

# **Interim Wood Supply Plan for the East Hyland Planning Unit Timber Harvest Plan**



## **FOREST MANAGEMENT BRANCH**

This transitional planning document is identified in Schedule 4 of the Forest Resource Regulations and according to Section 85(1), indicates the plan as an existing Timber Harvest Plan under the Forest Resources Act.

# Interim Wood Supply Plan for the East Hyland Planning Unit

Prepared for the Kaska Forest Resource Stewardship Council

Prepared by the  
Interim Wood Supply Technical Working Group  
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## Executive Summary

In January 2004, the Kaska Forest Resources Stewardship Council (KFRSC) made recommendations on interim wood supply as identified in the MOU on forest stewardship within the Kaska Traditional Territory of the Yukon Territory. KFRSC identified local wood supplies for further planning for Watson Lake and Ross River, and a volume of timber in the East Hyland Planning Unit. The interim wood supply for Watson Lake and the East Hyland Planning Unit timber volume is up to 128,000 m<sup>3</sup>/year, for three years, while the Ross River local wood supply is 5000 m<sup>3</sup> over three years. The wood supply for the East Hyland Planning Unit was implemented in two stages: a Year One wood supply plan that is now complete, and a Year Two and Year 3 combined plan.

In July 2004, the Technical Working Group (TWG) met and identified the components required for a plan, and provided direction for a contractor to develop material for the working group. In August, the Yukon Forest Management Branch (YFMB) contracted Industrial Forestry Service Limited (IFS) to prepare materials to identify the interim wood supply for Year Two and 3 within the East Hyland Planning Unit. The contractor was to consider the B Blocks, I Blocks and Blocks C14 and C15 as identified in the landscape level plan. (IFS, 2003). Further direction was provided by KFRSC and the TWG.

The goals were to propose harvest blocks for Year Two and Year Three that met the April 2004 KFRSC recommendations and identify up to 128,000m<sup>3</sup> per year (or up to 256,000m<sup>3</sup> for the 2 years). A draft was submitted by IFS (November 2004) and reviewed by the TWG. Changes were discussed and processed in November 2004. Options for the plan were presented to Council in early December, KFRSC provided final recommendations for the East Hyland Planning Unit on December 6, 2004, and this plan reflects those changes. This plan proposes 12 blocks (26 sub-blocks) containing a net harvestable volume of approximately 185,808 m<sup>3</sup> over 1390 ha.

***\*\*Through out the report the reader will see i1, i2, etc. This is not an editorial mistake. The upper case I is often mistaken for the numeral 1. The lower case i has been selected to minimize the potential for confusion. \*\****

## 1 BACKGROUND

### 1.1 Kaska Forest Resources Stewardship Council

On July 29, 2002, the Government of Canada, the Kaska Nation, and the Government of Yukon signed a memorandum of understanding (MOU) on forest stewardship in the Kaska Traditional Territory within the Yukon, to begin implementing recommendations identified in the *Yukon Forestry Issues: A Reality Check and a New Direction* (Tough, G. 2002).

The Kaska Forest Resources Stewardship Council (KFRSC), established under the MOU, is tasked with directing the development of forest management plans. Specifically, KFRSC is expected to have reached the following milestones by July 2005 (see section 6.0 of the MOU):

- An ecosystem-based Regional Forest Management Plan,
- Sub-regional Forest Management Plans, and
- An Interim Wood Supply Plan to meet interim commercial needs while regional planning proceeds.

On February 3, 2003, KFRSC agreed, by consensus, on recommendations to proceed with planning for interim wood (up to 128,000 m<sup>3</sup>/yr for 3 years) on three areas in the planning area (East Hyland, Watson Lake, and West Rancheria). The timber will come from forest management units Y02 and Y03. Council also recommended that a supply of timber (5000 m<sup>3</sup> over 3 years) be identified for an area near Ross River. The timber supply for Ross River is separate from the Interim Wood Supply, as identified in the MOU.

Information provided by this plan will also be considered as part of the Regional Forest Management Plan. The Interim Wood Supply is only for a three-year period. If a Regional Forest Management Plan is approved prior to the end of three-year period, then the Regional Plan takes precedent.

In January and April 2004, Council provided recommendations on where interim wood could be available, identified areas that will not be harvested, and provided proposed blocks to achieve the

first year of the interim wood supply (KFRSC 2004). Further, Council provided interim recommendations on what to consider in completing the remaining years of interim wood in the East Hyland, Watson Lake, and Ross River plan areas (Appendix 3). The final recommendations are to be implemented in a similar fashion.

## **1.2 Criteria for Interim Wood Supply Plans**

The general approach was to select large aggregates of wood within 5-10 km of existing access, but outside areas, which Kaska had selected through the land claims process. Next, areas where potential conflict with environmental or cultural interests was apparent were removed. Finally, the proximity to Watson Lake and the planning horizon were considered. These options were presented to KFRSC. The KFRSC then provided recommendations on final areas for Interim Wood.

## **1.3 Interim Wood Supply Technical Working Group**

A technical working group was established by KFRSC, with representatives from Kaska, Canada's Environmental Conservation Branch, Yukon Government (YG) Department of Energy, Mines, and Resources, and Department of Environment. This group took direction from the KFRSC, providing technical information in a neutral manner, and implementing recommendations. Where policy concerns arise, senior managers were expected to bring those concerns to the Council. The initial task of the technical team was to prepare an Interim Wood Supply Plan for KFRSC, based on a transparent and objective assessment of technical information, including Traditional Knowledge, and expert opinion.

In January 2004, the Technical Working Group (TWG) provided a series of options for consideration by KFRSC. This became the basis for subsequent recommendations and proposed blocks to the Environmental Assessment process (EA) (Forest Management Branch 2004). Further work, in April 2004, allowed several additional blocks to be submitted for an Environmental Assessment.

Further recommendations were provided to direct the TWG in identifying the remaining Interim Wood Supply in the East Hyland Planning Unit. The Watson Lake and Ross River interim plans have been treated separately and will be submitted for public review and for an Environment Assessment through a separate process.

June to August, the TWG worked at preparing information, based on KFRSC's recommendations, for a contractor. The contractor took direction from the TWG. Members of Yukon Forest Management Branch and Department of Environment, sitting as TWG representatives, monitored the contractor's work. Specific direction included:

- Ecosystem: manage harvesting within upland ecosystems and apply current ecological/disturbance zoning for East Hyland.
- Rotation and Forest Values: Zoning for East Hyland to be in place until harvested stands become mature (Includes Year One Blocks).
- Watershed: manage the potential impacts resulting from forest cover removal on water quality and flows. Modify blocks to meet Cosh Creek watershed recommendations.
- Disturbance patterns: interaction between anthropogenic and natural disturbances. Include a buffer from forest/burn edges that would not be harvested for biodiversity concerns.
- Forest Composition: manage forest types and seral stages. Seral changes will be analyzed for Irons Creek and Contact Creek watersheds as part of the technical package developed for KFRSC.
- Legacy: apply an average of 50 ha cutblocks with 20% in-block grouped retention. The degree of retention scales with the size of an opening; consider THPOG guidelines for retention (THPOG 1999).
- Block Distribution/Pattern: arrange blocks so at least 200m between blocks (includes old blocks) for wildlife movement.
- Forest/stand Fragmentation: reconfigure blocks to include old blocks as part of opening, or move boundaries to capture more forest away from the old blocks (at least 200 m).
- First Nations: No blocks will be considered near the trail from lower Cosh Creek to Loon Lake and out of the East Hyland Interim Wood Supply area; Blocks on the east edge of



Cosh Creek watershed and blocks C15 and C14 will have site plans that address trails in the area

- Stand Practices: Apply agreed to strategies for stand practices (Forest Management Branch 2004, KFRSC 2004)

The project progressed in stages. The first stage consisted of fieldwork, which identified the range of options for timber in the East Hyland. Blocks are not being flagged or painted until KFRSC has made final recommendations and the plan has been approved through an EA process. This multiple-phase approach saved time, money, and retained flexibility in decision making which had been problematic in evaluating the Year 1 proposed blocks. The next phase will capture the above stand level recommendations and additional KFRSC direction in development of site and harvest plans.

IFS was awarded the contract. The TWG and contractor met several times as field work progressed to ensuring the April recommendations were being implemented. Originally, twenty blocks were considered for development in this plan. Through a series of meetings, with the TWG and the contractor, a number of blocks were dropped for economic and ecological reasons. This plan proposes 12 blocks (26 sub-blocks) (Table 2 & 3).

In late November 2004, the TWG provided the East Hyland interim wood supply options for Council to consider. On December 2, KFRSC provided its recommendations for the plan area and directed the TWG to implement them into this plan. TWG requested some specific direction on the degree of retention in the larger blocks, which has been incorporated in this report (Appendix 3). Finally, KFRSC suggested that, in light of this report and associated maps, the recommended changes can be further implemented through the development of site and harvest plans once the EA process has concluded.

## **1.4 Traditional Knowledge**

Since the Traditional Knowledge Protocol agreement between the Kaska Nation and KFRSC has not been signed, Traditional Knowledge was not directly provided. However, the Land Steward did provide general information on areas to avoid, trapping trails to protect, and areas that are to be trapped the next several winters. This information was considered by the KFRSC as they provided direction on the completion of this plan.

The Yukon Heritage Branch (Thomas Heritage Consulting 2004) completed an archaeological overview assessment. No concerns were raised by this assessment. From community consultation, known information indicates that there is a trail network within or proximal to Blocks C14 and C15. Recommendations by the KRSC were to avoid development from Lower Cosh Creek to Loon Lake to respect traditional use. Any other cultural concerns will be addressed specifically in the site plans, once all the Traditional Knowledge becomes available.

## **1.5 East Hyland Planning Unit**

The East Hyland Planning Unit is located in Forest Management Unit Y02. This planning unit is located approximately 45 km east of Watson Lake along the Alaska Highway. The entire planning unit is bound by the Hyland River to the west, Contact Creek to the east, the headwaters of Irons Creek to the north, and the British Columbia\Yukon border to the south (Figure 1).

The East Hyland Unit covers approximately 109,000 hectares. The total forested land in this unit is approximately 97,640 ha (89% of the area). The proposed Year Two and Year Three developments encompass approximately 1390 ha (1% of the East Hyland Unit) (IFS, Nov 2004). The unit is composed of forested uplands separating Irons Creek from the Hyland River and Contact Creek from Irons Creek. The entire planning area is in the Liard Basin Ecoregion, which is part of the Boreal Cordillera Ecozone (Fisheries and Environment Canada. 1977).

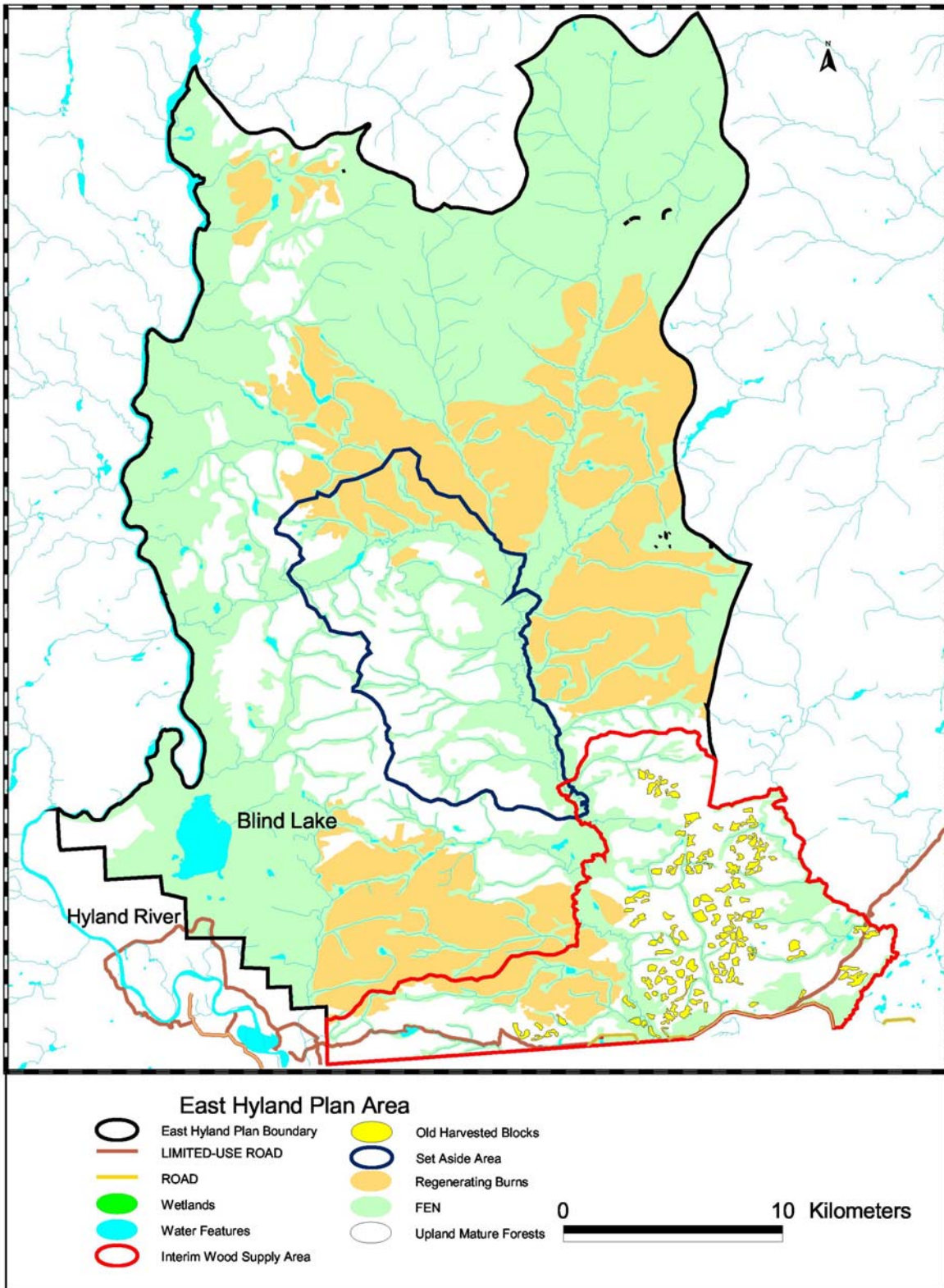
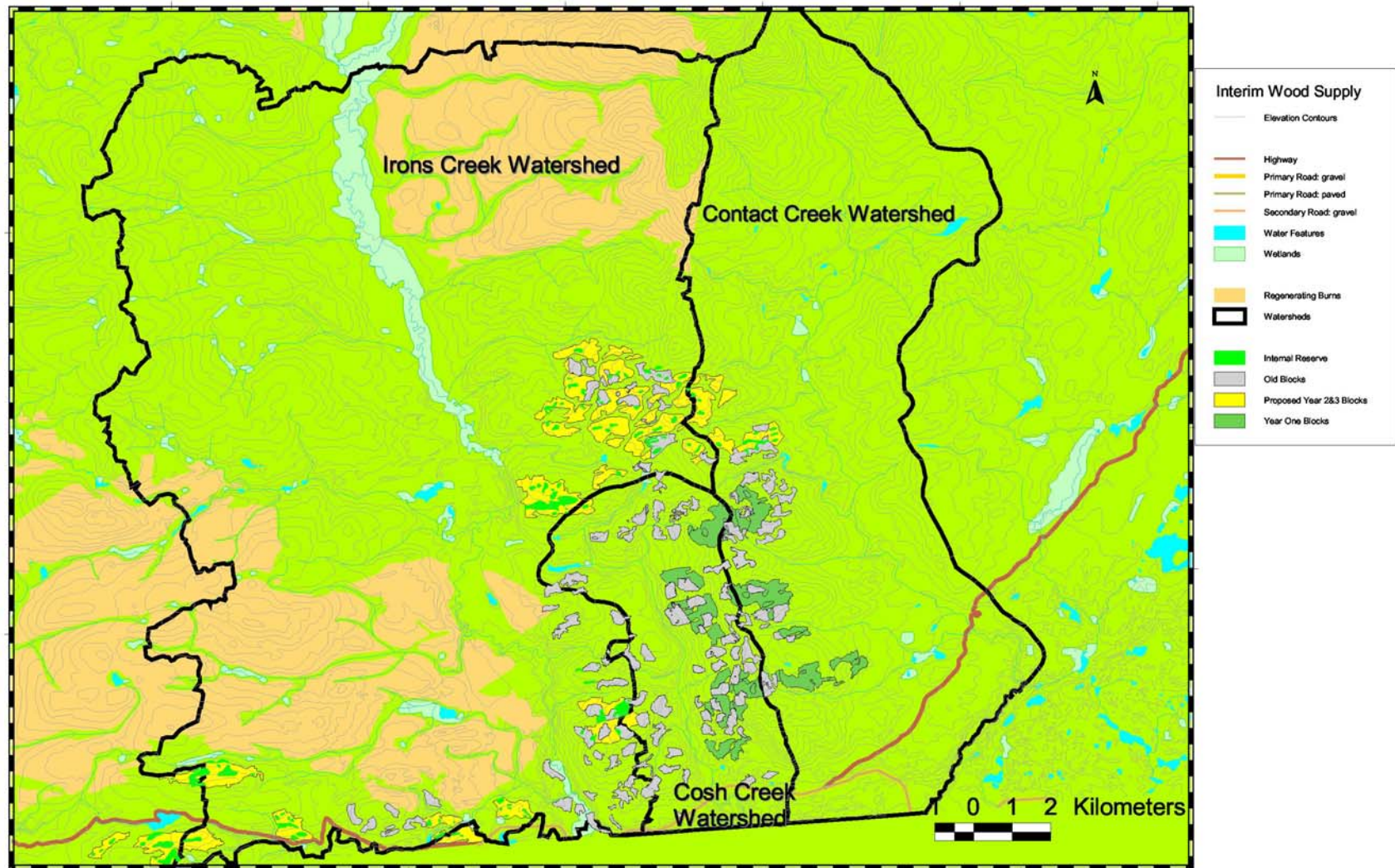


Figure 1. East Hyland plan unit





**Figure 2. Proposed Year Two& 3 interim wood supply blocks**

## **1.6 Year Two**

Proposed blocks for Year Two development are C14 A& B; C15 amalgamation of blocks A, B, C, D, E, F, G, I, K-south, L, P, and portions of M and N; and blocks i1, i5, and i6.

Detailed block summaries and maps are in Appendix 1. A portion of Block i1 and all of Block i2 were deleted from development to ensure that less than 18% of the Cosh watershed was impacted by harvest operations. This accommodates the concerns raised by Council and the Environmental Screening Report (May 2004). I4 was removed to maintain biodiversity along the fire edge. C14 and C15 were reconfigured to meet April 2004 recommendations and to see if additional volumes could be found, replacing volume lost due to the removal of some of the B Blocks (Year Three blocks).

## **1.7 Year Three**

The proposed blocks for Year Three are: B1; B7 (A, B); B9; B10; B12; B13 and B14.

Detailed block summaries and maps are in Appendix 1. Blocks B2, B3, B4 B5, B6, B8 and B11 are removed from Year Three development. Potential cost recovery indicated that the development of these block was marginally economic. B8 and B11 have been removed to maintain wildlife corridors and connectivity from the lowland areas to the upland areas.

## **1.8 Landscape Assessment of Proposed Blocks**

Based on the above-proposed blocks, spatial analysis was completed to determine changes in the ages of the forest (seral classes) due to timber harvesting. Due to previous timber harvesting record collection by the Federal Government, inclusion of seral classes from previous harvesting was not possible. Existing blocks were included in the early seral class. The seral classes were broken into early (0-29 years), immature (30-79 years), mature (80-129 years), and old (130+ years). The analysis did not incorporate any of the proposed internal retention and assumed that within the block it would all become early seral. This assumption probably results in an overestimation of forest cover change. Finally, the analysis was based on existing Yukon Forest Management Branch Forest Inventory and additional

changes may occur at the site plan level. For this report, the percentage of change is presented in Table One. The hectares of change are included in Appendix 4.

Irons Creek watershed (26,603 ha) will increase in early seral by 3.5 % and decrease in mature timber by the same amount. Old and immature seral classes did not change. Contact Creek watershed (11,427 ha) will increase in early seral by 1.3% and decrease in mature timber by the same amount. Old and immature seral classes did not change (Table 1).

**Table 1. Forest cover changes based on proposed blocks**

Seral Class	%	%	%	%	%
<b>WATERSHED</b>	<b>0-29</b>	<b>30-79</b>	<b>80-129</b>	<b>130+</b>	<b>Total</b>
Irons Creek	35.3	22.7	40.0	2.0	100
Contact Creek	35.4	23.0	40.7	0.8	100
<b>Post Harvest Seral Class</b>					
<b>WATERSHED</b>	<b>0-29</b>	<b>30-79</b>	<b>80-129</b>	<b>130+</b>	<b>Total</b>
Irons Creek	38.8	22.7	36.5	2.0	100
Contact Creek	36.7	23.0	39.4	0.8	100

Interior forest conditions were assessed for both the Contact Creek and Irons Creek watersheds. Interior forest conditions were assumed that, where there was a hard edge (e.g. edge of cutblock) or a soft edge (e.g. edge of a wetland), a 300m edge influence occurred. This distance was based on TWG discussions and review of other previously assessed forest plans. Given the approach, edge effects, on soft edge features, probably results in an under estimation of interior forest conditions. Detailed information is in Appendix 4.

Irons Creek watershed has about 10,400 hectares of interior forest conditions, and with the proposed blocks it would reduce it by 1263 ha or 12 %.

Contact Creek watershed has about 4,100 hectares of interior forest conditions, and with the proposed blocks it would reduce it by 238 ha or 6 %.

## 1.9 Stand Level Assessment of Proposed Blocks

In this plan, the average size of the blocks and the in-block retention goals were generally met for B Blocks, i Blocks, and Block C14. Generally, retention levels were determined on a sliding scale. Blocks on, or around 50ha, averaged 20% retention. Blocks that were less than 50 ha would have less retention and THPOG guidelines were considered in setting targets. Blocks greater than 50 ha were, on average, to have more than 20 % retention.

The TWG considered the application of the sliding retention scale. Options were provided to the KFRSC requested increased internal group retention for larger blocks. The number of identified wildlife patches also needs to increase. The TWG requested specific direction on several blocks. The following direction was provided:

- For B blocks, that are greater than 80 ha in gross ha, increase grouped retention targets to 30-33 %.
- For C15 blocks, increase the retention for blocks F, E, L, & B, to meet at least the 20 % retention target to meet the April 2004 recommendations.
- For Block i1, increase the retention to meet the 20 % retention target from the April 2004 recommendations.

The TWG review of the proposed blocks raised concerns regarding the amount of road required, movement corridors, and landscape features. Several sub-blocks were dropped as a result.

Specifically, Block C15 was reviewed and reconfigured in light of the following KFRSC recommendations:

- The sub-blocks are considered as an amalgamation of blocks and not one opening.
- Since it is not currently possible to track external reserves, internal reserves will be classified as the stand level reserves
- Internal reserves need to be increased for blocks F, E, L, & B. This will be accomplished by increasing proposed reserves to at least 20% internal grouped retention.

- Blocks D and P are part of interim wood supply
- K-North, O, and west ends of M, and N are removed.

## **2 YEAR TWO AND YEAR THREE DEVELOPMENT PLAN**

The twelve blocks (26 sub-blocks) considered for development in this plan are in the East Hyland Planning Unit located in Forest Management Unit Y02. The net area and estimated volumes have been taken from Harvesting Layout Final Reconnaissance Reports (IFS, Nov 2004) and modified to reflect recent Council recommendations.

### **2.1 Vegetation Types**

The vegetation types in the Irons Creek and the Contact Creek area can be broadly classified into vegetation types V17, V21 and V22. (Zoladeski, 1996)

- V17, generally, are White spruce dominated conifer stands. These stands occur on alluvial sites. They can be found in upland sites or bottomland forests. (Zoladeski, 1996)
- V21 are coniferous forests dominated by lodgepole pine, Black spruce and White spruce. Associated soils are fine to coarse textured, rapidly draining and developed on various parent materials. (Zoladeski, 1996)
- V22, generally, are coniferous stands dominated by Lodgepole pine. These stands are fire originated and tend to occur at lower to mid elevations. (Zoladeski, 1996).

### **2.2 Fish and Wildlife Considerations**

The key fish and wildlife considerations of this plan are:

- To maintain connectivity between the upland and lowland sites (all species).
- To minimize the line of sight between the blocks (ungulates).
- To increase the hiding cover (general parameter would attempt to be maintained at 200 m line of sight openings).



- If an active Northern Goshawk nest is found, a minimum perimeter of 200m buffer will be applied around the perimeter of the nest (Northern Goshawk).
- General guidelines for creating marten habitat will be prescribed. Coarse woody debris piles of 3x3x3m are to be left randomly in the blocks (Furbearers).
- Stand practices identified in the January Interim Wood Supply Plan will be prescribed.

### **2.3 Visual Quality Concerns**

The entire suite of B Blocks is located in complex terrain. The blocks have been engineered to minimize visual impacts from the Alaska Highway. Blocks C14 and C15 are approximately 10 km from the Alaska Highway. The hummocky terrain minimizes the visual concerns for these blocks. I1 and i5 are also of low visual concerns. During engineering, a detailed analysis will be completed to mitigate the visual concerns.

### **2.4 Regeneration**

FMB will be responsible for the regeneration of the blocks. Historically, blocks have been replanted, and assessed for survival. In addition to the planting and survival surveys, free-to-grow surveys will be required. Free-to-grow, in the Yukon context, occurs when regeneration of the preferred species has reached a height of greater than 1m taller than the competing vegetation. Preferred species would be White spruce and Lodgepole pine. The recommended target stocking for the harvested areas is 1200 stems\hectare.

The intent is to plant post harvest. Planting would occur approximately 3 years after harvest. Regen surveys would occur 5 years after harvest and performance surveys would occur 5 years post planting. Free-to-grow surveys are to be conducted eight years post planting. With the implementation of variable retention, the regen surveys and the performance surveys will determine if variable retention is practical.

This detailed monitoring will indicate success or failures; and, if required, appropriate intervention can change the prescription and move towards the desired outcome.

## 2.5 Access and Monitoring Plans

### 2.5.1 Access

Access management requires a numerous elements to be successful. These include:

- Limiting the density of new access,
- Identifying strategic access control points for physical barriers,
- Implementing appropriate water crossings and culverts to maintain soil and water quality, and,
- Monitoring impacts from new access (e.g. increases in wildlife harvest trends)

As this project is in phases, once the plan has proceeded through the EA process and the final blocks identified for the planning unit, a detailed access management plan will be developed in with the site and harvest plans. The plan will include scheduling for seasonal deactivation, permanent deactivation, access control points, and a monitoring plan to measure wildlife harvests. The monitoring will be a graduated response. If harvest levels increase and do not reduce over time. The response will first consider increasing the number of physical barriers, then requesting changes to wildlife regulations. Once the detailed access management plan is available, it will be provided to KFRSC for a public review.

Generally, in-block roads will be permanently deactivated once harvesting obligations are met. The Cosh mainline will be seasonally deactivated, using water bars and ditching to minimize erosion. The same strategy will be used with the mainline accessing the B Blocks and the i Blocks.

C14 and all the C15 blocks will be accessed via the existing East Cosh mainline. These blocks are winter access only. The mainline will be seasonally deactivated, post-harvest. Culverts will be pulled once the area has been replanted. Water bars and ditching will allow only ATV or foot access.

The i blocks will be accessed from the West Cosh mainline. These blocks are scheduled for winter harvest. The mainline will be seasonally deactivated, post-harvest. Culverts will be

pulled, once the area has been replanted. Water bars and ditching will allow only ATV or foot access.

The B blocks will be accessed the existing Irons Creek road. Access to B13 and B14 will be limited to ATV or foot traffic. The culvert east of block 13 will be pulled.

### **2.5.2 Harvest Monitoring**

It is recommended that these blocks be monitored from the implementation of harvesting through to the free-to-grow stage. It is FMB intent to work with operators to implement the variable retention system. Cruise plots will be established during the harvesting operations to ensure that the recommended retention levels are met. There will be some incidental windthrow as the stands are opened up. Blocks will be engineered to maximize wind firmness and boundaries will be feathered minimize the impacts. It will require a cooperative and collaborative approach as this is the first time variable retention systems are being implemented in the Yukon context.

The Year One monitoring plan will, when completed, serve as the template for the Year Two and Year Three monitoring plan.

## **3 PROPOSED YEAR TWO BLOCKS**

C14 (A, B), C15 (A, B, C, E, F, G, I, K, L, M N and P), i1, i5, and i6

### **3.1 Access**

I1 and i2 will be accessed via the existing West Cosh Mainline. Approximately 3 km of road will be upgraded to Class 2 roads. (THPOG, 1999) C14, C15, i5 and i6 will be accessed via the existing East Cosh mainline. The mainline will be re-established to a Class 1 road (THPOG, 1999). In-block roads will be Class 2 roads (THPOG, 1999). If harvested during winter, in-block roads drop to Class 3, 4 or 5. All in-block roads are temporary and will be permanently deactivated post harvest. The mainline will be seasonally deactivated.

### 3.2 Riparian Concerns

Year Two and Year Three development is within the Cosh Creek, Irons Creek, Contact Creek and Liard River watersheds. Fish species, known or expected, in Contact Creek are Arctic Grayling, mountain whitefish, and slimy sculpin. (Tobler and Richards, 2002). There have been limited surveys and studies associated with Contact Creek.

The known stream crossings are along the mainline to Block i5. Specific stream crossing assessments were complete in August 2004. (Environmental Dynamics, 2004) These assessments indicate no known suitable fish habitat in the streams crossed by the Cosh mainline (Environmental Dynamics, 2004). Riparian reserves will be established as per the Timber Harvesting Planning and Operating Guidebook (1999).

The eastern portions of Blocks i1 and the entire i2 Block were removed from the plan. This accommodates the concerns raised in the May 2004 Environmental Assessment. None of the proposed harvesting will occur within the Cosh watershed. C14 and C15 were reconfigured to make up volume from the deletion of the B Blocks.

**Table 2. Summary of block information for Year Two**

Block	Gross Area	Volume	Retention	Species
C14 A	27.4 ha	4700	8 %	Pine, Birch, White spruce
Comments	Proposed silviculture system is variable retention. Winter harvest. Visual concerns have been addressed through the prescribed aggregate and dispersed retention.			

Block	Gross Area	Volume	Retention	Species
C14B	100.7 ha	9570	25%	Pine, Birch
Comments	Proposed silviculture system is variable retention. Winter harvest. Visual concerns will be addressed through the prescribed aggregate and dispersed retention.			

Block	Gross Area	Volume	Retention	Species
C15A	32.8 ha	11220	5%	Pine, Birch
Comments	Proposed silviculture system is variable retention. Winter harvest.			

Block	Gross Area	Volume	Retention	Species
C15 B	58.7 ha	7830	20%	Pine, White spruce, Aspen
Comments	Proposed silviculture system is variable retention. Winter harvest.			

Block	Gross Area	Volume	Retention	Species
C15C	68.6 ha	12660	8 %	Pine, White spruce, Aspen
Comments	Proposed silviculture system is clear-cut with reserves. Winter harvest. Riparian concerns will be addressed with a 60 m riparian reserve on the stream adjacent to the eastern boundary.			

Block	Gross Area	Volume	Retention	Species
C15D	12.7	2159	0%	White spruce, Birch, Aspen
Comments	Proposed silviculture system is variable retention. Winter harvest.			

Block	Gross Area	Volume	Retention	Species
C15E	43.6 ha	4556	20%	White spruce, Pine, Birch, Aspen
Comments	Proposed silviculture system is variable retention. Winter harvest.			

Block	Gross Area	Volume	Retention	Species
C15F	85.2 ha	7506	20%	White spruce, Pine, Birch
Comments	<p>Proposed silviculture system is variable retention.                      Winter harvest.                      Visual concerns will be mitigated with the proposed retention strategy                      The structure to the south of this block is an industrial trailer. There is no evidence of trapping or traditional use associated with this structure.</p>			

Block	Gross Area	Volume	Retention	Species
C15G	47.6 ha	7938	7%	Pine, White spruce, Birch
Comments	<p>Proposed silviculture system is variable retention.                      Winter harvest.                      The Class 1 lake has will be buffered with a 340 m riparian reserve.                      Minimum 60 m riparian reserves will be applied to the stream on the eastern and western boundary.</p>			

Block	Gross Area	Volume	Retention	Species
C15i	87.6 ha	9840	12 %	Pine, White spruce, Birch
Comments	<p>Proposed silviculture system is variable retention.                      Winter harvest.</p>			

Block	Gross Area	Volume	Retention	Species
C15L	64.5 ha	10320	20 %	Pine, Birch
Comments	<p>Proposed silviculture system is variable retention.                      Summer harvest.                      Visual concerns will be addressed with the proposed variable retention</p>			

Block	Gross Area	Volume	Retention	Species
C15M	64.5 ha	10320	20 %	Pine, Birch
Comments	<p>Proposed silviculture system is variable retention.                      Summer harvest.                      Visual concerns will be addressed with the proposed variable retention</p>			

Block	Gross Area	Volume	Retention	Species
C15N	18.1 ha	3801	0 %	Pine, Birch, White spruce
Comments	Proposed silviculture system is variable retention. Summer harvest. Visual concerns will be addressed with the proposed variable retention.			

Block	Gross Area	Volume	Retention	Species
C15P	3.7 ha	740	0. %	Pine, White spruce, Birch
Comments	Proposed silviculture system is variable retention. Summer harvest. Visual concerns will be addressed with the proposed variable retention.			

Block	Gross Area	Volume	Retention	Species
i1	157.9 ha	12578	20%	White spruce, Pine, Birch
Comments	Proposed silviculture system is variable retention. Winter harvest. The eastern portion of this block has been removed to minimize the impact to the Cosh watershed. Wildlife corridors were retained.			

Block	Gross Area	Volume	Retention	Species
i5	135.6 ha	17440	36 %	Pine, Black spruce, White spruce, Aspen
Comments	Proposed silviculture system is variable retention. Winter harvest.			

Block	Gross Area	Volume	Retention	Species
i6	21.7 ha	4491	5 %	Pine, White spruce, Birch
Comments	Proposed silviculture system is variable retention. Winter harvest. There will be a 60 m riparian reserve on the Class 1 wetland in the NW section of this block.			

#### **4 PROPOSED YEAR THREE BLOCKS**

B1, B7 (A, B), B9, B10, B12, B13 and B14

Blocks B2 through B6 were removed from the plan on August 25. The economics of developing these blocks was deemed marginal. Additionally, the access for these blocks was contingent upon development of the L blocks to the north and west. B8 was removed to maintain structure between the old burn and the riparian area to the south.

##### **4.1 Access**

Blocks B1, B7 through to B14 will be accessed through the Irons Creek borrow pit on the north side of the Alaska Highway. These blocks are winter harvest only due to access constraints through the lowland area. Approximately 8.5 km of road will be upgraded to Class 2 specifications (THPOG, 1999). Preliminary indications, from air photo work and reconnaissance work, would suggest that these blocks would be harvested only in the winter. There are four stream crossings planned for this mainline. The road to the east and within Block B 10 has been realigned to minimize erosion concerns.

##### **4.2 Riparian Concerns**

Documented fish species in Irons Creek are Arctic Grayling, mountain whitefish, spoon head sculpin and slimy sculpin (Tobler 2002, BC FISS). Bull Trout is documented in the Hyland River (Karanka pers. com). Tributary streams to Irons Creek have not been surveyed nor sampled for fish. A stream assessment for Irons Creek (Tobler, P. 2004) indicates potential



for fish habitat. Where the mainline crosses Irons Creek, crossing structures will be installed to allow fish passage. (Tobler, P. 2004)

**Table 3. Summary of block information for Year Three**

Block	Gross Area	Volume	Retention	Species
B 1	41.2ha	4513	12%	Pine, Aspen, Black spruce
Comments	Proposed silviculture system is clear-cut, with reserves. Summer harvest.			

Block	Gross Area	Volume	Retention	Species
B 7A	33.9 ha	2340	9%	White spruce, Pine, Aspen
Comments	Proposed silviculture system is clear-cut with reserves. Summer harvest Reserve of 60m in width has been left between the Class 4 ephemeral stream to the north of this block			

Block	Gross Area	Volume	Retention	Species
B 7B	38.8ha	7020	12%	Pine, White spruce
Comments	Proposed silviculture system is clear-cut with reserves. Summer harvest Boundary is located on top of terrain break to ensure a 60m Reserve Zone between block and lake to the west. A 100 m visual buffer has been left in the SE corner of the block			

Block	Gross Area	Volume	Retention	Species
B9	11.9ha	2142	0%	Pine, White spruce
Comments	Proposed silviculture system is clear-cut. Winter harvest			

Block	Gross Area	Volume	Retention	Species
B10	49.6 ha	9288	22%	Pine, White spruce, Aspen
Comments	Proposed silviculture system is variable retention. Winter harvest.			

	Riparian values to the west and south of the block have been addressed with incorporation of 70-110 m and 70 -200m reserves
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Block	Gross Area	Volume	Retention	Species
B12	99.7ha	7797	32%	White spruce, Pine, Birch
Comments	Proposed silviculture system is clear cut with reserves Winter harvest Riparian values to the north of the block have been addressed with a 100 – 300m reserve zone. Game trails along the fire edge will be kept slash free.			

Block	Gross Area	Volume	Retention	Species
B13	115.1ha	17618	32%	Pine, Black spruce, White spruce
Comments	Proposed silviculture system is variable retention. Winter harvest Lake has been buffer with 130 m reserves. Additional internal reserves will provide visual screening Access management prescriptions suggest removal of the culverts post harvest. Trails were found on the north and west side of the small lake. There was no evidence of recent prospecting, trapping, or recreational use. Proposed harvesting is well away from these features.			

Block	Gross Area	Volume	Retention	Species
B14	22.7 ha	3255	4%	Black spruce, Pine
Comments	Proposed silviculture system is variable retention. Winter harvest Access management concerns have been addressed in B13.			

## 5 REFERENCES

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## **6 PERSONAL COMMUNICATIONS**

**Karanka, E.** pers. comm. Conversation between Robin Sharples, Environmental Assessment Coordinator, Yukon Government Forest Management Branch, and Ero Karanka, Fisheries Biologist, Department of Fisheries and Oceans, Whitehorse dated June 15, 2004.

## **Appendix 1. Proposed Block Reconnaissance Reports**

### **MULTI-PHASE TIMBER HARVESTING LAYOUT PHASE I, RECONNAISSANCE REPORTS**

#### **INTRODUCTION**

During August and September 2004, Industrial Forestry Service Ltd. completed reconnaissance of approximately 2000 hectares of forestland in the East Hyland Interim Wood Supply Planning Unit under contract to the Yukon Forest Management Branch (YFMB). The reconnaissance area was defined as 12 blocks proposed in the YFMB Development Plan for Years 2 & 3 of the Interim Wood Supply (IWS).

Within the parameters defined in the IWS Development Plan and the Phase I tele-conference (Aug 25<sup>th</sup>), the objective was to assess and refine the proposed Year Two and Year Three harvest blocks identifying a maximum net volume of 128,000m<sup>3</sup> per year (256,000m<sup>3</sup> total).

In the draft proposal submitted in October 2004, 12 blocks (30 sub-blocks) were identified with two additional blocks (B9 and C15-Q) having conditional potential. The draft also outlined a net harvestable volume of 221,702m<sup>3</sup> or 87% of the two-year target volume (1.7 years cut). Subsequent to the submission of the draft reconnaissance reports and a review by the TWG, a revised set of block maps and reports was developed for this report. A synopsis of the required revisions is as follows:

- A small Block B9 was added.
- Blocks I2A, I2B, C15H, C15J, and C15O and C15Q were deleted.
- Minor revisions were made to blocks B7, B10, B12, B13, B14, I1, I5, C14 & C15

The final plan proposes 12 blocks (26 sub-blocks) containing a net harvestable volume of 185,808 or 72.5% of the two year target (1.5 years cut). It is believed that all other resource issues, areas of concern, and development plan parameters were effectively achieved in all blocks.

The following “Recce” Reports detail the harvest chance, controlling site factors and harvest strategies for each proposed block. Block Maps are provided to illustrate the proposed boundaries, roads and retention (reserves) described in the reports.

## **YEAR TWO**

### **Block C14**

#### **Reconnaissance Report**

##### **GENERAL AREA OF DEVELOPMENT**

This block is near Cosh Creek, Yukon, within the Y02 Forest Management Unit and the Liard Basin Ecoregion. It is located about 1.9 km along an old block road that leaves the C10 road about 1.1 km. The C10 road joins the East Cosh Creek Mainline at approximately 10.0 km. The East Cosh Creek Mainline commences at the Alaska Highway approximately 75 km east of Watson Lake.

##### **RATIONALE FOR BLOCK DEVELOPMENT (LOCATION & ACCESS)**

As recommended by the Kaska Forest Resources Stewardship Council (KFRSC), Block C14 has been split into two blocks, C14A and C14B. Both blocks are designed to amalgamate old harvest areas into the two new blocks while providing connectivity between the blocks.

These blocks occupy the west and east slopes of a large drumlin and are both in the Simple Upland Natural Disturbance Zone (NDZ). Stand type changes and terrain features define the boundaries of both blocks.

C14A is a uniform west aspect with even topography and slopes ranging from five to 20%. The block is generally mesic to subhygric, with wetter areas being excluded from the harvest area. The soils are morainal sandy loams and fine sandy loams with 5-20% coarse fragments. The timber in the block consists of pine and spruce stands (V22 & V17) averaging 250 m<sup>3</sup> per hectare and about 21 cm average Diameter at Breast Height (DBH).

C14B consists of two distinct harvest areas separated by a reserve but since both areas adjoin the same “old cut block”, they are considered as one contiguous opening. One of the two

harvest areas occupies an upper slope position and the other a mid to lower slope position, but both occupy the same uniform east aspect. In general, C14B is has even topography with slopes ranging from five to 45%. The block is generally mesic with loam soils containing about 30-40% coarse fragments and the parent material is generally morainal. Some areas however, are very shallow to rock. This block targets pine and pine-spruce stands (V22 & V21) averaging 220 m<sup>3</sup> per hectare and approximately 16 cm DBH.

Access to C14A and C14B will be via the upgraded C10 road (requires one stream crossing as per the 2003 C10 reports) and an old block road that crosses one main NCD after leaving the C10 road. In-block access for both blocks is minimal requiring only three new spur roads extending off existing block roads. The lower (east) end of C14B is an adverse haul, but the roads are already in place from previous harvesting. No stream crossings are required on any in-block roads.

The moderately coarse soils, even terrain and moderate slopes will facilitate summer harvesting with few concerns in C14B, but C14A will need to be winter harvested due to the finer soils and localized subhygric (moist to wet) sites.

## **RETENTION OPTIONS**

Aggregated retention (reserves) in these blocks targets drains with large spruce, localized fir patches, small wet Spruce-Black spruce (SSb) patches and uniform pine and pine spruce stands. The proposed Gross Block Area for all of C14 is 128.1 ha. Individually, C14A has a Gross Block Area of 27.4 ha. with 2.1 ha. (8%) designated as internal reserves. C14B is 100.7 ha. with 25.2 ha. (25%) designated as internal reserves.

Dispersed retention options include leaving scattered fir vets and clumps of fir-spruce advanced regeneration. In addition, evenly distributed mature pine or spruce can be retained throughout.

## **HARVEST METHOD / SILVICULTURE SYSTEMS**

This block is proposed for variable retention harvest with a combination of dispersed and aggregated retention. Dispersed retention will be an evenly dispersed 10-20 mature conifer

trees per hectare. Harvesting can be conventional ground based (Feller-buncher & Grapple Skidder). Layout can be designed for roadside logging although some roadside slopes may be steeper than desired (i.e. > than 15%).

Planting of pine and spruce is the proposed regeneration method. No brush competition concerns are expected.

### **BLOCK SPECIFIC RESOURCE ISSUES**

The following forest values were considered during the reconnaissance: riparian features, wildlife, watershed values, visual, terrain, other tenures, and access management. Specific concerns are listed below:

#### *Visual*

This block is visible from the Alaska Highway but the proposed dispersed and aggregated retention will mitigate any viewscape concerns.



## **BLOCK C15**

### **RECONNAISSANCE REPORT**

#### **GENERAL AREA OF DEVELOPMENT**

This block is near Cosh Creek, Yukon, within the Y02 Forest Management Unit and the Liard Basin Ecoregion. C15 is located at approximately 11.7km on the East Cosh Creek Mainline, which commences at the Alaska Highway approximately 75km east of Watson Lake.

#### **RATIONALE FOR C15 DEVELOPMENT (General Strategies)**

The objectives for C15 development were as follows

- Review all harvest opportunities near the original C15 and develop a logical set of blocks averaging about 50 hectares in size with approximately 20% retention.
- Amalgamate all old harvest areas into the new blocks with at least 200m of timber between blocks. (*Note It is acknowledged that the regeneration in the old blocks will be protected from harvest equipment through designation of access routes and that “amalgamation” is for evaluation of block size, retention requirements, seral stages, and operational strategies only.*)
- Provide timbered connectivity between the blocks centered on riparian features, terrain features, noticeable travel routes, diverse habitat, etc.
- Forest Ecosystem Networks (FEN’s) centered on larger streams will define the maximum extent of C15 (on all sides).
- These blocks will occupy the height of land between the Irons Creek and Contact Creek watersheds
- Utilize the Timber Harvest Planning and Operating (THP &O) guidelines for harvest block development.
- Be aware of possible trails near C15 and accommodate these in the block design (development plan indicates “trappers cabin to the north of the block”).

- As noted on the reconnaissance map, an extensive area was reviewed for C15.

In total 993 hectares were encompassed by an external boundary that was walked in its entirety. This external boundary roughly defines the logical Integrated Resource Management Zone-Differentiated (IRMZD) / Forest Ecosystem Network (FEN) split for this portion of the East Hyland Development Plan Area. Reconnaissance strips covered this area in east west pattern, approximately 200m apart. Using the information gathered about stands and sites, and applying the above management criteria, we have developed the harvest plan shown on the Proposed C15 Block Map.

The Reconnaissance Block Summary for C15 provides a detailed area / volume summary for each sub-block and C15 as a whole.

In summary, it is recommended that the Kaska Forest Resources Stewardship Council consider the proposed C15 plan as it

- Achieves the intent of all management criteria through site-specific adaptation of the guidelines.
- Provides an ecosystem-based network of reserves maintaining connectivity, adjacency and habitat throughout the area.
- Minimizes disruption to the most critical parts of the ecosystem in this area.
- Incorporates the old harvest blocks within new blocks (de-fragmentation)
- Provides a dispersed pattern of “internal retention” that reduces sight & dash distances over both old and new harvesting.
- Average block size is <60 ha (range 87.6ha. to 38.2ha.).
- Minimizes the overall access needed and maximizes the use of existing access.
- Provides an economical harvest chance (localized development of 78,938m<sup>3</sup>)

In addition to the general development strategies above, the following pages provide a brief rationale for the development of each sub-block in C15.

## **Sub-block C15-A**

### **RATIONALE FOR SUB-BLOCK DEVELOPMENT (LOCATION & ACCESS)**

This block targets pine-spruce and spruce stands (V21 & V17) on a uniform northwest slope (10-40%). It is in the Simple Upland Natural Disturbance Zone (NDZ). It is bound on the north side by the slope break into a stream, on the west side by a Black spruce timber type. On the south and east sides a connectivity corridor has been located to separate it from the old harvest areas adjacent to sub-block C15B.

The soils are generally morainal loam to silt loam with 20-40% coarse fragments. The stands average 200 m<sup>3</sup> per hectare with an average Diameter at Breast Height (DBH) of 22 cm.

In block, access will generally have favorable to flat grades with some steeper pitches near the northeast corner. Winter harvest is preferred due to localized pockets of finer textured soils and compact till.

### **RETENTION OPTIONS**

Aggregated retention (reserves) in this block targets a centrally located Spruce-Black spruce (SSb) stand type. The proposed Gross Block Area for all of C15A is 38.2 ha. with 1.8 ha. (5%) designated as internal reserves.

Dispersed retention will include all deciduous, scattered fir vets and uniformly distributed pine and spruce.

### **HARVEST METHOD / SILVICULTURE SYSTEMS**

This block is proposed for variable retention harvest with a combination of dispersed and aggregated retention. Dispersed retention will be an evenly distributed 10-20 mature conifer trees per hectare. Harvesting can be conventional ground based (Feller-buncher & Grapple Skidder). Layout can be designed for roadside logging although some roadside slopes may be steeper than desired (i.e.> than 15%).

Planting of pine and spruce is the proposed regeneration method. Brush competition concerns will be limited to clonal aspen sprouts in localized patches. While prompt planting is expected to reduce this risk, monitoring of the plantation is recommended.

### **BLOCK SPECIFIC RESOURCE ISSUES**

The following forest values were considered during the reconnaissance: riparian features, wildlife, watershed values, visual, terrain, other tenures, and access management. There were no known site-specific concerns in this block.

### **Sub-block C15-B**

#### **RATIONALE FOR SUB-BLOCK DEVELOPMENT (LOCATION & ACCESS)**

This block targets pine and pine-spruce stands (V22 & V21) on a gently rolling to uniform drumlin (slopes 0-30%) with all aspects. It is in the Simple Upland Natural Disturbance Zone (NDZ). It is bounded on the north and east sides by old harvest blocks and connectivity reserves. The west boundary is a Black spruce timber type and the south boundary is terrain controlled (large gully).

The soils are generally morainal loam to silt loam with 10-40% coarse fragments. The stands average 225 m<sup>3</sup> per hectare with a 20 cm average Diameter at Breast Height (DBH).

In-block access will be mostly flat to favorable but may have slight adverse sections at the west end of the two spur roads in the block. Winter harvest is preferred due to localized pockets of finer textured soils and compact till.

#### **RETENTION OPTIONS**

Aggregated retention (reserves) in this block target mixed pine, spruce, aspen and Black spruce in pockets of variable terrain. The proposed Gross Block Area for C15B is 58.7 ha. with 11.7 ha. (20%) designated as internal reserves. Dispersed retention will include all deciduous, random advanced spruce regeneration clumps, and uniform mature pine & spruce.

## **HARVEST METHOD / SILVICULTURE SYSTEMS**

This block is proposed for variable retention harvest with a combination of dispersed and aggregated retention. Dispersed retention will be an evenly dispersed 10-20 mature conifer trees per hectare. Harvesting can be conventional ground based (Feller-buncher & Grapple Skidder). Layout can be designed for roadside logging.

Planting of pine and spruce is the proposed regeneration method. Brush competition concerns will be limited to minor clonal aspen sprouts in localized patches. While prompt planting is expected to reduce this risk, monitoring of the plantation is recommended.

## **BLOCK SPECIFIC RESOURCE ISSUES**

The following forest values were considered during the reconnaissance. riparian features, wildlife, watershed values, visual, terrain, other tenures, and access management. There are no known site-specific concerns in this block.

## **Sub-block C15-C**

### **RATIONALE FOR SUB-BLOCK DEVELOPMENT (LOCATION & ACCESS)**

This block targets pine and pine-spruce stands (V22 & V21) on a gently rolling to uniform drumlin (slopes 10-40%) with variable aspects. It is in the Simple Upland Natural Disturbance Zone (NDZ). The block is bounded on the north, west and south sides by stand type changes corresponding with terrain breaks. The east boundary is defined by a reserve composed of mixed spruce-pine stands on a broad riparian flat.

The soils are morainal and glacial fluvial loam to silt loam with 10-40% coarse fragments. The stands average 200 m<sup>3</sup> per hectare with an 18 cm average Diameter at Breast Height (DBH).

In-block access will be mostly flat to favorable with minor adverse sections. The access road into the block will require one Class 4 stream (or Non Classified Drain) crossing east of the block towards Block G. As this area is relatively flat, several crossing options may exist and all will be evaluated to ensure the least impact crossing is selected. Winter harvest is preferred due to localized pockets of finer textured soils and compact till.

### **RETENTION OPTIONS**

Aggregated retention (reserves) in this block targets mixed pine, spruce, aspen and Black spruce in pockets on variable terrain. The proposed Gross Block Area for C15C is 68.6 ha. with 5.3 ha (8%) designated as internal reserves. Dispersed retention will include all deciduous, scattered clumps of spruce advanced regeneration, and a few randomly distributed pine and spruce.

### **HARVEST METHOD / SILVICULTURE SYSTEMS**

This block is proposed for clearcut with reserves using a combination of dispersed and aggregated retention. Dispersed retention will be random mature trees and advanced

regeneration. Harvesting can be conventional ground based (Feller-buncher & Grapple Skidder). Layout can be designed for roadside logging.

Planting of pine and spruce is the proposed regeneration method. Brush competition concerns will be limited to minor clonal aspen sprouts in localized patches. While prompt planting is expected to reduce this risk, monitoring of the plantation is recommended.

### **BLOCK SPECIFIC RESOURCE ISSUES**

The following forest values were considered during the reconnaissance: riparian features, wildlife, watershed values, visual, terrain, other tenures, and access management. Specific concerns are listed below:

#### *Riparian Features*

Where the east boundary is adjacent to a stream, the boundary shall be located so that the Riparian Reserve Zone and most (if not all) of the Management Zone will be excluded from harvest (currently the minimum reserve width is 60m but this will be widened during final layout if needed after confirmation of the stream as Class 4 or Non Classified Drain (NCD).

#### *Wildlife*

Game trails were noted near the southeast side of this block. However, these areas have been excluded from harvest in adjacent reserves.

## **Sub-block C15-D**

### **RATIONALE FOR SUB-BLOCK DEVELOPMENT (LOCATION & ACCESS)**

This block targets pine-spruce stands (V21) on a uniform north slope (15-25%). It is in the Simple Upland Natural Disturbance Zone (NDZ). It is bounded on the north and east sides by the slope break into a stream, on the south and west sides by a connectivity reserve (open pine-spruce timber type and wetter ground).

The soils are generally morainal loam to silt loam with 20-40% coarse fragments. The stand averages 170 m<sup>3</sup> per hectare with a 22 cm average Diameter at Breast Height (DBH).

In-block access will be favorable to flat grades. Winter harvest is preferred to facilitate easy crossing of the moist to wet ground in the reserve surrounding the block.

### **RETENTION OPTIONS**

The proposed Gross Block Area for C15D is 12.7 ha. with no internal reserves (small size and narrow shape). Dispersed retention will include deciduous, scattered fir vets and uniformly distributed pine and spruce.

### **HARVEST METHOD / SILVICULTURE SYSTEMS**

This block is proposed for variable retention harvest with dispersed retention only. Dispersed retention will be an evenly dispersed 10-20 mature conifer trees per hectare. Harvesting can be conventional ground based (Feller-buncher & Grapple Skidder). Layout can be designed for roadside logging although some roadside slopes may be steeper than desired (i.e. > than 15%).

Planting of pine and spruce is the proposed regeneration method. Brush competition concerns will be limited to clonal aspen sprouts in localized patches. While prompt planting is expected to reduce this risk, monitoring of the plantation is recommended.



## **BLOCK SPECIFIC RESOURCE ISSUES**

The following forest values were considered during the reconnaissance: riparian features, wildlife, watershed values, visual, terrain, other tenures, and access management. There are no known site-specific concerns in this block.

### **Sub-block C15-E**

#### **RATIONALE FOR SUB-BLOCK DEVELOPMENT (LOCATION & ACCESS)**

This block is on a northwest aspect and is characterized as having rolling and benched terrain-averaging 8-30% slopes. It is in the Simple Upland Natural Disturbance Zone (NDZ). The block is bounded on the north side by the slope break into a Non Classified Drain (NCD) and on the west, side by a leading deciduous type and existing cut block. On the south and east, sides the block is bordered by a proposed connectivity corridor comprised of fir-spruce stand types.

The soils are generally morainal loam to silt loam with 20-40% coarse fragments. This block targets mixed pine and spruce stands (V21 & V17) averaging 180 m<sup>3</sup> per hectare with a 24 cm average Diameter at Breast Height (DBH).

The eastern half of the block will be accessed via a short spur road extending off an existing old block road. The western portion will be accessed by a spur road commencing off an existing road and proposed to continue on to Future Block C15-P. No stream crossings are required. Access would be reasonably easy with favorable soils for road construction. Winter harvest is preferred due to localized pockets of finer textured soils and compact till.

#### **RETENTION OPTIONS**

Aggregated retention (reserves) in this block will target uniform pine-spruce patches that are representative of the stands being harvested. The Gross Block Area is 43.6 ha. with 8.7 ha. (20%) designated as internal reserves. Dispersed retention will include all deciduous, scattered fir vets and uniformly distributed pine and spruce.

## **HARVEST METHOD / SILVICULTURE SYSTEMS**

This block is proposed for variable retention harvest with a combination of dispersed and aggregated retention. Dispersed retention will be composed of 10-20 evenly spaced, mature trees per hectare. Harvesting can be conventional ground based (Feller-buncher & Grapple Skidder). Layout can be designed for roadside logging although some roadside slopes may be steeper than desired (i.e. > than 15%).

Planting of pine and spruce is the proposed regeneration method. Brush competition concerns will be limited to clonal aspen sprouts in localized patches. While prompt planting is expected to reduce this risk, monitoring of the plantation is recommended.

## **BLOCK SPECIFIC RESOURCE ISSUES**

The following forest values were considered during the reconnaissance: riparian features, wildlife, watershed values, visual, terrain, other tenures, and access management. Specific concerns are listed below:

### *Riparian Features*

There are no riparian features in or adjacent to this block that would warrant special actions. A Non Classified Drain (NCD) borders the north boundary and all boundaries will be outside of any required reserves or management zones.

### *Visual*

This block may be partially visible from the Alaska Highway however, aggregated and dispersed retention will mitigate any viewscape concerns.

## **Sub-block C15-F**

### **RATIONALE FOR SUB-BLOCK DEVELOPMENT (LOCATION & ACCESS)**

This block is proposed on a southerly aspect and is characterized as having rolling and benched terrain-averaging 8-30% slopes. It is in the Simple Upland Natural Disturbance Zone (NDZ). Spruce-pine types (ranging from 80 to 170 meters wide) that separate it from

C15-E. bound it on the north side. The eastern boundary runs adjacent to spruce leading types and contains a Non Classified Drain (NCD). The boundary will be located to ensure that the NCD is at least 60 meters away from the proposed harvest area. The west side of the block borders a spruce-pine-deciduous type also containing an NCD that leads into a wet, Spruce- Black spruce (SSb) type at the south-west tip of the block. It is at this point that, the NCD may become a potential stream. The boundary will be located to ensure it remains outside the Riparian Reserve Zone. The southern boundary borders a low-lying wet area with a scattered SSb type. This reserve also contains a small portable prefabricated shed (about 8ft x 10 ft) that was probably brought in by helicopter, for use by prospectors (see mapped location). There are no indications of any trails or roads leading up to the shed.

The soils within the block are generally morainal loam to silt loam with 20-40% coarse fragments. This block targets mixed spruce pine stands (V22 & V17) averaging 180 m<sup>3</sup> per hectare with a 21cm average Diameter at Breast Height (DBH).

Access to the area is achieved from an existing road, which runs throughout the entire block. The only new construction required will be two short spurs to access the southeast and southwest portions of the proposed block. No new stream crossings will be required. Access would be reasonably easy with favorable soils for road construction. Winter harvest is preferred due to localized pockets of finer textured soils and compact till.

## **RETENTION OPTIONS**

Internal aggregated retention (reserves) target deciduous patches and uniform pine-spruce types that is representative of the stands being harvested. The proposed Gross Block Area is 85.2 ha. with 17 ha. (20%) designated as internal reserves. Dispersed retention options include leaving all mature deciduous, clumps of spruce-fir advanced regeneration and a few evenly distributed mature pine throughout the block (10 to 20 per hectare).

## **HARVEST METHOD / SILVICULTURE SYSTEMS**

This block is proposed for variable retention harvest with both aggregated and dispersed retention. This block can be laid out for conventional ground based roadside harvesting (Feller-buncher & Grapple Skidder) utilizing the existing road system.

Planting of pine and spruce is the proposed regeneration method. Brush competition concerns will be limited to clonal aspen sprouts in localized patches. While prompt planting is expected to reduce this risk, monitoring of the plantation is recommended.

## **BLOCK SPECIFIC RESOURCE ISSUES**

The following forest values were considered during the reconnaissance: riparian features, wildlife, watershed values, visual, terrain, other tenures, and access management. Specific concerns are listed below:

### *Riparian Features*

There are no riparian features within this block that would warrant special actions. Riparian features in the retention area include a potential stream in the southwest portion, (the block boundary will be out of both the Reserve Zone and Management Zone) and a meadow in the south, containing an industrial trailer. The eastern boundary is currently proposed with a minimum 60-meter buffer from the Non Classified Drain (NCD).

### *Visual*

This block may be partially visible from the Alaska Highway, however aggregated and dispersed retention will mitigate any viewscape concerns.

## **Sub-block C15-G**

### **RATIONALE FOR SUB-BLOCK DEVELOPMENT (LOCATION & ACCESS)**

This block targets mixed pine stands (V21 & V22) on a southerly aspect. It is in the Simple Upland Natural Disturbance Zone (NDZ).

The north boundary borders a low-lying wet area with a scattered Spruce- Black spruce (SSb) type. This wet draw contains a small portable prefabricated shed (about 8ft x 10 ft) that was probably brought in by helicopter, for use by prospectors. There are no indications of any trails or roads leading up to the shed. The eastern boundary runs adjacent to spruce leading types and excludes a potential stream. This boundary will be located to ensure that the required minimum Riparian Reserve Zone (RRZ) widths are maintained. The west side of the block borders on pine-spruce types that also contain a potential stream (or Non Classified Drain) draining the wet, low lying, SSb type near the south-west tip of Block C15-F. The boundary will at least be located outside any required RRZ here, and probably exclude most of any management zone. The south side of the block borders a proposed connectivity corridor comprised of leading spruce types. This corridor will be about 60-130 meters wide. The terrain is a series of rolling to broken drumlins with slopes that average 5-30%. Soils within the block are generally morainal loam to silty and sandy loam with 30-50% coarse fragments. The average volume of the block is 180 m<sup>3</sup> per hectare with an 18cm average Diameter at Breast Height (DBH).

There are existing roads that will access the southeast and center areas of the block. A short spur will be needed for the northeastern portion of the block. To the west, a branch road proposed to access Block C15-C, will be utilized to retrieve any remaining wood not skidded the existing mainline. No new stream crossings are required within this block. There is a proposed stream crossing in between blocks C15-G and C15-C. Access will be reasonably easy with favorable soils for road construction. Although there are some summer harvest areas, winter harvest is preferred due to localized pockets of finer textured soils and compact till.

## **RETENTION OPTIONS**

Aggregated retention (reserves) in this block target a spruce-Black spruce type and mixed pine-deciduous stands on variable terrain. The proposed Gross Block Area is 47.6 ha. with 3.5 ha. (7%) designated as internal reserves. Dispersed retention options include leaving all mature deciduous, clumps of spruce advanced regeneration and a few evenly distributed mature pine and spruce throughout the block (10-20 per hectare).

## **HARVEST METHOD / SILVICULTURE SYSTEMS**

This block is proposed for variable retention harvest with both aggregated and dispersed retention. This block can be laid out for conventional ground based roadside harvesting (Feller-buncher & Grapple Skidder) although some roadside slopes may be steeper than desired (i.e. > than 15%).

Planting of pine and spruce is the proposed regeneration method. Brush competition concerns will be limited to clonal aspen sprouts in localized patches. While prompt planting is expected to reduce this risk, monitoring of the plantation is recommended.

## **BLOCK SPECIFIC RESOURCE ISSUES**

The following forest values were considered during the reconnaissance. riparian features, wildlife, watershed values, visual, terrain, other tenures, and access management. Specific concerns are listed below:

### *Riparian Features*

Riparian features adjacent to the block include Non Classified Drains (NCD) and/or Class 4 streams outside the west and east boundaries. The block boundaries will be located to ensure any reserve zones (and most of the management zones) are excluded. The currently proposed reserve is at least 60m). To the south, a Class 1 lake is located at least 340 meters from the proposed boundary (well beyond the required Reserve and Management Zone).

### *Other Tenures*

A small portable industrial shed is located in a swampy opening as shown on the C15 Block Map (tent symbol). This shed is pre-fabricated, appears to have been set in by helicopter and contains paint & ribbon (along with a bed, stove and basic camping gear). This evidence along with existing ribbon lines in the area suggest prospecting activity rather than recreational, traditional or trapper use. Review mineral claim status for this and other C15 blocks.

## **SUB-BLOCK C15-I**

### **RATIONALE FOR SUB-BLOCK DEVELOPMENT (LOCATION & ACCESS)**

This block targets pine, pine-spruce and spruce stands (V22, V21 & V17) in the Simple Upland Natural Disturbance Zone (NDZ). It is bounded on all sides by connectivity reserves centered on Non Classified Drains (NCD's) and low-lying terrain containing mature spruce & pine stands.

The topography consists of a series of rolling drumlins with slopes of 10-45%. The soils are generally morainal loam to silt loam with 20-40% coarse fragments but include pockets of coarse glacial fluvial materials. In some areas, the soils are shallow to rock. The stand averages 200 m<sup>3</sup> per hectare with a 23 cm average Diameter at Breast Height (DBH).

In-block access will be favorable with grades near the maximum. Winter harvest is preferred to minimize site disturbance on the steeper portions of the block.

### **RETENTION OPTIONS**

The proposed Gross Block Area for Block C15-I is 87.6 ha. with 10.7 ha. (12%) designated as internal reserves. These reserves are oriented parallel with the prevailing wind, up the center of the new harvest area and in the old cutblock (27.7ha.) that is included into this block. These internal reserves include mixed pine deciduous, Spruce-Black spruce (SSb) types and uniform pine-spruce representative of the harvested stands. Dispersed retention will include all deciduous, scattered fir vets and uniformly distributed pine and spruce.

### **HARVEST METHOD / SILVICULTURE SYSTEMS**

This block is proposed for variable retention harvest with dispersed retention only. Dispersed retention will be an evenly distributed 10-20 mature conifer trees per hectare. Harvesting can be conventional ground based (Feller-buncher & Grapple Skidder). Layout will be designed for roadside logging or logging to landings depending on the how steep the average roadside slopes are.

Planting of pine and spruce is the proposed regeneration method. Brush competition concerns will be limited to clonal aspen sprouts in localized patches. While prompt planting is expected to reduce this risk, monitoring of the plantation is recommended.

### **BLOCK SPECIFIC RESOURCE ISSUES**

The following forest values were considered during the reconnaissance: riparian features, wildlife, watershed values, visual, terrain, other tenures, and access management. There are no known site-specific concerns in this block.

### **Sub-block C15-K**

#### **RATIONALE FOR SUB-BLOCK DEVELOPMENT (LOCATION & ACCESS)**

This block targets pine and pine-spruce stands (V22, V21) in the Simple Upland Natural Disturbance Zone (NDZ). The block is bounded on the south, west and east sides by connectivity reserves centered on Non Classified Drains (NCD's) and low lying terrain containing mature spruce & pine stands. The northwest boundary of this block is adjacent to an old cutblock and the northeast corner extends to hummocky terrain and rocky slopes.

The topography is even to slightly benched slope with slopes of 10-45%. The soils are generally morainal loams with 20-60% coarse fragments but pockets of coarse glacial fluvial materials are scattered throughout the block. In some areas, the soils are shallow to rock. The stand averages 150 m<sup>3</sup> per hectare with a 19 cm average Diameter at Breast Height (DBH).

In-block access will be favorable with moderate grades. Utilizing old block roads as much as possible minimizes new construction requirements. Although there are two old crossings (NCD or Class 4 stream) into this block (outside the west boundary), only the northernmost one will likely be required. When developing the final access routes, the best alternative for a main crossing upgrade will be proposed. Winter harvest is preferred to minimize site disturbance around the access crossing and where the soils are shallow.



## **RETENTION OPTIONS**

The proposed Gross Block Area for C15-K is 37.7 ha. with 2.7 ha. (7%) designated as internal reserves. These reserves are located in the northeast half of the block, are composed of uniform pine, and spruce representative of the harvested stands. Dispersed retention will include all deciduous, scattered old fir trees and uniformly distributed pine and spruce.

## **HARVEST METHOD / SILVICULTURE SYSTEMS**

This block is proposed for variable retention harvest with dispersed retention only. Dispersed retention will be an evenly distributed 10-20 mature conifer trees per hectare. Harvesting can be conventional ground based (Feller-buncher & Grapple Skidder). Layout will be designed for roadside logging.

Planting of pine and spruce is the proposed regeneration method. Brush competition concerns are low.

## **BLOCK SPECIFIC RESOURCE ISSUES**

The following forest values were considered during the reconnaissance; riparian features, wildlife, watershed values, visual, terrain, other tenures, and access management. Specific concerns are listed below:

### *Riparian Features*

Where the west boundary is adjacent to a Class 4 stream or NCD the boundary will be located so that any reserve zone and most of the management zone are excluded from the block (current proposed exclusion is a minimum 60m). Only NCD's and subhygric (moist to wet) draws appear to be adjacent to the remainder of the boundary, but re-confirmation will be ensured during the final layout.

### *Visual*

This block may be visible from the Alaska Highway. However, a combination of dispersed and aggregated retention will mitigate any viewscape concerns.

## **Sub-block C15-L**

### **RATIONALE FOR SUB-BLOCK DEVELOPMENT (LOCATION & ACCESS)**

This block targets pine and pine-spruce stands (V22, V21) in the Simple Upland Natural Disturbance Zone (NDZ). The block is bounded on the north, west and east sides by connectivity corridors. These corridors are centered on Non Classified Drains (NCD's), but connected to hummocky terrain, and rock outcrops. Uniform mature pine and spruce stands dominate these reserves. The north boundary of the block consists of uniform pine and fir stands on even terrain. The south boundary of the block is controlled by the slope break into a stream basin with steep rocky slopes. Pine stands dominate on this southern edge.

The topography is even to slightly benched with slopes of 5-45%. The soils in the block are generally morainal loams with 20-60% coarse fragments, but pockets of coarse glacial fluvial materials are scattered throughout the block. In some areas (particularly the southern portion) the soils are shallow to rock. The stand averages 200 m<sup>3</sup> per hectare with a 20 cm average Diameter at Breast Height (DBH).

In block access will be favorable with moderate to steep grades. There are few or no drains to cross to access this block but rocky sections of road will likely be encountered. Any rock encountered will likely be rippable. Due to the drier site conditions, coarse soils and generally dry access requirements, summer harvest is an option for this block.

### **RETENTION OPTIONS**

The proposed Gross Block Area for C15-L is 64.5 ha. with 12.9 ha. (20%) designated as internal reserves. The reserves are located evenly across the center of this block. They include mixed pine-deciduous, uniform pine and spruce representative of the harvested stands. Small terrain features are included in most of the reserves as well.

Dispersed retention will include all deciduous, scattered fir vets and uniformly distributed pine and spruce.

## **HARVEST METHOD / SILVICULTURE SYSTEMS**

This block is proposed for variable retention harvest with dispersed retention only. Dispersed retention will be an evenly distributed 10-20 mature conifer trees per hectare. Harvesting can be conventional ground based (Feller-buncher & Grapple Skidder). Layout will be designed for roadside logging.

Planting of pine is the proposed regeneration method. Brush concerns are low

## **BLOCK SPECIFIC RESOURCE ISSUES**

The following forest values were considered during the reconnaissance: riparian features, wildlife, watershed values, visual, terrain, other tenures, and access management. Specific concerns are listed below:

### *Visual*

This block may be visible from the Alaska Highway. However, a combination of dispersed and aggregated retention will mitigate any viewscape concerns.

## **Sub-block C15-M**

### **RATIONALE FOR SUB-BLOCK DEVELOPMENT (LOCATION & ACCESS)**

This block targets pine-leading types (V22) in the Simple Upland Natural Disturbance Zone (NDZ). However, the terrain immediately to the north of the block can be classified as Complex Upland.

The southwestern most portion of the block is a uniform morainal slope. The northern edge runs along an esker complex that is prevalent in the stream basin to the north of the block. The long narrow east-west orientation of the block is designed to maximize use of the Block “O” Road that climbs at a steady adverse grade toward Block K, crossing three minor Non Classified Drains (NCD’s) along the way. The Block “O” road is located as proposed to avoid crossings of the main FENs to the north and south of C15 (i.e. accept a steady adverse haul to minimize overall environmental impacts of access).

The northern boundary will follow the slope break, ensuring that the mainline road is contained within the block. The east and west sides are bounded by small drains having fir leading timber types. The south boundary excludes fir timber types with a few pine patches. All the excluded areas are part of the connectivity corridors that surround the block.

The in-block terrain is generally even to rolling and the slopes average 8-30%. The parent materials are a mix of coarse morainal and glacial fluvial deposits. Soil textures are loamy with 20-60% coarse fragments. The pine stands average 180 m<sup>3</sup> per hectare with a 24cm average Diameter at Breast Height (DBH).

Due to coarse textured soils, mesic site conditions and lack of in-block spur roads (logging to the mainline), summer harvesting is a suitable option for this block (particularly in conjunction with blocks N & O).

### **RETENTION OPTIONS**

The Gross Block Area of C15-M is 26.6 ha. with no internal reserves. Dispersed retention will include all fir, some pine and spruce and uniformly distributed spruce advanced regeneration.

### **HARVEST METHOD / SILVICULTURE SYSTEMS**

This block is proposed for variable retention harvest with only dispersed retention. Dispersed retention will be an evenly distributed 10-20 mature conifer trees per hectare (preferably fir). Harvesting can be conventional ground based (Feller-buncher & Grapple Skidder). Layout can be designed for roadside logging, although, some roadside slopes may be steeper than desired (i.e. > than 15%).

Planting of pine and spruce is the proposed regeneration method. Brush competition concerns are low.

## **BLOCK SPECIFIC RESOURCE ISSUES**

The following forest values were considered during the reconnaissance: riparian features, wildlife, watershed values, visual, terrain, other tenures, and access management. Specific concerns are listed below:

### *Riparian Features*

There are no riparian features in or adjacent to this block that would warrant special actions. As the boundaries are located on top of slope breaks or at the stand type changes, the small NCD's in the surrounding draws will be well outside the block boundary.

## **Sub-block C15-N**

### **RATIONALE FOR SUB-BLOCK DEVELOPMENT (LOCATION & ACCESS)**

This block targets pine and pine-fir stands (V22) in the Simple Upland Natural Disturbance Zone (NDZ). The block is bounded on the west and east sides by connectivity reserves centered on Non Classified Drains (NCD's). Uniform spruce-fir stands dominate these reserves. The north boundary of the block consists of uniform fir stands on even terrain. The south boundary of the block is controlled by the slope break into a stream basin with steep rocky slopes. Pine stands dominate this area.

The topography is slightly benched northeast aspect with of slopes 5-30%. The soils in the block are generally morainal loams with 20-60% coarse fragments. In some areas (particularly the southwest portion) the soils are shallow to rock. The stand averages 210 m<sup>3</sup> per hectare with a 21 cm average Diameter at Breast Height (DBH).

In-block access is composed of two separate routes. For the southern most routes, there is one major draw to cross to access this block (outside the west boundary). However, it is proposed that this crossing be at the height of land between the drains to minimize crossing difficulties. Some rocky sections will be encountered on this access route but they will likely be rippable. Because of the general northeast slope, the northeast corner of the block will be accessed by the Block "O" were a small landing would be needed to allow favorable skidding of the timber down to this road. Although the Block "O" road has a sustained

adverse section, the southern route is mainly favorable to the East Cosh Mainline with only a few adverse sections. In block road grades are slightly favorable to slightly adverse.

Due to the drier site conditions, coarse soils and generally dry access requirements, summer harvest is an option for this block.

### **RETENTION OPTIONS**

The proposed Gross Block Area for C15-N is 18.1 ha. with no internal reserves. The long narrow shape of this block combined with scattered dispersed retention will be sufficient to mitigate the impact of opening size.

### **HARVEST METHOD / SILVICULTURE SYSTEMS**

This block is proposed for clearcut harvest with dispersed retention only. Dispersed retention will include all deciduous, all fir and scattered clumps of fir-spruce advanced regeneration. Harvesting can be conventional ground based (Feller-buncher & Grapple Skidder). Layout will be designed for roadside logging with one landing in the northeast corner.

Planting of pine is the proposed regeneration method. Brush concerns are low.

### **BLOCK SPECIFIC RESOURCE ISSUES**

The following forest values were considered during the reconnaissance: riparian features, wildlife, watershed values, visual, terrain, other tenures, and access management. Specific concerns are listed below:

#### *Riparian Features*

There are no riparian features in or adjacent to this block that would warrant special actions (the block boundary will be out of both the Reserve Zone and Management Zone). Because the boundary will be at the top of the slope break, the small NCD or draws on the east and west sides will be well buffered from the harvest area.

### *Visual*

This block may be partly visible from the Alaska Highway but its long narrow shape, small size and dispersed retention will mitigate any viewscape concerns.

## **Block i1** **Reconnaissance Report**

### **GENERAL AREA OF DEVELOPMENT**

This block is near Irons Creek, Yukon, within the Y02 Forest Management Unit and the Liard Basin Ecoregion. It is located about 3.7 km along the West Cosh Creek Mainline. The West Cosh Creek Mainline commences at the old sawmill site on the Alaska Highway approximately 73.3 km east of Watson Lake.

### **RATIONALE FOR BLOCK DEVELOPMENT (LOCATION & ACCESS)**

Block i1 is proposed on the west side of a large drumlin within the Irons Creek drainage basin. The block is also in the Simple Upland Natural Disturbance Zone (NDZ). The north, west and south boundaries are defined by stand type changes while the east boundary is limited to the height of land between the Irons and Cosh watersheds. The boundary is designed to amalgamate several old cut blocks adjacent to the new harvest area but a large reserve in the center effectively splits the block into two distinct portions.

The topography is even to rolling with slopes ranging from zero to 30%. The block is generally mesic and drier sites. Most subhygric or wetter areas have been excluded in reserves. The soils are generally silt loam to sandy loams with 25-35% coarse fragments and the parent material consists of morainal blankets and veneers. The block targets pine, spruce and pine-spruce stands (V22, V17 & V21) that average 225 m<sup>3</sup> per hectare and about 25 cm average Diameter at Breast Height (DBH).

The West Cosh Creek Mainline transects the block from southwest to northeast providing readily available access for developing short in-block spur roads. Upgrading of this road requires clearing, installation of a few culverts and smoothing of grades only. There are no stream crossings required. In-block access requires short spur roads extending off the mainline and several old block roads so that very little new road must be constructed. Winter harvesting is preferred due to the variable terrain and site degradation risk (shallow compact till in localized areas)

### **RETENTION OPTIONS**

The main target for aggregated retention (reserves) in this block is variable terrain either side of a central harvested area that showed evidence of moose bedding and feeding. This linear reserve provides an east-west corridor effectively splitting the unit in half. This reserve consists of merchantable pine, pine-spruce, and spruce stands with some small Black spruce patches. It also excludes a wet seepage site. Some smaller reserves target a fir stand, some multi-layered spruce-fir and spruce stands. The proposed Gross Block Area is 157.9 ha. with 31.2 ha. (20%) designated as internal reserves.

Dispersed retention options include leaving all mature deciduous, scattered fir vets and clumps of fir-spruce advanced regeneration. In addition, evenly distributed mature pine or spruce can be retained throughout.

### **HARVEST METHOD / SILVICULTURE SYSTEMS**

This block is proposed for variable retention harvest with a combination of dispersed and aggregated retention. Dispersed retention will be an evenly distributed 10-20 mature conifer trees per hectare. Harvesting can be conventional ground based (Feller-buncher & Grapple Skidder). Layout can be designed for roadside logging.

Planting of pine and spruce is the proposed regeneration method. No brush competition concerns are expected except for a few localized clonal aspen patches.



## **BLOCK SPECIFIC RESOURCE ISSUES**

The following forest values were considered during the reconnaissance: riparian features, wildlife, watershed values, visual, terrain, other tenures, and access management. Specific concerns are listed below:

### *Riparian Features*

There are no riparian features in or adjacent to this block that would warrant special actions. The small Non Classified Drain (NCD)-Class 4 stream to the north of the block is a minimum of 120m from the block boundary.

### *Watershed*

The eastern boundary of the block excludes timber in the Cosh Creek watershed.

### *Wildlife*

Noted moose activity and east-west travel routes are accommodated by reserves.

### *Visual*

This block is to vehicular traffic from the Alaska Highway. Dispersed and aggregated retention will mitigate any viewscape concerns.

## **Block i5**

### **Reconnaissance Report**

#### **GENERAL AREA OF DEVELOPMENT**

This block is in the vicinity of Cosh Creek, Yukon, within the Y02 Forest Management Unit and the Liard Basin Ecoregion. It is located about 2.5 km along the proposed I5 road that will join the East Cosh Creek Mainline at approximately 11.5 km. The East Cosh Creek Mainline commences at the Alaska Highway approximately 75 km east of Watson Lake.

#### **RATIONALE FOR BLOCK DEVELOPMENT (LOCATION & ACCESS)**

Block I5 is in the Simple Upland Natural Disturbance Zone (NDZ) and is proposed on the southwest slope of a large rounded drumlin. The southwest, west and north boundaries are well defined by a stand type change (old fire edge), while the southeast boundary is largely terrain controlled.

The topography is even throughout most of the block with the exception of some rolling terrain in the southeast corner. Slopes range from five to 30%. The block is generally mesic and drier with subhygric or wetter areas being excluded in reserves. The soils are generally sandy loam to fine sandy loams with 20-30% coarse fragments and the parent material is morainal. The block targets pine and pine-spruce stands (V22 & V21) averaging 200 m<sup>3</sup> per hectare and about 20 cm average Diameter at Breast Height (DBH).

A large gully to the south of the block and the Irons Creek Valley to the west of the block limit access choices to I5. Thus, the proposed I5 road approaches from the Cosh Creek Mainline northeast of the block. The majority of the road is located on mesic (or drier) ground, has no stream crossings, few wet areas and few Non Classified Drain (NCD) crossings. The most noticeable NCD's are in the old cutblock near the start of the road. Adverse grades of 5-6% are present in the old cutblock at the start of the road, and between block I5 and I6. For in-block access, the grades are flat to favorable for the northern 2/3<sup>rds</sup> and adverse to flat for the southern 1/3<sup>rd</sup> of the block.

The moderately coarse soils, even terrain and moderate slopes will facilitate summer harvesting with few concerns.

### **RETENTION OPTIONS**

The main target for aggregated retention (reserves) in this block is an oblong shaped drainage basin composed of large diameter spruce stands, Black spruce stands, brush patches and NCD's. This reserve also includes merchantable pine –spruce stands on a uniform slope in the southwest corner. Some smaller reserves target merchantable pine and spruce, mixedwood clumps, depressional sites, and dense Spruce-Black spruce (SSb) patches. The proposed Gross Block Area is 135.6 ha. with 48.4 ha. (36 %) designated as internal reserves.

Dispersed retention options include leaving all mature deciduous, scattered fir vets and clumps of fir-spruce advanced regeneration. In addition, evenly distributed mature pine or spruce can be retained throughout.

### **HARVEST METHOD / SILVICULTURE SYSTEMS**

This block is proposed for variable retention harvest with a combination of dispersed and aggregated retention. Dispersed retention will be an evenly distributed 10-20 mature conifer trees per hectare. Harvesting can be conventional ground based (Feller-buncher & Grapple Skidder). Layout can be designed for roadside logging although some roadside slopes may be steeper than desired (i.e.> than 15%).

Planting of pine and spruce is the proposed regeneration method. No brush competition concerns are expected except for a few localized clonal aspen patches.

### **BLOCK SPECIFIC RESOURCE ISSUES**

The following forest values were considered during the reconnaissance: riparian features, wildlife, watershed values, visual, terrain, other tenures, and access management. Specific concerns are listed below:

### *Riparian Features*

There are no riparian features in or adjacent to this block that would warrant special actions. The northwest corner of the block is a minimum of 150m from Irons Creek (Class 2). Therefore, the entire Riparian Management Area will be excluded.

## **Block i6**

### **Reconnaissance Report**

#### **GENERAL AREA OF DEVELOPMENT**

This block is near Cosh Creek, Yukon, within the Y02 Forest Management Unit and the Liard Basin Ecoregion. It is located about 1km along the proposed I5 road that will join the East Cosh Creek Mainline at approximately 11.5 km. The East Cosh Creek Mainline commences at the Alaska Highway approximately 75km east of Watson Lake.

#### **RATIONALE FOR BLOCK DEVELOPMENT (LOCATION & ACCESS)**

Block I6 is in the Simple Upland Natural Disturbance Zone and is proposed as a replacement block for I4. This block utilizes the access road into block I5 for operational efficiency. The block is proposed between two small drumlins with the boundary being partly determined by terrain and partly determined by stand type change. It borders directly on Complex Upland at its eastern most edge. The proposed eastern boundary, however, excludes this complex terrain (eskers).

The topography is even to rolling with slopes ranging from five to 30%. With the exception of one wetter draw where the road crosses between the drumlins, the block is generally mesic and drier. The soils are generally silt loam to sandy loam morainal blankets with 10-25% coarse fragments. There are also some localized pockets of glacial fluvial materials and morainal veneers over rock. The block targets pine and spruce stands (V22 & V17) averaging 218 m<sup>3</sup> per hectare and about 19 cm average Diameter at Breast Height (DBH).

The I5 access road located on mesic or drier ground for the majority of its length, has no stream crossings, few wet areas and few Non Classified Drains (NCD's). The most

noticeable NCD's are in the old cutblock near the start of the road. Adverse grades of 5-6% are present through the old cutblock at the start of the road and between block I5 and I6. The grades in block I6 are flat to favorable. In-block access will be relatively easy as most of the block can be skidded to the I5 road with only a short spur needed for the northwest portion of the block.

Winter harvesting will be preferred to reduce the risk of site degradation on areas with compact till.

### **RETENTION OPTIONS**

The long narrow irregular shape and small size of this block reduces the need for in-block retention. Therefore, aggregated retention targets a single deciduous patch with scattered mature pine and spruce. The external boundary excludes all other significant features around this block. The proposed Gross Block Area is 21.7 ha. with 1.1 ha. (5%) designated as internal reserve.

Dispersed retention options are numerous and include leaving all mature deciduous, scattered fir vets, and clumps of fir-advanced regeneration that is present throughout the block.

### **HARVEST METHOD / SILVICULTURE SYSTEMS**

This block is proposed as a clearcut with reserve silviculture system. Harvesting can be conventional ground based (Feller-buncher & Grapple Skidder). Layout can be designed for roadside logging although some roadside slopes may be steeper than desired (i.e.> than 15%).

Planting of pine and spruce is the proposed regeneration method. No brush competition concerns are expected except for localized clonal aspen sprouts.

## **BLOCK SPECIFIC RESOURCE ISSUES**

The following forest values were considered during the reconnaissance: riparian features, wildlife, watershed values, visual, terrain, other tenures, and access management. Specific concerns are listed below:

### *Riparian Features*

At least a 60m Reserve Zone will be established between the Class 1 wetland near the northwest corner of the block and the block boundary.

## **YEAR THREE**

### **Block B1**

### **Reconnaissance Report**

#### **GENERAL AREA OF DEVELOPMENT**

This block is near Irons Creek, Yukon, within the Y02 Forest Management Unit and the Liard Basin Ecoregion. It is located adjacent to the Irons Creek Gravel Pit directly across the highway from the Iron Creek Lodge. The lodge is 68 km east of Watson Lake via the Alaska Highway. Block access will be off the gravel pit road extending eastward into the block.

#### **RATIONALE FOR BLOCK DEVELOPMENT (LOCATION & ACCESS)**

Block B1 is proposed on relatively flat glacial fluvial terrace with generally coarse soils. The upper soil horizons have a thin silty layer but this soon gives way to coarse sandy and gravelly soils deeper in the profile. The block targets pine and pine-spruce stands (V22 & V21) averaging 125 m<sup>3</sup> per hectare and about 16.5 cm average Diameter at Breast Height (DBH). Although the diameters are small, the stand has a relatively uniform density.

This block is in the Simple Upland Natural Disturbance Zone (NDZ) but borders directly on Complex Upland at its eastern most edge. The proposed eastern boundary has specifically excluded this complex terrain. Although the Interim Wood Supply (IWS) Development Plan notes indicate access concerns (stream crossing), no streams were found in or adjacent to the block that would require crossing. Access will be relatively easy with favorable soils for road construction. Due to the coarse soils, flat terrain, and easy access, this block can be summer harvested with no modifications and few concerns.

#### **RETENTION OPTIONS**

Aggregated retention in this block targets mixed pine-deciduous patches throughout, a small linear Spruce-Black spruce (SSb) type at the east end of the block and a uniform mature pine

type near the northwest corner. The proposed Gross Block Area of B1 is 41.2 ha. with 5.1 ha. (12%) designated as internal reserves.

Dispersed retention options include leaving all mature aspen and a few randomly scattered mature pine throughout the block.

## **HARVEST METHOD / SILVICULTURE SYSTEMS**

This block is proposed as a clearcut with reserves silviculture system. Harvesting can be conventional ground based (Feller-buncher & Grapple Skidder) and layout can be easily designed for roadside logging. Short-wood & Cut-to-Length harvest methods would also work well in this block.

Planting of pine is the proposed regeneration method. However, due to the terrain and soils, natural regeneration of pine is an option here. Natural regeneration, however, would take longer and may require site preparation to ensure uniform stocking. No brush competition concerns are expected except for localized clonal aspen sprouts. Spacing may be required if natural ingress of pine is excessive.

## **BLOCK SPECIFIC RESOURCE ISSUES**

The following forest values were considered during the reconnaissance: riparian features, wildlife, watershed values, visual, terrain, other tenures, and access management. Specific concerns are listed below:

### *Riparian Features*

A 70-450m Reserve Zone has excluded the Class 4- Class 5 stream to the north of the block. There is a small “pothole wetland” (<1 hectare in size) between the gravel pit and the block in the southwest corner that has been excluded with an appropriate (20-100m) timbered Reserve Zone.

### *Wildlife*

Due to the proximity of this block to the highway, the gravel pit, private land and Iron Creek Lodge, the habitat value is relatively low.



### *Visual*

This block has a flat profile but requires a visual screen from the Alaska Highway and the lodge. A timbered reserve ranging from 100 to 240m has been left to provide for visual screening.

### *Other Tenures*

The status of the gravel pit and surveyed location of near by private land will be confirmed prior to layout to ensure there are A quick review of Yukon Land Status Maps indicated that there is no overlapping tenures or that the overlap does not conflict with timber development.

## **Block B7**

### **Reconnaissance Report**

#### **GENERAL AREA OF DEVELOPMENT**

This block is near Irons Creek, Yukon, within the Y02 Forest Management Unit and the Liard Basin Ecoregion. It is located adjacent to the Irons Creek Gravel Pit, north of the highway and just west of the Iron Creek Lodge. Iron Creek Lodge is 68 km east of Watson Lake via the Alaska Highway. Block access will be via the proposed B-block Mainline originating at the gravel pit and extending northwestward until it connects with the original logging access road for this area.

#### **RATIONALE FOR BLOCK DEVELOPMENT (LOCATION & ACCESS)**

The request to find additional timber south of development plan block B7 has resulted in two blocks. The original B7 is now B7A and the southern addition is B7B. Both of these blocks are transitional between Simple Upland and Complex Upland Natural Disturbance Zones (NDZ's). The large draw separating B7A and B7B is a good connectivity corridor and will be left as a reserve even though it contains a partially logged high volume spruce stand. This draw dissipates at its eastern most end and is relatively flat and dry at the proposed mainline road location. Although the Interim Wood Supply (IWS) Development Plan notes indicated

access concerns (two stream crossings), the relocation of the mainline has eliminated the need for stream crossings near these two blocks.

Block B7A is proposed on an evenly sloped to level moraine and has a boundary that is largely determined by topographic breaks into riparian features and non-classified drains. The topography is generally even with slopes ranging from 5-25%. The soils are moderately coarse silt-loams to sandy loams. This block targets pine and pine-spruce stands (V22 & V21) averaging 120 m<sup>3</sup> per hectare and 17 cm Diameter at Breast Height (DBH). The proposed B-block mainline will provide in-block access so there is no need for additional spur roads. Due to the coarse soils, easy access and lack of wet sites, this block can be summer harvested with no modifications and few concerns.

Block B7B is proposed on variable topography. The west half of the block is composed of rolling moraines and the east half is predominantly a flat glacial fluvial terrace. The south boundary of B7B is mainly dictated by administrative jurisdiction (British Columbia-Yukon Border) while the north and west boundaries are dictated by slope breaks. The east boundary is the gravel pit.

The terrain is flat to moderately sloped (0-25%) and the soils are coarse to moderately coarse sandy loams. The timber in this block averages 200 m<sup>3</sup> per hectare and 17.5 cm DBH.

For in-block access, a spur road off the B-block mainline will be required to access the west end of the block. However, old access trails along the border can be upgraded to provide this access if needed. On block access is expected to be relatively easy with favorable grades and favorable soils for road construction. Due to the coarse soils, easy access and lack of wet sites, this block can be summer harvested with no modifications and few concerns.

## **RETENTION OPTIONS**

Aggregated retention in these blocks is composed of several small reserves. These reserves target a diversity of habitats such as mixed pine-deciduous patches, mature balsam, uniform pine stands, small linear Spruce-Black spruce (SSb) types and a brush patch with scattered vets. All reserves will have some component of merchantable timber. The proposed Gross Block Area for all of B7 is 73.7 ha. Individually, B7A is 33.9 ha. with 3.2 ha. (9%)

designated as internal reserves and B7B is 39.8 ha. with 4.7 ha (12 %) designated as internal reserves.

Dispersed retention options include leaving all mature aspen and a few randomly scattered understory SSb clumps in the block.

## **HARVEST METHOD / SILVICULTURE SYSTEMS**

This block is proposed as a clearcut with reserves silviculture system. Harvesting can be conventional ground based (Feller-buncher & Grapple Skidder) and layout can be easily designed for roadside logging.

Planting of pine is the proposed regeneration method. Natural regeneration of pine is an option in the eastern end of Block B7B on the glacial fluvial flat (about half the block). Natural regeneration, however, would take longer and may require site preparation to ensure uniform stocking. No brush competition concerns are expected except for localized clonal aspen sprouts

## **BLOCK SPECIFIC RESOURCE ISSUES**

The following forest values were considered during the reconnaissance: riparian features, wildlife, watershed values, visual, terrain, other tenures, and access management. Specific concerns are listed below:

### *Riparian Features*

The boundary will be located at the top of the terrain break ensuring a minimum 60m Reserve Zone is left between the block and the small lake to the west of block B7B.

The boundary will be located to ensure a minimum 60m Reserve Zone is left between the block and the ephemeral Non Classified Drain (NCD)-Class 4 stream to the north of block B7A (this drainage course now runs down the former road location into the swamp at the bottom of the hill).

As a side note, the old road could be deactivated (at the time of harvest of B7) by removing the log corduroy crossing in the swamp and re-establishing the natural water flow.

### *Wildlife*

Due to the proximity of this block to the highway, the gravel pit, private land and Iron Creek Lodge the habitat value is relatively low. However, a 70-220m corridor has been left between blocks B7A and B7B where the topography has provided a natural east- west travel corridor. In addition, a 150-200m buffer of mature timber has been excluded between these blocks and the large burn to the northeast to provide for “adjacent habitat”.

### *Visual*

A visual screen from the Alaska Highway and the lodge is required in a small portion of the southeast corner of B7B only. The proposed 100m reserve of mature pine should provide adequate visual screening here.

### *Other Tenures*

The status of the gravel pit and surveyed location of near by private land will be confirmed prior to layout to ensure there are no overlapping tenures or that the overlap does not conflict with timber development. In addition, the survey line through block B7B and all monuments along the British Columbia boundary must be left undisturbed after harvest. This would involve flagging of any survey pins, avoiding these structures during harvest and re-slashing the lines if necessary after harvest.

## **Block B9**

### **Reconnaissance Report**

#### **GENERAL AREA OF DEVELOPMENT**

This block is near Irons Creek, Yukon, within the Y02 Forest Management Unit and the Liard Basin Ecoregion. It is located about 3 km west of the Irons Creek Gravel Pit along the old road that will be upgraded as the B-block Mainline. The Irons Creek Gravel Pit is 68 km east of Watson Lake via the Alaska Highway.

#### **RATIONALE FOR BLOCK DEVELOPMENT (LOCATION & ACCESS)**

Block 9 is proposed in a uniform pine-pine spruce stand on a height-of-land, as shown on the proposed block map. The block boundary will be located to avoid any mixed-wood stands in the vicinity and to provide buffers of merchantable timber between the existing cut blocks and this block. A buffer of mature timber will also be left between the block and the large fire origin stand to the north of this block. The block will be located on an upper slope with access provided by extending a spur road from the existing cut block to the east of block B9.

Based on similar stands in this vicinity, the timber is estimated to be approximately 180m<sup>3</sup> per hectare with an average diameter of 22 cm Diameter at Breast Height (DBH).

#### **RETENTION OPTIONS**

Due to the small size of the block (11.9 ha.), its location at the height-of-land (potential wind-throw concern) and surrounding merchantable timber buffer, retention options should be limited to scattered advanced regeneration clumps were operationally feasible.

## **HARVEST METHOD / SILVICULTURE SYSTEMS**

This block should be considered a clearcut. Winter harvest will be preferred and the harvest method will be conventional ground based roadside harvest.

## **BLOCK SPECIFIC RESOURCE ISSUES**

The following forest values were considered during the reconnaissance: riparian features, wildlife, watershed values, visual, terrain, other tenures, and access management. Specific concerns are listed below:

### *Wildlife*

Adjacent mature timber buffers on all sides will provide for wildlife habitat.

### *Visual*

The surrounding mature timber will provide a visual screen between the block and the Alaska Highway.

## **Block: B10**

### **Reconnaissance Report**

#### **GENERAL AREA OF DEVELOPMENT:**

This block is near Irons Creek, Yukon, within the Y02 Forest Management Unit and the Liard Basin Ecoregion. This block is located approximately 5 km west of the Irons Creek Gravel Pit along the old road that will be upgraded as the B-block Mainline. The Irons Creek Gravel Pit is 68 km east of Watson Lake via the Alaska Highway.

#### **RATIONALE FOR BLOCK DEVELOPMENT (LOCATION & ACCESS):**

Block B10 is proposed on a southerly aspect of a series of drumlins in the Simple Upland Natural Disturbance Type (NDZ). The proposed boundary is generally terrain controlled on the east and west sides with a distinct fire boundary (stand type change) on the northern edge. The south boundary is along the old road that will be upgraded into the B-block mainline.

The topography in B10 is variable and is best described as rolling to benched terrain ranging from flat to about 45% slopes. The soils are moderately coarse silt loams to sandy loams. The block targets pine and spruce stands (V22 & V17) averaging 240 m<sup>3</sup> per hectare and about 22 cm average Diameter at Breast Height (DBH).

Although the IWS Development Plan notes indicate access concerns (three stream crossings), there are no stream crossings on the proposed mainline to the block. There are 2-3 small Non Classified Drains (NCD's) that will require culverts but no major crossings. One of these NCD's defines the east block boundary.

In-block access will be via the B12 road that winds its way up the block using the benches for corners and the rounded contours of the drumlins for gaining elevation. Access would be considered moderately difficult but the soils are relatively favorable for road construction. Although much of the block has dry coarse soils conducive to summer harvesting, winter is preferred to reduce the potential for site degradation on the slopes and small subhygric areas.

### **RETENTION OPTIONS:**

Aggregated retention in this block targets a pine stand on a small drumlin, mixed pine-spruce-deciduous patches throughout, a linear spruce draw in the center of the block and a Spruce-Black spruce (SSb) type in the southeast end of the block. About midway up the block, an elongated internal reserve and the east boundary pinch in to produce a connectivity corridor separated only by a narrow “height of land” on which the B12 road will be located. This ensures the integrity of both draws to the east and west of this narrow gap. The proposed Gross Block Area is 49.6 ha. with 10.9 ha. (22%) designated as internal reserves.

Dispersed retention options include leaving all mature aspen, clumps of spruce advanced regeneration and a few evenly distributed mature pine throughout the block (10-20 per hectare).

### **HARVEST METHOD / SILVICULTURE SYSTEMS:**

This block is proposed as variable retention harvest with both aggregated and dispersed retention. Harvesting can be conventional ground based (Feller-buncher & Grapple Skidder). Pending the best location for the B12 road, this block may require landings if the road side-slopes exceed 15% for the majority of the road. Otherwise, the block will be designed for roadside logging.

Planting of pine and spruce is the proposed regeneration method. Brush competition concerns are moderate and some localized clonal aspen sprouts are expected. However, prompt planting should reduce this risk.

### **BLOCK SPECIFIC RESOURCE ISSUES:**

The following forest values were considered during the reconnaissance: riparian features, wildlife, watershed values, visual, terrain, other tenures, and access management. Specific concerns are listed below:



*Riparian Features:*

The west boundary will be located at the slope break such that a 70-110m Reserve Zone is left between the block and the Class 4-Class 5 stream to the west of the block (Non-Fish Bearing Stream A, Reach 2, as per the Environmental Dynamics Inc. Stream Assessment Report, Aug. 31, 2004)

A 70 to 200m-Reserve Zone excludes the Unnamed Drainage to the south of the block. This drainage was considered a default fish-bearing stream in the Environmental Dynamics Inc. Stream Assessment Report, Aug. 31, 2004.

## **Block B12**

### **Reconnaissance Report**

#### **GENERAL AREA OF DEVELOPMENT**

This block is near Irons Creek, Yukon, within the Y02 Forest Management Unit and the Liard Basin Ecoregion. This block is located about 2 km north of block B10 that, in turn, is 6km west of the Irons Creek Gravel Pit along the old road that will be upgraded as the B-block Mainline. The Irons Creek Gravel Pit is 68 km east of Watson Lake via the Alaska Highway.

Two small, axe cut clearings (estimated to be over 40 years old from advanced regeneration on site) were noted on the southern fire boundary about mid way across the block. No trails were found leading in or out of these clearings and there were no structures of any kind found. The 25-30% slopes in these openings preclude reasonable camping spots. The clearings location on the fire edge, slope break and opening dimensions suggest they may have been helicopter toe-in spots for fire crews.

#### **RATIONALE FOR BLOCK DEVELOPMENT (LOCATION & ACCESS)**

Block B12 is proposed on the north aspect of a large drumlin and is the Simple Upland Natural Disturbance Zone (NDZ). The block exhibits the classic oblong shape characteristic of east-west fire events in this landscape and appears to be surrounded by a single large fire origin stand that is 60-80 years old. Consequently, the proposed boundary is well defined by a distinct stand type change.

The topography is uniform with even slopes ranging from five to 35%. The soils in the block are generally morainal silt loams to sandy loams with 5 to 40% coarse fragments.

The block targets pine/spruce and spruce stands (V21 & V17) averaging 115 m<sup>3</sup> per hectare and about 16.5 cm average Diameter at Breast Height (DBH). The volume per hectare is moderate to low but the larger block size provides a reasonable harvest volume.

Although the Interim Wood Supply (IWS) Development Plan notes indicated access concerns (2 stream crossings), there are no stream crossings on the proposed mainline to block B10 or on the B12 road through block B10 to B12.

In-block access consists of the B12 road and one spur. Both roads contours the side hill through out the block and allow favorable skidding. Access development will be easy with gentle grades and favorable soils for road construction.

Winter harvest is preferred on this block to reduce the potential for site degradation in the small subhygric sites, where the soils have silty textures in the upper soil profile and where compact till occurs.

### **RETENTION OPTIONS**

Aggregated retention in this block consists mainly of three larger reserves that target pine and spruce stands centered on draws, small non-classified drains, concave slopes and Spruce-Black spruce (SSb) stand types on toe slopes. These reserves provide a wide buffer for riparian features to the north of the block and good north-south connectivity. However, for the necessary road right-of-way, they would all be connected. One of the reserves effectively breaks the block into two parts, providing a movement corridor up and down the slope without disrupting the oblong block shape. The proposed Gross Block Area is 99.7 ha. with 31.9 ha. (32 %) designated as internal reserves.

Dispersed retention will be natural advanced regeneration or small diameter mature trees. Because of the small ground fire patches in this block (particularly along the north and south edges) natural pockets of advanced spruce and pine regeneration (up to 60-80 yrs old) can be left dispersed throughout the block. These clumps range from a few trees up to about one-half a hectare. In addition, smaller advanced regeneration is scattered throughout the block. Much of this regeneration will be acceptable (as crop trees) so will have the added benefits of reducing planting needs and hastening green up. Any mature deciduous can be left as well, although deciduous is not prevalent on this block.

## **HARVEST METHOD / SILVICULTURE SYSTEMS**

Although the development plan suggests a variable retention block, the stand structure is better suited for a clearcut with large reserves. However, it will have significant dispersed retention in the form of advanced regeneration and small diameter mature trees as explained above. Harvesting can be conventional ground based (Feller-buncher & Grapple Skidder). Layout will be for roadside logging.

Fill Planting of pine and spruce is the proposed regeneration method. Brush competition concerns are low to moderate. However, prompt planting should reduce this risk.

## **BLOCK SPECIFIC RESOURCE ISSUES**

The following forest values were considered during the reconnaissance: riparian features, wildlife, watershed values, visual, terrain, other tenures, and access management. Specific concerns are listed below:

### *Riparian Features*

The north boundary will be located at the toe of the slope such that a 100 to 300m Reserve Zone is left between the block and the Class 3- Class 4 stream to the north of the block.

### *Wildlife*

As expected, some portions of the old fire edge (block boundary) have a game trail along them. Mitigating actions will be to keep this area slash free after harvest.

## **Block: B13**

### **Reconnaissance Report**

#### **GENERAL AREA OF DEVELOPMENT:**

This block is near Irons Creek, Yukon, within the Y02 Forest Management Unit and the Liard Basin Ecoregion. This block is located about 8 km west of the Irons Creek Gravel Pit along the old road that will be upgraded as the B-block Mainline. The Irons Creek Gravel Pit is 68 km east of Watson Lake via the Alaska Highway.

To the north of this block, there is a small lake unnamed lake. A small clearing and cut trails exist on the north and west sides of this lake. In addition, an old road and ribbon trails were noted at the east end of the lake. These features are well away from the proposed harvesting.

#### **RATIONALE FOR BLOCK DEVELOPMENT (LOCATION & ACCESS):**

Block B13 is proposed on the top of a large uniform drumlin in the Simple Upland Natural Disturbance Type (NDZ). The block has a typical elongated shape characteristic of east-west fire events in this landscape. For the most part, the block is surrounded by a single large fire origin stand that is about 60-80 years old so most of the proposed boundary is well defined by a distinct stand type change. Only a few portions of the south boundary are defined by terrain rather than type changes.

This block has both north and south aspects with slopes ranging from two to 60%. All portions over 45% will be included in large internal reserves or excluded from the block. The soils are mainly morainal silt loams to sandy loams with 10-40% coarse fragments but a few areas of coarse glacial fluvial soils are present.

The block targets pine/spruce, pine and spruce stands (V22, V21 & V17) averaging 225 m<sup>3</sup> per hectare and about 20 cm average Diameter at Breast Height (DBH).

As noted in the Interim Wood Supply (IWS) Development Plan, access to the block requires two stream crossings. One is located just west of B10 where the mainline crosses a small Class 4 stream (Non-Fish Bearing Stream A, Reach 2, as per the Environmental Dynamics

Inc. Stream Assessment Report, Aug. 31, 2004). The second crossing is about 200m north of the northeast corner B13. This second crossing is proposed exactly where the old road crossed the creek as there is abundant gravel on each bank and a reasonably low profile for the crossing. Unfortunately, the original road builders did not install a crossing structure but simply filled the stream draw with clean gravel, restricting water movement to seepage through the gravel. Removing the gravel and installing a proper drainage structure will restore the natural stream flow. Thus, rehabilitation of this crossing can occur concurrent to construction of the new mainline. A rough estimate of culvert needs for these two crossings are a 1000mm and 1200mm culvert respectively.

In-block access will contour the drumlin keeping low in the block for favorable skidding. Slight adverse grades will be required in the southwest corner and west end toward block B14. The road has been routed to stay as far from the small lake (north of the block) as grades and skidding will permit, thus reducing recreational accessibility. If possible in-block roads will be routed parallel to the large central reserve to avoid crossing it twice, but adverse terrain may limit this option.

Winter harvest is preferred in this block to reduce the potential for site degradation in areas of compact till or where finer silty soils occur near the surface of the soil profile. Summer harvest would be an option with Low Ground Pressure (LGP) equipment.

### **RETENTION OPTIONS:**

Aggregated retention in this block will be made up of several reserves. One large elongated central reserve targets merchantable pine-spruce stands on variable terrain. Areas of steep slopes, draws, hummocky terrain and uniform slopes are all included in this reserve. The two midsize reserves are strategically placed patches of uniform pine and spruce (i.e. the reserve near the lake on the north boundary and the reserve adjacent to small wetland features outside the south boundary. Two small reserves target pine-deciduous, pine and Spruce-Black spruce (SSb) types on a variety of terrain. The proposed Gross Block Area is 115.1 ha. with 36.8 ha. (32 %) designated as internal reserves.

Dispersed retention opportunities include the few scattered deciduous and evenly distributed pine and spruce (10-20 per hectare). In addition, scattered advanced regeneration patches,

particularly along the boundaries, can also be retained. These patches would have originated as spot fires along the old fire front.

### **HARVEST METHOD / SILVICULTURE SYSTEMS:**

This block is suited to the variable retention harvest method utilizing both aggregated and dispersed retention. Harvesting can be conventional ground based (Feller-buncher & Grapple Skidder). Layout will be for roadside logging.

Planting of pine and spruce is the proposed regeneration method. Brush competition concerns are low.

### **BLOCK SPECIFIC RESOURCE ISSUES**

The following forest values were considered during the reconnaissance: riparian features, wildlife, watershed values, visual, terrain, other tenures, and access management. Specific concerns are listed below:

#### *Riparian Features:*

The boundary and an internal reserve have been located to provide a minimum 130m reserve between the Class 1 Lake north of the block and the harvest area.

The southeast boundary will be located at the top of the slope break to provide a minimum 80m reserve between the harvest area and the Non Classified Drain (NCD)-Class 4 stream to the south of the block.

#### *Wildlife:*

Most noticeable trails and signs are directly adjacent to the lake north of the block and are well excluded from the harvest. As expected some game trails exist along the old fire edge (block boundary). Mitigating actions will be to keep this area slash free after harvest.

#### *Visual:*

A portion of this block (south aspect) is visible from the Alaska Highway. However, the proposed dispersed and aggregated retention will minimize adverse viewscape impacts.

*Access Management:*

The mainstream crossing just north of the block would provide the best spot for a vehicle barrier. The culvert will be removed and the crossing restricted to ATV or foot only from this point.

## **Block B14**

### **Reconnaissance Report**

#### **GENERAL AREA OF DEVELOPMENT**

This block is near Irons Creek, Yukon, within the Y02 Forest Management Unit and the Liard Basin Ecoregion. This block is located about 10 km west of the Irons Creek Gravel Pit along an old road that will be upgraded as the B-block Mainline. The Irons Creek Gravel Pit is 68 km east of Watson Lake via the Alaska Highway.

#### **RATIONALE FOR BLOCK DEVELOPMENT (LOCATION & ACCESS)**

Block B14 is proposed on the northwest slope of a large drumlin and is in the Simple Upland Natural Disturbance Zone (NDZ). The proposed boundary is entirely defined by a distinct stand type change suggesting it is a single fire-skip in the same large, 60-80 year old, fire that encompassed both B13 and B12.

B14 is a uniform gently sloped block with slopes ranging from five to 15%. The soils are a mix of coarse morainal and glacial fluvial loams to sandy loams with 40-60% coarse fragments. The block targets a mixed Spruce-Black spruce stand with pockets of pine (V17, & V22) and averages 150 m<sup>3</sup> per hectare. Stand diameter averages about 14.5 cm Diameter at Breast Height (DBH). Species composition, age and structural uniformity suggest B13 and B14 are remnants of the same stand.

As noted in the Interim Wood Supply Plan (IWS) Development Plan, access to the block requires two stream crossings. These crossings are discussed in detail in the B13 block report. There are no mainline concerns between B13 and B14. In-block access will contour



the slope keeping low in the block for favorable skidding. Flat to very slight adverse grades will be required for the block road and between B13 and B14. There are no streams or Non Classified Drains (NCD's) in or near this block.

Due to the coarse soils and relatively flat terrain, this block could easily be harvested in summer with few concerns. However, if B13 were to be harvested in the winter, then this block should be winter harvested as well. Because of its size, B14 would be most economical if harvested in conjunction with B13.

### **RETENTION OPTIONS**

A single reserve is proposed in B14 containing merchantable pine-spruce. Due to the lack of stand variation, drains, or riparian features to target as reserves, the selected patch was placed to provide east-west connectivity while minimizing operational difficulties. The proposed Gross Block Area is 22.7 ha. with 1.0 ha. (4 %) designated as internal reserve.

Dispersed retention opportunities include the few scattered deciduous and evenly distributed small diameter pine and spruce (10-20 per hectare). In addition, scattered advanced regeneration patches, particularly along the boundaries can also be retained (old spot fires).

### **HARVEST METHOD / SILVICULTURE SYSTEMS**

This block is suited to the variable retention harvest method utilizing both aggregated and dispersed retention. Harvesting can be conventional ground based (Feller-buncher & Grapple Skidder). Layout will be for roadside logging.

Planting of pine and spruce is the proposed regeneration method. Brush competition concerns are low.

### **BLOCK SPECIFIC RESOURCE ISSUES**

The following forest values were considered during the reconnaissance: riparian features, wildlife, watershed values, visual, terrain, other tenures, and access management. Specific concerns are listed below:

*Wildlife*

Some game trails exist along portions of the old fire edge (block boundary). Mitigating actions will be to keep this area slash free after harvest.

*Access Management*

The mainstream crossing just north of the block would provide the best spot for a vehicle barrier. The culvert will be removed and the crossing restricted to ATV or foot only from this point.

## Appendix 2. Summary Tables for the Proposed Blocks

## Reconnaissance Block Summary For C14

Individual Sub-blocks (Blocks A & B)								
Sub-block Identification	Gross Area (Ha)	New Harvest Area (Ha)	Old Blocks (Included in Gross Area) (Ha)	Interior Reserves Only (Ha)	% Internal Retention Only (% of Gross)	Average Timber Type (Species %)	Average Volume/Ha (m <sup>3</sup> )	Total Volume (New Harvest Area) (m <sup>3</sup> )
C14-A	27.4	18.8	6.5	2.1	8%	Pl <sub>6</sub> Bl <sub>3</sub> Sw <sub>1</sub>	250	4700
C14-B	100.7	43.5	32.0	25.2	25%	Pl <sub>8</sub> Bl <sub>2</sub>	220	9570
<b>Total:</b>	128.1	62.3	38.5	27.3	21%			14270

## Reconnaissance Block Summary For C15

Individual Sub-blocks (Blocks A to L)								
Sub-block Identification	Gross Area (Ha)	New Harvest Area (Ha)	Old Blocks (Included in Gross Area) (Ha)	Interior Reserves Only (Ha)	% Internal Retention Only (% of Gross)	Average Timber Type (Species %)	Average Volume/Ha (m <sup>3</sup> )	Total Volume (New Harvest Area) (m <sup>3</sup> )
C15-A	38.2	36.4	0	1.8	5%	Pl <sub>7</sub> Sw <sub>3</sub>	200	7280
C15-B	58.7	34.8	12.2	11.7	20%	Pl <sub>8</sub> Sw <sub>2</sub>	225	7830
C15-C	68.6	63.3	0	5.3	8%	Pl <sub>6</sub> Sw <sub>3</sub> At <sub>1</sub>	200	12660
C15-D	12.7	12.7	0	0	0%	Pl <sub>6</sub> Sw <sub>2</sub> At <sub>1</sub> Bl <sub>1</sub>	170	2159
C15-E	43.6	25.2	9.7	8.7	20%	Sw <sub>3</sub> Pl <sub>3</sub> Bl <sub>3</sub> At <sub>1</sub>	180	4536
C15-F	85.2	41.7	26.5	17	20%	Sw <sub>5</sub> Pl <sub>3</sub> Bl <sub>2</sub>	180	7506
C15-G	47.6	44.1	0	3.5	7%	Pl <sub>7</sub> Sw <sub>2</sub> Bl <sub>1</sub>	180	7938
C15-I	87.6	49.2	27.7	10.7	12%	Pl <sub>5</sub> Sw <sub>4</sub> Bl <sub>1</sub>	200	9840
C15-K	37.7	24.4	10.6	2.7	7%	Pl <sub>5</sub> Sw <sub>3</sub> Bl <sub>2</sub>	150	3660
C15-L	64.5	51.6	0	12.9	20%	Pl <sub>8</sub> Bl <sub>2</sub>	200	10320
C15-M	26.6	26.6	0	0	0%	Pl <sub>7</sub> Sw <sub>2</sub> Bl <sub>1</sub>	180	4788
C15-N	18.1	18.1	0	0	0%	Pl <sub>7</sub> Bl <sub>3</sub> Sw <sub>1</sub>	210	3801
C15-P	3.7	3.7	0	0	0%	Pl <sub>5</sub> Sw <sub>3</sub> Bl <sub>2</sub>	200	740
<b>Total:</b>	592.8	431.8	86.7	74.3	13%			83058

### Reconnaissance Block Summary For I-BLOCKS

Individual Blocks (I1, I5, I6)								
Block Identification	Gross Area (Ha)	New Harvest Area (Ha)	Old Blocks (Included in Gross Area) (Ha)	Interior Reserves Only (Ha)	% Internal Retention Only (% of Gross)	Average Timber Type (Species %)	Average Volume/Ha (m <sup>3</sup> )	Total Volume (New Harvest Area) (m <sup>3</sup> )
I1	157.9	55.9	70.8	31.2	20%	Sw <sub>6</sub> Pl <sub>3</sub> Bl <sub>1</sub>	225	12578
I5	135.6	87.2	0	48.4	36%	Pl <sub>5</sub> Sb <sub>2</sub> Sw <sub>1</sub> Ep <sub>1</sub> At <sub>1</sub>	200	17440
I6	21.7	20.6	0	1.1	5%	Pl <sub>5</sub> Sw <sub>3</sub> Bl <sub>1</sub> Ep <sub>1</sub>	218	4491
<b>Total:</b>	<b>315.2</b>	<b>163.7</b>	<b>70.8</b>	<b>80.7</b>	<b>26%</b>			<b>34508</b>

### Reconnaissance Block Summary For B-BLOCKS

Individual Blocks (1, 7, 9, 10, 12, 13, 14)								
Block Identification	Gross Area (Ha)	New Harvest Area (Ha)	Old Blocks (Included in Gross Area) (Ha)	Interior Reserves Only (Ha)	% Internal Retention Only (% of Gross)	Average Timber Type (Species %)	Average Volume/Ha (m <sup>3</sup> )	Total Volume (New Harvest Area) (m <sup>3</sup> )
B1	41.2	36.1	0	5.1	12%	Pl <sub>7</sub> At <sub>2</sub> Sb <sub>1</sub>	125	4513
B7-A	33.9	19.5	11.2	3.2	9%	Sw <sub>6</sub> Pl <sub>3</sub> At <sub>1</sub>	120	2340
B7-B	39.8	35.1	0	4.7	12%	Pl <sub>8</sub> Sw <sub>2</sub>	200	7020
B9	11.9	11.9	0	0	0%	Pl <sub>7</sub> Sw <sub>3</sub>	180	2142
B10	49.6	38.7	0	10.9	22%	Pl <sub>7</sub> Sw <sub>2</sub> At <sub>1</sub>	240	9288
B12	99.7	67.8	0	31.9	32%	Sw <sub>8</sub> Pl <sub>1</sub> Bl <sub>1</sub>	115	7797
B13	115.1	78.3	0	36.8	32%	Pl <sub>6</sub> Sb <sub>3</sub> Sw <sub>1</sub>	225	17618
B14	22.7	21.7	0	1.0	4%	Sb <sub>7</sub> Pl <sub>3</sub>	150	3255
<b>Total:</b>	<b>413.9</b>	<b>309.1</b>	<b>11.2</b>	<b>93.6</b>	<b>23%</b>			<b>53972</b>

## **Appendix 3. Kaska Forest Resources Stewardship Council Recommendations**

### January 2004 Recommendations

KFRSC agreed to the following draft recommendations:

1. That watersheds be the basic unit for planning and be used for all levels of forest planning (Regional – Operational)
2. That the stand practices agreed by the Interim Wood Supply Committee and included in Site and Harvest Plans be applied for harvesting interim wood.
3. At this point, a Traditional Knowledge Protocol has not been signed with the Council, once this occurs Traditional Knowledge will be used to update interim wood supply.
4. That interim wood supply also includes commercial permits for green wood related to salvage logging, agricultural dispositions, clearing related to right of ways or land dispositions (e.g. roads or gravel pits).
5. That for regional planning, timber criteria for planning should be set at 150 m<sup>3</sup>/ha
6. The existing Timber Harvesting Planning and Operation Guidelines document is reviewed and forest management practices updated through a third party (e.g. Sustainable Forest Management Network) review with public input.
7. That to be adaptive to interest in timber, Forest Management Branch will report quarterly on the commercial timber permits to Council. KFRSC will monitor the volume being permitted.
8. That interim wood supply is sequenced to include seasonal harvesting, and multi-year (e.g. 3 year) permits be considered for blocks available this year. However, similar strategies for restricting raw log export proposed in October by KFRSC be used in permitting wood.
9. Blocks that are made available but not awarded will be made available in the next fiscal instead of new blocks being laid out.

10. That the following blocks identified in the Industrial Forest Service's Total Chance Landscape Plan (2003) be removed for timber harvesting in the East Hyland:
  - a. Blocks C1, C2, C3
  - b. Block C7
11. Due to concerns from forest cover removal in the Cosh Creek watershed on forest values, water quality, and aquatic ecosystems the following occur:
  - a. All blocks identified in the west and north portions of the watershed be removed (Year two or three blocks)
  - b. Blocks identified for Year one interim wood and on the eastern portion of the watershed be harvested in winter and apply mitigations as agreed by the Interim Wood Supply Technical Committee.
12. Upland ecosystem zoning in the East Hyland is more complex than indicated and a better classification is required for planning and regional planning.
13. Due to interest on adaptive management and monitoring of new forest practices, and as mitigations for forest values in the East Hyland, a set aside has been identified that has similar forest composition as the Interim Wood Supply Area. This area will be a temporary deferral for at least half a rotation, and will be used to provide comparisons when monitoring the outcomes of Interim Wood Supply Plan over time.
14. That the following blocks be made available for opportunity this winter, the volume be attributed to this year's 128,000 m<sup>3</sup> volume, and apply the prescriptions in the Site and Harvest Plans:
  - a. Blocks C4, C6, C8, C11 (please note at a February 4, 2004 KFRSC meeting, Council recommended block C10 also be made available for this winter. The status of this block was not indicated at the January meeting)
15. Blocks C5, C9, and C12 will be returned to the Interim Wood Supply Technical Committee for technical review. These blocks and blocks identified for the next 2 years will be completed before March 31, 2004 and the volume from C9, C12, or C5 attributed to this year's 128, 000 cubic meters.
16. The remaining blocks for year one will be considered for summer harvesting even though volumes will be from this years available volume

17. The Watson Lake interim wood supply strategy is still undergoing technical review, but in the short term, point source wood (up to 3,000 – 5000 cubic meters for the area) will be made available using existing guidelines, policies, and timber in the Miscellaneous Timber Unit. Community input into forest values, recreational uses, and other values will be requested during public review of interim wood supply. These blocks and blocks identified for the next 2 years will be completed before March 31, 2004 and the volume attributed to this year's 128, 000 cubic meters.
18. Ross River interim wood supply will be identified once Ross River Dena Council can provide direction on the proposed areas and recommendations:
  - a. That the cultural, social, and ecological values, identified in the Buttle Creek are greater than the timber values and this area and could be removed for interim wood supply
  - b. That blocks near Coffee Lake be removed, and visual quality from Coffee Lake be maintained

#### April 2004 Recommendations

The following solutions are recommended to address these technical concerns for year two and three interim timber:

- Blocks to be deferred or boundaries modified to meet Cosh Creek watershed January recommendations (Figure 1)
- Maintain harvesting within upland ecosystems and apply current zoning for East Hyland
- Apply an average of 50 ha cutblocks with 20% in-block grouped retention within defined blocks by IFS. Degree of retention scales with size of opening, consider guidelines for retention
- Arrange blocks so at least 200m between blocks (includes old blocks) for wildlife movement

- Reconfigure blocks to include old blocks as part of opening, or move boundaries to capture more forest away from the old blocks( at least 200 m)
- Apply strategies for that have been agreed for stand practices (January recommendations)
- Block modifications only looked at existing IFS material but forest cover mapping >100 m<sup>3</sup>/ha indicates more blocks could be considered
- Forest cover removal and seral changes will be analyzed for Irons Creek and Contact Creek as part of the technical package developed for KFRSC
- Zoning for East Hyland to be in place until harvested stands become mature (Includes year one blocks)
- No blocks will be considered near the trail from lower Cosh Creek to Loon Lake and out of the East Hyland Interim Wood Supply area
- Blocks on the east edge of Cosh Creek watershed and blocks C15 and 14 need to have site plans that addresses trails in the area.

Council also recommended that the following be technically reviewed for remaining year one blocks:

- Block 12B- the proposed block with adjacent opening is sufficient with the riparian management zone and width of forested area between blocks.
- Block 12A and 12C– east lobe of block 12A with V17 and V22 has fir component and possible slope operational problems. Conduct air photo review for these issues and consider area for grouped retention.
- Block 9- the block is on the height of land with two fir leading forest types, the block should be considered complex and the block considered for other harvesting systems. The proposed boundary contains the forest types with a higher component of spruce and pine. It should be considered as the block boundary if the neighboring forest type is not considered for harvesting.



- Block 5- block 5D has high component of fir and for connectivity between blocks, V9 forest type should become grouped retention.

### December 2004 Recommendations

#### Year Two & 3 wood

The recommendations are to be considered final and changes outside of the report and maps can be captured on the ground when site and harvest plans are developed for each block.

#### Maps

- Redo the maps so the old blocks are grey, internal reserves are green, proposed blocks are yellow and include forest cover as background. This will stop the impression of islands on the maps. Also include base map layers already identified (contours, water, etc., etc.)

#### Retention for I blocks, B blocks, and C14

- Internal reserves on the larger blocks could include more retention of merchantable timber. The air photos looked to have many unmerchantable and deciduous stands in reserves.

#### Block C15

- The blocks are considered as an amalgamation of blocks and not one opening.
- Since it is not currently possible to track external reserves, internal reserves will be the method for stand level reserves. Internal reserves need to be increased for blocks F, E, L, & B and be done by increasing proposed reserves.
- Blocks D and P are part of interim wood supply
- K-North, O, and west ends of M, and N are deferred

## Appendix 4. Landscape Assessment Data

Seral (ha)	Contact Creek Watershed				Total
	0-29	30-79	80-129	130+	
Black Spruce		247	1332		1579
Burn	3688				3688
Fir		193	86		279
Hardwood		208			208
Hardwood/Pine		483			483
Hardwood/Spruce		393	80		473
Larch			9		9
Pine	37	35	543		615
Pine/Hardwood		233	26		259
Pine/Spruce	106	476	942		1523
Spruce/Hardwood	52	40	170		263
Spruce/Pine	160	310	952	48	1470
White Spruce	4	12	511	49	577
<b>Total</b>	<b>4047</b>	<b>2631</b>	<b>4652</b>	<b>96</b>	<b>11427</b>

Post Seral (ha)	Contact Creek Watershed				Total
	0-29	30-79	80-129	130+	
Black Spruce	0	247	1332		1579
Burn	3688				3688
Fir		193	86		279
Hardwood		208			208
Hardwood/Pine		483			483
Hardwood/Spruce		393	80		473
Larch			9		9
Pine	118	35	463		615
Pine/Hardwood		233	26		259
Pine/Spruce	159	476	889		1523
Spruce/Hardwood	52	40	170		263
Spruce/Pine	173	310	938	48	1470
White Spruce	7	12	509	49	577
<b>Total</b>	<b>4197</b>	<b>2631</b>	<b>4502</b>	<b>96</b>	<b>11427</b>

Seral (ha)	Irons Creek Watershed				Total
	0-29	30-79	80-129	130+	
Black Spruce	5	1139	3208	76	4427
Burn	8775				8775
Fir		50	127		177
Hardwood					
Hardwood/Pine		277	144		421
Hardwood/Spruce	7	199	82		288
Larch					
Pine	38	199	1147		1385
Pine/Hardwood	11	167	291	202	670
Pine/Spruce	115	2789	2250	163	5317
Spruce/Hardwood	12	29	189		231
Spruce/Pine	156	928	1738		2821
White Spruce	62	125	1215	88	1490
<b>Total</b>	<b>9183</b>	<b>5902</b>	<b>10390</b>	<b>528</b>	<b>26003</b>

Post Seral (ha)	Irons Creek Watershed				Total
	0-29	30-79	80-129	130+	
Black Spruce	187	1139	3026	76	4427
Burn	8775				8775
Fir		50	127		177
Hardwood					
Hardwood/Pine	0	277	144		421
Hardwood/Spruce	7	199	82		288
Larch					
Pine	170	199	1016		1385
Pine/Hardwood	34	167	268	202	670
Pine/Spruce	448	2789	1917	163	5317
Spruce/Hardwood	12	29	189		231
Spruce/Pine	368	928	1525		2821
White Spruce	79	125	1198	88	1490
<b>Total</b>	<b>10081</b>	<b>5902</b>	<b>9492</b>	<b>528</b>	<b>26003</b>

Irons Creek Watershed			
Interior Forest Conditions (ha)	Preharvest	Harvest	Remaining Interior Forest Conditions
Forest Type	Total	Total	
Black spruce	2660	647	2013
Fir	178	0	178
Hardwood/Pine	278	246	32
Hardwood/Spruce	177	41	136
Pine	886	358	528
Pine/Hardwood	288	48	240
Pine/Spruce	3696	1104	2592
Spruce/Hardwood	46	6	40
Spruce/Pine	1405	286	1119
White spruce	826	188	638
<b>Total</b>	<b>10440</b>	<b>2924</b>	<b>7516</b>

Contact Creek Watershed			
Interior Forest Conditions (ha)	Preharvest	Harvest	Remaining Interior Forest Conditions
Forest Type	Total	Total	
Black spruce	916	8	908
Fir	187	0	187
Hardwood	141	0	141
Hardwood/Pine	343	0	343
Hardwood/Spruce	314	0	314
Larch	9	0	9
Pine	290	101	189
Pine/Hardwood	78	0	78
Pine/Spruce	882	185	697
Spruce/Hardwood	74	0	74
Spruce/Pine	646	120	526
White spruce	224	61	163
<b>Total</b>	<b>4104</b>	<b>475</b>	<b>3629</b>