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**Marsh Lake Dump Timber Harvest Plan
within
Carcross Tagish and Kwanlin Dun First Nations
Traditional Territories**

(DRAFT Version – Not an approved Plan)

DRAFT

**Forest Management Branch
Energy Mines and Resources
Prepared: September, 2010**

Executive Summary

The Marsh Lake Timber Harvest Plan (THP) has been designed to meet the requirements of the Forest Resources Act (FRA) and the regulation. Timber resource licenses issued under the FRA will be issued consistent with this THP.

All applications for Timber Resource Licenses under the FRA will be considered on a case by case basis with proponents required to submit a project description and site plan as part of the cutting permit application. Each license application will be required to be submitted for a 30 day review by First Nations, stakeholders and the general public.

The principle of sustainable use and the integrated forest resources management will be implemented in the THP as per the regulation. This means timber will be sustainably harvested while protecting all values, including soil, water quality, wildlife, biodiversity, and fish habitat. Non-ecological values including heritage/historic resources, recreation, and aesthetic values will also be protected and managed for integrated use.

The Marsh Lake THP also considers the forest resources harvesting and management customs of the Carcross Tagish and Kwanlin Dun First Nations, as well as their knowledge and experience in forest resources management and use of forest resources.

The Marsh Lake THP is proposed to create harvesting opportunities to facilitate forestry-based economic opportunities in the Marsh Lake area which is within the Carcross Tagish and Kwanlin Dun First Nation's Traditional Territory. The THP identifies two operating areas where harvesting has occurred historically. The total THP area encompasses 365 hectares and identifies the harvesting of approximately 2000 m³ of fuelwood and sawlogs.

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- Appendix B: 1:20,000 Detailed Map - Marsh Lake THP
- Appendix C: Heritage Resources Overview Assessment Report

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1.0 Introduction

The Marsh Lake THP area has been a traditional harvest area for the Marsh Lake and Whitehorse residents and nearby communities for several decades. The creation of the Marsh Lake THP is very important in maintaining an economic supply of timber for harvesting purposes. The sawlog and fuelwood stands in this THP are identified to help meet the social and economic forest product demands of local operators, while ensuring that environmental and other values are protected.

The *Forest Resources Act (the Act)* received assent in the fall of 2008. Throughout 2009 and 2010, the Forest Management Branch (FMB) of the Department of Energy, Mines and Resources has been working to develop the regulation required to bring the new statute into effect. The Act and regulation is anticipated to come into force during early 2011.

Upon approval, the Marsh Lake THP will be used to develop forest resources in accordance with the new Forest Resources Act and related regulation. This development will occur under the guidance of the Forest Management Branch through the issuance of authorizations allowing the cutting of timber.

A cutting permit will be required as a part of each timber license. As part of a cutting permit submission, a site plan will also be required. The site plan is a specific management plan identifying the specific area and its attributes for harvesting. The site plan will also include the stand management activities, methods and standards for harvesting and the protection of forest resource values, non-timber values and a reforestation plan.

All timber licenses, cutting permits and site plans will be consistent with the most current standards and guidelines as adopted by the Forest Management Branch. These standards have been developed to ensure the protection and conservation of known values in THP areas.

1.1 Planning Area

The Marsh Lake THP falls within the Kwanlin Dun First Nation (KDFN) and Carcross Tagish First Nation (CTFN) Traditional Territories. The THP area is located at the top Northwest corner of Marsh Lake. The area begins at approximately two kilometers west of McClintock Creek and extends for approximately four kilometers southwest along the Alaska Highway (see Figure 1).

There are two operating areas within the THP. Area one (1) is the Marsh Lake Dump area which has an existing access road. Area two is located adjacent to an unnamed road located approximately 1.5 kilometers southwest of the Marsh Lake Dump forest access road.

The map following this page displays a 1:250,000 overview map (Figure 1) of the boundaries of the operating area of the Marsh Lake THP area and a 1:20,000 (Figure 2) detailed scale map showing detailed features.

1.2 Eco-region

The Marsh Lake THP is located within the Boreal Cordillera Eco-zone and located in the Yukon Southern Lakes Eco-region. Characteristic terrain features include broad valleys and large lakes. Set within the rain shadow of the Elias Mountains, the climate is dry and cool, with a sporadic discontinuous permafrost zone, where permafrost underlies less than one-quarter of the landscape. Soils tend to be alkaline and wetlands are typically dominated by marl formation. The ecoregion supports the highest mammalian diversity in the Yukon, with 50 to 60 known species.

There are two major stand types; mature white spruce and lodgepole pine with scattered aspen and mature white spruce and lodgepole pine without aspen. Pine is the dominant species as it quickly regenerates in burned areas. White spruce-fernhorn forests are common on active floodplains and in small parcels that have not burned in the last 100 years. These stand types are on a variety of sites, from lowland transitional sites, upland flat to complex upland made up of eskers and moraine features. Black spruce has a limited distribution in this ecoregion. In higher elevation, subalpine fir is common.

1.3 Socio-Economic Values

Forests in the Marsh Lake THP area provide many significant values namely, ecological, aesthetic, cultural, and recreational values. In addition, these forests also help sustain the current small scale forest industry that provides timber for local markets, economic opportunity, and employment for some Marsh Lake residents and residents of Whitehorse. Historically the demand for forest products in the THP area has ranged from 50 m³ to 200 m³ per year.

2.0 Planning Area Values Identification

The main environmental and social values within the THP are outlined below. During the initial stages in developing the THP, stakeholders were consulted for input on what values were important to them. Local knowledge and scientific data was solicited regarding these values, along with proposed protection and conservation of the values in question.

2.1 Wildlife

2.11 Woodland Caribou

The habitat caribou winter range is located north of the THP area. However, there are areas in the northern section of the THP that are good forage for caribou (Open Pine Lichen). All measures will be taken to ensure that this area is managed so that timber harvesting will have the least impact on the Southern Lakes caribou habitat. No operations will be undertaken while caribou are sighted in the harvest area and areas where there are high percentages of lichen have been removed from

harvesting. The proposed blocks were field assessed with the Department of Environment (DOE) staff on July 22, 2010.

2.2 Fish Habitat, Riparian and Aquatic Resources

There was only one ephemeral creek identified in the THP area near the proposed block at the end of the Marsh Lake Dump Road. This ephemeral creek will have a riparian management zone up to 100 metres as per the Riparian Management on Streams. There are no other known creeks, lakes or ponds in the two blocks that have been flagged and mapped. Any creeks found near harvesting areas will be buffered as per the Guidelines. There will be further assessments at the Timber License and Cutting Permit stage which will protect the integrity of any identified water resources.

2.3 Heritage and Archeological Sites

Christian Thomas, Development Assessment Archaeologist employed by the Heritage Resources Unit formulated a Heritage Resources Overview Assessment Report regarding the Marsh Lake Valley THP (see Appendix C).

As recommended in the report, there is an area (approximately 15 hectares) identified in the southwestern corner as having elevated heritage resource potential (see detailed map – Appendix B).

No harvesting will commence in this area until a surface feature inventory is completed.

2.4 Soils Conservation

No new roads will be built in the THP area and all skidding and hauling will be done during conditions when the soil is not susceptible to rutting.

There is currently no skidder or other machinery being used in the planning area. During the past two years the current operator in the planning area used a power winch on his pickup truck for moving harvested logs from the stump and will continue to do so during the next permit which was issued on August 9, 2010. However, the plan proposes to allow for machinery to be used in transporting forest products. Any machinery proposed to be used in the project description by the licensee will be assessed to ensure it meets the standards to conserve soil quality. Considerations may include overall machine weight and load distribution, ground pressure; tire and track slip, and bogie versus single axle.

These provisions will ensure that the integrity of soils is maintained across all areas of the THP. A soil analysis will be completed on all blocks as part of the Site Plan. Soil conservation standards that will be incorporated in the THP are as follows:

- Landings will be placed in locations where the risk of compaction, rutting and erosion is minimized;
- The season of operation and soil conditions will be considered during the completion of the Site Plan;
- Operators will be required to minimize equipment traffic on soils susceptible to rutting, compaction and erosion by incorporating specific measures that will be included in the terms and conditions.
- Skidding and forwarding will be scheduled when soil conditions reduce susceptibility to rutting, compaction and erosion (i.e. conservation of soil quality may require operations to be scheduled for summer/fall (dry soils) or winter (frozen soils)).

2.5 Traditional Land Users

2.5.1 Trapping

The Marsh Lake THP plan area falls within two Registered Trapping Concessions (RTC), namely 290 and 291.

Attempts were made to contact the trappers. There has not been any evidence of any trapping in the vicinity of the THP during the past couple of years. If trapping does commence in the harvesting area, harvesting activities will be mitigated so as to minimize conflict with trapping activities.

2.5.2 Hunting

The THP area is not a popular location for hunting big game as the hunting of caribou is restricted and few moose frequent the area during the hunting season. Some small game hunting, including grouse, does occur. In the past harvesting activities have not been known to conflict with hunting activities in the THP area, hence no conflicts with hunting are anticipated.

2.6 Recreation

The impact of harvesting on recreation values is not identified as a major concern. Access to the area may be restricted during particular times of the year to protect the existing access road during wet conditions.

2.7 Visual Impact

Visual resource management aims to reduce the impact of timber harvesting. Timber harvesting can impact the visual quality of landscapes by creating visual contrasts between cut areas and adjacent stands.

Because the silvicultural system will be small patch cuts with retention and selective cutting, accompanied by lowlying areas; timber harvesting will not have a significant visual impact from the Alaska Highway or Marsh Lake.

2.8 Biodiversity

Representative timber types will be maintained in the planning and surrounding areas. In all blocks the following measures will be implemented:

- Maintain coarse woody debris (dead and rotten blowdown will be left on site, as well as tree tops and branches from harvested trees).
- Maintain all regeneration where feasible,
- Consider windthrow in boundary and retention strategies.

3.0 Past Resource Based Activities

3.1 Historical Forest Harvesting – Area One

The following table shows the volumes harvested for permits issued in 1998 and 1999. The summary table includes the volume harvested from the one documented harvest, as well as a volume for the rest of the cut blocks in the THP based on 120m³/ha:

Total Volume	Species	m3
Saw logs	Sw	608
Fuel wood	PI	126
Extrapolated Volume		4648
All Products		5382

There has been an approximate total volume of 5382 m³ of timber cut in the Marsh Lake Dump THP from 1985 to 1999. From 2000 to 2009 there was approximately 100 m³ per year for a total of 1000 m³, for a grand total of 6,382 m³.

The 1:20,000 detailed map in Appendix B displays polygons outlining past harvesting. There is a legend showing two types of harvesting; the patch cut and patch cut with retention.

3.2 Marsh Lake Dump Post Harvest Survey Summaries (2005 Whitehorse Planning Assessment)

Characteristics of the existing cut blocks in this area are as follows:

- Generally mid slope meso-position
- Some lower slope and toe meso-position

- Fresh to moderately moist soil moisture regime
- Moderately well to well drained soils
- Moderate to poor site classes.

Of the 10 cut blocks in this THP, four are patch cuts, and the remaining six are patch cuts with retention. All harvesting was conducted in the mid 1990's. The size of the cut blocks ranges from 0.2 to 10 hectares.

The regeneration species composition is dominated by Lodgepole Pine (about 70% average), with White Spruce as a secondary species. The height of these seedlings has an average of around 40cm, ranging from 5cm to 3m (2005 Whitehorse Planning Assessment).

Eight of the past harvested blocks in the Marsh Lake Dump THP have been planted. Seven blocks were planted in 2001 and one block planted in 1998. Generally, all the harvested blocks are sufficiently regenerated with low vegetation competition.

3.3 Retention Within Harvested Blocks

Of the total volume of retention per block, 45% of the trees are greater than 19 cm at diameter breast height (dbh), the primary species of the retention is Lodgepole Pine and the average height of the retention is 15 metres.

The following pages for pictures show planted cut blocks and retention stands in the THP area, (2005 Whitehorse Planning Assessment).



Marsh Lake Dump Planting



Marsh Lake Dump Planting



Marsh Lake Dump - Patch cut with retention

3.4 Past Mining Activities

The Marsh Lake Dump access road was constructed for the prospecting of minerals; however, no mining operations were ever commenced in the THP area. There are currently 4 non-active mining placer claims in the area north of the Marsh Lake Dump access road.

4.0 Silvicultural Systems

A silviculture system is defined as one or more planned series of treatments which sees a stand through at least one complete rotation, including harvesting, regeneration and stand tending. The type of silviculture systems chosen will be based on site conditions, and stand management objectives.

In the past, local operators have mainly used selective cutting and patch cuts with retention. This is because both merchantable size sawlogs and standing dead trees (fuelwood) are scattered throughout the THP. The harvesting methods in this THP

will be a combination of selective cutting and patch cuts with retention for all blocks in the THP. In blocks that are frequented by wildlife and in areas where other non-timber values are considered critical, only selection cutting will be implemented.

The following guiding principles will be followed when preparing site plans for each block:

- Each block will be assessed to determine the stand characteristics;
- The most appropriate silviculture system will be chosen based on site specifics to meet management objectives;
- Natural regeneration will be the preferred method of regeneration;
- The site plan will document the stand level objectives, silviculture system, ecological information, soils and harvest method and reforestation plan for each block,

5.0 Harvesting Section

5.1 Merchantable Volume

As mentioned, there are two operating areas within the THP. Area One (1) is the Marsh Lake Dump area which has a road existing access road. Area Two is an unnamed road located approximately 1.5 kilometers Southwest of the Marsh Lake Dump forest access road. Both areas have a combined total merchantable volume of 24, 550 m³.

The sawlog potential throughout the planning area is low to moderate. The average tree height is 17 meters with a range upwards up to 25 meters. The tree diameters range between 16 and 40 cm.

5.2 Block Area and Volume Summary

Area One

Area One has one block flagged and mapped that has an area of 12 hectares and an estimated volume of 1834 m³ (152 m³/ha. - cruise plot data – April 1, 2010).

The other harvestable area is 400 metres on both sides of the existing Marsh Lake Dump forest access road. This equates to approximately 145.5 hectares of forest (excluding the eight mapped blocks that were harvested in the 1990's.) for a total of 22,116 m³.

A total of 1600 m³ will be harvested in Area One.

Area Two

There is one 4 hectare flagged block in Area two consisting of 800 m³. This area was consulted and approved for harvest in 2004, however, the permittee did not harvest.

A total of 400 m³ will be harvested in Area Two.

5.3 Utilization of Trees for Sawlogs and Firewood

The only current operator in this THP area held a permit for 200 m³ of commercial fuelwood in November 2009 which expired April 30, 2010. No volume was harvested on this permit. In 2007, the operator was issued a two year permit for 200 m³ green fuelwood and 200 m³ sawlogs. A replacement permit was issued in August, 2010 for 100 m³ sawlogs and 100 m³ fuelwood for dead standing trees, blowdown and green standing trees.

For future permits issued under the THP, the permittee will selectively harvest both sawlogs and firewood. All suitable sawlogs will be used as sawlogs, which will be removed from the harvest area to be milled on private land near Marsh Lake.

However, because there is not a high volume of dead trees in the THP area, green trees are recommended to be harvested for fuelwood under the following conditions:

- a. Trees, including green defective, dead, blowdown, dying/decadent, crooked/twisted, will be selectively taken as firewood;
- b. Large dominant trees suitable for sawlogs must be left uncut or cut only for use as sawlogs;
- c. Trees utilized for sawlogs must have their tops utilized for fuelwood;
- d. All dead trees must be progressively utilized in the block while cutting green firewood;
- e. Only selective cutting of green trees for fuelwood will be permitted. This will be similar to the silviculture prescription completed on Fire Smart areas. The remaining crop trees will benefit from decreased competition and increased sunlight and nutrients from opening the canopy.

6.0 Access Management

Only existing access will be utilized, thereby minimizing the environmental impact (i.e. no new access roads will be constructed). The existing roads, as outlined on the detailed map – Appendix B, will be integrated with other land users (i.e. hunters, gatherers, hikers and bikers will also be able to use these roads).

The Marsh Lake Dump forest access road will be graded from the beginning to end

(approximately 2.5 kilometers) to improve transportation conditions. A gate will also be installed at the beginning of this road to control land use activity during specific times. This gate will restrict access during the wet periods to protect the road and for public safety. Another reason access may be restricted will be for the protection of wildlife.

7.0 Forest Health

The Forest management Branch in conjunction with Natural Resources Canada composed Forest Health reports on the Yukon Forests. The last available report was completed in 2009. Health surveys were completed over different areas of the Yukon

Among the pests encountered during the survey were: spruce beetle, *Dendroctonus rufipennis*, spruce engraver, *Ips perturbatus*, fir-spruce budworm, *Choristoneura orae*, eastern spruce budworm, *C. fumiferana*, pine engraver, *Ips pin, l*, pine needle cast, *Lophodermella concolor*, aspen serpentine leafminer, *Phyllocnistis populiella* and willow blotch miner, *Micrurapteryx salicifoliella*.

Diseases encountered during the survey were Pine needle cast, *Lophodermella concolor*, Spruce broom rust, *Chrysomyxa arctosyaphyli*, Large-spored Spruce – Labrador tea rust, *Chrysomyxa ledicola*; Willow rust (*Melampsora epitea*)

The forests in the Marsh lake THP are relatively healthy with no epidemic outbreaks of insects or disease. Although some of the insects and diseases listed above do exist, the population levels are normal (endemic) with normal dieback on individual trees scattered throughout different stands. This has been noted throughout field trips to the THP area over the past few years.

8.0 First Nations Knowledge

The development process of the Marsh Lake THP has recognized and considered the forest resources harvesting and management customs of the Carcross Tagish and Kwanlin Dun First Nation's, as well as their knowledge and experience in forest resources management and use of forest resources. Input was solicited from both First Nations commencing April 7, 2010 regarding the formation and development of the THP. A meeting was conducted with CTFN on April 29, 2010 and field trips were conducted with CTFN staff to the THP area. Both meetings and field trips were informative and productive, with a good exchange of information. Both First Nations also expressed their THP concerns in writing. All concerns were taken into consideration and addressed throughout the THP.

9.0 Marsh Lake Local Advisory Council

The terms of reference for the development of the Marsh Lake Local Area Plan (LAP) is currently being developed for the Marsh Lake area. The Marsh Lake Local Advisory area encompasses the Marsh Lake THP. When the Marsh Lake LAP is

approved, all direction and objectives with respect to timber harvesting in the THP must be congruent to the LAP. If necessary, the THP will be amended to follow the timber harvesting planning and directives as set down by the LAP.

Perry Savoie, a councilor with the Marsh Lake Local Advisory Council, was contacted and a scheduled meeting was attended by a FMB forester who appeared as a guest on August 17, 2010. The purpose of the meeting was to explain the goals and objectives of the Marsh Lake THP and to answer any questions the council had with respect to the THP and the new legislation.

10.0 Land Dispositions, Notations, KDFN Settlement Land and Reserves

All land dispositions, notations, KDFN Settlement Land and reserves are outlined on the 1:20,000 detail map located in Appendix B.

There is one surveyed land disposition adjacent to the THP area in the south eastern corner of the THP area, namely 105D09-030 issued to community Services, YTG for the Marsh Lake Dump.

There are two reserves partially in the THP area namely, 105D09-023 which is a reservation issued to the Northern Pipeline Agency for a gravel pit (burrow source) and 105D09-044, a reservation issued to Highways and Public works for a gravel pit.

There are two notations within the THP used for Permanent Sample Plots (Growth and Yield Timber Analysis). These plots will have a 100 meter buffer zone to ensure they will not be disturbed by harvesting.

The Northern Pipeline Agency has a right of way with the Foothills Pipeline, located adjacent to the Southern edge of the THP area.

Kwanlin Dun R-05A settlement land completely abuts the THP area on the Western and Northern edges of the THP. As mentioned, a 100 metre no harvesting buffer will be implemented where the THP is adjacent to R-05A.

11.0 Scientific Studies

A scientific study, entitled the *Lewes Marsh Monitoring Program*, is currently being undertaken to analyze the effects of harvesting on caribou lichen. The study is currently in its first phase and a draft report has been completed. The study area is near Lewes Marsh forested area which is very similar to the forests under the THP and an approximate distance of 5 kilometres apart.

The purpose of this study is to assess the effects of retention harvesting) on lichen abundances in the Southern Lakes ecoregion of Yukon Territory. Lichen, especially *Cladina*, *Cetraria*, and *Flavocetraria* spp., which are important winter forage for

caribou (*Rangifer tarandus caribou*). The focus of the study is to harmonize forest management with caribou management in the Southern Lakes.

When the study is completed and the results concluded, the scientific information will be incorporated into the THP and harvesting techniques modified if necessary.

12.0 Further Assessments

Upon approval of the THP, timber licenses and cutting permits can be applied for. As part of the cutting permit application, a site plan will be completed to specifically analyze and assess non-timber values. The site plan will include the silviculture system, soil conservation measures, reforestation plans, as well as the timing and sequence of all harvesting.

13.0 Monitoring Plan

After the Marsh lake THP is approved and all environmental assessment is completed, timber licenses and cutting permits will be issued. Regular cutting permit inspections will be conducted to ensure that the licensee is in compliance with all terms and conditions of the permit. These inspections will be conducted up to the time the licenses and permits expire and all terms and conditions are fulfilled.

14.0 Consultation

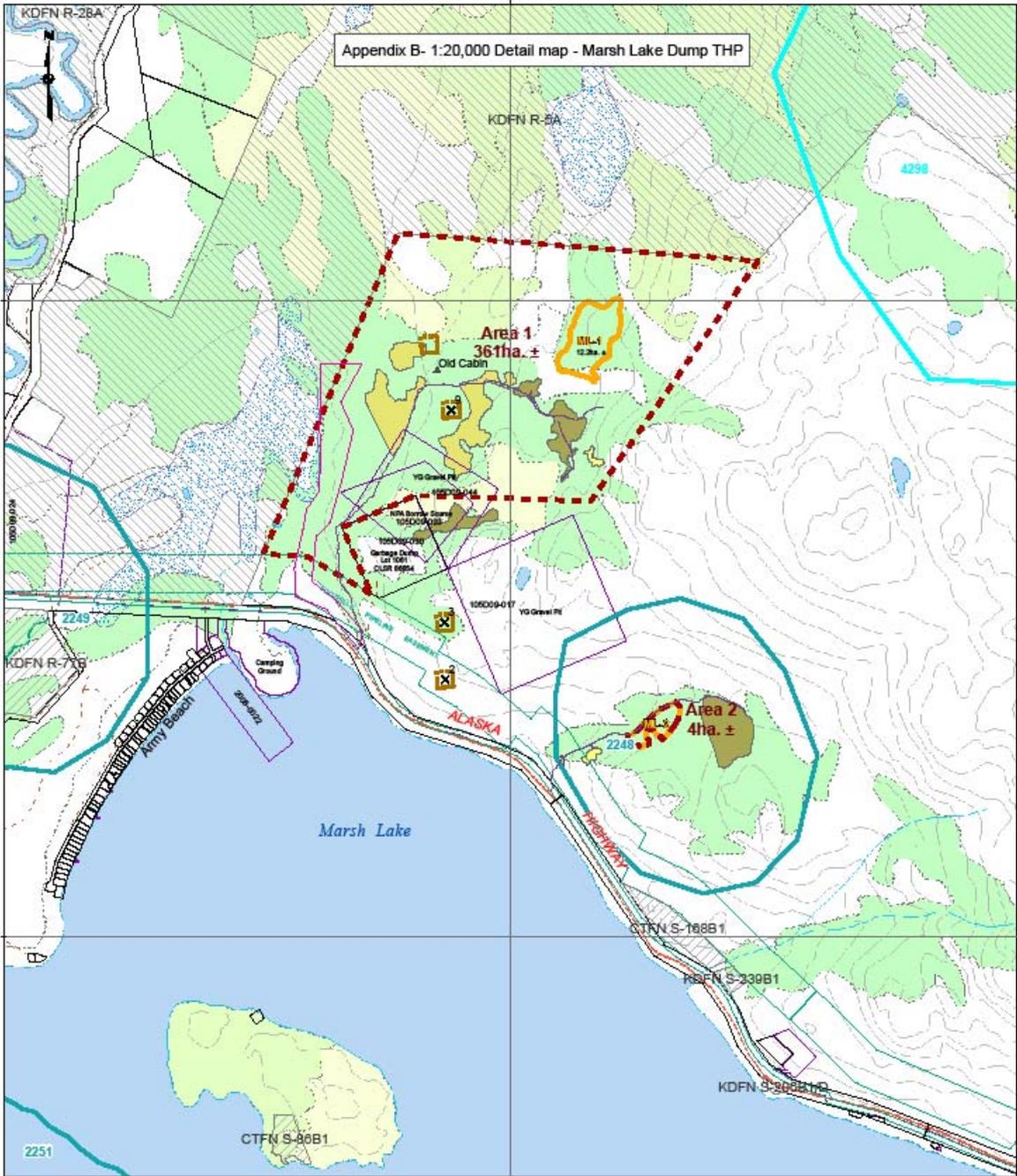
Consultation was undertaken with Carcross Tagish and Kwanlin Dun First Nations, Department of Environment, YG, Heritage Resources, YG and the Marsh Lake Local Advisory Council. No input was collected from the trappers or the outfitter. There were several meetings, joint field trips, telephone conversations and emails that commenced on April 7 to August 17, 2010. All concerns from all stakeholders were taken into consideration and the THP was developed to meet the demand of local traditional harvest, while the protecting the identified values.

15.0 References

2005 Whitehorse Planning Assessment, Forest Management Branch

Lewes Marsh Monitoring Program, Phase 1, Final report (draft), Angeline Gough, Masc. Sustainable Forest Management Research Group, University of British Columbia

Appendix B- 1:20,000 Detail map - Marsh Lake Dump THP



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|--|--|
| <p>Project Specific Features</p> <ul style="list-style-type: none"> X Permanent Sampling Plots Existing Access Routes Proposed Harvest Blocks Timber Harvest Plan Area Heritage Resource Potential <p>Patch Harvesting - Harvest Type</p> <ul style="list-style-type: none"> Patch Cut Partial Cut Patch Cut with Retention Landing Island | <p>Administrative Features</p> <ul style="list-style-type: none"> Surveyed Parcel Surveyed Easement Agriculture Tenure Land Disposition Notations <p>First Nation Settlement Lands</p> <ul style="list-style-type: none"> Category A Category B Fee Simple <p>WKA - Woodland Caribou</p> <ul style="list-style-type: none"> Winter range - survey data Winter range - local knowledge |
|--|--|

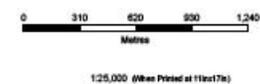
Area Forester: Todd Pugin
Contact: 456-3852
Date: September 9, 2010
Projection: NAD 1983 UTM Zone 8

Digital Data Sources

1:50,000 Canvec features downloaded from spatial data warehouse - www.geogratis.gc.ca. Her Majesty the Queen in Right of Canada, Department of Natural Resources. All rights reserved.

Original map design by EDI Environmental Dynamics Inc. Fall 2008.

Digital Elevation Models (30 metre and 90 metre) provided by Yukon Government Geomatics spatial data warehouse - www.geomatics.yukon.ca.



Appendix C: Heritage Resources Overview Assessment Report

Management Summary

An overview assessment of proposed Harvest Area 5 and 6 in the Marsh Lake Timber Harvest Planning Area has determined that parts of the project area have elevated potential for the presence of heritage resources such as archaeological and historic sites. The area with elevated heritage resource potential is located in proposed harvest areas along the road to Harvest Area 5 where cutting is proposed within 100 m of a wetland area on the eastern edge of the M'Clintock Valley. It is recommended that the area with elevated potential be surveyed for heritage sites before harvest begins. Proposed harvest areas 5 and 6 have low potential for the presence of heritage resources such as archaeological or historic sites. Heritage Resources Unit has no concerns with Harvest Areas 5 and 6.

Archaeological Potential Methodology

Heritage resource potential was determined by identifying site presence indicators using resources including the Yukon Archaeological Sites Database, the Yukon Historic Sites Database, high resolution orthographic images, paleo-lake level studies and spatial mapping of water courses and wetlands. Site databases were used to determine whether or not sites are located within the project areas or to determine if sites are present in areas similar to that of the project. Orthographic images were used to determine locations of prominent topography suitable for the presence of heritage resources. Spatial data on the location of water bodies, watercourses or wetlands is used to define geographic areas or corridors that generally have higher potential for site presence. Heritage resource potential is determined by assessing project development areas intersect with land that is within 100 m of a heritage resource indicator.

Overview Results - Summary

Known Sites: *A review of the Archaeological and Historic Sites Databases indicates that no heritage sites are located in or adjacent to the project area.*

Heritage Resource Potential: *Elevated potential was located along the eastern edge of the M'Clintock River valley. Specifically, elevated potential is located on ridge or series of hills to the east of a wetland that, in areas, overlaps with potential harvest sites within 400 m of the access road to harvest Area 5. Figure 1 highlights the area with elevated potential (in red). Orthographic images suggest this area is a wetland interspersed with glacial kame hills and may even have been a lake shore environment in the early post glacial period. Harvest areas 5 and 6 appear to have low potential for the presence of heritage resources because they located in an elevated mountain slope area that are not in proximity to water.*

Previous Disturbances / Exposures: *Access roads, pull outs and landings.*

Potential Impacts

The project proposes to cut timber within the bounds of Harvest Area 5 and 6 as well as within 400 m of the existing road that accesses Harvest Area 5. Impacts to heritage resources can be characterized as surficial in nature and would negatively

impact any resource on or above the ground surface. Rarely would subsurface resources, such as buried archaeological sites, be impacted by wood cutting. Thus, if wood cutting occurs in areas of elevated heritage resource potential then surface heritage resources could be impacted. If new roads or graded landings are developed in areas of elevated heritage resource potential those activities could impact subsurface heritage resources.

Recommendations

If wood cutting is planned in areas identified as having elevated heritage resource potential (see Figure 1) then a surface feature inventory is recommended in advance of harvest. If new road construction is planned in areas with elevated potential for the presence of heritage resources then an archaeological site inventory and assessment is recommended in advance of construction.