihood of damages [6242c] to the RRZ caused by windthrow.</u> Specifically for stands with:</p> <ol style="list-style-type: none"> 1. a Low likelihood of post-harvest windthrow within the RRZ, retention of trees is unnecessary in the RMZ. 2. a Moderate or High likelihood of post-harvest windthrow within the RRZ, <ol style="list-style-type: none"> a. retention will vary, with possible edge manipulation treatments to improve wind-firmness in the RMA. b. where trees are felled under section 6.2.4.1, retention may be reduced to minimize windthrow hazards. <p>Should specific wildlife and/or biodiversity values be identified appropriate retention levels will be maintained to conserve and protect these values.</p>	
<p><u>S4-6, L3, W3 RMZs including S4-6 RMZs not defined in FPPR Section 52(2) (FPPR Section 12(3))</u></p> <p><u>Trees will be retained where necessary to protect [6242d] the integrity of the stream bank, channel, or waterbody, on a site-specific basis within the RMZ, where it will benefit the protection of identified water quality, fish habitat, wildlife, and/or biodiversity values.</u></p>	

Additional Information and Rationale:

As described above, the greatest post-harvest risk to the conservation of water, fish, wildlife, and biodiversity values within riparian areas is windthrow. The strategy proposed for RMZs parallels and complements the RRZ strategy above.

Although not recognized in the purposes set out in the FPPR definitions of RRZ and RMZ, the “without unduly reducing the supply of timber” aspect of the objective suggests that in RMAs there is to be a balance between timber production and the four ecological values. As the RRZ is preserved in most instances (the occasional exceptions set out in the strategy for RRZs above) and is therefore the focus of ecological conservation, it would seem to follow that timber production should be an important value in the RMZ. As ecological values such as wildlife and biodiversity often increase in prominence with proximity to the stream, so too should timber importance increase with distance from the stream.

Harvesting trees prone to windthrow and likely to damage water quality and fish habitat would be a win-win in that water quality and fish habitat would be conserved, and the supply of timber maintained. Thus the strategy is complementary to both objectives (FPPR s. 6 & 8). Likewise if trees in the RMZ are not crucial to the conservation of wildlife habitat or biodiversity, harvesting them in support of the “unduly clause” would seem to strike a reasonable balance between non-timber and timber interests.

The strategy hinges on the likelihood of windthrow damage to the four values stated in the objective.

Where the likelihood is low, removal of trees from a RMZ adjacent to RRZ is unlikely to significantly compromise susceptibility of the RRZ to windthrow. If the trees felled in the RMZ, and their associated understory, are relatively common in terms of their habitat and biodiversity value, then harvesting would be a reasonable, balanced approach to accommodate timber objectives. If on the other hand, trees in the RMZ support specific wildlife and/or biodiversity values of significance or ecological functions along small fish bearing waters (i.e. S4), then effort would focus on conserving these values first and maintaining timber supply second. Examples of specific wildlife and/or biodiversity values may include, but would not be limited to: red-listed site series in an old seral condition, critical habitats for plant or animal species-at-risk, bear or other dens, raptor nests, perch trees, unusually high snag density, or other site-specific features identified by government or other professional biologists.

Where the likelihood of windthrow is high, removal of trees from RMZs may be a prudent approach to prevent or reduce damage to water quality and fish habitat values. This approach would be applicable where there is no adjacent RRZ, or where the windthrow hazard in an adjacent RRZ has been ameliorated using pruning/topping techniques and/or the RRZ strategy above. In the situation

where there is no RRZ, but significant values exist (e.g. S4 streams, S6 gullies) retention of understory or other windfirm trees and shrubs sufficient to protect the stream values are important.

Where the likelihood of windthrow is moderate, results are less predictable and implementation of strategies to balance ecological and timber values in RMZs are more difficult. Particularly in these instances, professional reliance is needed to understand, document and integrate the nuances of edaphic, topographical, tree height, tree species, prevailing storm winds, and other factors to come up with a site prescription with the highest probability of success.

It is noted however, that success is not guaranteed and a rare or unusual storm event could wreck havoc with any strategy, whether in the moderate, low, or high hazard category.

Pruning and topping treatments are a valuable part of the prescribing professional's tool kit for managing windthrow. Unfortunately, expense and human safety considerations make widespread application of these techniques impractical. They are most commonly used where they can be applied judiciously with good result. Moderate hazard stands would be a primary example, where success can be achieved by treating the relatively few, most susceptible trees. Topping and pruning treatments would often be used in conjunction with the proposed RMZ strategy.

It is sometimes suggested that where windthrow hazard exists, the precautionary approach is to merely expand the size of the RMZ to increase the RMA buffer along the stream. However, particularly in exposed and high rainfall locations near the coast, this may simply increase the amount of forest windthrown, increase the loading of debris in streams, or perhaps trigger landslides if implemented on steep terrain or along gullies. As well, this added area of salvage will have an undue effect on the timber supply, the License's harvesting costs/competitiveness, and the safety of workers.

Thus only where specific wildlife and/or biodiversity values of special significance are identified in the RMZ, would extraordinary efforts such as additional topping, pruning, or widening of the RMA be warranted. Associated with these efforts would be impacts on safety, delivered wood costs, and timber supply.

Although the FPPR Section 8 objective to which this strategy is directed does not specifically name anadromous fishes or the interests of the federal Fisheries and Oceans department, the protection of freshwater salmon habitats remains paramount under the Forest and Range Practices Act, as it was under the Code. Nothing in this strategy is meant to diminish habitat protection for anadromous fish species and WFP expects to continue to manage for salmon, particularly those species (i.e. coho) that rear in small streams and back channels. In the past WFP has been a significant proponent and participant in salmonid enhancement and restoration projects and independent audits have found

management of S4 streams to be above average. We do expect to continue these traditions.

7.0 Fisheries Sensitive Watersheds (FSP Sect 6.2.5)

The Artlish Watershed was declared fisheries sensitive by Order in Council on February 24, 2005. As this occurred after the Date of Submission of the FSP under FPPR 14(2)(b)(i) it need not be addressed in the FSP, yet FPPR 2(4) implies that FPPR 14(2)(b)(i) doesn't apply as objectives (e.g. FPPR 8.1) apply immediately. As this FSP did not receive approval on or before June 1 then FRPA 16(2) applies and therefore the FPPR 8.1 objective need not be addressed. Uncertain of the legal requirement but in consideration of the intent, the Licensee is voluntarily including the FPPR 8.1 objective and is providing a strategy for FDUs "o" and "p" for the temporary period ending December 31, 2005. Assuming that government will be providing further direction for the Artlish watershed via the Government Actions Regulation, the Licensee will amend the FSP at that time, if necessary to address any new or modified objective(s) that may be established.

Objectives set by government for fish habitat in fisheries sensitive watersheds (FPPR Section 8.1)

Until December 31, 2005 the objective set by government for fish habitat in fisheries sensitive watersheds is to prevent to the extent described in subsection (3) [only to the extent that it does not unduly reduce the supply of timber] the cumulative hydrological effects of primary forest activities in the fisheries sensitive watershed from resulting in a material adverse impact on the habitat of the fish species for which the fisheries sensitive watershed was established.

Result or Strategy	Applies to FDUs "o" and "p" only
Licensees will <u>monitor</u> to confirm [625] that watershed equivalent clearcut areas are: <ol style="list-style-type: none"> a. below 30%, b. between 30% and 40% with no significant indications of watershed instability, or c. greater than or equal to 40% only where supporting hydrological information confirms that significant cumulative downstream impacts, in addition to known channel impacts related to historic forest development, are unlikely. 	

Additional Information and Rationale:

The objective does not identify the fish species for which the fisheries sensitive watershed was designated. Therefore the strategy cannot speak to specific fish species.

It is noted that neither of the FDUs which overlap the Artlish watershed contain any fish habitat of significance. The only possible impact then would seem to be

downstream hydrological effects induced by forest harvesting activities in the upstream portions of the watershed. The strategy establishes a number of rate-of-cut thresholds which are to trigger increasing levels of caution. To reduce risk of impacts where potential impacts are discernable, harvesting proposals would only proceed where the advice and recommendations of hydrological experts are incorporated into plans.

The objective requires that hydrological effects be managed “only to the extent that it does not unduly impact the supply of timber.” Restrictions that may be recommended by hydrologists are not anticipated to unduly restrict the supply of timber; hence the strategy does not speak to this clause. In the event that recommendations do prove restrictive, this strategy may need to be amended to address timber supply issues.

Work is underway in Nootka Region to inventory roads and sub-basins for hydrological indicators such as geomorphology, slope, stability, drainage density, road density, channel condition, riparian condition and risk/hazard of hydrological and fish habitat impacts. Once completed we will be better positioned to develop a long term strategy and respond to refinement of the Artlish designation that is expected by year-end.

It is also noted that a Coastal Watershed Assessment was completed for the Artlish a number of years ago. Recommendations stemming from that analysis, including significant protection of the sub-basin 6 tributary with an elk corridor and the Artlish Cave Park, have been implemented. Today equivalent clearcut area (ECA) is, even without considering hydrological recovery, well within thresholds set by the CWAP. Much of the information contained in the original reports remains valid and will continue to be used to help guide operational planning and development in the Artlish sub-basins.

8.0 Wildlife and Biodiversity (FSP Sect 6.2.6)

Objectives set by government for wildlife and biodiversity (FPPR Section 9, 9.1)

The objective set by government for wildlife and biodiversity at the landscape level is, without unduly reducing the supply of timber from British Columbia’s forests and to the extent practicable, to design areas on which timber harvesting is to be carried out, that resemble, both spatially and temporally, the patterns of natural disturbance that occur within the landscape.

The objective set by government for wildlife and for biodiversity at the stand level, is without unduly reducing the supply of timber from British Columbia’s forests, to retain wildlife trees.

Result or Strategy for conditional exemption under FPPR Section 12.4(1)

Applies to FDUs "I", "L", "X", "m", "n", "p", "o" only

The practice requirement set out in Section 64 (1) of the FPPR (effective December, 2004) applies [6261], except cutblocks may exceed 40 hectares where:

1. UWRs, WHAs and/or OGMA's have been designated or drafted such that wildlife and biodiversity values are adequately accommodated in the vicinity of the FDU in accordance with Provincial government policy directives,
2. the patch size distribution for age class one is consistent [6261a] with the following tables for each landscape unit or portion thereof covered by the FSP area:

Table 1: Ecosystems with Rare Stand Initiating Events (NDT1)

Patch Size (ha)	% Forest Area within Landscape Unit
< 40	30-40
40-80	30-40
80-250	20-40

For the purposes of this analysis FDUs will be grouped by landscape unit as follows:

Landscape Unit	Applicable Forest Development Units	Lead Licensee
Artlish	o, p	WFP
Kaouk	m, n	WFP
Zeballos	I, L, X	WFP

3. Annually, all Licensees signatory to this FSP agree in writing to a list of proposed blocks >40 ha attributable to each Licensee. A Licensee harvesting without or contrary to an all Licensee agreement assumes responsibility for this result irrespective of the later harvesting activities of the other signatory and agreeing Licensees. Otherwise, where written agreement is documented and with respect to this result only, the Lead Licensee assumes responsibility for the legally authorized and agreed to harvesting of all signatory Licensees, provided block list and sizes attributable to each Licensee remain as agreed, and
4. Licensees demonstrate that:
 - a. prior to unforeseen natural disturbance that may or may not occur, stand level retention [6261b] in the form of wildlife tree retention areas was:
 - i. a minimum of 7% of the gross cutblock area,
 - ii. representative of the tree species and tree height classes within the proposed cutblock,
 - iii. located within or adjacent to the cutblock boundary, and
 - iv. the distance from any point in the net area to be reforested to any edge, tree or group of trees of age class 2 or greater is no more than 250 meters,
 - b. monitoring [6261c] to confirm that watershed equivalent clearcut areas are:
 - v. below 30%,
 - vi. between 30% and 40% with no significant indications of watershed instability, or
 - vii. greater than or equal to 40% only where supporting hydrological

- information confirms that significant cumulative impacts, in addition to known channel impacts related to historic forest development, are unlikely,
- and,
- c. where a significant resource concern has been noted, development is unlikely to increase the risk [6261d] to that resource.

Additional Information and Rationale²:

Review of harvesting practices in British Columbia has revealed that cutblocks are frequently much smaller than the maximum size prescribed under the Forest Practices Code and now in the Forest Planning and Practices Regulation. Although well intentioned the effect of these regulations can be detrimental to other forest values. These practices are creating more openings that are more widely distributed on the landbase. As block sizes are much smaller than those seen in previous decades, this trend is leading to increased roading and fragmentation of old forest remaining in the THLB. This may create less desirable conditions for non-timber resources such as certain wildlife. Furthermore, this pattern, when combined with constraints on harvesting adjacent cutblocks, has significantly increased delivered wood costs and has been suggested to be impacting timber supply.

Over the past six years block sizes on TFL 19 have ranged as shown in Table 2. It should be noted that even with some cutblocks averaging close to 100 hectares within certain enhanced landscape units, the average for this period is 24.8 hectares. More specifically 75% of all blocks logged in the TFL have been in a narrow range between 15 and 28 hectares in size.

Table 3: Average Block Sizes in Past 6 Years Within TFL 19

Year	Hectares
1998	25.5
1999	30.3
2000	24.4
2001	20.5
2002	22.2
2003	25.8

Although there are circumstances where small cutblocks may be required to adequately manage and conserve forest resources, there needs to be flexibility to allow a wider range of cutblock sizes. A wider range would better ensure various resource values are protected while ensuring there is economic opportunity for licensees operating under this plan.

² These Notes are primarily drawn from the Forest Practices Code Bulletin Number 20, May 25, 1999., the Clayoquot Sound Scientific Panel Report, April 1995 and the Landscape Unit Planning Guide, January 1999

It is generally accepted among ecologists that forested patches and openings should reflect the variability in sizes, shapes, patterns and age classes that is established through natural processes occurring in space and time. To achieve this outcome, proactive planning and management decisions help to ensure that an appropriate balance between larger openings and larger forested areas with interior forest conditions is maintained through time. In areas where there has been a history of progressive clearcutting there may be limited opportunities to establish this variability in the first rotation. However, in areas where a more dispersed harvesting pattern has been implemented, there will likely be more opportunities to utilize the provisions established in this strategy which should enable the creation of a greater variety of patch sizes within landscape units. Over time there would be a balance in patch sizes throughout young, medium, and older age classes. This strategy ensures that a wider range of landscape and stand level values are managed.

Under natural conditions, the characteristic elements and frequency of natural openings vary from site to site, landscape to landscape, and from century to century. Therefore, it is appropriate to vary those same elements in managed forests.

To address the spatial and temporal distribution of natural openings, a patch size distribution regime should be established over large areas such as landscape units, phased-in over a period of time, and maintained through time as part of the forest rotation. The wording in section 2 of this strategy emphasizes the proposed activity, as it is generally accepted that the Licensees operating under this policy can only affect forward looking change. There may currently be an imbalance of patch sizes in the less than 40 hectare range; however over time the intent will be to bring the distribution of patch sizes in each class into balance.

Table 4: Biodiversity Emphasis for FDUs in General Management Zones

FDU	VILUP Zone	Management Regime	Biodiversity Emphasis
I, L, X	RMZ 16 - Zeballos	General Management	Basic
m, n, o, p	RMZ 17 – Artlish Kaouk	General Management	General

The emphasis for the management of biodiversity values for general and basic biodiversity regimes is similar in that old seral representation is required. This strategy ensures that these spatial retention targets at the landscape level have been met first before allowing larger blocks that could compromise old growth and wildlife values at the landscape level.

The strategy also ensures that targets are in place to ensure structural retention is emphasized at the stand level. For these larger blocks, the minimum retention is increased relative to the FPPR 66(2) requirement to facilitate a spatial distribution and size range of tree retention patches that better reflect the

patterns of retention that might be observed in larger areas influenced by natural disturbances.

In addition to the ecological benefits, managing a variety of patch sizes may provide a number of other environmental and economic benefits that are consistent with the objective for wildlife and biodiversity, including:

- reduced logging costs, less initial access development and fewer roads kept in an active and maintained condition;
- an increased range of sizes for cutblocks and retention areas which should reduce forest fragmentation and edge effects on wildlife;
- increased potential for maintaining biological diversity by implementing diversification across the landscape, including size, shape and structural retention.
- reduced potential for disturbing wildlife, reduced vehicle related wildlife mortality, and fewer barriers to wildlife movement due to a less extensive active road network;
- reduced risk of stream sedimentation and road related slope failures as a result of fewer active (undeactivated) roads; and
- greater potential to rehabilitate roads to recover site productivity where access is not needed for further logging.

8.1 Retention of Wildlife Trees and Restrictions on Harvesting Wildlife Trees

Result or Strategy for conditional exemptions under FPPR Section 12.5(2)	Applies to all FDUs
<p><u>Section 67 of the FPPR (effective December, 2004) applies [6263] unless wildlife tree retention is rendered ineffective by wind, fire or another damaging agent.</u></p> <p>Where damage occurs timber may be <u>removed from a wildlife tree retention area [6263a]</u> where it is demonstrated that stand level requirements for wildlife tree retention under section 66(1) are not compromised within the FSP area.</p>	
<p>Section 67 of the FPPR (effective December, 2004) applies and a Licensee may, for facilitating adjacent cable logging operations, establish <u>one or more tail holds [6263b]</u> or guyline tiebacks in a wildlife tree retention area.</p>	

Additional Information and Rationale:

The strategy above allows the salvage of timber from wildlife tree retention areas where the originally intended function of the wildlife tree retention area is compromised by agents such as windthrow, fire, landslide, insect infestation, or others. Salvage could include single downed trees where the tree no longer provides the intended wildlife habitat, but in most cases single stems would be retained to contribute to coarse woody debris as a secondary objective. Multiple downed stems, as well as incidental standing stems that may need felling for safety reasons, may be selectively removed with the intention of retaining the original function of the WTP to the degree feasible given the circumstances. Where damage to a wildlife tree retention area is extensive, and little or none of the intended biological function remains, the WTP may be removed for salvage but only to the extent that the 7% annual retention requirement set out in FPPR 66(1) is maintained. In other words there is to be “no net loss” with respect to the 7%, as per the intent of FPPR 91(2). Where the Licensee has provided wildlife tree retention in excess of the requirement, salvage of damaged WTPs can occur up to the amount of excess retention area provided for that year.

The second part of the strategy allows for Licensees to establish tailholds and guyline anchors in wildlife tree retention areas with the expectation that doing so would be inconsequential to the long term biological function of the wildlife tree retention area. This would be used to improve deflection so as to reduce ground disturbance (FPPR 5; 35(3)) in adjacent cable logging operations, to reduce risk of fire ignition (Wildfire Act 6(2)(b)), to improve productivity and harvesting cost (FPPR 6(b)), or for safety reasons. Normally anchor trees would be left standing, but in some cases anchors and/or other nearby trees/snags may need to be felled to comply with Workers Compensation Board requirements (FPPR 2(3)).

Result or Strategy for conditional exemption under FPPR Section 12.5(1)

Applies to all FDUs except "O"

Section 66 of the FPPR applies, except that:

1. the one or more cutblocks referred to in 66(1) refer to each Licensee's cutblock(s) within the FSP area, and
2. in the event that wildlife tree retention overlaps otherwise operable area and exceeds the percentage requirements in s.66(1), the following applies:

The retention requirements for a cutblock identified in s. 66(2) may be reduced or be zero [6263c] provided:

- a. specific wildlife values or features of significance in the cutblock are unaffected, and
- b. stand level retention provided in other cutblocks referred to in item #1 above was representative of the tree species and tree height classes which were present in or near the identified cutblock prior to harvest.

Additional Information and Rationale:

Although not explicit, subsection 66(1) of FPPR implies that the 7% annual retention requirement applies to the cutblocks completed within the area of the licence. Item # 1 confines the population of cutblocks to the FSP area for administrative simplicity, and to ensure that the result is measurable and verifiable in the context of the FSP. It also confirms that each Licensee is responsible for its own population of cutblocks and therefore cannot draw from the wildlife retention efforts of another Licensee to attain the 7% annual retention result.

Item #2 covers situations where wildlife tree retention is surplus to the 7% annual requirement and such timber may be available to further the objectives for timber (FPPR 6). Retention levels for individual cut blocks may be reduced to facilitate salvage under the previous strategy, to improve the supply of timber (FPPR 6(1)), to improve delivered wood costs (FPPR 6(b)), and/or to enhance a Licensee's ability to exercise harvesting rights (FPPR 6(c)). However, this approach may be employed only where specific values such as, but not limited to, dens, nests, or critical habitats would not be destroyed or otherwise negatively affected. Again there is to be a "no net loss" with respect to the 7% annual stand level retention requirement. Thus any wildlife tree retention that is in addition to the 7% and substituted for retention not provided for in the cutblock with reduced retention, is to be similar in terms of height and species to the pre-harvest forest in and around the cutblock with reduced retention.

These strategies and outcomes provide for flexibility to ensure that the objectives for wildlife trees (FPPR s. 9.1) and the intent of FPPR sections 66 and 67 are attained, while concurrently complementing the objectives for timber (FPPR s. 6(a) and 6(c)).

9.0 Cultural Heritage Resources (FSP Sect 6.2.7)

The objective set by government for cultural heritage resources is to conserve or if necessary, protect cultural heritage resources that are

- a) the focus of a traditional use by aboriginal people, that is of continuing importance to that people, and
- b) not regulated under the Heritage Conservation Act.

Result or Strategy	Applies to all FDUs
<p>The Licensees will, in the exercise of their rights and the carrying out of their obligations under the agreements to which this forest stewardship plan pertains, take <u>action that is consistent</u> [627] with:</p> <ol style="list-style-type: none"> 1. conserving or, if necessary, protecting cultural heritage resources that are: <ol style="list-style-type: none"> (a) referred to in s. 10 of the Forest Planning and Practices Regulation, as of the date of submission of this FSP or as designated to be resource features under GAR 3(1)(f); (b) likely to be adversely impacted by the activities of the Licensee under this FSP; (c) not conserved or protected by other arrangements; (d) capable of being addressed in the context of this FSP; and (e) in the context of a traditional use by an aboriginal people, are determined through: <ol style="list-style-type: none"> i. consultation with First Nations prior to review and comment of this Forest Stewardship Plan under s.20 of the <i>Forest Planning and Practices Regulation</i>; or ii. comments made by affected First Nations in accordance with s. 21 of the <i>Forest Planning and Practices Regulation</i> and, subsequently, confirmed by government in consultation with the First Nations, or iii. comments made by affected First Nations during information meetings with the Licensee that may occur from time to time during the term of the FSP and, subsequently, confirmed by government in consultation with the First Nations, <p style="margin-left: 40px;">to be important, valuable, scarce and of continued importance;</p> 2. the historical extent of the traditional use within a forest development unit of the cultural heritage resources referred to in paragraph (i); and 3. the timber harvesting rights in the agreements to which this FSP pertains. 	

Result or Strategy**Applies to all FDUs**

To the extent that above criteria are met in regards to cedar, opportunities for traditional uses will be maintained as follows:

4. Cedar Bark

- (a) Cedar will be planted [627a] on ecologically suitable sites to ensure it is maintained as an inventory component of this planning area.
- (b) Upon request from First Nations, Licensees will identify opportunities [627b] to bark strip in areas under cutting permit or to gather bark from cedar at dryland sort yards.

5. Cultural Cedar Timbers –

- (a) Licensees will make available this wood [627c] through operational sources where that the wood is for cultural or other traditional uses and the quantity of wood made available is consistent with the historical extent of the traditional use within the FSP area.
- (b) A Licensee operating under this FSP, will, upon request, assist a First Nation in identification of cedar trees suitable for cultural uses [627d] should the First Nation choose to harvest trees themselves.
- (c) Over the term of the plan, Licensees will work in cooperation with each First Nation to identify areas [627e] that support cultural cedar timber and within the plan area and term will identify and set aside at least 20 cedar trees with characteristics (dbhs ranging from 90-200+ cm; straight bole; >30m tall; sound outer shell > 45cm thick and free of frost cracks) suitable for carving poles or canoes. Wherever possible large cultural trees will be identified or located in constrained areas including:
 - i) Riparian Management Zones
 - ii) Wildlife Tree Retention Areas
 - iii) Ungulate Winter Ranges or Wildlife Habitat Areas
 - iv) Old Growth Management Areas
 - v) Riparian Reserve Zones
 - vi) Any other area constrained for non timber values

Cultural Cedar Needs

Nuu-chah-nulth Tribal Council

- Ehattesaht First Nation
- Ka;'yu:'k't'h/Che:k:tle First Nation
- Nuchatlaht First Nation

Recorded donations and Free Use Permits covering the last five years are used to provide an indication of the amount and type of cedar timber being used by the First Nations with traditional territory in the Zeballos FSP area. For example, over the last five years all three Nations combined used less than 20 cedar logs for the purposes of canoe building or pole carving. Cedar use where the tree is not felled and/or removed from site (i.e. bark stripping) is not recorded in this information.

It is expected that this summary will be supplemented with additional information from First Nations during FSP review and comment as well as during other ongoing information sharing processes.

Table 5: First Nation Donations and FUPs

First Nation	End Use	1999 - 2003	
		# of Logs	Volume (m3)
Ehattesaht	Canoe	2	10.7
	Carving	9	31.2
	Herring roe	8 ³	32
	Paddles	1	1
	Pole	~2	5
<i>Ehattesaht Total</i>		22	79.9
Nuchatlaht	Canoe	~8	45
	Longhouse	6	18.3
<i>Nuchatlaht Total</i>		6	63.3
Ka;'yu:'k't'h/Che:k:tle	Canoes	6	75
<i>Ka;'yu:'k't'h/Che:k:tle Total</i>		6	75
Grand Total		32	243.2

Additional Information and Rationale:

The first part of the strategy for cultural heritage resources commits the Licensees to conserving and as necessary protecting cultural heritage resources in the course of their activities under the FSP, but only to the degree that:

- conservation or protection is within the control of the Licensee. The Licensee may be constrained in some respects due to provisions of their license agreement, government enactments or policy, legal jurisprudence, actions by other individuals or organizations, and other factors. The Licensee will do what it reasonably can to conserve and protect.

³ full length hemlock logs, including crowns, were provided. Hemlock is preferred over cedar for this use.

- the resource or feature has been made known to the Licensee. A Licensee can do little if a resource is known to them only in a very general sense. The more specific and precisely located a particular resource or feature, the more effective any measures a Licensee may describe for conservation or protection will be.
- the resource is of continuing importance and value to the First Nation. The objective (FPPR 10) makes it clear that the traditional uses of forests and forest resources that are to be addressed are those that are of “continuing importance” and that have significant value (“focus of”) to aboriginal peoples. The extent of historic and ongoing use are key indicators of importance.
- the activities of the Licensees may make the resource difficult to access or find. If a particular resource is worthy of conservation or protection it is implied then that the resource has previously or is not now readily available for use by First Nations peoples. Therefore the strategy focuses on resources that are also scarce.
- other enactments, in particular the Heritage Conservation Act, do not already provide for conservation and/or protection. Many cultural heritage resources are already managed for, notably under the Heritage Conservation Act, but also for resources such as fish, wildlife, species-at-risk, etc. under various government enactments and in fact other portions of this FSP.

There may be specific areas which are important for spiritual reasons. If this is the case, to date this site specific information has not been made known to the licensees operating under this plan. When provided, item #1 of the strategy outlines the Licensees’ responsibilities for conserving or protecting these and other locations of cultural significance.

Cedar use by First Nation’s people is one aspect of cultural resource use that is well recognized on the coast. The second part of the strategy ensures that access to cedar⁴ resources for First Nations cultural uses is not hindered or forgone.

The forest inventory data in the following has been developed to summarize the amount of cedar available in each First Nation’s traditional territory. This information was further broken down to identify how much cedar is within the Zeballos FSP area.

At an overview scale these inventories demonstrate that cedar in a general sense is not necessarily scarce. The older age classes (Age Class 7-9) are stands where larger diameter cedar may be found to meet the cultural need for

⁴ the term “cedar” is used generically to mean both western redcedar and yellow cedar (or cypress).

larger logs. As indicated in the Summary of Use above, demand for large logs (canoes and poles) has recently been in the order of 4 large trees per annum, or if current use levels continued, about 20 large trees over the term of the plan. Individual licensees will be responsible for tracking and recording cultural logs provided over the term of the plan.

Although there are over 24 million cubic meters of wood for the entire landbase associated with the Ehattesaht, Nuchatlaht and Ka:yu:'k't'h/Che:k:tles7et'h territories that are in these age classes, arguments are still made that these types of logs are at risk of becoming scarce. Unfortunately forest inventories are not designed for sampling the frequency of large trees suitable for poles or ocean-going canoes. Section 10.0 and Appendix D of the TFL 25 Timber Supply Analysis⁵ provide a discussion of various modeling issues with respect to predicting cedar availability and in particular the availability of large cedar suitable for totem poles and seaworthy canoes. In particular, guidance is needed from First Nations with respect to the characteristics of cedar trees for specific cultural end uses, and for correction factors that might be applied to both old and second growth data to predict trees suitable for cultural use over time.

As the concern for larger cedar trees remains, item #5 of the strategy provides the framework to look at spatially identifying areas in the constrained landbase to ensure the conservation and long term supply of this resource. Presuming that First Nations want to reciprocate, Licensees will work with the First Nations to ensure that areas identified are mindful of current and historical use of the resource. Even if First Nations are unable to participate due to lack of capacity or other reasons, the Licensees commit to setting aside suitable trees. Over the term of the plan and during the course of normal field layout of cutblocks, at least 20 cedar trees thought suitable for carving totem poles and/or canoes will be identified and set aside from harvesting. As noted above, 20 trees was the usage of all three First Nations over their combined traditional territories. If this strategy were continued for future FSPs it should provide assurances that a supply of large trees with cultural potential will be available. As the plan area covers only about half of the combined area of the traditional territories, and assuming the signatories to FSPs in other parts of the combined territories develop similar strategies, the number of trees set aside should well exceed recent usage.

As well, the Licensees will take reasonable steps to make wood and logs available for cultural purposes from current operations, so long as requests respect the principle of consistency with the amount of historic and ongoing cultural uses. This approach will generally provide easier and safer access to First Nations people, and be less disruptive of Licensee operations and delivered wood costs. However should a First Nation wish to harvest cedar trees using their own equipment and personnel, Licensees would facilitate this if only to

⁵ <http://www.westernforest.com/download/TFL%2025%20Management%20Plan%2010%20-%20Appendices%201%20to%20V.pdf>

ensure the safety of its own road users and again to minimize disruptions that might impact delivered wood costs.

Bark stripping trees are expected to be found in both middle-aged (age class 4-6 generally, although bark could potentially be drawn from age class 2 or 3 type stands as well) and older stands (age class 7-9). Again there is no shortage of these age classes. As with cedar timber, item #4(b) is to facilitate bark stripping at a dryland sort or similar location to make easier and safer access for First Nations peoples. Where First Nations prefer to strip standing trees, cutting permit areas generally have easy road access and facilitating activities there would decrease the probability of scarring damage to second growth cedar stands.

And finally, item #4(a) reconfirms the Licensees' commitments to ensuring that there is a long term supply of cedar in roughly similar or great proportion than occurs now and/or in the past.

Table 6: Cedar Inventories

First Nations	Age Class	Area (ha)		Volume (m ³)		Total	
		THLB	NCLB	THLB	NCLB	Area (ha)	Volume (m ³)
Ehattesaht	1-3	3,547	138	122,971	11,619	3,685	134,590
	4-6	209	100	77,444	21,911	309	99,356
	7-9	5,313	8,594	3,007,877	3,024,557	13,907	6,032,434
<i>Total</i>		<i>9,069</i>	<i>8,832</i>	<i>3,208,293</i>	<i>3,058,087</i>	<i>17,901</i>	<i>6,266,379</i>
Ka:'yu:'k't'h' /Che:k:tles7et'h'	1-3	7,776	472	223,519	61,879	8,249	285,398
	4-6	110	68	42,251	15,482	178	57,733
	7-9	6,989	27,136	4,387,414	10,754,564	34,126	15,141,978
<i>Total</i>		<i>14,876</i>	<i>27,677</i>	<i>4,653,184</i>	<i>10,831,925</i>	<i>42,553</i>	<i>15,485,109</i>
Nuchatlaht	1-3	1,678	52	17,122	5,888	1,730	23,009
	4-6	20	135	9,214	47,820	155	57,034
	7-9	1,463	7,177	830,786	2,516,380	8,640	3,347,166
<i>Total</i>		<i>3,161</i>	<i>7,364</i>	<i>857,122</i>	<i>2,570,088</i>	<i>10,525</i>	<i>3,427,210</i>
Grand Total		27,106	43,873	8,718,598	16,460,099	70,979	25,178,698

FDU	Age Class	Area (ha)		Volume (m ³)		Total	
		THLB	NCLB	THLB	NCLB	Area (ha)	Volume (m ³)
I	4-6	190	22	56,545	6,015	212	62,560
	7-9	676	601	249,998	264,616	1,277	514,614
I Total		866	622	306,543	270,631	1,489	577,174
L	4-6	131	16	47,708	5,755	147	53,463
	7-9	375	534	167,922	248,893	909	416,815
L Total		506	549	215,630	254,648	1,056	470,279
O	7-9	446	381	223,957	132,611	827	356,568
O Total		446	381	223,957	132,611	827	356,568
X	7-9	670	506	247,690	188,496	1,176	436,187
X Total		670	506	247,704	188,497	1,176	436,201
Z	4-6	26	2	8,073	770	29	8,843

	7-9	920	596	324,933	233,416	1,515	558,350
Z Total		946	598	333,006	234,187	1,544	567,193
h	7-9	282	494	151,286	210,166	776	361,453
h Total		282	494	151,286	210,166	776	361,453
m	7-9	764	213	353,613	135,849	977	489,462
m Total		764	213	353,613	135,849	977	489,462
n	7-9	860	596	365,005	345,228	1,456	710,233
n Total		860	596	365,005	345,228	1,456	710,233
o	7-9	261	240	103,256	128,431	501	231,687
o Total		261	240	103,256	128,431	501	231,687
p	7-9	77	101	27,891	48,329	178	76,220
p Total		77	101	27,891	48,329	178	76,220
Grand Total		5,397	3,807	2,176,606	1,738,411	9,203	3,915,017
Proportion in FSP Area		20%	9%	25%	11%	13%	16%

The management of cultural heritage resources can be expected to evolve over the term of the plan. Certain aspects of the conservation and protection of access to resources such as monumental cedar extend beyond the context of a Forest Stewardship Plan and arguably beyond the scope of a licensee's timber harvesting rights. Nevertheless, management of cultural heritage resources may significantly impact a licensee's rights and to that end the signatory Licensees are committed to working with local First Nations, communities, the Ministry of Forests, and perhaps others to develop a better understanding of the demand for and supply of monumental cedars and how to manage for them. Carvers, with traditional knowledge of wood and tree characteristics, will be of paramount importance to such deliberations.

On the demand side, it is important to understand the historic use of monumental cedar on a per capita basis and how that demand may translate into present day and predicted future needs.

With respect to canoes, what is the size range of canoes in a historical sense and how many canoes of each size class would make up the fleet for a given First Nation? How is that demand and size distribution modified by a shift in demand away from functional purposes (hunting, fishing, and gathering uses replaced by boats or motor vehicles; militaristic uses no longer relevant) to more ceremonial or symbolic purposes? Given that going forward modern preservative coatings will be used and canoes are less likely to be subjected to the wear and tear of the daily excursions that would have occurred historically, can large canoes be expected to have a much longer life expectancy than in the past? How will this affect the demand for canoes over the longer term? Given the recent rebirth in expression of First Nation culture, how much and for how long will demand for canoe logs increase?

How important is it that canoe logs be 100% sound? What sorts of knots or imperfections are allowable? Can defects be corrected using traditional and/or modern wood working techniques? Could laminated, finger-jointed, or other

composite cedar products potentially be substitutes for dugout canoe blanks? Unlike other conifers, the cedars have relatively uniform wood density across growth rings and the early/latewood transition; thus is second growth (if of suitable diameter) any less or unsuitable for carving? As very old, large diameter cedars most commonly have heart rot and younger, but smaller diameter, cedars have the highest concentrations of decay-resistant thujaplicins in their heartwood, could the ideal canoe log be a tree of intermediate age and diameter? What silvicultural interventions on what growing sites might accelerate development of assumed desirable characteristics such as diameter, knot size, wood density? The answers to these and other questions may have profound implications for the supply side of the equation.

As with canoes, for carved poles what is the historical range of height classes and how many would be required in each class. Again, given protection with modern preservatives and above ground mounting, how much can we expect the life expectancy of house and family poles to increase? Are hollow trees acceptable for pole carving, given that a hollow cone has a higher strength to weight ratio than a solid one of comparable dimensions? Given the modern-day use of steel carving implements, could other woods such as Douglas-fir be suitable for carving poles?

For canoe or pole carving, is there any or a useful correlation between the intended use and standard forest industry log grades for lumber suitability? "D" and "F" cedar lumber grades used in cruising and scaling allow some rot, butt flare, knots, and may be very short in length. Perhaps only a tiny percentage of such logs may be ideal for monumental purposes. Perhaps a large, long, sound "H" grade with tight knots might be just as or more suitable than a shorter "D" grade with significant defect?

If field personnel are to be able to readily identify the best monumental logs in the field they need to be trained in and understand the aforementioned issues.

As First Nations increasingly become licensees, what portion of their demand for cultural wood might be met within their own cutting permit areas?

On the forest inventory side, the prediction of supply of monumental cedars in the short, medium, and long terms is hampered by an inadequate description of tree characteristics, lack of a cost-effective sampling design for monumental potential trees, and an inability of current stand and tree growth simulators to predict time to attain suitable tree sizes and other characteristics. Deliberations will have to involve forest inventory specialists, growth modelers, and timber supply modelers to try to address some of these issues.

Clearly if cultural heritage resources - and in particular a supply of monumental cedars - are to be maintained in perpetuity a close and ongoing cooperation by all players will be needed to explore and understand many of the details. Western Forest Products remains committed to working with both governments and other interested or affected parties to this end.