

***Bruin Creek III
Timber Harvest Plan
within
Tr'ondëk Hwëch'in Traditional Territory***

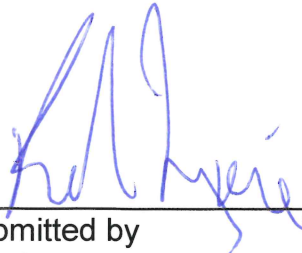
**FOREST MANAGEMENT BRANCH
ENERGY MINES AND RESOURCES
YUKON GOVERNMENT**

Prepared: May 2017



Approved by
Director Forest Management Branch

May 26, 2017
Date



Submitted by
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Date

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Executive Summary

The Bruin Creek III Timber Harvesting Plan (THP) is an extension of the existing Bruin Creek II THP and has been identified as a continued timber source for commercial woodcutters in Dawson City and area.

The area surrounding Dawson City has had timber harvesting in support of local industrial operations since the early 1900's. Roads in the area, developed for a variety of uses, have been used for access to timber for personal fuelwood and building products during this time period. This has created a situation where the roaded land-base has a minimal supply of timber available for commercial development.

The Bruin Creek area has had commercial permits ranging from 50 m³ to 500 m³ along with personal fuel wood permits issued in the past 6 years. The Bruin Creek III THP will support harvesting to meet local needs and current demands for a minimum 5 years. This timeframe will be dependent on the rate of decomposition of the spruce which is partially infected with heart rot.

This THP identifies one operating unit (OU) that is 95 ha, with an estimated gross timber volume of 5022 cubic meters (m³). After allowances for riparian management, wildlife management, and operational constraints the potential net dead wood harvest for the OU is 4195m³. It is anticipated that future OU's within the THP area contain an estimated gross timber volume of 2000 m³ of timber and 1600m³ of potential net dead wood available for harvest.

The THP sets operational goals and objectives for the issuance of harvesting rights within the planning area.

The *Forest Resources Act* (FRA) requires that commercial timber harvesting licences may only be issued where a THP is in place. The objective of this THP is to provide opportunities for small scale commercial harvesting which assist in satisfying local demand and provides mitigation to protect identified values (see section 2).

All applicants for timber harvesting will be required to meet the submission requirements of the *Forest Resource Act* (FRA), Section 19(1). The applications for harvesting licences require notification to the affected First Nation and public in the area of the application. The First Nation and public may make representations to the Forest Management branch Director on the application for a period of no less than 30 days (FRA, Section 18).

In addition, a Yukon Environmental and Socio-economic Assessment may be required prior to issuance of permits where a project falls within the requirements of the assessable activities regulations.

1.0 Introduction

1.1 Background

The Bruin Creek area has been a traditional harvest area since the 1900's. This THP is designed to help meet the social and economic forest product demands of Dawson City region while ensuring that environmental and other values are conserved. The majority of the THP area was burned in a 1991 fire. The Bruin Creek area was chosen as the location for this THP due to its fuel wood suitability and history as a fuel wood area.

The Bruin Creek THP was developed in 2011 to gauge interest and feasibility. This small THP was permitted and harvested in 2011 and 2012. Due to the demand for fuelwood in the Bruin Creek area, the Bruin Creek II THP was developed to meet these needs. An additional operating unit was identified that is outside of the Bruin Creek II THP boundary, and therefore the Bruin Creek III THP is being developed. This plan follows recommendations of the Dawson Forest Resource Management Plan.

Opportunities to develop harvest areas close to Dawson City and surrounding residential areas are limited due to historical use, natural disturbance patterns and other land use objectives. This THP will provide a wood supply that is close to Dawson City and surrounding residential areas.

1.2 Eco-region and Drainages

This THP lies in the Boreal Cordillera Eco-zone within the northern extent of the Klondike Plateau Eco-region. It is bounded by Bruin Creek to the west and Mickey Creek to the east, both of which flow in a northerly direction to the Forty Mile River and then into the Yukon River.

Characteristic terrain features include smooth, un-glaciated, rolling plateau topography with moderate to deeply incised valleys and large structural basins composed of level to undulating glaciated terrain.

The THP area is within the 1991 Bruin Creek fire, and consists mostly of fire-killed dry standing and downed white and black spruce stems. Although there are patches of timber that were unaffected by this fire (mostly on north aspects), only the fire killed stems are being targeted for harvest. Slopes in this THP area range from 0 to 40% on ridges and midslopes and 30 to 50% near valley bottoms. As harvest units are developed, only slopes less than 35% will be targeted, therefore most streams and valley bottom features will be outside of the harvest area. Leading species within the region consist of black spruce, white spruce, trembling aspen and white birch. Understory species are generally comprised of suckering species such as willow and aspen regeneration.

The most common natural disturbance is fire, with a return interval of approximately 170 years; therefore early seral communities are most common. Elevations range from 600 to 1100 meters. Most of the harvesting will occur in the mid to higher elevations of this range.

Loamy moraine and sandy fluvioglacial material is dominant in the ecoregion. Much of the ecoregion is covered by a veneer of volcanic ash 2-15 cm thick. Permafrost is discontinuous to sporadic with high ice content associated with fine-textured valley deposits. Characteristic wildlife includes caribou, grizzly and black bear, moose, beaver, fox, wolf, hare, raven, rock and willow ptarmigan, and golden eagle. Land uses reflect recreational, tourism, hunting, and trapping values as well as some forestry activities and mining.

1.3 Socio-Economic Considerations

Dawson City is home to approximately 1,300 people. The major economic drivers in the region are tourism and gold mining. The current annual timber demand in Dawson City is approximately 3500m³ for saw log and 1500m³ for fuel wood. The industry consists primarily of one sawmill and numerous commercial fuel wood operators.

The forests in the Dawson City region provide significant ecological and aesthetic values, cultural and heritage values, recreational values, and other non-timber values. Dawson City's forests can sustain a vibrant, small-scale forest industry that provides timber for local markets, energy, economic opportunity, and employment for the region's residents (Dawson Forest Resources Management Plan). Many of the residents of Dawson City rely on fuel wood harvesting as an economical heating alternative throughout the winter.

2.0 Planning Area Identification

The planning area lies north of the Top of the World Highway, between Bruin and Mickey Creek (refer to Appendix A – Overview Map). This area is part of the 1991 Bruin Creek burn and therefore the operating units and subsequent blocks will be targeting dead timber. One operating unit has been identified based on terrain, road accessibility and timber potential. A description is listed below;

Operating Unit 1 –

Operating Unit 1 is 95 hectares and is located in the southern portion of the planning area within the Bruin creek burn. This unit will be accessed from the Clinton Creek road. A Forest resources road will be constructed to access this operating unit. Wood quality and quantity varies within this unit. A timber cruise compilation of the area has yielded an average volume of 61.7m³/ha. Although some of the stems show signs of heart rot at the base, the majority of stems are sound. There is a geological feature that forms a cave located near the edge of this operating unit. This will have a 100m buffer from the harvest area.

Subsequent Operating Units

This area is composed of a mid to high elevation site that has been burned in 1990, and has discontinuous timber on it. Areas that would be suitable for operating units in the future will be area's that meet product profile of the permittee and are on slopes less than 45%, outside of any riparian management zones, and other reserves. This historically has been dry standing spruce greater than 15cm in diameter.

It is estimated that there will be less than 2000m³ of suitable timber within future operating units that might be identified. The maximum anticipated road development associated with future operating unit development will not exceed 10km. Future road development would trigger additional YESAB assessments.

2.1 Landscape Issues

2.1.1 Wildlife

The THP area overlaps the Forty Mile caribou herd winter (October to April) range. Much of the lichen (*Cladina spp.*) on site was burned in the 1991 fire which burned very hot. It is recognized that the caribou herd could use this area for migration during the winter months however this area has been identified by the Department of Environment as low suitability winter habitat. It is expected that as time passes this lichen will regenerate and restore itself as a valuable source of caribou forage.

Consultation with the Department of Environment highlighted wildlife habitat for:

1. *Cow and calf moose habitat –High suitability late-winter habitat (relative to regions north and south of the harvest block). Whenever possible, the removal of downfall should be minimized.*
2. *Adult moose habitat –Large amount of moderate-high suitability late-winter habitat.*
3. *Forty Mile caribou –THP is within the winter range - low suitability late-winter habitat.*
4. *Potential for short tailed grouse. The habitat is right, however limited data exists.*

Mitigations:

To mitigate these concerns of high ungulate winter range habitat, harvest will be limited to summer and fall months. The closure of the Top of the World highway precludes winter harvest. If this highway is plowed in the future, winter harvest opportunities that do not impact the above values should be assessed, however under the current conditions; there will be no winter harvest.

Removal of downfall will be limited to only those stems that have greater than 50 percent soundwood. During operations and site plan layout, should indicators such as wildlife features warrant, mitigation for wildlife concerns shall meet the FMB Planning Standards for Wildlife Features, approved under the new legislation, which may be found at: http://www.emr.gov.yk.ca/forestry/pdf/planning_standards_wildlife_features.pdf

If the Forty Mile Caribou Herd are spotted within 1km of operations, stop all activities and notify Environment. Direction from the Regional Biologist will determine when operations can resume.

To help monitor wildlife health, the Tr'ondëk Hwëch'in Fish and Wildlife Department requests that the timber harvester report any unique animal sightings while working in the area.

The expected small scale of operations and previous disturbance leads to an expectation that the various species of wildlife will not be significantly impacted by proposed harvesting activity. Cavity nests were identified as a potential concern and where identified within harvest areas, operators will be required to meet the FMB wildlife standards and shall reserve snags and trees with indications of cavity nesting, when operationally safe to do so.

2.1.2 Biodiversity

To maintain landscape level biodiversity over time, both harvest rate and cut/leave pattern must be considered. Forest harvesting should attempt to emulate the Natural Disturbance Zone (NDZ) regime, as described Dawson Forest Resource Management Plan (FRMP). This area experiences frequent stand replacing events from fire, the return interval of these events averages

170 years, and greater than 100 hectares in size. Operational concerns and demand will limit the size of harvest openings. Planned retention and reserve areas within patch cutting will best emulate this fire disturbance pattern and conserve biodiversity across the landscape.

The Department of Environment has identified two rare plants that might occur in the area; Twin-flowered Violet (*Viola biflora*) and Yukon Woodroot (*Posistera yukonensis*). Woodroot may occur on or below rock outcrops in the area. It would not be directly affected by wood-cutting unless activities such as road building occur. Field crews and operators will be made aware of these rare plants and instructed to stop operations and consult with Forest Management branch if encountered.

2.1.3 Riparian and Water Resources

The THP is bound by Bruin Creek to the west and Mickey Creek to the east and Maiden Creek to the north-east. The operating units are above most riparian features, and outside of most of the riparian management zones as defined in the Forest Management branch Standards and Guidelines found at: (http://www.emr.gov.yk.ca/forestry/pdf/planning_standards_riparian_management.pdf)

Although there may be some non-classified drainages, there is very little overlap with riparian features. All riparian features that are found will have protective reserves established as defined in the above standards.

2.1.4 Recreation and Visual Impact

The Top of the World Highway, the Clinton Creek Road and the town site of Forty Mile are known tourist travel corridor in the summer months.

This THP is located within a previously burned area and although parts of the THP area may be visible from these roads, the visual impact will be minimal. Irregular boundaries, along with boundaries that follow the natural lines of force and existing disturbance will yield a harvest area that is natural in appearance. The road development is on gentle slopes (<30%), resulting in roads that will have little impact on visual quality. It is expected that both road and harvesting activities will be most visible in the first 3 years, after which time they will much less visible. The total visual impact of harvesting on this landscape will be less than five percent.

This THP is not visible from the town of Forty Mile. Therefore, there is minimal visual quality impact from harvesting operations on Forty Mile site.

2.1.5 Archaeological and Cultural Values

The Archaeology Branch of the Department of Tourism and Culture has worked with the TH heritage department to identify areas of Archaeological or heritage potential. Two areas of heritage potential were identified, however the proposed road will not impact either of these areas. Harvest activities will avoid these areas.

2.1.6 Other Users

Registered trapping concession 22 overlaps the THP area. The concession holder was contacted on September 12th, 2016 and had no concerns with timber harvesting in the area.

2.1.7 Other Values

The historic town site of Forty Mile is located to the south of this THP. There are currently active mining claims outside of the THP area. Although mining claims exist over the THP area, there are presently no active operations.

Forest Health

There are no major forest health concerns in this area. An outbreak of spruce needle rust (*Chrysomyxa ledicola*) in 2011 infected a larger percentage of spruce across the Top of the World Highway. This turned much of the needles red, however this disease is generally not damaging to the spruce it infects and is of no major concern. Spruce Broom rust (*Chrysomyxa arctostaphyli*) also commonly infects spruce trees in the area; however this does not result in major loss or damage to the trees. For a more complete list of common pests and diseases, refer to the 2015 Forest Health Report, under zone 3. The Bruin Creek III THP is in a recent burn with a healthy understory and presently shows no forest health concerns.

3.0 Harvesting Section

3.1 Operating Unit Areas and Volume Summaries

Table 1 provides a summary of areas and estimated timber volumes in the operating unit identified.

Table 1 – Area and Volume Summary for Spruce Leading Stands > 120 yrs.

Operating Unit	Area (ha) ¹		Volume (m ³) ²	
	Gross	Net (Harvest Area)	Gross	Net
BRC-1	95	85	5022	4195
All additional operating units	50	33	2000	1600

¹ Net area estimated from removal of riparian, low volume or isolated stands in OU.

² Gross volumes identified are based on an average estimate of 61.7m³/ha multiplied by the net area. Net volume is averaged at 20% reduction of the gross volume due to defect, rot and retention.

Operating Unit 1 –

Operating Unit 1 is located in the southern portion of the planning area. This unit will be accessed from the Clinton Creek Road. . This new road will be on gentle ground of slopes less than 35% and have adverse grades of up to

10%. An initial reconnaissance of the area has shown various natural erosional events to the north of the road location. These have occurred in steeper gullies flowing southwest. It is believed that these events were a result of the fire in the area which reduced evapotranspiration and slope anchoring roots. Harvest activities will not be taking place near these areas of natural instability, nor are they expected to have adverse effect on them. New roads built will have drainage structures installed to maintain a natural drainage pattern and will be decommissioned following the completion of harvesting.

Subsequent Operating Units:

These have not been identified spatially, and will be left to the licensee to apply for future areas within the THP that are deemed feasible. The THP area is characterized by dis-continuous timber types, and an abundance of burned timber that does not meet the product profile of the licensee. Areas that would be suitable for operating units in the future will be areas that meet product profile of the permittee and are on slopes less than 45%, outside of any riparian management zones, and other reserves. This historically has been dry standing spruce greater than 15cm in diameter. Separate YESAB submission may be required at that time if appropriate triggers are met.

3.2 Harvest Scheduling and Season

Harvesting with ground based methods should start in the summer of 2017, and is expected to occur in the summer months for 4 to 10 years following completion of this THP. Ground conditions indicate medium textured soils (> 50% silts) which will enable harvesting during dry soil summer conditions. The site plan that will be developed for each block will adhere to the approved FMB soil standards.

3.3 Silviculture Systems and Reforestation

Natural regeneration is preferred for both operating units. During site plan development, advanced regeneration will be assessed to guide harvest operations to protect advanced regeneration. After harvest is complete, the harvest areas will be assessed to determine regeneration options. The Soils Standards limit the amount of on block disturbance, and are designed to promote the establishment of early successional forest and vegetation. Monitoring activities will be guided by the Silviculture Strategy.

4.0 Access Management

The construction of approximately 3 km of Forest Resource road will be required to access the full extent of Operating Unit 1. Future road construction will be to a maximum of 10km to access future operating units. This will be built to the specifications outlined in the Forest Resource Act Standards and

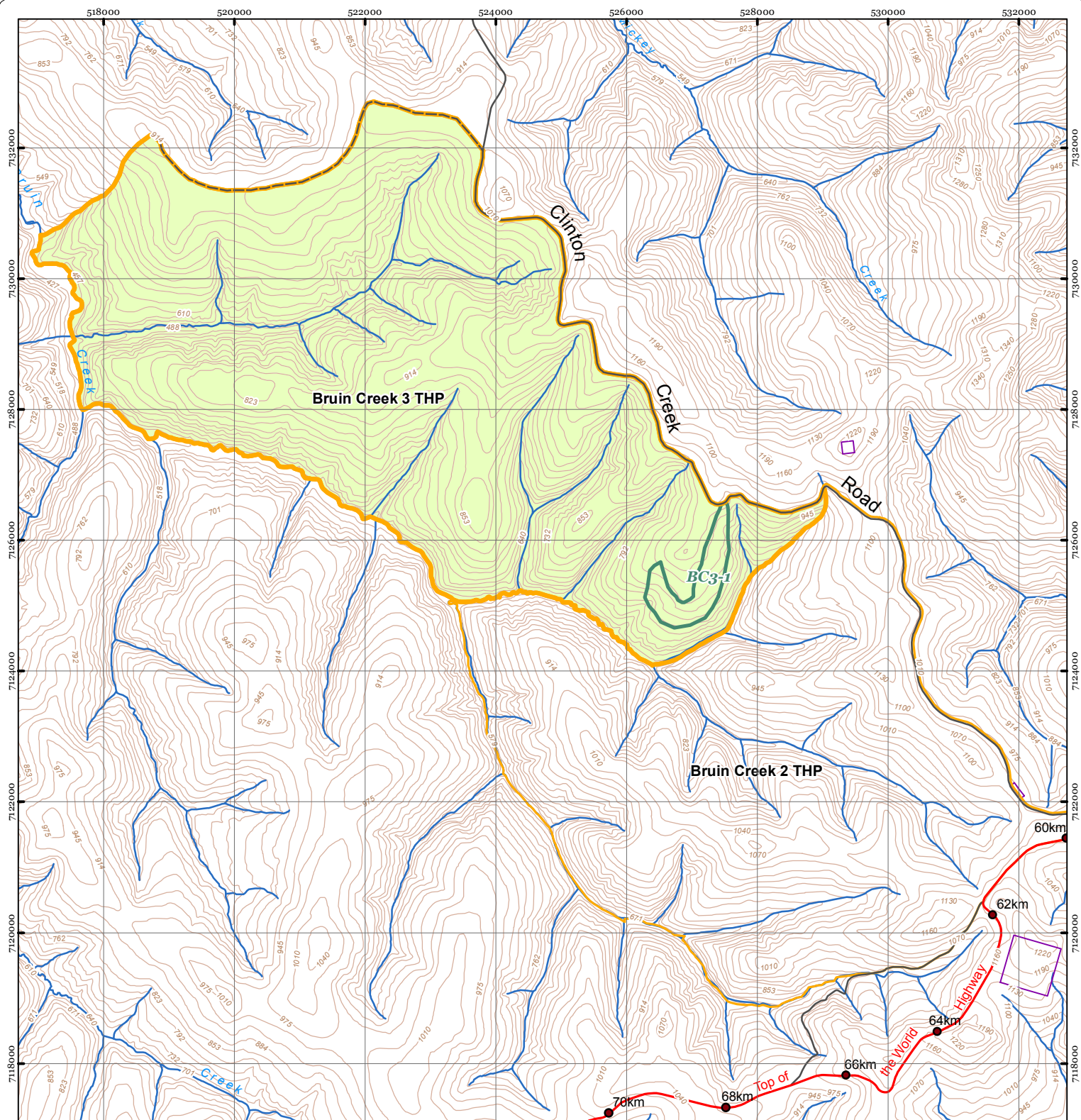
guidelines of Forest Resource Roads for construction, maintenance and decommissioning.

All proposed harvesting will require site plans approved by FMB, which contain standards for soil conservation and disturbance levels within the harvest block. Newly bladed trails, roads and landings used during frost free conditions (summer/fall) may require scarification to reduce compaction and aid in the re-establishment of vegetation within the harvest area following harvesting.

All new road construction will be gated, and decommissioned following completion of THP activities to address erosional concerns and access following completion, unless otherwise stated. Access along newly developed roads may be restricted to timber resource licence holders to reduce negative environmental impacts, for reasons of safety or other considerations.

See the THP map and harvesting section above for the description of access into each operating unit.

Appendix A: Overview Map



2016 Bruin Creek 3 Timber Harvest Plan

October 03, 2016

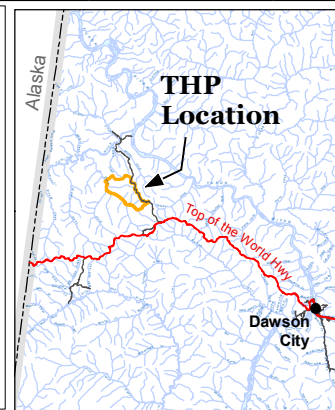
Yukon
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Forest Management Branch

- Bruin Creek 3 Boundary
- Bruin Creek 2 THP
- Operating Units
- Land Dispositions
- Existing Trail



0 1,000 2,000
Metres

1:82,000
North American Datum 1983
UTM Zone 7N



Appendix B: Representations

Bruin Creek III Timber Harvest Plan

Prepared: Sept 12, 2016

Prepared by: Dawson Area Forester

The following representations were made by TH on March 8, 2017.

Representation	mitigation
Consider appropriate measures to decommission forestry access roads to Bruin Creek I and II THPs. This may include gating roads, removing culverts, creating berms or ditches, and installation of wildlife cameras.	Bruin Creek 1 will be looked at and decommissioned if required in the summer of 2017. Bruin Creek II currently is controlled by gate, this will be bermed if required to restrict access.
Ensure Bruin Creek III forest resources road is built on gentle slopes to minimize erosion, runoff and sedimentation problems. Road building should avoid lichen areas or high value caribou habitat.	The Bruin creek III road is currently ribboned on the gentlest slopes found in that location. This is on an existing bench that reaches flat ground on that slope. Our Road Standards and Soil Standards have erosion and sediment control measure in them. This road will be built to those standards, and monitored by CMI staff to ensure effectiveness. There are low levels of lichen in this location.
All road building activities should cease if the FMCH migrate into an active work area, and remain suspended until the herd leave the area.	It is anticipated that the road will be built before the forty mile caribou show up in late summer, however road building will stop if the forty mile caribou herd shows up and course of action will be determined with Regional Biologist.
Within site plans, decommissioning goals for roads and operating units should involve leaving disturbed areas in a condition conducive to re-vegetation by native plant species to encourage vegetation communities comparable to similar, naturally-occurring ecosystems in the area.	The THP provides direction for road decommissioning in the access section. The Silviculture section references the revegetation goals. The Site plan for each block will give direction and targets for meeting the silviculture targets
Undertake post-harvesting silviculture activities, where necessary, to encourage rapid but locally suitable revegetation and reforestation.	The reforestation targets are listed in the site plan for each permit. The THP gives direction on reforestation and soil disturbance which is guided by the Silviculture program and includes a monitoring component to ensure targets are met.
Ensure Bruin Creek III forest resources road is eventually decommissioned by trenching or ditching the gravel apron connecting it to the Clinton Creek Road.	Once activities are complete, this road will be decommissioned by trenching or ditching to prevent access.
Furthermore, FMB should ensure that any timber harvesting licences issued under the THP: Require permittee to cease all activities if FMCH	This is addressed in section 2.1.1 of the THP, and will be a requirement of each cutting permit. The Licencee, FMB and Environment will work together to minimize disturbance of the herd.

migrate into, or are known to be close by, an active work area. All activities should remain suspended until the herd has left the area. TH recommends a 1 kilometer buffer around activities and caribou. Proponent should be especially vigilant for caribou during fall. Sightings of caribou should be reported to TH Fish and Wildlife Branch at 867-993-7100 ext. 115 or ext. 127.	
FMB should inform the Regional Biologist about all active permits that are issued so that information can be communicated with the permit holders regarding caribou activities in the area, or herds approaching the general vicinity.	As a government department, all permit information will be available to the Regional Biologist. Regular communication between CMI and Environment staff members will ensure permittee information is shared.
Require permittee to follow standard fuel management practices to prevent spills and leaks of petroleum hydrocarbon products, which may be particularly detrimental to lichens (preferred caribou habitat).	Fuel management is guided by the Environment Act. These terms and conditions are listed in all cutting permits and monitored by CMI Staff.
Require equipment and trucks to be clean of any soil or vegetative material, to prevent the introduction of invasive plant species.	This will be added into the road construction contract
Limit harvesting on steep slopes to minimize potential erosion and rutting; and require riparian buffers to prevent sedimentation of water.	Slopes will be limited to less than 40%, and adhere to the soil standards
Prevent road use during wet weather to reduce rutting, compaction or damage to surface.	The terms and conditions in the cutting permit restrict operation to dry conditions. CMI staff have the ability to close the road at any time to prevent rutting and sedimentation.
Prevent harvesting within a 100m buffer around heritage features (e.g. the cave located during 2016 field visit)	This and any other heritage features will be buffered by 100m.
Road and/or trail upgrading or building activities should be planned to avoid and minimize impact to berry producing plants, (e.g. blueberry and cranberry) along the periphery of the access road.	Berry plants will be avoided and minimized where possible during the construction.
Safety of the public using existing access roads for recreation and berry picking purposes needs to be considered both during wood hauling and road construction activities.	This road will be built to our Road Standards, which incorporate safety features such as grade, curve radius, and pullouts. The road construction contractor will require a safety plan during construction of this road to address safety hazards that might exist. An operating within the right-of-way permit from highways will also be required and will address safety issues such as site distance.