# BLOCK REPORT

**Client: Yukon Forest Management Branch**
**Job #: 030482**
**Reported by: Paul Schuetz**
**Company: Industrial Forestry Service Ltd.**
**Date: November 25, 2003**

## *COSH CREEK BLOCK C4*

### Location and Access

This block is located in the vicinity of Cosh Creek, ±51 km east of the town of Watson Lake, Yukon within the Y02 Forest Management Unit and the Liard Basin Ecoregion.

The town of Watson Lake is situated along the Alaska Hwy at Mile 635. From Watson Lake, proceed eastward along the Alaska Hwy for approximately 75 km to reach the beginning of the Cosh Mainline Road (about 2 km west of the Contact Creek Lodge). Heading north along the Cosh Mainline Road, continue for about 2.7 km at which point the point of commencement (P.O.C.) of the C4-1 can be seen on the left. The boundary of Cosh Block C4 is reached about 36m from the P.O.C. of the C4-1 Road.

The total distance to Watson Lake is approximately 77.7 km.

### Located Roads

Three block roads and five landings have been proposed for this block. While the total harvesting area of this block is rather small, the road system and number of landings were deemed necessary to meet skidding specifications in the hummocky and broken terrain that defines this block. All roads and landings should be constructed to allow for easy rehabilitation following harvesting activities.

Areas of note along the Block C4 road system include the following:

- The first 36m of the C4-1 Road cross an existing plantation. This distance was kept to a minimum while remaining operationally feasible.
- From the P.O.C. to GPS #38, the C4-1 Road is located along gently favourable grades. Some areas of rippable rock were encountered west of Landing #1.
- The section of road between GPS #38 to the junction with the C4-2 Road is located along steep (average 8%) adverse grades. The remainder of the C4-1 Road is also adverse but along grades ranging from 2-5%.
- The first part of the C4-2 Road is located along adverse grades of 6-8% (with short sections of relief) until GPS #46. The remainder of the road is favourable.
- The section of the C4-2 Road between GPS #51 & 49 passes through a small saddle between relatively broken ground. Some significant cuts and fills will be required in this area with side slopes of 32% and favourable grades of 12% (for

short pitches). This saddle was utilized to access a large bench upon which the remainder of the road, and Landing #4, are situated.
- The C4-3 Road is located along favourable grades with pitches of up to 12%.

The majority of skidding in Block C4 will be favourable on moderate slopes with the following exceptions:
- Adverse to Landing #1 from the north along slopes of 10%.
- Adverse to Landing #2 from the west and southwest along slopes of 15-20%. Slopes deemed too steep to be skidded adversely to Landing #2 can be skidded along benches to Landing #3.
- Skidding to Landing #4 will be adverse from the west along slopes of 20%, and from the northwest along slopes of 10%.
- Skidding to Landing #5 will be adverse from the east and northeast along slopes of 10%.

**Block Boundary**

The Block C4 harvesting boundary has been significantly modified from the area that was proposed in the Interim Wood Supply Plan. The most noticeable change is the amount of retention, which has increased from the proposed amount of 30% to the current amount of 64.1%. The areas of note that helped to determine the location of the proposed harvesting boundary are as follows:
- The section of boundary between GPS #3 and 10 has been located to exclude deciduous leading stands and a narrow band of black spruce that parallels the Cosh mainline.
- The section of boundary between GPS #10 and 14 has been located to exclude non-productive types and subhygric ecotypes where some wildlife use was noted. A reserve has been maintained in this area. The boundaries on the north and south side of the C4-2 Road have been located in a way as to allow road access into the western part of the block without impeding the construction process.
- The section of boundary between GPS #14 and 19 has been located along the edge of a wide bench and excludes several steep (50%+) breaks toward Cosh Creek.
- The section of boundary between GPS #19-21, 24-26, and 32-34 follows the break to a non-classifiable drain (NCD) located between the northern boundary of Block C4 and the built road to the north. This section of boundary also excludes some areas of exposed rock and provides a suitable buffer for wildlife movement along the NCD.
- The section of boundary between GPS #21 and 24 was originally proposed to be an internal wildlife tree patch (WTP) however, it was decided that maintaining connectivity to the corridor to the north of the block would better meet wildlife objectives.
- The section of boundary from GPS #27 to 32 excludes a subhygric draw where some minor wildlife sign was noted.
- The section of boundary from GPS #34 to 3 has been located along the edge of an existing cut block.

**Harvesting Strategy**

- This block will be managed for coniferous species.
- Season of Harvest: Winter. *
- Harvest System: Variable Retention (with even age silviculture).
- Harvest Method: Ground-based Conventional. Skidding to landings.
- Suggested Equipment: Feller buncher and grapple skidder.

**Summer Option* – for harvesting this block during the summer months, the following steps must be taken:

- All access routes must be upgraded to allow for summer haul.
- Harvesting must be done during dry soil conditions to minimize site degradation.
- Minimize duff disturbance to reduce aspen suckering (i.e., use a dispersed skidding pattern, do not blade skid trails, if available use rubber tired skidders).
- Access would become permanent for any road that access more than one landing. In the case of Block C4, this would include the C4-1 Road to the junction with the C4-2 Road, and the C4-2 Road up to Landing #3 (the remaining roads, or sections of roads, would remain temporary access).

Potential Resource Conflicts:

- an old mineral claim post (numbers YB51674 to YB51677) was discovered within the block at GPS 175, however no current claims were on record at the Yukon Mining Recorder office in Watson Lake (Source: www.yukonminingrecorder.ca).
- marten boxes were found at various points along the Cosh Mainline Road. While these boxes are old and dilapidated, consultation with the trapper before harvesting will allow him/her to relocate these "sets".

**Temporary Access Structures and Drainage Control**

- Scatter construction and harvesting debris away from seasonal draws.
- Maintain natural drainage patterns immediately after harvesting.
- Rehabilitate all roads and landings that have been designated as "Temporary Access" and included within the "Net Area to be Reforested" (refer to the FMB Site and Harvest Plan for further details concerning temporary and permanent access).

**Biodiversity Areas and Wildlife Tree Retention**

To meet the objectives of a Variable Retention harvest system, 10-20 trees/hectare (preferably large, mature, and windfirm trees) will be retained uniformly throughout the harvested area of this block (refer to the FMB Site and Harvest Plan for further leave tree specifications).

Biodiversity reserve areas have been located totaling 60.5 hectares (64% of the gross block area) to provide representative wildlife habitat. These areas have been excluded from consideration for harvesting due to the following reasons:

- The large (42.8 ha) external reserve that makes up the eastern portion of the block was originally inventoried as being a mixedwood (aspen and pine) stand with about 50% of the type being made up of deciduous species. After field reconnaissance of this area, it was found that the amount of deciduous was much greater than originally assumed and that the pine was scattered throughout the area (as opposed to being in potentially harvestable clumps). While the pine was found to be of high volume and selective harvesting could have been proposed, this consideration was deemed ecologically unfeasible, as the diversity of the stand would be significantly disrupted.
- The westernmost external reserve (11.4 ha) has been added to the Forest Ecosystem Network (FEN) and the Cosh Creek and Stream 'A' Riparian Management Areas to make each of these features larger than what has been proposed in the IWSP. This reserve is made up of representative pine and spruce and the topography is short, steep pitches to defined benches that continue until the Cosh Creek lowland area is reached.
- The smallest (6.9 ha) reserve in the north consists of two fingers that point southerly. The westernmost finger excludes a large hummock made up mostly of pine and spruce. This hummock has slopes of up to 45% and some areas of exposed rock along the north side. Originally proposed as an internal WTP, this hummock has been connected to the FEN located north of the block. The easternmost finger excludes a narrow draw containing minor evidence of wildlife movement. The banks of this draw are gently sloping (10-15%) and the draw itself is subhygric. This part of the reserve is made up of large spruce, pine and deciduous species.

**Streams and Wetlands**

The Cosh Creek, a Class 3 stream, and a small Class 4 stream (labeled Stream 'A' on the site plan map) are located within the vicinity of this block with a small portion (0.06ha) of the Riparian Management Area (RMA) of Stream 'A' lying within the westernmost boundary. The RMA is made up of the Riparian Reserve Zone that has been excluded from the harvesting boundary, and the Riparian Management Zone (RMZ). The small section of RMZ will be treated as per the adjacent treatment unit.

A small lake is located to the south of the southwest corner of this block and a complex of small wetlands and black spruce stands are found to the east of this small lake.

**Wildlife**

Wildlife sign noted in the vicinity of this block include black bear tracks, found along a defined game trail that follows the western edge of Cosh Creek, and moose tracks found along the Cosh Mainline road.

**Terrain Stability**

No terrain stability indicators were identified within this block. Some areas of exposed rock were noted outside of the northern boundary along the break to the NCD that joins up with Stream 'A'.

**Visual Sensitivity**

This block has been classified, in the IWSP, as having potential visual sensitivity. A Digital Terrain Model (DTM) has been completed for this block to confirm an adequate level of dispersed and aggregated retention, however, results show that no portions of the Block C4 harvesting boundary are visible from viewpoints along the Alaska Highway.

**Cultural Heritage**

To assist with identification of potential cultural sites, crewmembers from the local First Nation community were consulted to assist in all operational field stages of this project. No cultural, archaeological, or historical sites were noted within, or in the vicinity of, this block.

**Site Specific Block Refinements**

The following refinements to the proposed block boundaries (presented at the end of Phase I to the Interim Wood Supply Committee) were made during the final layout phase to better address site-specific issues particular to each block:

- The "connectivity corridor" (reserve) that passes through the center of this block has been maintained. A narrow break in the reserve (at road GPS #46) has been located to allow access into the western portion of the block. The other option would have been to access the western portion of the block from the north. However, the FEN that has been maintained along the northern boundary: i) has a diversity of stand structures and habitats, so is of greater importance to wildlife, ii) is much wider and more delineated by topography, iii) contains an NCD, and iv) would afford a more costly access route than that located through the central reserve in this block.
- The section of road that passes through the reserve is located on hummocky ground with an 8% adverse grade to the east of GPS 46. The width of the access right-of-way will provide sufficient room for falling of timber and road construction with minimal risk of disrupting areas outside of the harvest area. It will also allow for potential realignment, minimization of cuts and fills and minimization of site degradation on this temporary road section.
- The actual width of the reserve was determined by the exclusion of excessive adverse skidding (operational constraints) and by the exclusion of diverse stand structures on subhygric soils with the associated ecotypes (ecological constraints). Being a nutrient rich site, the trees that are found within this reserve zone are among the largest in the gross block area. The low height to diameter ratio of these trees will help to increase the wind firmness of the reserve and the natural

draw will protected it from the wind on both the east and west sides. In other words, this section utilizes natural boundaries. To widen this zone would be of no ecological benefit, would probably be less windfirm and would hamper the operability of the block.

- The non-productive areas located to the southwest have been excluded from the block and have been included within the large easternmost external reserve.
- Based on the results of the DTM, the final harvest area is not visible from viewpoints along the Alaska Highway.

**Field Crew**

Timber reconnaissance in this block was done by Kevin Parker and Paul Schuetz, while silviculture and ecotype information was collected by Barry Mills and Greg Jonuk. Engineering related field work (including boundary and roads) was done by Barry Mills and Paul Schuetz and the timber cruising was completed by Greg Jonuk and Kevin Parker. First Nation crewmembers that worked in this block include Glenis Allen, Sylvia Crouse, Dustin Dickson, Richard Dickson, Neona Pitman, and Ken Stewart. All phases of fieldwork were completed from September to November 2003.

# FOREST MANAGEMENT BRANCH

## SITE AND HARVEST PLAN

**1. LOCATION**

| District | GEOGRAPHIC LOCATION NAME | | MAPSHEET |
|---|---|---|---|
| Watson Lk | Cosh Creek | | 095-D-04 |
| FMU | LATITUDE | LONGITUDE | SIS # |
| Y02 | 60 deg. 01' 04" | 127 deg. 48' 50" | |
| DEVELOPMENT AREA | BLOCK NUMBER | | AIR PHOTO NUMBERS |
| East Hyland | C4 | | IAS(03) 54509 #276 |

**2. ECOLOGY AND SITE CONDITION**

| ECO-REGION | VEGETATION TYPE | SOIL TYPE |
|---|---|---|
| LIARD BASIN | V17, V22 | S3/S4 |

| ELEV | SLOPE % | ASPECT | TERRAIN | SLOPE POSITION | MOIST REGIME | SOIL DRAINAGE | LFH(OM) DEPTH | SOIL TEXTURE |
|---|---|---|---|---|---|---|---|---|
| 680-740m | 2-37% | VAR | ROLLING | MID-UPPER | 3-4//C | WELL TO MODWELL | 6-15cm | fSL-L-SiL |

**3. BLOCK AREA SUMMARY IN HECTARE**

| TOTAL AREA | NP NAT | IMMATURE PATCHES | MERCHANT. AREA | RESERVES | PERM. ROADS, LANDINGS | NET AREA TO |
|---|---|---|---|---|---|---|
| 94.4 | 0 | 0 | 33.3 | 60.5 | 0.6 | 33.3 |

**4. HARVEST STAND DESCRIPTION**

| STAND NUMBER | MERCH. AREA | SPECIES | CROWN CLOSURE | AGE | HEIGHT | AVG. DBH | EST. VOL/HA |
|---|---|---|---|---|---|---|---|
| V17 | 13.10 | SW6F2P1W1 | 30.00% | 160 | 20 | 24.90 | 211.00 |
| V22 | 20.20 | P9SW1 | 25.00% | 151 | 21 | 25.20 | 334.00 |

# FOREST MANAGEMENT BRANCH

## SITE AND HARVEST PLAN

**5. RIPARIAN MANAGEMENT**

| RIPARIAN ID # | CLASS (STREAM, WETLAND, LAKE) | RESERVE ZONE WIDTH (M) | RATIONALE FOR RESERVE | MNGMT. ZONE WIDTH (M) | STRATEGIES FOR MANAGEMENT ZONE |
|---|---|---|---|---|---|
| A | Class 4 stream | 30.00 | as per the Yukon Forest Management Branch THP&O Guidebook | 70.00 | The harvest area boundary has been located to exclude the majority of the Riparian Management Zone (RMZ). The small (0.06 ha.) portion of the RMZ within the harvesting boundary will be treated as per the remainder of the block using a variable retention harvest method. |

### 6. STAND MANAGEMENT OBJECTIVES

| HIGHER LEVEL AND OTHER PLANS |
|---|
| Identify any higher level plans, Resource Reports or other plans with which this prescription must be consistant. |
| This plan is consistent with the INTERIM WOOD SUPPLY PLAN for FOREST MANAGEMENT UNITS Y02, Y03 and Y09 in the KASKA YUKON TRADITIONAL TERRITORY (September 30th, 2003). |
| **STAND-LEVEL OBJECTIVES** |
| Discuss non-timber values that may be affected by the proposed treatment and measures proposed to accommodate these. |
| TRADITIONAL OR FIRST NATION |
| Based on reviews of the Interim Wood Supply Plan and extensive on block observations by First Nations crew members, no known cultural sites or issues exist within the harvest area of this block. |
| Wildlife_Values: |
| External reserves contiguous with a landscape level Forest Ecosystem Network (FEN) will provide interior forest habitat for late seral species (Marten, Boreal Owls, etc.), while internal reserves and/or dispersed on-block retention provdes stand structural diversity, visual screening, and "edge effect" throughout the harvest area for early seral species (Moose, Bear, etc.). In addition, both dispersed and aggregated retention will provide for biodiversity through "lifeboating", "enrichment" and "connectivity" at the stand level until this block returns to mature forest. Dispersed and aggregated retention also provides transitional elements between late and early seral stand structures that has been shown to increase utility of an area to both early and late seral species. |
| Fish_Water_Values: |
| In addition to any specific actions outlined in section 4.0 (RIPARIAN MANAGEMENT) of this SP, the following general conditions will be applied during harvest: 1) Culverts have been proposed for all non-classifiable drains (NCDs), draws, and streams for road crossings as shown on the SP Map. 2) Narrow draws or NCDs will not be used as skid routes, and skidding will be away from such features, as much as possible. 3) The preferred harves season will be winter to minimize the overall impact of harvesting on the hydrology of the area. |
| Recr_Visual_Values: |
| Variable Retention harvesting using dispersed and aggregated retetion will minimize the visual impact of this block as shown in the post harvest Visual Impact Simulations of the Cosh Creek area. |
| Other_Values: |
| As the Trapper appears to have been using the Cosh Mainline as a trapping route, this and other harvest blocks should be reviewed with the Trapper so that he can adjust his "sets" accordingly before harvesting commences. |

Yukon
Energy, Mines and Resources

# FOREST MANAGEMENT BRANCH

## SITE AND HARVEST PLAN

**7. SILVICULTURE SYSTEM DESCRIPTION**

| STAND NUMBER | SILVICULTURE SYSTEM | SEASON | RATIONALE |
|---|---|---|---|
| All Stands | Variable Retention harvest with even-age stand management. Total aggregated retention in external reserves is 64.1% of the gross block area. Dispersed retention throughout the harvest area is approximately 2% of the current basal area/ha. | Winter | Rationale described in Section 5.2 of the INTERIM WOOD SUPPLY PLAN for FOREST MANAGEMENT UNITS Y02, Y03 and Y09 in the KASKA YUKON TRADITIONAL TERRITORY (September 30th, 2003). |

# FOREST MANAGEMENT BRANCH

## SITE AND HARVEST PLAN

### 8. SOIL CONSERVATION

ON BLOCK PERMANENT DISTURBANCE CALCULATION TAB

| DISTURBANCE TYPE (ROAD/LANDING) | IDENTIFICATION (NAME/NUMBER) | ROAD STANDARD | LENGTH (M) | WIDTH (M) | TOTAL AREA L x W / 10,000 (HA) |
|---|---|---|---|---|---|
| ROAD | COSH MAINLINE | CLASS 3 | 630.00 | 10.00 | 0.60 |
| | | | 0.00 | 0.00 | 0.00 |
| | | | 0.00 | 0.00 | 0.00 |
| | | | 0.00 | 0.00 | 0.00 |

| ROAD AREA | LANDING AREA | TOTAL AREA | BLOCK GROSS AREA | BLOCK NET AREA | % DISTURB. OF GROSS AREA |
|---|---|---|---|---|---|
| 0.60 | 0.00 | 0.60 | 94.40 | 33.30 | 0.60% |

| | HAZARD RATINGS | | | PERMAFROST OR FROST HEAVING | PROPOSED HARVEST SEASON |
|---|---|---|---|---|---|
| DEPTH OF OM | COMPACTION | SURFACE EROSION | DISPLACEMENT | | |
| 15cm | HIGH | HIGH | LOW | LOW | WINTER |

PROPORTION OF TEMPORARY ACCESS WITHIN NET AERA TO BE REFORESTED: (explain rehabilitation measures)

Temporary access is 4.8% of the NAR. Rehabilitation will include, as required: 1) Removal of culverts, cleaning of ditches, and restoration of natural drainage. 2) Ripping of excessively compacted areas. 3) Re-spreading of over-burden (LFH) & Replantin

FIRE HAZARD ABATEMENT: (explain measures for slash abatement)

CWD: Leave 2-5 small piles (approx. 3mX3mX3m) randomly in the block for small furbearer habitat. In addition, leave slash scattered throughout the block as widely dispersed as possible to simulate wildfire debris while maintaining reasonable plantibility . Minimize slash piles at the landings by processing at the stump or re-distributing some slash from the landings back over the block. Burn any remaining landing accumulations, as required, to abate the potential fire hazard.

FOREST HEALTH: (explain measures to reduce current and future risk of forest to disease and insects)

No significant forest health issues were noted in this block. Diverse stand structure and ecologically suitable species mixes will, in general, reduce the potential for post-harvest stand health concerns. Windfirmness of the residual stand edges has been considered in the location of all block boundaries.

ADDITIONAL COMMENTS

Dispersed Retention Leave-Tree Specs: To meet the variable retention objectives on the harvest area, the following mature trees must be left: 1) Leave all aspen and birch regardless of condition. 2) Leave large diameter standing snags unless they are a worker safety hazard, in which case a 3m stub can be left. 3) Leave 10-20 conifers per hectare uniformly across the entire opening using the following parameters: a) All trees will be dominant or co-dominant. b) Species preference will be Subalpine Fir>White Spruce>Lodgepole Pine. c) All trees will be single or in small aggregates of 2-3 trees. d) All trees will be above average diameter for the stand, and preferably some of the largest diameter trees will be included (low height to diameter ratio for windfirmness). e) Spacing will vary to allow operational flexibility but will be roughly 20 to 30m between tree or aggregates. f) Most of the trees will be of good form and vigor (straight with healthy crowns). In addition, the following no merchantable trees will be left in all V17, V21, & V22 types: 1) Leave any scattered White Spruce or fir (<7m tall, >40% live crown, and 13.5cm DBH) of good form and vigor where it is operationally feasible to do so (preferably in association with the mature trees or aggregates for maximum structural effect).

### 9. REFORESTATION DESCRIPTION

Yukon
Energy, Mines and Resources

# FOREST MANAGEMENT BRANCH

## SITE AND HARVEST PLAN

| SIS # | STAND # | NET AREA TO REFOREST | RESTOCKING | | TARGET STOCKING (SPH) | ASSESSMENT DATES | | |
|---|---|---|---|---|---|---|---|---|
| | | | PREF. SPECIES | ACC. SPECIES | | DELAY TO TREAT | REGEN SURVEYS | |
| | | | | | | | EARLY STOCKING | LATE PERFORMANC |
| | V17 | 13.10 | SW, P | F | 1200 | H+2 | H+5 | H+10 |
| | V22 | 20.20 | P | SW | 1200 | H+2 | H+5 | H+10 |
| | | | | | | | | |
| | | | | | | | | |

REFORESTATION PLAN:

Site preparation V17 & V22 Types: If slash levels are excessive, pending a post harvest inspection, chain drag, or excavator rake/pile to create plantable spots. Otherwise, minimize disturbance to reduce potential aspen suckering. Raw plant mixed pine and spruce (2+0 415 size or equivalent) within two years of harvest is the preferred option.

ESTABLISHMENT TO ASSESSMENT DATE CONCERNS:

V17 & V22 Types: Prompt reforestation with large stock, provides the best chance of circumventing potential aspen and brush competition problems. Monitor plantation annually and provide remedial action if brush or aspen prevents achievement of free growing status.

ADDITIONAL COMMENTS:

Evaluate dispersed slash levels on all types ASAP after harvest to confirm site prep requirements, if any.

FMB
Approval by: _____ Date: _____

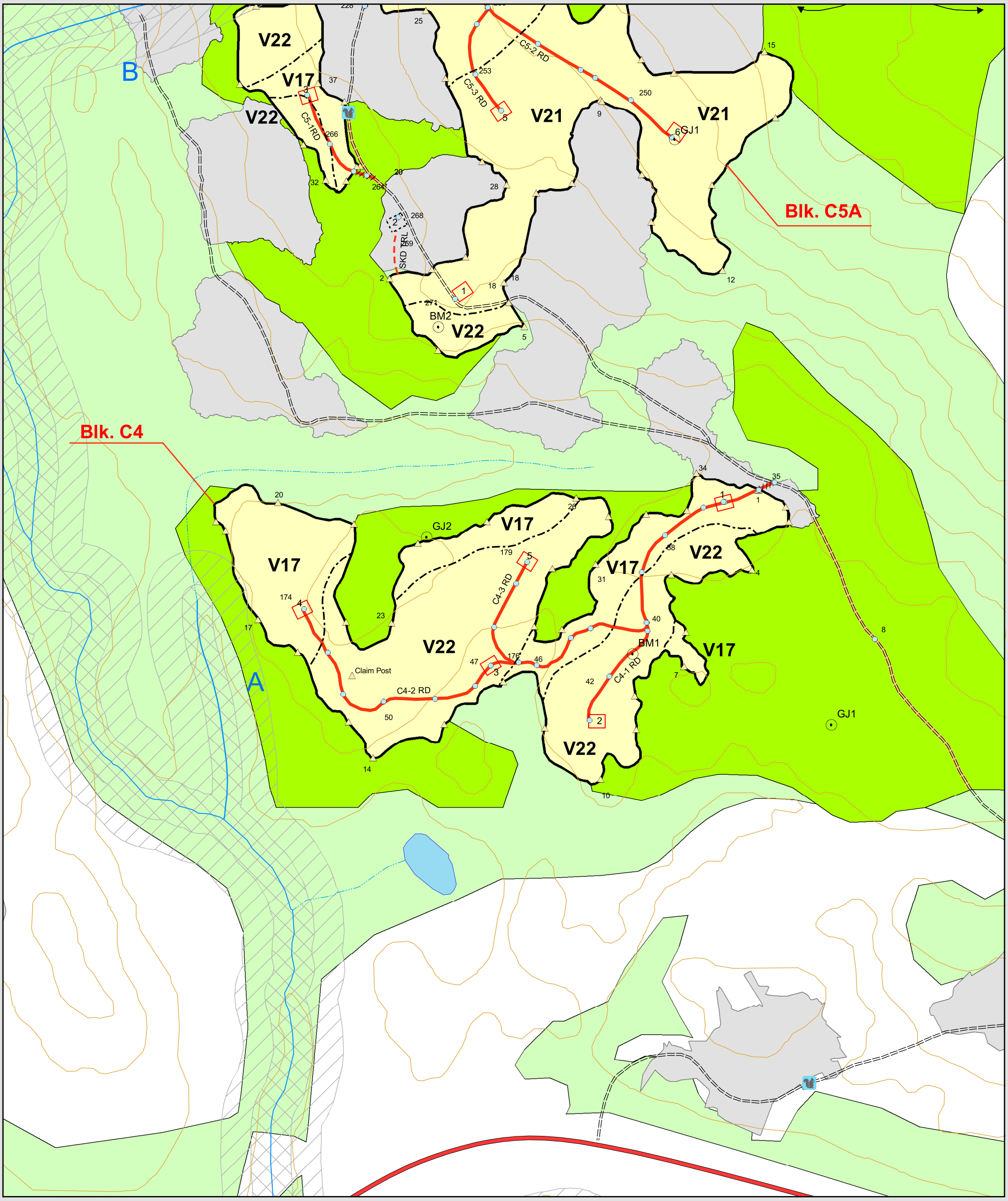
Position: _____ Signature: _____

**10. ATTACHMENTS**

SITE PLAN MAP @ 1:_____

HARVEST PLAN MAP @ 1:_____

# SITE PLAN MAP
## Cosh Creek - Block C4




FOREST MANAGEMENT BRANCH

SPATIAL MAPPING LTD.

I.F.S.

| FIELD MARKING STANDARDS | |
|---|---|
| APPPLICATION | PATTERN & COLOUR |
| Harvest Boundary | Orange ribbon with "BLOCK BOUNDARY" |
| | Orange paint |
| | Blue poly ribbon (traverse stations) |
| Roads | Red poly ribbon (recce line) |
| | Pink ribbon with "ROAD" |
| | Yellow poly ribbon (traverse stations) |
| Landings | Pink ribbon with "LANDING" |
| | Yellow poly ribbon (traverse stations) |
| Culverts | Red ribbon with "CULVERT" |
| Skid Trails and Crossings | Blue candy-stripe ribbon with "SKID TRAIL" |
| Machine Free Zone | Orange and black candy-stripe ribbon |
| Riparian Management Zone | Orange with "RIPARIAN MANAGEMENT ZONE" |
| Reserve Zones | Orange ribbon with "RESERVE" |
| Cruising | Blue and yellow poly ribbon for plots and new strips |
| | Blue Paint |
| Reconnaissance Lines | Green poly |

**HARVEST STAND DESCRIPTION**

| STAND NUMBER/V-TYPE | MERCH AREA (ha) | SPECIES COMP | CROWN CLOSURE | AGE | HEIGHT | AVERAGE DBH (cm) | EST. VOL/HA (m3/ha) |
|---|---|---|---|---|---|---|---|
| V17 | 13.1 | SW6F2P1W1 | 30% | 160 | 20 | 24.9 | 211 |
| V22 | 20.2 | P9 SW1 | 25% | 151 | 21 | 25.2 | 334 |

| LOCATION | | ECOLOGY AND SITE CONDITION | | BLOCK AREA SUMMARY | |
|---|---|---|---|---|---|
| DISTRICT | Watson Lake | VEGETATION TYPE | V17, V22 | TOTAL AREA (ha) | 94.4 |
| GEOGRAPHIC LOCATION NAME | Cosh Creek | SOIL TEXTURE | fSL-L-SiL | NP NAT ((ha) | 0 |
| MAPSHEET | 095-D-04 | SOIL TYPE | S3/S4 | IMMATURE PATCHES (ha) | 0 |
| FMJ | Y02 | ELEVATION | 680-740m | MERCH AREA (ha) | 33.3 |
| Latitude | 60°01' 04" | SLOPE % | 2-37% | RESERVES (ha) | 60.5 |
| Longitude | 127°48' 50" | ASPECT | Variable | PERM ROADS (ha) | 0.6 |
| DEVELOPMENT AREA | East Hyland | TERRAIN | Rolling | NET AREA TO REFOREST (ha) | 33.3 |
| BLOCK NUMBER | C4 | SLOPE POSITION | Mid-Upper | | |
| AIR PHOTO NUMBERS: IAS(03) | 54509 #276 | MOIST REGIME | 3-4//C | | |
| ECO-REGION | Liard Basin | SOIL DRAINAGE | Well - Moderately Well | | |
| | | LFH(OM) | 6-15cm | | |

**Legend**

- POC/POT Markers
- Marten Box Locations
- Cruise Plots
- SP Plots
- Boundary
- Culvert
- Road
- Skid Direction Arrows
- Timber Type Lines
- Cutblock
- External Reserve
- Internal Reserve
- Existing Openings
- FEN
- IRMZD
- Game Trail
- Permanent In-Block Built Road
- Permanent Out-of-Block Built Road
- Skid Trail
- Temporary In-Block Proposed Road
- Temporary Out-of-Block Built Road
- Temporary Out-of-Block Proposed Road
- Contours
- Alaska Highway
- NCD Streams
- S3/S4 Streams
- Existing Landing
- Proposed Landing
- LAKE
- RIVER
- Wetlands
- RMZ
- RRZ

N

0 50 100 200 300 400 Meters

1:7,500

# BLOCK REPORT

**Client: Yukon Forest Management Branch**
**Job #: 030482**
**Reported by: Paul Schuetz**
**Company: Industrial Forestry Service Ltd.**
**Date: November 25, 2003**

## *COSH CREEK BLOCK C6*

### Location and Access

This block is located in the vicinity of Cosh Creek, ±54 km east of the town of Watson Lake, Yukon within the Y02 Forest Management Unit and the Liard Basin Ecoregion.

The town of Watson Lake is situated along the Alaska Hwy at Mile 635. From Watson Lake, proceed eastward along the Alaska Hwy for approximately 78 km to reach the beginning of the unmarked Contact Creek Mainline Road (the first left, about 200m past the Contact Creek Lodge). Heading northeast along the Contact Road, continue for about 1.4 km to the junction with a secondary branch road (the C6 Branch Road) at GPS 191. Turn left (north-west) at this junction and follow the 'C6 Branch Road' for 2.4 km to reach the point of commencement (P.O.C.) of the C6-1 Road located on the right side.

The total distance from Landing #1 to Watson Lake is approximately 81.8 km.

### Located Roads

Eight block roads and twelve landings have been proposed for this block. The large number of proposed roads and landings (considering the harvesting boundary is <100 ha) is a result of the fact that this block is split up into three sections (A, B, and C) all of which being rather irregular in shape. However, the permanent access does not exceed 1% and the temporary access does not exceed 5%, which are normal levels for a block of this size. Rehabilitation measures have been prescribed for all temporary access.

Areas of note along the Block C6 road system include the following:

- The most obvious area of note, when reviewing the road system on the harvest plan map, is that a section of built road on the eastern side of the existing cut-block was not utilized. Instead, the C6-1 Road skirts around the existing cut-block, and joins up with the existing road further to the west. By doing this, very steep (20+%) grades and a potentially dangerous switchback are avoided.
- From the start of the C6-1 Road to Landing #1, adverse grades of about 6-8% are encountered through broken ground. From Landing #1 to the junction with the C6-5 Road, only favourable grades are encountered.
- The culvert on the C6-1 Road, just south of the junction with the C6-11 Road, crosses a fairly significant draw and will require an estimated 1.5-2.0m of fill.

- Steep (10-12%) favourable grades are encountered along the C6-1 Road in the vicinity of GPS 174. To compensate for the steep grades, good alignment and gentle curves were maintained to minimize any potential dangers and to allow empty trucks to keep up adequate speeds.
- To minimize site degradation in the existing cut-block, built roads were utilized wherever it was feasible to do so. These areas include a 227m stretch along the C6-1 Road, the first 90m of the C6-3 Road, and the first 182m of the C6-4A Road. It should be noted that steep (12%) favourable grades were encountered along the built portion of the C6-3 Road.
- A portion of the C6-1 Road, in the vicinity of GPS #168, passes through an existing plantation for 322m. This section is the most direct route to the existing road while maintaining feasible grades and minimizing cuts and fills.
- Adverse grades ranging are encountered along the C6-1 Road from the junction of the C6-5 Road to Landing #10 with the steepest (5-8%) being west of Landing #8.
- Side slopes along the C6-1 Road average about 25% west of the junction of the C6-5 Road and about 10-15% for the sections to the east of this junction.

The majority of skidding in Block C6 will be favourable on moderate slopes. Areas of note and general skidding information is provided below:

- Skidding will be mostly favourable to Landing #1, with minor adverse grades from the east.
- Adverse to Landing #2 from the east and southeast through rolling terrain with slopes that reach up to 12%.
- Mostly favourable to Landing #3 as it is located on a large, flat bench in one of the lowest points in the block. This landing will service all areas to the north of the draw at boundary GPS #45 and everything deemed too steep to skid up to Landing #4.
- Adverse to Landing #4 from the east along slopes of 20% or more. Any areas deemed too steep to skid to Landing #4 can be skidded favourably to Landing #3.
- All favourable to Landing #5, which services the narrow finger between existing openings. This landing has been proposed in the lowest point of the finger.
- Adverse to Landing #6 from the south along slopes of less than 10%. The boundary is located just over a steep drop-off (to improve the windfirmness of the adjacent stand) below a large bench upon which Landing #6 is located.
- Adverse to Landing #7 from the east along slopes of 15-20%.
- Favourable to Landing #8. All timber deemed too steep to skid adversely to this landing could be skidded downhill to Landing #9.
- Adverse to Landing #9 from the south along slopes of about 20%. The majority of the timber in the vicinity of GPS #26 can be skidded side-hill along benches with side slopes of 10-20%.
- Adverse to Landing #10 from the west along slopes of less than 10%. Landing #10 is located at the toe of a large bench that stretches southward to the boundary.
- Adverse to Landing #11 from the west along slopes of 15-20%.

- Side-hill skidding from the east of Landing #12 along slopes of 25-30%. Timber to the south can be directionally felled to the landing instead of skidding along excessive adverse slopes.

**Block Boundary**

The Block C6 boundary has only been slightly modified from that which was proposed in the Interim Wood Supply Plan. What has changed is the amount of retention, which has increased from the proposed amount of 20% to the current amount of 37%. The areas of note that helped to determine the location of the proposed harvesting boundary are as follows:

- The southern boundary of Block C6-A, the northern and western boundary of Block C6-B, and the eastern boundary of Block C6-C have all been located along existing cut-blocks. While these cut-blocks are connected (i.e., they appear as one opening) they are in fact three separate blocks harvested under three separate licenses.
- The northern boundary of Block C6-A, between GPS #37 and 43, and the northern boundary of Block C6-C, from GPS #10 to 20, follows a natural fire boundary leaving simulated old growth patches and stringers along the type edge where evidence of animal use was found to be high (game trails).
- The eastern boundary of Block C6-A, from GPS #43 to 53, excludes wet, brushy areas, non-classifiable drains (NCD's) and mixed SW/SB stand types that provide a diversity of habitats. The boundary contours the slope at the toe allowing harvest of the uniform, dry P/F/SW types.
- The southern boundary of Block C6-A, from GPS #53 to the C6 Branch Road, follows the break of excessively steep slopes and open non-commercial brush (NCBr) patches on a southern aspect.
- Block C6-B is a small (1.7 ha) patch of timber that was easily accessible from the C6-1 Road. This harvesting area was originally going to be much larger however, steep grades (45%+) to the south and southeast called for this area to be reserved for operational reasons.
- The southern boundary of Block C6-C, in the vicinity of GPS 30, contours open P/SW/F/deciduous stands that descend into the Stream 'G' basin to the south. All of the diverse stands located on inoperable ground have been excluded here.
- The narrow finger between GPS #26 and 29 along the southern boundary of Block C6-C is small in area but very high in habitat value. It simulates a fire stringer composed of the largest diameter fir in this block, mixed with scattered clumps of spruce and pine. Small openings link the clumps of windfirm trees together and provide a natural, open exclusion.
- The southern boundary of Block C6-C, between GPS #20 and 26, contours a natural toe slope adjacent to an open NCBr patch containing a non-classifiable drain (NCD). A spring near the west end of this boundary is also included. These exclusions make up most of the Riparian Management Zone (RMZ) of Stream 'G'.
- The westernmost part of Block C6-C, from GPS #20 to 21, is located along the edge of an existing cut-block.

- In the vicinity of the northwest corner of this block, a 100m reserve around a Permanent Sample Plot has been maintained. This reserve area was included into the landscape level forest ecosystem network (FEN).

**Harvesting Strategy**

- This block will be managed for coniferous species.
- Season of Harvest: Winter. *
- Harvest System: Variable Retention (with even age silviculture).
- Harvest Method: Ground-based Conventional. Skidding to landings.
- Suggested Equipment: Feller buncher and grapple skidder.

**Summer Option* – for harvesting this block during the summer months, the following steps must be taken:

- All access routes must be upgraded to allow for summer haul. The "C6 Branch Road" would require major upgrading with proper drainage control measures as it passes through several sections of wet ground.
- Harvesting must be done during dry soil conditions to minimize site degradation.
- Minimize duff disturbance to reduce aspen suckering (i.e., use a dispersed skidding pattern, do not blade skid trails, if available use rubber tired skidders).
- A minimum 5m Machine Free Zone must be placed on either side of all NCD's or wet draws. Designated skidder crossings of these drains will be proposed where required.
- Access would become permanent for any road that access more than one landing. In the case of Block C6, this would include the entire length of the C6-1 Road up to Landing #10 and with exception to the section of already existing road that is utilized (the remaining roads, or sections of roads, would remain temporary access).

Potential Resource Conflicts:

- evidence of trapping was noted in the vicinity of this block (i.e., old marten boxes discovered along the Cosh Mainline Road to the west).

**Temporary Access Structures and Drainage Control**

- Scatter construction and harvesting debris away from seasonal draws.
- Maintain natural drainage patterns immediately after harvesting.
- Rehabilitate all road and landings that have been designated as "Temporary Access" and included within the "Net Area to be Reforested" (refer to the FMB Site and Harvest Plan for further details concerning temporary and permanent access).

**Biodiversity Areas and Wildlife Tree Retention**

To meet the objectives of a Variable Retention silviculture system, 30 trees/hectare (preferably large, mature, and windfirm trees) will be retained uniformly throughout the harvested area of this block (refer to the FMB Site and Harvest Plan for further leave tree specification information).

Biodiversity reserve areas have been located totaling 47.5 hectares (37.0% of the gross block area) to provide representative wildlife habitat. These areas have been excluded from consideration for harvesting due to the following reasons:

- The large reserve to the north of Block C6-C and A is connected to a landscape level FEN and provides high value habitat in these areas with a diversity of stand structures in close proximity to each other. The reserve also provides a windfirm buffer adjacent to a well-used game trail and includes the entire riparian management area (RMA) of a small lake located northwest of this block. The section of the reserve, that is located near GPS #46 in Block C6-A, excludes steep (45%+) slopes adjacent to two natural draws. If harvested, these slopes could potentially pose a terrain stability risk.
- In the southern portions of Block C6-C, the reserve zone in the southwest excludes a NCD, a narrow NCBR patch, and a small spring. The small finger that protrudes northward excludes a brushy, scattered type containing very large, windfirm fir and some deciduous.
- The large reserve zone south of Block C6-B contains a variety of good F/P/SW stands intermixed with small patches of NCBr and scattered deciduous stems. Much of this area is located along steep (45%+) slopes that connect to the RMA of Stream 'G'.
- The one internal, aggregated reserve zone, located in Block C6-C, excludes a small non-productive (NP) pothole and provides a windfirm buffer of mature timber around this feature.

**Streams and Wetlands**

One Class 4 stream (labeled Stream 'G' on the site plan map) are located within the vicinity of this block, with a portion (0.47 ha) of the Riparian Management Zone (RMZ) of Stream 'G' lying within the harvesting boundary of Block C6-C. This section of RMZ will be treated as per the adjacent treatment unit. A small lake, located in the northwestern part of the block, has portions of its RMA lying within one of the external reserves of this block. The RMA of this lake is not located within the harvesting boundary of this block.

**Wildlife**

Wildlife sign noted in the vicinity of this block include Black bear tracks along the built road inside the existing opening, moose dropping in various locations within, and adjacent to, the existing openings, and a well used game trails along the northern boundary.

**Terrain Stability**

No terrain stability indicators were identified within the harvesting boundary of this block. Areas of steep (45+%) slopes were found adjacent to the two draws near GPS #46 (Block C6-A) and along areas of the southern boundary of Blocks C6-B and C. These areas have been taken out of the harvesting boundary and have been included into external reserve zones. A few internal slopes have short pitches (<50m) of over 45%, but these areas can be hand felled and line skidded to avoid potential site disturbance.

**Visual Sensitivity**

This block has been classified, in the IWSP, as having potential visual sensitivity from viewpoints along the Alaska Hwy. A Digital Terrain Model (DTM) has been completed for this block to help determine the level of variable retention that will be required. Based on the results of the DTM it has been found that this block is highly visible from the Alaska Highway however, dispersed retention of 25-35 trees/hectare in the harvest area, as well as the proposed aggregated retention, is sufficient to ameliorate visual concerns. The existing visual quality will also improve since the retention proposed in Block C6 will help to feather the edges of the existing cut-blocks (also highly visible), allowing them to better blend in with adjacent stands.

**Cultural Heritage**

To assist with identification of potential cultural sites, crewmembers from the local First Nation community were consulted to assist in all operational field stages of this project. No cultural, archaeological, or historical sites were noted within, or in the vicinity of, this block.

**Site Specific Block Refinements**

The following refinements to the proposed block boundaries (presented at the end of Phase I to the Interim Wood Supply Committee) were made during the final layout phase to better address site-specific issues particular to each block:

- The finger that has been excluded in the vicinity of boundary GPS #26, and some areas south of the existing cut-blocks and Block C6-B contains stands with large components of willow and birch. These stands are typically located on rich, sub-hygric soils and also contain large, scattered fir. These areas have been excluded from the harvesting area for reasons of wildlife habitat and windfirmness.

- Connectivity between Stream ‘G’ in the south and the small fir stands to the north of this block has been deemed of minor importance as very little or no evidence of wildlife movement through the area currently exists (with the exception of wildlife utilizing built roads as travel routes). Windfirmness would also be a major concern if a reserve, which stretches across the block in a northerly-southerly direction, were retained. All evidence of existing travel routes lie along Stream ‘G’ and, more evidently, along the wildlife trails adjacent to the northern boundary. A suitable string of old growth patches have been placed along these wildlife trails, utilizing natural stand openings to lower windthrow risk.
- In portions of Block C6, presumably valuable fir stands have been retained throughout. By doing this, the species composition (based on the cruise data) of this block is now Pine dominant (50%) with fir being the secondary species (40%). Based on field observation of stand characteristics, the fir-leading stands within and adjacent to this block differ very little from any of the other fir-leading stands encountered in the Cosh and Contact Creek areas.

**Field Crew**

Timber reconnaissance in this block was done by Kevin Parker and Paul Schuetz, while silviculture and ecotype information was collected by Barry Mills and Greg Jonuk. Engineering related fieldwork (including boundary and roads) was done by Barry Mills and Paul Schuetz and the timber cruising was completed by Greg Jonuk and Kevin Parker. First Nation crewmembers that worked in this block include Glenis Allen, Sylvia Crouse, Dustin Dickson, Richard Dickson, Neona Pitman, and Ken Stewart. All phases of fieldwork was completed from September to November 2003.

# FOREST MANAGEMENT BRANCH

## SITE AND HARVEST PLAN

**1. LOCATION**

| District | GEOGRAPHIC LOCATION NAME | | MAPSHEET |
|---|---|---|---|
| Watson Lk | Cosh Creek | | 095-D-04 |
| FMU | LATITUDE | LONGITUDE | SIS # |
| Y02 | 60 deg. 02' 02" | 127 deg. 46' 04" | |
| DEVELOPMENT AREA | BLOCK NUMBER | | AIR PHOTO NUMBERS |
| East Hyland | C6 | | IAS(03) 54509 #282 |

**2. ECOLOGY AND SITE CONDITION**

| ECO-REGION | VEGETATION TYPE | SOIL TYPE |
|---|---|---|
| LIARD BASIN | V16, V17, V22 | S3 |

| ELEV | SLOPE % | ASPECT | TERRAIN | SLOPE POSITION | MOIST REGIME | SOIL DRAINAGE | LFH(OM) DEPTH | SOIL TEXTURE |
|---|---|---|---|---|---|---|---|---|
| 780-1015m | 5-40% | SW-S-SE-E | EVEN-ROLLING | LOWER-UPPER | 3-4//C | WELLTO MODWELL | 5-15cm | L |

**3. BLOCK AREA SUMMARY IN HECTARE**

| TOTAL AREA | NP NAT | IMMATURE PATCHES | MERCHANT. AREA | RESERVES | PERM. ROADS, LANDINGS | NET AREA TO |
|---|---|---|---|---|---|---|
| 128.4 | 0 | 0 | 80.8 | 47.5 | 0.1 | 80.8 |

**4. HARVEST STAND DESCRIPTION**

| STAND NUMBER | MERCH. AREA | SPECIES | CROWN CLOSURE | AGE | HEIGHT | AVG. DBH | EST. VOL/HA |
|---|---|---|---|---|---|---|---|
| V16 | 49.10 | F5P4SW1 | 35.00% | 107 | 18 | 25.80 | 275.00 |
| V17 | 11.40 | SW4F3P2 | 35.00% | 196 | 19 | 21.20 | 283.00 |
| V22 | 20.30 | P7F2SW1 | 35.00% | 132 | 20 | 24.10 | 276.00 |

# FOREST MANAGEMENT BRANCH

## SITE AND HARVEST PLAN

**5. RIPARIAN MANAGEMENT**

| RIPARIAN ID # | CLASS (STREAM, WETLAND, LAKE) | RESERVE ZONE WIDTH (M) | RATIONALE FOR RESERVE | MNGMT. ZONE WIDTH (M) | STRATEGIES FOR MANAGEMENT ZONE |
|---|---|---|---|---|---|
| G | Class 4 stream | 30.00 | as per the Yukon Forest Management Branch THP&O Guidebook | 70.00 | The harvest area boundary has been located to exclude the majority of the Riparian Management Zone (RMZ). The small (0.47 ha.) portion of the RMZ within the harvesting boundary will be treated as per the remainder of the block using a variable retention harvest method. |

# FOREST MANAGEMENT BRANCH

## SITE AND HARVEST PLAN

**6. STAND MANAGEMENT OBJECTIVES**

| HIGHER LEVEL AND OTHER PLANS |
|---|
| Identify any higher level plans, Resource Reports or other plans with which this prescription must be consistant. |
| This plan is consistent with the INTERIM WOOD SUPPLY PLAN for FOREST MANAGEMENT UNITS Y02, Y03 and Y09 in the KASKA YUKON TRADITIONAL TERRITORY (September 30th, 2003). |
| **STAND-LEVEL OBJECTIVES** |
| Discuss non-timber values that may be affected by the proposed treatment and measures proposed to accommodate these. |
| TRADITIONAL OR FIRST NATION |
| Based on reviews of the Interim Wood Supply Plan and extensive on block observations by First Nations crew members, no known cultural sites or issues exist within the harvest area of this block. |
| Wildlife_Values: |
| External reserves contiguous with a landscape level Forest Ecosystem Network (FEN) will provide interior forest habitat for late seral species (Marten, Boreal Owls, etc.), while internal reserves and/or dispersed on-block retention provdes stand structural diversity, visual screening, and "edge effect" throughout the harvest area for early seral species (Moose, Bear, etc.). In addition, both dispersed and aggregated retention will provide for biodiversity through "lifeboating", "enrichment" and "connectivity" at the stand level until this block returns to mature forest. Dispersed and aggregated retention also provides transitional elements between late and early seral stand structures that has been shown to increase utility of an area to both early and late seral species. |
| Fish_Water_Values: |
| In addition to any specific actions outlined in section 4.0 (RIPARIAN MANAGEMENT) of this SP, the following general conditions will be applied during harvest: 1) Culverts have been proposed for all non-classifiable drains (NCDs), draws, and streams for road crossings as shown on the SP Map. 2) Narrow draws or NCDs will not be used as skid routes, and skidding will be away from such features, as much as possible. 3) The preferred harves season will be winter to minimize the overall impact of harvesting on the hydrology of the area. |
| Recr_Visual_Values: |
| Variable Retention harvesting using dispersed and aggregated retetion will minimize the visual impact of this block as shown in the post harvest Visual Impact Simulations of the Cosh Creek area. |
| Other_Values: |
| As the Trapper appears to have been using the Cosh Mainline as a trapping route, this and other harvest blocks should be reviewed with the Trapper so that he can adjust his "sets" accordingly before harvesting commences. |

# FOREST MANAGEMENT BRANCH

## SITE AND HARVEST PLAN

**7. SILVICULTURE SYSTEM DESCRIPTION**

| STAND NUMBER | SILVICULTURE SYSTEM | SEASON | RATIONALE |
|---|---|---|---|
| All Stands | Variable Retention harvest with even-age stand management. Total aggregated retention in external and internal reserves is 37.0% of the gross block area. Dispersed retention throughout the harvest area is approximately 2-3% of the current basal area/ha. | Winter | Rationale described in Section 5.2 of the INTERIM WOOD SUPPLY PLAN for FOREST MANAGEMENT UNITS Y02, Y03 and Y09 in the KASKA YUKON TRADITIONAL TERRITORY (September 30th, 2003). |

# FOREST MANAGEMENT BRANCH

## SITE AND HARVEST PLAN

### 8. SOIL CONSERVATION

ON BLOCK PERMANENT DISTURBANCE CALCULATION TAB

| DISTURBANCE TYPE (ROAD/LANDING) | IDENTIFICATION (NAME/NUMBER) | ROAD STANDARD | LENGTH (M) | WIDTH (M) | TOTAL AREA L x W / 10,000 (HA) |
|---|---|---|---|---|---|
| ROAD | C6 BRANCH ROAD | CLASS 4 | 130.00 | 10.00 | 0.10 |
| | | | 0.00 | 0.00 | 0.00 |
| | | | 0.00 | 0.00 | 0.00 |
| | | | 0.00 | 0.00 | 0.00 |

| ROAD AREA | LANDING AREA | TOTAL AREA | BLOCK GROSS AREA | BLOCK NET AREA | % DISTURB. OF GROSS AREA |
|---|---|---|---|---|---|
| 0.10 | 0.00 | 0.00 | 128.40 | 80.80 | 0.10% |

| | HAZARD RATINGS | | | PERMAFROST OR FROST HEAVING | PROPOSED HARVEST SEASON |
|---|---|---|---|---|---|
| DEPTH OF OM | COMPACTION | SURFACE EROSION | DISPLACEMENT | | |
| 15cm | HIGH | HIGH | MODERATE | LOW | WINTER |

PROPORTION OF TEMPORARY ACCESS WITHIN NET AERA TO BE REFORESTED: (explain rehabilitation measures)

Temporary access is 4.7% of the NAR. Rehabilitation will include, as required: 1) Removal of culverts, cleaning of ditches, and restoration of natural drainage. 2) Ripping of excessively compacted areas. 3) Re-spreading of over-burden & Replanting.

FIRE HAZARD ABATEMENT: (explain measures for slash abatement)

CWD: Leave 2-5 small piles (approx. 3mX3mX3m) randomly in the block for small furbearer habitat. In addition, leave slash scattered throughout the block as widely dispersed as possible to simulate wildfire debris while maintaining reasonable plantibility . Minimize slash piles at the landings by processing at the stump or re-distributing some slash from the landings back over the block. Burn any remaining landing accumulations, as required, to abate the potential fire hazard.

FOREST HEALTH: (explain measures to reduce current and future risk of forest to disease and insects)

No significant forest health issues were noted in this block. Diverse stand structure and ecologically suitable species mixes will, in general, reduce the potential for post-harvest stand health concerns. Windfirmness of the residual stand edges has been considered in the location of all block boundaries.

ADDITIONAL COMMENTS

Dispersed Retention Leave-Tree Specs: To meet the variable retention objectives on the harvest area, the following mature trees must be left: 1) Leave all aspen and birch regardless of condition. 2) Leave large diameter standing snags unless they are a worker safety hazard, in which case a 3m stub can be left. 3) Leave 20-30 conifers per hectare uniformly across the entire opening using the following parameters: a) All trees will be dominant or co-dominant. b) Species preference will be Subalpine Fir>White Spruce>Lodgepole Pine. c) All trees will be single or in small aggregates of 2-3 trees. d) All trees will be above average diameter for the stand, and preferably some of the largest diameter trees will be included (low height to diameter ratio for windfirmness). e) Spacing will vary to allow operational flexibility but will be roughly 18-20m between trees o aggregates. f) Most of the trees will be of good form and vigor (straight with healthy crowns). To supplement this mature tre retention the following non-merchantable trees will be left in all V9 and V16 types: 1) Leave random clumps of Subalpine Fir advanced regeneration (<7m tall & <13.6cm DBH), where operationally feasible. These clumps will preferably be associated with the mature leave trees or aggregates for maximum effect and ease of harvesting (i.e., minimize the amount of non-merchantable Subalpine Fir slash by retaining the natural clumps of trees that currently exist in these stand types). In addition, the following non-merchantable trees will be left in all V17, V21, & V22 types: 1) Leave any scattered White Spruce (<7m tall, >40% live crown, and 13.5cm DBH) of good form and vigor where it is operationally feasible to do so.

Yukon
Energy, Mines and Resources

# FOREST MANAGEMENT BRANCH

## SITE AND HARVEST PLAN

### 9. REFORESTATION DESCRIPTION

| SIS # | STAND # | NET AREA TO REFOREST | RESTOCKING | | TARGET STOCKING (SPH) | ASSESSMENT DATES | | |
|---|---|---|---|---|---|---|---|---|
| | | | PREF. SPECIES | ACC. SPECIES | | DELAY TO TREAT | REGEN SURVEYS | |
| | | | | | | | EARLY STOCKING | LATE PERFORMANC |
| | V16 | 49.10 | F, SW | P | 1200 | H +3 | H +5 | H +10 |
| | V17 | 11.40 | SW, P | F | 1200 | H +2 | H +5 | H +10 |
| | V22 | 20.30 | P | SW, F | 1200 | H +2 | H +5 | H +10 |
| | | | | | | | | |

REFORESTATION PLAN:

Site preparation V17 & V22 types: If slash levels are excessive, pending a post harvest inspection, chain drag, or excavator rake/pile to create plantable spots. Otherwise, minimize disturbance to reduce potential aspen suckering. Raw plant mixed pine and spruce (2+0 415 size or equivalent) within two years of harvest is the preferred option. Site Preparation V16 type: Preparation objectives would be to create plantible spots, promote soil warming and retain or mixing in organic material. Suitable alternatives would be chain drag, disc trench, screef & raw plant. Excavator rake/pile or spot burning would be optio if slash levels are excessive. Microsite plant pine and spruce 2+0 313 or equivalent stock. If raw planting, obstacle plant for so warmth

ESTABLISHMENT TO ASSESSMENT DATE CONCERNS:

V17 & V22: Prompt reforestation with large stock, provides the best chance of circumventing potential aspen and brush competition problems. Monitor plantation annually and provide remedial action if brush or aspen prevents achievement free growing status. V16 type: Brush competition is not expected to be a concern on this type.

ADDITIONAL COMMENTS:

Evaluate dispersed slash levels ASAP after harvest to confirm site prep requirements, if any. Survey V16 & V17 types for levels of acceptable Subalpine Fir and spruce regeneration to determine planting stock amounts.

FMB
Approval by: _____ Date: _____

Position: _____ Signature: _____

### 10. ATTACHMENTS

SITE PLAN MAP @ 1:_____

HARVEST PLAN MAP @ 1:_____

# BLOCK REPORT

**Client: Yukon Forest Management Branch**
**Job #: 030482**
**Reported by: Paul Schuetz**
**Company: Industrial Forestry Service Ltd.**
**Date: November 25, 2003**

## *COSH CREEK BLOCK C8*

### Location and Access

This block is located in the vicinity of Cosh Creek, ±52 km east of the town of Watson Lake, Yukon within the Y02 Forest Management Unit and the Liard Basin Ecoregion.

The town of Watson Lake is situated along the Alaska Hwy at Mile 635. From Watson Lake, proceed eastward along the Alaska Hwy for approximately 75 km to reach the beginning of the Cosh Mainline Road (about 2 km west of the Contact Creek Lodge). Heading north along the Cosh Mainline Road, continue for about 6.8 km to the junction with a large branch road (the C9 Branch Road) at GPS 36. Stay right at this junction and follow the C9 Branch Road for another 1.1 km to reach the junction with a smaller branch road (the C8 Branch Road) that commences on the right (heading south-easterly). Follow this road for 1.8 km to reach the point of commencement (P.O.C.) of the C8-1 Road located on the left side of the branch road and heading northward.

The total distance to Watson Lake is approximately 84.7 km.

### Located Roads

One block road and three landings (including one built landing) have been proposed for this block. While the two proposed landings would be more than suitable to service a block of this size, the existing landing has been included to minimize excessive skidding distances. Minor upgrading to the existing road that leads to this landing will be required. All roads and landings should be constructed to allow for easy rehabilitation following harvesting activities.

Areas of note along the Block C8 road system include the following:

- The proposed culvert (at GPS #41) ensures drainage patterns are maintained along a non-classifiable drain (NCD) with large, defined banks. At least 1m of fill will be required for this crossing.
- The section of road from the P.O.C. to Landing #1 is fairly flat to slightly rolling through open pine.
- The section or road between Landing #1 and 2 is very windy and primarily adverse (the lowest point in the block is the northeast corner). The road snakes through very hummocky terrain making use of natural saddles and draws to avoid

excessive cuts and fills. Adverse grades in this area average 6% with highly variable side slopes due to the terrain.

The majority of skidding in Block C8 will be favourable on moderate slopes with the following exceptions:

- Adverse to Landing #1 from the north and east along slopes of 10-15%. The terrain in the western half of the block is less broken so skidding to Landing #1 should not be a problem. Areas to the east deemed too steep to skid to Landing #1 can be skidded favourably to Landing #2.
- Adverse to Landing #2 from the east and northeast along slopes of 10-20%. The adverse skidding to this landing will be minimal, as Landing #2 has been proposed in the vicinity of the lowest point in the block.
- Steep favourable skidding to Landing #2 will be encountered from the south in the vicinity of GPS #6. Slopes encountered here are in the range of 20-40%.
- Adverse to Landing #3 along slopes of about 10-20% (this is the grade of the proposed skid trail. The amount of timber that will be processed at Landing #3 is expected to be very low. Areas deemed too steep to skid adversely to Landing #3 may be skidded favourably to Landing #2.

**Block Boundary**

The Block C8 harvesting boundary has been significantly modified from the area that was proposed in the Interim Wood Supply Plan. The most noticeable change is the amount of retention, which has increased from the proposed amount of 0% to the current amount of 19.3%. The areas of note that helped to determine the location of the proposed harvesting boundary are as follows:

- The northern boundary follows a natural topographic break excluding most of the Riparian Management Zone (RMZ) of Stream 'I' to the north.
- The eastern boundary and southern boundary, between GPS #2 and 8, also contours the slope along a natural break, excluding most of the RMZ of Stream 'H' to the east. The natural breaks that are followed in this block are likely to be windfirm, thus ensuring harvesting does not impact the integrity of the streams, and separate the harvest area from the higher value riparian habitat.
- Portions of the southern boundary, in the vicinity of Landing #3, and the section from GPS #12 to 16, follow existing openings. A short section of this boundary follows the right of way of the C8 Branch Road, excluding the opening from the gross block area.
- The section of the southern boundary between GPS #9 and 12 has been excluded for reasons of operability. Slopes of more than 45% have been taken out of the harvest area.

**Harvesting Strategy**

- This block will be managed for coniferous species.
- Season of Harvest: Winter. *
- Harvest System: Variable Retention (with even age silviculture).
- Harvest Method: Ground-based Conventional. Skidding to landings.
- Suggested Equipment: Feller buncher and grapple skidder.

**Summer Option* – for harvesting this block during the summer months, the following steps must be taken:

- All access routes must be upgraded to allow for summer haul.
- Harvesting must be done during dry soil conditions to minimize site degradation.
- Minimize duff disturbance (i.e., use a dispersed skidding pattern, do not blade skid trails, if available use rubber tired skidders).
- Access would become permanent for any road that access more than one landing. In the case of Block C8, this would include the C8-1 Road up to Landing #1 (the remaining section of road would remain temporary access).
- A minimum 5m Machine Free Zone must be placed on either side of the non-classifiable drain (NCD) located at the proposed culvert location on the C8-1 Road. Designated skidder crossings of this drain will be proposed where required.

Potential Resource Conflicts:

- marten boxes were found at various points along the Cosh Mainline Road. While these boxes are old and dilapidated, consultation with the trapper before harvesting will allow him/her to relocate these "sets".

**Temporary Access Structures and Drainage Control**

- Scatter construction and harvesting debris away from seasonal draws.
- Maintain natural drainage patterns immediately after harvesting.
- Rehabilitate all roads and landings that have been designated as "Temporary Access" and included within the "Net Area to be Reforested" (refer to the FMB Site and Harvest Plan for further details concerning temporary and permanent access).

**Biodiversity Areas and Wildlife Tree Retention**

To meet the objectives of a Variable Retention harvest system, 10-20 trees/hectare (preferably large, mature, and windfirm trees) will be retained uniformly throughout the harvested area of this block (refer to the FMB Site and Harvest Plan for further leave tree specifications).

Biodiversity reserve areas have been located totaling 3.8 hectares (19.3% of the gross block area) to provide representative wildlife habitat. These areas have been excluded from consideration for harvesting due to the following reasons:

- The narrow, external reserve near boundary GPS #11 has been excluded from the harvesting boundary as it contains an area of steep, inoperable ground with moderate to open-grown, old growth fir. This exclusion is well protected from the prevailing winds on a dry, north-facing slope.
- The easternmost external reserve connects to the landscape level Forest Ecosystem Network (FEN) and contains portions of the Stream 'H' Riparian Reserve Zone (RRZ) and RMZ.
- The small northernmost external reserve connects to the landscape level FEN and contains portions of the Stream 'I' RMZ.

**Streams and Wetlands**

Two Class 4 streams (labeled Stream 'H' and Stream 'I' on the site plan map) are located within the vicinity of this block with a portion (1.7ha) of the RMZ of Stream 'H' and a portion (1.3ha) of the RMZ of Stream 'I' lying within the harvesting boundary. These zones have been included into the harvesting boundary to ensure a natural, windfirm timber edge will be left post-harvest. The sections of RMZ that are located within the harvesting boundary will be treated as per the adjacent treatment units.

**Wildlife**

Wildlife sign noted in the vicinity of this block was rather minimal however the occasional moose track or dropping was observed.

**Terrain Stability**

Some steep (45%+) areas were noted in the vicinity of the external reserve near boundary GPS #11. This area has been excluded from the harvesting boundary. Potentially unstable ground was found on steep (60%+) slopes located to the north, and sections to the east, of the harvesting boundary as the slope breaks toward Stream 'H' and 'I'. These sections have also been avoided and are now included into external reserves or FENs.

**Visual Sensitivity**

This block has been classified, in the IWSP, as having potential visual sensitivity from viewpoints along the Alaska Hwy. A Digital Terrain Model (DTM) has been completed for this block to help determine the level of variable retention that will be required. Based on the results of the DTM it has been found that this block has low visual concerns as it is naturally screened by adjacent stands and land formations. Dispersed retention of 10-20 trees/hectare in the harvest area, as well as the proposed aggregated retention, is sufficient to ensure visual objectives have been met.

## Cultural Heritage

To assist with identification of potential cultural sites, crewmembers from the local First Nation community were consulted to assist in all operational field stages of this project. No cultural, archaeological, or historical sites were noted within, or in the vicinity of, this block.

## Site Specific Block Refinements

The following refinements to the proposed block boundaries (presented at the end of Phase I to the Interim Wood Supply Committee) were made during the final layout phase to better address site-specific issues particular to each block:

- The northern and eastern boundaries have been adjusted to follow the natural breaks discussed in the 'Boundary Location' section of this report. While most of the RMZ's of Stream 'H' and 'I' have been excluded from the block, it was deemed more ecologically feasible to include some portions and follow the natural breaks. If these areas were reserved, the solid boundary line that would be created would most likely be subject to windfall. These zones will be treated with variable retention as per the rest of the block.
- The external reserve in the vicinity of GPS #11 was originally going to be located as an internal reserve. Instead, it has been connected to the existing cut-block to the south. This refinement greatly improves the operability of the block by lessening the skidding distances and excluding excessive slopes. This reserve zone was not connected to the stand adjacent to the eastern boundary, as it would impede skidding to Landing #2. If this were done, an additional 200m of road and another landing would have been proposed.

## Field Crew

Timber reconnaissance in this block was done by Kevin Parker and Paul Schuetz, while silviculture and ecotype information was collected by Barry Mills and Greg Jonuk. Engineering related fieldwork (including boundary and roads) was done by Barry Mills and Paul Schuetz and the timber cruising was completed by Greg Jonuk and Kevin Parker. First Nation crewmembers that worked in this block include Glenis Allen, Sylvia Crouse, Dustin Dickson, Richard Dickson, Neona Pitman, and Ken Stewart. All phases of fieldwork were completed from September to November 2003.

# FOREST MANAGEMENT BRANCH

## SITE AND HARVEST PLAN

**1. LOCATION**

| District | GEOGRAPHIC LOCATION NAME | | MAPSHEET |
|---|---|---|---|
| Watson Lk | Cosh Creek | | 095-D-04 |
| FMU | LATITUDE | LONGITUDE | SIS # |
| Y02 | 60 deg. 02' 42" | 127 deg. 46' 38" | |
| DEVELOPMENT AREA | BLOCK NUMBER | | AIR PHOTO NUMBERS |
| East Hyland | C8 | | IAS(03) 54509 #282 |

**2. ECOLOGY AND SITE CONDITION**

| ECO-REGION | VEGETATION TYPE | SOIL TYPE |
|---|---|---|
| LIARD BASIN | V16, V22 | S3 (minor SS5/S8) |

| ELEV | SLOPE % | ASPECT | TERRAIN | SLOPE POSITION | MOIST REGIME | SOIL DRAINAGE | LFH(OM) DEPTH | SOIL TEXTURE |
|---|---|---|---|---|---|---|---|---|
| 880-950m | 5-45% | N-NE-E-S | HUMMOCK | MID-UPPER | 3-5//B | WELL TO IMPER | 10-25cm | L |

**3. BLOCK AREA SUMMARY IN HECTARE**

| TOTAL AREA | NP NAT | IMMATURE PATCHES | MERCHANT. AREA | RESERVES | PERM. ROADS, LANDINGS | NET AREA TO |
|---|---|---|---|---|---|---|
| 19.7 | 0 | 0 | 15.9 | 3.8 | 0 | 15.9 |

**4. HARVEST STAND DESCRIPTION**

| STAND NUMBER | MERCH. AREA | SPECIES | CROWN CLOSURE | AGE | HEIGHT | AVG. DBH | EST. VOL/HA |
|---|---|---|---|---|---|---|---|
| V16 | 10.50 | F6SW3P1 | 25.00% | 187 | 18 | 20.60 | 133.00 |
| V22 | 5.40 | P5F3SW2 | 30.00% | 114 | 21 | 24.10 | 255.00 |

# FOREST MANAGEMENT BRANCH

## SITE AND HARVEST PLAN

**5. RIPARIAN MANAGEMENT**

| RIPARIAN ID # | CLASS (STREAM, WETLAND, LAKE) | RESERVE ZONE WIDTH (M) | RATIONALE FOR RESERVE | MNGMT. ZONE WIDTH (M) | STRATEGIES FOR MANAGEMENT ZONE |
|---|---|---|---|---|---|
| H | Class 4 stream | 30.00 | as per the Yukon Forest Management Branch THP&O Guidebook | 70.00 | The harvest area boundary has been located to exclude the majority of the Riparian Management Zone (RMZ). The small (1.74 ha.) portion of the RMZ within the harvesting boundary will be treated as per the remainder of the block using a variable retention harvest method. |
| I | Class 4 stream | 30.00 | as per the THP&O Guidebook | 70.00 | The harvest area boundary has been located to exclude the majority of the Riparian Management Zone (RMZ). The small (1.32 ha.) portion of the RMZ in the harvest area will be treated as per the remainder of the block using a variable retention harvest method. |

# FOREST MANAGEMENT BRANCH

## SITE AND HARVEST PLAN

**6. STAND MANAGEMENT OBJECTIVES**

| HIGHER LEVEL AND OTHER PLANS |
|---|
| Identify any higher level plans, Resource Reports or other plans with which this prescription must be consistant. |
| This plan is consistent with the INTERIM WOOD SUPPLY PLAN for FOREST MANAGEMENT UNITS Y02, Y03 and Y09 in the KASKA YUKON TRADITIONAL TERRITORY (September 30th, 2003). |
| **STAND-LEVEL OBJECTIVES** |
| Discuss non-timber values that may be affected by the proposed treatment and measures proposed to accommodate these. |
| TRADITIONAL OR FIRST NATION |
| Based on reviews of the Interim Wood Supply Plan and extensive on block observations by First Nations crew members, no known cultural sites or issues exist within the harvest area of this block. |
| Wildlife_Values: |
| External reserves contiguous with a landscape level Forest Ecosystem Network (FEN) will provide interior forest habitat for late seral species (Marten, Boreal Owls, etc.), while internal reserves and/or dispersed on-block retention provdes stand structural diversity, visual screening, and "edge effect" throughout the harvest area for early seral species (Moose, Bear, etc.). In addition, both dispersed and aggregated retention will provide for biodiversity through "lifeboating", "enrichment" and "connectivity" at the stand level until this block returns to mature forest. Dispersed and aggregated retention also provides transitional elements between late and early seral stand structures that has been shown to increase utility of an area to both early and late seral species. |
| Fish_Water_Values: |
| In addition to any specific actions outlined in section 4.0 (RIPARIAN MANAGEMENT) of this SP, the following general conditions will be applied during harvest: 1) Culverts have been proposed for all non-classifiable drains (NCDs), draws, and streams for road crossings as shown on the SP Map. 2) Narrow draws or NCDs will not be used as skid routes, and skidding will be away from such features, as much as possible. 3) The preferred harves season will be winter to minimize the overall impact of harvesting on the hydrology of the area. |
| Recr_Visual_Values: |
| Variable Retention harvesting using dispersed and aggregated retetion will minimize the visual impact of this block as shown in the post harvest Visual Impact Simulations of the Cosh Creek area. |
| Other_Values: |
| As the Trapper appears to have been using the Cosh Mainline as a trapping route, this and other harvest blocks should be reviewed with the Trapper so that he can adjust his "sets" accordingly before harvesting commences. |

# FOREST MANAGEMENT BRANCH

## SITE AND HARVEST PLAN

**7. SILVICULTURE SYSTEM DESCRIPTION**

| STAND NUMBER | SILVICULTURE SYSTEM | SEASON | RATIONALE |
|---|---|---|---|
| All Stands | Variable Retention harvest with even-age stand management. Total aggregated retention in external reserves is 19.3% of the gross block area. Dispersed retention throughout the harvest area is approximately 2% of the current basal area/ha. | Winter | Rationale described in Section 5.2 of the INTERIM WOOD SUPPLY PLAN for FOREST MANAGEMENT UNITS Y02, Y03 and Y09 in the KASKA YUKON TRADITIONAL TERRITORY (September 30th, 2003). |

# FOREST MANAGEMENT BRANCH

## SITE AND HARVEST PLAN

### 8. SOIL CONSERVATION

ON BLOCK PERMANENT DISTURBANCE CALCULATION TAB

| DISTURBANCE TYPE (ROAD/LANDING) | IDENTIFICATION (NAME/NUMBER) | ROAD STANDARD | LENGTH (M) | WIDTH (M) | TOTAL AREA L x W / 10,000 (HA) |
|---|---|---|---|---|---|
| | | | 0.00 | 0.00 | 0.00 |
| | | | 0.00 | 0.00 | 0.00 |
| | | | 0.00 | 0.00 | 0.00 |
| | | | 0.00 | 0.00 | 0.00 |

| ROAD AREA | LANDING AREA | TOTAL AREA | BLOCK GROSS AREA | BLOCK NET AREA | % DISTURB. OF GROSS AREA |
|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 19.70 | 15.90 | 0.00% |

| | HAZARD RATINGS | | | PERMAFROST OR FROST HEAVING | PROPOSED HARVEST SEASON |
|---|---|---|---|---|---|
| DEPTH OF OM | COMPACTION | SURFACE EROSION | DISPLACEMENT | | |
| 25cm | HIGH | MODERATE | HIGH | LOW | WINTER |

PROPORTION OF TEMPORARY ACCESS WITHIN NET AERA TO BE REFORESTED: (explain rehabilitation measures)

Temporary access is 4.4% of the NAR. Rehabilitation will include, as required: 1) Removal of culverts, cleaning of ditches, and restoration of natural drainage. 2) Ripping of excessively compacted areas. 3) Re-spreading of over-burden & Replanting.

FIRE HAZARD ABATEMENT: (explain measures for slash abatement)

CWD: Leave 2-5 small piles (approx. 3mX3mX3m) randomly in the block for small furbearer habitat. In addition, leave slash scattered throughout the block as widely dispersed as possible to simulate wildfire debris while maintaining reasonable plantibility . Minimize slash piles at the landings by processing at the stump or re-distributing some slash from the landings back over the block. Burn any remaining landing accumulations, as required, to abate the potential fire hazard.

FOREST HEALTH: (explain measures to reduce current and future risk of forest to disease and insects)

No significant forest health issues were noted in this block. Diverse stand structure and ecologically suitable species mixes will, in general, reduce the potential for post-harvest stand health concerns. Windfirmness of the residual stand edges has been considered in the location of all block boundaries.

ADDITIONAL COMMENTS

Dispersed Retention Leave-Tree Specs: To meet the variable retention objectives on the harvest area, the following mature trees must be left: 1) Leave all aspen and birch regardless of condition. 2) Leave large diameter standing snags unless they are a worker safety hazard, in which case a 3m stub can be left. 3) Leave 10-20 conifers per hectare uniformly across the entire opening using the following parameters: a) All trees will be dominant or co-dominant. b) Species preference will be Subalpine Fir>White Spruce>Lodgepole Pine. c) All trees will be single or in small aggregates of 2-3 trees. d) All trees will be above average diameter for the stand, and preferably some of the largest diameter trees will be included (low height to diameter ratio for windfirmness). e) Spacing will vary to allow operational flexibility but will be roughly 20 to 30m between trees or aggregates. f) Most of the trees will be of good form and vigor (straight with healthy crowns). To supplement this mature tree retention the following non-merchantable trees will be left in all V9 and V16 types: 1) Leave random clumps of Subalpine Fir advanced regeneration (<7m tall & <13.6cm DBH), where operationally feasible. These clumps will preferably be associated with the mature leave trees or aggregates for maximum effect and ease of harvesting (i.e., minimize the amount of non-merchantable Subalpine Fir slash by retaining the natural clumps of trees that currently exist in these stand types). In addition, the following non-merchantable trees will be left in all V17, V21, & V22 types: 1) Leave any scattered White Spruce (<7m tall, >40% live crown, and 13.5cm DBH) of good form and vigor where it is operationally feasible to do so.

Yukon
Energy, Mines and Resources

# FOREST MANAGEMENT BRANCH

## SITE AND HARVEST PLAN

### 9. REFORESTATION DESCRIPTION

| SIS # | STAND # | NET AREA TO REFOREST | RESTOCKING | | TARGET STOCKING (SPH) | ASSESSMENT DATES | | |
|---|---|---|---|---|---|---|---|---|
| | | | PREF. SPECIES | ACC. SPECIES | | DELAY TO TREAT | REGEN SURVEYS | |
| | | | | | | | EARLY STOCKING | LATE PERFORMANC |
| | V16 | 10.50 | F, P | SW | 1200 | H +3 | H +5 | H +10 |
| | V22 | 5.40 | P | SW, F | 1200 | H +2 | H +5 | H +10 |
| | | | | | | | | |
| | | | | | | | | |

REFORESTATION PLAN:

Site Preparation V16 & V22 type: Preparation objectives would be to create plantible spots, promote soil warming and retain or mixing in organic material. Suitable alternatives would be chain drag, disc trench, screef & raw plant. Excavator rake/pile or spot burning would be options if slash levels are excessive. Microsite plant pine and spruce 2+0 310 or equivalent stock. If ra planting, obstacle plant for soil warmth.

ESTABLISHMENT TO ASSESSMENT DATE CONCERNS:

V16 & V22 type: Brush competition is not expected to be a concern on these types.

ADDITIONAL COMMENTS:

Evaluate dispersed slash levels ASAP after harvest to confirm site prep requirements, if any. Survey V16 & V22 types for levels of acceptable Subalpine Fir and spruce regeneration to determine planting stock amounts. Short root stock is preferred on this block due to the patches of coarse shallow soils in this block. Plant spruce on raised sites in the subhygric draws.

FMB
Approval by: _____ Date: _____

Position: _____ Signature: _____

### 10. ATTACHMENTS

SITE PLAN MAP @ 1:_____

HARVEST PLAN MAP @ 1:_____

# BLOCK REPORT

**Client: Yukon Forest Management Branch**
**Job #: 030482**
**Reported by: Paul Schuetz**
**Company: Industrial Forestry Service Ltd.**
**Date: November 25, 2003**

## *COSH CREEK BLOCK C10*

### Location and Access

This block is located in the vicinity of Cosh Creek, ±53 km east of the town of Watson Lake, Yukon within the Y02 Forest Management Unit and the Liard Basin Ecoregion.

The town of Watson Lake is situated along the Alaska Hwy at Mile 635. From Watson Lake, proceed eastward along the Alaska Hwy for approximately 75 km to reach the beginning of the Cosh Mainline Road (about 2 km west of the Contact Creek Lodge). Heading north along the Cosh Mainline Road, continue for about 6.8 km to the junction with a large branch road (the C9 Branch Road) at GPS 36. Keeping to the Cosh Mainline Road, stay left at this junction and continue for another 3.2 km to reach another branch road (the C10 Branch Road) that commences to the right (easterly). Follow this the C10 Branch Road for 2.0 km to reach the boundary of block C10 at the existing landing #2. The C10-2 and 3 Roads both commence on the right side of the branch road about 70m further along from the boundary crossing.

The total distance to Watson Lake is approximately 87.0 km.

### Located Roads

Five block roads and twelve landings (including one existing road and one built landing) have been proposed for this block. Road and landing locations have been proposed in such a way as to balance skidding distances throughout the block and to have each landing service approximately 11ha of area. All roads and landings should be constructed to allow for easy rehabilitation following harvesting activities.

Areas of note along the Block C10 road system include the following:

- The C10-1 Road utilizes only a portion of an existing road that accesses a small cut-block to the north of boundary GPS #30. The portion of the existing road that joins with the C10 Branch Road was not utilized because it follows a riparian class stream (Stream 'F') crossing it twice and disrupting its flow. To avoid this area of concern, the C10-1 Road crosses the stream at an existing crossing on the built road, and then enters the timber on a b-line to the C10 Branch Road. The C10 Branch Road must be re-constructed with proper drainage structures to allow the creek to flow in it's natural drainage.

- The section of the C10-1 Road, between GPS #135 and 136, crosses a very narrow (21m wide) finger of opening that is a part of the small cut block located to the north of GPS #80.
- The section of the C10-1 Road near GPS #137 skirts around an esker where side slopes of over 30% are encountered. The block boundary has been located a minimum of 10m (right of way distance) away from the road.
- The entire length of the C10-3 Road is favourable with a steep (18%) favourable pitch of about 30m located near GPS #84. Relief grades are located above and below this pitch and alignment has been maintained.
- Areas of rock (see Harvest Plan map for locations) have been noted along the C10-3 Road and are the reason why the road contours its way up to Landing #5. Large rock outcrops can be found to the south of GPS #80 and along the section of road that heads southwest from this point, to the east of Landing #5, and to the south of Landing #5 paralleling the road as it heads south west. These rock outcrops will have to be skidded around, however they will not impede road construction as the location of the C10-3 Road avoids areas where ripping would be required. The rock outcrops should be considered prime areas for dispersed retention clumps to minimize site disturbance.
- The C10-4 Road follows good favourable grades up to Landing #7. This landing has been located on a slight side slope and should be constructed at a 60m x 40m scale.
- The section of the C10-4 Road between GPS #110 and 114 will be the most costly section to construct. From GPS #110, the road enters a wide, adverse (average grade is 6% made up of a flat approach to a steep, 12% for 10m adverse pitch, followed by another flat section) switchback and then a moderate, adverse descent to a large bench where Landing #6 is located. The road switches back again, continues along moderate grades to the crossing of a steep banked non-classifiable drain (NCD) at GPS #113. This drain crossing will require at least 2m of fill, much of which will be provided from the construction of the landing and switchbacks. After the drain is crossed, the road follows a bench for a short distance before descending along the side of a steep-sloped esker where side slopes of 55% for about 50m is experienced (at GPS #114). Extensive cuts and fill will be required for this short piece of road in order to reach the defined bench below the esker. This steep area has been minimized by proposing a 10% adverse grade line. Once the bench below this steep area is reached, a 2-4% favourable grade is proposed along the bench to allow loaded trucks to have a run at this steep (10%), adverse 50m pitch. The slopes found along this esker are the steepest where the road is located (the area could not be avoided due to terrain conditions) and has therefore not been excluded from the block boundary. Falling along this slope will be either by hand, or increased retention may be applied to leave clumps of dispersed trees here.
- The section of the C10-4 Road from GPS #114 to 120 follows a bench with side slopes averaging about 20%. From GPS #120 to 121, the road follows a steep gradeline to avoid encroaching into the existing cut-block plantation to the east. The road is located on grades averaging about 12% and is at least right of way

distance away from the block boundary. Once GPS #121 is reached, the road flattens out again and follows open pine benches for the remainder of its length.
- The C10 Branch Road that accesses this block will require minor upgrading for winter harvesting, up until about 300m before the proposed location of Landing #12. This final section of built road will require major upgrading as much of it appears to have been slightly rehabilitated.

The majority of skidding in Block C10 will be favourable on moderate slopes with the following exceptions:

- Adverse to Landing #1 from the north in the vicinity of boundary GPS #301 and 302. This area can be skidded directly to the C10-1 Road then along this road to the landing.
- Adverse to Landing #4 from the north and northwest along slopes of 10-15%.
- Adverse to the built Landing #2 from the north, in the vicinity of GPS #71, along slopes of 15-20%.
- Favourable to Landing #5 but skidding will have to avoid areas of exposed rock and outcrops to the east and south of this landing. Several natural saddles can be utilized for easy skidding around these features.
- Adverse to Landing #9 from all areas to the south, and in the vicinity of boundary GPS #32, along slopes of up to 20%.
- Adverse to Landing #10 from the east along slopes of about 15%.
- Adverse to Landing #11 from the east, in the vicinity of GPS #17, along slopes of 10-15%.

**Block Boundary**

The Block C10 harvesting boundary has been slightly modified from the area that was proposed in the Interim Wood Supply Plan. The most noticeable change is the amount of retention, which has increased from the proposed amount of 10% to the current amount of 18.7%. This increase is a result of adding external reserves to join the harvesting boundary to the landscape level Forest Ecosystem Network (FEN). The areas of note that helped to determine the location of the proposed harvesting boundary are as follows:

- The section between GPS #302 and CCC (short for cut-block corner) in the vicinity of the C10-1 Road follows the edge of a small existing cut-block that does not exist on any of the current inventory maps.
- From GPS #CCC to the built road near GPS #101, the boundary follows a defined timber type edge excluding wetter fir/spruce types which likely contain old growth remnants from past fires.
- The section of boundary that follows the beginning of the C10-4 Road, has been located at least right of way distance from the proposed road and has been located to ensure this road remains within the harvesting boundary (alleviates road permit issues).
- The section of boundary from GPS #68 to 62 follows the old fire boundary along dense fir types and excludes various small habitats such as a non-productive (NP) pothole, clumps of deciduous, and rocky outcrops.

- The section of boundary, from GPS #52 to halfway between GPS #57 and 58, follows a defined timber type edge excluding dense fir and pine clumps with variable stand structures.
- The section of boundary from GPS #9 to 13 (northeast edge) excludes non-merchantable pine on shallow soils with areas of exposed rock.
- The section of boundary between GPS #13 to 22 contours the slope excluding sub-hygric sites and open black spruce patches. Exclusion of these areas reduces the impact of harvesting on water resources by protecting the run-off channels along this slope.
- The sections of boundary between GPS #22 and 25, and from 30 to 42, follow existing cut-block edges. The section from GPS #28 to 30 contours the slope for reasons of operability (i.e., to minimize adverse skidding to Landing #9). This section of boundary cuts through a merchantable stand of fir and pine.
- The section of boundary from GPS #42 to just west of #48 follows an old, well-defined fire boundary and is hidden by a natural ridge to reduce visual impact and increase windfirmness.
- The section from just past GPS #48 to #302 contours a hill at the toe of the slope to facilitate ease of harvest and have a low profile boundary out of view on the west end.

**Harvesting Strategy**

- This block will be managed for coniferous species.
- Season of Harvest: Winter. *
- Harvest System: Variable Retention (with even age silviculture).
- Harvest Method: Ground-based Conventional. Skidding to landings.
- Suggested Equipment: Feller buncher and grapple skidder.

**Summer Option* – for harvesting this block during the summer months, the following steps must be taken:

- All access routes must be upgraded to allow for summer haul.
- Harvesting must be done during dry soil conditions to minimize site degradation.
- Minimize duff disturbance (i.e., use a dispersed skidding pattern, do not blade skid trails, if available use rubber tired skidders).
- Access would become permanent for any road that accesses more than one landing. In the case of Block C10, this would include the C10-3 Road up to Landing #5, and the C10-4 Road up to Landing #10 (the remaining sections of road would remain temporary access).
- A minimum 5m Machine Free Zone must be placed on either side of all non-classifiable drains (NCD's) or wet draws. Designated skidder crossings of these drains will be proposed where required.
- Proper reconstruction of a portion of the C10 Branch Road to avoid impacts on Stream 'F' (i.e., proper drainage structures and restoration of the stream's natural flow).

Potential Resource Conflicts:

- marten boxes were found at various points along the Cosh Mainline Road. While these boxes are old and dilapidated, consultation with the trapper before harvesting will allow him/her to relocate these "sets".

**Temporary Access Structures and Drainage Control**

- Scatter construction and harvesting debris away from seasonal draws.
- Maintain natural drainage patterns immediately after harvesting.
- Rehabilitate all roads and landings that have been designated as "Temporary Access" and included within the "Net Area to be Reforested" (refer to the FMB Site and Harvest Plan for further details concerning temporary and permanent access).

**Biodiversity Areas and Wildlife Tree Retention**

To meet the objectives of a Variable Retention harvest system, 10-20 trees/hectare (preferably large, mature, and windfirm trees) will be retained uniformly throughout the harvested area of this block (refer to the FMB Site and Harvest Plan for further leave tree specifications).

Biodiversity reserve areas have been located totaling 30.0 hectares (18.7% of the gross block area) to provide representative wildlife habitat. These areas have been excluded from consideration for harvesting due to the following reasons:

- The easternmost external reserve zone in the vicinity of GPS #13 and 17 excludes areas of low volume pine with small, scattered patches of terrestrial lichen, as well as some sub-hygric, black spruce areas (refer to the 'Block Boundary' section of this report for further details).
- The other large external reserve zone, between GPS #68 and 53, excludes an old fire made up of pockets of old, dense fir and scattered remnants. This area also includes a few wet NP patches and a small pond with some sign of wildlife use. This reserve separates the two existing cut-blocks located adjacent to the northern half of the block.
- The small external reserve near boundary GPS #62 contains a small area of sub-hygric ground and a stand of black spruce.
- The easternmost internal reserve excludes low volume, variable diameter pine with open areas that contain small patches of terrestrial lichen.
- The westernmost internal reserve (see GPS #505) excludes a nutrient rich sub-hygric area containing high volume spruce and fir. A small, old wildlife den has also been noted in this area and a windfirm reserve has been placed on it.

**Streams and Wetlands**

One Class 4 stream (labeled Stream 'F' on the site plan map) is located within the vicinity of this block with a portion (0.27ha) of the riparian management zone (RMZ) lying within the harvesting boundary. This section will be treated as per the adjacent treatment units.

**Wildlife**

Wildlife sign noted in the vicinity of this block include a small den with no evidence of recent use. This den was excluded from the harvesting boundary and can be found within the westernmost internal reserve. Other wildlife sign included moose tracks along the existing road that passes through the large external reserve adjacent to the middle of the block (between GPS #68 and 53). Bear feeding signs were noted in all old cut-blocks in the Cosh Creek area.

**Terrain Stability**

Some steep (45%+) areas were noted near GPS #114 at the toe of a large esker. This area has not been removed from the harvesting area, as it would disrupt road construction along the C10-4 Road. While steep, this area is quite small and did not appear to have any terrain stability concerns. Rock outcrops were noted paralleling the C10-3 Road between GPS #80 and 84. Skidding will be done around these outcrops and falling can be safely done above or below these areas, however, trees which would otherwise require hand-falling should be considered for variable retention.

**Visual Sensitivity**

This block has been classified, in the IWSP, as having potential visual sensitivity from viewpoints along the Alaska Hwy. A Digital Terrain Model (DTM) has been completed for this block to help determine the level of variable retention that will be required. Based on the results of the DTM it has been found that this block has low visual concerns as it is naturally screened by adjacent stands and land formations, and is a significant distance from all viewpoints. Dispersed retention of 10-20 trees/hectare in the harvest area, as well as the proposed aggregated retention, is sufficient to ensure visual objectives have been met.

**Cultural Heritage**

To assist with identification of potential cultural sites, crewmembers from the local First Nation community were consulted to assist in all operational field stages of this project. No cultural, archaeological, or historical sites were noted within, or in the vicinity of, this block.

**Site Specific Block Refinements**

The following refinements to the proposed block boundaries (presented at the end of Phase I to the Interim Wood Supply Committee) were made during the final layout phase to better address site-specific issues particular to each block:

- A large portion has been added to the western boundary due to its accessibility and similarity to stands located to the east of the westernmost internal reserve. The southern portions of this area continue to follow an old fire boundary, however the western portion cuts through the timber type, following contours, to make skidding to Landing #1 operationally feasible.
- The areas of rock located in the middle of the block have been left inside the harvesting boundary as windfirmness is a concern in this area and proposing an internal reserve would hinder the operability of the area (esp. skidding through saddles to Landing #5). These rock outcrops are operationally infeasible with a ground-based system of harvesting, however, there is considerable room for machinery to work around, and avoid these areas (thus avoiding any site disturbance concerns). The variable retention harvest system will allow loggers to retain any trees that are rooted to these rock outcrops (or in the close proximity) that might cause potential site disturbance.
- Only one internal reserve zone has been proposed in the northeastern section of the block. The second reserve that was originally proposed, has been connected to the large external reserve south of boundary GPS #53, thus making the zone of aggregated retention larger. This was done to include more representative pine into the reserve zone and to avoid potential operational problems by including very narrow fingers for harvesting activities to take place.

**Field Crew**

Timber reconnaissance in this block was done by Kevin Parker and Paul Schuetz, while silviculture and ecotype information was collected by Barry Mills and Greg Jonuk. Engineering related fieldwork (including boundary and roads) was done by Barry Mills and Paul Schuetz and the timber cruising was completed by Greg Jonuk and Kevin Parker. First Nation crewmembers that worked in this block include Glenis Allen, Sylvia Crouse, Dustin Dickson, Richard Dickson, Neona Pitman, and Ken Stewart. All phases of fieldwork were completed from September to November 2003.

# FOREST MANAGEMENT BRANCH

## SITE AND HARVEST PLAN

**1. LOCATION**

| District | GEOGRAPHIC LOCATION NAME | | MAPSHEET |
|---|---|---|---|
| Watson Lk | Cosh Creek | | 095-D-04 |
| FMU | LATITUDE | LONGITUDE | SIS # |
| Y02 | 60 deg. 04' 21" | 127 deg. 48' 25" | |
| DEVELOPMENT AREA | BLOCK NUMBER | | AIR PHOTO NUMBERS |
| East Hyland | C10 | | IAS(03) 54509 #273/284 |

**2. ECOLOGY AND SITE CONDITION**

| ECO-REGION | VEGETATION TYPE | SOIL TYPE |
|---|---|---|
| LIARD BASIN | V16, V22 | S3 (minor SS5/S8) |

| ELEV | SLOPE % | ASPECT | TERRAIN | SLOPE POSITION | MOIST REGIME | SOIL DRAINAGE | LFH(OM) DEPTH | SOIL TEXTURE |
|---|---|---|---|---|---|---|---|---|
| 905-1045m | 10-45% | VAR | EVEN-ROLLING | MID-CREST | 4//C | MODWELL | 10-20cm | L-SL |

**3. BLOCK AREA SUMMARY IN HECTARE**

| TOTAL AREA | NP NAT | IMMATURE PATCHES | MERCHANT. AREA | RESERVES | PERM. ROADS, LANDINGS | NET AREA TO |
|---|---|---|---|---|---|---|
| 160.9 | 0 | 0 | 130.2 | 30 | 0.7 | 130.2 |

**4. HARVEST STAND DESCRIPTION**

| STAND NUMBER | MERCH. AREA | SPECIES | CROWN CLOSURE | AGE | HEIGHT | AVG. DBH | EST. VOL/HA |
|---|---|---|---|---|---|---|---|
| V16 | 51.60 | F4SW4P2 | 35.00% | 129 | 18 | 24.60 | 190.00 |
| V22 | 78.60 | P7F2SW1 | 30.00% | 120 | 18 | 21.10 | 180.00 |

**5. RIPARIAN MANAGEMENT**

| RIPARIAN ID # | CLASS (STREAM, WETLAND, LAKE) | RESERVE ZONE WIDTH (M) | RATIONALE FOR RESERVE | MNGMT. ZONE WIDTH (M) | STRATEGIES FOR MANAGEMENT ZONE |
|---|---|---|---|---|---|
| F | Class 4 stream | 30.00 | as per the Yukon Forest Management Branch THP&O Guidebook | 70.00 | The harvest area boundary has been located to exclude the majority of the Riparian Management Zone (RMZ). The small (0.27 ha.) portion of the RMZ within the harvesting boundary will be treated as per the remainder of the block using a variable retention harvest method. |
| K | Class 4 stream | 30.00 | as per the THP&O Guidebook | 70.00 | The harvest area boundary has been located to exclude the ENTIRE Riparian Management Zone (RMZ). |

# FOREST MANAGEMENT BRANCH

## SITE AND HARVEST PLAN

**6. STAND MANAGEMENT OBJECTIVES**

| HIGHER LEVEL AND OTHER PLANS |
|---|
| Identify any higher level plans, Resource Reports or other plans with which this prescription must be consistant. |
| This plan is consistent with the INTERIM WOOD SUPPLY PLAN for FOREST MANAGEMENT UNITS Y02, Y03 and Y09 in the KASKA YUKON TRADITIONAL TERRITORY (September 30th, 2003). |
| **STAND-LEVEL OBJECTIVES** |
| Discuss non-timber values that may be affected by the proposed treatment and measures proposed to accommodate these. |
| TRADITIONAL OR FIRST NATION |
| Based on reviews of the Interim Wood Supply Plan and extensive on block observations by First Nations crew members, no known cultural sites or issues exist within the harvest area of this block. |
| Wildlife_Values: |
| External reserves contiguous with a landscape level Forest Ecosystem Network (FEN) will provide interior forest habitat for late seral species (Marten, Boreal Owls, etc.), while internal reserves and/or dispersed on-block retention provdes stand structural diversity, visual screening, and "edge effect" throughout the harvest area for early seral species (Moose, Bear, etc.). In addition, both dispersed and aggregated retention will provide for biodiversity through "lifeboating", "enrichment" and "connectivity" at the stand level until this block returns to mature forest. Dispersed and aggregated retention also provides transitional elements between late and early seral stand structures that has been shown to increase utility of an area to both early and late seral species. |
| Fish_Water_Values: |
| In addition to any specific actions outlined in section 4.0 (RIPARIAN MANAGEMENT) of this SP, the following general conditions will be applied during harvest: 1) Culverts have been proposed for all non-classifiable drains (NCDs), draws, and streams for road crossings as shown on the SP Map. 2) Narrow draws or NCDs will not be used as skid routes, and skidding will be away from such features, as much as possible. 3) The preferred harves season will be winter to minimize the overall impact of harvesting on the hydrology of the area. |
| Recr_Visual_Values: |
| Variable Retention harvesting using dispersed and aggregated retetion will minimize the visual impact of this block as shown in the post harvest Visual Impact Simulations of the Cosh Creek area. |
| Other_Values: |
| As the Trapper appears to have been using the Cosh Mainline as a trapping route, this and other harvest blocks should be reviewed with the Trapper so that he can adjust his "sets" accordingly before harvesting commences. |

# FOREST MANAGEMENT BRANCH

## SITE AND HARVEST PLAN

**7. SILVICULTURE SYSTEM DESCRIPTION**

| STAND NUMBER | SILVICULTURE SYSTEM | SEASON | RATIONALE |
|---|---|---|---|
| All Stands | Variable Retention harvest with even-age stand management. Total aggregated retention in external and internal reserves is 18.6% of the gross block area. Dispersed retention throughout the harvest area is approximately 2% of the current basal area/ha. | Winter | Rationale described in Section 5.2 of the INTERIM WOOD SUPPLY PLAN for FOREST MANAGEMENT UNITS Y02, Y03 and Y09 in the KASKA YUKON TRADITIONAL TERRITORY (September 30th, 2003). |

# FOREST MANAGEMENT BRANCH

## SITE AND HARVEST PLAN

### 8. SOIL CONSERVATION

ON BLOCK PERMANENT DISTURBANCE CALCULATION TAB

| DISTURBANCE TYPE (ROAD/LANDING) | IDENTIFICATION (NAME/NUMBER) | ROAD STANDARD | LENGTH (M) | WIDTH (M) | TOTAL AREA L x W / 10,000 (HA) |
|---|---|---|---|---|---|
| ROAD | C10 BRANCH ROAD | CLASS 4 | 680.00 | 10.00 | 0.70 |
| | | | 0.00 | 0.00 | 0.00 |
| | | | 0.00 | 0.00 | 0.00 |
| | | | 0.00 | 0.00 | 0.00 |

| ROAD AREA | LANDING AREA | TOTAL AREA | BLOCK GROSS AREA | BLOCK NET AREA | % DISTURB. OF GROSS AREA |
|---|---|---|---|---|---|
| 0.70 | 0.00 | 0.00 | 160.90 | 130.20 | 0.40% |

| | HAZARD RATINGS | | | PERMAFROST OR FROST HEAVING | PROPOSED HARVEST SEASON |
|---|---|---|---|---|---|
| DEPTH OF OM | COMPACTION | SURFACE EROSION | DISPLACEMENT | | |
| 20cm | HIGH | HIGH | HIGH | LOW | WINTER |

PROPORTION OF TEMPORARY ACCESS WITHIN NET AERA TO BE REFORESTED: (explain rehabilitation measures)

Temporary access is 2.9% of the NAR. Rehabilitation will include, as required: 1) Removal of culverts, cleaning of ditches, and restoration of natural drainage. 2) Ripping of excessively compacted areas. 3) Re-spreading of over-burden & Replanting.

FIRE HAZARD ABATEMENT: (explain measures for slash abatement)

CWD: Leave 2-5 small piles (approx. 3mX3mX3m) randomly in the block for small furbearer habitat. In addition, leave slash scattered throughout the block as widely dispersed as possible to simulate wildfire debris while maintaining reasonable plantibility . Minimize slash piles at the landings by processing at the stump or re-distributing some slash from the landings back over the block. Burn any remaining landing accumulations, as required, to abate the potential fire hazard.

FOREST HEALTH: (explain measures to reduce current and future risk of forest to disease and insects)

No significant forest health issues were noted in this block. Diverse stand structure and ecologically suitable species mixes will, in general, reduce the potential for post-harvest stand health concerns. Windfirmness of the residual stand edges has been considered in the location of all block boundaries.

ADDITIONAL COMMENTS

Dispersed Retention Leave-Tree Specs: To meet the variable retention objectives on the harvest area, the following mature trees must be left: 1) Leave all aspen and birch regardless of condition. 2) Leave large diameter standing snags unless they are a worker safety hazard, in which case a 3m stub can be left. 3) Leave 10-20 conifers per hectare uniformly across the entire opening using the following parameters: a) All trees will be dominant or co-dominant. b) Species preference will be Subalpine Fir>White Spruce>Lodgepole Pine. c) All trees will be single or in small aggregates of 2-3 trees. d) All trees will be above average diameter for the stand, and preferably some of the largest diameter trees will be included (low height to diameter ratio for windfirmness). e) Spacing will vary to allow operational flexibility but will be roughly 20 to 30m between trees or aggregates. f) Most of the trees will be of good form and vigor (straight with healthy crowns). To supplement this mature tree retention the following non-merchantable trees will be left in all V9 and V16 types: 1) Leave random clumps of Subalpine Fir advanced regeneration (<7m tall & <13.6cm DBH), where operationally feasible. These clumps will preferably be associated with the mature leave trees or aggregates for maximum effect and ease of harvesting (i.e., minimize the amount of non-merchantable Subalpine Fir slash by retaining the natural clumps of trees that currently exist in these stand types). In addition, the following non-merchantable trees will be left in all V17, V21, & V22 types: 1) Leave any scattered White Spruce (<7m tall, >40% live crown, and 13.5cm DBH) of good form and vigor where it is operationally feasible to do so.

Yukon
Energy, Mines and Resources

# FOREST MANAGEMENT BRANCH

## SITE AND HARVEST PLAN

### 9. REFORESTATION DESCRIPTION

| SIS # | STAND # | NET AREA TO REFOREST | RESTOCKING | | TARGET STOCKING (SPH) | ASSESSMENT DATES | | |
|---|---|---|---|---|---|---|---|---|
| | | | PREF. SPECIES | ACC. SPECIES | | DELAY TO TREAT | REGEN SURVEYS | |
| | | | | | | | EARLY STOCKING | LATE PERFORMANC |
| | V16 | 51.60 | F, SW | P | 1200 | H +3 | H +5 | H +10 |
| | V22 | 78.60 | P | SW, F | 1200 | H +2 | H +5 | H +10 |
| | | | | | | | | |
| | | | | | | | | |

REFORESTATION PLAN:

Site Preparation V16 & V22 type: Preparation objectives would be to create plantible spots, promote soil warming and retain or mixing in organic material. Suitable alternatives would be chain drag, disc trench, screef & raw plant. Excavator rake/pile or spot burning would be options if slash levels are excessive. Microsite plant pine and spruce 2+0 310 or equivalent stock. If ra planting, obstacle plant for soil warmth.

ESTABLISHMENT TO ASSESSMENT DATE CONCERNS:

V16 & V22 type: Brush competition is not expected to be a concern on these types.

ADDITIONAL COMMENTS:

Evaluate dispersed slash levels ASAP after harvest to confirm site prep requirements, if any. Survey V16 & V22 types for levels of acceptable Subalpine Fir and spruce regeneration to determine planting stock amounts. Short root stock is preferred on this block due to the patches of coarse shallow soils in this block. Plant spruce on raised sites in the subhygric draws.

FMB
Approval by: _____ Date: _____

Position: _____ Signature: _____

### 10. ATTACHMENTS

SITE PLAN MAP @ 1:_____

HARVEST PLAN MAP @ 1:_____

# BLOCK REPORT

**Client: Yukon Forest Management Branch**
**Job #: 030482**
**Reported by: Paul Schuetz**
**Company: Industrial Forestry Service Ltd.**
**Date: November 25, 2003**

## *COSH CREEK BLOCK C11*

### Location and Access

This block is located in the vicinity of Cosh Creek, ±50 km east of the town of Watson Lake, Yukon within the Y02 Forest Management Unit and the Liard Basin Ecoregion.

The town of Watson Lake is situated along the Alaska Hwy at Mile 635. From Watson Lake, proceed eastward along the Alaska Hwy for approximately 75 km to reach the beginning of the Cosh Mainline Road (about 2 km west of the Contact Creek Lodge). Heading north along the Cosh Mainline Road, continue for about 6.3 km at which point the boundary of Block C11 is reached. The point of commencement (P.O.C.) of the C11-2 Road that accesses Landing #2 is on the right side of the mainline approximately another 120m north.

The total distance to Watson Lake is approximately 81.5 km.

### Located Roads

Two road and two landings have been proposed for this block, one on either side of the Cosh Mainline Road. All roads and landings should be constructed to allow for easy rehabilitation following harvesting activities.

Areas of note along the Block C11 road system include the following:

- The first 65m of the C11-1 Road pass through an existing cut-block plantation. The reason for this out of block section of road was to avoid excessive adverse gradients. From where the C11-1 Road commences, the mainline climbs significantly before crossing the Block C11 boundary. This gain in elevation was avoided with the C11-1 Road, which simply contours the slope to Landing #1. The C11-1 Road is still located on adverse grades of about 6%, to reach the bench where Landing #1 has been proposed. The terrain that is crossed is very broken however, the road manages to follow a slight bench for most of the route. Side slope along the bench are 15-20%, however some short sections of 20-40% side slopes are encountered.
- The C11-2 Road is a short, 60m road that accesses Landing #2. The road accesses a small bench where a 40m x 30m landing may be constructed. The steep, difficult terrain in this area does not accommodate suitable landing sizes or

ideal locations. The C11-2 Road commences off of the Cosh Mainline near the top of a hill, before it descends toward GPS #1. One option, to avoid adverse skidding, was to propose a landing at the bottom of the hill (near GPS #1) however trucks would not be able to climb this hill without a run. The current location of the C11-1 Road alleviates this problem of adverse haul.

The majority of skidding in Block C11 will be favourable on steep to moderate slopes with the following exceptions:

- Adverse to Landing #1 from the west along slopes of up to 25%, however the terrain in this area is benchy and steep pitches can be avoided. The areas in the southernmost portion of the block (near GPS #6) is also adverse (10-15%) but follows benches most of the way and side-hill skids the rest.
- Adverse to Landing #2 from the northwest. Landing #2 is located on top of a steep slope that breaks down toward the northwestern boundary. Timber in this area can be directionally felled to Landing #2, skidded across the mainline to Landing #1 (following a flat bench), up the mainline along 12-15% grades to landing #2, or long-lined to Landing #2 (by far the least desirable option). The area affected by adverse skidding is possibly about 0.5 ha, and therefore skidding across the mainline, with traffic control in place, is by far the best option.

**Block Boundary**

The Block C11 harvesting boundary has been significantly modified from the area that was proposed in the Interim Wood Supply Plan. The most noticeable change is the amount of retention, which has increased from the proposed amount of 0% to the current amount of 40.8%. The areas of note that helped to determine the location of the proposed harvesting boundary are as follows:

- The northwestern boundary, between GPS #3 and 13, is located on a dry site leaving large fir and white spruce to compliment an open non-commercial brush (NCBr) area that provides high value habitat and minimizes impact on water resources.
- The northeastern boundary, between GPS #13 and 9, contours across a slope break where inoperable (45%+) slopes are encountered to the east (excluded from the block boundary).
- The southern boundary between GPS #9 and 7 follows the edge of existing cut-blocks.
- The southwestern boundary, between GPS #7 and 3, follows a natural slope break and stand edge excluding a wet, sub-hygric site below the block.

**Harvesting Strategy**

- This block will be managed for coniferous species.
- Season of Harvest: Winter. *
- Harvest System: Variable Retention (with even age silviculture).
- Harvest Method: Ground-based Conventional. Skidding to landings.

- Suggested Equipment: Feller buncher and grapple skidder (tracked skidder if winter harvest).

**Summer Option* – for harvesting this block during the summer months, the following steps must be taken:

- All access routes must be upgraded to allow for summer haul (i.e., Cosh Mainline Road).
- Harvesting must be done during dry soil conditions to minimize site degradation.
- Minimize duff disturbance (i.e., use a dispersed skidding pattern, do not blade skid trails).

Potential Resource Conflicts:

- marten boxes were found at various points along the Cosh Mainline Road. While these boxes are old and dilapidated, consultation with the trapper before harvesting will allow him/her to relocate these "sets".

**Temporary Access Structures and Drainage Control**

- Scatter construction and harvesting debris away from seasonal draws.
- Maintain natural drainage patterns immediately after harvesting.
- Rehabilitate all roads and landings that have been designated as "Temporary Access" and included within the "Net Area to be Reforested" (refer to the FMB Site and Harvest Plan for further details concerning temporary and permanent access).

**Biodiversity Areas and Wildlife Tree Retention**

To meet the objectives of a Variable Retention harvest system, 10-20 trees/hectare (preferably large, mature, and windfirm trees) will be retained uniformly throughout the harvested area of this block (refer to the FMB Site and Harvest Plan for further leave tree specifications).

A Biodiversity reserve area has been located totaling 10.0 hectares (40.8% of the gross block area) to provide representative wildlife habitat. This area has been excluded from consideration for harvesting due to the following reason:

- The 10 ha external reserve located adjacent to the western boundary, excludes a large, wet, hygric to sub-hygric, horsetail/Black spruce site located to the east of GPS #6. In addition, a non-classifiable drainage area (north of GPS #1) and the northern banks of this drain have been excluded to minimize impact on water resources.

**Streams and Wetlands**

One Class 4 stream (labeled Stream 'D' on the site plan map) is located within the vicinity of this block, to the west of the southwestern boundary. No portions of the riparian management area (RMA), which includes both the reserve and management zones, are found within the harvesting boundary of Block C11.

**Wildlife**

Wildlife sign noted in the vicinity of this block include both moose and wolf tracks found along the Cosh Mainline road, and minor evidence of moose browse and bear feeding in the existing cut-blocks located to the south of this block.

**Terrain Stability**

Some steep (45%+) areas were noted east of the northeastern boundary. These areas have been deemed inoperable and have been excluded from the harvest boundary.

**Visual Sensitivity**

This block has been classified, in the IWSP, as having potential visual sensitivity. A Digital Terrain Model (DTM) has been completed for this block to confirm an adequate level of dispersed and aggregated retention. Results of the DTM show that this block is naturally screened by surrounding land formations, therefore no portions of the Block C11 harvesting boundary are visible from viewpoints along the Alaska Highway.

**Cultural Heritage**

To assist with identification of potential cultural sites, crewmembers from the local First Nation community were consulted to assist in all operational field stages of this project. No cultural, archaeological, or historical sites were noted within, or in the vicinity of, this block.

**Site Specific Block Refinements**

The following refinements to the proposed block boundaries (presented at the end of Phase I to the Interim Wood Supply Committee) were made during the final layout phase to better address site-specific issues particular to each block:

- The northwestern boundary parallels a non-classifiable drain (NCD), and uses the sub-hygric ecotype as a natural boundary to follow. Riparian reserves and management zones were not required in this area as the drain was unclassifiable.
- The northeastern boundary is much more irregular than originally proposed, as a natural break was followed and excessively steep terrain was excluded for potential terrain stability and operational reasons.

**Field Crew**

Timber reconnaissance in this block was done by Kevin Parker and Paul Schuetz, while silviculture and ecotype information was collected by Barry Mills and Greg Jonuk. Engineering related fieldwork (including boundary and roads) was done by Barry Mills and Paul Schuetz and the timber cruising was completed by Greg Jonuk and Kevin Parker. First Nation crewmembers that worked in this block include Glenis Allen, Sylvia Crouse, Dustin Dickson, Richard Dickson, Neona Pitman, and Ken Stewart. All phases of fieldwork were completed from September to November 2003.

Yukon
Energy, Mines and Resources

# FOREST MANAGEMENT BRANCH

## SITE AND HARVEST PLAN

**1. LOCATION**

| District | GEOGRAPHIC LOCATION NAME | | MAPSHEET |
|---|---|---|---|
| Watson Lk | Cosh Creek | | 095-D-04 |
| FMU | LATITUDE | LONGITUDE | SIS # |
| Y02 | 60 deg. 02' 43" | 127 deg. 49' 01" | |
| DEVELOPMENT AREA | BLOCK NUMBER | | AIR PHOTO NUMBERS |
| East Hyland | C11 | | IAS(03) 54509 #274 |

**2. ECOLOGY AND SITE CONDITION**

| ECO-REGION | VEGETATION TYPE | SOIL TYPE |
|---|---|---|
| LIARD BASIN | V17, V22 | S3 (minor SS5/S8) |

| ELEV | SLOPE % | ASPECT | TERRAIN | SLOPE POSITION | MOIST REGIME | SOIL DRAINAGE | LFH(OM) DEPTH | SOIL TEXTURE |
|---|---|---|---|---|---|---|---|---|
| 795-935m | 5-45% | W | EVEN-RIDGED | LOWER-MID | 4-5//C | MODWELL TO IMPER | 5-25cm | L |

**3. BLOCK AREA SUMMARY IN HECTARE**

| TOTAL AREA | NP NAT | IMMATURE PATCHES | MERCHANT. AREA | RESERVES | PERM. ROADS, LANDINGS | NET AREA TO |
|---|---|---|---|---|---|---|
| 24.5 | 0 | 0 | 14.1 | 10 | 0.4 | 14.1 |

**4. HARVEST STAND DESCRIPTION**

| STAND NUMBER | MERCH. AREA | SPECIES | CROWN CLOSURE | AGE | HEIGHT | AVG. DBH | EST. VOL/HA |
|---|---|---|---|---|---|---|---|
| V17 | 8.30 | SW8F1P1 | 40.00% | 128 | 20 | 31.00 | 462.00 |
| V22 | 5.80 | P6SW4 | 40.00% | 121 | 19 | 21.40 | 368.00 |

# FOREST MANAGEMENT BRANCH

## SITE AND HARVEST PLAN

**5. RIPARIAN MANAGEMENT**

| RIPARIAN ID # | CLASS (STREAM, WETLAND, LAKE) | RESERVE ZONE WIDTH (M) | RATIONALE FOR RESERVE | MNGMT. ZONE WIDTH (M) | STRATEGIES FOR MANAGEMENT ZONE |
|---|---|---|---|---|---|
| D | Class 4 stream | 30.00 | as per the Yukon Forest Management Branch THP&O Guidebook | 70.00 | The harvest area boundary has been located to exclude the ENTIRE Riparian Management Zone (RMZ). |

Yukon
Energy, Mines and Resources

# FOREST MANAGEMENT BRANCH

## SITE AND HARVEST PLAN

**6. STAND MANAGEMENT OBJECTIVES**

| **HIGHER LEVEL AND OTHER PLANS** |
|---|
| Identify any higher level plans, Resource Reports or other plans with which this prescription must be consistant. |
| This plan is consistent with the INTERIM WOOD SUPPLY PLAN for FOREST MANAGEMENT UNITS Y02, Y03 and Y09 in the KASKA YUKON TRADITIONAL TERRITORY (September 30th, 2003). |
| **STAND-LEVEL OBJECTIVES** |
| Discuss non-timber values that may be affected by the proposed treatment and measures proposed to accommodate these. |
| TRADITIONAL OR FIRST NATION |
| Based on reviews of the Interim Wood Supply Plan and extensive on block observations by First Nations crew members, no known cultural sites or issues exist within the harvest area of this block. |
| Wildlife_Values: |
| External reserves contiguous with a landscape level Forest Ecosystem Network (FEN) will provide interior forest habitat for late seral species (Marten, Boreal Owls, etc.), while internal reserves and/or dispersed on-block retention provdes stand structural diversity, visual screening, and "edge effect" throughout the harvest area for early seral species (Moose, Bear, etc.). In addition, both dispersed and aggregated retention will provide for biodiversity through "lifeboating", "enrichment" and "connectivity" at the stand level until this block returns to mature forest. Dispersed and aggregated retention also provides transitional elements between late and early seral stand structures that has been shown to increase utility of an area to both early and late seral species. |
| Fish_Water_Values: |
| In addition to any specific actions outlined in section 4.0 (RIPARIAN MANAGEMENT) of this SP, the following general conditions will be applied during harvest: 1) Culverts have been proposed for all non-classifiable drains (NCDs), draws, and streams for road crossings as shown on the SP Map. 2) Narrow draws or NCDs will not be used as skid routes, and skidding will be away from such features, as much as possible. 3) The preferred harves season will be winter to minimize the overall impact of harvesting on the hydrology of the area. |
| Recr_Visual_Values: |
| Variable Retention harvesting using dispersed and aggregated retetion will minimize the visual impact of this block as shown in the post harvest Visual Impact Simulations of the Cosh Creek area. |
| Other_Values: |
| As the Trapper appears to have been using the Cosh Mainline as a trapping route, this and other harvest blocks should be reviewed with the Trapper so that he can adjust his "sets" accordingly before harvesting commences. |

# FOREST MANAGEMENT BRANCH

## SITE AND HARVEST PLAN

**7. SILVICULTURE SYSTEM DESCRIPTION**

| STAND NUMBER | SILVICULTURE SYSTEM | SEASON | RATIONALE |
|---|---|---|---|
| All Stands | Variable Retention harvest with even-age stand management. Total aggregated retention in external reserves is 40.8% of the gross block area. Dispersed retention throughout the harvest area is approximately 1-3% of the current basal area/ha. | Winter | Rationale described in Section 5.2 of the INTERIM WOOD SUPPLY PLAN for FOREST MANAGEMENT UNITS Y02, Y03 and Y09 in the KASKA YUKON TRADITIONAL TERRITORY (September 30th, 2003). |

# FOREST MANAGEMENT BRANCH

## SITE AND HARVEST PLAN

### 8. SOIL CONSERVATION

ON BLOCK PERMANENT DISTURBANCE CALCULATION TAB

| DISTURBANCE TYPE (ROAD/LANDING) | IDENTIFICATION (NAME/NUMBER) | ROAD STANDARD | LENGTH (M) | WIDTH (M) | TOTAL AREA L x W / 10,000 (HA) |
|---|---|---|---|---|---|
| ROAD | COSH MAINLINE | CLASS3 | 402.00 | 10.00 | 0.40 |
| | | | 0.00 | 0.00 | 0.00 |
| | | | 0.00 | 0.00 | 0.00 |
| | | | 0.00 | 0.00 | 0.00 |

| ROAD AREA | LANDING AREA | TOTAL AREA | BLOCK GROSS AREA | BLOCK NET AREA | % DISTURB. OF GROSS AREA |
|---|---|---|---|---|---|
| 0.40 | 0.00 | 0.00 | 24.50 | 14.10 | 1.60% |

| | HAZARD RATINGS | | | PERMAFROST OR FROST HEAVING | PROPOSED HARVEST SEASON |
|---|---|---|---|---|---|
| DEPTH OF OM | COMPACTION | SURFACE EROSION | DISPLACEMENT | | |
| 25cm | HIGH | HIGH | HIGH | LOW | WINTER |

PROPORTION OF TEMPORARY ACCESS WITHIN NET AERA TO BE REFORESTED: (explain rehabilitation measures)

Temporary access is 2.8% of the NAR. Rehabilitation will include, as required: 1) Removal of culverts, cleaning of ditches, and restoration of natural drainage. 2) Ripping of excessively compacted areas. 3) Re-spreading of over-burden (LFH) & Replanting

FIRE HAZARD ABATEMENT: (explain measures for slash abatement)

CWD: Leave 2-5 small piles (approx. 3mX3mX3m) randomly in the block for small furbearer habitat. In addition, leave slash scattered throughout the block as widely dispersed as possible to simulate wildfire debris while maintaining reasonable plantibility . Minimize slash piles at the landings by processing at the stump or re-distributing some slash from the landings back over the block. Burn any remaining landing accumulations, as required, to abate the potential fire hazard.

FOREST HEALTH: (explain measures to reduce current and future risk of forest to disease and insects)

No significant forest health issues were noted in this block. Diverse stand structure and ecologically suitable species mixes will, in general, reduce the potential for post-harvest stand health concerns. Windfirmness of the residual stand edges has been considered in the location of all block boundaries.

ADDITIONAL COMMENTS

Dispersed Retention Leave-Tree Specs: To meet the variable retention objectives on the harvest area, the following mature trees must be left: 1) Leave all aspen and birch regardless of condition. 2) Leave large diameter standing snags unless they are a worker safety hazard, in which case a 3m stub can be left. 3) Leave 10-20 conifers per hectare uniformly across the entire opening using the following parameters: a) All trees will be dominant or co-dominant. b) Species preference will be Subalpine Fir>White Spruce>Lodgepole Pine. c) All trees will be single or in small aggregates of 2-3 trees. d) All trees will be above average diameter for the stand, and preferably some of the largest diameter trees will be included (low height to diameter ratio for windfirmness). e) Spacing will vary to allow operational flexibility but will be roughly 20 to 30m between trees or aggregates. f) Most of the trees will be of good form and vigor (straight with healthy crowns). In addition, the following no merchantable trees will be left in all V17, V21, & V22 types: 1) Leave any scattered White Spruce or fir (<7m tall, >40% live crown, and 13.5cm DBH) of good form and vigor where it is operationally feasible to do so (preferably in association with the mature trees or aggregates for maximum structural effect).

### 9. REFORESTATION DESCRIPTION

Yukon
Energy, Mines and Resources

# FOREST MANAGEMENT BRANCH

## SITE AND HARVEST PLAN

| SIS # | STAND # | NET AREA TO REFOREST | RESTOCKING | | TARGET STOCKING (SPH) | ASSESSMENT DATES | | |
|---|---|---|---|---|---|---|---|---|
| | | | PREF. SPECIES | ACC. SPECIES | | DELAY TO TREAT | REGEN SURVEYS | |
| | | | | | | | EARLY STOCKING | LATE PERFORMANC |
| | V17 | 8.30 | SW, P | F | 1200 | H +2 | H +5 | H +10 |
| | V22 | 5.80 | P | SW, F | 1200 | H +2 | H +5 | H +10 |
| | | | | | | | | |
| | | | | | | | | |

REFORESTATION PLAN:

Site preparation V17 & V22 Types: If slash levels are excessive, pending a post harvest inspection, chain drag, or excavator rake/pile to create plantable spots. Otherwise, minimize disturbance to reduce potential aspen suckering. Raw plant mixed pine and spruce (2+0 410 size or equivalent) within two years of harvest is the preferred option.

ESTABLISHMENT TO ASSESSMENT DATE CONCERNS:

V17 & V22 Types: Prompt reforestation with large stock, provides the best chance of circumventing potential aspen and brush competition problems. Monitor plantation annually and provide remedial action if brush or aspen prevents achievement of free growing status.

ADDITIONAL COMMENTS:

Evaluate dispersed slash levels on all types ASAP after harvest to confirm site prep requirements, if any. Short root stock is preferred on this block due to the patches of coarse shallow soils in this block. Plant spruce on raised sites in the subhygric areas.

FMB
Approval by: _____ Date: _____

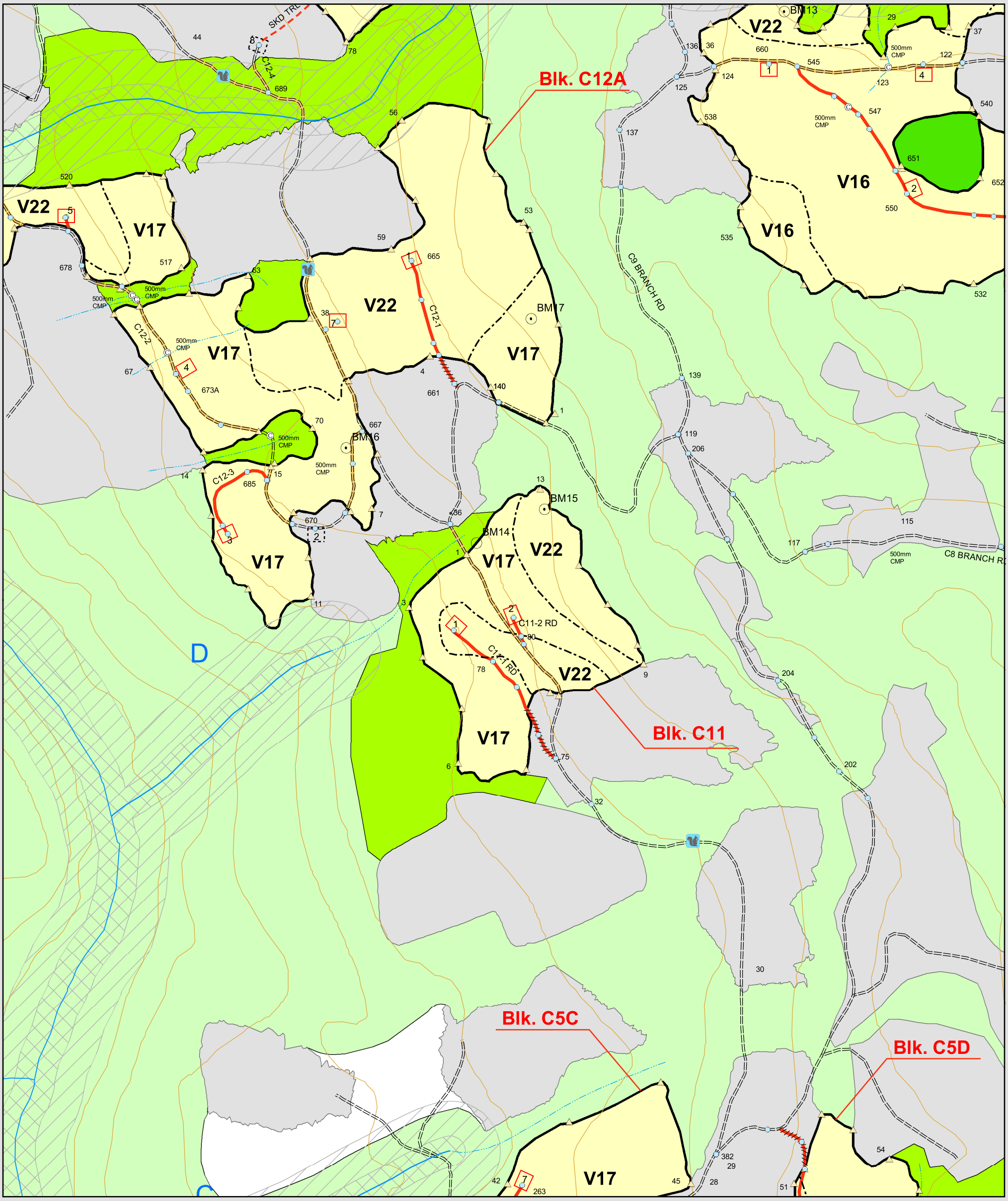
Position: _____ Signature: _____

**10. ATTACHMENTS**

SITE PLAN MAP @ 1:_____

HARVEST PLAN MAP @ 1:_____

# SITE PLAN MAP
## Cosh Creek - Block C11




| FIELD MARKING STANDARDS | |
|---|---|
| APPPLICATION | PATTERN & COLOUR |
| Harvest Boundary | Orange ribbon with "BLOCK BOUNDARY" |
| | Orange paint |
| | Blue poly ribbon (traverse stations) |
| Roads | Red poly ribbon (recce line) |
| | Pink ribbon with "ROAD" |
| | Yellow poly ribbon (traverse stations) |
| Landings | Pink ribbon with "LANDING" |
| | Yellow poly ribbon (traverse stations) |
| Culverts | Red ribbon with "CULVERT" |
| Skid Trails and Crossings | Blue candy-stripe ribbon with "SKID TRAIL" |
| Machine Free Zone | Orange and black candy-stripe ribbon |
| Riparian Management Zone | Orange with "RIPARIAN MANAGEMENT ZONE" |
| Reserve Zones | Orange ribbon with "RESERVE" |
| Cruising | Blue and yellow poly ribbon for plots and new strips |
| | Blue Paint |
| Reconnaissance Lines | Green poly |

**HARVEST STAND DESCRIPTION**

| STAND NUMBER/V-TYPE | MERCH AREA (ha) | SPECIES COMP | CROWN CLOSURE | AGE | HEIGHT | AVERAGE DBH (cm) | EST. VOL/HA (m3/ha) |
|---|---|---|---|---|---|---|---|
| V17 | 8.3 | SW8F1P1 | 40% | 128 | 20 | 31 | 462 |
| V22 | 5.8 | P6SW4 | 40% | 121 | 19 | 21.4 | 368 |

| LOCATION | | ECOLOGY AND SITE CONDITION | | BLOCK AREA SUMMARY | |
|---|---|---|---|---|---|
| DISTRICT | Watson Lake | VEGETATION TYPE | V17, V22 | TOTAL AREA (ha) | 24.5 |
| GEOGRAPHIC LOCATION NAME | Cosh Creek | SOIL TEXTURE | L | NP NAT ((ha) | 0 |
| MAPSHEET | 095-D-04 | SOIL TYPE | S3 (minor S8/SS5) | IMMATURE PATCHES (ha) | 0 |
| FMU | Y02 | ELEVATION | 795-935m | MERCH AREA (ha) | 14.1 |
| Latitude | 60°02' 43" | SLOPE % | 5-45% | RESERVES (ha) | 10 |
| Longitude | 127°49' 01" | ASPECT | W | PERM ROADS (ha) | 0.4 |
| DEVELOPMENT AREA | East Hyland | TERRAIN | Even-Ridged | NET AREA TO REFOREST (ha) | 14.1 |
| BLOCK NUMBER | C11 | SLOPE POSITION | Lower-Mid | | |
| AIR PHOTO NUMBERS: IAS(03) | 54509 #274 | MOIST REGIME | 4-5//C | | |
| ECO-REGION | Liard Basin | SOIL DRAINAGE | Moderately Well-Imperfect | | |
| | | LFH(OM) | 5-25cm | | |

**Legend**

- POC/POT Markers
- Marten Box Locations
- Cruise Plots
- SP Plots
- Boundary
- Culvert
- Road
- Skid Direction Arrows
- Timber Type Lines
- Cutblock
- External Reserve
- Internal Reserve
- Existing Openings
- FEN
- IRMZD
- Game Trail
- Permanent In-Block Built Road
- Permanent Out-of-Block Built Road
- Skid Trail
- Temporary In-Block Proposed Road
- Temporary Out-of-Block Built Road
- Temporary Out-of-Block Proposed Road
- Contours
- Alaska Highway
- NCD Streams
- S3/S4 Streams
- Existing Landing
- Proposed Landing
- LAKE
- RIVER
- Wetlands
- RMZ
- RRZ

N

0 50 100 200 300 400 Meters

1:7,500