Meadow Lake Oriented Strand Board

Term Supply Licence

2018 Forest Management Plan

VOLUME I

BACKGROUND INFORMATION DOCUMENT

Version 1.2

August 2016

Prepared for:

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FOREST MANAGEMENT PLAN - VOLUME I

for the

Meadow Lake OSB TSL

for the 20-year period from April 1, 2018 to March 31, 2038

I hereby certify that I have prepared this FMP - Volume I to the best of my professional skill and judgment in accordance with the requirements of the Forest Planning Manual.

Michelle Young , RPF (Plan Author) — August 31, 2016 (Date)

Submitted by: Michelle Young, RPF
Woodlands Manager, Forestry
Meadow Lake OSB LP — August 31, 2016 (Date)

I recommend that this FMP – Volume 1 document be approved for implementation and certify that it has been prepared in accordance with the requirements of the Forest Management Planning Standard, relevant policies and obligations, including any relevant SE agreements with aboriginal people. I also certify that the forest management plan has been prepared in accordance with the approved standards of other applicable manuals.

Certified and Recommended for Approval by:

Mark Doyle, RPF — Sept. 7, 2016 (Date)
Forest Management Planning Coordinator
Forest Service Branch, Ministry of Environment

Approved by:

Aaron Kuchirka — Sept 16, 2016 (Date)
Executive Director, Forest Service Branch
Ministry of Environment

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1.0 Introduction

Meadow Lake OSB Limited Partnership (MLOSB) is owned by Tolko Industries Ltd. and operates an oriented strand board (OSB) plant near Meadow Lake, SK. MLOSB is initiating work on a new Forest Management Plan (FMP) for the Meadow Lake OSB Term Supply Licence (TSL) with the objective of acquiring provincial government approval for the new plan on or before January 5, 2018. Tolko will follow the Ministry of Environment's FMP process to meet both provincial FMP and Environmental Assessment requirements.

FMPs are prepared for tenured forest areas in Saskatchewan to establish the strategic direction of forest resource management for a 20-year timeframe. An FMP process results in the completion of three primary products, typically occurring, over a two-year period.

1. Volume I Document – provides background and contextual information on the TSL area and describes historical management practices.
2. Volume II Documents – a collection of foundation documents supporting the planning process:
    a. Planning Inventory
    b. Growth & Yield Projections
    c. SGRs and Transitions Rules
    d. VOITs
    e. Modeling Assumptions
    f. Forest Estate Modeling - Scenario Forecasts
3. A Volume III Document that describes the forest management plan:
    a. Selected Management Strategy
    b. Tactical Plan (20-yr harvest sequence plus reserved areas)
    c. Implementation Strategies

Once the Volume III is approved by the Minister of Environment, the FMP process shifts into implementation and monitoring which includes annual reports to the public.

1.1 Location of Licence Area

The Meadow Lake OSB TSL contains three distinct parcels of land in west-central Saskatchewan (Figure 1). The Makwa and Bronson parcels are located southwest of Meadow Lake and are accessed along Saskatchewan highways 699, 21, and 26. They are largely surrounded by farms and are separated by the Bronson Forest Recreation Site. The Green Lake / Sled Lake parcel is located northeast of Meadow Lake on Highway 155, and is intersected by the Beaver River system.

The total area (land, water, swamp) of the TSL in 203,928 hectares with approximately 131,365 hectares of productive forest land. The communities of Green Lake and Loon Lake are located in or near the collective TSL area. The nearby communities of Makwa, Meadow Lake, and St. Walburg will also benefit from forest management activities in the MLOSB TSL area.

This area is located at the border of the Western canada Sedimentary Basin and the Canadian Shield. Common commercial tree species are trembling aspen, jack pine, black and white spruce, tamarack, and white birch.

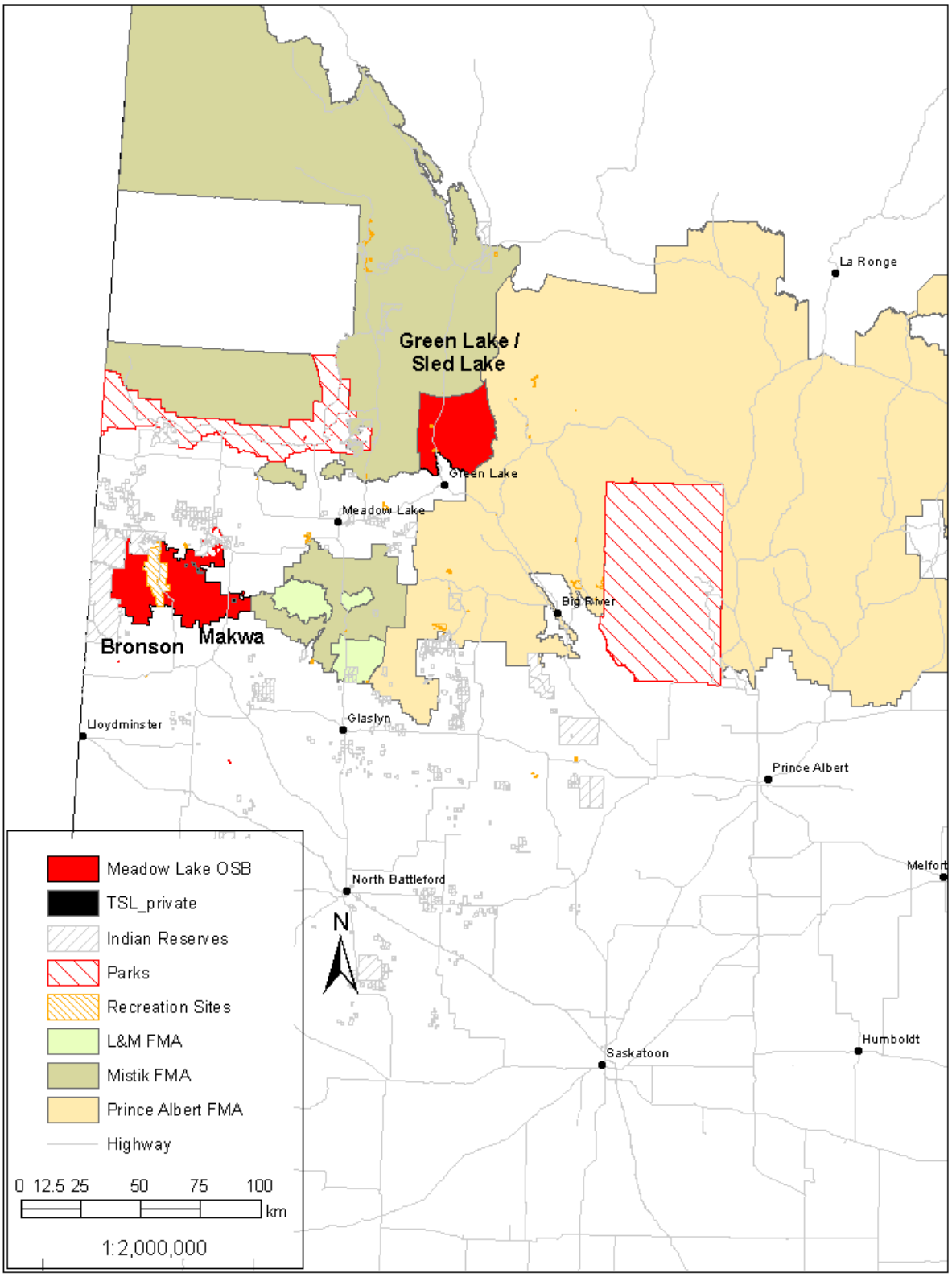

Figure 1 Location of the MLOSB TSL

1.2 Provincial Sources of Direction

The MLOSB TSL does not currently have a Forest Management Plan as the lands were extracted from the Mistik FMA. A 20 Year Plan will be prepared in support of the TSL. MLOSB and the Forest Service have targeted the completion of a new FMP on January 5, 2018.

1.2.1 Provincial Standards

The Ministry of Environment (ministry) has implemented a results-based regulatory (RBR) model to help achieve its vision of providing public service excellence in protecting the environment and promoting sustainable use of natural resources to enhance economic and social benefits. Under RBR the ministry, in consultation with stakeholders, defines the expected environmental outcomes, but leaves the specific methods on how to achieve those outcomes up to the regulated community. To support the RBR model, the ministry has made legislative changes, reallocated resources and invested in information technology and management (http://www.environment.gov.sk.ca/legislation/). At the heart of the legislative framework supporting RBR is the Saskatchewan Environmental Code (http://www.environment.gov.sk.ca/Code). The Environmental Code was adopted by the province November 3, 2014 and the code chapters applicable to forest management were proclaimed on January 5, 2015: 1) Forest Regeneration Assessment, 2) Forest Data Submission, 3) Forest Operating Plan, 4) Forest Products Scaling, and 5) Forest Management Planning.

The remainder of the code was proclaimed in June 2015 (chapters related to air, land and water protection, industrial and municipal activities).

1.2.2 Monitoring Program Reports

The Provincial Forest Management Effects Monitoring Program was implemented in the late 1990's as part of the Province's adaptive management strategy for forest management. The Minister established a "Scientific Advisory Board" to review and propose standards, develop measurement protocols and methods to produce an ecologically and scientifically appropriate monitoring framework to assess the long-term effects of forest management activities on the health of the provincial forest ecosystem.

Learning from the program was used in the development of Provincial, TSL, and FMA Standards and Guidelines. Data collected has also been used by the scientific and academic community to aid in additional studies.

The Monitoring Program was suspended in 2007 as recommended by the "Minister's Task Force Report on Forest Sector Competitiveness" (Government of Saskatchewan, 2006). Licensees have not been required to collect monitoring information since.

The future direction for Monitoring in Saskatchewan is being reviewed by the Forest Service Branch. "In an effort to address the concerns of the Minister's Task Force Report Recommendation and growing concerns for environmental monitoring data suitable for the MLOSB Strategy, a proposal to develop an Integrated Forest Ecosystem Monitoring Program was prepared and submitted to Forest Service branch management and executive on June 24, 2009" (McLaughlin, 2014). The proposal outlined the business case, proposed program objectives, program features, structure, implementation schedule, area of deployment, and estimation of required resources. No decision on the implementation of this proposal has occurred yet. At this time there is no expectation that licensees would need to engage in scientific studies or monitoring

programs as it will be a government responsibility. The licensee will provide input, as required, into scientific study undertaken by the Ministry. The annual FMP report compiled by the licensee will also provide a basis for monitoring of forest management activities.

1.2.3 Sustainable Forest Management Audit Report

Section 35 of the Forest Resources Management Regulations requires FMA holders to ensure that an independent sustainable forest management audit is done approximately every five years. A Section 35 Audit is not required as the area is currently administered as a Term Supply Licence with the expectation of being converted to a FMA once the FMP has been approved.

2.0 Historical Review of the Licence Area

2.1 Licence History

In 1988, when Norsask Forest Products was created, they were given rights to a 3.3 million hectare area under a Forest Management Agreement (FMA). The area covered by this FMA was commonly referred to as the NorSask Forest. As part of the FMA, a user was to be found for the aspen hardwood. In 1990 Millar Western started construction on a pulp mill in Meadow Lake designed to use this hardwood component. NorSask and Millar Western then created Mistik Management Ltd. to manage the FMA, which has since been referred to as the Mistik FMA.

The Saskatchewan Government determined that the Mistik FMA included land base and volume surplus to the needs of NorSask Forest Products and Millar Western. As a result, the government developed a strategy to increase the forest products industry in the Meadow Lake area. This initiative resulted in the formation of the Meadow Lake OSB Limited Partnership in 2001, the construction of an OSB plant near Meadow Lake, and the assignment of volume and operating area from the Mistik FMA to Meadow Lake OSB.

Meadow Lake OSB was originally a partnership consisting of Tolko Industries Ltd., North West Community Holdings Ltd., Meadow Lake Tribal Council Resource Development Inc., and CIC OSB Products Ltd. Tolko Industries Ltd. was the majority partner (75%) and managed the forest lands, mill operations, and marketing. Tolko acquired full ownership of Meadow Lake OSB in November, 2014.

Initially, Meadow Lake OSB's forestry operations were carried out under the authority of assigned agreements. Operational and management requirements were provided by Provincial and Federal laws and regulations, provisions of Mistik Management's amended FMA License (Forest Management License Amending Agreement) and the Assignment Agreements.

Up until April 2005, Meadow Lake OSB's forest management practices were tied directly to Mistik Management Ltd.'s 20 Year Plan by Section 7.1(c) of the Assignment Agreement dated November 1st, 2002. Saskatchewan Environment determined through auditing that some of the 20 Year FMP objectives are not operationally achievable, in part due to the Forest Management License Amending Agreement (November 1st, 2002) which provided for Meadow Lake OSB's operations within the Green Lake, Sled Lake and Bronson parcels. Meadow Lake's operations were guided by Mistik Management's "Forest Management Agreement

Area Standards and Guidelines" (FMAASG) until November of 2007, at which time MLOSB started to operate under the Meadow Lake OSB TSL Standards and Guidelines.

In 2007, Meadow Lake OSB signed a 5 year term supply license with the Province for the TSL area. The TSL was revised and signed in September, 2014. Within the newly signed TSL, a commitment was made to complete a Forest Management Plan for the area.

2.2 Changes to Legal Administrative Boundaries

A revised digital outer boundary for the TSL was received from the Saskatchewan government in early 2016. Significant changes from the map contained in the original TSL document dated October 31, 2007 include exclusion of Indian Reserves #119-1 (Onion Lake), #161 (Ministikwan), Makwa Lake Provincial Park, Bronson Forest Recreation Site, and Beaver/Cowan River Recreation Site. These areas were previously excluded through the *Schedule "B" Areas Excepted and Reserved* clause in the licence document. There are also other smaller changes to the outer boundary along the northern forest line.

The 2007 and 2014 licence documents indicate a gross area for the TSL of 203,804.3 hectares. The lease disposition withdrawals as of March 31, 2014 are listed as 639.06 hectares, as follows:

- 338.87 hectares (1979 to October 31, 2002)
- 165.85 hectares (November 1, 2002 to October 31, 2007)
- 134.34 hectares (November 1, 2007 to October 31, 2014)

GIS data used for the preparation of this Volume 1 document indicate that the gross crown land area for the TSL is now 203,134 hectares.

2.3 Changes and Accomplishments in Forest Management

2.3.1 General Harvest Trends

Information obtained from the Saskatchewan Ministry of Economy shows that both hardwood and softwood harvest volumes have fluctuated significantly over the past 10 years (Figure 2), and has consistently been less than the annual allowable cut for the licence. This trend is very similar to that of other forest tenures in the province. The average harvest volume for the past ten years by Meadow Lake OSB has been approximately 57,000 m^3 per year. It is anticipated that this volume will increase in the future.

The volume harvested by independent operators has typically been low. Since 2010, roughly 380 cubic metres of hardwood and 24,110 cubic metres of softwood have been harvested under Forest Products Permit tenures.

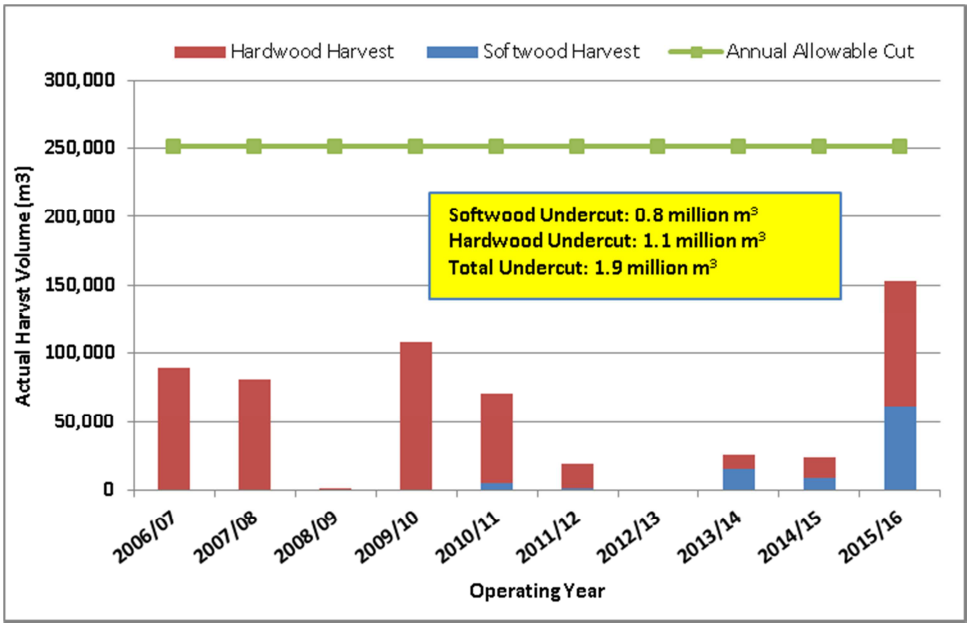

Figure 2 Meadow Lake OSB TSL Timber Harvest History (2006 – 2015)

2.3.2 Access Development

One of the significant infrastructure challenges associated with the MLOSB TSL is the weight restrictions on Highway 155 and the challenges associated with transportation of harvested timber in the Makwa and Bronson areas.

Section 12.02 of the TSL document states that "The Minister and the Licensee agree that they will work collaboratively to develop a Licensee roads map by April 1, 2015, or such later date as may be agreed to by both parties". This agreement to document the current state of roads has been extended to September 30, 2017 so work will be occurring during FMP development.

2.3.3 Silviculture

Since acquiring the TSL, Meadow Lake OSB has been meeting all silviculture obligations for the area. Additional details concerning forest renewal activities are provided in Section 10.2.

2.3.4 Inventory and Growth & Yield Program

The current forest inventory for the MLOSB TSL comes from two sources.

- UTM inventory based on 1981 photography (roughly 7% of the area)
- SFVI inventory based on 2007 photography (roughly 93% of the area)

There is also a very small area (253 hectares) within the net area of the TSL that does not have any forest inventory information.

There is no growth and yield program specific to this TSL. In 2005 Timberline Forest Inventory Consultants developed, on behalf of the Saskatchewan Ministry of Environment, a set of empirical natural stand yield curves for the commercial forests of Saskatchewan (Timberline Natural Resource Group Ltd., 2005). The yield curves were developed using the province's 3P data (25,000+ temporary sample plots) and then

validated using cleaned permanent sample plots provided by Weyerhaeuser in Saskatchewan. These yield curves are specific to Ecoregion and species groups and take into account differences in site productivity and site density. Yield tables to support the Harvest Volume Schedule (HVS) will be developed using these as the base.

2.3.5 Research Program

Tolko is a signatory to the Canadian Boreal Forest Agreement, and has commissioned and participated in studies on carbon modelling, biomass use, caribou habitat identification, and caribou nutrition through membership in the National Council for Air and Stream Improvement (NCASI). Tolko is also a member of the Foothills Research Institute.

2.3.6 Tree Improvement

Currently there is no tree improvement work ongoing within the TSL and planted stock comes from natural seed sources.

2.3.7 Work with Stakeholder, Community and Aboriginal Groups

Meadow Lake OSB is committed to on-going public engagement. A Public Advisory Group was previously in place until 2013 as part of the requirements for CSA certification, and has been re-established to provide input into this Forest Management Planning process. The membership covers a broad range of interests and is focused on people and interest having a direct attachment to the land covered by the TSL.

In addition, Meadow Lake OSB will hold information sessions to allow the public to review and comment on the FMP product. Broad aboriginal participation will be encouraged through engagement of community leaders, and all local aboriginal groups will be encouraged to attend public information session and/or submit comments on forest management issues that concern them. Representatives will be offered meetings in their communities to review and provide input into the Volume 1 and Volume 3 documents.

First Nations and local stakeholders (municipalities, trappers, and outfitters) are also provided opportunities annually for input into the Operating Plan through phone calls, field tours, meetings, public open houses and letters. Where possible, their issues are taken into account and accommodated. Meadow Lake OSB also attends meetings of the Green Lake Co Management Board.

All stakeholder engagement is documented and tracked, and summaries are provided in both the FMP and the AOP.

Comments received from the public, stakeholders and First Nations are summarized in Appendix A.

3.0 Biophysical Description

3.1 Climate

The MLOSB TSL is characterized by a humid, moderately cold to very cold, continental climate with long cold winters and warm summers. Historical weather station data (Table 1) for population centers indicate nominal fluctuations from north to south around the TSL. The climate of the Mid- Boreal Upland Ecoregion which makes up the majority of the TSL is described as having a predominantly sub-humid mid-boreal ecoclimate. The mean annual precipitation ranges from 400-550mm. (Environment Canada, 2016)

Table 1 Historical Weather Station data 1981 - 2010

Location	Avg. July Temp (°C)	Avg. January Temp (°C)	Avg. Precipitation July (mm)	Avg. Precipitation Jan (mm)
Loon Lake	16.5	-16.0	75.6	15.5
Meadow Lake	16.7	-17.2	75.2	15.7

Canadian Climate Normals 1981-2010 Station Data http://climate.weather.gc.ca/climate_normals/index_e.html

Future climate simulations to the end of the 21st century (2080-2099) project increased annual temperature and precipitation over the TSL. Annual averages for temperatures and precipitation are projected to increase about 3.0 to 3.5°C and 5 to 10%, respectively. For winter, a 3.5 to 4.0°C warming and 10% to 15% increase in precipitation are projected, and for summer, a 3.0 to 3.5°C warming and 0% to 5% increase in precipitation are projected (Pomeroy, Fang, & Williams, 2009). This implies a lengthened growing season, leading to an overall increase in forest productivity but also a likely increase in natural disturbance (e.g. forest fires and pests) (Barrow, 2009).

3.2 Landforms

Most major landforms of Saskatchewan were created by the deposition and erosion of sediments and rock by water and ice during the glacial and immediate postglacial periods (Figure 3). A flat hummocky landform makes up most of the Bronson and Makwa parcels in the MLOSB TSL, while the Green Lake/Sled parcel is made up of undulating, flat bog, and knoll and kettle landforms (Figure 4).

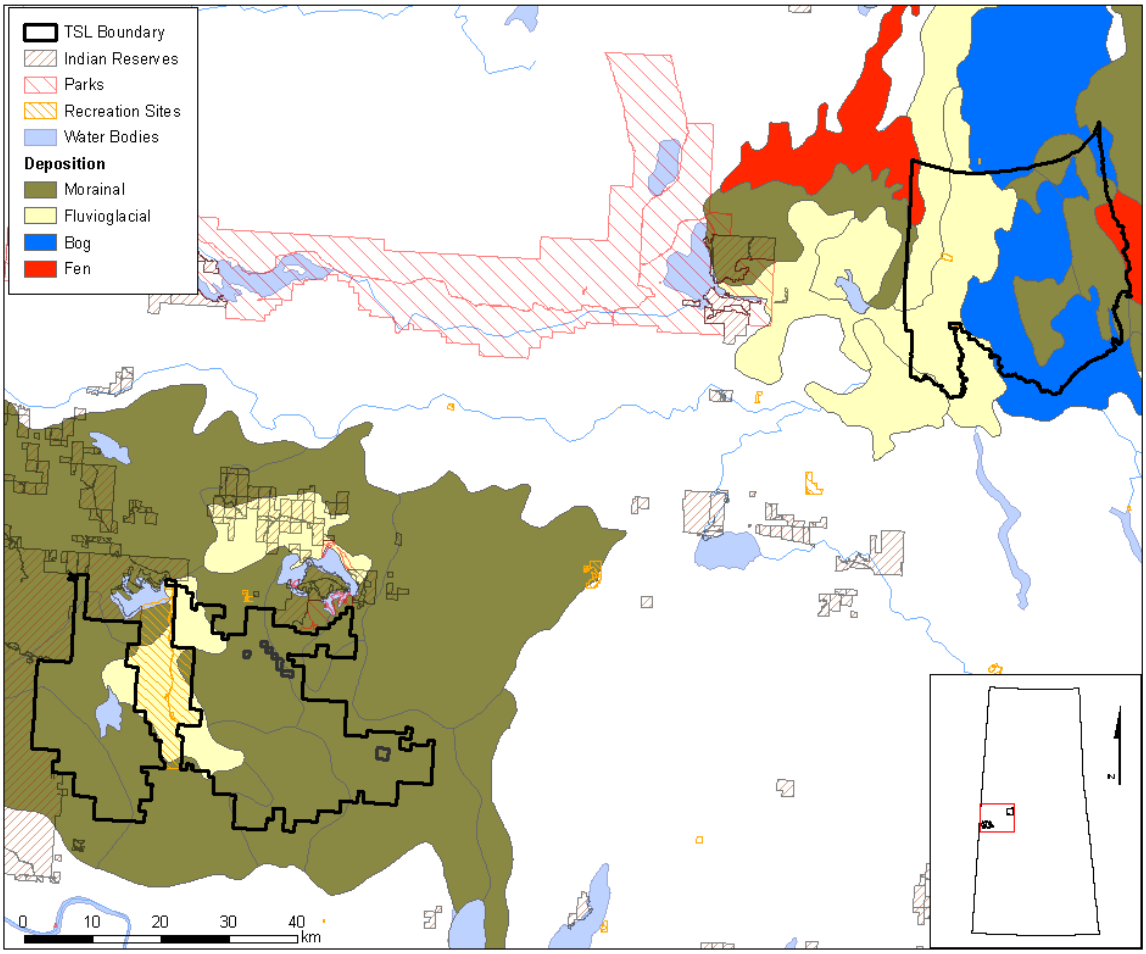

Figure 3 Parent Soil Mode of Deposition

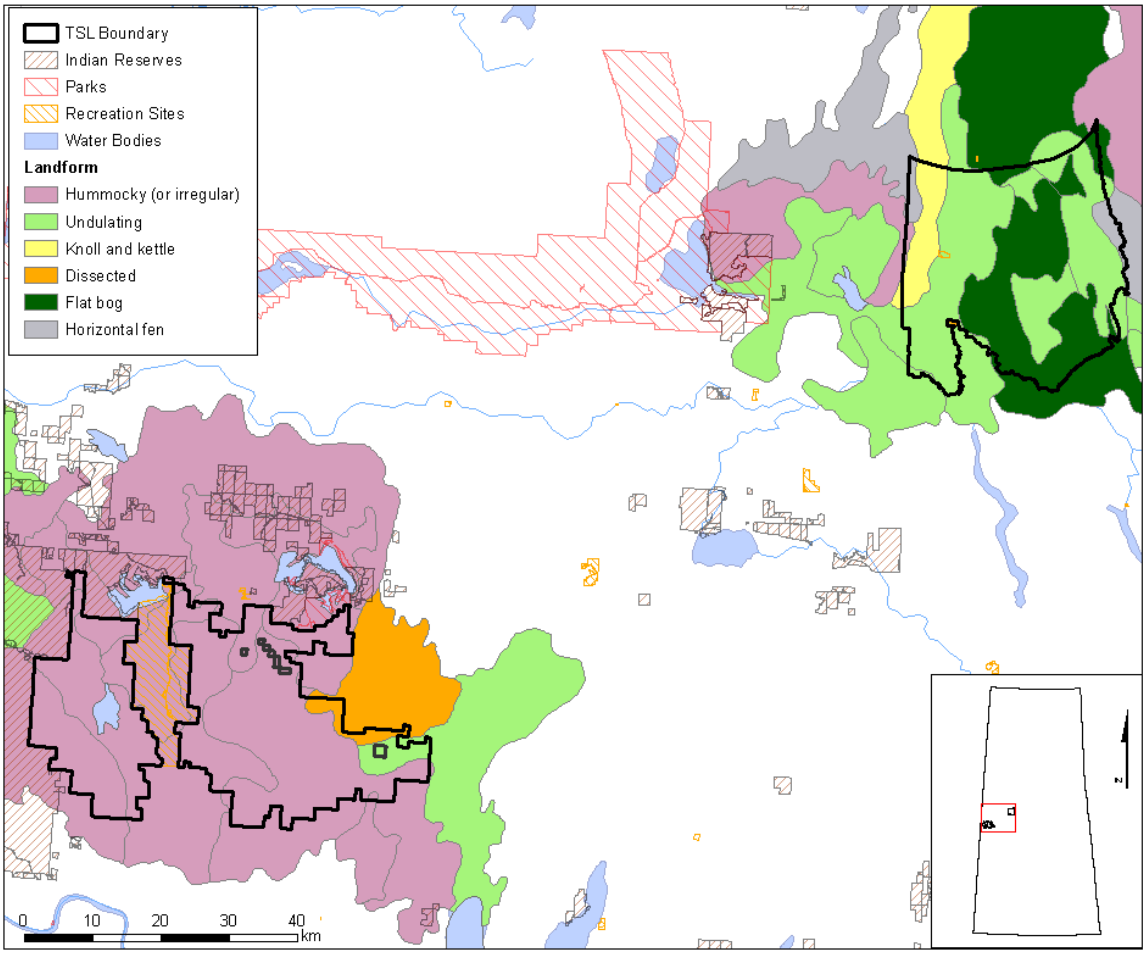

Figure 4 Local Surface Forms Covering the MLOSB TSL

3.3 Geology

The Bronson/Makwa and southern region of the Green Lake/Sled Lake portions of the MLOSB TSL are located over sedimentary rock of the Western Canada Sedimentary Basin. The northern edge of the Green Lake/Sled Lake region is part of the Canadian Shield and is comprised from Metamorphic and Intrusive rock formations.

3.4 Soils

Soils and soil landforms within the MLOSB TSL are determined to a large degree by the manner in which the soils were deposited after the last glaciation. Morainal and fluvioglacial make up the majority of the parental modes of deposition, with bog and fen modes covering an area in the Green Lake/Sled parcel.

The upland areas that dominate the TSL area consist of deep, loamy to clayey-textured glacial till, lacustrine deposits, and inclusions of coarse fluvioglacial deposits. These deposits are surrounded by rough morainal deposits with a large number of small lakes, ponds, and sloughs occupying shallow depressions.

Well-drained gray Luvisolic soils are dominant in the region. Significant inclusions are peaty Gleysols and Mesisols that occupy poorly drained depressions. Dystric Brunisols occur on droughty, sandy sites (University of Saskatchewan, 2016). Figure 5 displays the soil great groups occurring within the TSL. Figure 6 displays the soil productivity zone by class. A description of the soil types (based on great groups and order) is provided below (University of Saskatchewan College of Agriculture and Bioresources, 2016) .

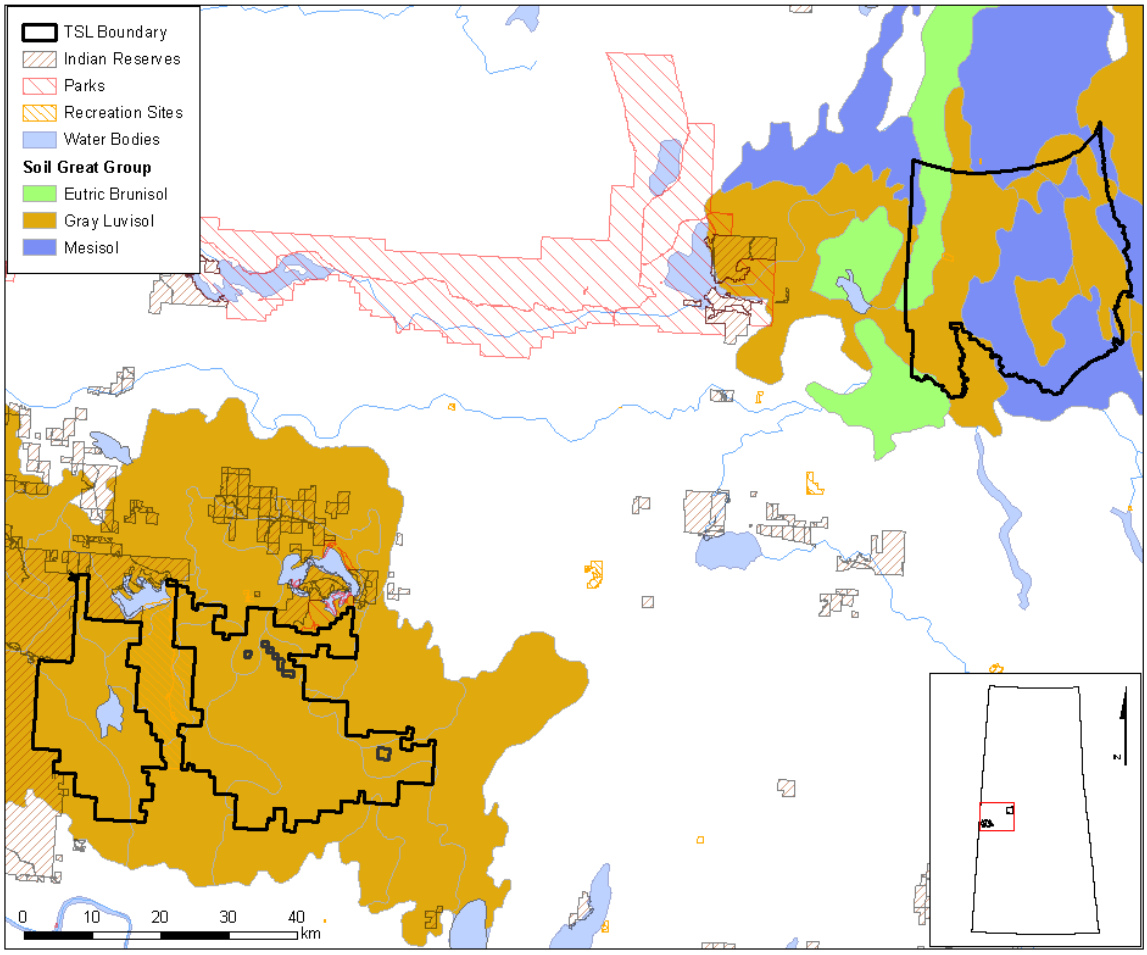

Figure 5 Soil Development Showing the Dominant Great Groups

Luvisols

Luvisolic soils are the dominant soils group of Central Saskatchewan. They occur on loamy glacial till deposits throughout this region. The glacial deposits are derived from sedimentary rocks and have an abundant supply of base cations such as calcium and magnesium. They typically have a grayish, sandy or silty Ae horizon overlying a B horizon that has higher clay content than either the Ae or the C horizon. The C horizon of the Luvisolics usually contains calcium carbonate (lime). When scarified the surface Ae horizon is exposed and the soils often have a grayish appearance and hence this region is known as the Gray soil zone in Saskatchewan.

Brunisols

Brunisolic soils are Boreal forest soils that primarily develop in sandy glacial sediments. Sand is resistant to transformation by weathering and these soils have undergone very limited soil formation. The diagnostic horizon is the Bm horizon, which has undergone only slight chemical change from the original parent material although it may have a bright red colour compared to the underlying C horizon. The sandy glacial sediments contained little or no calcium carbonate and hence carbonate rich C horizons are rare in the Brunisolic soils.

Eutric Brunisol soils occur primarily on glacio-fluvial sand parent materials in Central Saskatchewan of the boundary with the Canadian Shield. The pH of the soils is neutral or basic (i.e., greater than 5.5). The sand deposits may also occur as small inclusions in the glacial till uplands in this region.

Mesisols

The three Great Groups of the Organic Order found in Saskatchewan are based on the degree of decomposition of the middle tier (i.e., from 40 to 120 cm thickness of the peat). The degree of decomposition can be assessed in the field using the Van Post Scale of Decomposition. Mesisols consist of organic soils of which the material in the middle layer is in an intermediate stage of decomposition between fibric and humic.

Water-saturated conditions of wetlands in the forested regions of Saskatchewan commonly lead to the formation of layers of organic matter or peat. Where the high organic content (i.e., > 17% organic carbon) layer is greater than 60-cm thick (if fibrous) or 40-cm thick (if it is more decomposed), the soils are classified into the Organic Order. In Saskatchewan, organic soils occur in two main types of peat lands. Fens are dominated by sedges and brown mosses, and the water is high in dissolved base ions (e.g. calcium, magnesium); bogs are dominated by sphagnum and woody peat and the water has a low base cation content.

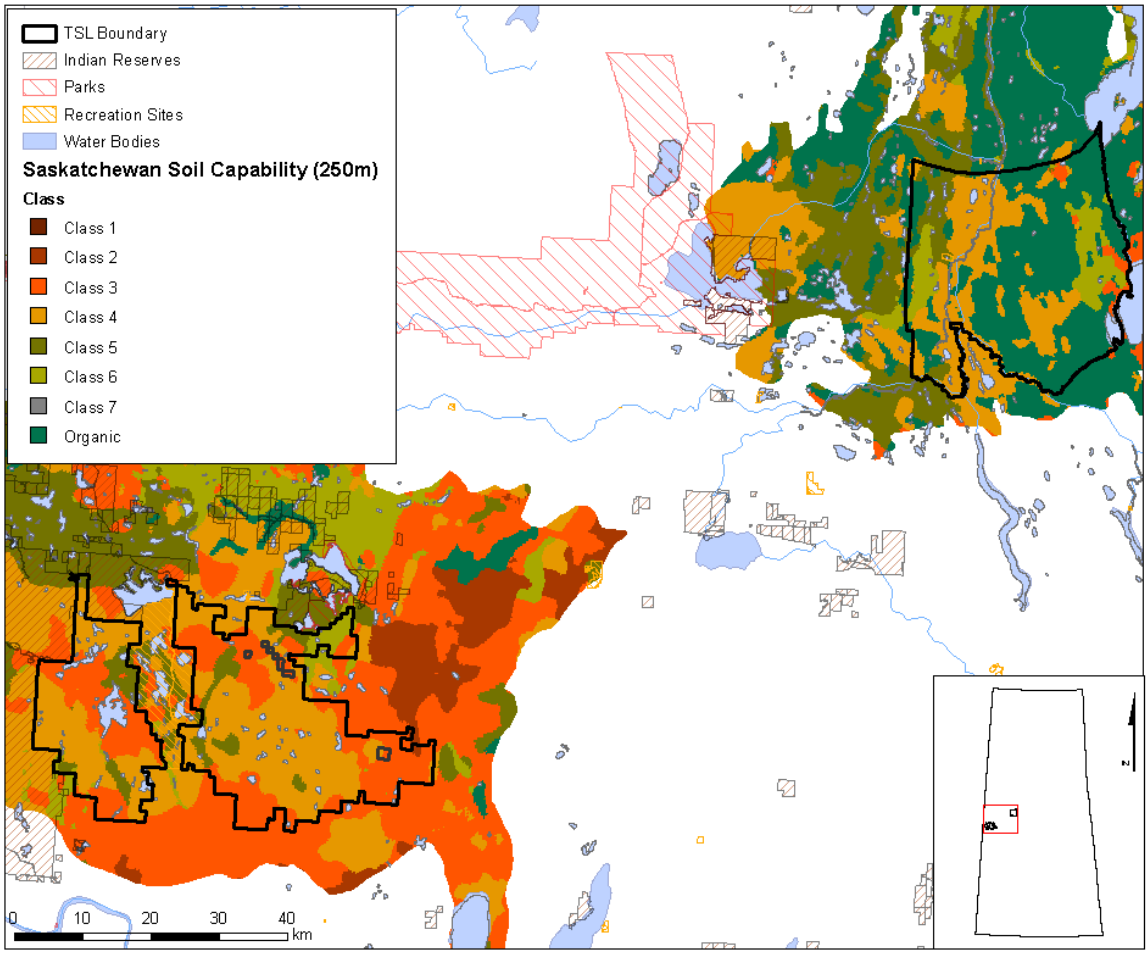

Figure 6 Soil Productivity Zone by Class

3.5 Vegetation

The TSL is located in the boreal forest in Saskatchewan and is comprised of upland forest, muskeg, brush land, rock and water. The upland forest areas are suitable for timber production and contain different age classes of commercial tree species such as jack pine, white spruce, trembling aspen, white birch, and tamarack. Stands of different ages are created by both variation in site growing conditions that favour different vegetation types, and by the effects of forest fires.

The MLOSB TSL encompasses 203,928 ha with approximately 131,365 hectares being considered productive forest (Figure 7).

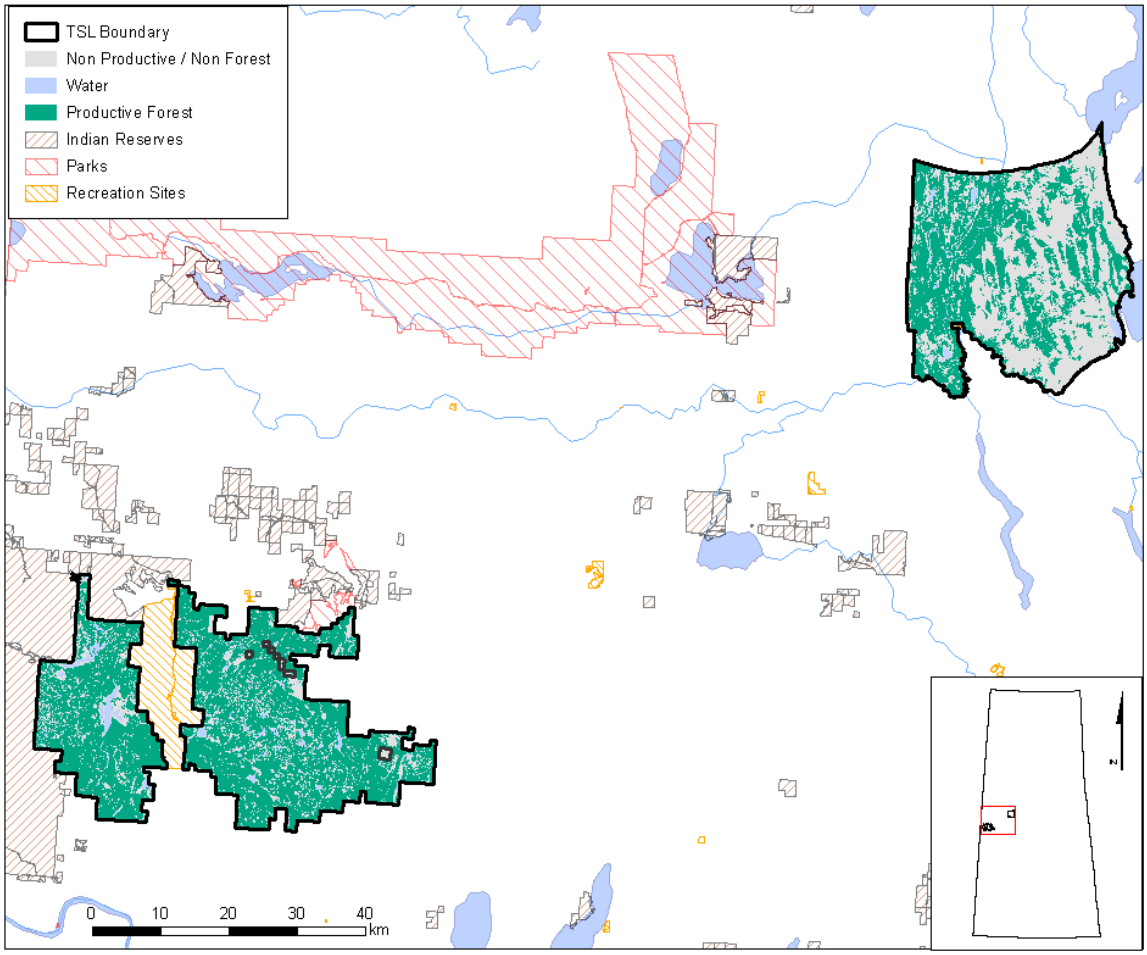

Figure 7 Productive Forest within the MLOSB TSL Area

3.6 Watersheds

The largest watershed associated with the MLOSB TSL is the Beaver River watershed (Figure 8). This watershed composes the majority of the Bronson/Makwa and the Green Lake/Sled Lake portions of the TSL. The Beaver River flows east from headwaters at Beaver Lake, Alberta, to Hudson's Bay. The lake storage within the basin serves to control flows, generally resulting in continuous flow throughout the entire year. Major lakes within the watershed include Cold, Moose, Muriel, Ethel, and Wolf lakes. A Source Water Protection Plan is currently being developed for the Beaver River Watershed by the Beaver River Watershed Alliance.

The Bronson/Makwa portion of the TSL contains sections of the North Saskatchewan River (NSR) watershed to the south. The NSR watershed includes large sections of Alberta and Saskatchewan, with headwaters at the Saskatchewan Glacier in the Columbia Icefield, Alberta. The NSR flows east before draining into Lake Winnipeg. Water resources in the watershed are heavily influenced by oil and gas activities, and major cities including Edmonton (AB), Saskatoon (SK), and Prince Albert (SK).

The North Saskatchewan River Watershed Source Water Protection Plan was developed co-operatively by Watershed Advisory Committees established in each watershed planning area, the SK Watershed Authority

and its successor, the Water Security Agency (www.wsask.ca). The membership of the Watershed Advisory Committees includes representatives from urban and rural municipalities, First Nations, industry, environmental and agricultural interest organizations.

The source water protection plans identify the threats to source water in each watershed and recommend key actions to address those threats. These plans will be evaluated during the development of Volume 3 to determine their applicability to forest management in the TSL.

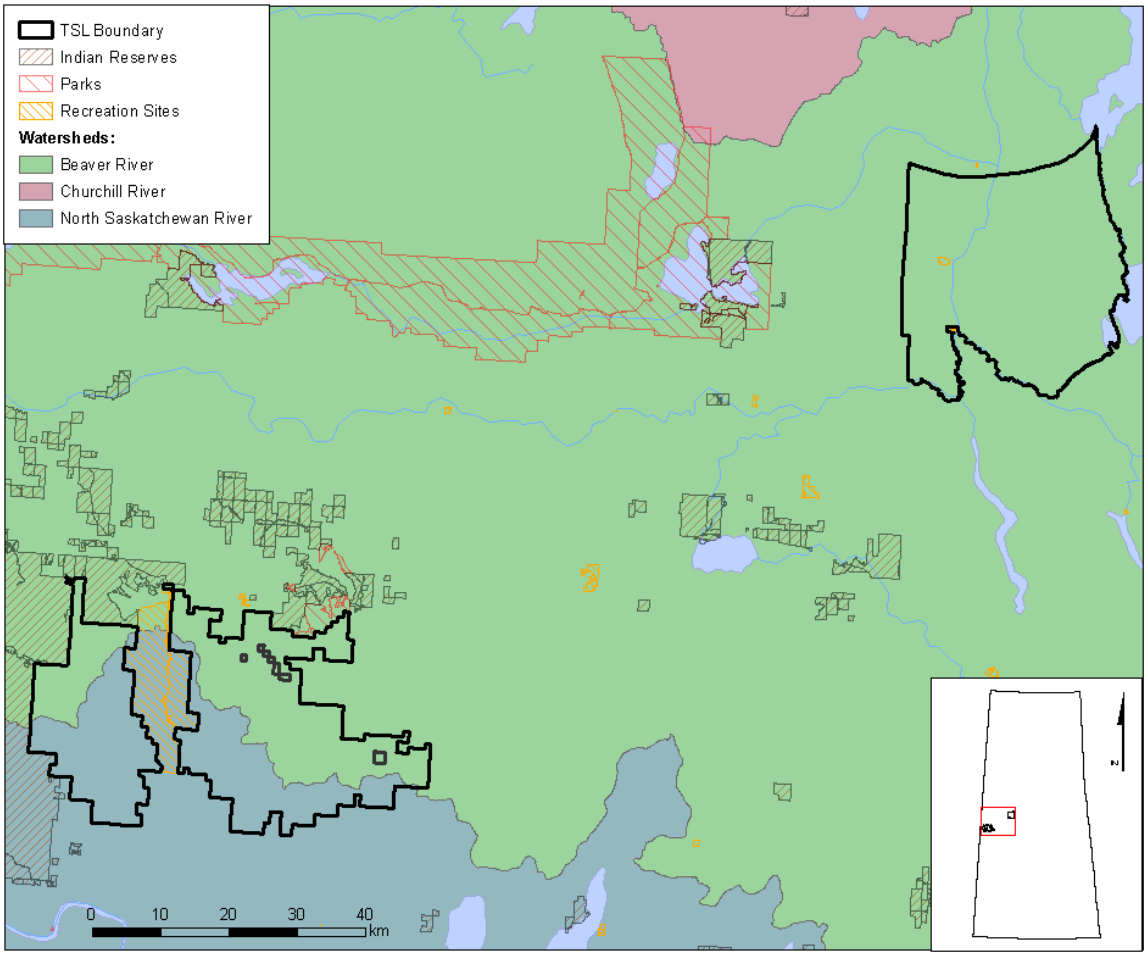

Figure 8 Watersheds Covering the MLOSB TSL

3.7 Ecozones, Ecoregions and Ecodistricts

The TSL is in the Boreal Plain Ecozone, and overlaps the Mid Boreal Uplands and Boreal Transition ecoregions (University of Saskatchewan, 2016) south of the Canadian Shield (Figure 9). Ecoregions each have a particular climate, soil or landform structure that determines the types of forest and productivity found within them. The Mid Boreal Uplands ecoregion is characterized by prominent uplands and poorly drained muskegs and bogs, while the Boreal Transition ecoregion contains a mix of forest and farmland.

Ecoregions are further subdivided into Ecodistricts reflecting local variations of the same factors and often expressed with distinctive vegetation. The Ecodistricts of the TSL are shown in Figure 10 below.

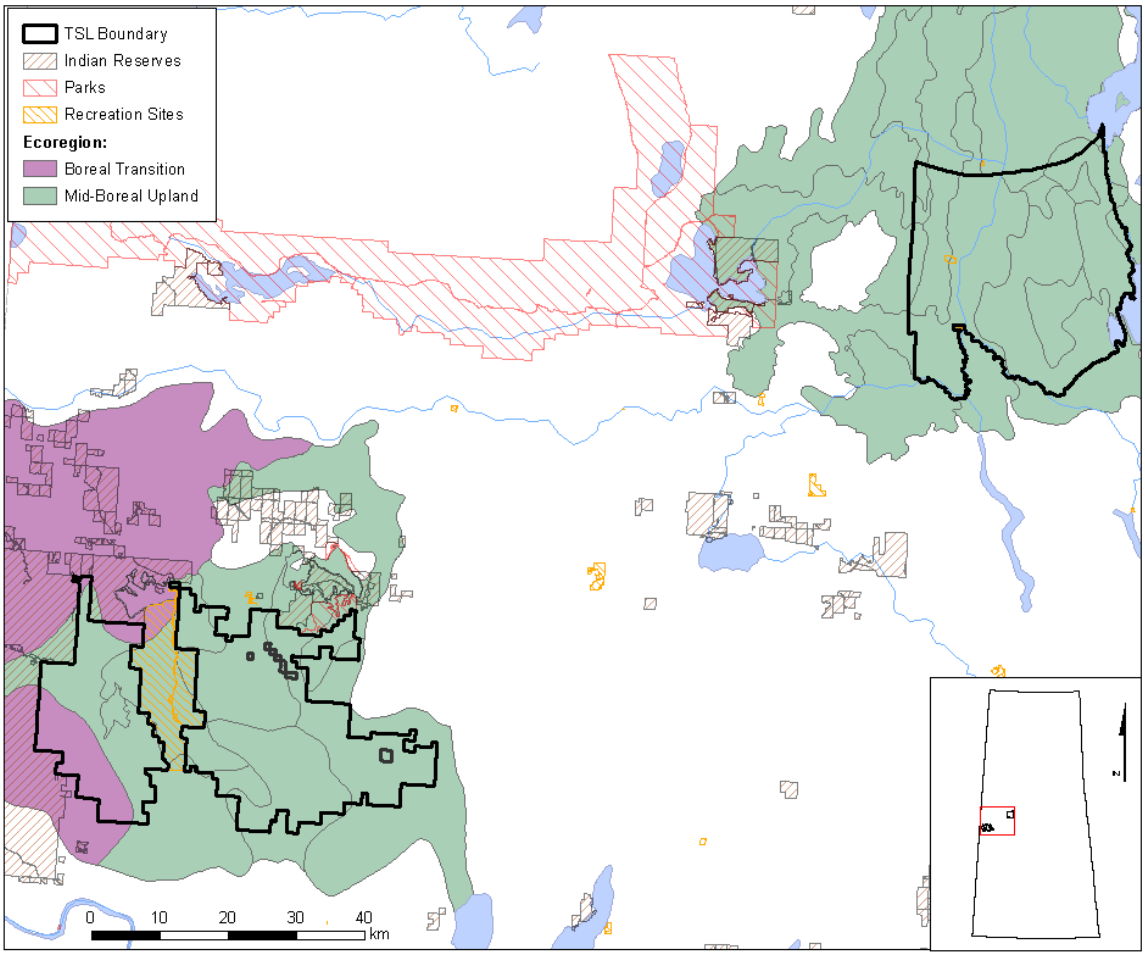

Figure 9 Ecoregions in the MLOSB TSL area

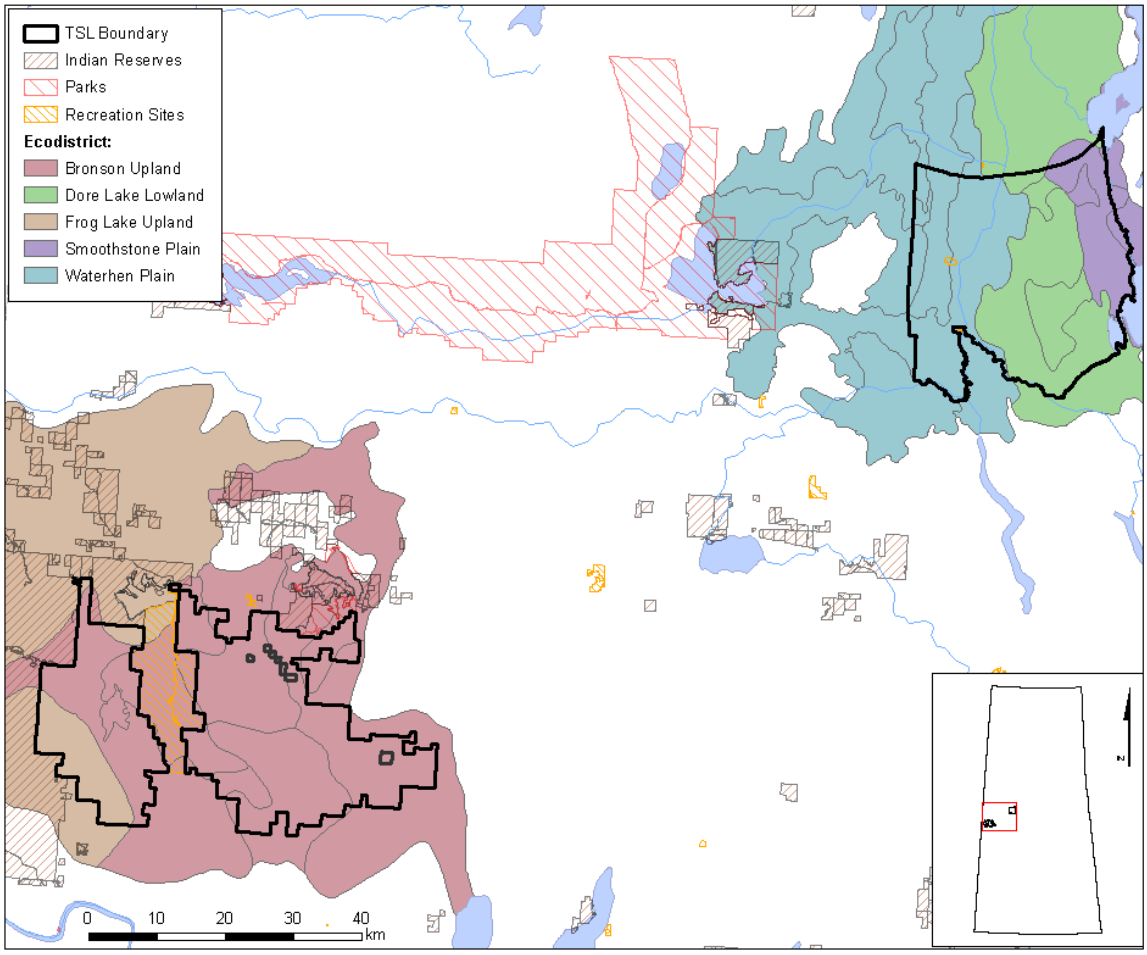

Figure 10 Ecodistricts within the MLOSB TSL.

The Ecoregions within the MLOSB TSL are described below:

The smallest Ecoregion in the TSL is the Boreal Transition, which is a mix of forest and agricultural land (Figure 11). The forest is a mixed coniferous and deciduous forest section of the boreal forest, with sparse sections of peatland and muskeg. Forested zones consist of scattered stands of aspen, white spruce, and jack pine. The landscape is characterized by river valley, forested stands, and cultivated lowlands and plains. The soil structure contains black and dark-gray soils, which are ideal for the production of forage crops, feed grains, cereals and oilseeds.

Figure 11 Boreal Transition Ecoregion

The Mid-Boreal Upland Ecoregion composes the majority of the TSL and is located south of the Canadian Shield (Figure 12). Topography is characterized by hilly glacial till plains, steeply sloping escarpments, and level plateaus. Sparsely treed peatlands and muskeg are common. The region contains the majority of Saskatchewan's merchantable timber, with mixed forests of aspen, tamarack, spruce (white and black), and jack pine. Soil structure is characterized by loamy, gray soils, with sandy, poorly-drained soils towards the north.

Figure 12 Mid- Boreal Upland Ecoregion

3.8 Lakes

Lakes are a dominant feature across the northern Saskatchewan landscape and make up a significant area of the TSL. Major lakes in the surrounding area include Meadow, Dore, Waterhen, Sled, Keeley, Makwa, and Ministikwan lakes.

3.9 Landbase Summary

Table 2 describes the area within the extents of the current outer TSL boundary. Not all area within this boundary is within the licence or available for forest management. The gross area of the TSL is 203,928 hectares of which 794 hectares is excluded because it is private land. The remaining area is further differentiated between the areas available for forest management (202,492 hectares) and areas designated

as unavailable and excluded (642 hectares for the Beatty Recreation Site and various lease dispositions). It is also noted that 253 hectares within the TSL has not had a forest inventory completed.

Table 2 Licence Area Land Summary

Land Ownership and Type	Crown		Private	Total
	Managed (ha)	Designated (ha)	(ha)	
Forested	**190,500**	**582**	**167**	**191,249**
Productive Forest	130,747	511	107	131,365
Non Productive Forest	59,753	72	60	59,885
Treed Wetland	37,304	18	26	37,349
Open Wetland	14,109	38	34	14,180
Brush and Alder	8,339	16	0	8,355
Rock	0	0	0	0
Non-Forested	**11,739**	**60**	**369**	**12,167**
Water	8,012	41	19	8,071
Developed Agricultural Land	484	0	340	824
Grass	1,612	1	0	1,613
Unclassified	1,317	18	10	1,345
Other	314	0	0	314
Un-Surveyed	**253**	**0**	259	**512**
Total	**202,492**	**642**	**794**	**203,928**
Total Crown	**203,134**			

3.10 Forest Attributes

Table 3 and Table 4 describe and summarize the total productive forest area for the TSL by Provincial Forest Type (PFT) and seral stage. It can be seen that Trembling aspen or white birch dominated hardwood stands are the most prevalent, making up roughly 60 percent of the productive forest. Of these, the majority (81%) are in the immature seral stage category. Figure 13 highlights this graphically, while Figure 14, Figure 15 and Figure 16 provide an overview of the spatial distribution of the seral stages, Provincial Forest Types, and Cover Species Groups within the TSL.

Table 3 Description of Provincial Forest Types in Saskatchewan

PFT	Broad Description of Forest Type and Non-Forested Areas
WSF	White spruce or balsam fir dominated softwood stands
BSL	Black spruce or tamarack/larch dominated softwood stands
BSJ	Black spruce and Jack pine dominated mixed softwood stands
JLP	Jack or lodgepole pine dominated softwood stands
PMW	Pine dominated mixedwood stands
SMW	Spruce dominated mixedwood stands
HSM	Hardwood with spruce (bS, wS, bF, and tL) mixedwood
HPM	Hardwood with pine mixedwood
TAB	Trembling aspen or white birch dominated hardwood stands
AOH	Any other hardwood dominated hardwood stand except TAB

Table 4 Area by Provincial Forest Type and Seral Stage

Provincial Forest Type	Area (Ha) by Seral Stage					
	Young (0-20 yrs)	Immature H/HS: (21-70 yrs) S/SH (JP): (21-70 yrs) S/SH (S): (21-80 yrs)	Mature H/HS: (71-90 yrs) S/SH (JP): (71-90 yrs) S/SH (S): (81-100 yrs)	Old H/HS: (91-110 yrs) S/SH(JP): (91-110 yrs) S/SH (S): (101-120 yrs)	Very Old H/HS: (>110 yrs.) S/SH: (>120 yrs.)	Total Area (ha)
WSF	237	3,429	1,225	454	79	5,425
BSL	102	4,945	3,073	3,637	139	11,896
BSJ	38	2,248	217	399	371	3,274
JLP	12	3,423	210	160	192	3,998
PMW	19	990	115	24	146	1,293
SMW	1,040	3,891	1,974	1,060	164	8,128
HSM	1,005	5,071	1,115	1,261	599	9,052
HPM	28	932	268	10	67	1,304
TAB	7,121	64,246	4,670	2,594	671	79,302
AOH	138	7,092	358	99	6	7,693
Total	9,741	96,267	13,224	9,698	2,434	131,365

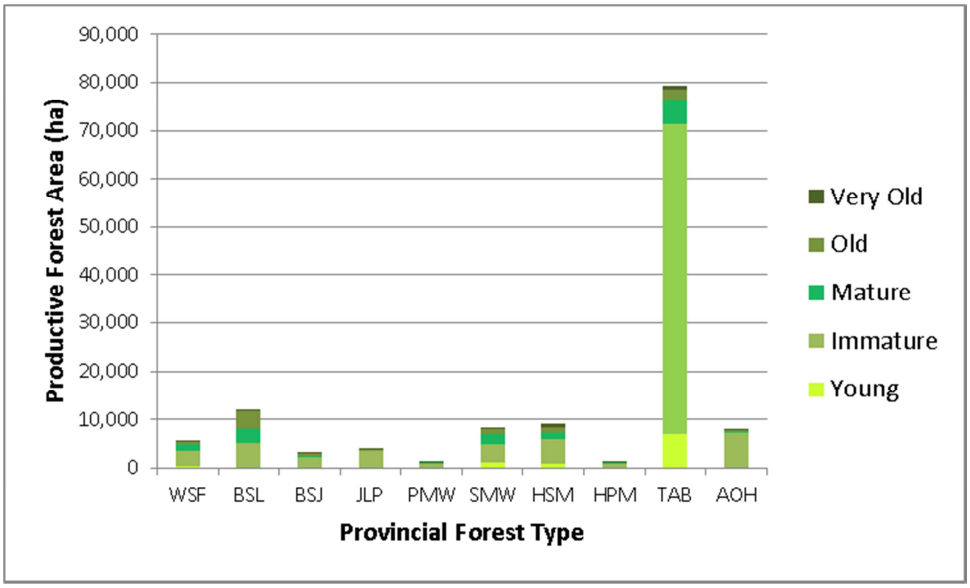

Figure 13 Productive Forest Area by PFT and Seral Stage

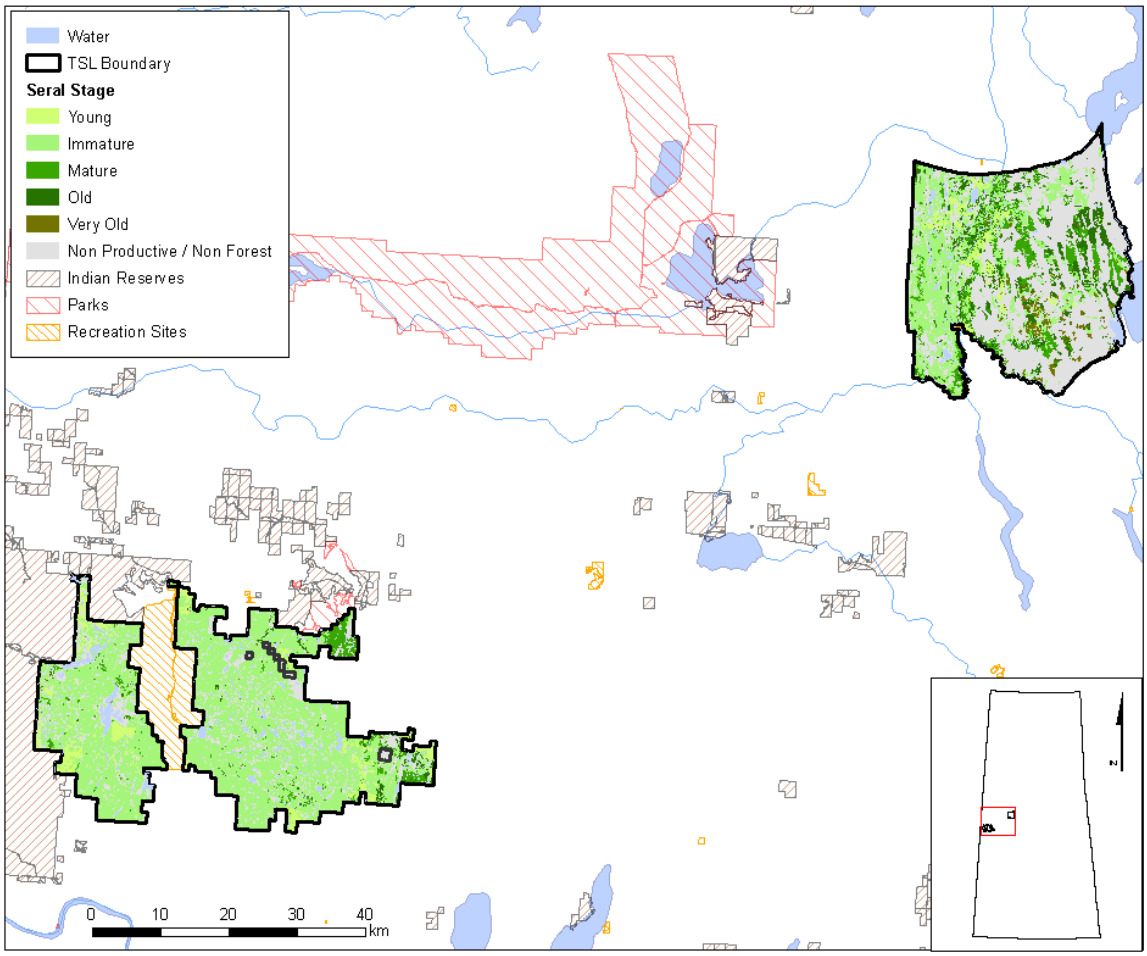

Figure 14 Productive Forest by Seral Stage in the MLOSB TSL

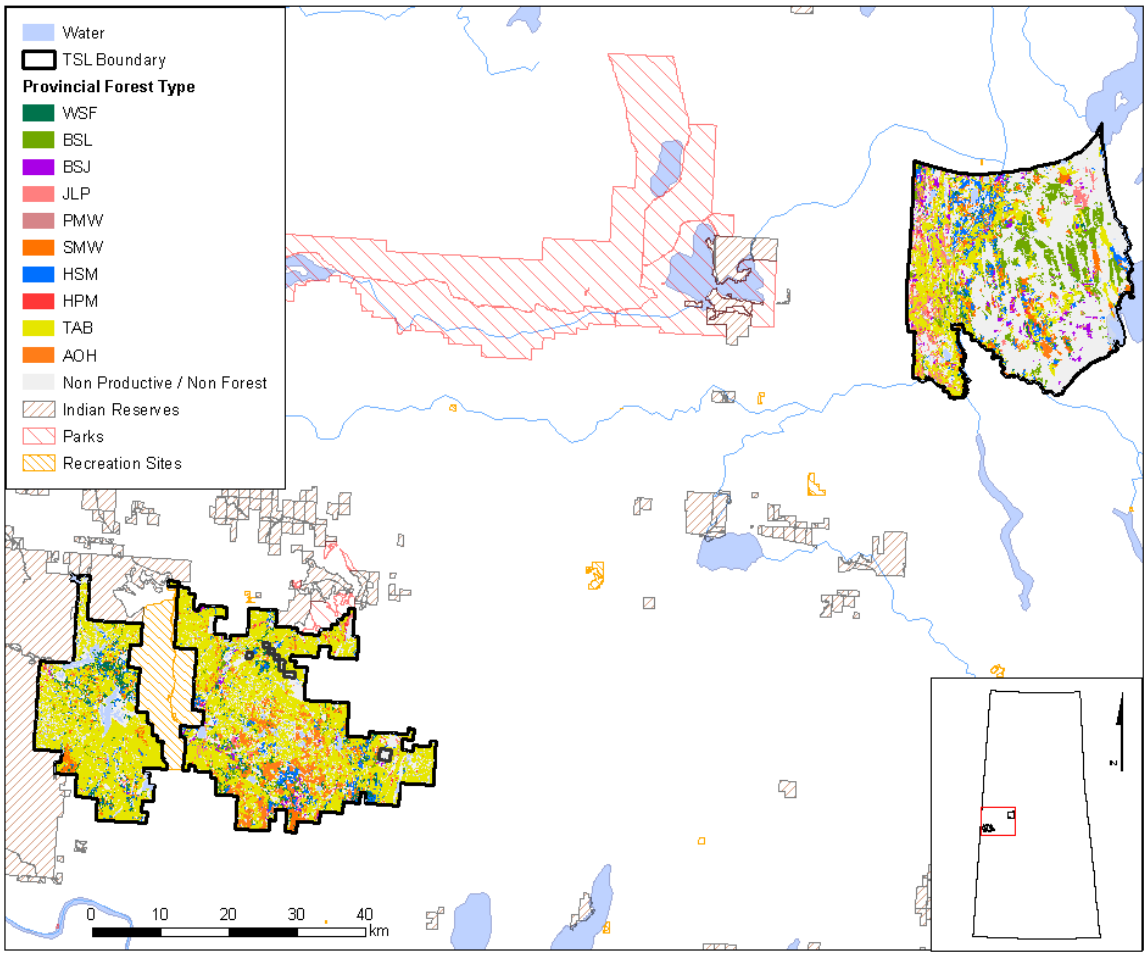

Figure 15 Productive Forest by Provincial Forest Type in the MLOSB TSL

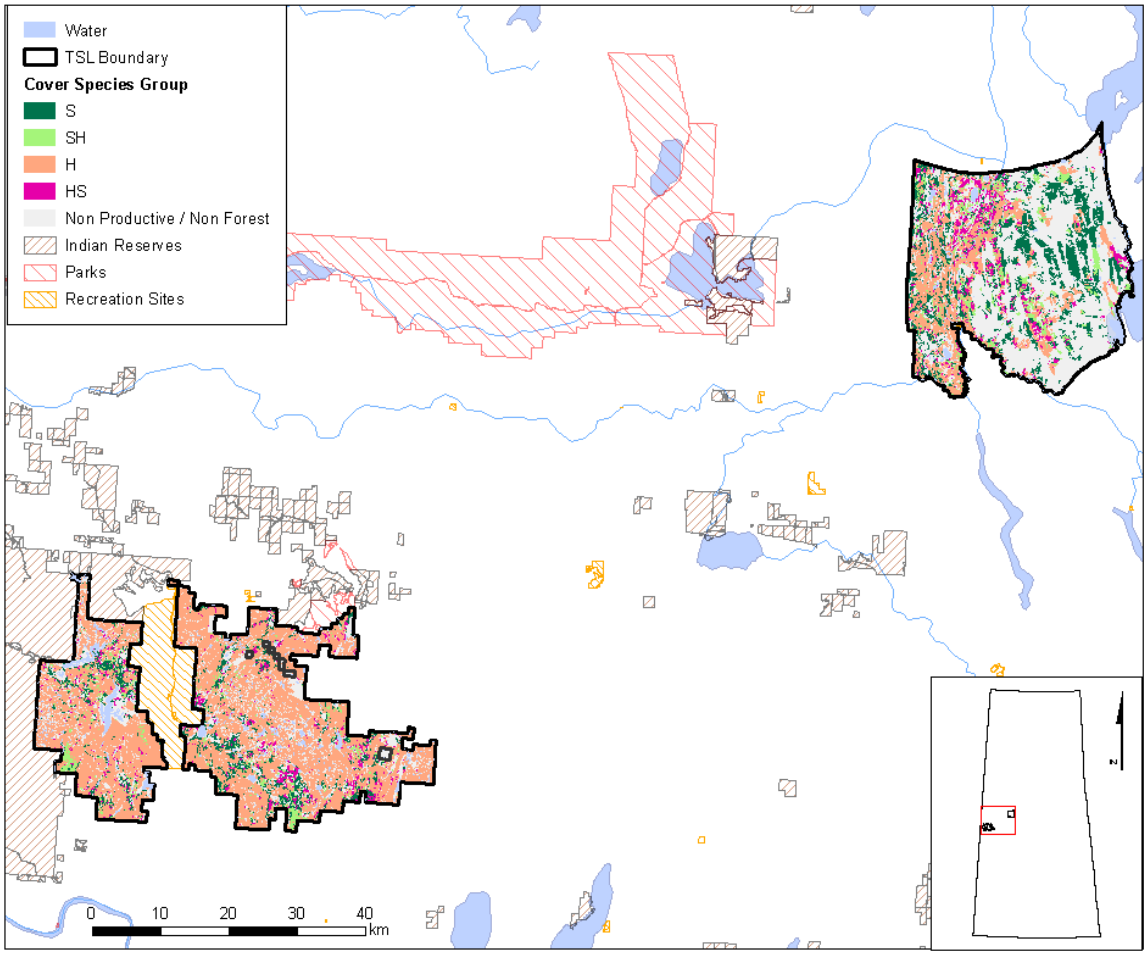

Figure 16 Productive Forest Area by Cover Species Group in the MLOSB TSL

3.11 Natural Disturbance

3.11.1 Fire

Natural disturbance plays a dominant role in the ecology of the TSL and fire is the primary natural disturbance agent affecting large amounts of forest each year. Available fire records for the MLOSB TSL (1985-2015) were obtained from the Ministry of Environment. Figure 17 shows the location of all known fires >= 100 hectares in size during this period and the spatial area covered on and adjacent to the MLOSB TSL. Members of the public have also indicated that fires occurred in 1919 and 1948 within the TSL boundaries.

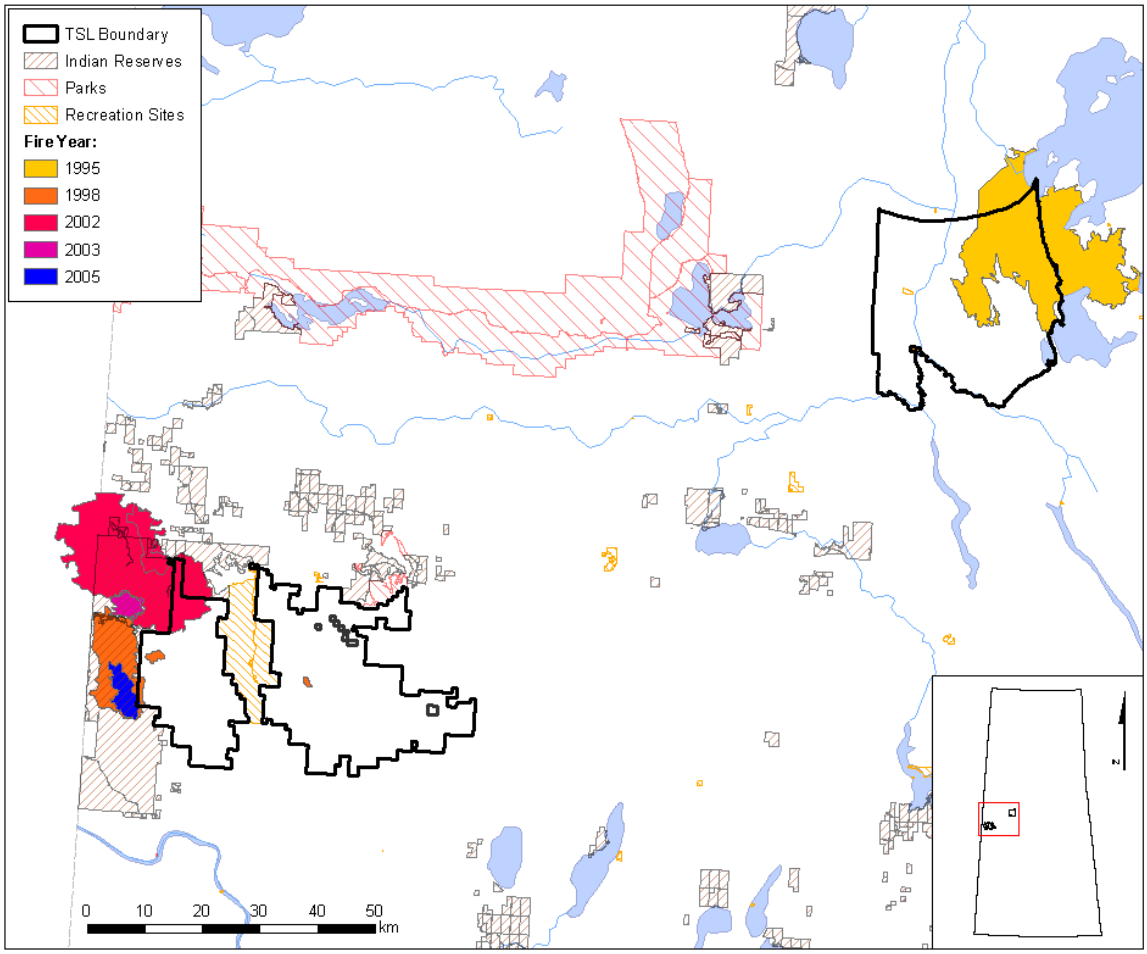

Figure 17 Location of fires greater than 100 ha from 1985 - 2015

Table 5 and Figure 18 summarize the areas disturbed for fires from 1985-2015 that are greater than 100 hectares. Over the the past seven years, only 48 hectares were burned by fires larger than 100 hectares (26 hectares of Immature TAB and 22 hectares of Mature TAB).

Table 5 Area Affected by Fires 1985 – 2015 (> 100 hectares)

PFT	Seral Stage	Area (ha)
BSJ	YOUNG	17
	IMMATURE	538
	MATURE	191
	OLD	252
	VERY OLD	67
	Total	***1,064***
BSL	YOUNG	3
	IMMATURE	310
	MATURE	1,511
	OLD	5,054
	VERY OLD	281
	Total	***7,158***
HPM	YOUNG	8
	IMMATURE	127
	MATURE	0
	OLD	6
	VERY OLD	0
	Total	***141***
HSM	YOUNG	9
	IMMATURE	223
	MATURE	37
	OLD	319
	VERY OLD	637
	Total	***1,224***
JLP	YOUNG	39
	IMMATURE	464
	MATURE	0
	OLD	5
	VERY OLD	1
	Total	***509***
PMW	YOUNG	0
	IMMATURE	137
	MATURE	0
	OLD	4
	VERY OLD	3
	Total	***144***
SMW	YOUNG	1
	IMMATURE	74
	MATURE	75
	OLD	518
	VERY OLD	75
	Total	***742***
TAB	YOUNG	90
	IMMATURE	2,819
	MATURE	541
	OLD	164
	VERY OLD	285
	Total	***3,898***
WSF	YOUNG	0
	IMMATURE	47
	MATURE	5
	OLD	144
	VERY OLD	10
	Total	***207***
Total		**15,087**

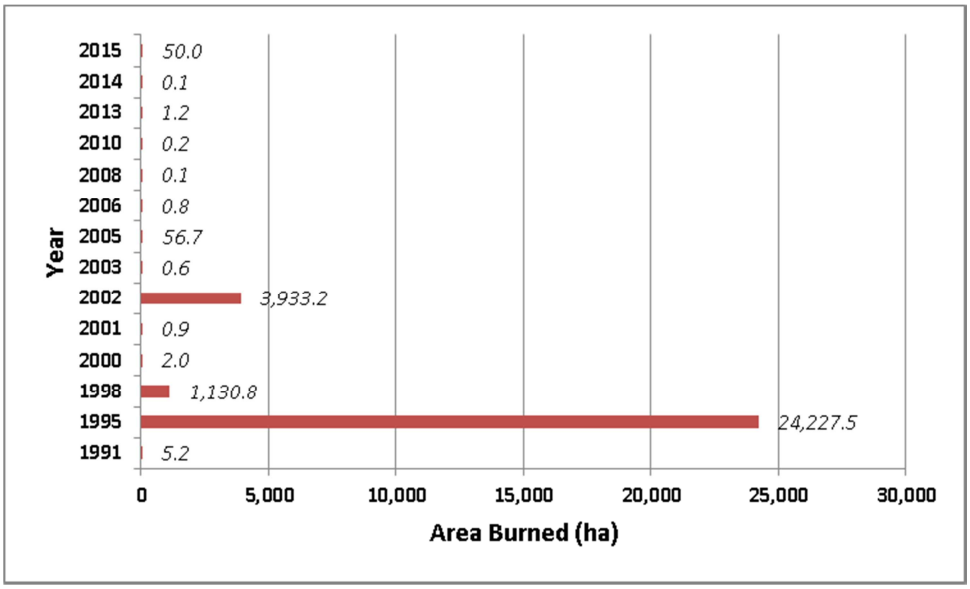

Figure 18 Annual Area Burned within the MLOSB TSL 1985-2015

Fire acts as a catalyst for stand renewal and is a key agent for the maintenance of forest health and vigor (Government of Saskatchewan, 2012) ; fire plays an important role in controlling insect and disease outbreaks within the forest. If left to die of old age, disease, or from insect damage, many forest stands will not be replaced by healthy, vigorous new growth. Instead, sparse, ecologically different stands can result and grass, scrubby brush and balsam fir will become more common.

Most plant and tree species in the boreal forest are adapted to regenerate following fire, creating even aged forest stands. Trembling aspen and white birch sprout back from their roots immediately after a fire. Jack pine and black spruce cones require heat to open. The heat of a fire opens the cones so that the seeds are released onto the newly burned forest floor. Softwood species depend on fire burning away much of the forest floor's organic (duff) layer so that their seeds can germinate on exposed mineral soil. White spruce regenerate from seed blown onto exposed soil by the wind from nearby unburned patches of forest. Furthermore, fire results in a pulse of nutrients being released from burned trees, shrubs and other organic materials which promote the growth of newly suckering and germinating seedlings in the first few years following a fire.

The fire analysis also examined the annual area burned and size distribution of fires. The area burned within the boundaries of the TSL by all fires is summarized in Figure 18. Table 6 summarizes the fire size information for all fires that intersect the boundary of the TSL. Note that this table includes the entire area of the fire rather than just the area within the TSL and is intended to give an indication of the fire size distribution for fires that occur in the vicinity of the TSL. The annual area burned shows a relationship with climate conditions – hot/dry years tend to have a larger burn area. Roughly fifty-five percent of fires are

less than 10 hectares in size, but fires greater than 100 hectares represent 99.9% of the total area burned by all fires.

Table 6 Fire size distribution of fires intersecting the TSL area (1985 -2015)

Fire Size (ha)	# of Known Fires	% of Known Fires	% of Area Burned
0.0 – 0.09	2	9.1	0.00
0.1 – 0.99	7	31.8	0.00
1.0 – 9.99	3	13.6	0.01
10.0 – 99.99	3	13.6	0.09
100.0 – 999.99	2	9.1	0.56
1,000.0 – 9,999.99	2	9.1	6.48
10,000.0 – 99,999.99	3	13.6	92.86

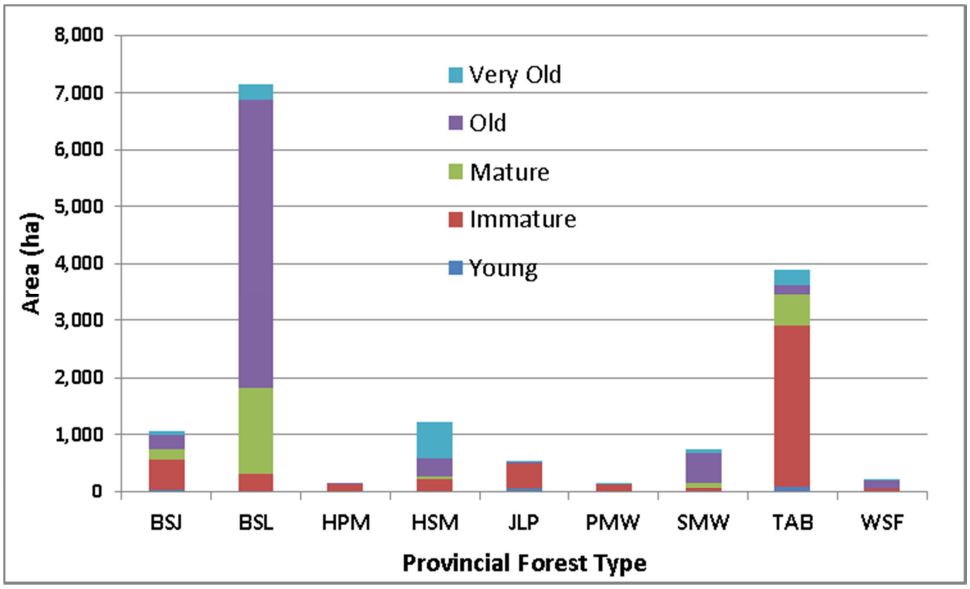

Figure 19 Area Disturbed from Fires > 100 ha by Provincial Forest Type and Seral Stage 1985-2015

Dr. David Andison has conducted detailed research on wildfire events within Saskatchewan forests to understand and quantify patterns of burning within individual fire events. His research focused on three topic areas: 1) Disturbance event patterns (Andison, 2005); 2) Island remnant patterns (Andison, 2006), and; 3) Event composition and spatial controls (Andison,2006). The key finding from each of the three areas in relation to the MLOSB TSL are summarized below:

- In general, wildfires in Saskatchewan create a single large contiguous disturbed patch, which may or may not have associated smaller patches. Disturbed patches become significantly more complex as they increase in size;

- The corridor matrix remnant (unburned vegetation between disturbed patches) area is absent from fire events smaller than 150 ha. In events larger than 150 ha, an average of 28% of the total area is in corridor matrix remnants;
- On average island remnants (areas with greater than 5% tree survival) account for 27% of the disturbed area, with a high degree of variability.
- Majority of burn and residual patterns can be captured by one of three parameters: soil moisture, topography or major vegetation type. Soil moisture is the simplest and most robust parameter; topography is simple, but highly correlated with soil moisture and more subjective to define, and; major vegetation type can be used to differentiate various burn and retention probabilities, but requires soil moisture – vegetation alone was less able to predict burn and retention probabilities.
- There is a large amount of pattern variation within disturbance events that cannot be predicted and is therefore a naturally occurring phenomenon.
- Forest type (softwood vs. hardwood) has no influence on the formation of remnant islands (partially disturbed) within an event. Hardwood areas are about twice as likely to be in matrix remnants (completely undisturbed areas) than pure softwood forests.
- Older forests had a higher burnt area and smaller matrix remnant than younger forests.
- The more complex land types (e.g. hilly) are more likely to burn and have smaller island remnants than the simpler land types (e.g. depression).
- The greater the canopy closure the higher the percentage of area burnt. Probability of burning generally increases with tree height.
- Multiple forest canopy types (two canopy layers) has an increased burn area compared to simple or complex (three or more layers) classes, and a lower area in island remnant.

Previous research suggests that the Saskatchewan boreal forest likely had a pre-1900 fire cycle of between 30 and 50 years (Thorpe, 1996). Dr. Andison broke this average down as follows: "If one assumes that the natural fire cycle is 50 years, the fire return interval for forested areas would be 47 years, 60 years for non-commercial forest, and 74 years for non-forested areas" (Andison, 2006). Based on the three parameters (i.e. vegetation class, soil moisture regime and topographic position) the forested, dry and hilly classes would have a more frequent fire return interval than the non-forest, wet and flat classes.

3.11.2 Windthrow & Flood

Abiotic factors are another factor that contribute to natural disturbance cycles. These have been relatively minor in the TSL. From 2008 to 2014, there were 167 hectares of windthrow and 110 hectares of flood damage to stands as summarized in Table 7, and shown spatially in Figure 20 and Figure 21.

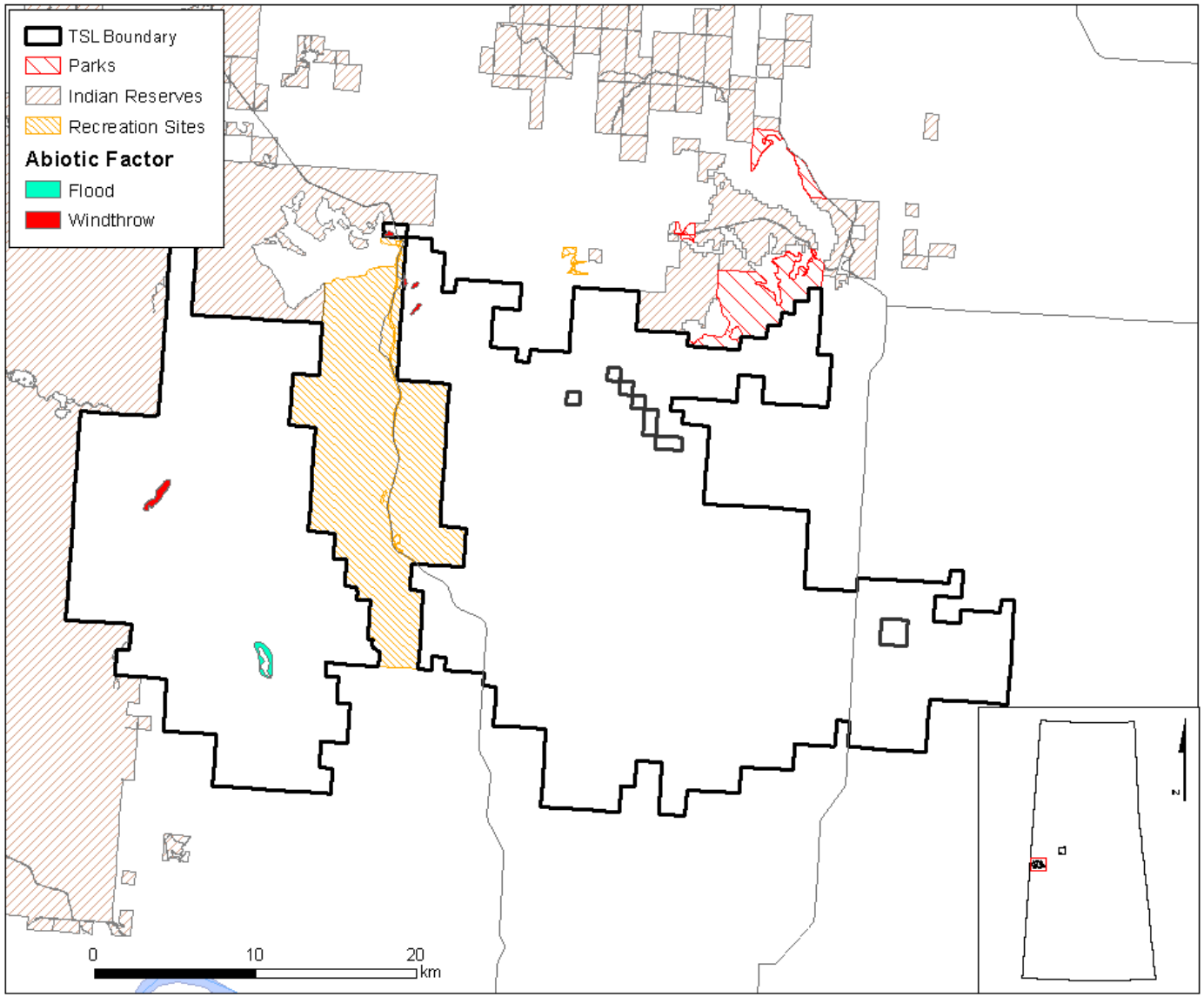

Figure 20 Abiotic Disturbances in the MLOSB TSL (Bronson/Makwa) from 2008-2014

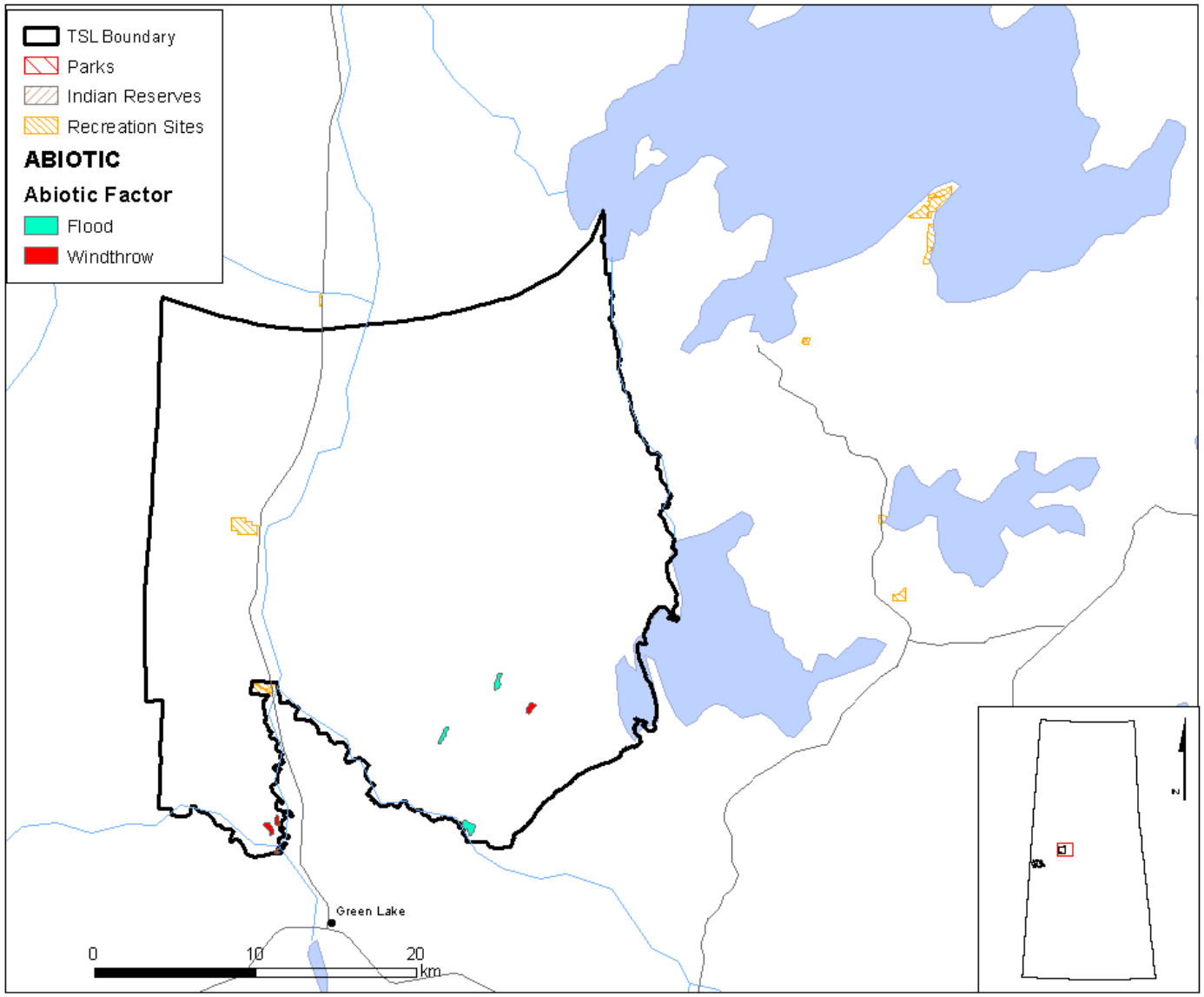

Figure 21 Abiotic Disturbances in the MLOSB TSL (Sled/Green Lake) from 2008-2014

Table 7 Area Affected by Abiotic Disturbances 2008 – 2014 (>2 ha)

		Area affected (hectares)		
PFT	**Seral Stage**	**Windthrow**	**Flood**	**Total**
AOH	YOUNG	0.0	0.0	0.0
	IMMATURE	1.4	0.0	1.4
	MATURE	1.2	0.0	1.2
	OLD	0.0	0.3	0.0
	VERY OLD	0.0	0.0	0.0
	Total	***2.6***	***0.3***	***2.9***
BSJ	YOUNG	0.0	0.0	0.0
	IMMATURE	0.0	0.0	0.0
	MATURE	0.0	0.8	0.8
	OLD	0.0	0.0	0.0
	VERY OLD	0.7	0.0	0.7
	Total	***0.7***	***0.8***	***1.5***
BSL	YOUNG	0.0	0.0	0.0
	IMMATURE	0.0	5.9	5.9
	MATURE	0.0	0.0	0.0
	OLD	0.0	0.0	0.0
	VERY OLD	0.5	0.0	0.5
	Total	***0.5***	***5.9***	***6.4***
HPM	YOUNG	0.0	0.0	0.0
	IMMATURE	0.7	0.0	0.7
	MATURE	0.0	0.0	0.0
	OLD	0.0	0.0	0.0
	VERY OLD	0.0	0.0	0.0
	Total	***0.7***	***0.0***	***0.7***
HSM	YOUNG	1.4	6.0	7.4
	IMMATURE	2.3	10.6	12.9
	MATURE	0.0	0.0	0.0
	OLD	0.0	0.0	0.0
	VERY OLD	0.0	0.0	0.0
	Total	***3.7***	***16.6***	***20.3***
JLP	YOUNG	0.0	0.0	0.0
	IMMATURE	0.0	0.0	0.0
	MATURE	0.0	0.0	0.0
	OLD	0.0	1.6	1.6
	VERY OLD	0.0	0.0	0.0
	Total	***0.0***	***1.6***	***1.6***
PMW	YOUNG	0.0	0.0	0.0
	IMMATURE	1.2	0.0	1.2
	MATURE	0.0	0.0	0.0
	OLD	0.0	0.0	0.0
	VERY OLD	0.0	0.0	0.0
	Total	***1.2***	***0.0***	***1.2***
SMW	YOUNG	0.0	0.0	0.0
	IMMATURE	5.5	0.4	5.9
	MATURE	0.0	0.0	0.0
	OLD	0.0	1.3	1.3
	VERY OLD	0.0	0.0	0.0
	Total	***5.5***	***1.7***	***7.2***
TAB	YOUNG	1.5	4.7	6.2
	IMMATURE	116.4	54.1	170.5
	MATURE	19.9	0.0	19.9
	OLD	14.4	4.4	18.8
	VERY OLD	0.0	11.8	11.8
	Total	*152.2*	*75.0*	*227.2*
WSF	YOUNG	0.0	0.0	0.0
	IMMATURE	0.0	2.4	2.4
	MATURE	0.0	0.5	0.5
	OLD	0.0	5.3	5.3
	VERY OLD	0.0	0.0	0.0
	Total	**0.0**	**8.2**	**8.2**
Total		**167.1**	**110.2**	**277.4**

3.11.3 Insects and Disease

Table 8 summarizes insect and disease information obtained from the Forest Service for 2008 to 2014, and the spatial location is depicted in Figure 22 and Figure 23. Hardwood defoliators (forest tent caterpillar and/or large aspen tortrix) are the main insect pests, affecting almost 6,900 hectares during the period. Forest tent caterpillar outbreaks tend to occur at intervals of six to 16 years, and can result in light thinning of foliate to complete defoliation. Trees that are completely defoliated will produce a second set of leaves. Control of forest tent caterpillar outbreaks in commercial forests is not considered necessary since widespread tree mortality does not occur.

Large aspen tortrix outbreaks are common in Saskatchewan and usually last two to three years and then suddenly collapse. Outbreaks have often been in association with infestations of forest tent caterpillars. Defoliation by the large aspen tortrix causes growth reduction in trees, but tree mortality is rare. As a result, large-scale control has not been considered necessary.

Other insect damage was minor, and included eastern larch bark beetle (200 hectares) and spruce budworm (140 hectares). Eastern larch beetle occurs in tamarack, commonly in stems that have been compromised by a previous infestation or other environmental factor. Outbreaks of the spruce budworm commonly result in stem defoliation, reducing growth and often resulting in mortality.

Diseases included aspen leaf spot disease (350 hectares) and spruce needle rust (17,500 hectares). Spruce needle rust causes rust on the current year's needles and results in varying degrees of defoliation. The presence of Labrador tea helps sustain the life of the fungus.

3.11.4 Links to Forest Management

Much of the natural forest present on the MLOSB TSL today was initiated by fire. The protection of forest resources through fire suppression alters the natural disturbance regime of these forests. To some degree natural disturbance patterns can be emulated through strategic landscape planning by creating a natural range of harvest opening sizes and appropriate levels of stand retention. Harvest openings cannot entirely replicate the character of fire disturbances; conversely wildfire cannot be eliminated, so collectively these disturbances may capture reasonably well many of the ecological processes observed across the broader landscape.

Diversity of native species is more likely to be conserved over the long-term if natural patterns and processes are emulated in forest management. As the climate changes, in particular warmer temperatures and shifts in seasonal precipitation, the fire return interval and disease and insect outbreak will be altered and may need to be considered in future planning.

To some degree the impact of wildfires, blowdown and other damaging agents can be minimized by salvaging merchantable timber in the impacted areas. Implementing salvaging operations may also improve overall utilization and provide opportunities for more prompt and improved regeneration programs. Although salvaging timber is not always feasible, opportunities for timber salvage operations will be explored where operationally and economically feasible.

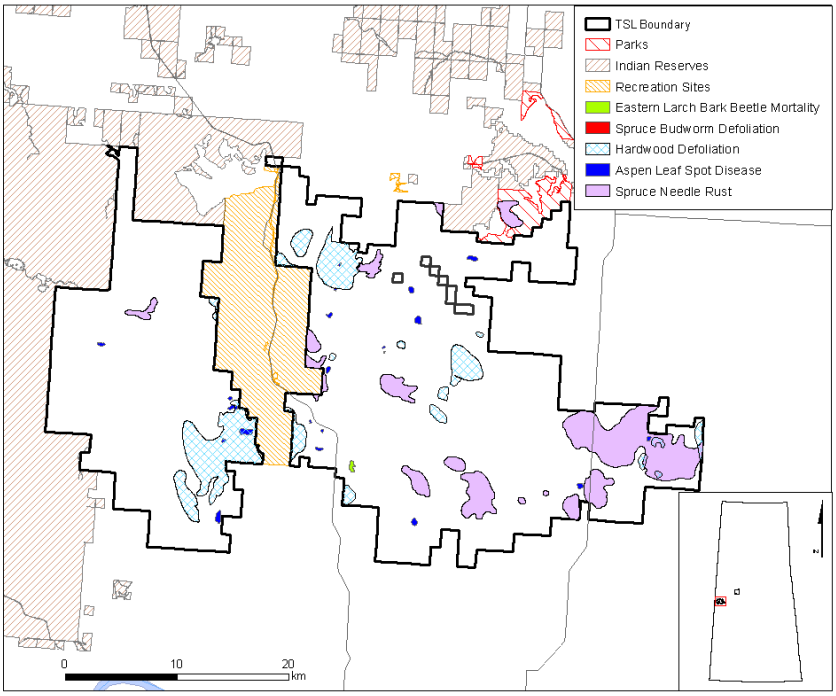

Figure 22 Insects and Disease in the MLOSB TSL (Bronson/Makwa) from 2008 to 2014

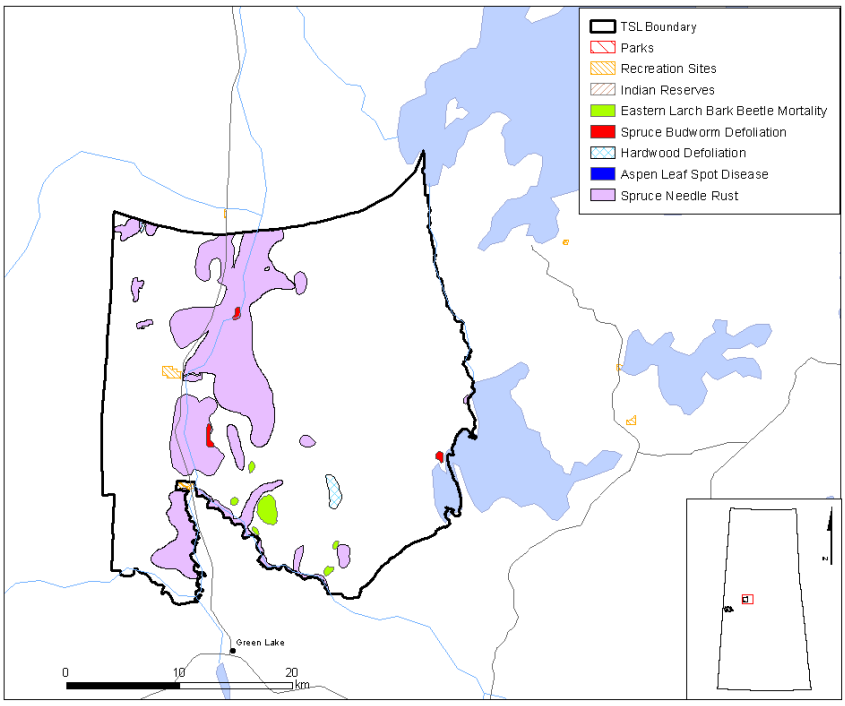

Figure 23 Insects and Disease in the MLOSB TSL (Sled/Green Lake) from 2008 to 2014

Table 8 Area Affected by Insects and Disease 2008 – 2014 (>2 ha)

PFT	Seral Stage	Area affected (hectares) Spruce Budworm	Hardwood Defoliation	Eastern Larch Bark Beetle	Aspen Leaf Spot Disease	Spruce Needle Rust	Total
AOH	YOUNG	0.0	17.9	0.0	0.0	52.1	70.0
	IMMATURE	0.0	197.7	0.0	32.2	263.8	493.7
	MATURE	0.0	0.0	0.1	0.0	9.3	9.4
	OLD	0.0	0.0	0.0	0.0	0.0	0.0
	VERY OLD	0.0	0.0	0.0	0.0	0.0	0.0
	Total	***0.0***	***215.6***	***0.1***	***32.2***	***325.2***	***573.1***
BSJ	YOUNG	0.0	0.0	0.0	0.0	20.6	20.6
	IMMATURE	0.0	0.8	0.0	2.5	356.0	359.3
	MATURE	0.0	0.0	0.0	0.0	11.6	11.6
	OLD	0.0	0.0	0.0	0.0	102.0	102.0
	VERY OLD	0.0	0.0	0.0	0.0	20.8	20.8
	Total	***0.0***	***0.8***	***0.0***	***2.5***	***511.0***	***514.3***
BSL	YOUNG	0.0	0.0	0.0	0.0	37.1	37.1
	IMMATURE	0.0	54.5	64.9	0.0	708.9	828.3
	MATURE	0.0	0.0	36.1	0.0	147.0	183.1
	OLD	9.1	0.0	6.6	0.0	556.4	572.1
	VERY OLD	0.0	0.0	9.1	0.0	0.3	9.4
	Total	***9.1***	***54.5***	***116.7***	***0.0***	***1,449.7***	***1,630.0***
HPM	YOUNG	0.0	0.0	0.0	0.0	3.4	3.4
	IMMATURE	0.0	1.1	0.0	0.0	133.6	134.7
	MATURE	0.0	0.0	0.0	0.0	16.7	16.7
	OLD	0.0	0.0	0.0	0.0	5.2	5.2
	VERY OLD	0.0	0.0	0.0	0.0	0.0	0.0
	Total	***0.0***	***1.1***	***0.0***	***0.0***	***158.9***	***160.0***
HSM	YOUNG	0.0	9.0	0.0	0.0	357.3	366.3
	IMMATURE	3.5	158.7	1.1	13.9	1,370.6	1,547.8
	MATURE	7.3	23.1	0.0	0.0	548.6	579.0
	OLD	9.8	2.6	1.3	0.0	840.8	854.5
	VERY OLD	5.3	35.3	0.0	0.0	81.7	122.3
	Total	***25.9***	***228.7***	***2.4***	***13.9***	***3,199.0***	***3,469.9***
JLP	YOUNG	0.0	0.0	0.0	0.0	0.5	0.5
	IMMATURE	0.0	9.9	28.8	0.3	238.9	277.9
	MATURE	0.0	0.0	0.6	0.0	6.8	7.4
	OLD	0.0	0.0	0.0	0.0	37.4	37.4
	VERY OLD	14.3	0.0	0.0	0.0	33.9	48.2
	Total	***14.3***	***9.9***	***29.4***	***0.3***	***317.5***	***371.4***
PMW	YOUNG	0.0	0.0	0.0	0.0	0.0	0.0
	IMMATURE	0.0	0.0	0.0	0.0	131.9	131.9
	MATURE	0.0	0.0	0.0	0.0	2.2	2.2
	OLD	0.0	0.0	0.0	0.0	0.0	0.0
	VERY OLD	4.2	0.0	0.0	0.0	22.5	26.7
	Total	***4.2***	***0.0***	***0.0***	***0.0***	***156.6***	***160.8***
SMW	YOUNG	0.0	1.7	0.0	0.0	92.6	94.3
	IMMATURE	0.1	184.9	0.0	5.1	778.6	968.7
	MATURE	2.2	34.1	0.0	2.5	906.4	945.2
	OLD	20.1	0.0	3.0	0.0	297.6	320.7
	VERY OLD	13.4	3.5	0.0	0.0	23.9	40.8
	Total	***35.8***	***224.2***	***3.0***	***7.6***	***2,099.1***	***2,369.7***
TAB	YOUNG	12.1	82.0	0.0	0.0	1,199.8	1,293.9
	IMMATURE	24.2	5,803.9	28.3	267.4	4,874.8	10,998.6
	MATURE	0.3	127.6	3.5	1.6	941.2	1,074.2
	OLD	5.8	26.5	3.4	0.7	955.8	992.2
	VERY OLD	0.0	29.1	0.0	0.0	184.9	214.0
	Total	***42.4***	***6,069.1***	***35.2***	***269.7***	***8,156.5***	***14,572.9***
WSF	YOUNG	0.0	0.0	0.0	0.0	60.4	60.4
	IMMATURE	0.0	84.4	10.6	17.8	515.6	628.4
	MATURE	5.0	6.9	0.5	3.6	402.8	418.8
	OLD	0.0	0.0	0.4	0.1	104.6	105.1
	VERY OLD	0.0	0.0	0.0	0.0	0.0	0.0
	Total	**5.0**	**91.3**	**11.5**	**21.5**	**1,083.4**	**1,212.7**
Total		**136.7**	**6,895.2**	**198.3**	**347.7**	**17,456.9**	**25,034.8**

4.0 Other Land Uses and Values

4.1 Traditional Land Use

No Traditional Use Studies have been conducted within the MLOSB TSL.

4.2 Hunting and Trapping

Trapping and trading for furs was the first commercial activity in the MLOSB TSL. Over the years, significant changes have occurred in the regulation of trapping and in the role and importance of trapping to the economy of the aboriginal people in northern Saskatchewan.

There are currently seven individual Fur Conservation Areas (FCAs) within the TSL which are contained within the Northern Fur Conservation Block (Figure 24). FCAs are typically associated with nearby communities and managed through the Northern Saskatchewan Trappers Association. Fur licenses are granted to registered members to trap in a portion of their local FCA.

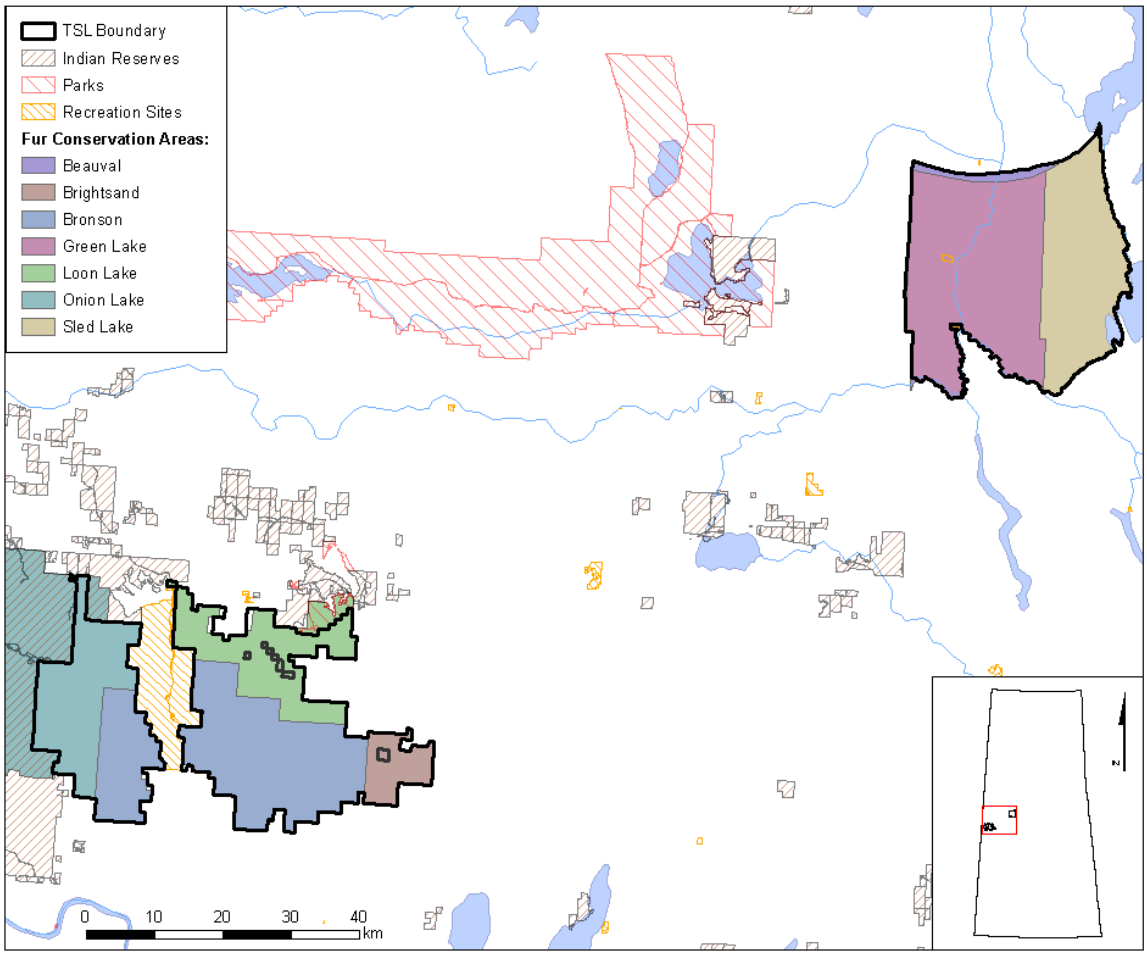

Figure 24 Fur Conservation Areas within the MLOSB TSL

A diverse species mix of animals are hunted and trapped in the MLOSB TSL (Table 9) with estimated province wide revenue of $40 million generated from outfitting in 2006 (Saskatchewan Ministry of Environment Fish and Wildlife Branch, 2015). A further $1 to $ 6 million is generated from the sale of pelts annually across the province.

Table 9 Species Hunted and Trapped in the MLOSB TSL

Big Game	Birds	Furbearers	
White Tail Deer	Ruffed grouse	Bear	Muskrat
Elk	Spruce Grouse	Beaver	Otter
Moose	Willow Ptarmigan	Bobcat	Raccoon
Black Bear	Geese: All Species	Coyote	Skunk
	Ducks: All Species	Fisher	Squirrel
	American Coot	Fox	Weasel
	Wilson's Snipe	Lynx	Wolf
		Marten	Wolverine
		Mink	

Adapted from Saskatchewan Wildlife Management Report 2013-2014, MOE Fish and Wildlife Branch, October 2015

The future of the trapping industry depends heavily on fur prices and access to European, and more recently, Chinese markets. If fur prices continue to be low, then trapping activity will be low. If there is a renewed interest in fur coats and other fur products, rising prices could rejuvenate the industry and increase trapping levels.

A small amount of cultural / recreational trapping may also occur on the TSL area, with the animals trapped for food and fur. This activity could increase in the future as younger generations of aboriginal people take up this activity to restore their cultural identity and enjoy the outdoors.

Subsistence hunting is widely practiced by Aboriginal communities in northern Saskatchewan. The main species hunted for sustenance meat is moose but also harvested to a lesser extent is bear, deer, waterfowl, grouse and snowshoe hare. Since Aboriginal hunting is an unregulated activity, the data on the number of hunters and harvest levels is not available.

There are approximately 625 Licenced hunting outfitters in Saskatchewan with up to 16 operating exclusively within the MLOSB TSL (see Figure 25 and **Figure 26** for outfitter zones). Commercial outfitters are an important employer and revenue generator within the region.

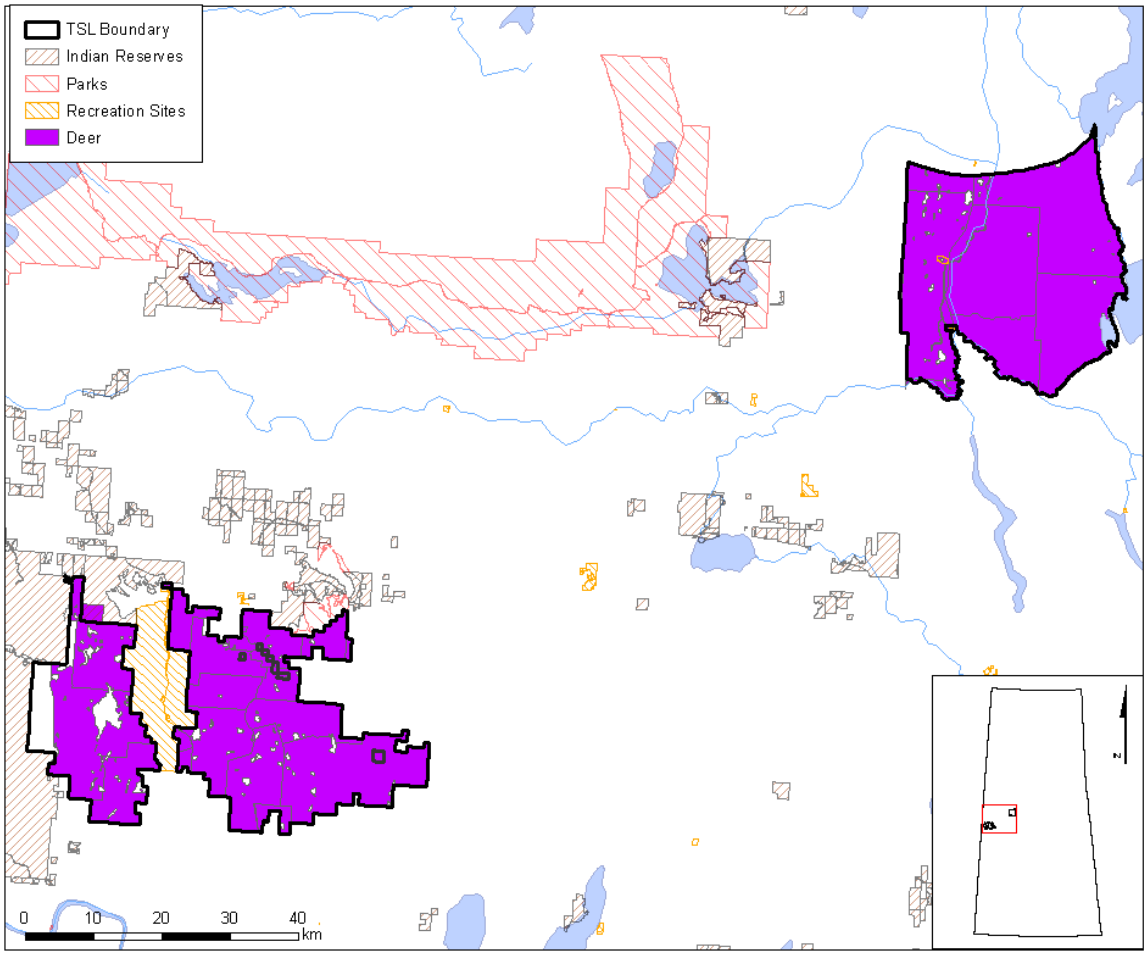

Figure 25 Outfitter boundaries in the MLOSB TSL for white-tail deer

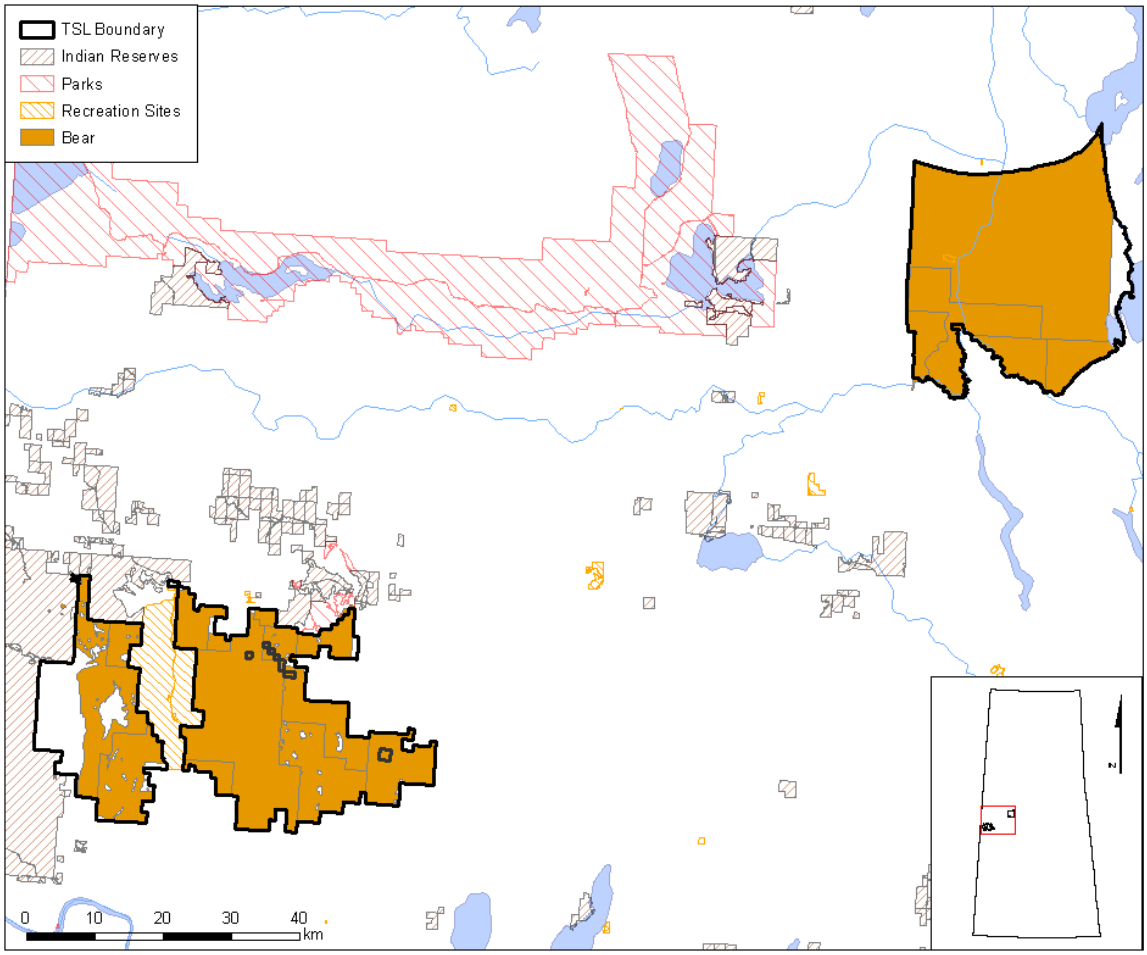

Figure 26 Outfitter boundaries in the MLOSB TSL for bear

Sport hunting is open to both Canadian and non-resident hunters with limits, season and other restrictions set by the Ministry of Environment. Wildlife Management Zones 66, 67, 68S and 69 cover the MLOSB TSL.

Wildlife populations in the southern boreal forest grew steadily from the mid-1990's onwards due to a series of mild winters, which peaked in the mid-2000s. Some winter mortality occurred in 2004 – 2007, however between 2007 and 2010 several consecutive mild winters allowed populations in the forest to recover until a particularly harsh winter in 2010/2011 set population recovery back.

4.3 Archaeological, Cultural and Heritage Sites

Archaeological heritage sites consist of archaeological and historic sites recognized under the Heritage Property Act, which provides for the preservation, interpretation and development of heritage property in Saskatchewan. In the TSL, there are 32 archaeological sites known to the Heritage Conservation Branch of the Ministry of Parks, Culture and Sport. Of these, six are burial locations and one is a petroglyph, or a stone with carvings incised onto it. The burial locations and petroglyph are all considered Sites of a Special

Nature (SSN), which are given special protection under the Heritage Property Act due to their cultural significance (Thompson, 2016).

Cultural sites consist of sites identified by local Aboriginal groups that have traditional and cultural importance. These sites include, but are not limited to, burial sites, ceremonial grounds, and sacred sites.

The Ministry of Parks, Culture and Sport plays an important role to ensure that irreplaceable and non-renewable heritage is protected and preserved. These heritage resources contribute to our understanding and appreciation of Saskatchewan's past, its people and its culture. Through careful and sensitive management, our heritage will continue to provide educational, social and economic benefits to present and future generations (Saskatchewan Ministry of Parks, Culture and Sport, 2016).

The Heritage Property Act of Saskatchewan broadly defines heritage property as:

- Archaeological objects;
- Paleontological objects; and,
- Any property of interest for its architectural, historical, cultural, environmental, archaeological, paleontological, aesthetic or scientific value.

In Saskatchewan, the main heritage resources that have been traditionally recognized, and are actively managed and regulated, include:

- Archaeological heritage sites and objects reflecting First Nations and later Euro-Canadian settlement and use of land;
- Paleontological heritage sites and objects, including dinosaur fossil localities and stratotypes and,
- Built heritage properties and structures of historical and architectural importance.

Other types of heritage locations are only now being recognized as heritage resources. These include:

- "traditional cultural properties" (associated with the cultural practices and beliefs of a living community, and are central to the cultural and historical identity of that community); and
- "Cultural heritage landscapes" (geographical areas that have been modified or influenced or give special cultural meaning by people)

While there have not been any specific heritage locations identified within the boundaries of the TSL, there are four locations in the vicinity, as follows:

- Steele Narrows (approximately 3 km north)
- St. Joseph Roman Catholic Church (Loon Lake, approximately 1 km east)
- Frenchman Butte (approximately 10 km south)
- Fort Pitt (approximately 17 km south)

4.4 Recreational Activities

The MLOSB TSL is adjacent to a provincial park at Makwa Lake, which includes amenities such as a campground, golf course, extensive trail networks, and access to water-based recreational activities (Figure 27). The large Bronson Forest Recreation Site separates the Bronson and Makwa TSL units, and two small recreation sites are located in the Green Lake / Sled parcel. Recreation within the remainder of the TSL is in the road-accessible areas around lakes adjacent to local communities. There are also several cabin dispositions assigned within the TSL (Figure 32), and numerous recreation trails exist within the Bronson/Makwa TSL units.

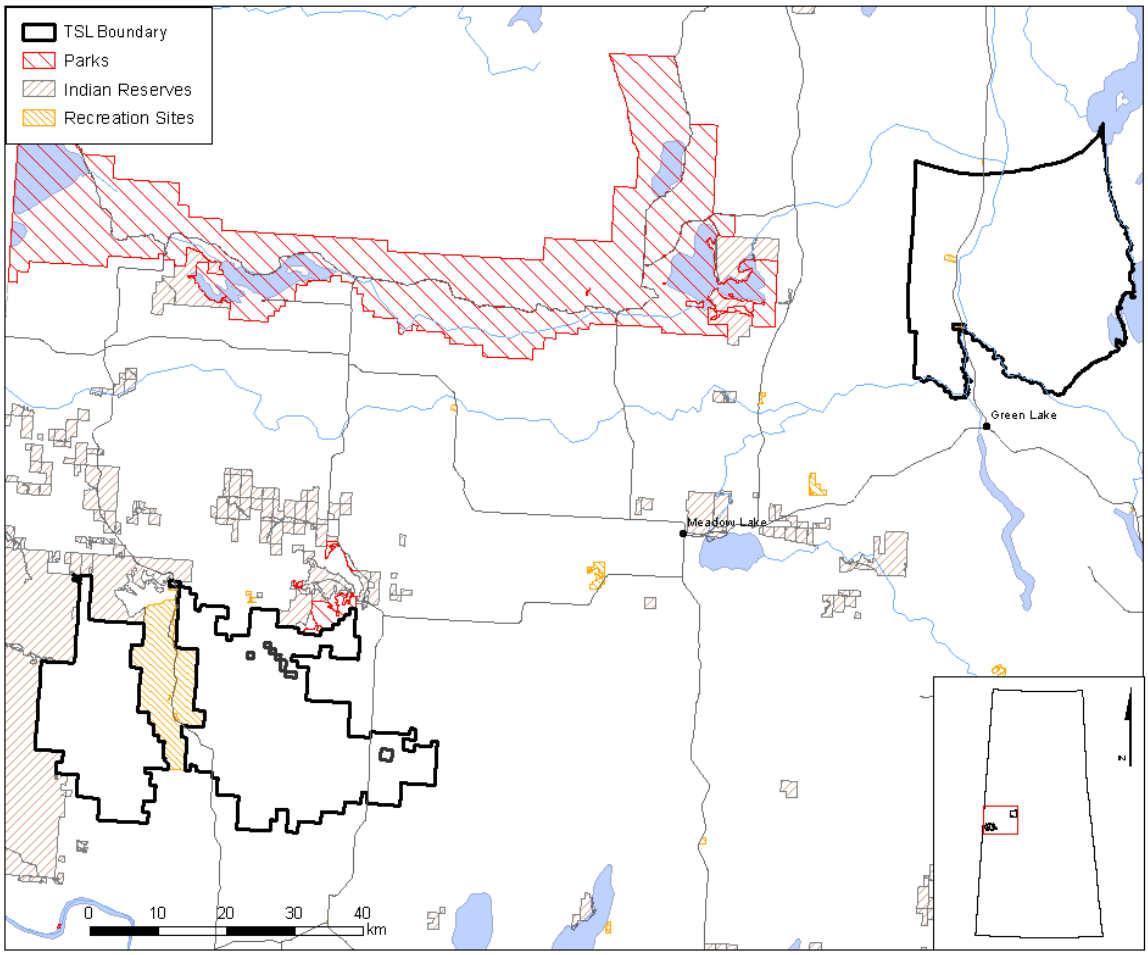

Figure 27 Recreation areas within the MLOSB

4.5 Visually Sensitive Areas

Visual sensitive areas within the MLOSB TSL have not been formally identified. Meadow Lake OSB's intent is to apply visual quality objectives in areas adjacent to highways, recreational lakes and other important viewscapes through consultation with the Public Advisory Group and stakeholders where appropriate.

4.6 Species at Risk

In Saskatchewan, the Wildlife Act, the Wild Species at Risk Regulations and the federal Species at Risk Act (SARA) provide the mechanisms for both protecting wildlife and species at risk. The intent of the legislation is to prevent native species from becoming extirpated or extinct, to provide for the recovery of extirpated, endangered or threatened species, and to encourage the management of other species to prevent them from becoming threatened or endangered.

Within the MLOSB TSL, there are a number of species that are identified as "at risk" by the Species at Risk Act (SARA). These species are summarized in Table 10, and were identified using data obtained from the provincial Conservation Data Centre (CDC) filtered for the relevant ecoregions / landscape areas. The Subnational Rankings from the CDC data are also included, which indicates that many of the species are not considered at risk at the local level.

Although Whooping Crane and Long-billed Curlew have a subnational rank of S3 or higher, they are waterbirds and not expected to be impacted by forestry operations.

The woodland caribou is the species of primary concern in the TSL. The federal government has developed a recovery strategy (2012) and the province of Saskatchewan is currently preparing a range plan for this species. Meadow Lake OSB is working with the province to determine a management strategy that can be implemented in the MLOSB TSL in the near term while the range is being developed. This interim approach will need to be revised, as required, once the Woodland Caribou Range plan is made available.

Table 10 Species at Risk (MLOSB TSL)

	Common Name	Scientific Name	COSEWIC STATUS	Schedule	SARA Status	Sub-national Rank
Mammals	Plains Grizzly Bear	*Ursus arctos horribilis*	NA	1	XT	SX
	Woodland Caribou	*Rangifer tarandus caribou*	T	1	T	S3
Birds	Bank Swallow	*Riparia riparia*	T			S5BS5M
	Barn Swallow	*Hirundo rustica*	T			S5BS5M
	Canada Warbler	*Wilsonia canadensis*	T	1	T	S5B
	Common Nighthawk	*Chordeiles minor*	T	1	T	S4S5BS4S5M
	Horned Grebe	*Podiceps auritus*	SC			S5B
	Long-billed Curlew	*Numenius americanus*	SC	1	SC	S3BS4M
	Olive-sided Flycatcher	*Contopus cooperi*	T	1	T	S4BS4M
	Red-necked Phalarope	*Phalaropus lobatus*	SC			S4BS3M
	Rusty Blackbird	*Euphagus carolinus*	SC	1	SC	S4B
	Western Grebe	*Aechmophorus occidentalis*	SC			S5B
	Whooping Crane	*Grus americana*	E	1	E	SXBS1M

The following definitions in the above table are used by COSEWIC and SARA:

Extirpated (XT)	A wildlife species no longer existing in the wild in Canada, but occurring elsewhere.
Endangered (E)	A wildlife species facing imminent extirpation or extinction.
Threatened (T)	A wildlife species likely to become endangered if limiting factors are not reversed.

Subnational rank definitions in the above table:

SX	Believed to be extinct or extirpated
SXBS1M	Extirpated (breeding population), Critically Imperiled/Extremely rare (transient population)
S3	Vulnerable/Rare to uncommon
S3BS4M	Vulnerable/Rare to uncommon (breeding population), Apparently Secure (transient population)
S4BS3M	Apparently Secure (breeding population), Vulnerable/Rare to uncommon (transient population)
S4B	Apparently Secure (breeding population)
S4BS4M	Apparently Secure (breeding population), Apparently Secure (transient populatin)
S5B	Secure/Common (breeding population)
S5BS5M	Secure/Common (breeding population), Secure/Common (transient population)
S4S5BS4S5M	Apparently Secure, Secure/Common(breeding population), Apparently Secure (transient population)

4.6.1 Woodland Caribou Recovery Strategy

The Committee of the Status of Endangered Wildlife in Canada (COSEWIC) classified the Boreal Woodland Caribou as a "threatened" species in 2002 under the Species at Risk Act (SARA). As a result of this classification, Environment Canada began working on a recovery strategy for the Boreal Woodland Caribou, and then released its "Proposed Recovery Strategy for the Woodland Caribou, Boreal Population, in Canada" on August 26, 2011 and a Final Recovery Strategy document in 2012. (Environment Canada, 2012). Saskatchewan's Ministry of Environment put a Woodland Caribou Management Team in place in 2002 that has been working to develop and refine recovery strategies since that time. They are currently working to deliver a provincial strategy (habitat zone maps and management guidance) in response to the federal government's 2012 Recovery Strategy that did not yet have herd trend data for Saskatchewan and some other provinces.

The federal document indicates that there are two caribou ranges in Saskatchewan. The southern (Boreal Plain) range is identified as being 'As Likely As Not' to have self-sustaining populations, while the northern (Boreal Shield) range's ability to sustain a Caribou population is unknown due to a lack of data (Figure 28). The northern portion of the MLOSB TSL is almost entirely in the Southern Range (SK2).

Caribou habitat suitability based on ecosite has been completed by the government, and generally applies to stands that are 50 years and older, as shown in Figure 29. Ratings of Moderate and High are considered important for providing forage, refuge and calving habitat.

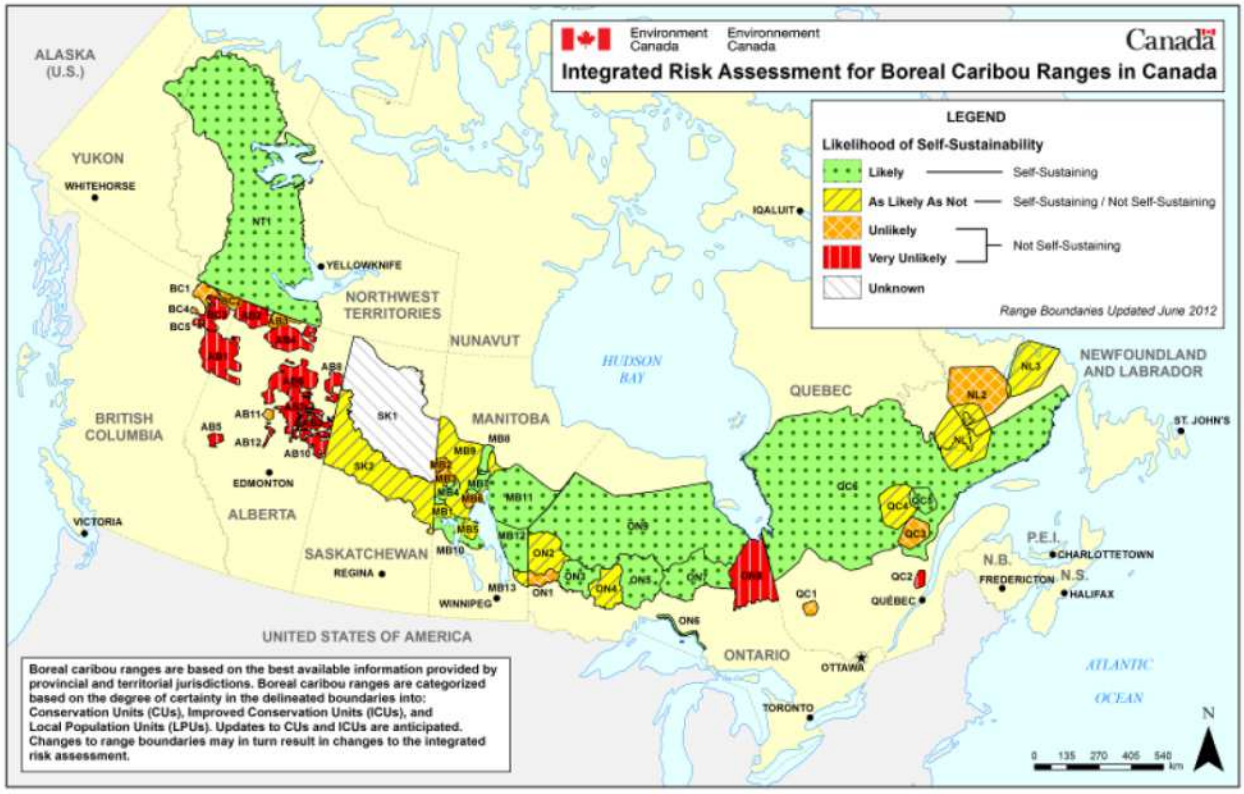

Figure 28 Boreal Caribou Distribution and Status (2012 Federal Recovery Strategy)

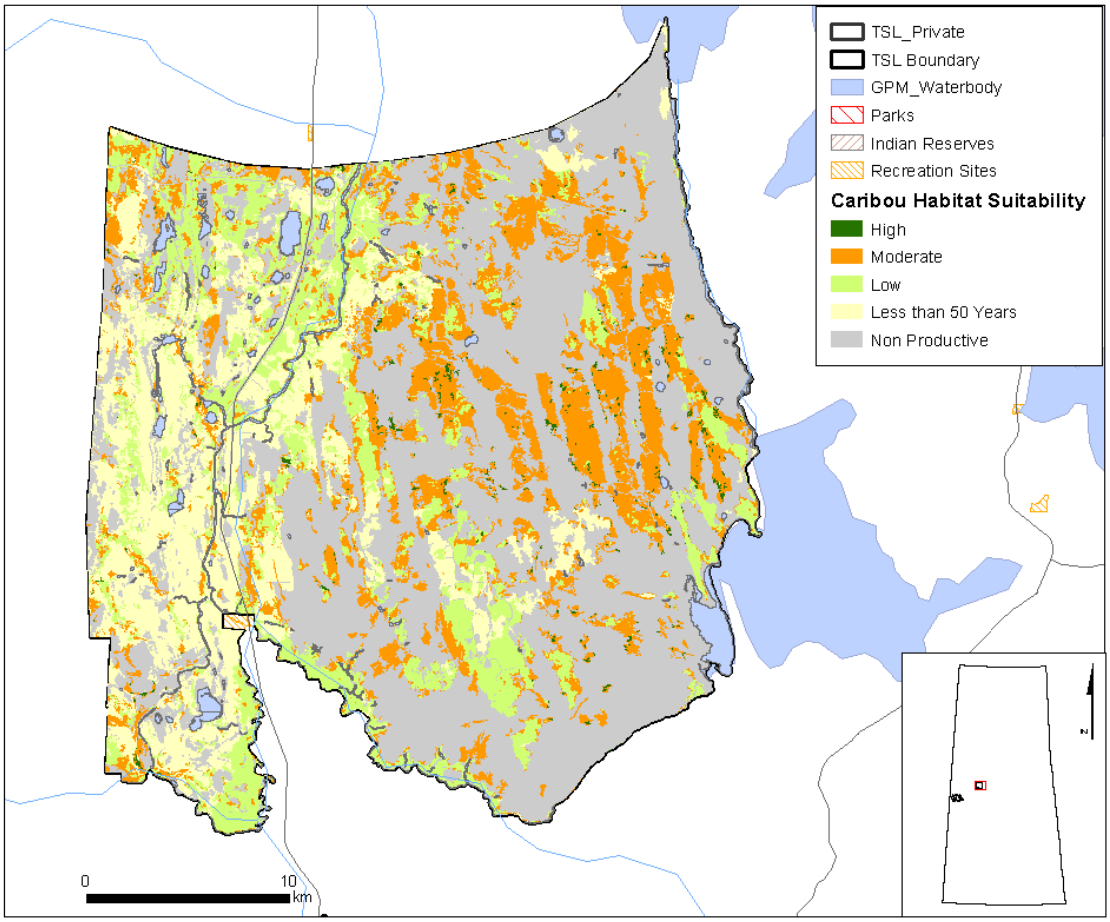

Figure 29 Caribou Habitat Suitability in the MLOSB TSL

4.7 Wildlife

The TSL's forested land, water, plants and ecological processes provide habitat for an array of wildlife species. Common wildlife species found in the TSL include moose, woodland caribou, white-tailed deer, mule deer, elk, black bear, timber wolf, beaver, northern flying squirrel, and the short-tailed shrew.

Numerous bird species are found within the TSL. Some example species include (Saskatchewan Ministry of Environment, 2016) :

- Alder Flycatcher
- American Crow
- American Kestrel
- American Redstart
- American White Pelican
- Bald Eagle
- Black and White Warbler
- Black-capped Chickadee
- Black Tern
- Blue Jay
- Black and White Warbler
- Canada Goose
- Cedar Waxwing
- Cliff Swallow
- Common Loon
- Common Merganser
- Common Raven
- Common Tern
- Eastern Phoebe
- Great-Horned Owl
- Gray Jay
- Ovenbird
- Herring Gull
- Horned Lark
- Hermit Thrush
- Killdeer
- Least Flycatcher
- Lincoln's Sparrow
- Northern Flicker
- Osprey
- Ovenbird
- Pileated Woodpecker
- Red-necked Grebe
- Red-tailed Hawk
- Red-winged Blackbird
- Ruffed Grouse
- Sandhill Crane
- Sharp-tailed Grouse
- Tree Swallow
- White-throated Sparrow
- White Warbler
- White-winged Scoter
- Yellow-rumped Warbler
- Yellow Warbler

The *Migratory Birds Convention Act* (MBCA) of 1994 protects most of the migratory birds located in Canada and works in conjunction with the Migratory Birds Convention of 1916 between Canada and the USA. Environment Canada holds the responsibility to develop and implement policies and regulations to ensure the protection of migratory birds, theirs eggs and nests identified in the Convention. The Canadian Wildlife Service branch of Environment Canada administers the MBCA.

Enforcement of the MBCA in Saskatchewan is coordinated by the Wildlife Enforcement Directorate of Environment Canada in cooperation with Environment Canada Game Officers, Government of Saskatchewan Ministry of Environment, the Royal Canadian Mounted Police and provincial law enforcement agencies. (Environment Canada, 2015).

The wildlife serves as a source of income for trappers and big game outfitters, food for domestic resource harvesters and enjoyment for sport hunters and wildlife observers. Wildlife harvesting for food and clothing by the area's traditional inhabitants is among the oldest human activity in the forest. Saskatchewan Ministry of Environment is responsible for overall management of the TSL's wildlife resources and the allocation of rights to harvest and use these resources.

There are approximately 120.3 hectares of Fish and Wildlife Development Fund (FWDF) Lands located along an abandoned rail corridor within the TSL. FWDF lands are intended for protecting wildlife habitat, and are funded revenues generated from all fur, angling and hunting licenses sold in the province.

4.8 Fish

About 4% of the TSL area consists of water. The area's lakes and rivers support domestic, commercial, sport and tourist-based fishing opportunities.

Domestic (subsistence) fishing provides an important food source for Saskatchewan's Aboriginal communities. First Nations and Métis people have the right to hunt and fish for food as written in treaties and guaranteed in the Natural Resources Transfer Agreement. These rights are protected in the Canadian Constitution and are given priority in resource allocation over all other users.

Commercial fishing is an important industry in northern Saskatchewan (Figure 30). There are up to 31 commercial fishing licences issued for lakes and rivers within or adjacent to the TSL. Important commercial fishing waterbodies in the area include Dore, Hillyer, Sled, Branch, Ministikwan, and Muckingham Lakes, as well as the Beaver, Cowan, and Green Rivers. The main commercial fish species harvested are whitefish, northern pike, walleye, lake trout, mullet and sauger (SaskNetWork, 2016).

Sport fishing has been a major recreational activity in and around the TSL since the 1960's when roads opened many lakes in the area. Pike, walleye, perch and lake trout are among the most popular sport fishing species in the region. In addition to personal enjoyment, recreational fishing provides income and employment to fishing outfitters.

The Fisheries Management Plan released by the Ministry of Environment (2010) provides a framework for maintaining and building upon the significant values and benefits of the provincial fishery. This plan will apply to fisheries management in the TSL and Meadow Lake OSB will work towards ensuring the fishery remains viable by meeting all relevant regulatory requirements relating to water and riparian management.

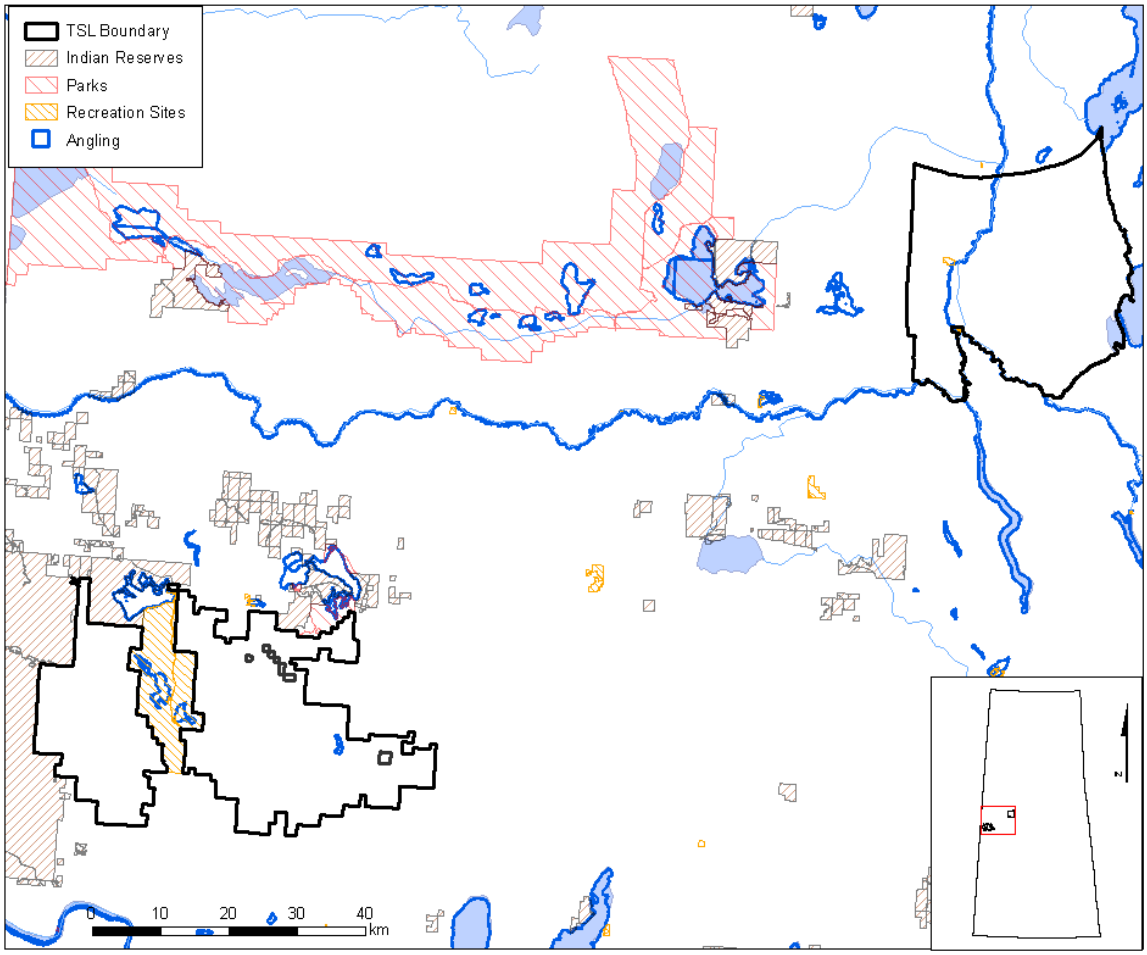

Figure 30 Commercial Outfitter Angling Licences in the MLOSB TSL

4.9 Non-Timber Forest Products

Aboriginal people who live on or adjacent to the MLOSB TSL have traditionally gathered firewood, berries, medicinal plants, branches and birch bark from the forest for food, health remedies and crafts. There are also a number of wild rice lease dispositions within the TSL.

4.10 Mineral Dispositions

The Green Lake/Sled Lake parcel of the TSL has approximately 20 active mineral dispositions around the municipality of Green Lake, while the Bronson/Makwa parcels have none (Figure 31).

4.11 Oil and Gas Exploration

Saskatchewan is Canada's second largest oil producer and third largest producer of natural gas. In 2011, Saskatchewan produced 157.7 million barrels of oil with an approximate value of $12.7 billion. The Bronson/Makwa portion of the TSL contains hundreds of active oil and gas dispositions, while the Green Lake/Sled Lake portion has none (Figure 31).

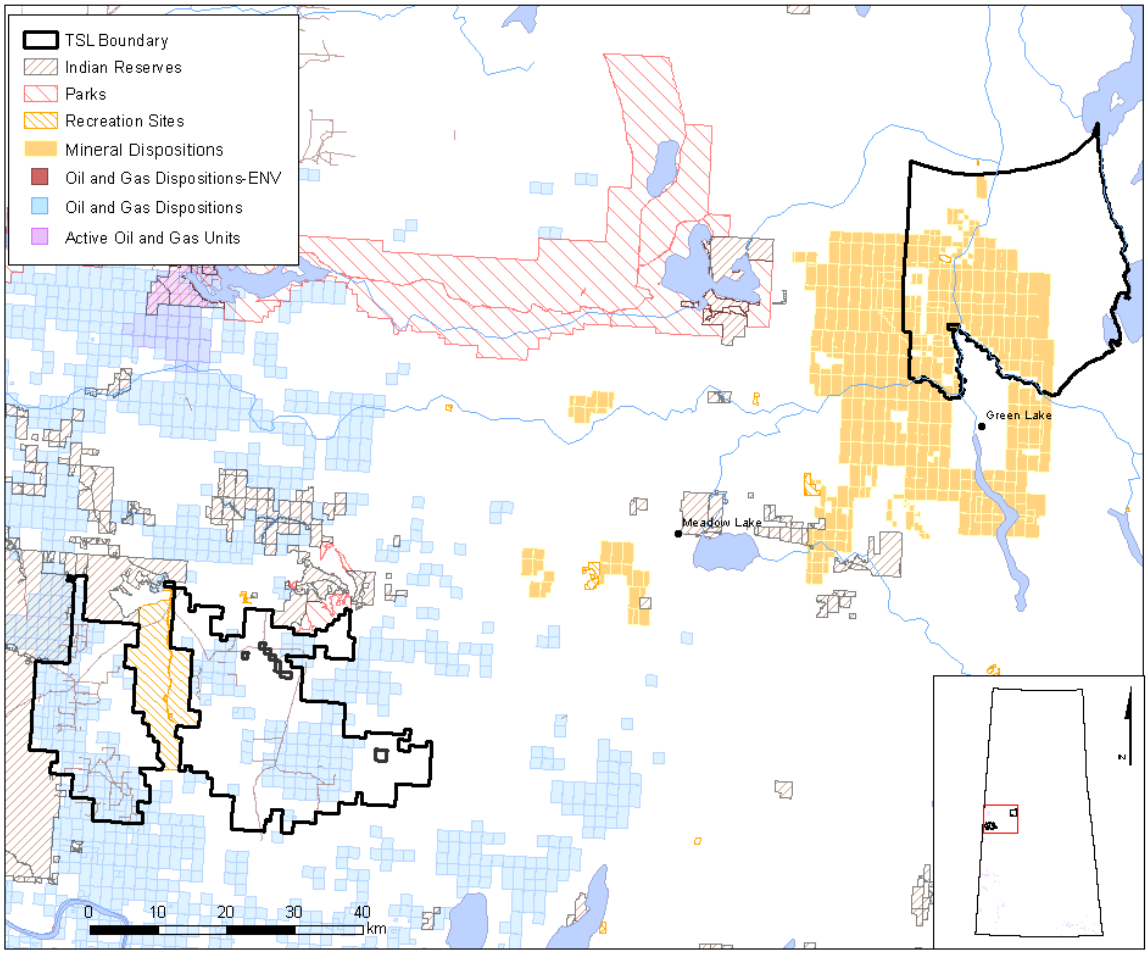

Figure 31 Oil, Gas, and Mineral Dispositions in the MLOSB TSL

4.12 Land Dispositions and Leases

The Ministry of Environment has leased a number of other parcels within the MLOSB TSL for non-timber uses. These include gravel and sand quarries, telecommunication towers, trapper, outfitter and recreation cabins, etc (Figure 32).

4.13 Linear Developments

Figure 33 provides an overview of the linear developments on the MLOSB TSL, including cut-lines, seismic lines, trails, pipelines, powerlines, abandoned rail bed, and approximately 274 km of roads and highways. The majority of roads are public and are not managed by Meadow Lake OSB. A more detailed tabular summary of linear developments and roads lengths, by type and responsibility, is provided below in Section 10.3.

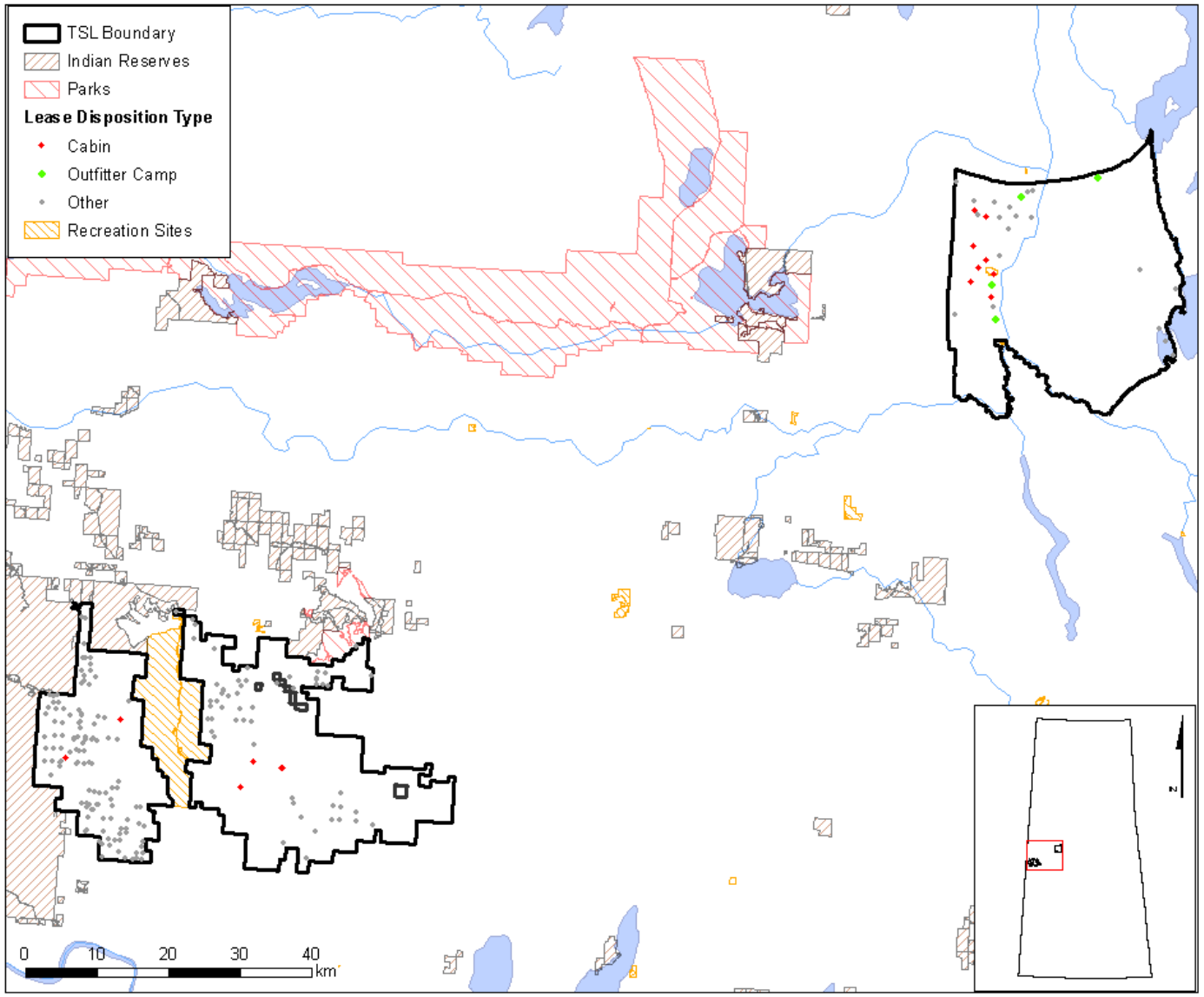

Figure 32 Non-timber Dispositions on the MLOSB TSL

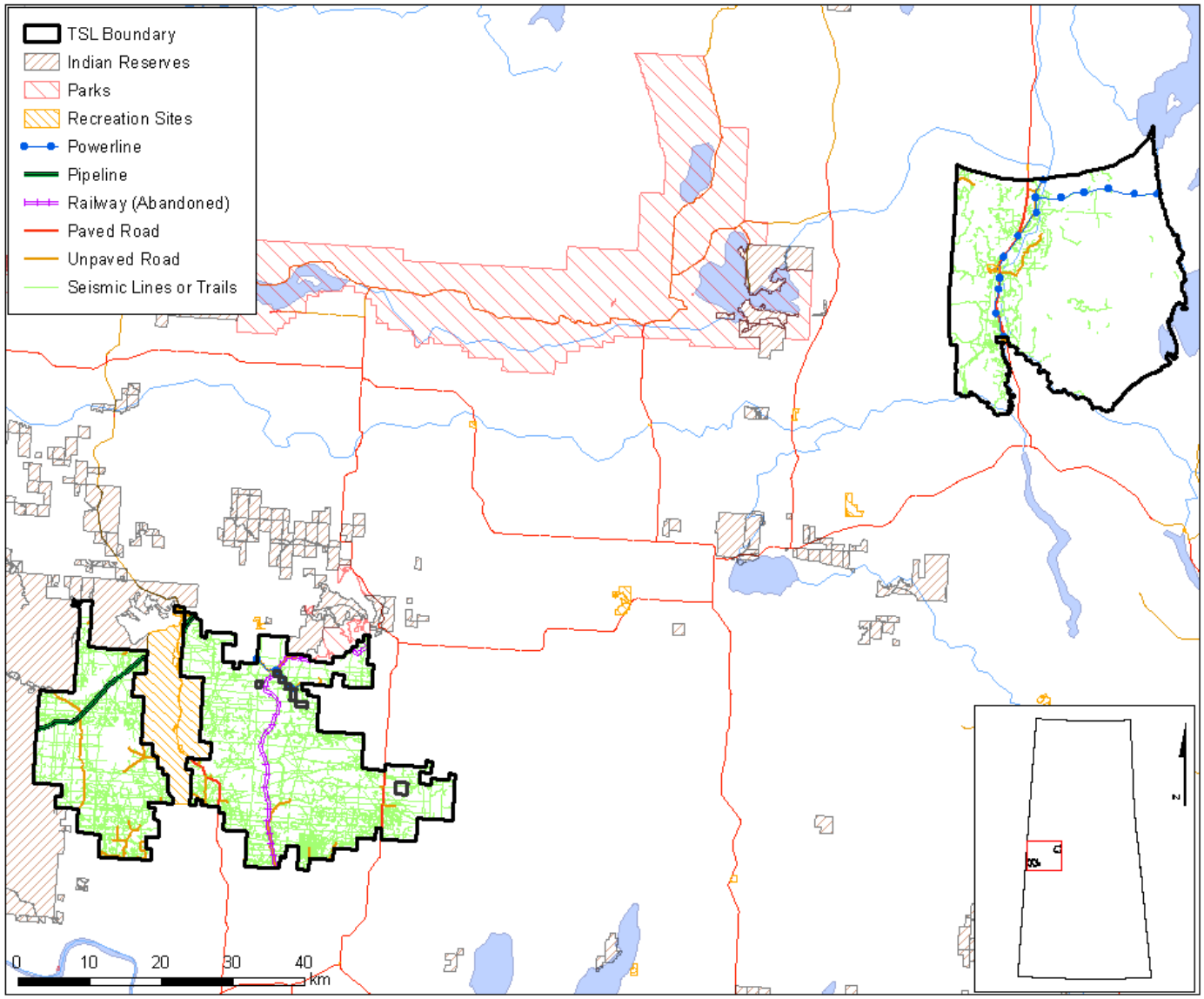

Figure 33 Roads, trails and other linear Developments within the MLOSB TSL

4.14 Agriculture

There are no Prairie Farm Rehabilitation Area (PFRA) Community Pasture areas within the MLOSB TSL. However, there are a number of tenures that allow for grazing within the TSL boundary (Figure 34), and cattle/forestry interactions are a significant consideration. In particular, identification and preservation of fences is important during planning, harvesting, and silviculture activities.

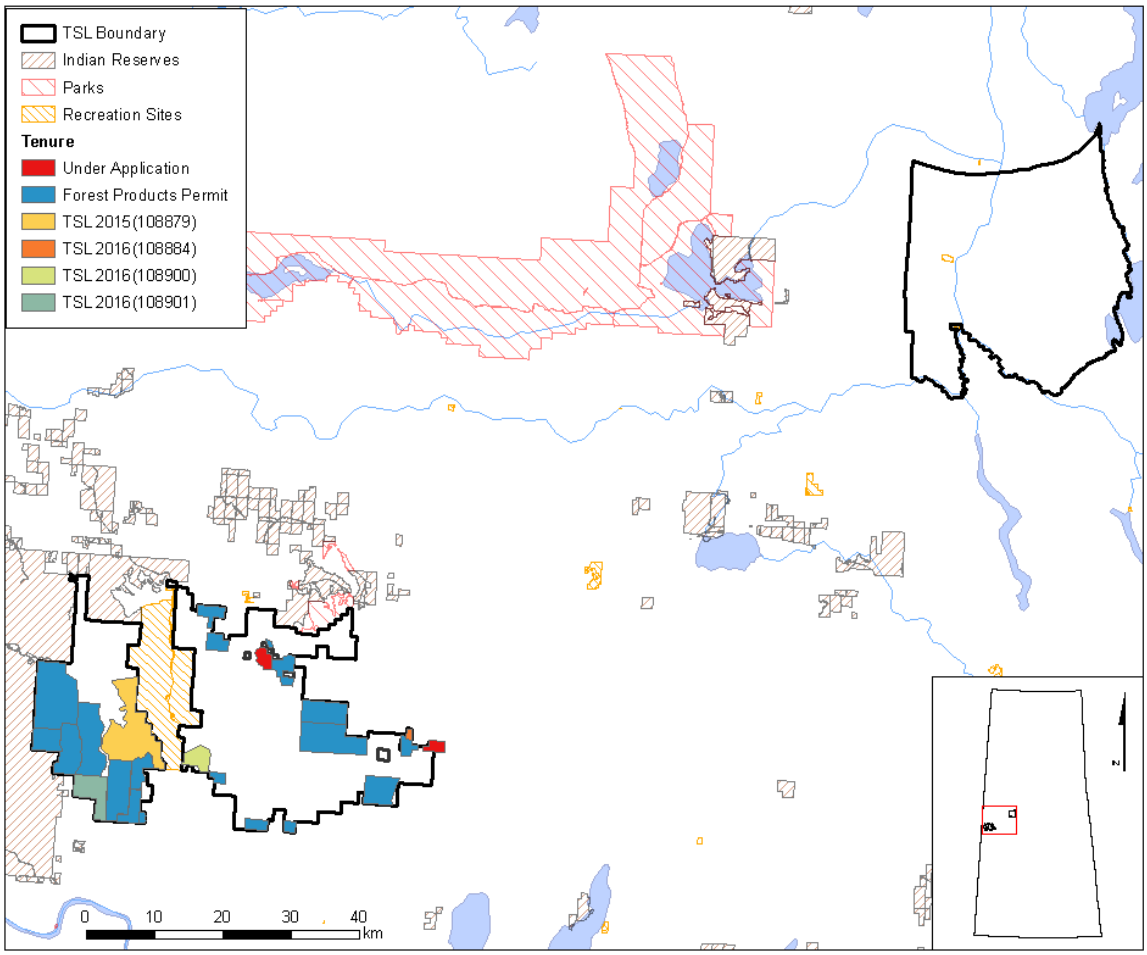

Figure 34 Grazing Tenures within the MLOSB TSL.

5.0 Community and Social Profile

The major settlements closest to the MLOSB TSL area are the villages of Loon Lake and Makwa, the northern village of Green Lake, the northern settlement of Sled Lake, the city of Meadow Lake, the town of St. Walburg, as well as the First Nations communities of Island Lake, Makwa Sahgaiehcan, and Flying Dust. Higher populated areas include the city of Lloydminster, which is approximately 90 km southwest of the Bronson parcel of the TSL, and Prince Albert, which is located approximately 190 km and 245 km southeast

of the Green Lake/Sled Lake and Bronson/Makwa parcels. Both cities act as a service center to northern communities and are dependent on agriculture, forestry, tourism, and mining. Information for this section was obtained from Statistics Canada's website for Census years 2001, 2006 and 2011.[1]

5.1 Human Population

In the 2011 Census of Canada, 15% of the Saskatchewan population identified themselves as Aboriginal[2]. Between the 2006 and 2011 census, the general population trend in communities associated with the MLOSB TSL increased, with the exception of Barthel (Loon Lake No. 561) and Flying Dust First Nation, which experienced a decrease in population (Table 11).

Table 11 Population data from Statistics Canada 2001, 2006, and 2011 Census

Communities	Population Census 2001	Population Census 2006	Population Census 2011	Percentage Change from 2006 to 2011
Saskatchewan	978,935	968,157	1,033,381	6.7
Barthel (Loon Lake No. 561)	788	815	725	-11.0
Green Lake	498	361	418	15.8
Loon Lake	318	306	314	2.6
Makwa	101	96	97	1.0
Meadow Lake	4582	4771	5045	5.7
Indian Reserves				
Island Lake First Nation	771	731	955	31
Makwa Sahgaiehcan First Nation	763	800	900	13
Flying Dust First Nation	575	619	505	-18

Median age describes the population where half the people are younger than this age and half are older. The weighted average median age for communities in the area of the MLOSB TSL is 35.3 years, which is lower than the province as a whole at 38.2 years (Table 12). The median age on Indian reserves in the study area is considerably lower with the average median age being approximately 23.8 years younger in these communities.

As of the 2011 Census, Aboriginal people (First Nation and Métis) made up 15.3% of Saskatchewan's total population. Of the selected communities in and around the MLOSB TSL, the aboriginal community accounts for a significant portion of residents. The non-reserve communities have a significant proportion of aboriginal residents. The 2011 Census had some reporting issues and reliable data for several communities within the MLOSB TSL area is not available.

[1] Limited data is available from the 2011 Census on income and educational achievement; however, 2006 and 2011 data is presented where available in the tables. The communities selected represent the major centers and First Nation communities that the near or within the MLOSB TSL. Due to small population sizes on many of the Indian Reserves, data is often suppressed by Statistics Canada because of privacy concerns. Information is also presented in the tables for the Province of Saskatchewan as a whole for comparison purposes.

[2] National Household Survey (NHS) Aboriginal Population Profile, 2011 – Census Profile

Table 12 Population Characteristics from Statistics Canada 2011 Census Period

Communities	Median Age of Population	% of Population Age 15 or Over	Non-Aboriginal Population	Aboriginal Population	Percent Aboriginal Population
Saskatchewan	38.2	80.9%	875,641	157,740	15.3
Barthel (Loon Lake No. 561)*	49.9	84.7	--	--	--
Green Lake*	32.8	73.6	--	--	--
Loon Lake*	41.3	79.3	--	--	--
Makwa*	50.5	78.4	--	--	--
Meadow Lake	32.7	74.6	2870	2175	43.1
Indian Reserves					
Island Lake First Nation	17.0	55.5	--	--	--
Makwa Sahgaiehcan First Nation	18.2	57.9	--	--	--
Flying Dust First Nation	21.6	65.3	--	--	--

*An Aboriginal population profile is not available for the area.

5.2 Educational Achievement

According to Statistics Canada's 2011 census, education levels in communities near the MLOSB TSL are approximately equal to the education levels for Saskatchewan as a whole. Within Saskatchewan, 39% of the population over the age of 15 have completed a Trade, College or University Certificate or Degree; the community of Meadow Lake was anomalous with a 44.6% completion rate. With the exception of Flying Dust First Nation, education levels in the Indian Reserves are significantly lower than the neighbouring communities and the provincial average. On average for the two remaining Indian Reserves in the MLOSB TSL, 86.5% of the total population over the age of 15 did not complete a Certificate, Degree or Diploma, with only 23.4% completing High School or a Trade, College or University Certificate or Degree. Table 13 provides detailed information regarding education levels of the nearby communities and Indian Reserve populations.

Table 13 Education Levels from Statistics Canada 2011 Census Period

Communities	Total Population 15 and over	No Certificate, Diploma or Degree	High School Certificate or Equivalent	Trade, College or University Certificate or Degree
Saskatchewan	835,525	231,730	205,495	329,015
Barthel (Loon Lake No. 561)	610	--	--	--
Green Lake	305	--	--	--
Loon Lake	250	85	45	95
Makwa	80	25	20	30
Meadow Lake	3765	1115	840	1680
Indian Reserves				
Island Lake First Nation	405	320	40	45
Makwa Sahgaiehcan First Nation	465	325	80	40
Flying Dust First Nation	395	170	65	165

5.3 Employment

In February 2015, the unemployment rate in Saskatchewan was 5.5%, up 1.4 percent from February 2014. Saskatchewan's labour force increased by 3,900 to 590,700 persons in February 2015 from 586,800 persons in January 2015. This is 9,100 more than the February 2014 labour force of 581,600 persons (Government of Saskatchewan, 2015). With the exception of Look Lake Subdivision No. 561, unemployment rates within rural communities near the MLOSB TSL are considerably higher than the provincial rate (Table 14). In 2011, the average unemployment rate for Aboriginal adults on the Indian Reserves close to the MLOSB TSL was 25.7% compared to non-Reserve adults at 9.6%. Notably, the community of Makwa is reporting no unemployment. Between 1995 and 2000 the income of Aboriginal families increased. However the gap between Aboriginal and non-Aboriginal families remains very large with Aboriginal families only averaging two-thirds the income of non-Aboriginal families (Gingrich, 2009). The Saskatchewan government recognized the need for Aboriginal and community involvement in 1999 when it announced a major redevelopment of the forest industry. Changes that were implemented through this initiative were the need for industry to demonstrate that the development is a) economically viable b) maintains resource sustainability c) has a corporate partner and d) had a community partner (Government of Saskatchewan, 2007).

Table 14 Labour Force Activity from Statistics Canada 2011 Census Period (City-Data.com, 2016)

Communities	Total Population 15 and over	Total in the Labour Force	Total Employed	Total Unemployed	Un-Employment Rate (%)
Saskatchewan	835,525	562,310	529,095	33,210	5.9
Loon Lake Subdivision No. 561	725	495	480	15	3.2
Green Lake	418	166	126	40	23.8
Loon Lake	314	147	147	--	--
Makwa	97	61	61	0	0
Meadow Lake	5045	2475	2185	288	11.5
Indian Reserves					
Island Lake First Nation	405	130	80	50	38.5
Makwa Sahgaiehcan First Nation	460	175	155	20	11.4
Flying Dust First Nation	395	240	175	65	27.1

5.4 Income

The median total income for individuals in Saskatchewan in 2010 was $31,220 – higher than all other provinces except Alberta. Saskatchewan median income has been rising steadily since 2006 and house prices have steadily increased since 2010 with an annual change in 2012 of 8% to a current average residential resale price of $271,741 (Table 15).

Table 15 MLS average residential resale price

	Average resale price ($)			Annual change (%)		
	2010	2011	2012	2010	2011	2012
Canada	$339,212	$364,289	$368,485	5.8%	7.4%	1.6%
Saskatchewan	$242,258	$258,386	$271,741	4.0%	6.7%	8.0%

The average value of owned dwellings and median income for most nearby communities has been suppressed in the Census data. Available data has been summarized in Table 16. Based on the limited data, it appears that values of owned dwellings have increased between 2006 and 2011. The province of Saskatchewan has been in an economic expansion situation since 2007 which will likely continue as natural resources are developed throughout the province, including within the MLOSB TSL.

Table 16 Economic Data from 2006 and 2011 Census Periods

Communities	Median Income 15 Years of Age and Over (2006)	Median Income 15 Years of Age and Over (2011)	Average Value of Owned Dwellings (2006)	Average Value of Owned Dwellings (2011)	Percent Increase In Dwelling Value
Saskatchewan	$23,755	$31,408	$132,111	$267,006	102.1
Loon Lake Subdivision No. 561	$13,993	N/A	$151,643	N/A	N/A
Green Lake	$15,744	N/A	$61,000	N/A	N/A
Loon Lake	N/A	N/A	N/A	N/A	N/A
Makwa	N/A	N/A	$58,437	N/A	N/A
Meadow Lake	$24,920	$32,686	$98,083	$210,740	114.9
Indian Reserves					
Island Lake First Nation	$5,688	$7,238	N/A	N/A	N/A
Makwa Sahgaiehcan First Nation	$7,920	$11,095	N/A	N/A	N/A
Flying Dust First Nation	$10,688	$16,218	N/A	N/A	N/A

6.0 Corporate Profile

Meadow Lake OSB Limited Partnership (MLOSB) is wholly owned by Tolko Industries Ltd. and is located in Meadow Lake, Saskatchewan. This mill uses hardwood species to produce performance rated oriented strand board (OSB) panels and sheathing, structural flooring, rim board, concrete edge form, SIP facers and stair treads. It has approximately 159 full time employees (mill and forestry staff). MLOSB sources fibre from this Term Supply Licence, the Prince Albert FMA, Agriculture Crown Lands, and open market purchases. Forestry and logging/hauling operations are typically contracted out.

Tolko Industries Ltd. is a family owned wood products manufacturing company founded in 1956. Tolko's head office is located in Vernon, British Columbia and it has 16 manufacturing facilities located in British Columbia, Alberta, Saskatchewan, and Manitoba, as well as a nursery and seed orchard in Armstrong, B.C.

Products manufactured include lumber, plywood and veneer, OSB, unbleached kraft papers, co-products, biomass power, and a growing number of specialty wood products.

The TSL area is administered by woodlands staff located in Meadow Lake and Prince Albert, with additional support from a corporate forestry group located in Vernon, British Columbia.

7.0 Forest Management Principles and Certification

Meadow Lake OSB is committed to the following Forest Management Principles:

> *Forest lands managed by Tolko make an important contribution to the quality of life for many communities by providing a wide range of environmental, social and economic benefits.*
>
> *Tolko is committed to professional and sustainable forest management. Our ability to provide raw materials to our manufacturing facilities depends on managing forest resources and respecting all forest values.*
>
> *Tolko's Management Team develops strategic direction and provides resources to the Woodlands departments. The Woodlands group, drawing on the input from our employees, stakeholders, aboriginals and members of the public, will develop professional resource plans that demonstrate an innovative and sensitive approach to forest land management. Tolko's activities will be ecologically suitable, economically feasible and socially acceptable.*
>
> ***Activities that support these principles are:***

- *Maintaining or improving the health and productivity of forest ecosystems and biological diversity;*
- *Actively promoting stakeholder and public participation through open communication;*
- *Respecting and recognizing established aboriginal title and rights, and treaty rights;*
- *Providing for safeguards to the health and safety of employees, contractors and the public in our Woodlands operations;*
- *Complying with relevant forest management legislation, policies, and legally-binding international conventions or agreements to which Canada is a signatory;*
- *Evaluating our forest management performance through internal and external audits, reviews and benchmarking; and,*
- *Increasing our knowledge and expertise through advances in science and the implementation of adaptive management.*

Meadow Lake OSB is certified to the following standards:

- Environmental Management System (EMS): ISO 14001
- Sustainable Forest Management (SFM): Sustainable Forestry Initiative (SFI)
- Chain of Custody (CoC): PEFC CoC Standard

The International Organization for Standardization (ISO) 14001 EMS standard is an internationally-accepted system that ensures forest management operations are conducted under strict rules and procedures in order to protect the environmental values of the forests. It requires that environmental policy, objectives, programs and targets be developed and tracked over time to ensure impacts are measured and mitigated. (http://www.iso.org/iso/iso14000). Tolko has been certified to this standard continuously since July 2003.

SFI Inc. is an independent, non-profit organization responsible for maintaining, overseeing and improving a sustainable forestry certification program that is internationally recognized and is the largest single forest standard in the world. The standard promotes sustainable forest management, including measures to protect water quality, biodiversity, wildlife habitat, species at risk and Forests with Exceptional Conservation Value. (http://www.sfiprogram.org/). MLOSB was certified to this standard in August 2013.

The Programme for the Endorsement of Forest Certification (PEFC) Chain of Custody Standard is a mechanism for tracking certified material from the forest to the final product to ensure that the wood, wood fibre or non-wood forest produce contained in the product can be traced back to certified forests. (http://www.pefc.org/standards/chain-of-custody). This certification has been in place at Tolko since January 2009.

8.0 Economic Profile

8.1 Northern Saskatchewan Forest Sector Economic Profile

Over half of Saskatchewan is forested, of which over 90% is owned by the Province. Of the 34 million hectares of Provincial Forest, 11.7M ha (34%) is currently classified as commercial forest, and available for commercial timber harvesting. The Commercial Forest Zone consists of 47% softwood stands, 37% mixed wood stands and 16% hardwood stands.

The primary manufacturing facilities in the province and their production capacities are:

- 1 Chemi-thermal mechanical Pulp Mill in Meadow Lake (400,000 air dried metric tonnes)
- 1 Kraft Pulp Mill in Prince Albert (310,000 air dried metric tonnes, but not currently operating)
- 2 Oriented Strand Board Mills - Meadow Lake / Hudson Bay (1.36 million square feet, 3/8 basis)
- 1 Plywood Mill in Hudson Bay (135 million square feet, 3/8 basis – not currently operating)
- 6 Sawmills - Meadow Lake, Big River, Prince Albert, Carrot River, Glaslyn, La Ronge (604 million board feet of SPF dimension lumber)

Because of the mixed species stands present on much of the land base, harvesting often results in multiple facilities processing the volume. A healthy industry relies on each type of facility being able to successfully merchandize different components of stands (e.g. softwood saw timber, aspen for OSB, and pulpwood) or residuals from primary product manufacturing (woodchips and hog fuel).

The current annual allowable cut for the Commercial Forest Zone within the Province is 8.2 million m^3/yr. (4.8 million softwood and 3.4 million hardwood). Over the past decade there have been significant swings in the volume of timber actually harvested. The highest volume harvested was 5.0 million m^3 in 2004-05 and the lowest was 1.2 million m^3 in 2008-2009 – always well under the allowable cut level (Figure 35) (Saskatchewan Ministry of the Economy, 2016).

Figure 36 shows that each of the licence areas in the province has a similar trend for historical harvest levels.

Figure 37 provides a historical look at US housing starts and also provides a future forecast. After falling to historical lows in 2009-2011, housing starts are predicted to climb to a long term average of 1.67 million in 2016-2030. These future projections of housing starts suggest that there will be demand for Meadow Lake OSB product in the future, and that there will be a continued requirement for the available hardwood volumes on the TSL.

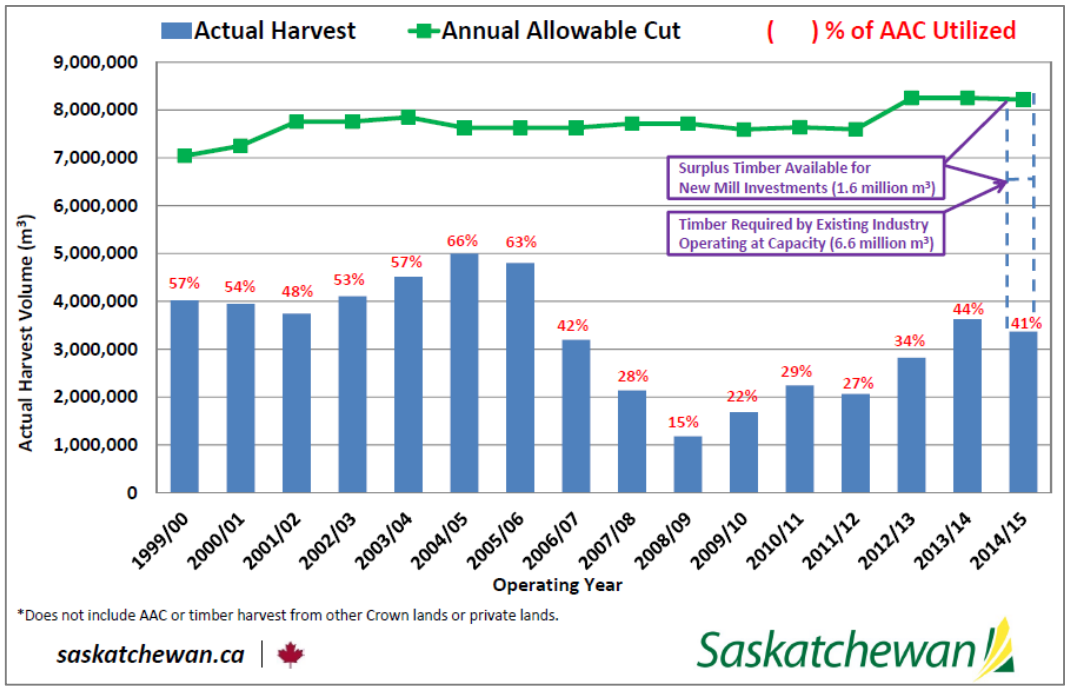

Figure 35 Saskatchewan aggregate allowable vs actual historical timber harvesting levels

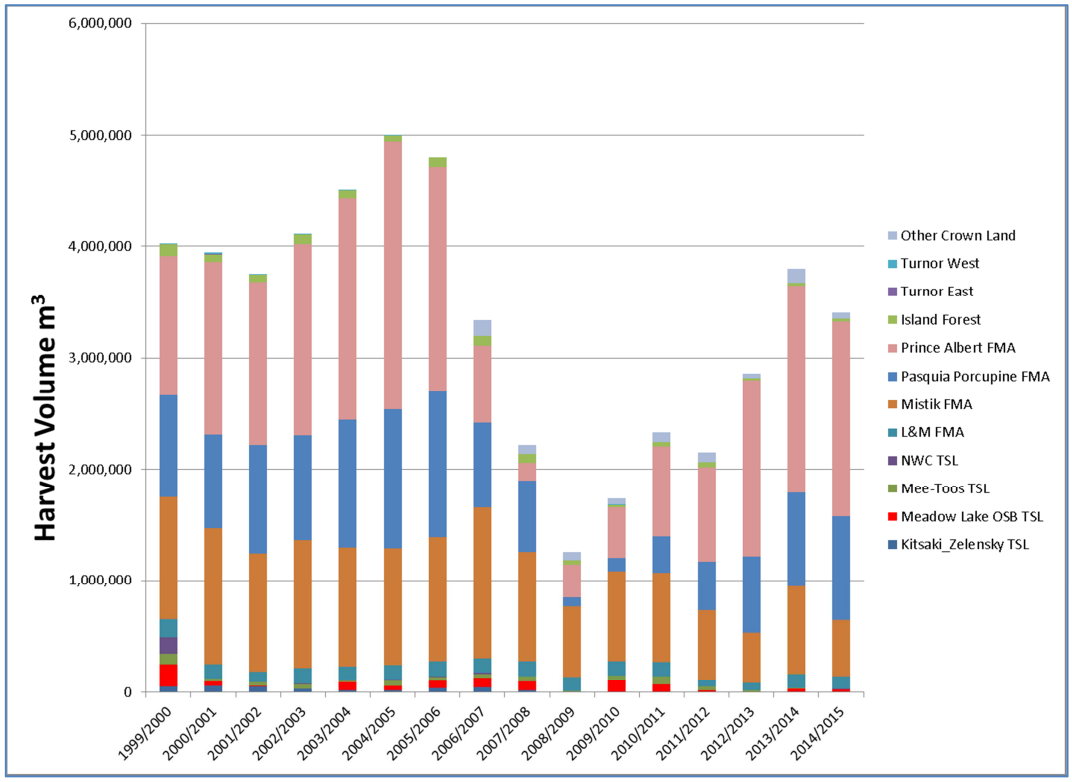

Figure 36 Provincial Historical Harvest Levels by Management Unit

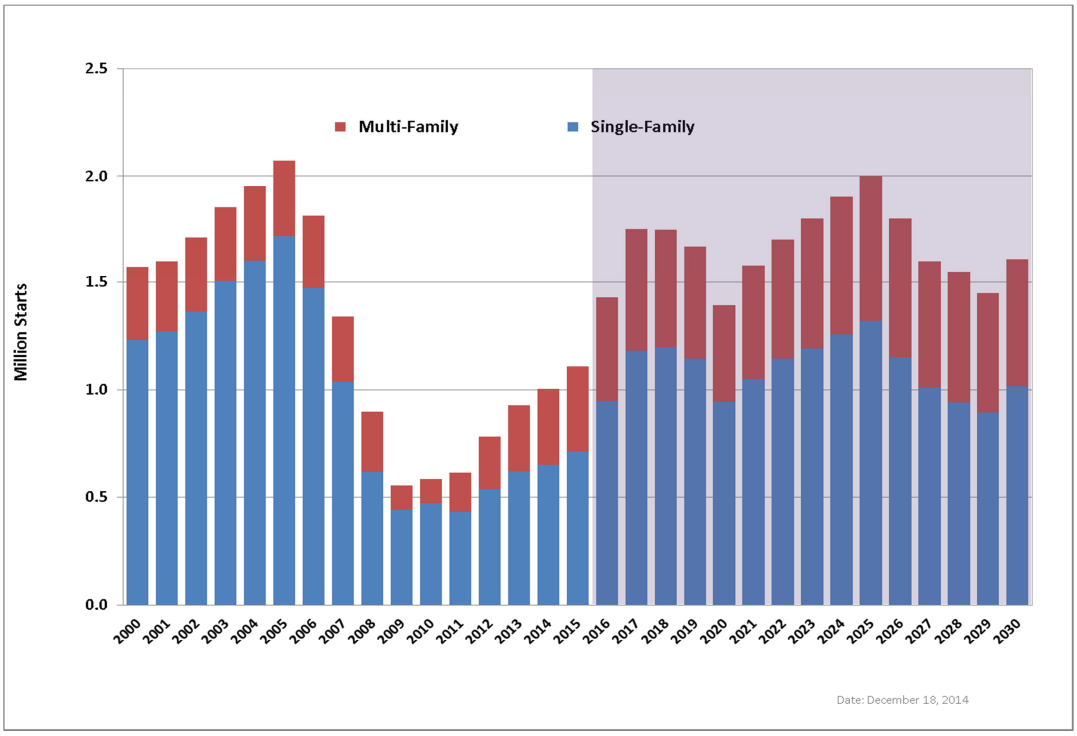

Figure 37 US Housing Starts Historical and Forecasted Trends

Stats Canada provides estimates of Forest Product Sales and Forest Product Exports in Canadian $'s for Saskatchewan (Figure 39 and Figure 40). The figures indicate that recently:

1. Product sales revenue for solid wood products is approximately twice that of pulp/paper.
2. Exports make up a significant portion of total sales.
3. Export sales are dominantly pulp/paper products and plywood/OSB, with a lesser amount of lumber and other forest products.

Saskatchewan's forest industry employment numbers have yet to recover fully from levels prior to 2006. In 2013, jobs directly related to the forest industry through logging, lumber production, pulp and paper manufacturing and management were about 2,800 (Figure 38). This is down from over 5,000 direct jobs in 2004. However, it is expected that there will be increased employment as demand for forest products increases in the future.

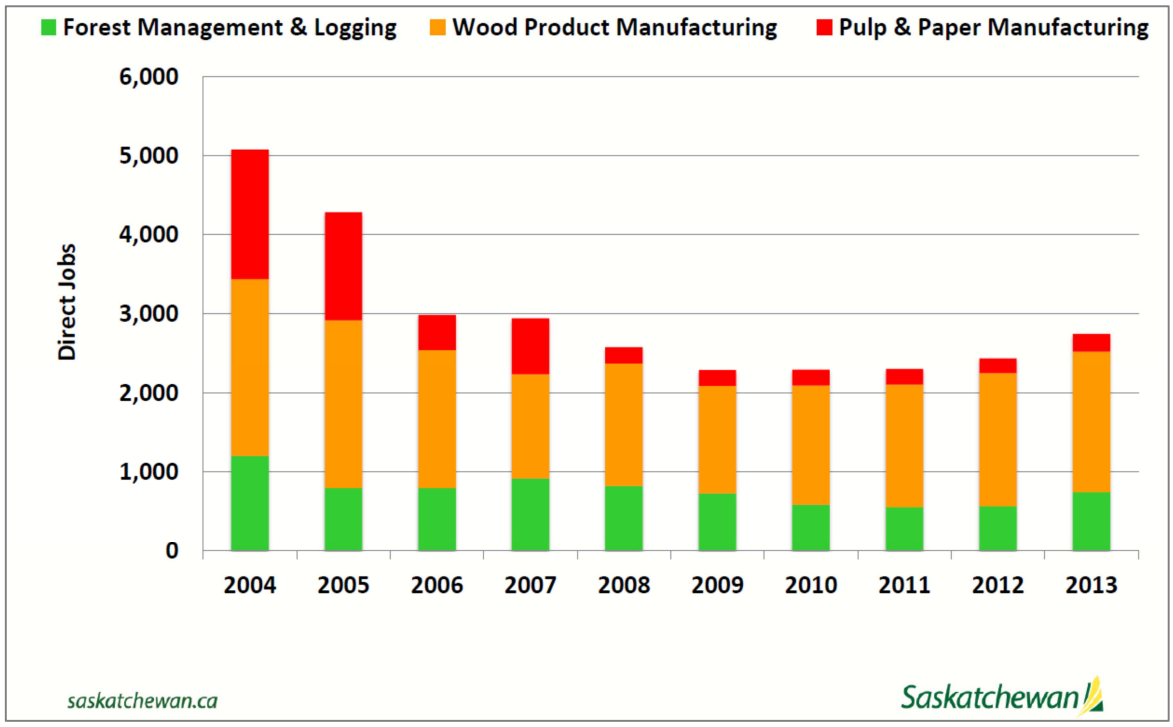

Figure 38 Saskatchewan Forest Industry Employment 2004-2013

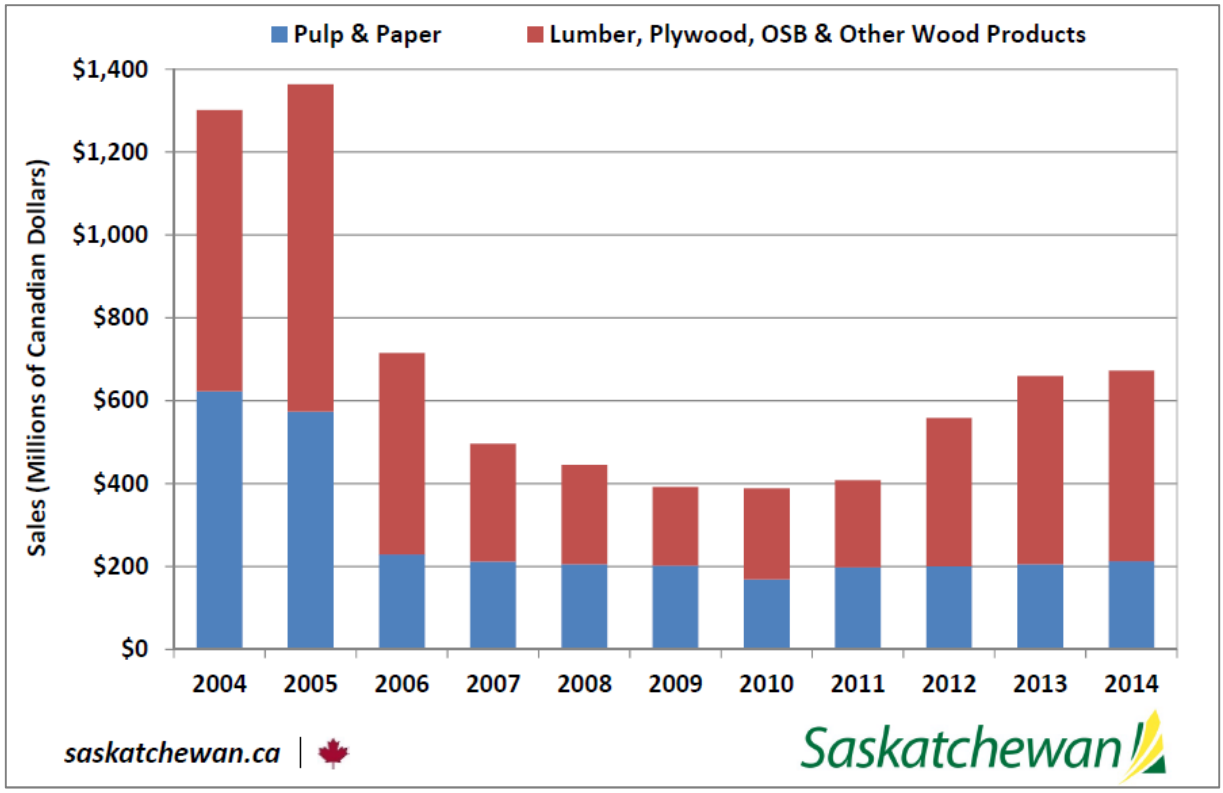

Figure 39 Saskatchewan Forest Product Sales

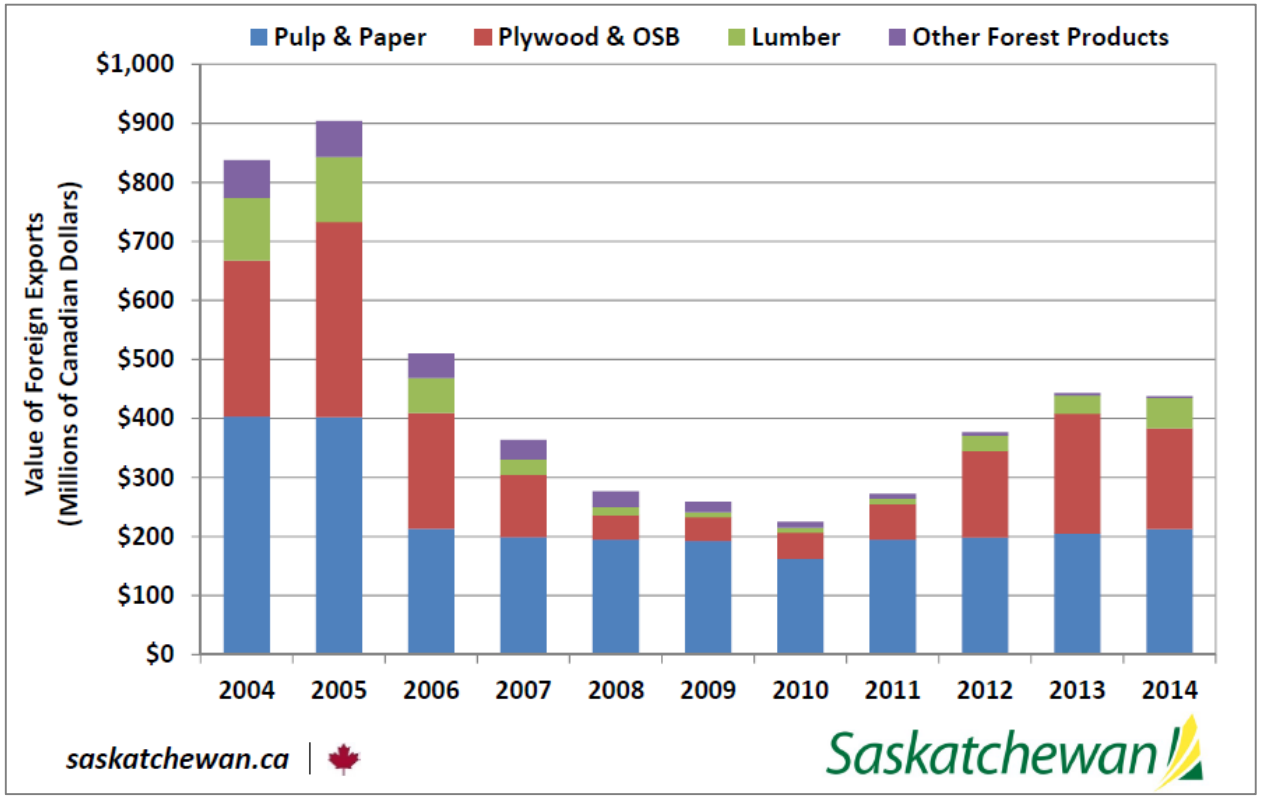

Figure 40 Provincial Forest Products Exports

8.2 Meadow Lake OSB

Similar to trends for other operators, harvest levels within the MLOSB TSL have been below the annual allowable cut, and have averaged approximately 57,000 m^3 per year over the past ten years, as outlined in Section 2.3.1. The harvest level for the 2015/2016 operating year was slightly over 153,000 m^3, and is expected to increase in the future.

The MLOSB manufacturing facility has consumed an average of 680,000 m^3 per year since 2004, and is currently consuming almost 900,000 m^3 per year (Figure 41). There has been an increasing trend in annual consumption since 2009, and this is expected to continue into the future.

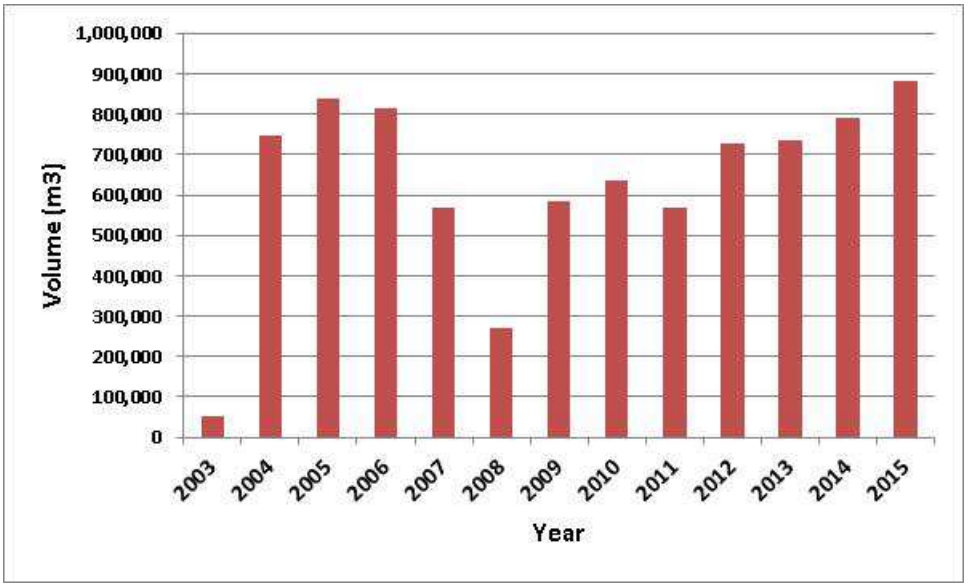

Figure 41 MLOSB Annual Mill Consumption

8.3 Independent Operators

There are 1,500 m^3/year of softwood and 1,200 m^3/year of hardwood allocated to third parties from the Bronson area of the MLOSB TSL. There are also 15,000 m^3/year of softwood allocated to the Northern Village of Green Lake through the Green Lake Wood Supply Agreement dated the 9th of October, 1997.

There are currently no Term Supply Licences issued for these volumes. Since 2010, roughly 380 metres of hardwood and 24,110 metres of softwood have been harvested under Forest Products Permit tenures, which is below the allocated volume.

9.0 Commitments in the Licence Agreement

The current Harvest Volume Schedule (HVS) for the TSL is 91,000 m^3 of softwood and 160,310 m^3 of hardwood. This HVS includes the softwood volumes committed to other operators as outlined in Section 8.3. Hardwood volume harvested from within the licence area by MLOSB is consumed in the OSB facility at Meadow Lake, while softwood is typically sold or traded to other manufacturing facilities. A small amount of softwood is consumed in the OSB mill. Additional volume sources for the OSB facility include the Prince Albert FMA, purchases/trades from other tenure holders, and purchases from private land owners.

10.0 Forest Management Activities

10.1 Harvest

The distribution of area harvested from 2006 to 2015 by PFT and seral stage are shown in Table 17. Figure 42 and Figure 43 illustrate the locations of harvesting over the period 2006-2015. There has not been any targeted salvage harvesting during the period, although minor amounts of blowdown have been included in some of the harvested blocks.

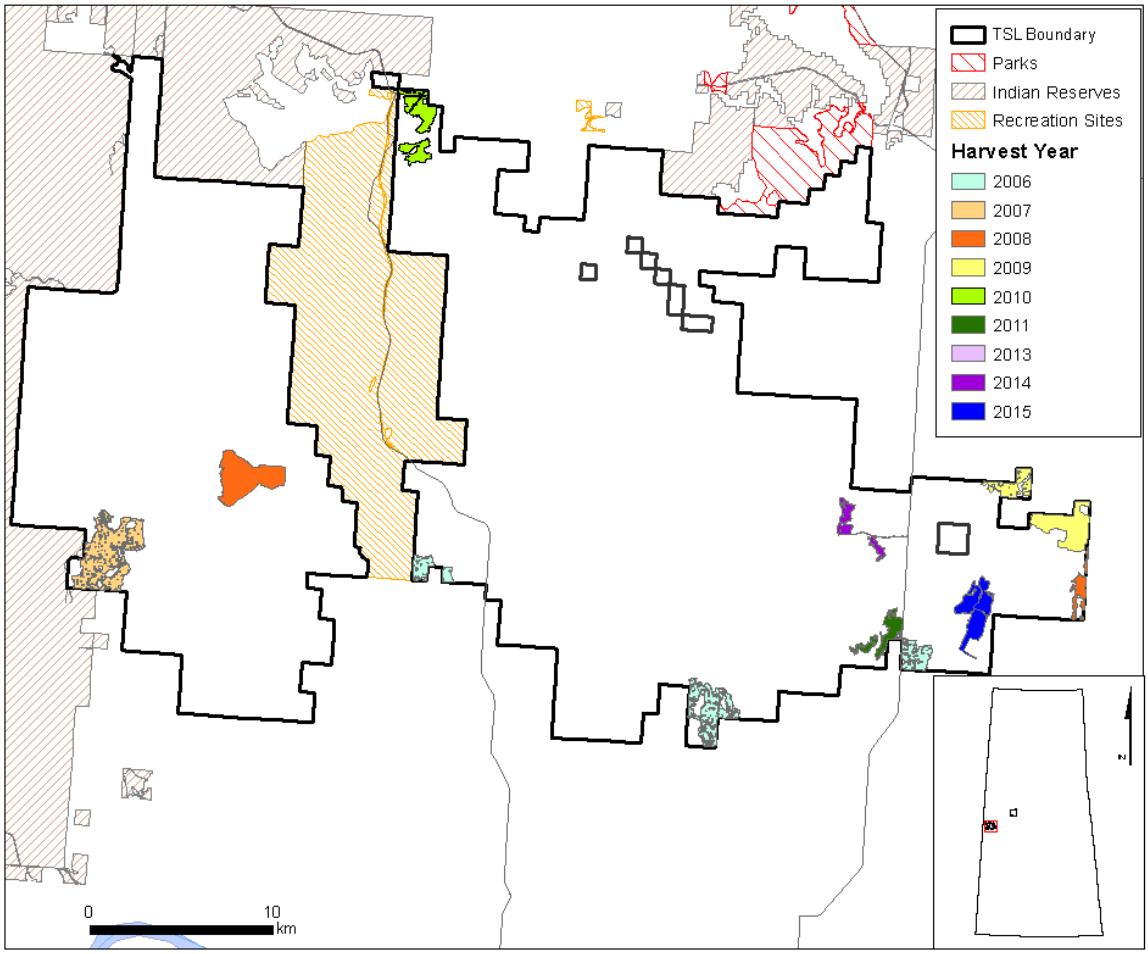

Figure 42 Locations of Historical Harvest (Makwa/Bronson) in MLOSB TSL (2006 to 2015)

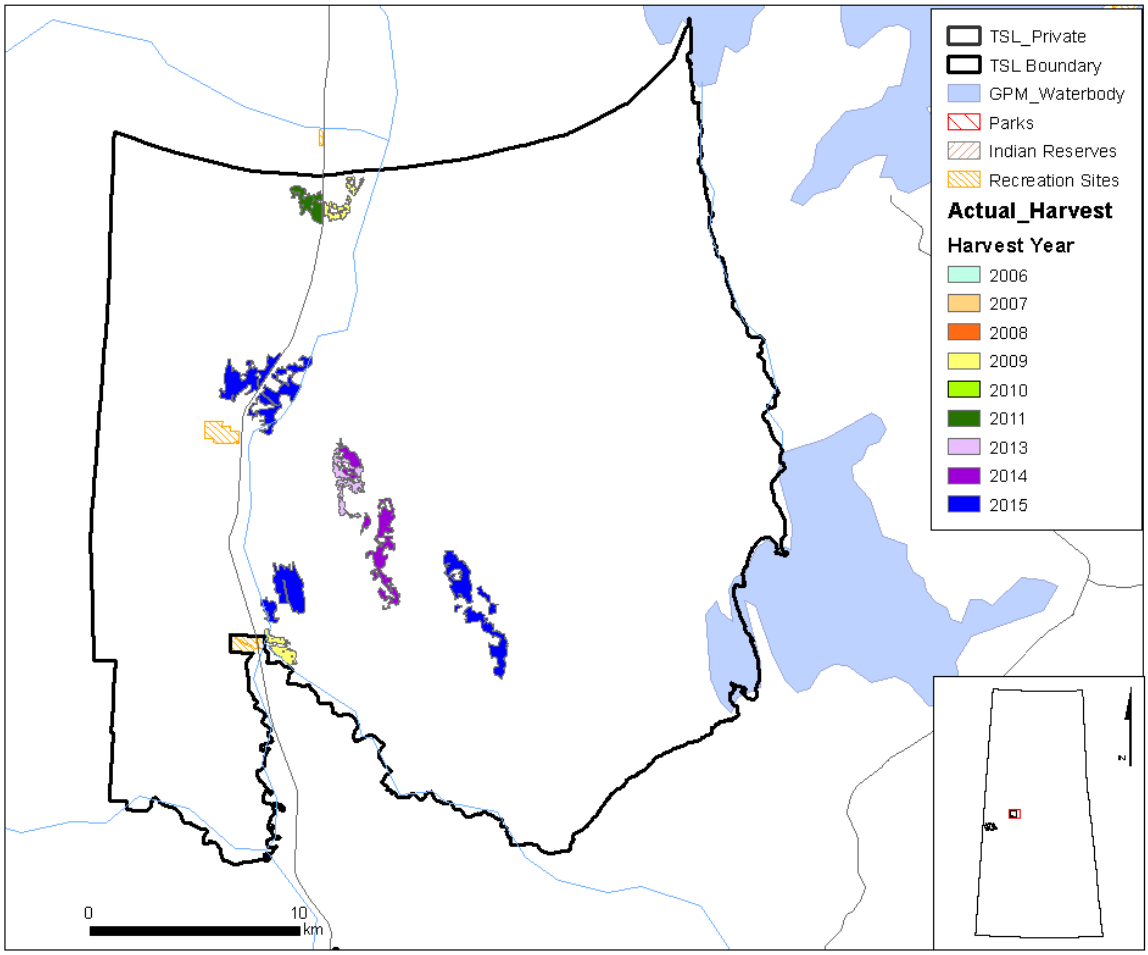

Figure 43 Locations of Historical Harvest (Sled/Green Lake) in MLOSB TSL (2006 to 2015)

Table 17 Historical Harvest by PFT and Seral Stage

PFT	Seral Stage	Area (ha) Harvested 2006-2010	Area (ha) Harvested 2011-2015	Total	% of Total
AOH	Young	0	0	0	
	Immature	14	70	84	
	Mature	0	0	0	
	Old	0	0	0	
	Very Old	0	0	0	
	Subtotal	14	70	84	1.4
BSJ	Young	0	0	0	
	Immature	1	9	10	
	Mature	0	0	0	
	Old	0	29	29	
	Very Old	0	18	18	
	Subtotal	1	56	57	1.0
BSL	Young	0	0	0	
	Immature	1	5	6	
	Mature	0	17	17	
	Old	0	69	69	
	Very Old	0	0	0	
	Subtotal	1	91	92	1.5
HPM	Young	0	0	0	
	Immature	3	53	56	
	Mature	0	27	27	
	Old	0	2	2	
	Very Old	0	0	0	
	Subtotal	3	82	85	1.4
HSM	Young	0	0	0	
	Immature	38	105	143	
	Mature	5	136	141	
	Old	0	218	218	
	Very Old	0	208	208	
	Subtotal	43	667	710	11.9
JLP	Young	0	0	0	
	Immature	0	5	5	
	Mature	0	0	0	
	Old	0	3	3	
	Very Old	0	0	0	
	Subtotal	0	8	8	0.1
PMW	Young	0	0	0	
	Immature	0	11	11	
	Mature	0	0	0	
	Old	0	0	0	
	Very Old	0	0	0	
	Subtotal	0	11	11	0.2
SMW	Young	0	0	0	
	Immature	810	128	938	
	Mature	0	151	151	
	Old	1	147	148	
	Very Old	0	26	26	
	Subtotal	811	452	1,263	21.2
TAB	Young	4	2	6	
	Immature	2,035	737	2,772	
	Mature	372	108	480	
	Old	42	66	108	
	Very Old	0	99	99	
	Subtotal	2,453	1,012	3,465	58.0
WSF	Young	0	12	12	
	Immature	86	23	109	
	Mature	12	56	68	
	Old	0	0	0	
	Very Old	0	6	6	
	Subtotal	98	97	195	3.3
Grand Total		**3,424**	**2,546**	**5,970**	**100.0**

10.2 Forest Renewal

Following harvest in the MLOSB TSL, Meadow Lake OSB will ensure that all harvested areas are regenerated to required standards that maintain or enhance future timber supply and the full range of non-timber resource values. Four to seven years after harvesting, harvest blocks are assessed for stocking. If an area achieves 80% stocking (and 800 trees per ha) at a minimum height of 30 cm, it is considered Sufficiently Regenerated (SR). If an area is <80% stocking, it may be retreated to ensure sufficient stocking will exist at year 14. Eight to fourteen years after harvest, a Free to Grow (FTG) survey is conducted to confirm stands are not being hampered by competing vegetation and are achieving a growth track that will result in a fully-stocked, mature forest, and are consistent with the Silviculture Ground Rules (SGRs). Stands not meeting the regeneration assessment standard at this time are designated as Not Sufficiently Regenerated (NSR).

Forest renewal responsibilities within the MLOSB TSL are as follows:

- Forest renewal obligations associated with the entire MLOSB TSL, including third-party operators, are to be met by MLOSB utilizing funds paid into the Forest Renewal Trust Fund.

Figure 44 and Figure 45 show the status of the silviculture surveys completed from 2010 to 2013 for blocks harvested by MLOSB since 2003/2004. Establishment and/or free growing surveys have been completed on approximately 4,237 hectares with all blocks meeting the requirements. Stocking levels ranged between 83% and 100%, with a weighted average of 96%

In general, forest renewal across the MLOSB TSL involves one of three approaches:

1) natural regeneration (e.g. aspen stands left to colonize from existing root systems)
2) assisted natural regeneration (e.g. use of site prep – for example jack pine stands are drag scarified to promote germination)
3) planting (e.g. white spruce stands are planted).

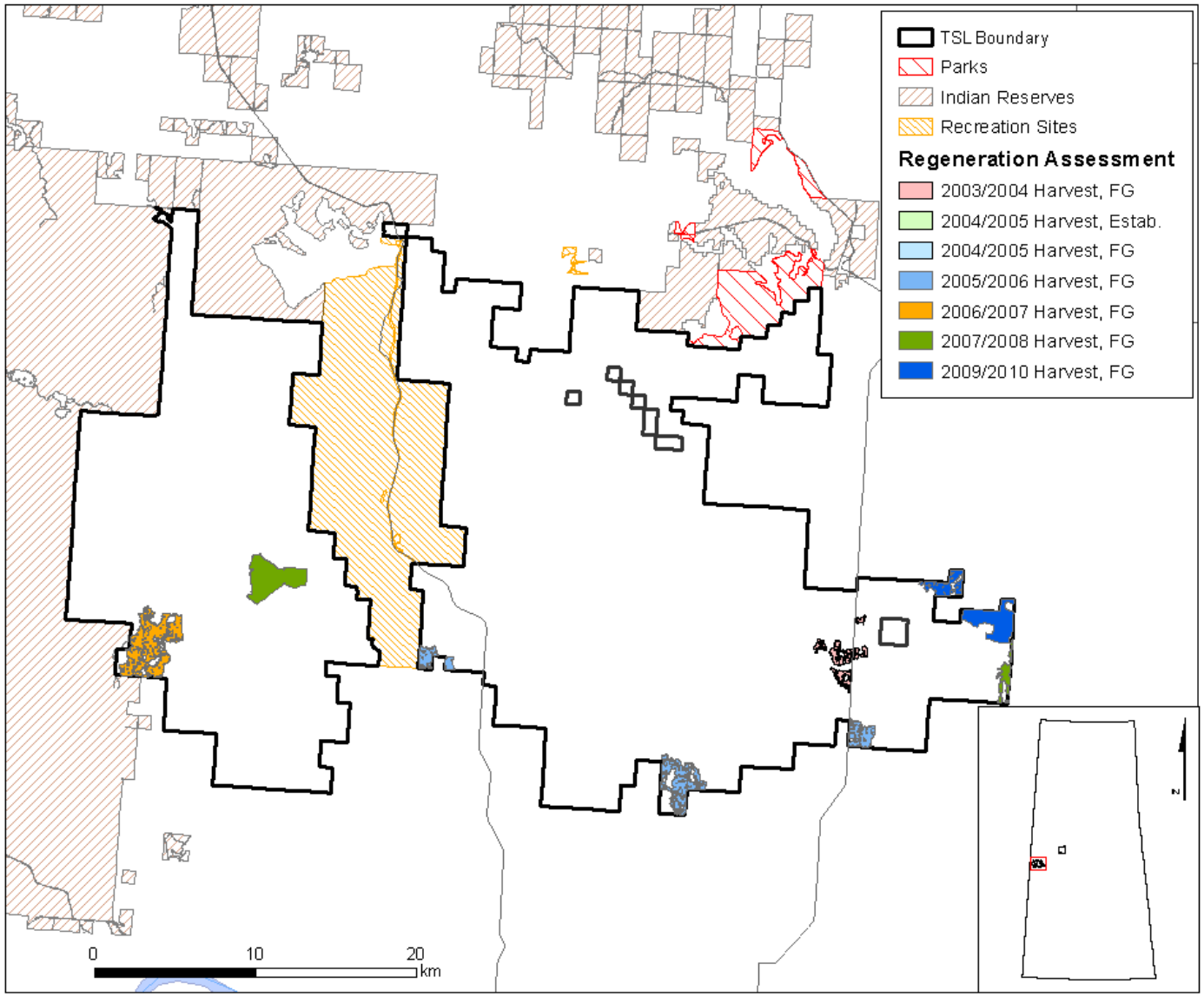

Figure 44 Results of Silviculture Surveys (Makwa / Bronson) in the MLOSB TSL

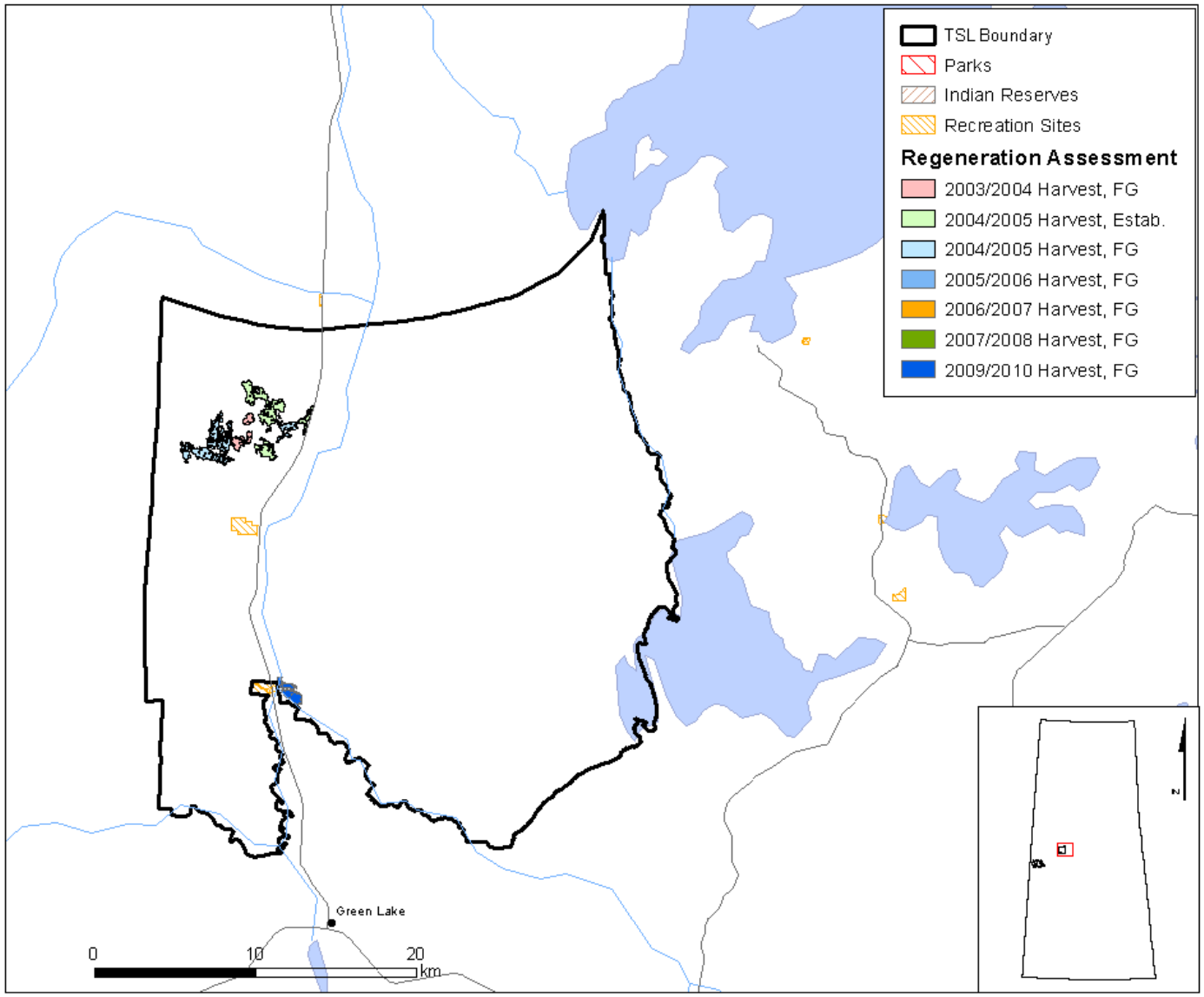

Figure 45 Results of SIlviculture Surveys (Sled / Green Lake) in the MLOSB TSL

10.3 Access Development

Forest road development and maintenance is a vital part of forest management. The road network in and adjacent to the MLOSB TSL allows harvested wood to be transported from the licence area to the processing facility and provides access for ongoing forest management activities. However, roads are expensive to construct and maintain. Unused roads represent an environmental and financial liability, and they may deplete the overall productivity of the forest land base. Meadow Lake OSB's policy regarding temporary roads, such as those located within harvest units, is to deactivate and reclaim these sites soon after harvest.

In cases where road closures are required to address forest management objectives, they will be identified in operating plans.

Hauling does not normally occur from early April to mid-June as spring break-up and wet conditions make roads near harvest sites impassable. Using roads at this time of year can also cause excessive damage to the road structure.

Public traffic is permitted on open TSL roads and Meadow Lake OSB maintains roads to a standard that ensures the safe passage of logging trucks. Grading, snow removal, re-gravelling and dust control are performed in a manner that ensures safety in bad weather and minimizes soil erosion into watercourses.

Specifications for the various road types within the MLOSB TSL are presented in Table 18.

A map of the roads within the TSL is provided in Figure 33. The distribution of existing road lengths constructed by road class is provided in Table 19. Note that data availability was limited for the forest roads. There is also uncertainty about the amount of seismic lines in the TSL, particularly in the Green Lake portion. Many of the linear features identified as seismic lines in the data appear to be either non-existent or other older trails when compared to recent imagery.

Inter-block (class 3) and in-block (class 4) roads will be the main source of road development. A 24.5 kilometre main haul road is being proposed for the Makwa Area, and has been identified as a concern by local stakeholders due to the improved access it provides for hunters and other users. To address this concern, the first 6.5 kilometres will be built as a Class 2 (all-weather) haul road and the remaining 18 kilometres as a Class 3 (winter) haul road. The rationale including a wood flow and economic summary and a description of reasoning for location has been presented to the Ministry and has been presented to stakeholders. In the 2015-2016 Operating Plan, 12.5 km (6.5 km all weather and 6 km winter) was approved for construction as well as an all season crossing at Muckingham. During the 2015-2016 season, MLOSB constructed the Muckingham crossing and constructed 4.1 km of the IBR. MLOSB is proposing to construct the remaining 2.4 kilometers of all-season road and 6.0 kilometers of winter road, in 2016-2017. This road will be included within the tactical plan and further details will be included in Volume 3.

There are also a large number of recreational trails within the Bronson/Makwa areas of the TSL that have been developed by the general public. Although identification and preservation of these trails is a significant issue that must be considered by Meadow Lake OSB during planning, harvesting, and silviculture activities, buffers are not generally required.

Table 18 Road Specifications for the MLOSB TSL

Attribute	Road Class			
	1 Major Improved Bush Road	**2 Minor Improved Bush Road**	**3 Bush Road and Bush Winter Road**	**4 In-Block Bush Road**
Access	All Weather Primary access roads to multiple operating areas containing long-term timber supplies	Winter or Summer Typically accessing one or more operating areas	Winter or Summer Typically accessing one or more harvest blocks in an operating area	Winter or Summer
Life Expectancy Maximum Right of Way Width	Permanent 40m	5-20 years 30m	1-15 years 20-30m	Up to 2 years 20 m
Road Driving Surface Width (Grade)	8.0m - 10.0m	7.0 -8.0m	≤7.0m	≤7.0m
Travel Surface	Gravel	Gravel Winter Road - Existing soil Option - Gravel/Clay/Sand capping	Existing Soil Option - Gravel/Clay/Sand capping	Existing Soil Option - Gravel/Clay/Sand capping
Minimum Road Side Slope	2:1	2:1	Licensee to provide adequate erosion control methods	Licensee to provide adequate erosion control methods
Minimum Ditch Back Slope	2:1	2:1	2:1	2:1
Maximum Vegetation Control Width	40m	30m	20-30m	N/A

Table 19 Existing & Planned Roads within the MLOSB TSL

Road Class	Existing Road (km)	Planned Construction (km)	Planned Reclamation (km)
Highways, Roads, Trails, Lines (Not Managed by MLOSB)			
Express way / Highway	43.5		
Collector	80.0		
Resource / Recreation	68.5		
Seismic Lines	3,907.9		
Stakeholder Trails	40.6		
Forest Roads (Managed by MLOSB)			
Class 1 Major Improved Bush Road	0.0	0.0	
Class 2 Minor Improved Bush Road	4.1	11.3	
Class 3 Bush Road and Bush Winter Road	25.4	52.0	4.3
Class 4 In Block Bush Road	54.7	177.7	54.7

11.0 Significant Changes Expected to Affect Wood Supply and Forest Management Practices

There are a number of areas of known issues and concerns around the management of forest resources in the TSL area:

- State of the current forest inventory:
  A new SFVI was completed in 2014 using 2007 photos. It covers all but a very small area of the TSL. A portion of this can be filled in with UTM inventory information and a composite set of attributes generated. However, the UTM inventory is very old (30+ years) which is a concern. There is also a small area in the TSL (approximately 253 hectares) where neither UTM or SFVI inventory data is available, which is a concern.

- Caribou:
  Caribou is listed under the federal Species at Risk Act and the province is currently working on Range Plans for the caribou to address habitat needs. A concern is the uncertainty in direction that these Range Plans will take. Therefore, subsequent phases in the FMP process will need to develop an interim approach which will need to be revised, as required, once the Woodland Caribou Range plan is made available. It is recognized that achieving old forest targets will be a challenge given the current age class of the productive forest, and MLOSB will work with the Ministry on a recruitment strategy in areas where old forest targets cannot be currently met.

- Roads mapping commitment:
  Section 12.02 of the TSL document states that "The Minister and the Licensee agree that they will work collaboratively to develop a Licensee roads map by April 1, 2015, or such later date as may be agreed to by both parties". There has been agreement to extend this commitment to September 30, 2017. There is a concern with this outstanding commitment and data gap, and the reliance on the delivery schedule from Saskatchewan Geospatial Imagery Collaborative which is not within MLOSB's control.

- Transportation and infrastructure:
  One of the significant infrastructure challenges associated with the MLOSB TSL is the weight restrictions on Highway 155 and the challenges associated with transportation of harvested timber in the Makwa and Bronson areas.

12.0 FMP Registry

There are no FMP Registry items to consider as there is no previous Forest Management Plan in effect.

13.0 Literature Cited

Andison, D. (2005). *Determining Island Remnants and Meso-scale Fire Patterns in Saskatchewan. Part 1: Disturbance Event Patterns.* Vancouver: Bandaloop Landscape-Ecosystem Services.

Andison, D. (2006). *Determining Island Remnants and Meso-scale Fire Patterns in Saskatchewan. Part 2: Island Remnant Patterns.* Vancouver: Bandaloop Landscape-Ecosystem Services.

Andison, D. (2006). *Determining Island Remnants and Meso-scale Fire Patterns in Saskatchewan. Part 3: Event Composition and Spatial Controls.* Vancouver: Bandaloop Landscape-Ecosystem Services.

Barrow, E. (2009). *Climate Scenarios for Saskatchewan.* University of Regina, Prairie Adaptation Research Collaborative.

City-Data.com. (2016). *City-Data*. Retrieved from City-Data.com: http://www.city-data.com/canada/Saskatchewan-Index.html

Environment Canada. (2012). *Recovery Strategy for the Woodland Caribou (Ranger tarandus caribou), Boreal population, in Canada.* Retrieved from Species at Risk Public Registry.

Environment Canada. (2015, 01 05). *Migratory Birds Convention Act (MBCA) and Regulations*. Retrieved from https://www.ec.gc.ca.

Environment Canada. (2016). *Canadian Climate Normals*. Retrieved from Canadian Climate Normals: http://climate.weather.gc.ca/climate_normals/index_e.html

Gingrich, P. (2009). *Boom and Bust: The Growing Income Gap in Saskatchewan.* Regina: Canadian Centre for Policy Alternatives.

Government of Saskatchewan. (2006, October 26). *Minister's Task Force Report on Forest Sector Competitiveness.* Retrieved from http://www.gov.sk.ca/news-archive/2006/10/26-767-attachment.pdf

Government of Saskatchewan. (2007, September 27). *Premier's Task Force on Forest Development Report.* Retrieved from http://www.gov.sk.ca/news-archive/2006/10/05-716-attachment.pdf

Government of Saskatchewan. (2012). *2012 Report on Saskatchewan Forests.*

Government of Saskatchewan. (2015). *Saskatchewan Labour Force Statistics, February 2015.* Retrieved from 2015 Labour Force Survey Releases.

ISO. (2016). *ISO 14000 - Environmental management*. Retrieved from http://www.iso.org/iso/iso14000

McLaughlin, M. (2014, December 8). Forest Ecologist, Forest Sevice Branch. (P. Communication, Interviewer)

PEFC. (n.d.). *Chain of Custody*. Retrieved from PEFC - Caring for our forests globally: http://www.pefc.org/standards/chain-of-custody

Pomeroy, J., Fang, X., & Williams, B. (2009). *Impacts of Climate Change on Saskatchewan's Water Resources.* University of Saskatchewan Centre for Hydrology.

Saskatchewan Ministry of Environment. (2016). *Saskatchewan Bird Atlas*. Retrieved from Saskatchewan Bird Atlas: http://gisweb1.serm.gov.sk.ca/imf/imf.jsp?site=birds

Saskatchewan Ministry of Environment. (n.d.). *Environmental Code*. Retrieved from http://www.environment.gov.sk.ca/Code

Saskatchewan Ministry of Environment Fish and Wildlife Branch. (2015). *Saskatchewan Wildlife Management Report 2013-2014.*

Saskatchewan Ministry of Environment. (n.d.). *Legislation*. Retrieved from Saskatchewan Ministry of Environment: http://www.environment.gov.sk.ca/legislation

Saskatchewan Ministry of Parks, Culture and Sport. (2016). *Heritage*. Retrieved from http://www.tpcs.gov.sk.ca/about/

Saskatchewan Ministry of the Economy. (2016). *Saskatchewan Forestry Sector.* Retrieved from http://economy.gov.sk.ca/Forest-Sector-Overview

Saskatchewan Water Security Agency. (2016). Retrieved from Water Security Agency: https://www.wsask.ca/

SaskNetWork. (2016). *Industry Profile - Commercial Fishing*. Retrieved from SaskNetWork.

Statistics Canada. (2016). *Census Program*. Retrieved from Census Program.

Sustainable Forestry Initiative. (2016). *Sustainable Forestry Initiative Home*. Retrieved from SFIprogram.org: http://www.sfiprogram.org/

Thompson, J. (2016, April 25). Email Request for Archaeological Communication. (R. Kennett, Interviewer)

Thorpe, J. (1996). Fire history and its application to management of Saskatchewan forest.

Timberline Natural Resource Group Ltd. (2005). *Development of Product-Based Natural Stand Yield Curves for Saskatchewan.* Saskatchewan Ministry of Environment.

University of Saskatchewan. (2016). *Ecoregions of Saskatchewan.* Retrieved from Ecoregions of Saskatchewan: http://www.usask.ca/biology/rareplants_sk/root/htm/en/researcher/4_ecoreg.php

University of Saskatchewan College of Agriculture and Bioresources. (2016). *Soils of Saskatchewan*. Retrieved from Soil Classification: http://www.soilsofsask.ca/soil-classification

14.0 List of Acronyms

COSEWIC	Committee of the Status of Endangered Wildlife in Canada
FCA	Fur Conservation Area
FMP	Forest Management Plan
HVS	Harvest Volume Schedule
IFLUP	Integrated Forest Land Use Plan
MBCA	Migratory Birds Convention Act
MOE	Minister of Environment
MLOSB	Meadow Lake Oriented Strand Board
NSR	Not Sufficiently Regenerated
OP	Operating Plan
OSB	Oriented Strand Board
PFT	Provincial Forest Type
PFRA	Prairie Farm Rehabilitation Area
RAN	Representative Areas Network
RBR	Results Based Regulatory
SARA	Species at Risk Act
SGR	Silviculture Ground Rules
SSN	Site of a Special Nature
TSL	Term Supply Licence
VOIT	Values Objectives Indicators Targets

Appendix A Issues and Concerns Tracking Table

Public Issues and Concerns Summary Related to Forest Management within the MLOSB TSL			
Topic Area	**Source/Date**	**Issue/Comment**	**MLOSB Response**
Trails	PAG, March 2016	There are a large number of recreational trails in the TSL. Want to ensure that trails continue to be accessible following harvest & silviculture activities.	MLOSB works with the public and stakeholders to identify and address operational issues during operational plan development
Wildlife	PAG, March 2016	There is concern about possible impacts to wildlife, especially elk.	MLOSB will follow all government guidelines with respect to protecting wildlife habitat and controlling access
Grazing/fencing	PAG, March 2016	There is significant grazing activity within the TSL, and numerous fences that may be damaged during forestry operations	MLOSB works with ranchers to identify and protect fences during development, harvesting and silviculture arctivities
Communication	PAG, March 2016	Would like to see better lines of communication for dissemination of information to trappers.	MLOSB works with public and stakeholders to identify and address operational issues during operational plan development. Plans are provided to trappers at this time.
Access	PAG, March 2016	There is concern about the proposed inter-block road in the Makwa area, and the access and impact to wildlife that it will create.	MLOSB requires access to the TSL for harvesting, and has taken steps to mitigate the impacts from the road (e.g. gating, construction of portions as winter haul roads).
Biodiversity	PAG, March 2016	There is general concern about maintaining biodiversity and ensuring sustainability.	MLOSB will meet all government requirements relating to biodiversity/sustainability during the development of this FMP.
Compensation	PAG, March 2016	Trappers would like MLOSB to pay compensation to trappers for timber harvest.	MLOSB does not pay compensation to trappers in Saskatchewan.
Site Preparation	PAG, March 2016	Don't like disk trenching.	MLOSB is required to reforest the site after harvesting. Many sites are difficult to regenerate successfully without disk trenching.
Harvesting Location	PAG, March 2016	Concerns about operating in Berry Lake, Muckingham Lake	MLOSB works with public and stakeholders at the time of operating plan development to identify specific issues and attempt resolution, while ensuring that all THLB can be accessed.
Forest Health	PAG, March 2016	There is concern about the decline in forest health in certain areas of the TSL.	In many cases, harvesting and reforestation is the preferred method for ensuring ongoing forest health as stands become over-mature.
Wetlands	PAG, March	Would like to see incorporation of	This is an operational issue that is

	2016	wetland best management practices into FMP.	dealt with at the time of harvesting/silviculture.
Cattle	PAG, March 2016	There is concern about the impacts of cattle on forest regeneration, wetlands, water and riparian areas.	Grazing is a permitted activity within the TSL, and MLOSB has little opportunity to influence their management beyond maintenance of existing fences.
Harvest	PAG, March 2016	There is concern about understory protection, utilization, and spruce utilization in the mill.	Parking Lot item to be discussed later
Trucking	PAG, March 2016	Product truck safety and transport inefficiency from highways.	Parking Lot item to be discussed later
Annual area harvested	PAG, March 2016	The PAG would like to know the % of forest in the TSL that is harvested annually.	MLOSB will provide this information.
Trapping	Public Meeting, June 14th 2016	Seems to be a decline in mink populations	
Watercourses	Public Meeting, June 14th 2016	Staying away from creeks and leaving poplar for beavers	Will be included in operational considerations
Trails	Public Meeting, June 14th 2016	Want to see more regulations controlling ATV's	This is out of MLOSB's control
Trails/Acccess	Public Meetings, June 14th 2016 June 15th 2016	Lack of availability to create new trails, and want to preserve/maintain access	MLOSB is obligated to close roads by ministry. Roads interfere with caribou movement
Fire History	Public Meeting, June 14th 2016	A fire occurred in 1919 in the MLOSB operating area	Thank you. Incorporated this information into the Volume 1 document
Caribou	Public Meeting, June 15th 2016	Caribou tracks were observed in the Sled Lake Area	
Aesthetic Values	Public Meeting, June 15th 2016	Cutting up to watercourses and the road on highways	VSA's are considered when harvesting. Certain things are approved or denied by Ministry. Windfall can occur on linear buffers, then this interferes with DO Highways
Watercourses	Public Meeting, June 15th 2016	Schools are using rivers to take kids canoeing	
Wildlife Predation	Public Meeting, June 15th 2016 June 16th 2016	Larger cut blocks are creating a line of sight for wolves to predate on ungulates	Line-of-sight is considered when planning blocks. Retention is included to mitigate the issue.
Caribou	Public Meeting, June 15th, 2016	With no area to support a sustainable breeding population there will be no increase in numbers	
Harvesting	Public Meeting, June 15th 2016, June 16th 2016	Wants slash available for public utilization and piled roadside for pickup	Firewood can be piled roadside upon request
VSA's	Public Meeting, June 15th 2016	Wants no cut zones or buffers near Beaver River, Water Hen and Green River	MLOSB will exclude those VSA's
Traplines & Harvesting	Public Meeting, June 15th 2016	Stressed the need for trapper consultation when cutting in trapping areas, and proper buffers around cabins	MLOSB notifies all resource users present in the database of proposed harvest during the planning process

Harvesting	Public Meeting, June 15th 2016	Wants a smaller patchwork harvest similar to Weyerhaeuser 10 years ago	MLOSB considers this, and plans harvests to mimic natural disturbances. At times, disturbances deforest large areas and eventually regenerate large areas
Fire History	Public Meeting, June 16th 2016	Mentioned the 1919 fire and also indicated there was one in 1948 within the MLOSB operating area	Thanks you. Incorporated this information into the Volume 1 document
Insects	Public Meeting, June 16th 2016	An area in Bronson had defoliators that ultimately killed 10 to 15 hectares of hardwood	
Access	Public Meeting, June 16th 2016	Wants historical roads and trails maintained	Any roads belong to Tolko – MLOSB have a legal obligation to be reclaimed. Access prior to harvest is maintained
Historical Access	Public Meeting, June 16th 2016	Aboriginal trails exist in the TSL that became hay trails in the 1930's	
Seismic Activities	Public Meeting, June 16th 2016	Seismic exploration lines were made in the 1960's and have grown over. Lines made in 1988 can be found	
Preserving Advance Regeneration	Public Meeting, June 16th 2016	Roadwidth cut in excess	MLOSB will consider this in planning
Harvesting	Public Meeting, June 16th 2016	Wants logs skidded in appropriate areas	MLOSB will work with contractors to ensure proper operations
Softwood Preservation	Public Meeting, June 16th 2016	Wants spruce to mature and become old growth for public use. Immature spruce is harvested during hardwood harvests	MLOSB leaves retention and preserves understory when harvesting. MLOSB only harvests areas that are of proper maturity, and will look at preserving some heavy spruce areas.
Harvesting	Public Meeting, June 16th 2016	Suggests a 'dog line' on trails to reduce line of site for predators	MLOSB will consider this in planning
ATV's	Public Meeting, June 16th 2016	Would like to see more ATV regulations, potentially only operations outside breakup period	Out of MLOSB's jurisdiction
Trapping	Public Meeting, June 16th 2016	Beavers were shot instead of contacting fur block trapper	MLOSB will ensure in the future situations of this nature that the trappers will be contacted
Communications	Public Meeting, June 16th 2016	Wants open communication and relationships between public and MLOSB	MLOSB holds operational and strategic information gathering sessions throughout its TSL. As well, MLOSB notifies all resource users present in the database of proposed harvests during the planning process. Invitation extended to directly contact staff.
Fences	Public Meeting, June 16th 2016	Wants better monitoring of machinery around fences	MLOSB will work with contractors to create awareness. Not all fences are in database
Harvesting	Public Meeting,	Wants processors to minimize waste	MLOSB will work with contractors

	June 16th 2016	when cutting logs to length	to minimize waste
Harvesting	Public Meeting, June 16th 2016	Wants smaller patches (e.g. there is a large block at Berry Lake)	MLOSB considers this and plans harvests to mimic natural disturbances. At times disturbances deforest large areas and eventually regenerate large areas
Access	Public Meeting, June 16th 2016	Wants to maintain existing hunting pressure in certain areas, not more pressure by new access	MLOSB is obligated to close roads by ministry, can close gates on certain roads
Petroglyphs	Public Meeting, June 16th 2016	Indicated that multiple new petroglyphs were recently found in the area	
ATV's	Public Meeting, June 16th 2016	Many quad users come from Alberta	
Wildlife	Public Meeting, June 16th 2016	There is a need for factual population numbers of caribou, wolves, etc.	Many caribou population numbers are anecdotal. Ministry will have more information
Harvesting	Public Meeting, June 16th 2016	There is a need to train contractors	MLOSB works with contractors to operate sustainably on the landscape
Regeneration	Public Meeting, June 16th 2016	Doesn't want mono-culture/mono-species regeneration. Wants regeneration to accurately represent species composition prior to harvest	MLOSB regenerates areas to accurately represent species composition prior to harvest. There is also a visual difference in natural versus planted regeneration.
Buffers and Line-of-sight	Public Meeting, June 16th, 2016	Wants buffers on major highways and roads to reduce poaching and shooting from the highway	VSA's are considered when harvesting. Certain things are approved or denied by Ministry. Windfall can occur on linear buffers, which then interferes with DO Highways.