



**MISTIK MANAGEMENT LTD.**

# **2019 20-YEAR FOREST MANAGEMENT PLAN (AMENDED APRIL 2023)**

## ***Volume III***

### ***Plan Implementation (2019 - 2039)***

# **2019 FOREST MANAGEMENT PLAN – VOLUME III PLAN IMPLEMENTATION DOCUMENT**

**(Amended April 2023)**

**for the**

**Mistik and L&M Forest Management Agreement (FMA) Areas**



**For the 20-year period from April 1, 2019 to March 31, 2039**

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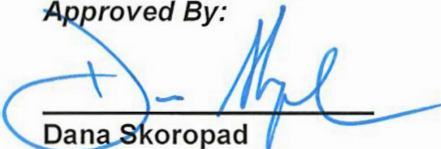
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## EXECUTIVE SUMMARY

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*April 2023 update: This document is the second version of Volume III (initially submitted late 2018) for the 2019-2039 Forest Management Plan for the Mistik and L&M Forest Management Agreement Areas. As the province of Saskatchewan finalized the Range Plan for Woodland Caribou in Saskatchewan (SK2 West Caribou Administration Unit) in October 2021, Mistik has updated the forest management plan to gain alignment with the range plan and meet the new requirements. Please see below the changes in Volume III to address these new requirements:*

- **Appendix A**
  - Various text changes
- **Appendix B**
  - Section 6.7 FMP Amendment Engagement (2022-23)
- **Appendix C: Caribou Habitat Amendment**
  - Landbase Changes
  - Updated Selected Management Strategy
- **Appendix D: Values, Objectives, Indicators, and Targets (April 2023)**
  - Updated
  - Other various text edits
- **Appendix E: Silviculture Ground Rules**
  - Updated

On behalf of Mistik Management Ltd. (Mistik) and L&M Forest Products 2018 LP (L&M), I am pleased to present Mistik's 2019 20-Year Forest Management Plan (FMP) Volume III: Plan Implementation. FMP Volume III: Plan Implementation provides both the Province of Saskatchewan and the public with information related to sustainable forest management of Mistik's and L&M's Forest Management Agreements, hereby known as the Mistik FMP Area.

Previously approved FMP documents reference "L&M Wood Products 2011". In 2018, L&M was purchased by the Meadow Lake Tribal Council and the new legal name for L&M is "L&M Wood Products 2018 Limited Partnership". All references to L&M in the forest management plan now apply to this new business entity.

The total Mistik FMP area is 1,878,499 hectares (1,809,288 ha in the Mistik FMA area and 69,211 ha in the L&M FMA area), of which 878,510 ha (817,285 ha in the Mistik FMA area and 61,266 ha in the L&M FMA area) is considered net landbase, which contributes to the timber supply. For the purposes of the FMP, the 13 Management units have been grouped into 5 distinct planning units (Divide, West, Central, North, and L&M) of which details can be found within Volume II.

FMPs in Saskatchewan provide strategic direction for forest resource management over a 20-year timeframe. Preparation of a 20-year FMP requires development of three (3) primary documents:

1. Volume 1 of the FMP provides background and contextual information on the Mistik FMP area and describes historical forest management practices.





2. Volume 2 includes six documents that establish the foundations for the Mistik FMP area, including the following: Planning Inventory, Forest Development Report, Silviculture Ground Rules, Values Objectives Indicators and Targets, Modelling Assumptions Report, and Forest Estate Modelling Report.
3. Volume 3 presents the harvest volume schedule (HVS), which was determined based on the forest estate modeling analysis. It also includes the tactical plan and associated maps along with implementation strategies for the FMP. The specified tactical plan prepared for the 2019 FMP identifies the areas in which harvesting is expected to occur within the next 20 years (T1+T2). Values were identified by forest planners knowledgeable with the landbase to ensure operational feasibility and adjusted with the forest estate modelling procedures. It also identifies caribou, seral stage, old forest, and L&M black spruce constraints. In association with the tactical plan Mistik and L&M have 27 values, objectives, indicators, and targets (VOITs) which define sustainable forest management attributes within the Mistik FMP area. Implementation of the FMP will also be guided by strategies to address natural disturbance (i.e. wildfire, insects, and disease) as well as a strategy for management of woodland caribou habitat until a range plan has been developed.

Given the requirements of the FMP Standard, Forest Management Scenario (FMS) 11 is the strategy that has been selected. This FMS was determined to be the selected management strategy (SMS) as it maintained the desired harvest flows while also satisfying the non-timber constraints. The preferred and alternative utilization standards and resulting annual Harvest Volume Schedule (HVS), over the life of this plan (2019-2039) based on the selected management strategy are as follows:

Table E-1: Mistik FMP Area Utilization Standards

UTILIZATION PARAMETER	L&M YIELD CURVE ( # 7)		MISTIK + L&M (ALL OTHER YIELD CURVES)	
	Hardwood	Softwood	Hardwood	Softwood
Stump Height (m)	0.3	0.3	0.3	0.3
Minimum Top Diameter Inside Bark (cm)	8	10	7.5	10
Log Length (m)	n/a	n/a	2.6	2.6
Merchantable Min. Bole Length (m)	4.9	5.2	5.2	5.2

Table E-2: Mistik FMP Area Harvest Volume Schedule *(updated April 2023)*

Result	Mistik FMA HVS (m <sup>3</sup> /yr)			L&M FMA HVS (m <sup>3</sup> /yr)		
	Softwood Sawlog	Softwood Pulp	Hardwood	Softwood Sawlog	Softwood Pulp	Hardwood
Amended SMS Model Result	536,596	N/A	1,001,657	79,429	N/A	49,899
Reduction for Insular Retention (4%)	-21,464	N/A	-40,066	-3,177	N/A	-1,996
Weighted Average Degrade (Mistik: 12%, L&M: 9%)	-61,816	61,816	N/A	-6,863	6,863	N/A
Tops (10cm to 8cm) and additional merch. trees	N/A	121,897	N/A	N/A	12,077	N/A
Final HVS (m <sup>3</sup> /yr)	453,316	183,713	961,591	69,389	18,940	47,903

Section 2.3.1 contains an explanation of how the softwood pulp figures (above) were determined, including the weighted average degrade values, which were based on species-specific factors.



# 1. TACTICAL PLAN

The purpose of the tactical plan is to provide the general public, Saskatchewan Ministry of Environment, Mistik, and L&M with a clear definition of the location, extent and profile of forest stands scheduled for harvest and the location of the supporting access network that is scheduled for construction within the active portion of the 2019 20-Year FMP. The tactical plan also provides a critical linkage between the strategic-level modelled Selected Management Strategy and actual operational plans.

The Mistik FMP area will be managed and will be presented in the 2019 FMP within the context of five planning units, consisting of a total of twelve landscape-level management units ranging in size from 13,706 ha to 355,677 ha. The management units were combined to define the larger planning units (Map 1).

*April 2023 Update: Mistik has made landbase changes (since 2016) in Appendix C (Caribou Habitat Amendment 2023). These were done as part of the Caribou Habitat Amendment to gain alignment with the Range Plan for Woodland Caribou in Saskatchewan (SK2 West Caribou Administration Unit) which was finalized in October 2021. The Tactical Plan was not changed as a result of this amendment. However, any tactical areas falling within CHMA Tier 1 and selected CHMA Tier 2 areas will be deferred from harvest for the term of this FMP.*

Table 1-1 Planning Unit Area Summary

Planning Unit	Management Unit	Gross Area (ha)	Net Productive Area	% Productive
West	20-Beaver River	13,706	8,044	59%
	03-Big Island Lake	37,926	26,751	71%
	12-Murray Bay	62,412	37,166	60%
	02-Pierceland	119,855	65,597	55%
<b>Subtotal</b>		<b>233,899</b>	<b>137,558</b>	<b>59%</b>
Central	09-Ile-a-la Crosse	112,426	34,464	31%
	10-Buffalo Narrows	125,665	50,060	40%
	07-Beauval	149,212	53,693	36%
	04-Waterhen	186,515	106,428	57%
	08-Canoe Lake	189,585	60,688	32%
<b>Subtotal</b>		<b>763,403</b>	<b>305,333</b>	<b>40%</b>
North	21-Peter Pond	283,956	102,578	36%
	11-Dillon	355,677	172,488	48%
<b>Subtotal</b>		<b>639,633</b>	<b>275,066</b>	<b>43%</b>
Divide	01-Divide	160,128	99,326	62%
<b>Subtotal</b>		<b>160,128</b>	<b>99,326</b>	<b>62%</b>
L&M	85- L&M	69,211	61,226	88%
<b>Subtotal</b>		<b>69,211</b>	<b>61,226</b>	<b>88%</b>
<b>Total</b>		<b>1,866,274</b>	<b>878,510</b>	<b>47%</b>

Mistik and L&M have designed a tactical harvest and access plan (Map 2 through Map 6) for the 2019 FMP comprised of two 10-year harvest pools. For each of the two harvest pools (referred to as 'T1' and 'T2', respectively), Mistik and L&M have planned additional area and volume than



will be harvested. The additional area and volume allow for the required flexibility in a selection of harvest locations. Note that although additional area and volume is shown in the tactical plan as well as annual operating plans, Mistik and L&M are still required to harvest within the limits of the approved HVS.

In the wood supply model, priority was given to the T1 harvest pool to be harvested first. Mistik & L&M will strive to keep first 10 years of harvest confined to T1 areas where possible however, there is flexibility to access T2 wood provided it is identified and justified in an operating plan. Mistik and L&M have also designed and delineated deferral areas for old and very old forest retention (Map 12). In association with the tactical plan, the merchantable stands by forest development type from the net productive landbase can be found in Maps Map 7 through Map 11.

A profile of the tactical plan is presented in Table 1-2 with the volumes, areas, and age class distribution by T1 and T2.

A description of how the Tactical Plan was incorporated into the wood supply modeling is included in Section 2.



Table 1-2 Tactical Plan Profile.

HVS Summary						
	Mistik		L&M			
	T1	T2	T1	T2		
Tactical Plan Area (ha)	140,137	78,218	18,497	12,126		
Tactical Plan Current Softwood Volume (m³)	5,031,266	3,139,272	1,684,983	931,376		
Tactical Plan Current Hardwood Volume (m³)	16,095,854	8,484,641	1,117,522	755,604		
Tactical Plan Initial Development Type Distribution						
Development Type	T1 Area (ha)		T2 Area (ha)		Total Area (ha)	
	Mistik	L&M	Mistik	L&M	Mistik	L&M
No Development Type	17,899	849	9,090	1,254	26,989	2,103
1 S-WS-A-A	4,697	1,143	2,436	493	7,159	1,636
2 S-BS-A-A	644	2,533	387	1,804	1,046	4,338
3 S-JP-LD-A-1	4,744	0	3,733	0	8,478	0
4 S-JP-LD-A-2	4,763	0	2,738	0	7,501	0
5 S-JP-HD-A-1	6,469	0	5,784	0	12,254	0
6 S-JP-HD-A-2	9,719	0	6,376	0	16,114	0
7 S-JP-L&M	0	6,681	0	4,046	0	10,726
8 SH-JP-A-A	3,148	1,605	2,100	783	5,253	2,388
9 SH-WS-A-A	3,000	828	1,873	326	4,867	1,154
10 HS-WS-A-A	8,532	1,438	4,091	477	12,653	1,915
11 HS-JP-A-A	3,393	1,128	2,535	422	5,940	1,549
12 H-A-LD-A-1	3,355	41	2,000	259	5,341	301
13 H-A-LD-A-2	8,933	276	3,908	446	12,840	722
14 H-A-HD-A-1	10,736	357	6,489	497	17,199	855
15 H-A-HD-A-2	29,843	898	14,256	523	44,116	1,421
16 H(S)-A-LD-A	7,484	377	3,223	353	10,707	730
17 H(S)-A-HD-A	12,779	342	7,199	443	19,978	785



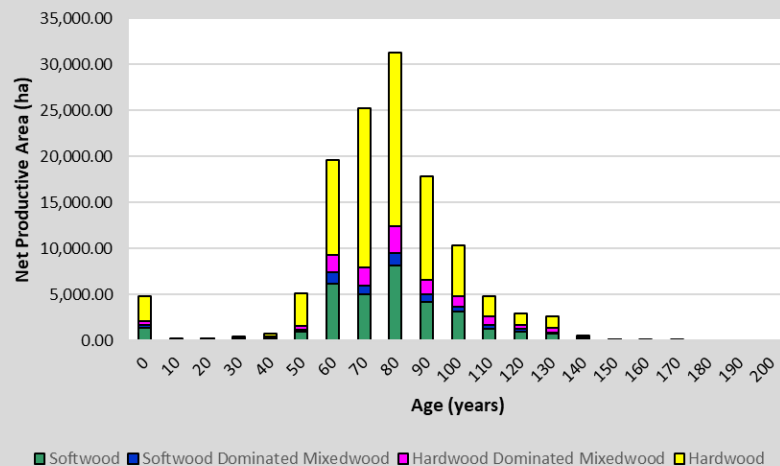
**Tactical Plan Initial Development Type Distribution**

Development Type	T1 Area (ha)		T2 Area (ha)		Total Area (ha)	
	Mistik	L&M	Mistik	L&M	Mistik	L&M
Total Area (ha)	140,137	18,497	78,218	12,126	218,438	30,622

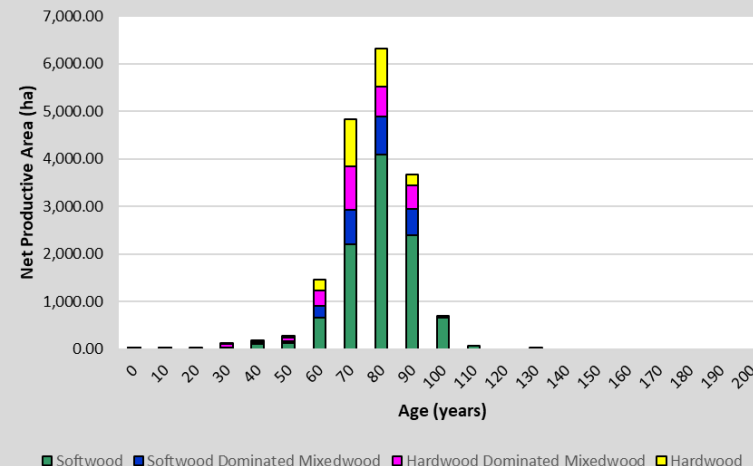




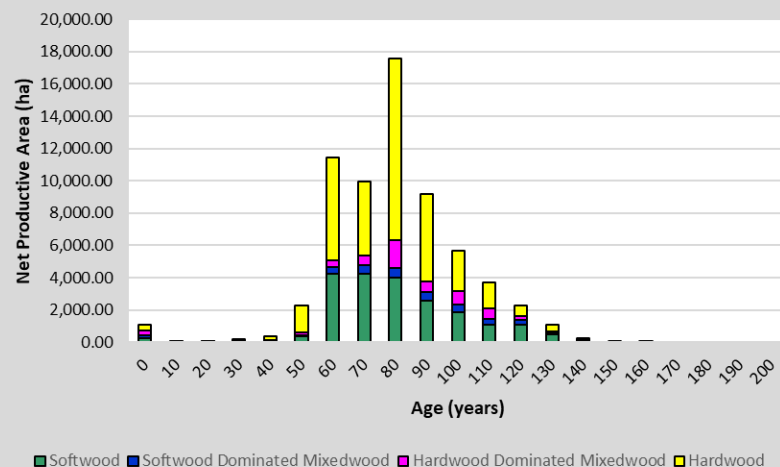
**Tactical Plan T1 Initial Age Class Distribution (MISTIK)**



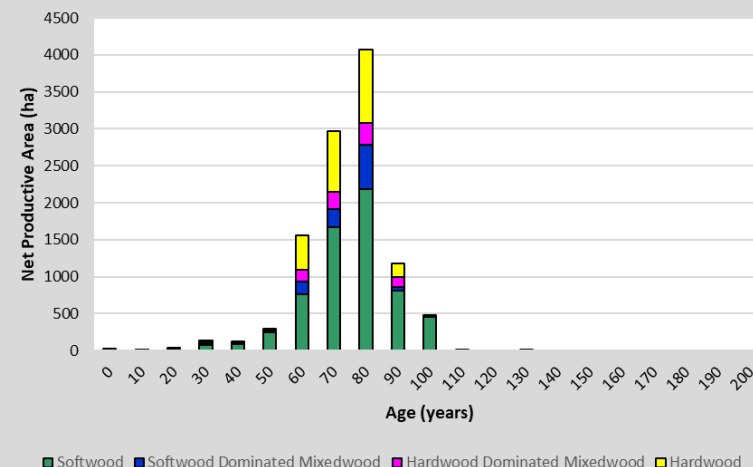
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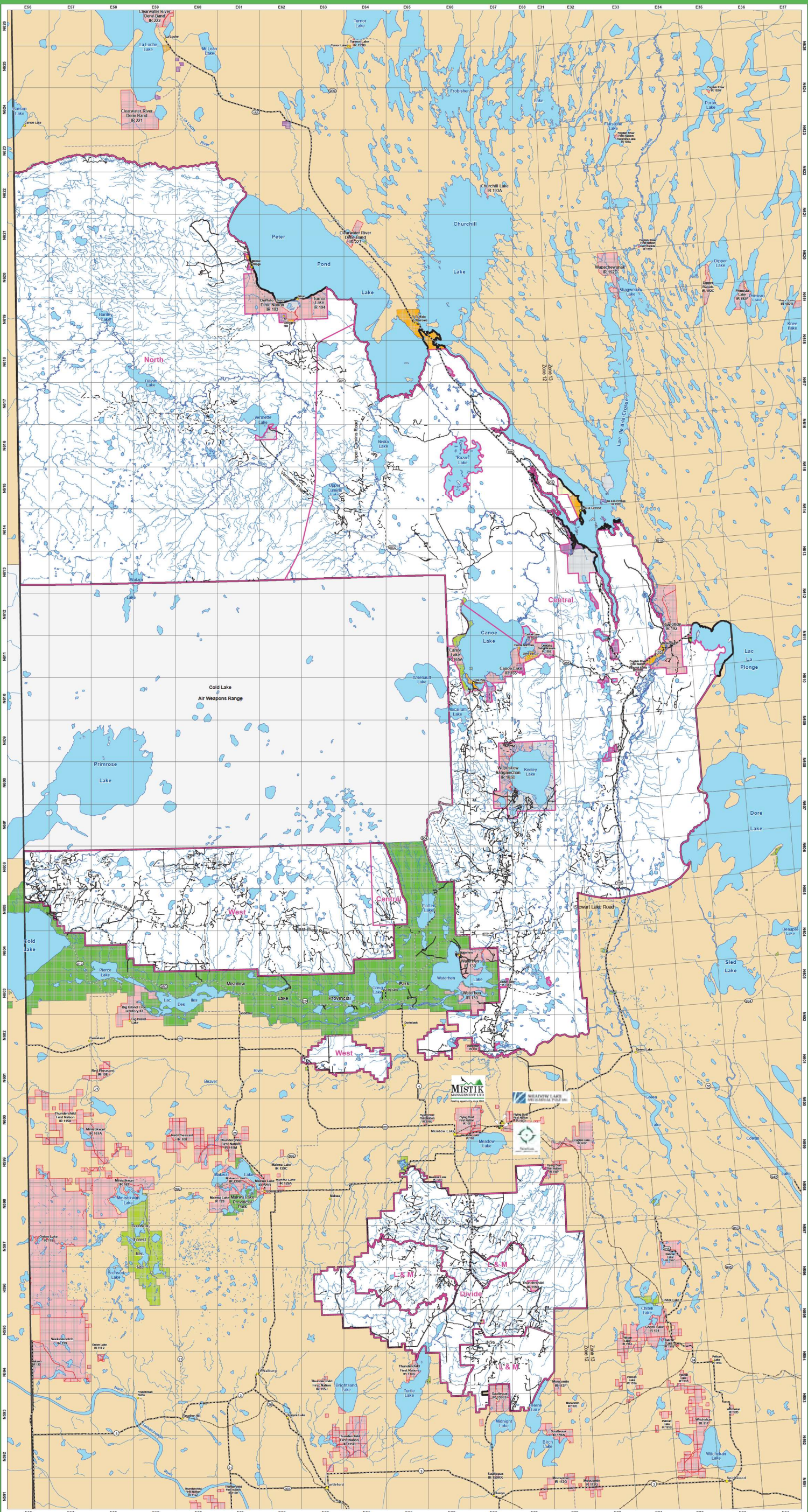
**Tactical Plan T1 Initial Age Class Distribution (L&M)**



**Tactical Plan T2 Initial Age Class Distribution (L&M)**







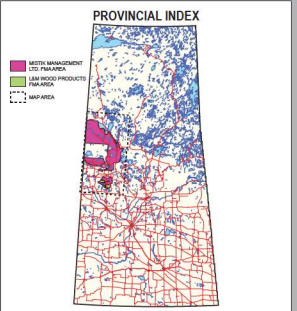


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**PLANNING UNITS**

























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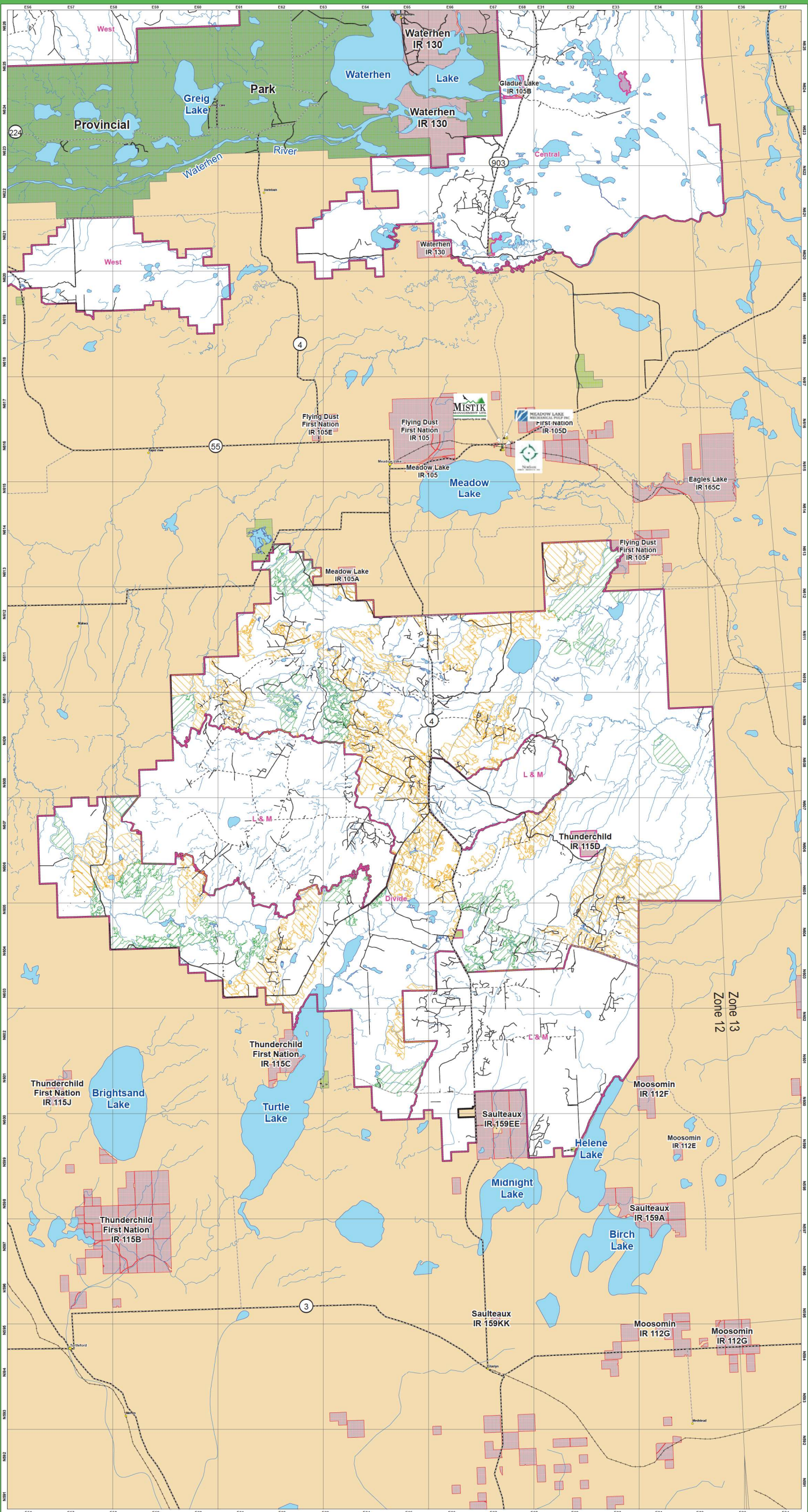
**FEATURES OF INTEREST**

 Planning Unit

**PLANIMETRIC LEGEND**

 Public Road	 FMA Boundary
 Paved Highway	 Provincial Park
 Gravel Highway	 Recreation Site
 Non-Motor	 Indian Reserve
 Oil / Gas	 Air Weapons Range
 3rd Party	 Settlement
 Provincial Forestry Class Road	 Timber Reserve
 Class 1 (PRR)	 Town
 Class 2 (BR)	 Village / Hamlet
 Class 3 (Bush Road)	 Woodlands Office
 Railroad	 Mill Site
Lake	
Creek	
Provincial Border	
UTM Tile Boundary	









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## PLANNED HARVEST EVENTS - DIVIDE



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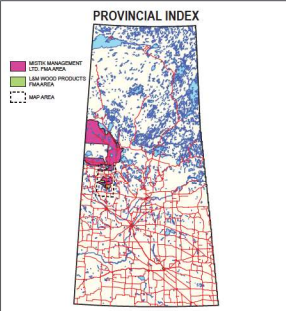


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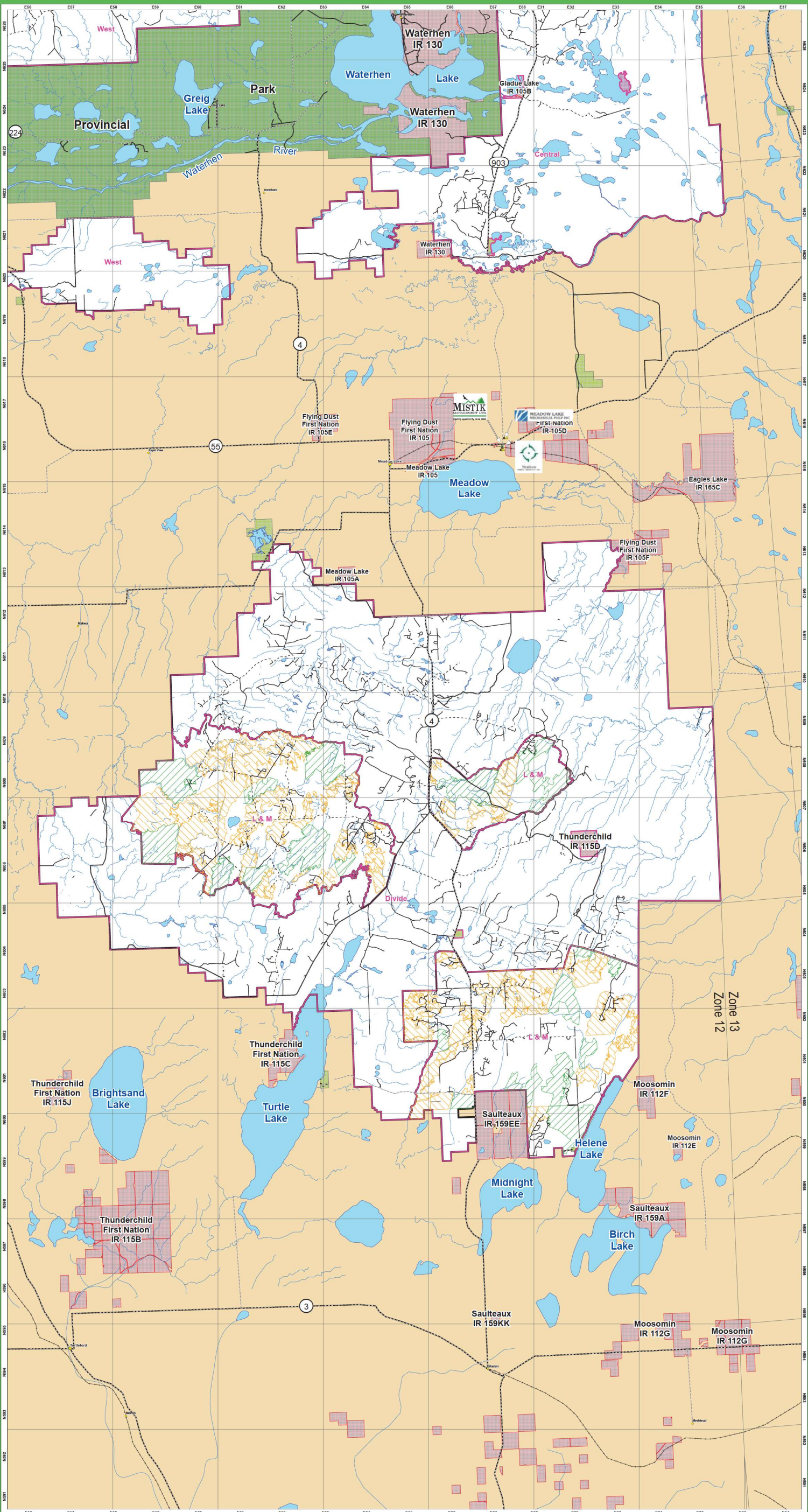
**Tactical Plan**

- T1
- T2

### PLANIMETRIC LEGEND

Public Road	Paved Highway	FMA Boundary
Gravel Highway	Provincial Park	Recreation Site
Non-Mile	Indian Reserve	Air Weapons Range
Oil / Gas	Settlement	Timber Reserve
3rd Party	Village	Town
Provincial Forestry Class Road	Village / Hamlet	Woodlands Office
Class 1 (FRR)	Mill Site	
Class 2 (BR)		
Class 3 (Bush Road)		
Railroad		
Lake		
Creek		
Provincial Border		
UTM Tile Boundary		









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**PLANNED HARVEST EVENTS - L & M**



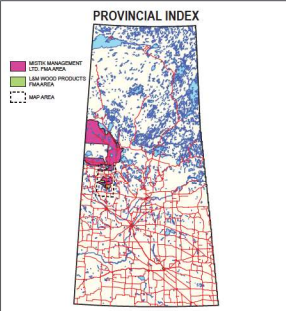
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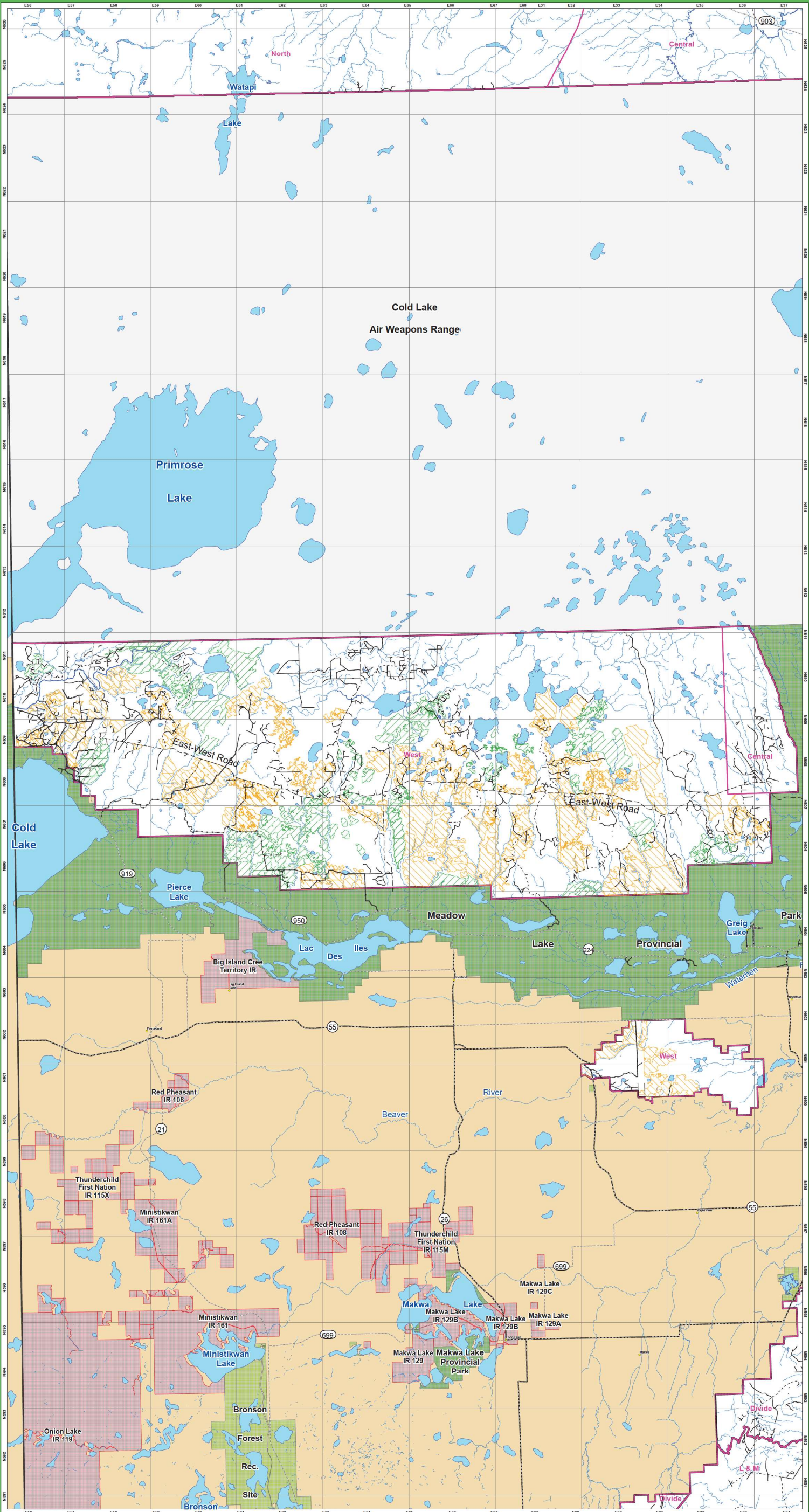
**Tactical Plan**

- T1
- T2

**PLANIMETRIC LEGEND**

Public Road	— Paved Highway	— FMA Boundary
— Gravel Highway	— Provincial Park	— Recreation Site
— Non-Mile	— Indian Reserve	— Air Weapons Range
— Oil / Gas	— Settlement	— Timber Reserve
— 3rd Party	— Class 1 (FRR)	— Village
— Provincial Forestry Class Road	— Class 2 (BR)	— Town
— Class 3 (Bush Road)	— Railroad	— Village / Hamlet
— Lake	— Creek	— Woodlands Office
— Provincial Border	— UTM Tile Boundary	— Mill Site





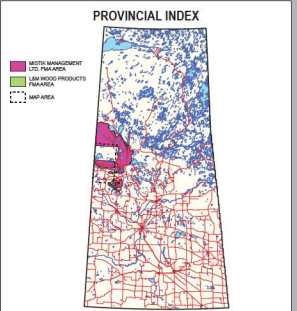
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**PLANNED HARVEST EVENTS - WEST**

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**FEATURES OF INTEREST**

**Tactical Plan**

- T1
- T2

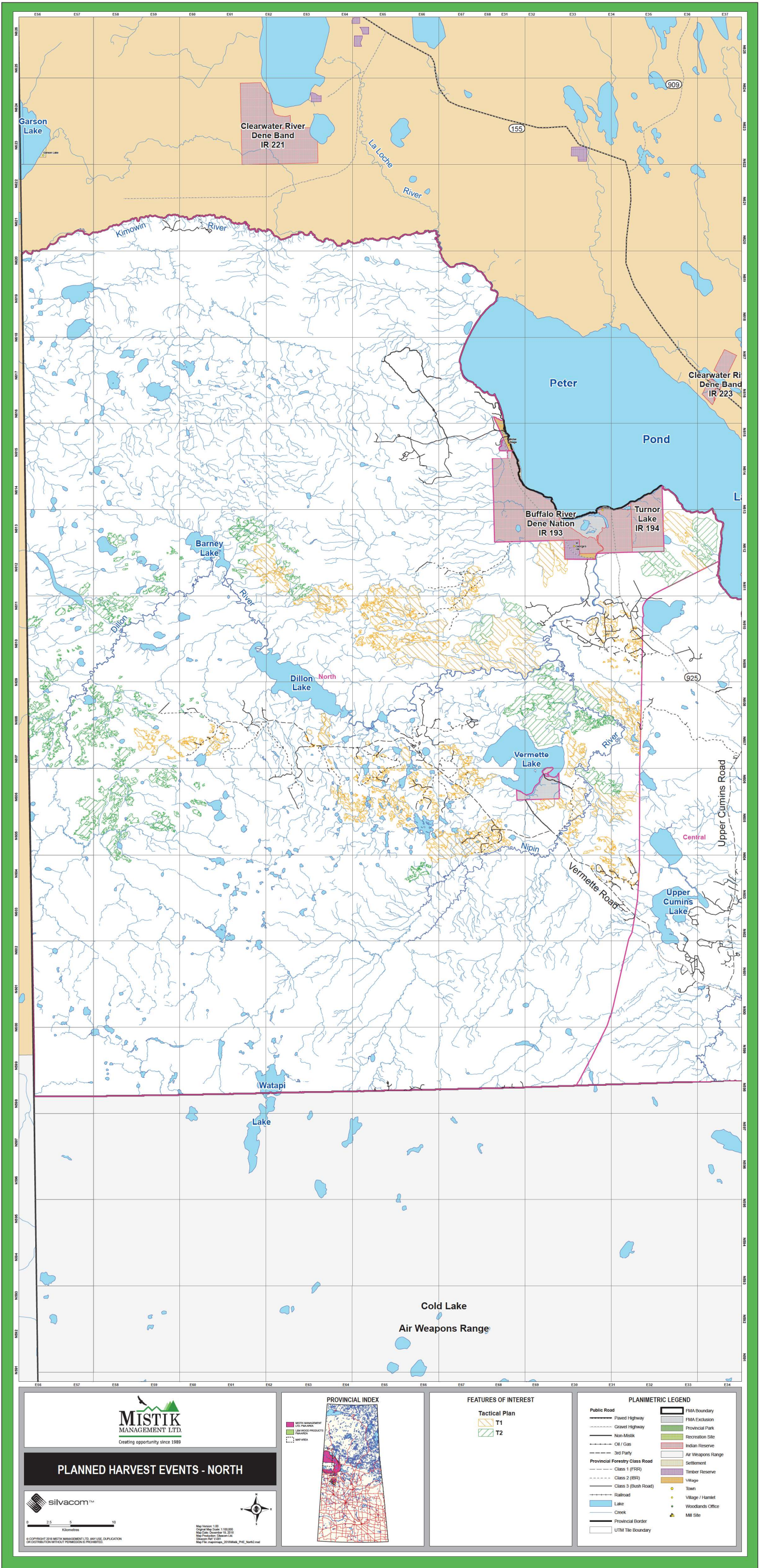
**PLANIMETRIC LEGEND**

Public Road	Paved Highway	FMA Boundary
Gravel Highway	Non-Mileage	Provincial Park
Oil / Gas	3rd Party	Recreation Site
Provincial Forestry Class Road	Class 1 (FRR)	Indian Reserve
Class 2 (BFR)	Class 3 (Bush Road)	Air Weapons Range
Railroad	Lake	Settlement
Creek	UTM Tile Boundary	Timber Reserve
		Village
		Town
		Village / Hamlet
		Woodlands Office
		Mit Site

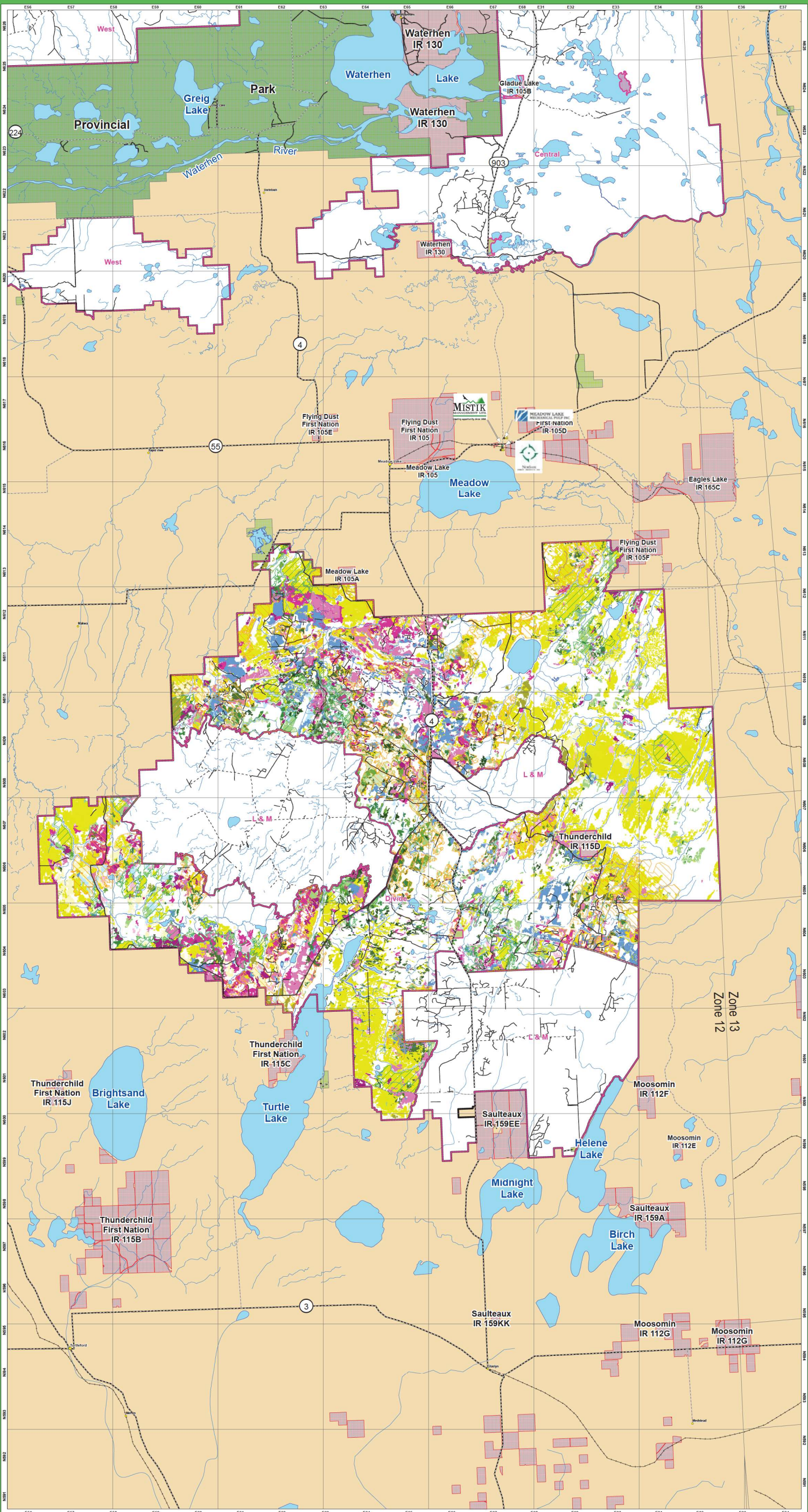
















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**MERCHANTABLE STANDS BY FOREST DEVELOPMENT  
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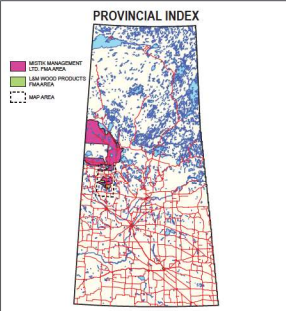


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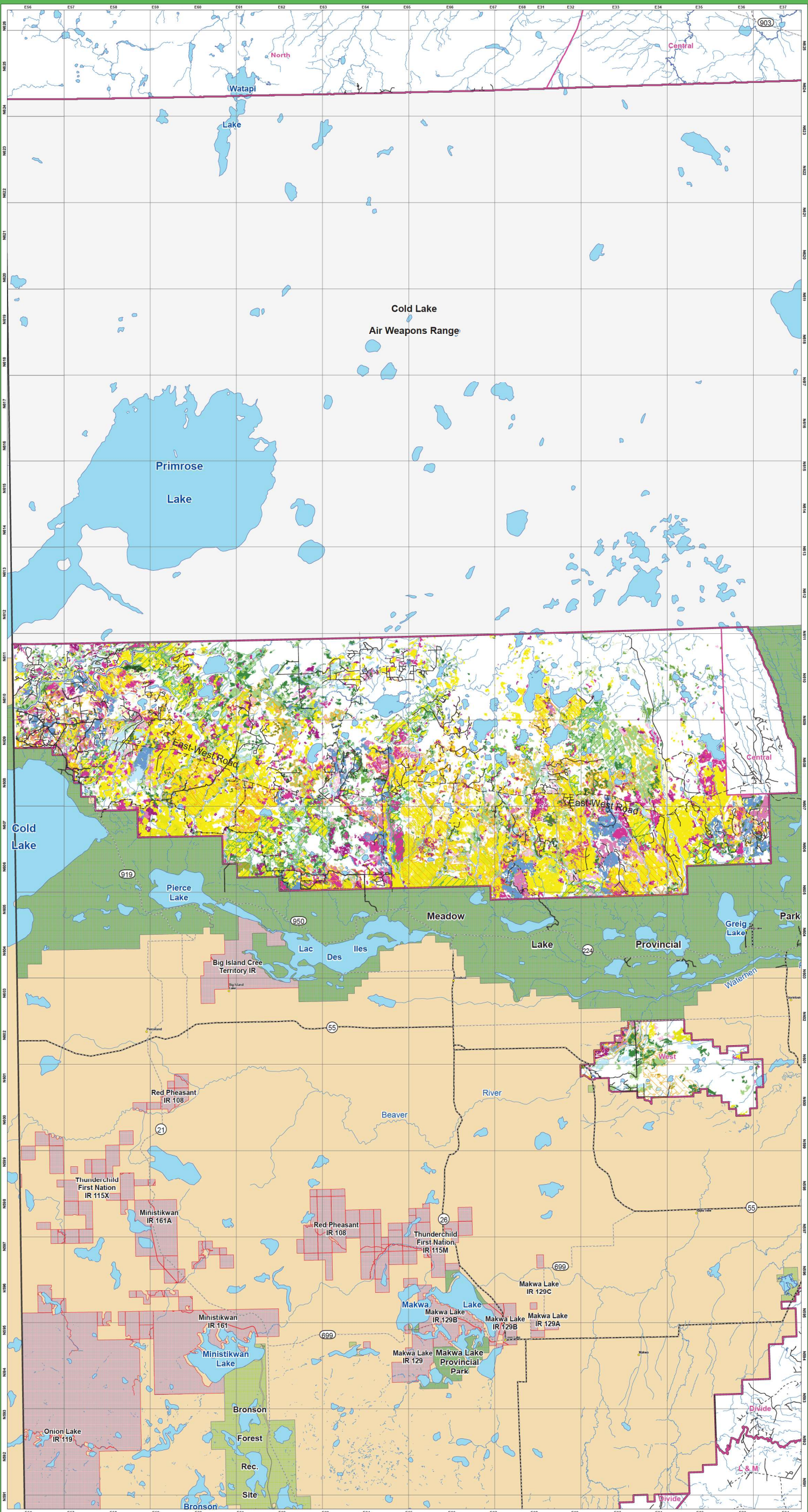
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- Tactical Plan  
T1  
T2
- Forest Development Type  
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S-BS-A-A  
S-JP-LD-A-1  
S-JP-LD-A-2  
S-JP-HD-A-1  
S-JP-HD-A-2  
S-JP-L&M  
S-JP-A-A  
S-H-WS-A-A  
S-H-BS-A-A  
S-H-JP-A-A  
H-A-LD-A-1  
H-A-LD-A-2  
H-A-HD-A-1  
H-A-HD-A-2  
H-S-A-HD-A  
H-S-A-LD-A

- PLANIMETRIC LEGEND**
- Public Road  
Paved Highway  
Gravel Highway  
Non-Malleable  
Oil / Gas  
3rd Party  
Provincial Forestry Class Road  
Class 1 (FRR)  
Class 2 (BFR)  
Class 3 (Bush Road)  
Railroad  
Lake  
Creek  
Provincial Border  
UTM Tile Boundary
- FMA Boundary  
Provincial Park  
Recreation Site  
Indian Reserve  
Air Weapons Range  
Settlement  
Timber Reserve  
Village  
Town  
Village / Hamlet  
Woodlands Office  
Mill Site









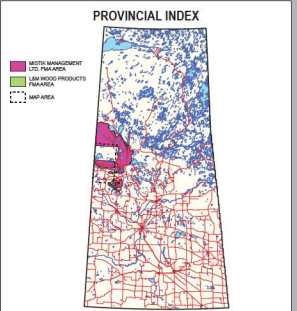


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**MERCHANTABLE STANDS BY FOREST DEVELOPMENT  
TYPE FROM THE NET PRODUCTIVE LANDBASE - WEST**



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**FEATURES OF INTEREST**

Tactical Plan  
T1  
T2

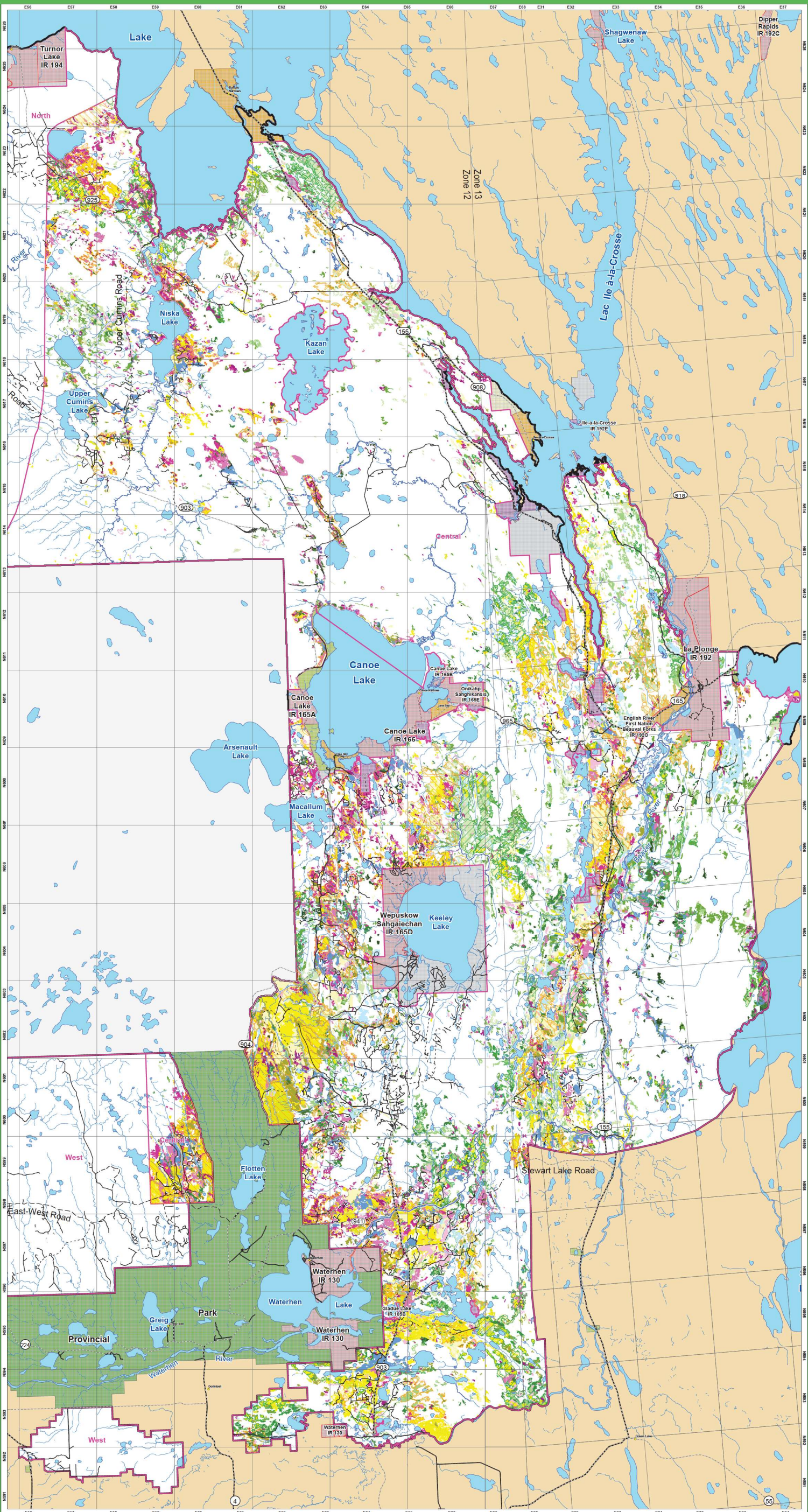
Forest Development Type  
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S-JP-LD-A-2  
S-JP-LM  
S-JP-A-A  
S-H-WS-A-A  
S-H-WS-A-A  
H-A-HD-A-1  
H-A-HD-A-2  
H-A-LD-A-1  
H-A-LD-A-2  
H-SJA-HD-A  
H-SJA-LD-A

**PLANIMETRIC LEGEND**

Public Road  
Paved Highway  
Gravel Highway  
Non-Motor  
Oil / Gas  
3rd Party  
Provincial Forestry Class Road  
Class 1 (FRR)  
Class 2 (BR)  
Class 3 (Bush Road)  
Railroad  
Lake  
Creek  
Provincial Border  
UTM Tile Boundary

FMA Boundary  
FMA Exclusion  
Provincial Park  
Recreation Site  
Indian Reserve  
Air Weapons Range  
Settlement  
Timber Reserve  
Village  
Town  
Village / Hamlet  
Woodlands Office  
Mill Site





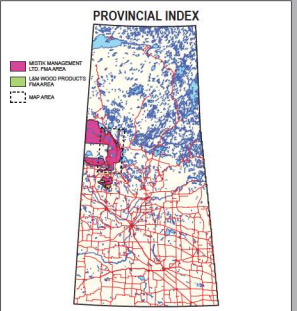


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**MERCHANTABLE STANDS BY FOREST DEVELOPMENT  
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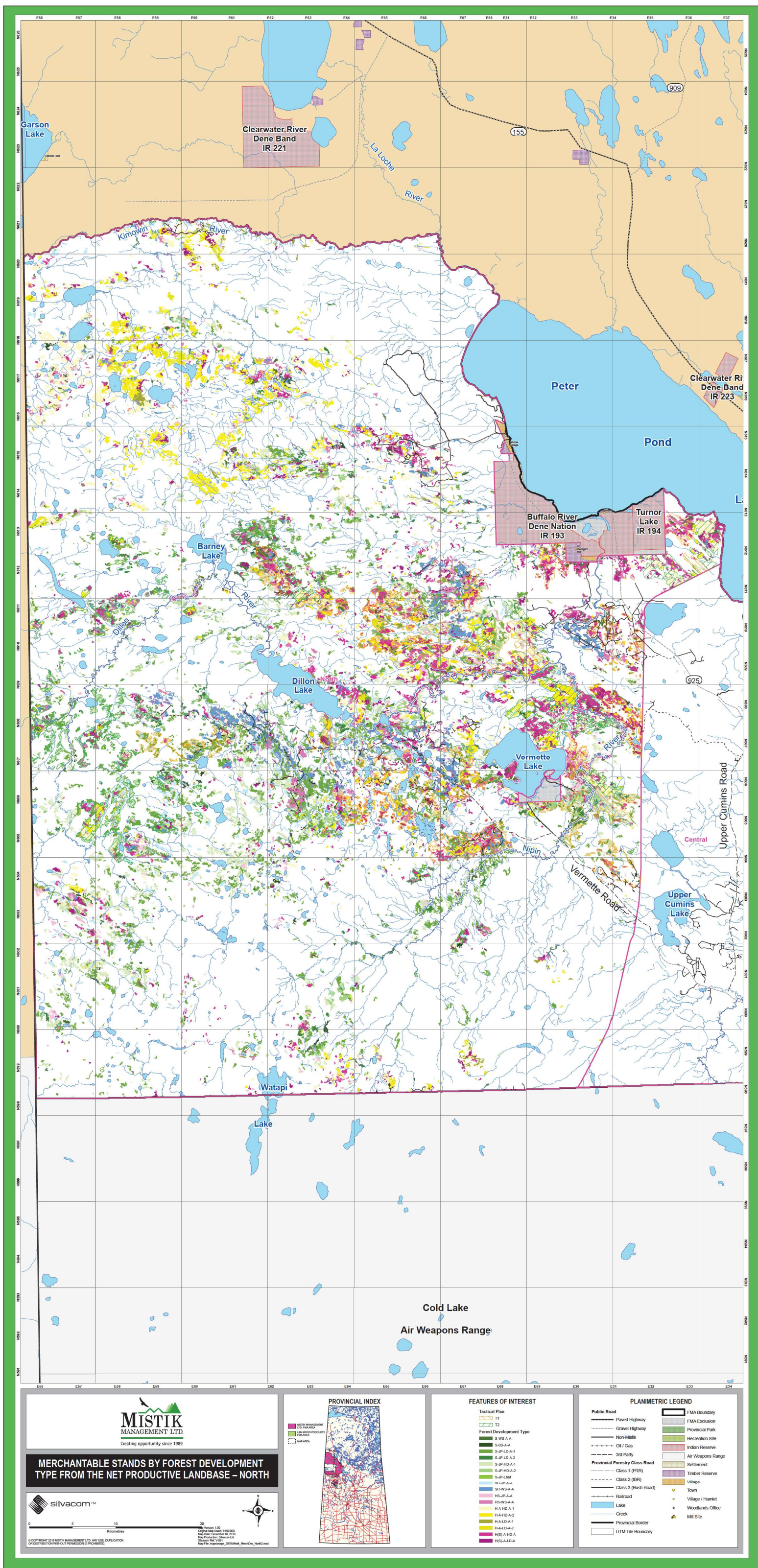
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- FEATURES OF INTEREST**
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- T1
  - T2
- Forest Development Type**
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  - S-B-S-A-A-2
  - S-B-S-A-A-3
  - S-B-S-A-A-4
  - S-B-S-A-A-5
  - S-B-S-A-A-6
  - S-B-S-A-A-7
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  - S-B-S-A-A-10
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  - S-B-S-A-A-97
  - S-B-S-A-A-98
  - S-B-S-A-A-99
  - S-B-S-A-A-100

- PLANIMETRIC LEGEND**
- Public Road**
- Paved Highway
  - Gravel Highway
  - Non-Motor
  - OH / Gas
  - 3rd Party
  - Provincial Forestry Class Road
  - Class 1 (PRR)
  - Class 2 (BR)
  - Class 3 (Bush Road)
  - Railroad
  - Lake
  - Creek
  - Provincial Border
  - UTM Tile Boundary
- FMA Boundary**
- Provincial Park
  - Recreation Site
  - Indian Reserve
  - Air Weapons Range
  - Settlement
  - Timber Reserve
  - Village
  - Town
  - Village / Hamlet
  - Woodlands Office
  - Mit Site













## 2. SELECTED MANAGEMENT STRATEGY

The Forest Management Scenario (FMS) that has been identified as the Selected Management Strategy (SMS) for the Mistik FMP area was chosen based on its ability to achieve specific goals and objectives. This section displays how the SMS (FMS 11) harvest sequence and modeled management actions fulfill these goals and objectives as well as the required outputs described in the 2017 Forest Management Planning Standard.

*April 2023 Update: Selected Management Strategy has been updated based on the changes Mistik has made to the forest management plan to align with the Range Plan for Woodland Caribou in Saskatchewan (SK2 West Caribou Administration Unit) which was finalized in October 2021. Refer to Appendix C for updated Selected Management Strategy.*

### 2.1. SPATIAL PARAMETERS

The FMS that was selected as the SMS by the planning team was FMS 11. However, Woodstock provides the optimal solution by analyzing a complex set of problems directed towards achieving the desired future forest conditions; Woodstock solutions are aspatial. Stanley on the other hand, implements Woodstock solutions spatially, subject to any additional spatial constraints that are applied. As it was necessary for the Natural Forest Patterns to have a spatial assignment of the harvest schedule it was necessary to implement the Woodstock solution within Stanley.

The harvest sequence was constrained in Stanley by several factors outlined in Table 2-1.

Table 2-1 Spatial Rules for Stanley Run

HARVEST SEQUENCE ASSUMPTIONS	
<b>Goal:</b>	Assess the spatial harvesting sequence of the timber supply model
<b>SMS Scenario Description</b>	<i>FMS 11 – Maximize Total Volume, Even Flow Harvest, Non-Declining Growing Stock (GS), Force Planned and Tactical Blocks, Seral Stage, Caribou, and Old Forest, and Black Spruce Constraints</i>
<b>Spatial Simulation length</b>	70 year
<b>Minimum block size</b>	NONE*
<b>Target block size</b>	50 ha
<b>Maximum block size</b>	1,000 ha

\*As the tactical plan was already incorporated within the model a minimum block size was not assigned.

Following the assignment of the harvest schedule to polygons using Stanley, it was necessary to run the results back through Woodstock to update the harvest profiles. The following model parameters (Section 2.2) were the settings used in Woodstock to produce the final harvest profiles (Figure 1 and Figure 2).

### 2.2. MODEL PARAMETERS

The parameter settings used in the analysis of this scenario are displayed in Table 2-3. The utilization standards used for the SMS model run are presented in Table 2-2.





*Table 2-2 Utilization Standards (10 cm) – Selected Management Strategy*

UTILIZATION PARAMETER	MISTIK + L&M (all other Yield Curves)		L&M Yield Curve # 7	
	Hardwood	Softwood	Hardwood	Softwood
Stump Height (m)	0.3	0.3	0.3	0.3
Minimum Top Diameter Inside Bark (cm)	7.5	10	8	10
Log Length (m)	2.6	2.6	n/a	n/a
Merchantable Minimum Bole Length (m)	5.2	5.2	4.9	5.2

*Table 2-3 Control Parameters - SMS Total Volume with Caribou, Seral Stage, Old Forest Constraints and the Planned/Tactical Blocks*

SMS: MAXIMIZE TOTAL VOLUME WITH CARIBOU, SERAL STAGE, OLD FOREST AND PLANNED/TACTICAL BLOCKS	
CONTROL PARAMETER	PARAMETER SETTING
<b>Objective:</b>	Maximize total volume harvested over the planning horizon
<b>Model constraints:</b>	<ol style="list-style-type: none"> <li>1) Even flow softwood and hardwood volume harvest for the Mistik FMA area</li> <li>2) Even flow softwood and hardwood volume harvest for the L&amp;M FMA area</li> <li>3) Non-declining softwood and hardwood operable growing stock in the last 50 years in both the Mistik and L&amp;M FMA areas</li> <li>4) ≤3% of the 2006 caribou range can be harvested per decade</li> <li>5) Old and Very old seral stage constraints applied based on targets in VOITs 2a and 2b</li> <li>6) No identified old forest will be harvested in years 1-20</li> <li>7) Limit black spruce harvest to ≤ 30,000 m<sup>3</sup>/yr. in L&amp;M</li> </ol>
<b>Effective Date</b>	2017
<b>Harvest unit:</b>	Mistik and L&M FMA areas
<b>Planning horizon:</b>	200 yrs
<b>Minimum harvest age:</b>	100 Years- Black and White Spruce Softwood 70 Years- Jack Pine Softwood 80 Years- Jack Pine Leading Softwood Mixed wood (SH) 90 Years- Spruce Leading Softwood Mixed wood (SH) 80 Years- Jack Pine and Spruce Deciduous Mixed wood (HS) 70 Years- Hardwood
<b>Landbase:</b>	2016 submitted landbase which includes both Mistik and L&M FMA areas
<b>Yield curves:</b>	Yield curves (17 yield curves/development types) based on <b>10 cm</b> top diameter utilization standards
<b>Cull deductions:</b>	Applied to yield curves (1.5% Softwood, 7.4% Hardwood)
<b>Regeneration transition:</b>	SGR transition rules
<b>Regeneration lag:</b>	Not applied



## SMS: MAXIMIZE TOTAL VOLUME WITH CARIBOU, SERAL STAGE, OLD FOREST AND PLANNED/TACTICAL BLOCKS

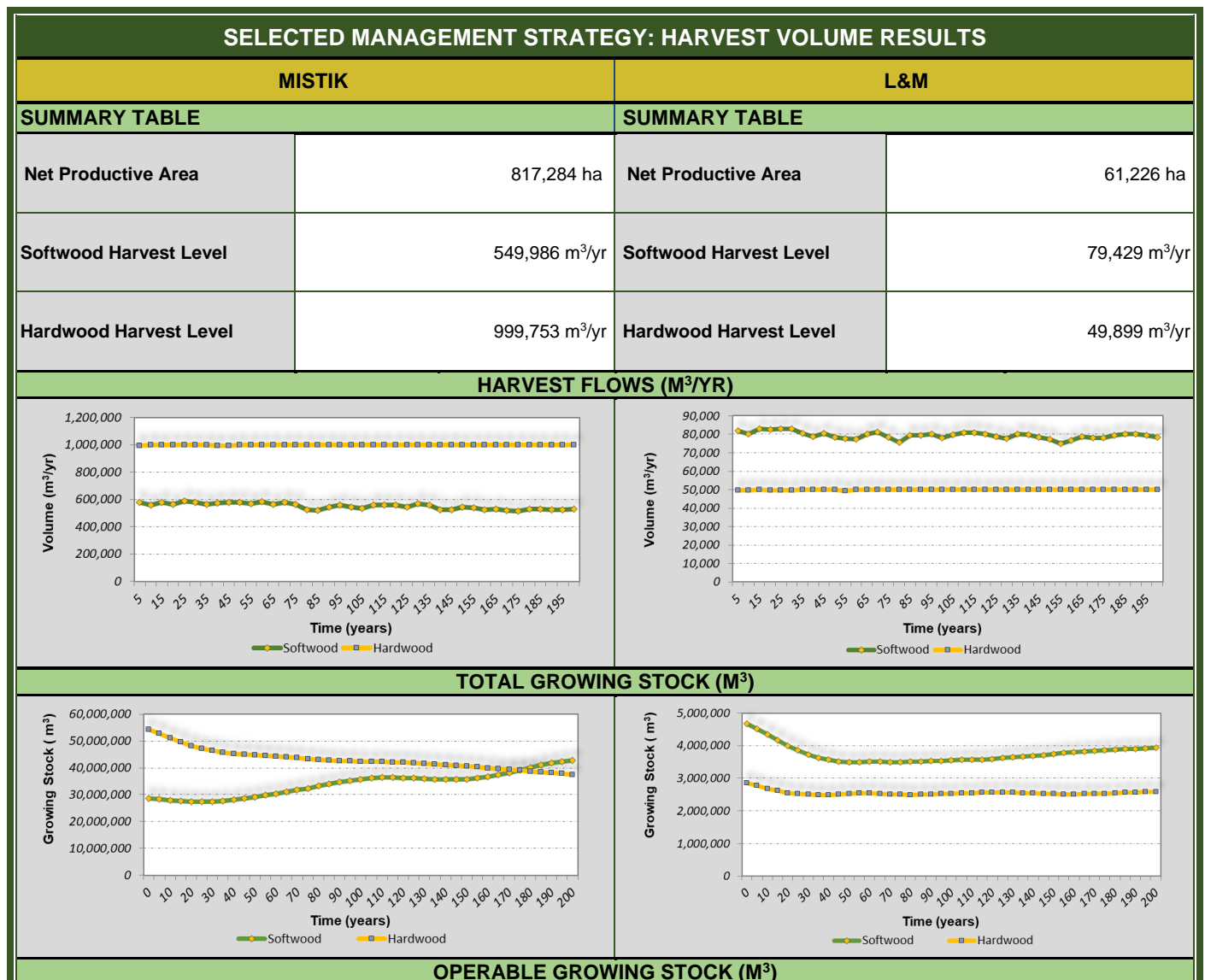
CONTROL PARAMETER	PARAMETER SETTING
Introduce harvest plans:	Planned and tactical blocks applied

### 2.3. HARVEST PROFILE

**\*\*Please see Appendix C for SMS (2023) harvest volume results based on the 2023 FMP Amendment**

The spatial harvest volume results of the SMS for both Mistik and L&M are displayed in Figure 1 below.

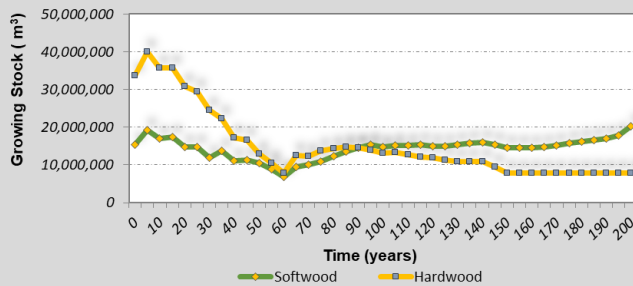
Figure 1 Harvest Volume Results – Selected Management Strategy



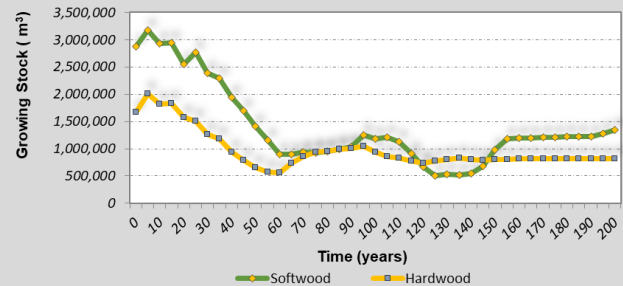


## SELECTED MANAGEMENT STRATEGY: HARVEST VOLUME RESULTS

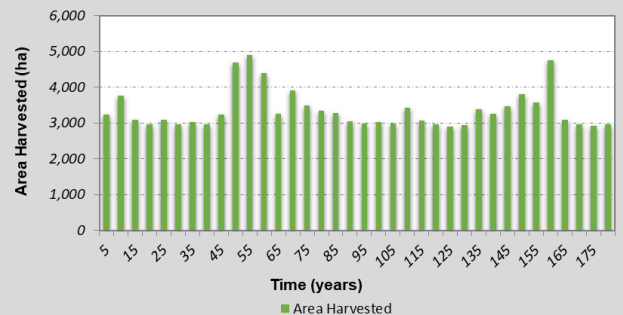
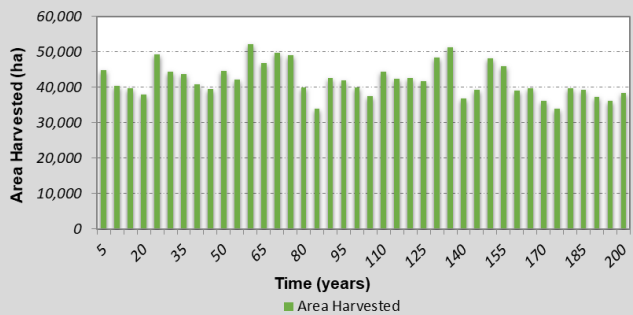
### MISTIK



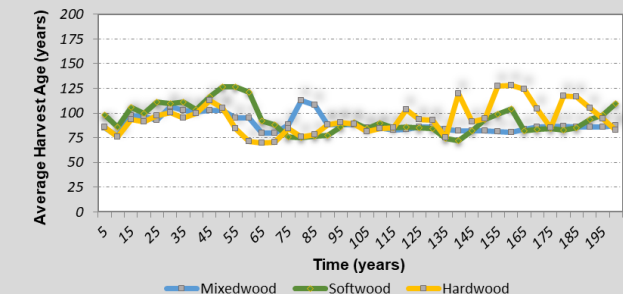
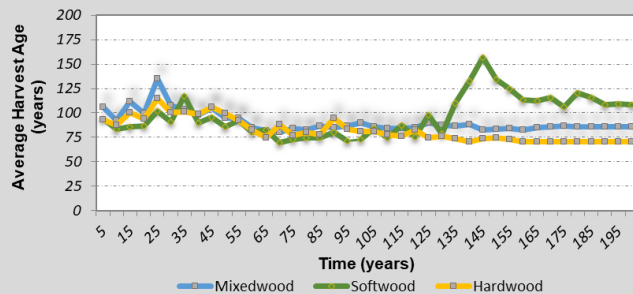
### L&M



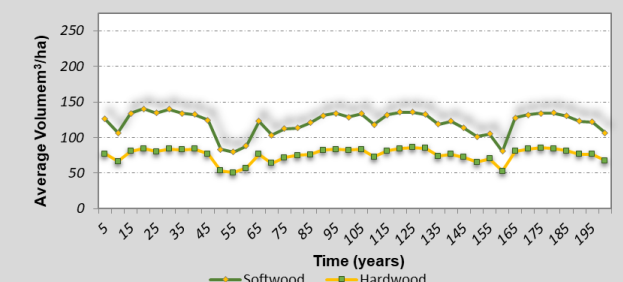
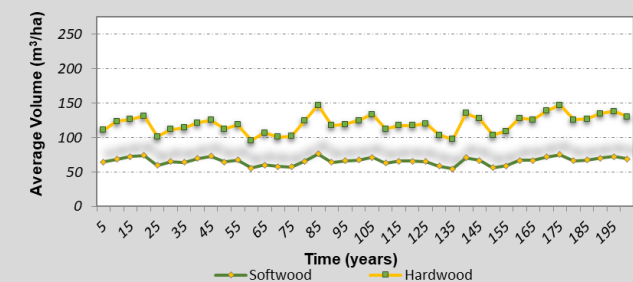
## AREA HARVESTED



## AVERAGE HARVEST AGE



## AVERAGE VOLUME (M³/HA)

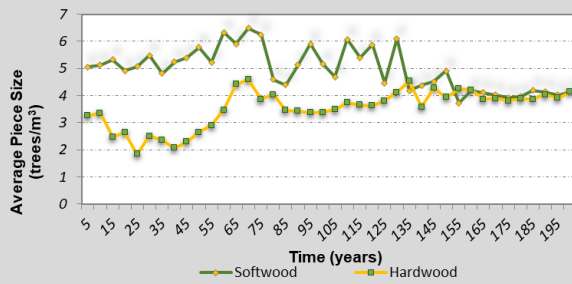


## AVERAGE PIECE SIZE (TREES/M³)

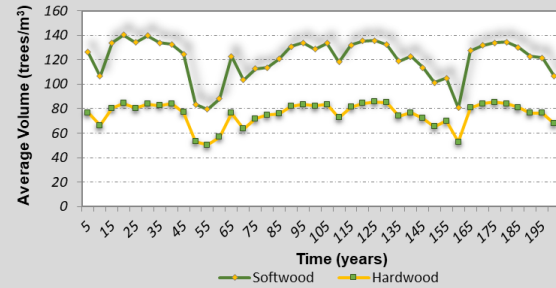


### SELECTED MANAGEMENT STRATEGY: HARVEST VOLUME RESULTS

#### MISTIK



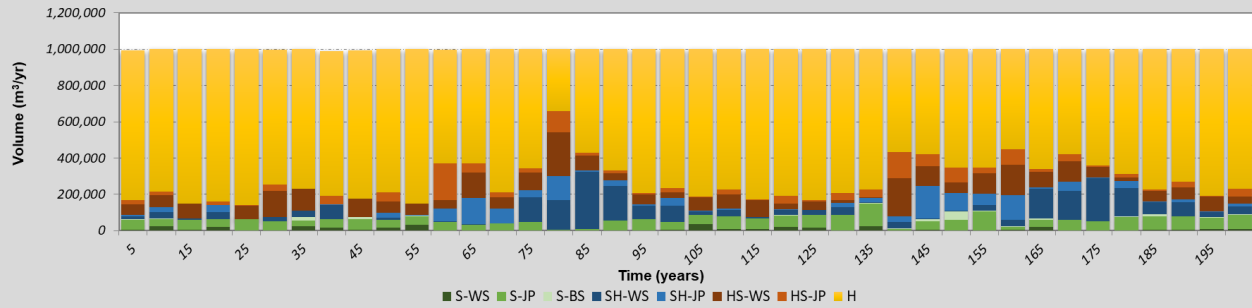
#### L&M



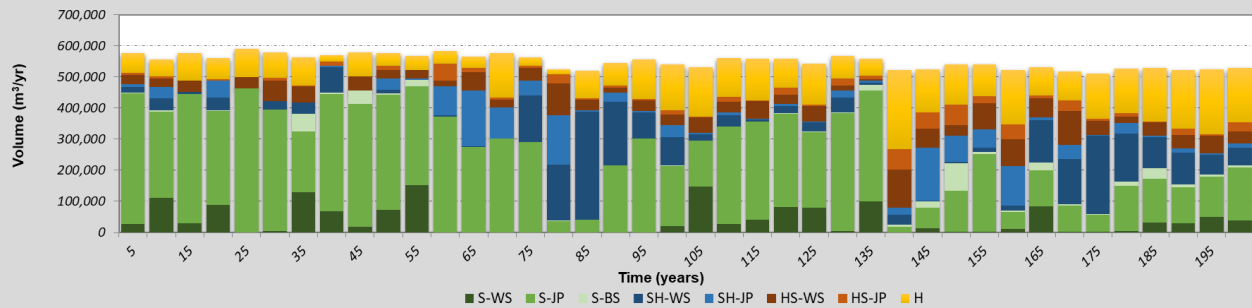


## SELECTED MANAGEMENT STRATEGY: HARVEST VOLUME RESULTS Continued

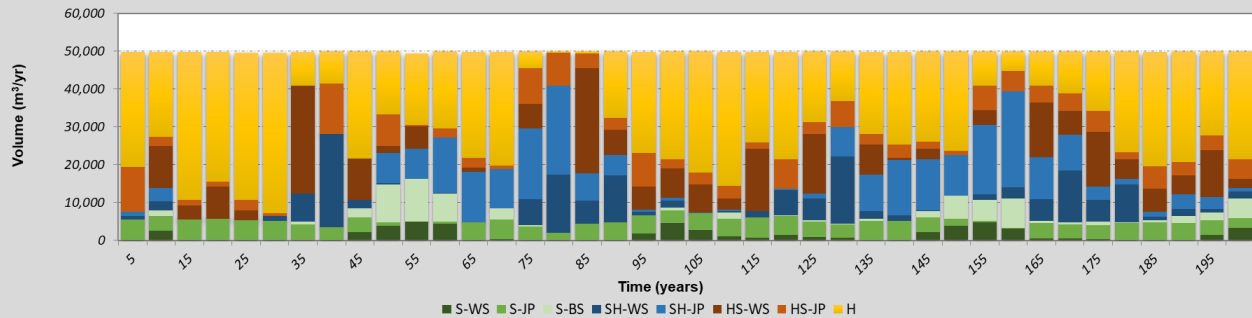
### MISTIK HARDWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



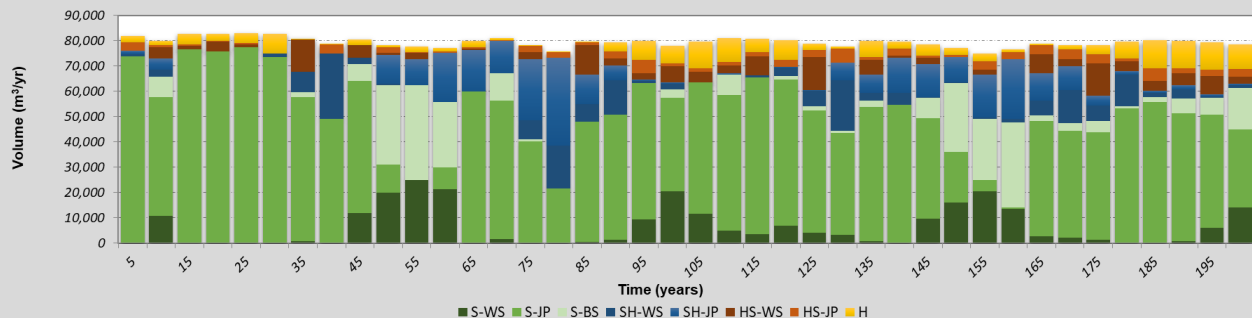
### MISTIK SOFTWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



### L & M HARDWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



### L & M SOFTWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE





### 2.3.1. HVS AND HVS PULP SUMMARY

As requested by the MOE, the following summary outlines the saw log, pulp, and total volumes for both hardwood and softwood for each company based on the selected management strategy. The final softwood saw log HVS is calculated from reducing the retention and then applying the factor for softwood degrade (Table 2-4). The process used to determine the weighted average softwood saw log degrade is shown in Table 2-5. The final softwood pulp HVS is calculated from the combination of the volume removed from the softwood degrade and tops/additional merchantable trees (Table 2-4). The tops / additional merchantable trees volume was calculated using a ratio based on the softwood HVS of Scenario 2 (7.5 cm top) versus the softwood HVS of Scenario 1 (10 cm top). The ratio between the Mistik softwood HVS of the two scenarios is 26.89% and between the L&M softwood HVS is 17.41%.

Table 2-4 Saw log and Pulp HVS Breakdown

Result	Mistik FMA HVS (m <sup>3</sup> /yr)			L&M FMA HVS (m <sup>3</sup> /yr)		
	Softwood Sawlog	Softwood Pulp	Hardwood	Softwood Sawlog	Softwood Pulp	Hardwood
SMS Model Result	549,986	N/A	999,753	79,429	N/A	49,899
Reduction for Insular Retention (4%)	-21,999	N/A	-39,990	-3,177	N/A	-1,996
Weighted Average Degrade (Mistik: 12%, L&M: 9%)	-63,358	63,358	N/A	-6,863	6,863	N/A
Tops (10cm to 8cm) and additional merch. trees	N/A	124,920	N/A	N/A	12,077	N/A
<b>Final HVS (m<sup>3</sup>/yr)</b>	<b>464,628</b>	<b>188,278</b>	<b>959,763</b>	<b>69,389</b>	<b>18,940</b>	<b>47,903</b>

Species-specific factors for softwood sawlog degrade were provided by MOE (white spruce 5%, Jack pine 18%, black spruce 8%). Because the L&M FMA is known to have considerably better quality pine, 10% was used as the degrade factor for L&M Jack pine. These species-based factors were applied to the Tactical Plan softwood volumes to calculate a weighted average degrade value.

Table 2-5 Volume-Weighted Average Degrade Calculation

FMA	Softwood Species	Tactical Plan (T1+T2) Softwood Volume (m <sup>3</sup> )	Degrade Factor	Degrade Volume (m <sup>3</sup> )	Volume Weighted Average Degrade (Rounded)
Mistik	White Spruce	3,848,349	5%	192,417	
	Jack Pine	4,277,713	18%	769,988	
	Black Spruce	44,476	8%	3,558	
	<b>Total</b>	<b>8,170,538</b>		<b>965,964</b>	<b>12%</b>
L&M	White Spruce	559,995	5%	28,000	
	Jack Pine	1,892,956	10%	189,296	
	Black Spruce	163,408	8%	13,073	
	<b>Total</b>	<b>2,616,359</b>		<b>230,368</b>	<b>9%</b>



### 2.3.2. HARVEST PROFILE BY PLANNING UNIT

The following figure displays the harvest profile (HVS) for each planning unit within the plan area. The following SMS harvest volume results are averages of what the model chose and are not to be used as annual targets or commitments. The harvest volumes also do not include the reduction for retention or degrade. Mistik and L&M are required to follow their tactical plan, not the harvest areas by planning unit summarized here. Mistik Target #22 (See VOIT document in Volume II) outlines the reporting requirements for harvest levels by planning unit which are based on a five-year assessment cycle.

Figure 2 SMS Harvest Volume Results by Planning Unit

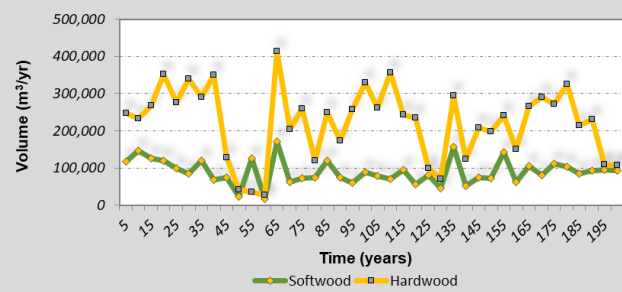
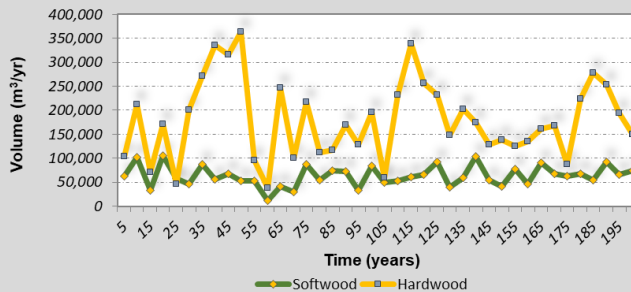
SELECTED MANAGEMENT STRATEGY		
PLANNING UNIT SUMMARY		
PLANNING UNIT	METRIC	
DIVIDE	Net Productive Area	99,326 ha
	Average SWD HVS Level	63,198 m <sup>3</sup> /yr
	Average HWD HVS Level	179,921 m <sup>3</sup> /yr
WEST	Net Productive Area	137,558 ha
	Average SWD HVS Level	90,024 m <sup>3</sup> /yr
	Average HWD HVS Level	222,096 m <sup>3</sup> /yr
CENTRAL	Net Productive Area	305,333 ha
	Average SWD HVS Level	218,605 m <sup>3</sup> /yr
	Average HWD HVS Level	355,533 m <sup>3</sup> /yr
NORTH	Net Productive Area	275,066 ha
	Average SWD HVS Level	178,141 m <sup>3</sup> /yr
	Average HWD HVS Level	242,203 m <sup>3</sup> /yr
L & M	Net Productive Area	61,226 ha
	Average SWD HVS Level	79,429 m <sup>3</sup> /yr
	Average HWD HVS Level	49,899 m <sup>3</sup> /yr
DIVIDE HARVEST FLOWS (M <sup>3</sup> /YR)		WEST HARVEST FLOWS (M <sup>3</sup> /YR)



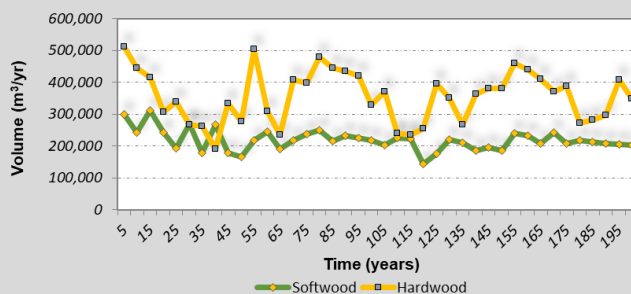


## SELECTED MANAGEMENT STRATEGY

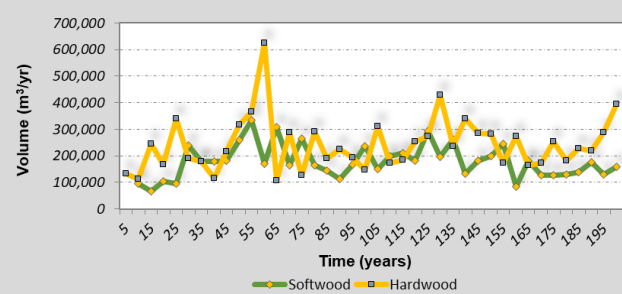
### PLANNING UNIT SUMMARY



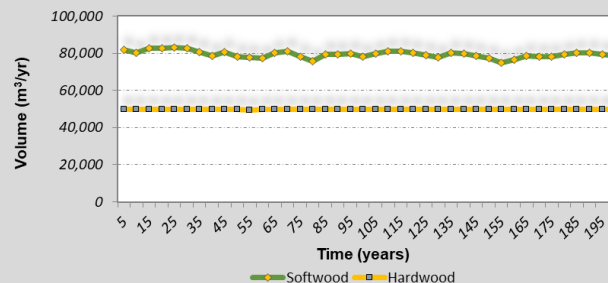
### CENTRAL HARVEST FLOWS (M³/YR)



### NORTH HARVEST FLOWS (M³/YR)



### L&M HARVEST FLOWS (M³/YR)



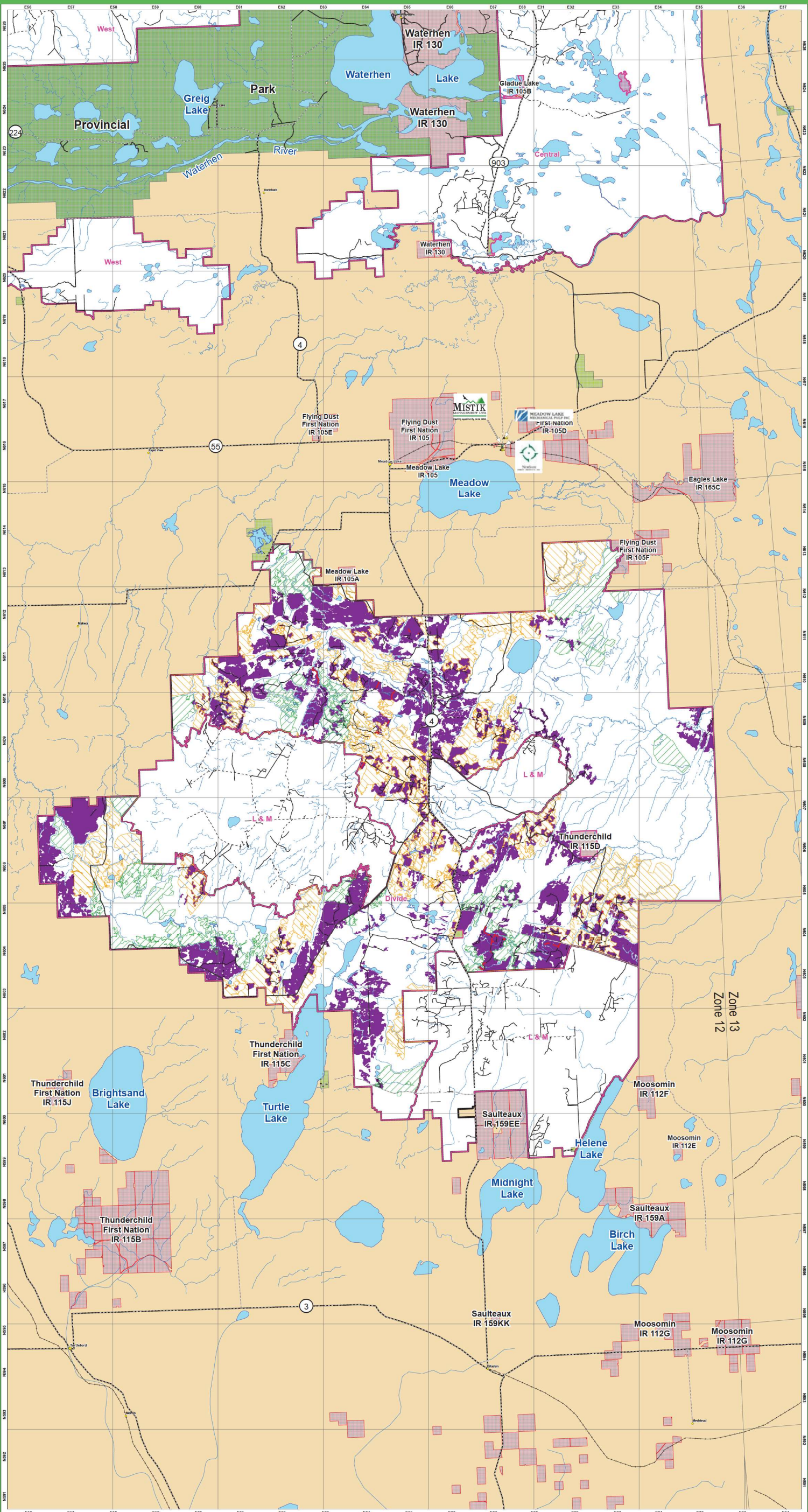
## 2.4. FOREST RENEWAL

The following section outlines the previously harvested areas and all-season roads, as well as the reforestation of the backlog of not sufficiently regenerating (NSR) areas within the Mistik FMP area.

### 2.4.1. PREVIOUSLY HARVESTED AREAS AND EXISTING ALL-SEASON ROADS

Map 13 through Map 17 demonstrate the previously harvested areas and existing all-season roads within the Mistik FMP area. It should be noted that the previously harvested areas and roads are up to the landbase year of 2016.

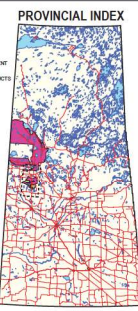




**PREVIOUSLY HARVESTED AREAS AND EXISTING ALL-SEASON ROADS (CLASS 1, 2, AND 3) – DIVIDE**



Map Version: 1.00  
Original Map Scale: 1:50,000  
Map Date: December 16, 2019  
Map Projection: UTM Zone 18N  
Stereom Pair: V.001  
Map File: c:\projects\2019\mistik\_silvacom\roads\Divide.mxd



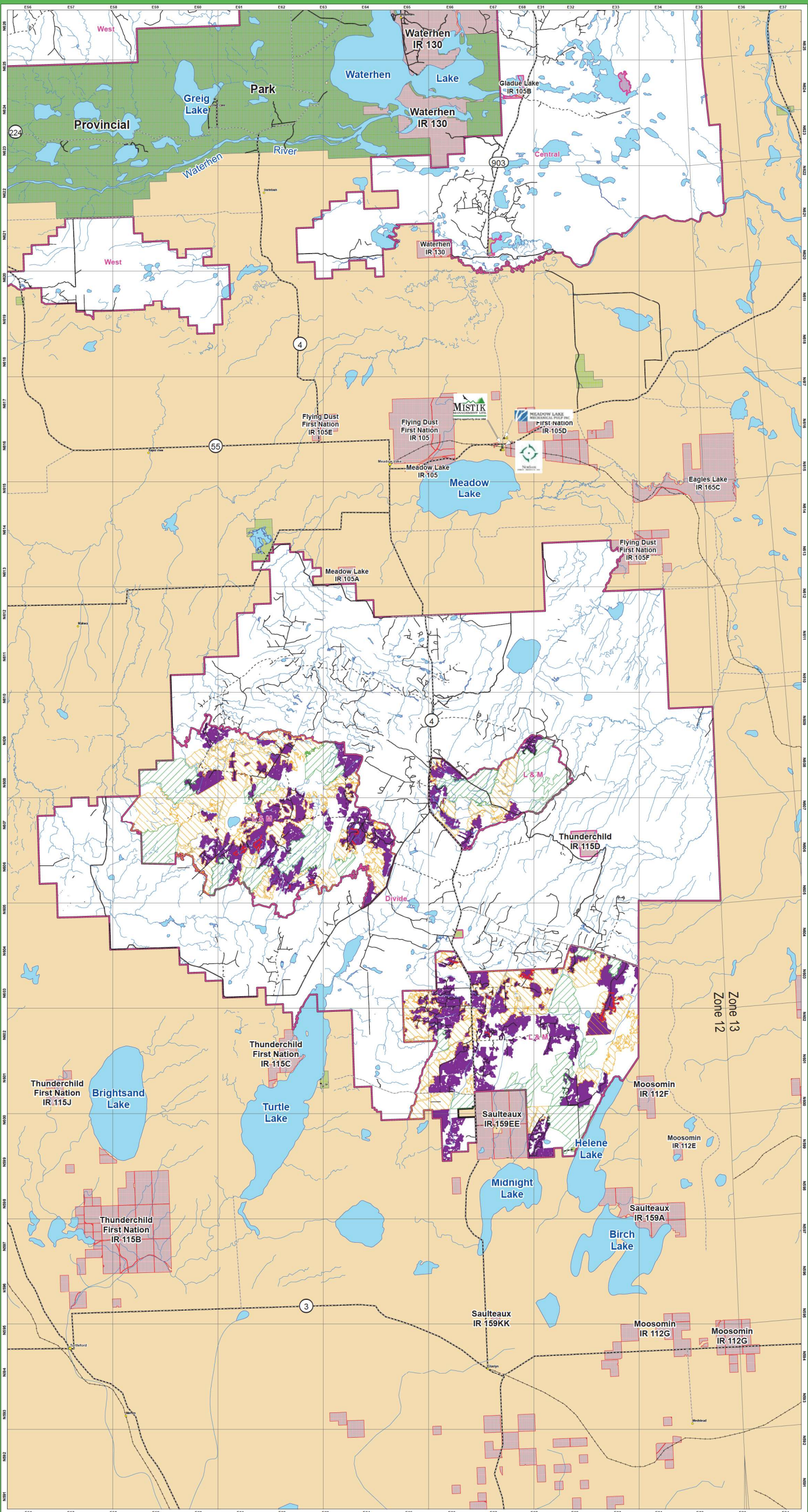
**FEATURES OF INTEREST**

- Existing All-Season Roads**
- Class 1
  - Class 2
  - Class 3
- Tactical Plan**
- T1
  - T2
- Previously Harvested Area**

**PLANIMETRIC LEGEND**

- Public Road**
- Paved Highway
  - Gravel Highway
  - Non-Motor
  - Oil / Gas
  - 3rd Party
- Provincial Forestry Class Road**
- Class 1 (FRR)
  - Class 2 (BFR)
  - Class 3 (Bush Road)
- Railroad**
- Lake
  - Creek
  - Provincial Border
  - UTM Tile Boundary
- FMA Boundary**
- Provincial Park
  - Recreation Site
  - Indian Reserve
  - Air Weapons Range
  - Settlement
  - Timber Reserve
  - Village
  - Town
  - Village / Hamlet
  - Woodlands Office
  - Mill Site









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**PREVIOUSLY HARVESTED AREAS AND EXISTING ALL-SEASON ROADS (CLASS 1, 2, AND 3) – LM**

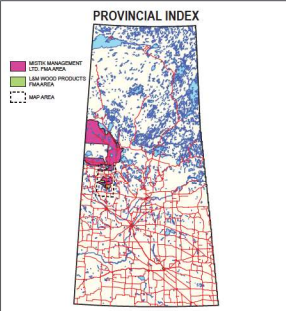


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0 2.5 5 10  
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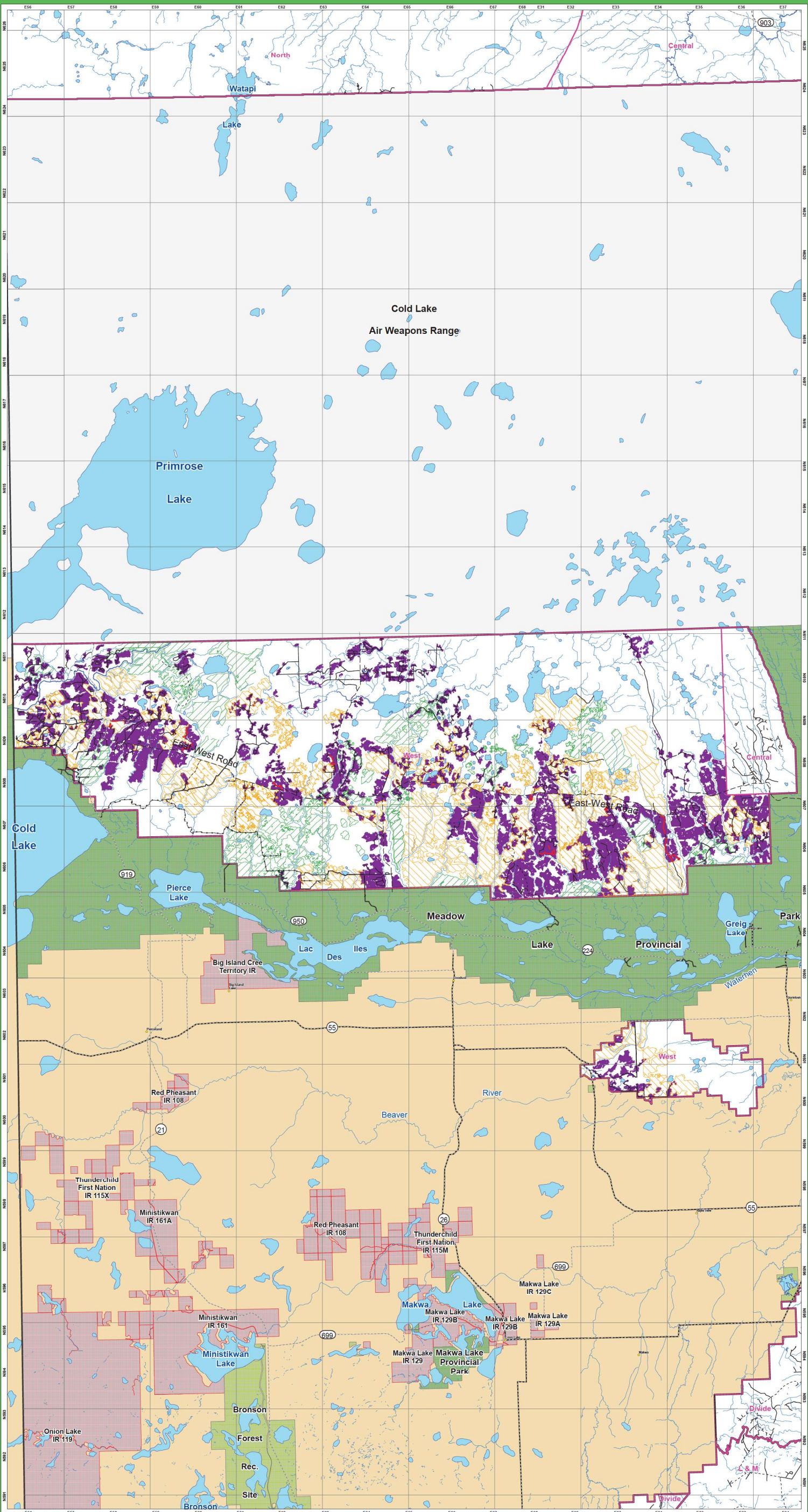
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Map Projection: UTM Zone 18N  
Stereom Pair: V.001  
Map File: c:\projects\2016\mistik\_ahsroads\roads\_lm1.mxd



- FEATURES OF INTEREST**
- Existing All-Season Roads**
- Class 1
  - Class 2
  - Class 3
- Tactical Plan**
- T1
  - T2
- Previously Harvested Area**

- PLANIMETRIC LEGEND**
- Public Road
    - Paved Highway
    - Gravel Highway
    - Non-Motor
    - Oil / Gas
    - 3rd Party
  - Provincial Forestry Class Road
    - Class 1 (FRR)
    - Class 2 (BFR)
    - Class 3 (Bush Road)
  - Railroad
  - Lake
  - Creek
  - Provincial Border
  - UTM Tile Boundary
  - FMA Boundary
  - Provincial Park
  - Recreation Site
  - Indian Reserve
  - Air Weapons Range
  - Settlement
  - Timber Reserve
  - Village
  - Town
  - Village / Hamlet
  - Woodlands Office
  - MRI Site





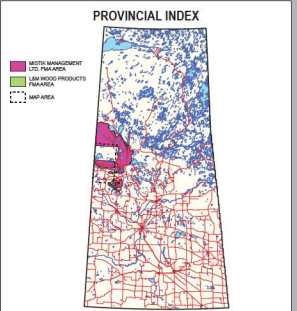


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**PREVIOUSLY HARVESTED AREAS AND EXISTING ALL-SEASON ROADS (CLASS 1, 2, AND 3) – WEST**



Map Version: 1.00  
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Map Date: December 16, 2016  
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Scale: 1:50,000  
Map File: c:\projects\2016\mistik\_ahsroads\roads\_west.mxd



**FEATURES OF INTEREST**

**Existing All-Season Roads**

- Class 1
- Class 2
- Class 3

**Tactical Plan**

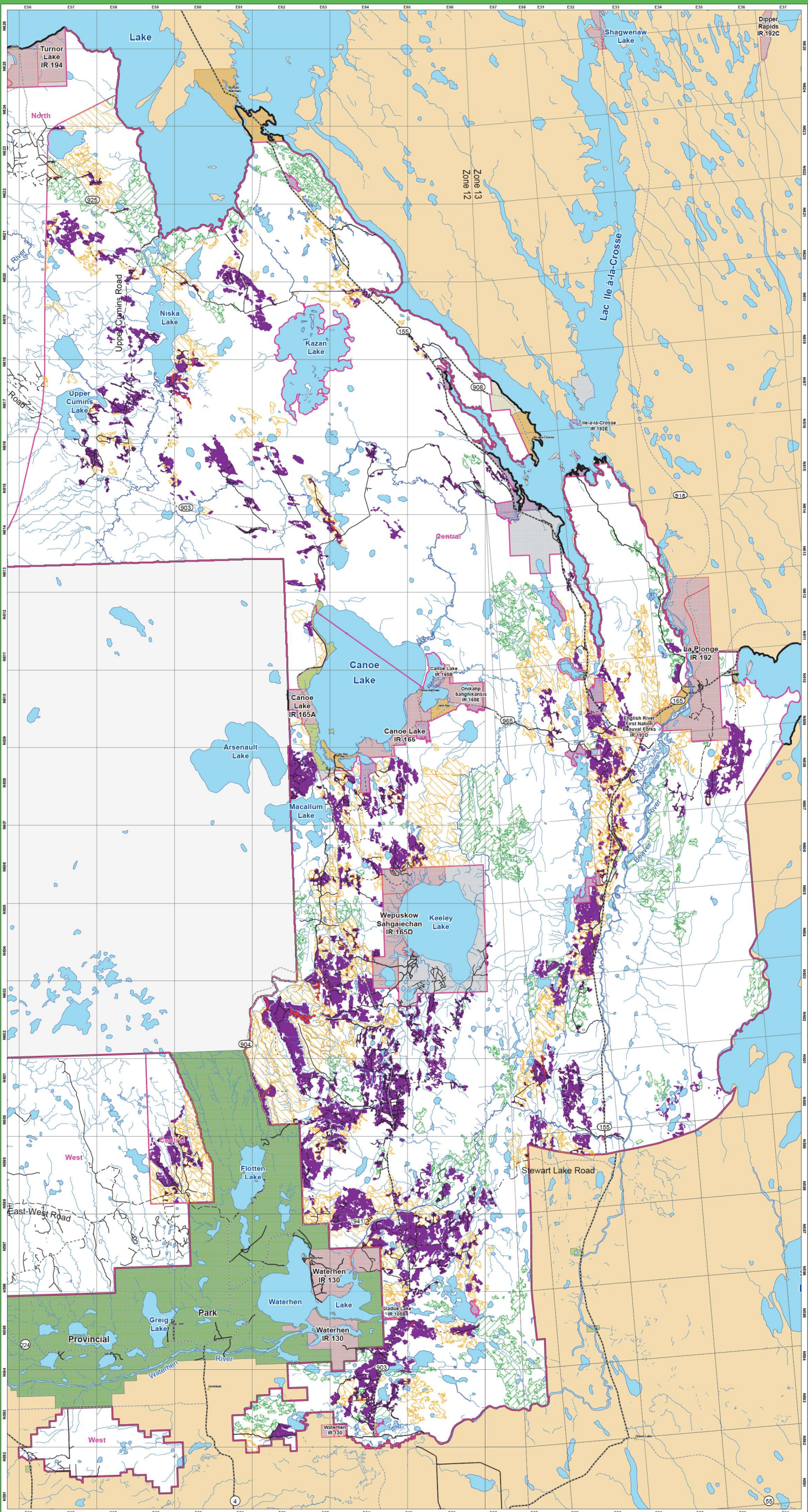
- T1
- T2

**Previously Harvested Area**

**PLANIMETRIC LEGEND**

Public Road	— Paved Highway	— FMA Boundary
— Gravel Highway	— Provincial Park	— Recreation Site
— Non-Motor	— Indian Reserve	— Air Weapons Range
— Oil / Gas	— Settlement	— Timber Reserve
— 3rd Party	— Village	— Town
Provincial Forestry Class Road	— Class 1 (FRR)	— Village / Hamlet
— Class 2 (BR)	— Woodlands Office	— Mill Site
— Class 3 (Bush Road)	— Provincial Border	— UTM Tile Boundary
— Railroad		
— Lake		
— Creek		









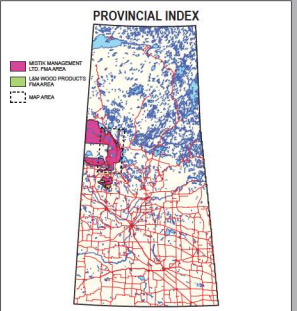
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**PREVIOUSLY HARVESTED AREAS AND EXISTING ALL-SEASON ROADS (CLASS 1, 2, AND 3) – CENTRAL**



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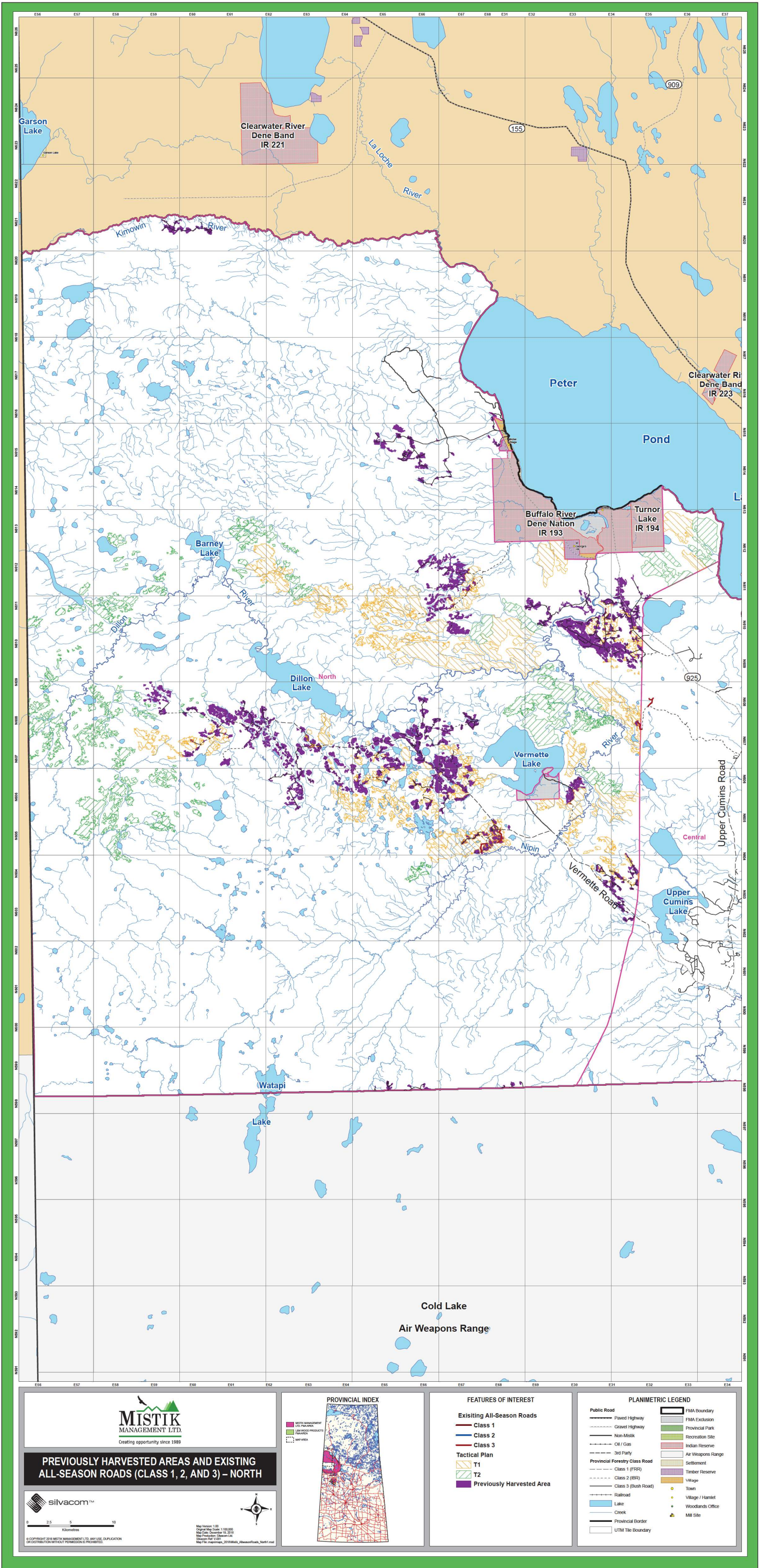
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Map File: c:\projects\2016\mistik\_road\road\_central.mxd



- FEATURES OF INTEREST**
- Existing All-Season Roads**
- Class 1
  - Class 2
  - Class 3
- Tactical Plan**
- T1
  - T2
- Previously Harvested Area**

- PLANIMETRIC LEGEND**
- Public Road**
- Paved Highway
  - Gravel Highway
  - Non-Motor
  - Oil / Gas
  - 3rd Party
  - Provincial Forestry Class Road
  - Class 1 (FRR)
  - Class 2 (BFR)
  - Class 3 (Bush Road)
  - Railroad
  - Lake
  - Creek
  - Provincial Border
  - UTM Tile Boundary
- FMA Boundary**
- FMA Exclusion
  - Provincial Park
  - Recreation Site
  - Indian Reserve
  - Air Weapons Range
  - Settlement
  - Timber Reserve
  - Village
  - Town
  - Village / Hamlet
  - Woodlands Office
  - Mill Site









## 2.4.2. STRATEGY FOR HARVEST AREAS WHICH ARE NOT SUFFICIENTLY REGENERATING

Not sufficiently regenerated (NSR) area within the harvested land base is unacceptable. Monitoring and implementing plans to address all NSR areas is an important forest management process. It is Mistik's goal to ensure that all harvested areas are fully stocked with acceptable tree species according to provincial standards. Current backlog NSR areas can be found in Map 18. The following table summarizes the current and historic NSR on the Mistik FMP area:

*Table 2-6 NSR Summary for the Mistik FMP Area (includes Mistik & L&M)*

Summary of NSR areas- Establishment Surveys	Area (ha)
Total amount of all NSR (all years)	2,040
Total amount of NSR that is now Sufficiently Regenerated (confirmed by resurvey result)	1,712
Total amount of existing NSR that is "Pre-Standard" (i.e. current provincial standard does not apply as blocks were harvested before 2004/05)	318
Total amount of NSR under current provincial Regeneration Assessment Standard	10

The action plan for the outstanding NSR areas is as follows:

### For "pre-standard" NSR:

Voluntarily monitor the areas over time and re-survey if any significant changes occur. These areas are typically flooded, heavily grazed by cattle, or are severely impacted by Dwarf Mistletoe. Most have shown slight improvement in stocking in subsequent surveys that have been done.

### For blocks that are NSR under the current Regeneration Assessment Standard:

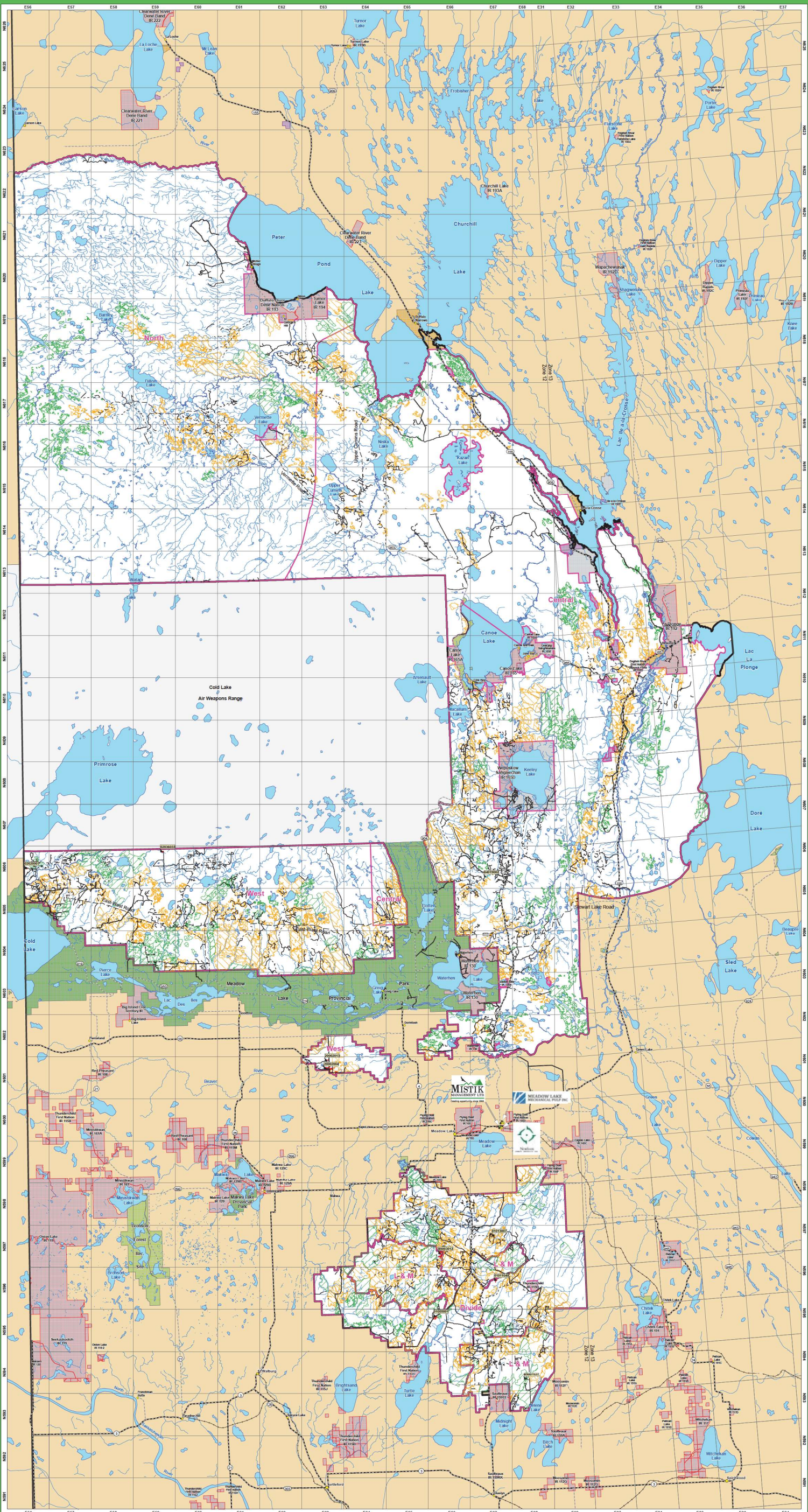
There is currently only one block that does not meet the current standard requirement for stocking. A 2015 survey shows the current stocking of this block is 75%. A re-survey is planned for 2019.


Any additional NSR areas that are identified through the survey process will either be fill-planted and/or re-surveyed approximately every 2 years depending on the circumstances causing the low stocking percentage.

Under the current standard, Free-to-Grow surveys (done at year 14 post-harvest) will commence in the 2018/19 operating year.

VOIT #9 addresses regeneration of post-harvest areas. Please refer to Volume II (VOIT document) and associated Mistik Annual Reports.








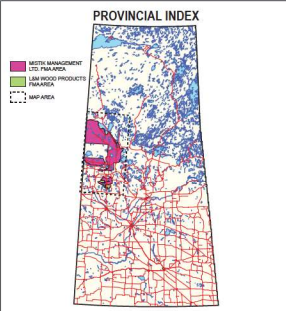
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**BACKLOG NSR**



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Map Version 1.00  
Original Map Scale 1:250,000  
Map Date: December 20, 2015  
Map Projection: UTM  
Scale: 1:250,000  
Map File: c:\projects\2015\backlog\backlogNSR.mxd



**FEATURES OF INTEREST**

**NSR Area**

- Pre-Standard
- Current Provincial Standard

**Tactical Plan**

- T1
- T2

**PLANIMETRIC LEGEND**

Public Road	— Paved Highway	— FMA Boundary
— Gravel Highway	— Provincial Park	— Recreation Site
— Non-Mile	— Indian Reserve	— Air Weapons Range
— 3rd Party	— Settlement	— Timber Reserve
Provincial Forestry Class Road	— Class 1 (PRR)	— Village
— Class 2 (BR)	— Town	— Village / Hamlet
— Class 3 (Bush Road)	— Woodlands Office	— Mill Site
— Railroad	— Provincial Border	— UTM Tile Boundary
— Lake		
— Creek		





## 2.5. ROADS

Mistik's intent regarding road access planning, construction and reclamation is to establish a road network using the following guiding principles:

- roads are safe, built and maintained to regulatory standards and based on public and relevant government agency involvement;
- road work is completed in a manner that minimizes impacts to water courses and the environment;
- road construction incorporates cost-effective approaches based on knowledge of landform, surficial sediments and seasonality constraints;
- long-term disturbance is minimal in terms of the amount of area affected, and the length of time in which roads are operational (non-reclaimed) to minimize impacts on wildlife;
- access planning considers additional non-timber forest values

Mistik currently uses several major road classes, built by various agencies, to support its timber harvest and delivery system. Map 19 through Map 23 demonstrate the tactical plan maps for the Mistik FMP area for the potential spatial locations of planned roads by planning unit.

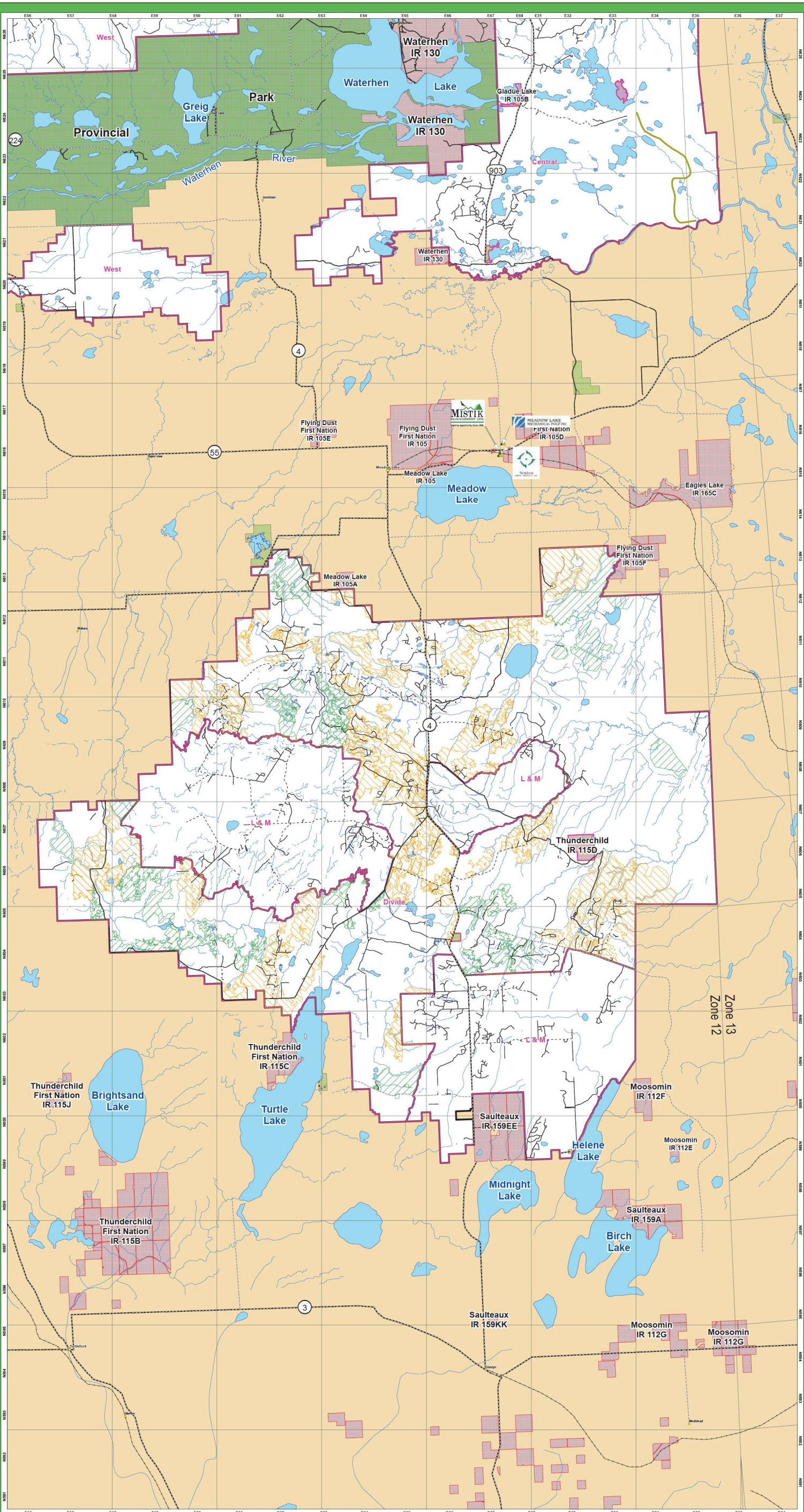
VOITs #16 and #17 provide for reporting on compliance regarding harvesting and watercourse crossing activities.

Table 2-7 Tactical Road Class by Tactical Plan Period

Road Class <sup>1</sup>	T1(0-10) (km)	T2 (10-20) (km)
1	0	0
2	176.19	196.27
Total	176.19	196.27

<sup>1</sup> Road classes are defined through the Saskatchewan Forest Operating Plan Code Standard







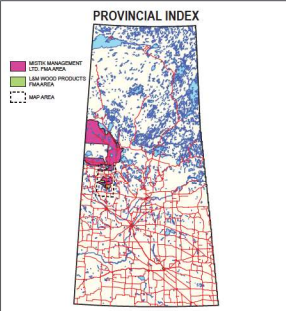


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**PLANNED ROADS  
INCLUDING CLASS 1 AND 2 ROADS – DIVIDE**



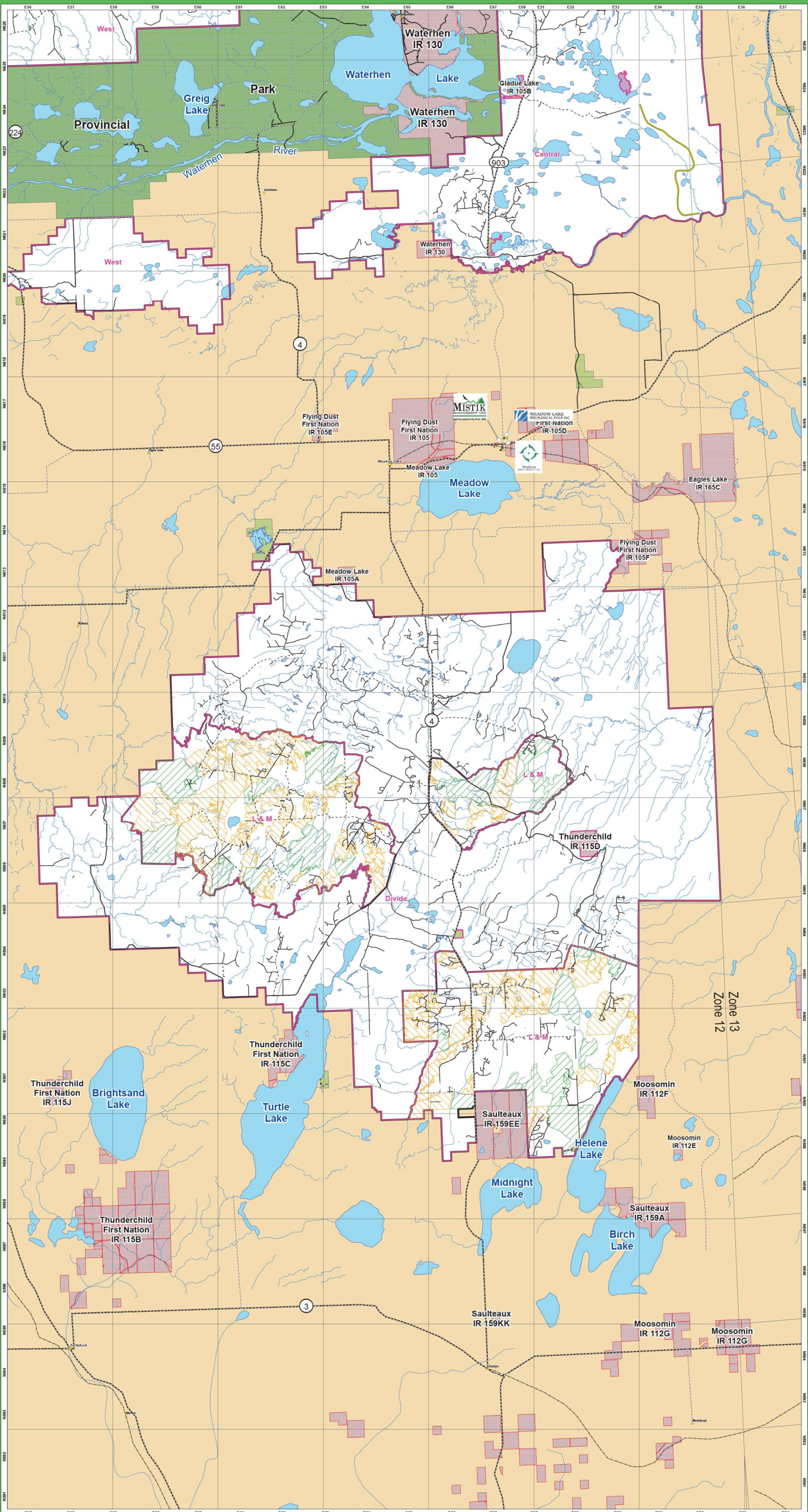
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Map Date: December 16, 2015  
Map Projection: UTM Zone 18E  
Stereom Pair: V.001  
Map File: c:\projects\2015\mistik\TheRoads\_Divide.mxd



- FEATURES OF INTEREST**
- Planned Roads (T1)**
- Class 1 (None Present)
  - Class 2
- Planned Roads (T2)**
- Class 1 (None Present)
  - Class 2
- Tactical Plan**
- T1
  - T2

- PLANIMETRIC LEGEND**
- |                                |                    |                     |
|--------------------------------|--------------------|---------------------|
| Public Road                    | — Paved Highway    | — FMA Boundary      |
| — Gravel Highway               | — Provincial Park  | — Recreation Site   |
| — Non-Mile                     | — Indian Reserve   | — Air Weapons Range |
| — 3rd Party                    | — Settlement       | — Village           |
| Provincial Forestry Class Road | — Class 1 (FRR)    | — Town              |
| — Class 2 (BFR)                | — Village / Hamlet | — Woodlands Office  |
| — Class 3 (Bush Road)          | — Mill Site        |                     |
| — Railroad                     |                    |                     |
| — Lake                         |                    |                     |
| — Creek                        |                    |                     |
| — Provincial Border            |                    |                     |
| — UTM Tile Boundary            |                    |                     |







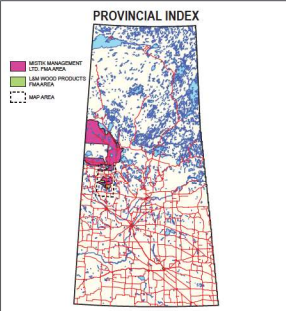


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**PLANNED ROADS  
INCLUDING CLASS 1 AND 2 ROADS – L&M**



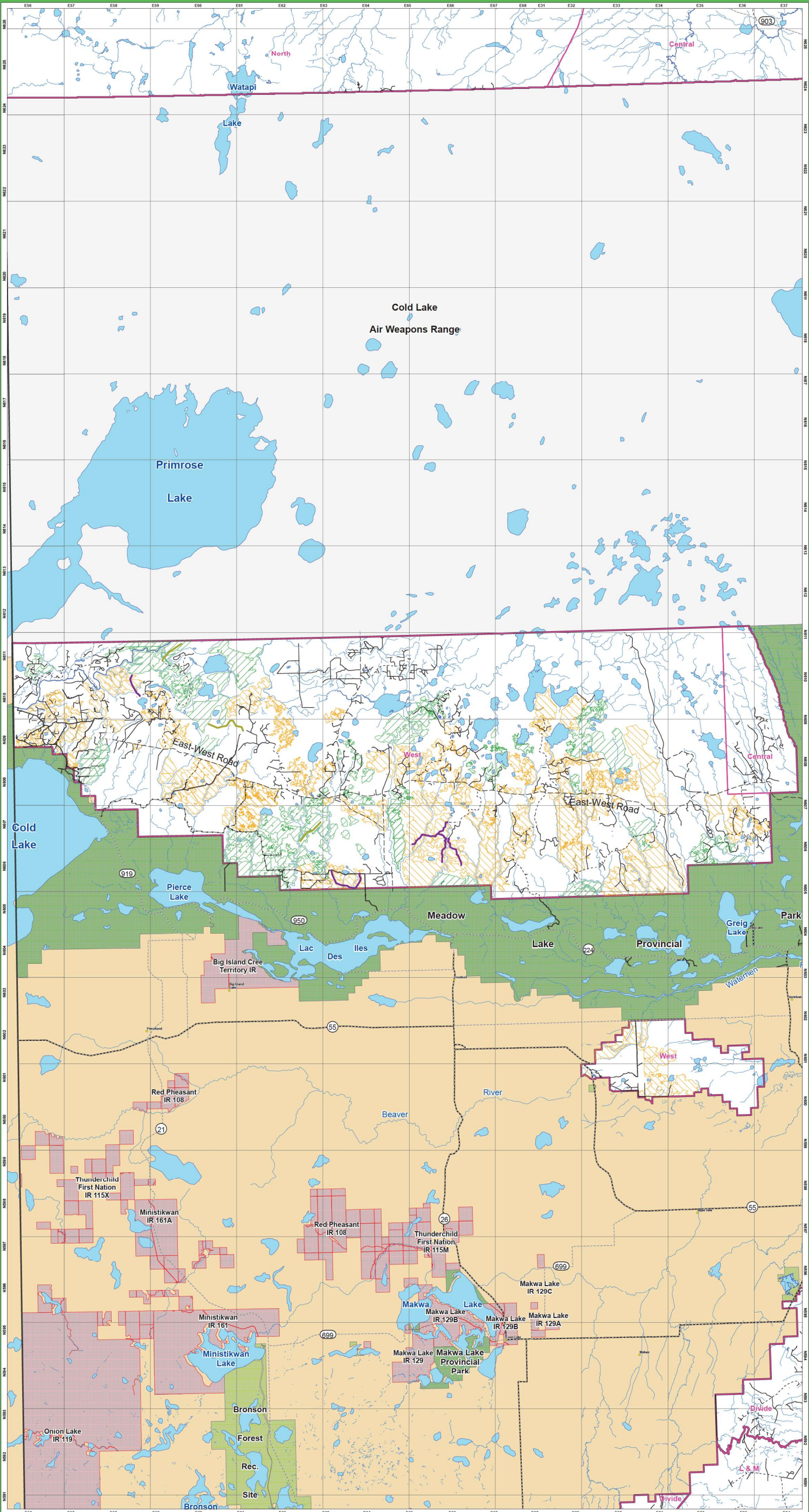
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Stereom Pair: V.001  
Map File: c:\projects\2015\mistik\_t2\roads\_L&M.mxd




- FEATURES OF INTEREST**
- Planned Roads (T1)**
- Class 1 (None Present)
  - Class 2
- Planned Roads (T2)**
- Class 1 (None Present)
  - Class 2
- Tactical Plan**
- T1
  - T2

- PLANIMETRIC LEGEND**
- |                                |                     |                |
|--------------------------------|---------------------|----------------|
| Public Road                    | — Paved Highway     | — FMA Boundary |
| — Gravel Highway               | — Provincial Park   |                |
| — Non-Mile                     | — Recreation Site   |                |
| — Oil / Gas                    | — Indian Reserve    |                |
| — 3rd Party                    | — Air Weapons Range |                |
| Provincial Forestry Class Road | — Settlement        |                |
| — Class 1 (FRR)                | — Village           |                |
| — Class 2 (BFR)                | — Town              |                |
| — Class 3 (Bush Road)          | — Village / Hamlet  |                |
| — Railroad                     | — Woodlands Office  |                |
| — Lake                         | — Mill Site         |                |
| — Creek                        |                     |                |
| — Provincial Border            |                     |                |
| — UTM Tile Boundary            |                     |                |









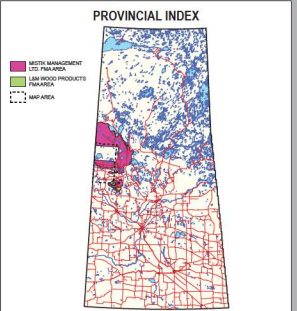
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**PLANNED ROADS  
INCLUDING CLASS 1 AND 2 ROADS - WEST**



0 5 10 20  
Kilometres

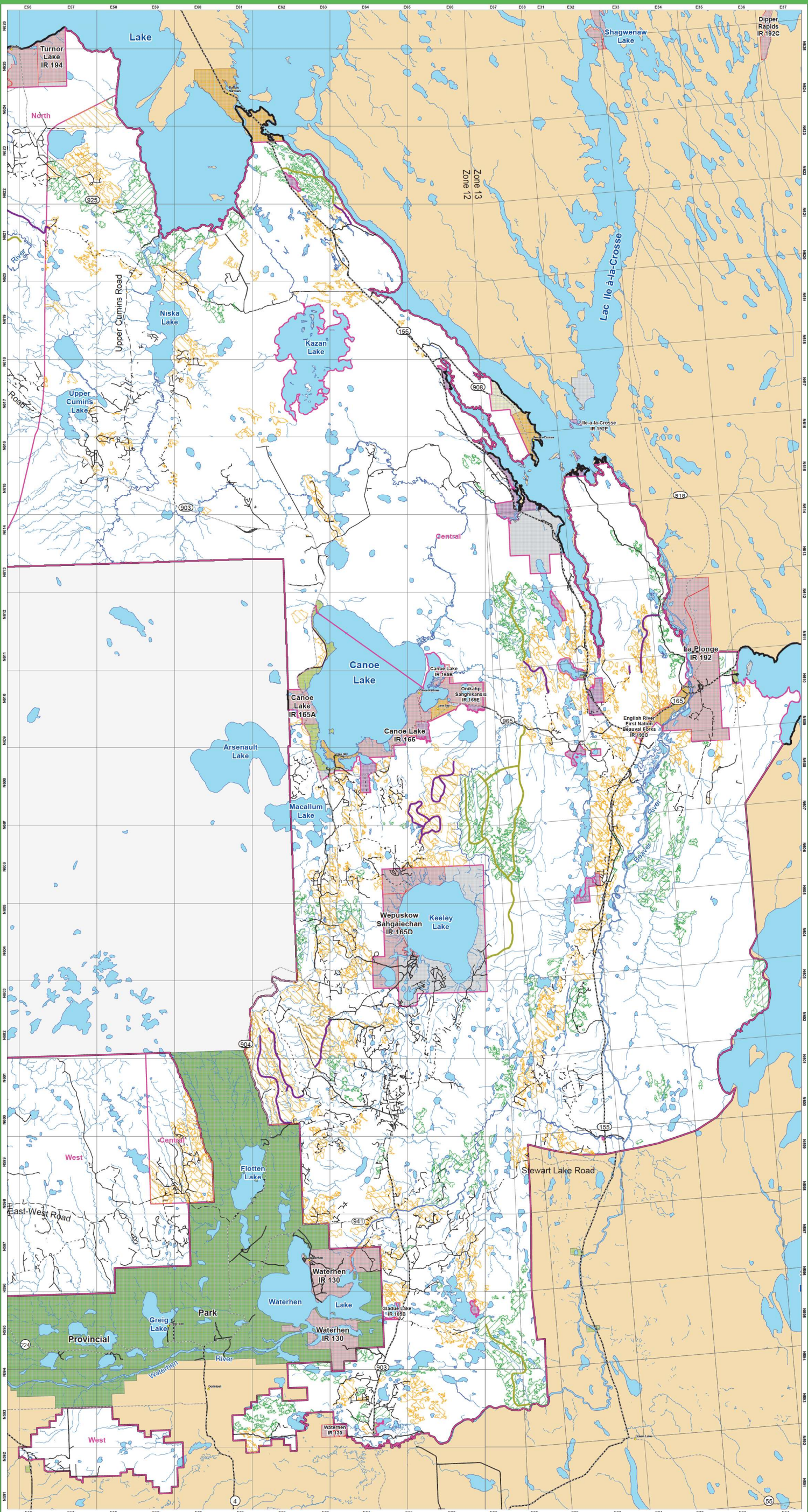
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Source: RBC V.001  
Map File: c:\projects\2016\makw\T2Roads\_West.mxd




- FEATURES OF INTEREST**
- Planned Roads (T1)**
- Class 1 (None Present)
  - Class 2
- Planned Roads (T2)**
- Class 1 (None Present)
  - Class 2
- Tactical Plan**
- T1
  - T2

- PLANIMETRIC LEGEND**
- |                                |                     |                   |
|--------------------------------|---------------------|-------------------|
| Public Road                    | Paved Highway       | FMA Boundary      |
| Gravel Highway                 | Non-Mileage         | Provincial Park   |
| Oil / Gas                      | 3rd Party           | Recreation Site   |
| Provincial Forestry Class Road | Class 1 (FRR)       | Indian Reserve    |
| Class 2 (BFR)                  | Class 3 (Bush Road) | Air Weapons Range |
| Settlement                     | Town                | Timber Reserve    |
| Village / Hamlet               | Woodlands Office    | Mill Site         |
| Lake                           | Creek               | Provincial Border |
| UTM Tile Boundary              |                     |                   |







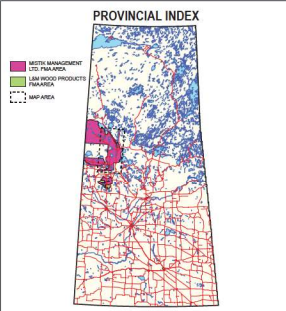


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**PLANNED ROADS  
INCLUDING CLASS 1 AND 2 ROADS – CENTRAL**



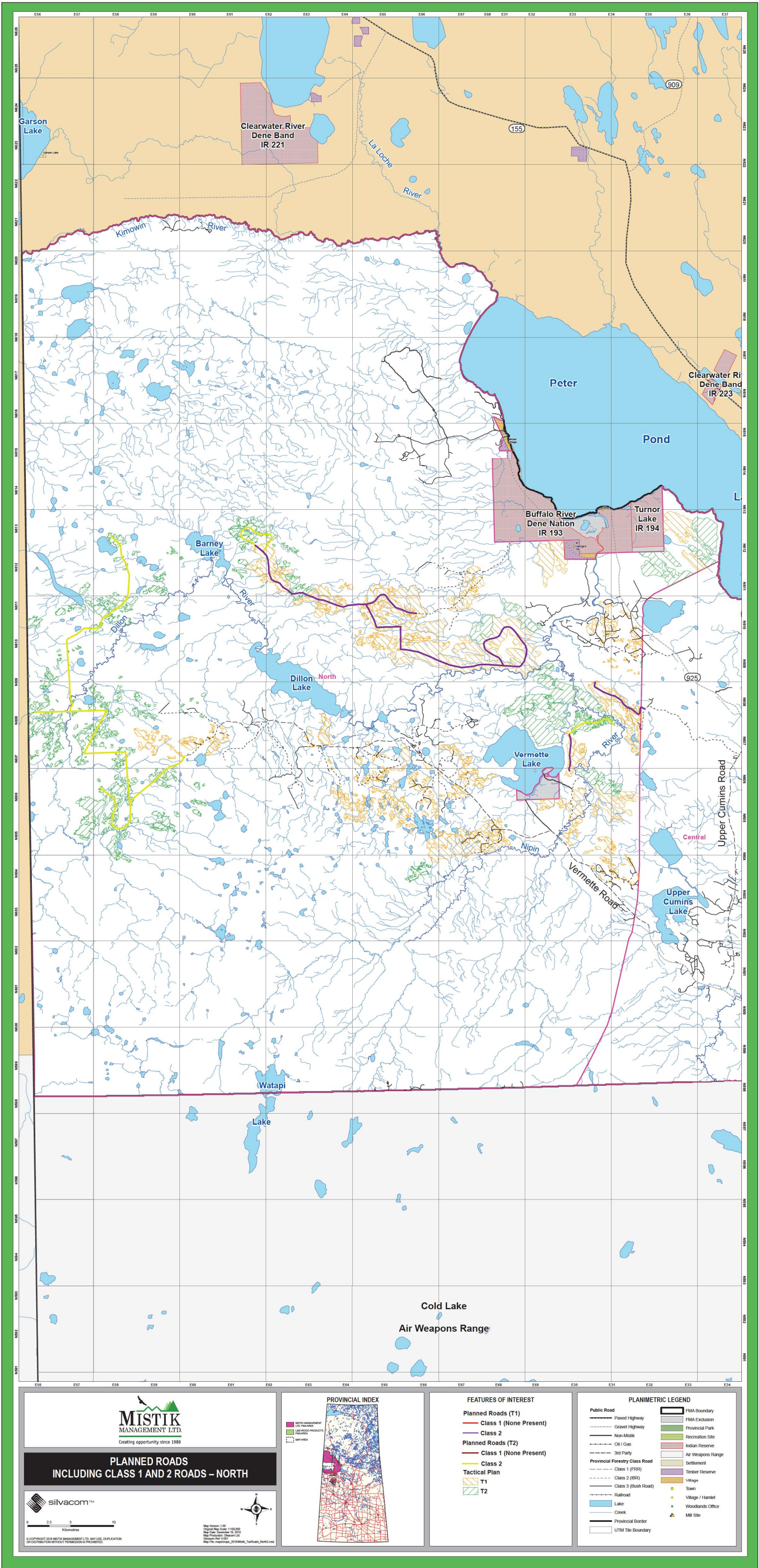
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Scale: 1:50,000  
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- FEATURES OF INTEREST**
- Planned Roads (T1)**
- Class 1 (None Present)
  - Class 2
- Planned Roads (T2)**
- Class 1 (None Present)
  - Class 2
- Tactical Plan**
- T1
  - T2

- PLANIMETRIC LEGEND**
- |                                |                     |                |
|--------------------------------|---------------------|----------------|
| Public Road                    | — Paved Highway     | — FMA Boundary |
| — Gravel Highway               | — Provincial Park   |                |
| — Non-Mile                     | — Recreation Site   |                |
| — Oil / Gas                    | — Indian Reserve    |                |
| — 3rd Party                    | — Air Weapons Range |                |
| Provincial Forestry Class Road | — Settlement        |                |
| — Class 1 (FRR)                | — Village           |                |
| — Class 2 (BR)                 | — Town              |                |
| — Class 3 (Bush Road)          | — Village / Hamlet  |                |
| — Railroad                     | — Woodlands Office  |                |
| — Lake                         | — Mill Site         |                |
| — Creek                        |                     |                |
| — Provincial Border            |                     |                |
| — UTM Tile Boundary            |                     |                |





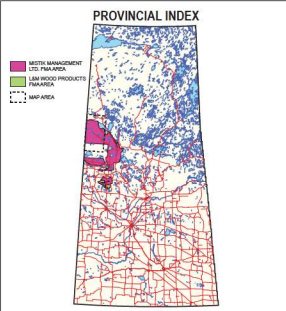
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**PLANNED ROADS  
INCLUDING CLASS 1 AND 2 ROADS – NORTH**

**silvacom**

0 2.5 5 10  
Kilometres

Map Version: 1.00  
Original Map Scale: 1:100,000  
Map Date: December 15, 2015  
Map Project: Silvacom Ltd.  
Map File: mapinfo\_20150908\_TheRoads\_North.mxd



**FEATURES OF INTEREST**

**Planned Roads (T1)**

- Class 1 (None Present)
- Class 2

**Planned Roads (T2)**

- Class 1 (None Present)
- Class 2

**Tactical Plan**

- T1
- T2

**PLANIMETRIC LEGEND**

Public Road	Paved Highway	FMA Boundary
Gravel Highway	Provincial Park	
Non-Mileage	Recreation Site	
Oil / Gas	Indian Reserve	
3rd Party	Air Weapons Range	
Provincial Forestry Class Road	Settlement	
Class 1 (PRR)	Village	
Class 2 (BR)	Town	
Class 3 (Bush Road)	Village / Hamlet	
Railroad	Woodlands Office	
Lake	Mill Site	
Creek		
Provincial Border		
UTM Tile Boundary		





## 2.6. FOREST MANAGEMENT

Mistik's and L&M's overall management objectives are to supply wood fibre to the mills through sustainable harvesting on the FMP area. This is done while protecting environmental values, traditional and cultural land uses, and other non-timber values (wildlife habitat, visual aesthetics, etc.) through collaboration with First Nation and Metis people, stakeholders and other individuals who use the forest.

Spatial identification of eligible exclusions, lake and stream buffers, heritage resources, and visually sensitive areas have been implemented by Mistik as the first step of protection. Once identified, operational plans can be created and implemented with consideration of the identified values and stakeholder impacts in mind.

Identification of sites and activities will be completed by soliciting input from Mistik staff, ministry staff and advisory/co-management boards through Mistik's planning and ongoing engagement processes. Field visits with the interested party and/or verification by Mistik staff may be required for verification of the value identified. Mistik considers it very important that all known traditional Aboriginal forest values are spatially identified, and a level of protection implemented that is agreeable to affected Aboriginal forest users.

Cooperative strategies (such as avoidance or patch retention) often depend on the size of the area affected and the nature of the value identified. Mistik works with the interested party to determine a solution that is most beneficial to both parties.

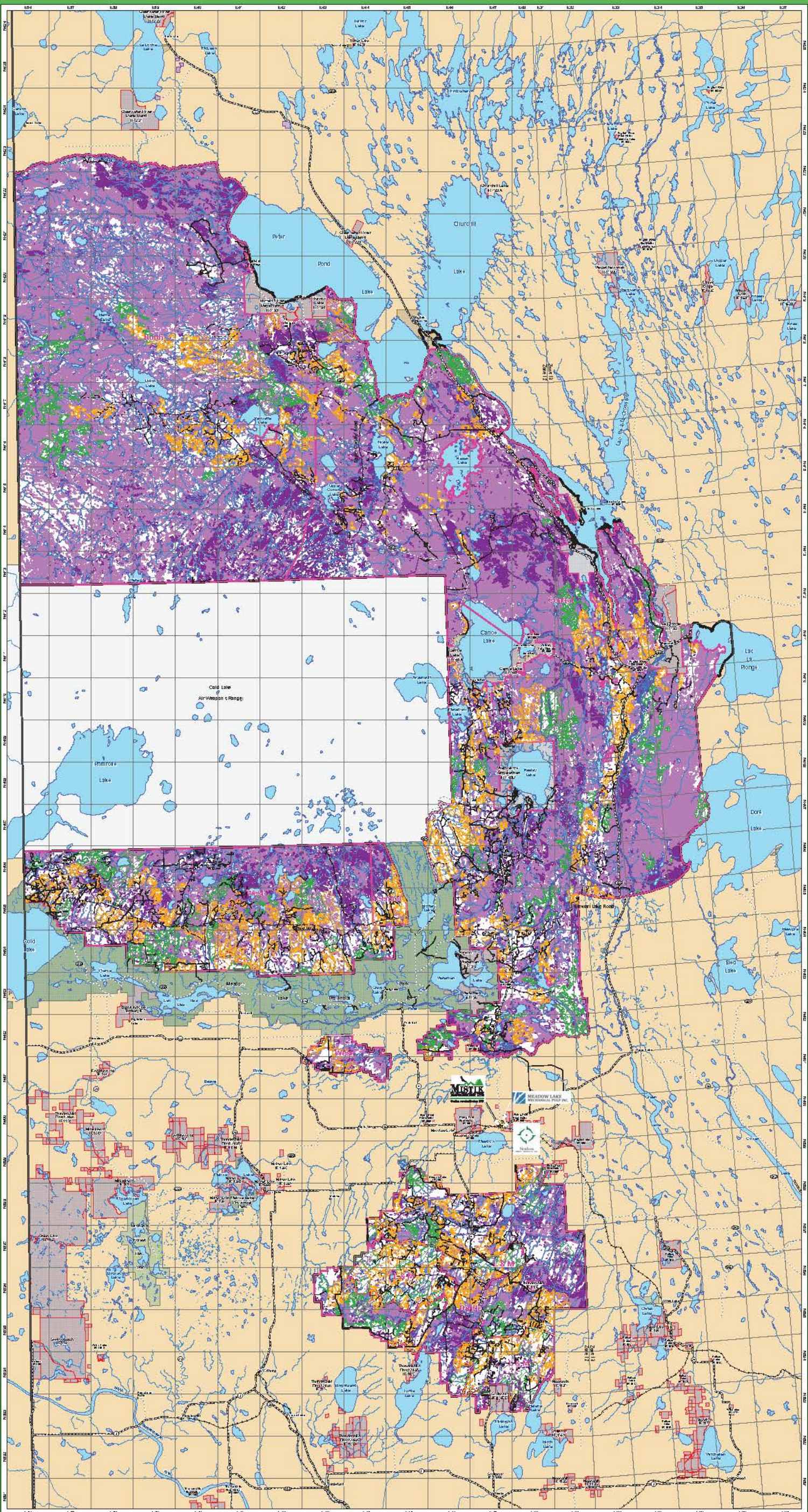
See also Mistik VOIT details which can be found in FMP Volume II - Values Objectives Indicators & Targets

Mistik Indicator #21 relates to spatially identified non-timber resources and forest use activities  
Mistik Indicator #24 relates to spatial identification and protection of culturally significant heritage and aboriginal sites. See FMP Volume II - Values, Objectives, Indicators & Targets (VOIT) document.

### 2.6.1. ELIGIBLE EXCLUSIONS

The working forest includes forested areas deemed capable of supporting reasonable rates of tree growth and merchantable yields at rotation. It excludes all areas deemed unsuitable or not operable for forestry activities based on environmental protection concerns, inaccessibility, very low productivity and/or timber size (below economically-viable timber utilization thresholds). Of the total area of 1,878,499 ha comprising the Mistik FMP area, only ~ 878,000 ha (47%) of forest land contributes to the determination of sustainable timber harvest levels. However, an amount totalling 138,766 ha of forest area contained in the permanent and partial exclusion land base is eligible for contribution to late seral retention in the forest estate modeling. These are forested areas that contribute ecological values (late seral) but have been removed from the 'working forest' area for reasons related to environmental or operational constraints. See the Forest Characterization Document under section 4.0 for further detail (Map 24).







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**PERMANENT AND PARTIAL EXCLUSIONS**



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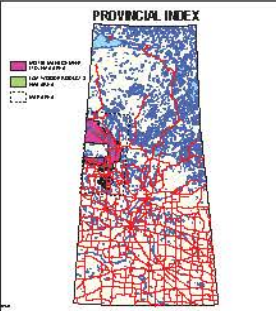


North arrow



0 5 10 20 Kilometers

Map created by: MML  
Map data: MML  
Map scale: 1:50,000  
Map date: 2010  
Map version: 1.0  
Map status: Final  
Map title: Permanent and Partial Exclusions



**FEATURES OF INTEREST**

- Permanent Exclusion
- Partial Exclusion
- Tactical Plan
- T1
- T2

**PLANIMETRIC LEGEND**

- Public Road
- Class 1 (Hwy)
- Class 2 (Hwy)
- Class 3 (Hwy)
- Railroad
- Lake
- Creek
- Provincial Border
- UTM Tie Boundary
- RNA Boundary
- Provincial Park
- Recreation Site
- Indian Reserve
- Settlement
- Timber Reserve
- Village
- Town
- Village / Hamlet
- Woodlands Office
- MML Site





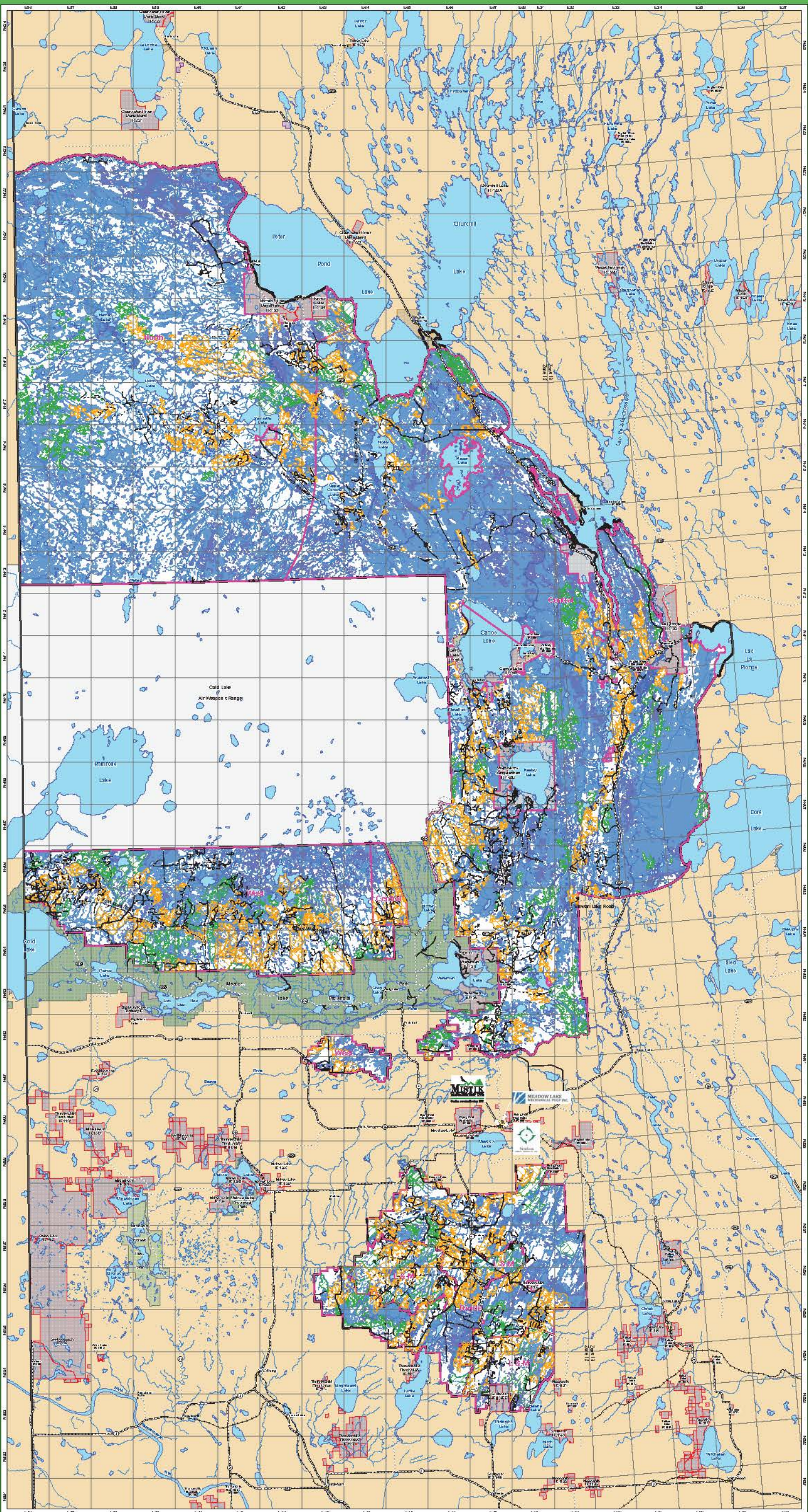
## 2.6.2. LAKE AND STREAM BUFFERS

Protection of water resources (quality and quantity) is a critical forest management objective. A provincial standard has been established to ensure that forest harvesting impacts adjacent to water bodies are minimized. Buffers (no harvest areas) are required adjacent to all water bodies. A 15, 30 or 90 m buffer is used depending on the size of the water body and known fisheries values. In some instances, seepage areas (including seasonal intermittent / ephemeral watercourses) and areas adjacent to stands with forest health issues, buffers may not be required.

In some instances, Mistik has agreed to protect values specifically identified by other forest users. One example of this is the 200m buffer around Niska Lake, Niska Channel and the McCusker River. In April 2007, the Buffalo Narrows Co-management Board identified these areas as high-conservation/special places, having important spawning, aesthetic, cultural/heritage, trapping, biodiversity, flora & fauna values. Through its consultation process, Mistik agreed that the co-management board would be consulted if any forestry activities are planned for within the 200m special management consideration zone. To date, no activities have been planned within these areas.

Map 25 demonstrates the current lakes, streams, and wetlands within the Mistik FMP area.







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**LAKES, STREAMS, AND WETLANDS**



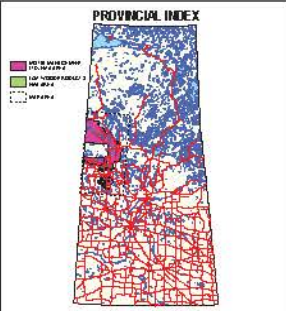
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North arrow pointing up.

Scale bar: 0, 5, 10, 20

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Map projection: UTM  
Map datum: NAD83  
Map coordinate system: UTM  
Map file name: Lakes, Streams, and Wetlands.mxd  
Map file path: C:\Users\mml\Documents\Projects\2014\Lakes, Streams, and Wetlands.mxd



- FEATURES OF INTEREST**
- Wetlands
    - Open Muskeg
    - Treed Muskeg
  - Tactical Plan
    - T1
    - T2

- PLANIMETRIC LEGEND**
- Public Road
  - Post Highway
  - Gravel Highway
  - Non-Gravel Highway
  - Old Road
  - Provincial Roadway Class Road
  - Class 1 (Hwy)
  - Class 2 (Hwy)
  - Class 3 (Hwy)
  - Railroad
  - Lake
  - Creek
  - Provincial Border
  - UTM Tie Boundary
  - MMA Boundary
  - Provincial Park
  - Recreation Site
  - Indian Reserve
  - Air Weapons Range
  - Settlement
  - Timber Reserve
  - Village
  - Town
  - Village / Hamlet
  - Woodlands Office
  - MMA Site





### 2.6.3. HERITAGE RESOURCES

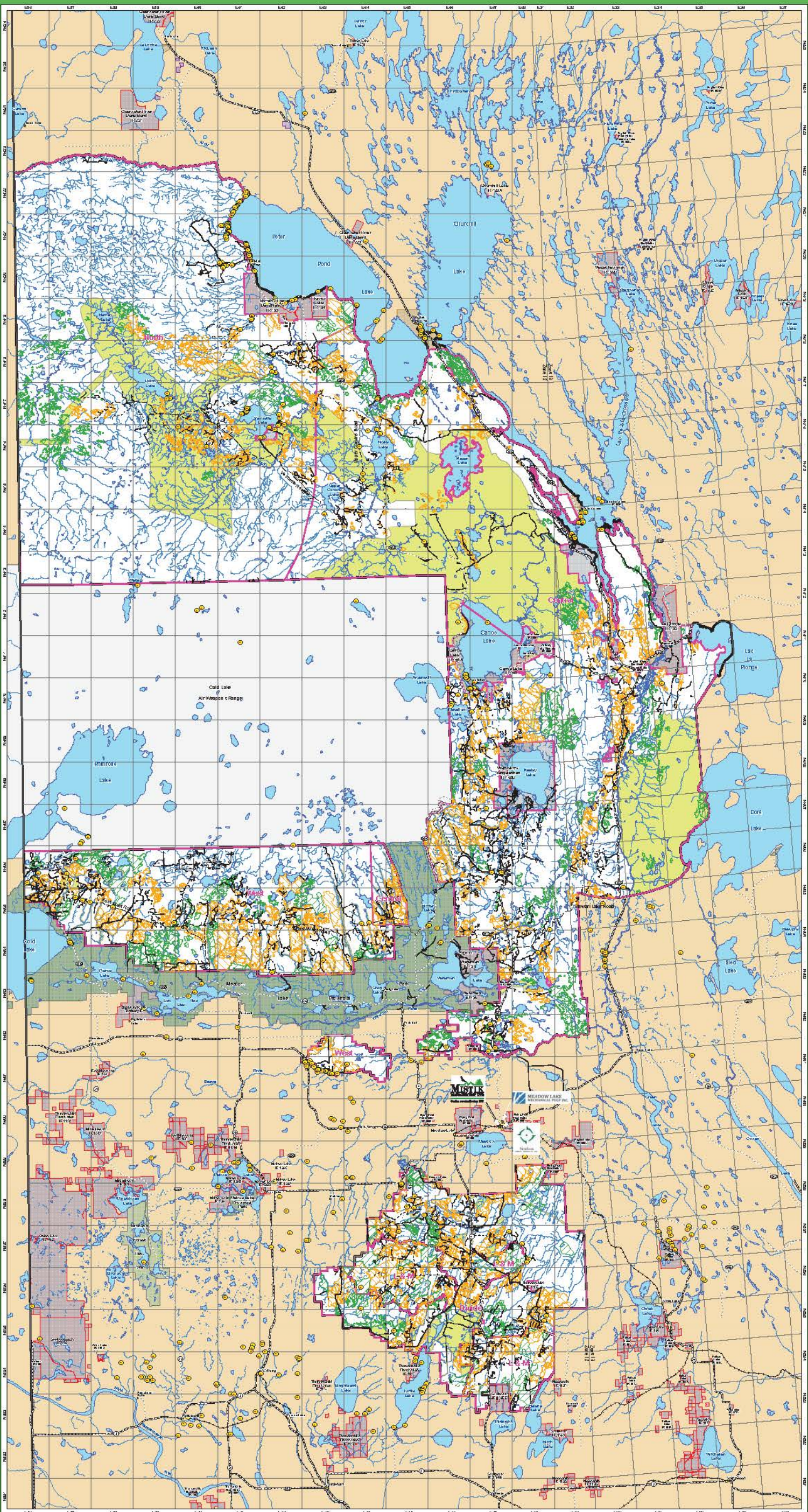
Cabins, sweat-lodges, hunting, fishing, berry-picking, mushroom-picking, nature appreciation, medicinal-plant use and wild rice harvesting are common ‘traditional forest use’ values and activities in the Mistik FMP area. Many of these ‘traditional use’ activities have developed, to some extent, into commercial or semi-industrial enterprises. In the recent past, significant industries have grown (and in some cases waned) around commercial freshwater fisheries, mink-ranching, blueberry picking, and guided outfitting for deer and bear. Recently, ecotourism has become a business opportunity for several northern communities. Wild rice harvesting has become the most significant non-timber forest use industry in the Mistik FMP area. A number of the small lakes and waterways in the Waterhen, Canoe Lake, Beauval, Ile-a-la Crosse, Buffalo Narrows and Dillon Management Units are actively seeded and harvested on an annual basis.

Annually, through the operating plan process, locations of known heritage sites are considered when designing harvest blocks, events and road networks. All planned operational activities are screened by Heritage Conservation Branch of the Ministry of Parks, Culture and Sport. Activities are rated by the branch for heritage potential and indication is given as to the requirement to complete a Heritage Resource Impact Assessment (HRIA). In most cases, high heritage potential areas are located next to larger rivers and creeks. Road construction and site preparation activities are most likely to trigger the requirement to do a heritage assessment. Since Mistik uses only scarification for site preparation with a low-impact disturbance created, this activity does not typically require a HRIA. For road building, Mistik attempts to design road networks that avoid areas that would require a HRIA and have a high potential for heritage values. If Mistik is unable to avoid specific areas or uses an alternate site preparation technique, all requirements of the heritage assessment are followed.

Indicator #24 in the VOIT document (FMP Volume II) addresses mapping of heritage values.

Map 26 demonstrates the significant features within the Mistik FMP area. Examples shown on the map include historical access routes (“Keeley Portage” in the Central Planning Unit for example), unique landforms, visually sensitive areas, rare wildlife sightings, wildlife features such as nests, and public concern areas of historical value. Mistik maintains a database with the location and details around each identified feature for planning purposes.







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### SIGNIFICANT FEATURES



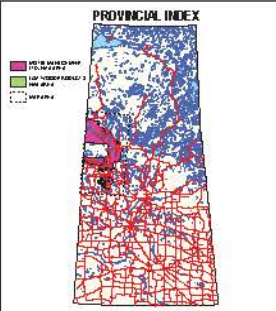
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North arrow pointing up.

Scale bar: 0 5 10 20  
kilometres

Map created by: MML  
Map data: MML  
Map style: MML  
Map scale: 1:50,000  
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Map author: MML  
Map reviewer: MML  
Map approver: MML  
Map status: Final  
Map version: 1.0  
Map notes: This map is a summary map and should not be used for detailed planning or design.



#### FEATURES OF INTEREST

- Archaeological / Heritage Site
- Special Places
- Tactical Plan
- T1
- T2

#### PLANIMETRIC LEGEND

Public Road	Provincial Boundary
Gravel Highway	Provincial Park
Gravel Highway	Recreation Site
Oil Road	Indian Reserve
Oil Road	Air Weapons Range
Provincial Boundary	Settlement
Class 1 (Hwy)	Timber Reserve
Class 2 (Hwy)	Village
Class 3 (Hwy)	Town
Railroad	Village / Hamlet
Lake	Woodlands Office
Creek	MML Site
Provincial Border	
UTM Tie Boundary	





#### 2.6.4. VISUALLY SENSITIVE AREAS

Areas that have been designated as visually sensitive areas (VSA's) include major highways and roads, and high recreation-use lakes and rivers as well as other areas identified based on input from the public (Map 27).

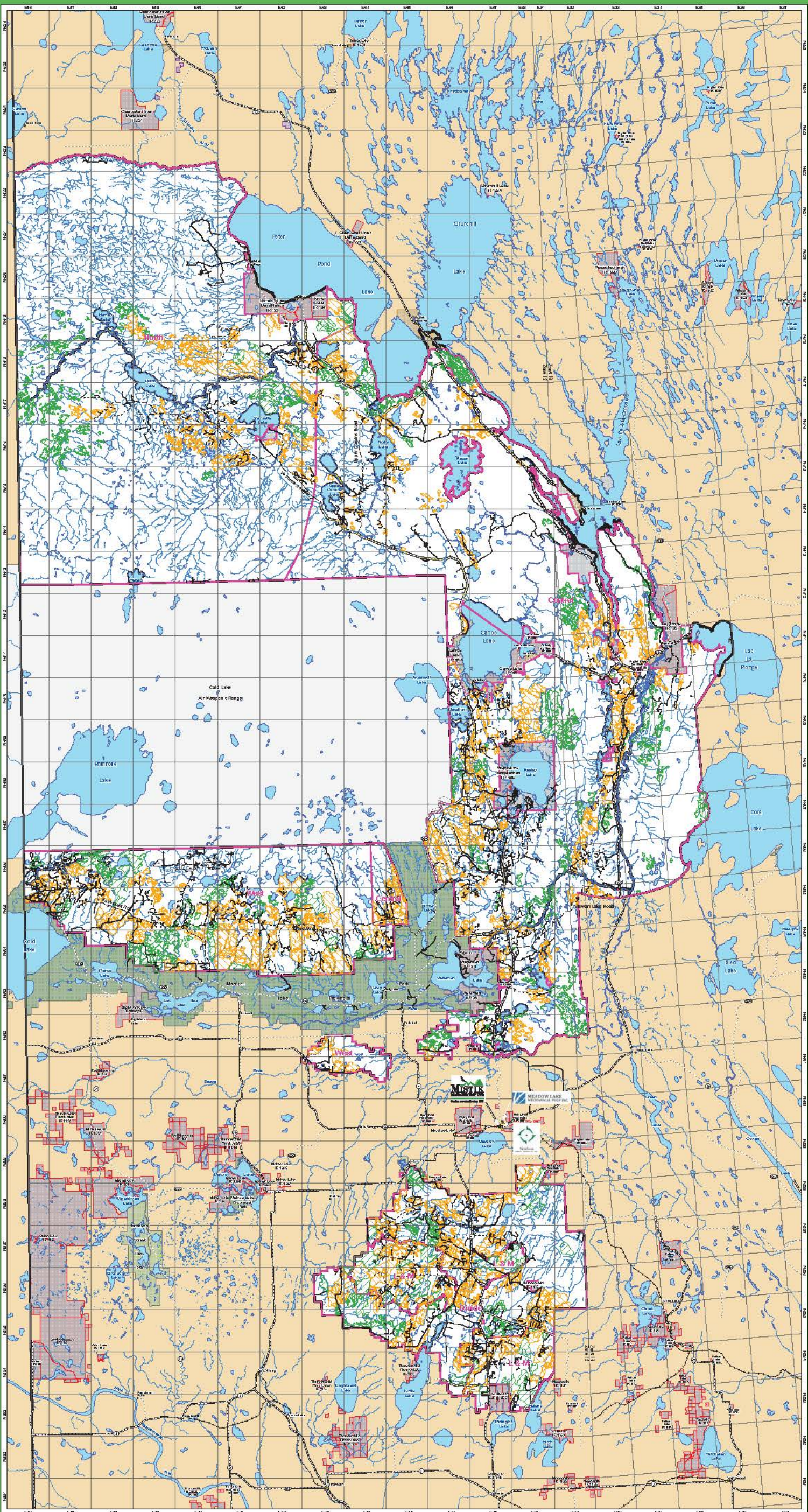
Mistik and L&M have several visual quality objectives (VQOs) when conducting harvesting activities within visually sensitive areas. Operations with respect to VQO's are guided by provincial standards and internal standard operating procedures. In general, VQO's are addressed with the following in mind:

- Harvest impact may be visually dominant in the local landscape;
- Harvest impact may allow for significant visibility directly into the local harvest area;
- Harvest impact will maintain scenic diversity;
- Retention of vertical structure (patches) will be maintained in harvest areas in patterns that minimize line of sight into VSA's

Operating plans identify and describe the objectives for VQO's associated with planned operations. Harvesting and other forest management activities will be implemented consistent with those objectives.

With the exception of jack pine forest types where Dwarf Mistletoe is present, VQOs will be achieved by strategic placement of variable size retention patches and single trees. Riparian buffers and retention levels along roads often exceed the provincial standards in visually sensitive areas. Local topography and existing forest structural diversity within and adjacent to the harvest blocks will be used to maintain scenic diversity. In some cases, required buffer widths for riparian areas may also be exceeded upon the request of stakeholders who identify visually sensitive areas along rivers or lakes.







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## VISUALLY SENSITIVE AREAS



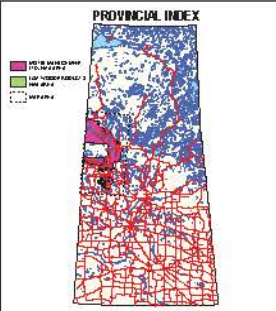
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North arrow pointing up.

Scale bar: 0, 5, 10, 20 km

Map created by: MISTIK MANAGEMENT LTD.  
Map data: OpenStreetMap contributors, Esri, DeLorme, NAVTEQ, SwatchNoid, Mapbox, Aerion, etc.  
Map projection: UTM Zone 18N  
Map scale: 1:50,000  
Map date: 2023-10-27



### FEATURES OF INTEREST

- Visually Sensitive Area
- Tactical Plan
- T1
- T2

### PLANIMETRIC LEGEND

Public Road	Provincial Boundary
Class 1 (Hwy)	Provincial Park
Class 2 (Hwy)	Recreation Site
Class 3 (Local Road)	Indian Reserve
Railroad	Aboriginal Range
Lake	Settlement
Creek	Timber Reserve
Provincial Border	Village
UTM Tie Boundary	Town
	Village / Hamlet
	Woodlands Office
	MNI Site





## 2.7. WILDLIFE

Wildlife is abundant within the Mistik FMP area. The most common large mammals within the FMP area include white-tailed deer, moose and lesser numbers of black bear, elk and woodland caribou.

Saskatchewan Ministry of Environment undertakes periodic surveys of population trends for select wildlife. Mistik summarized this data for the FMP area in section 6.6 of Volume 1.

Caribou, Moose and Fisher have been selected as indicator species for habitat monitoring as part of the FMP process. Caribou have been designated as a species at risk and are now protected under the federal *Species at Risk Act* (SARA). Moose and Fisher are locally important species for sustenance and trapping respectively and are frequently identified by First Nation, Metis and other stakeholders on the FMP area as important to their livelihood.

A quantitative analysis of the current habitat supply for moose, fisher, and caribou was reported by Alpha Wildlife in “Development of Queries and Predictive Distribution Maps for Wildlife Indicator Species, Species of Concern, and Species at Risk for the Current Forest Condition (2006) in the Mistik FMP Area”. Habitat supply was determined based on stand structural characteristics for each species.

Many of these structural characteristics used to define habitat quality can be difficult to incorporate into a wood supply analysis through time. A forest model can predict with reasonable certainty a stand’s future development type and future age for any given point in time but cannot with certainty predict how a stand’s crown closure or vertical structure, for example, will change.

This section briefly details the procedures developed in consultation with Dr. Gilbert Proulx of Alpha Wildlife to revise the predictive criteria for use in the analysis of the future habitat supply for the three species selected for the FMP area: Woodland Caribou, Fisher, and Moose.

### 2.7.1. MOOSE

Potential winter moose habitat is based on many stand characteristics including stand type (species group), vertical structure, canopy closure, tree height, basal area and adjacency to early seral stage blocks and/or aquatic vegetation and/or streams as outlined in the report by Alpha Wildlife. As an important note Mistik is not actively managing for moose habitat. Proulx’s work is used to identify and monitor the maintenance of moose habitat in the annual report.

The following methodology for assessing moose habitat was based on work by Dr. Gilbert Proulx of Alpha Wildlife aimed at developing predictive criteria for use in the analysis of the current and future habitat supply for moose. This is the same approach that was used in the 2007 Mistik FMP.





Table 2-8 Moose Habitat Methodology

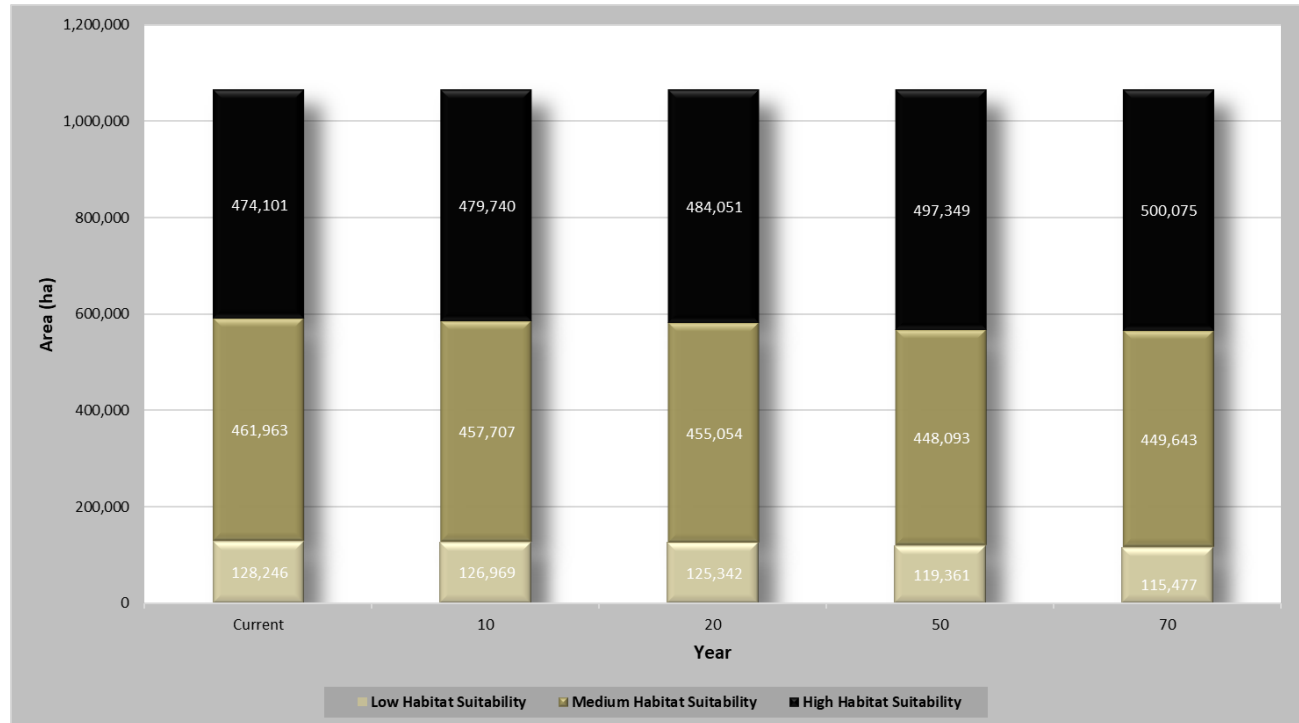
Scoring Category	Methodology
Adjacency	A spatial analysis was conducted at each time interval to test the adjacency to early seral stage blocks, aquatic vegetation and streams. Aquatic vegetation and the location of streams are assumed to remain constant throughout the planning horizon. Early seral stage blocks were queried at each interval based on the wood supply model output. Stands being tested for their adjacency to early seral stage blocks, aquatic vegetation and streams were queried at each time interval based on species group and age, both of which are determined based on the wood supply model output, and then tested for adjacency. Stands are assigned points based on their adjacency.
Stand Type	Stand type was then given a score with stands of a species group of softwood or softwood dominated mixed wood were given a stand type score of 2. Hardwood dominated mixed wood and hardwood stands that also had a conifer percentage of over 18 than a stand type score was given of 1.
Structure Score	Multi stands were present than a structure score of 1 was given.
Canopy Score	If the cruz flag (see forest characterization document for further details) equaled 0 and the total crown was greater than 40 a canopy score of 1. If the cruz flag equaled 1 and the crown closure was greater than 40 than a canopy score of 1 was given.
Total Score	The total score was the summation of the stand type, structure, canopy, and the adjacency score. If the total score was greater or equal to 4 it was considered "High Quality", if it was greater or equal to 2 but less than 4 it was considered "Medium Quality", and if it was greater or equal to 1 but less than 2 it was considered "Low Quality".

The future habitat suitability was calculated based on the same principles above and adjusting for age. As shown in Figure 3, total Moose habitat is projected to remain relatively constant over the next 70 years, with slight increases projected for High and Medium habitat suitability. For spatial distribution of moose habitat, now and projected into the future, please refer to Map 28 through Map 32.

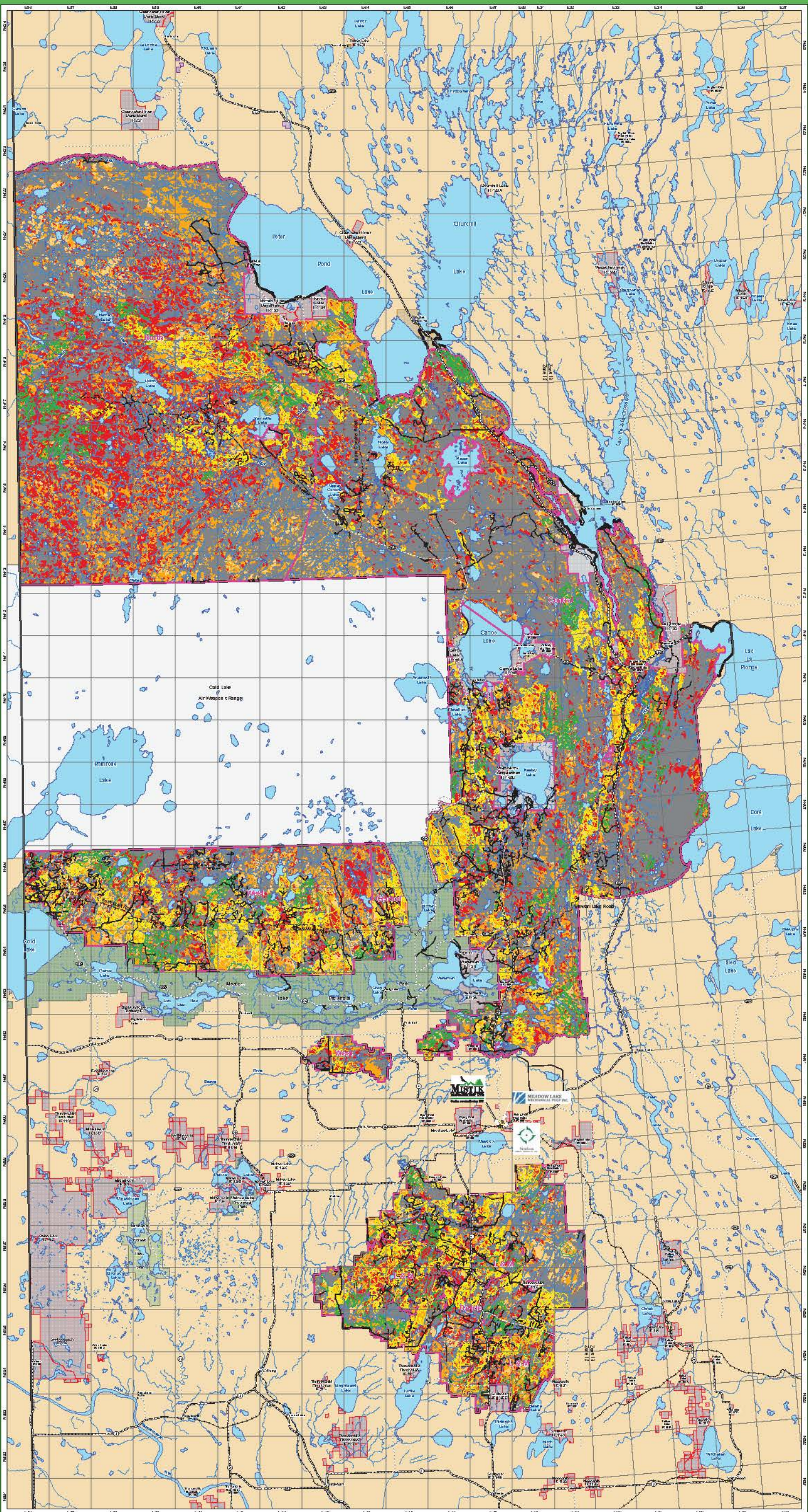




*Figure 3 Moose Habitat Features*









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## MOOSE YEAR 0 – CRITICAL HABITAT AND HABITAT FEATURES



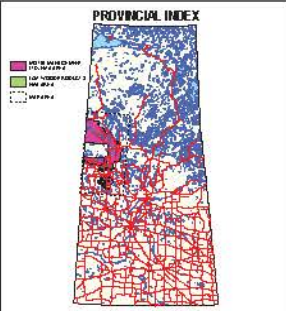
silva.com



North arrow

Scale bar: 0 5 10 20 Kilometers

Map created by: MISTIK MANAGEMENT LTD.  
Map data: MISTIK MANAGEMENT LTD.  
Map date: 2010  
Map scale: 1:50,000  
Map projection: UTM Zone 18N  
Map datum: NAD 83  
Map units: Meters



### FEATURES OF INTEREST

**Moose Habitat**

- High
- Medium
- Low
- Unsuitable Habitat

**Tactical Plan**

- T1
- T2

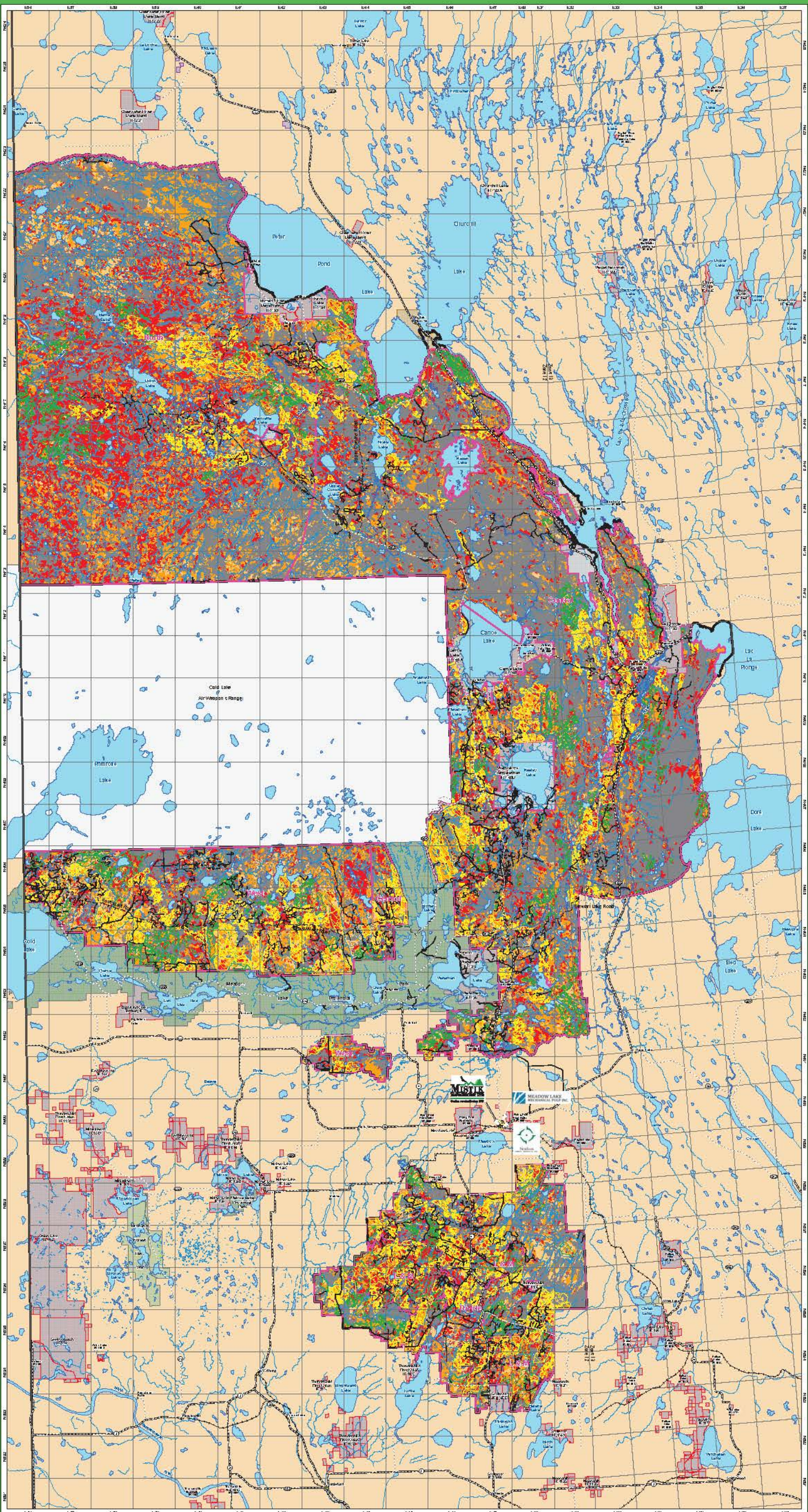
### PLANIMETRIC LEGEND

Public Road	RNA Boundary
Post Highway	Provincial Park
Gravel Highway	Recreation Site
Non-PA	Indian Reserve
Oil Road	Air Weapons Range
3rd Party	Settlement
Provincial Road: Class Road	Timber Reserve
Class 1 (Hwy)	Village
Class 2 (Hwy)	Town
Class 3 (Hwy Road)	Village / Hamlet
Railroad	Woodlands Office
Lake	MNI Site
Creek	
Provincial Border	
UTM Tie Boundary	





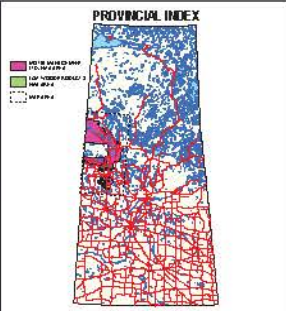




# MOOSE YEAR 20 – CRITICAL HABITAT AND HABITAT FEATURES

Scale: 0 5 10 20 Kilometers

Map created by: MISTIK MANAGEMENT LTD.  
Map data: MISTIK MANAGEMENT LTD.  
Map date: 2019-09-10  
Map by: MISTIK MANAGEMENT LTD.



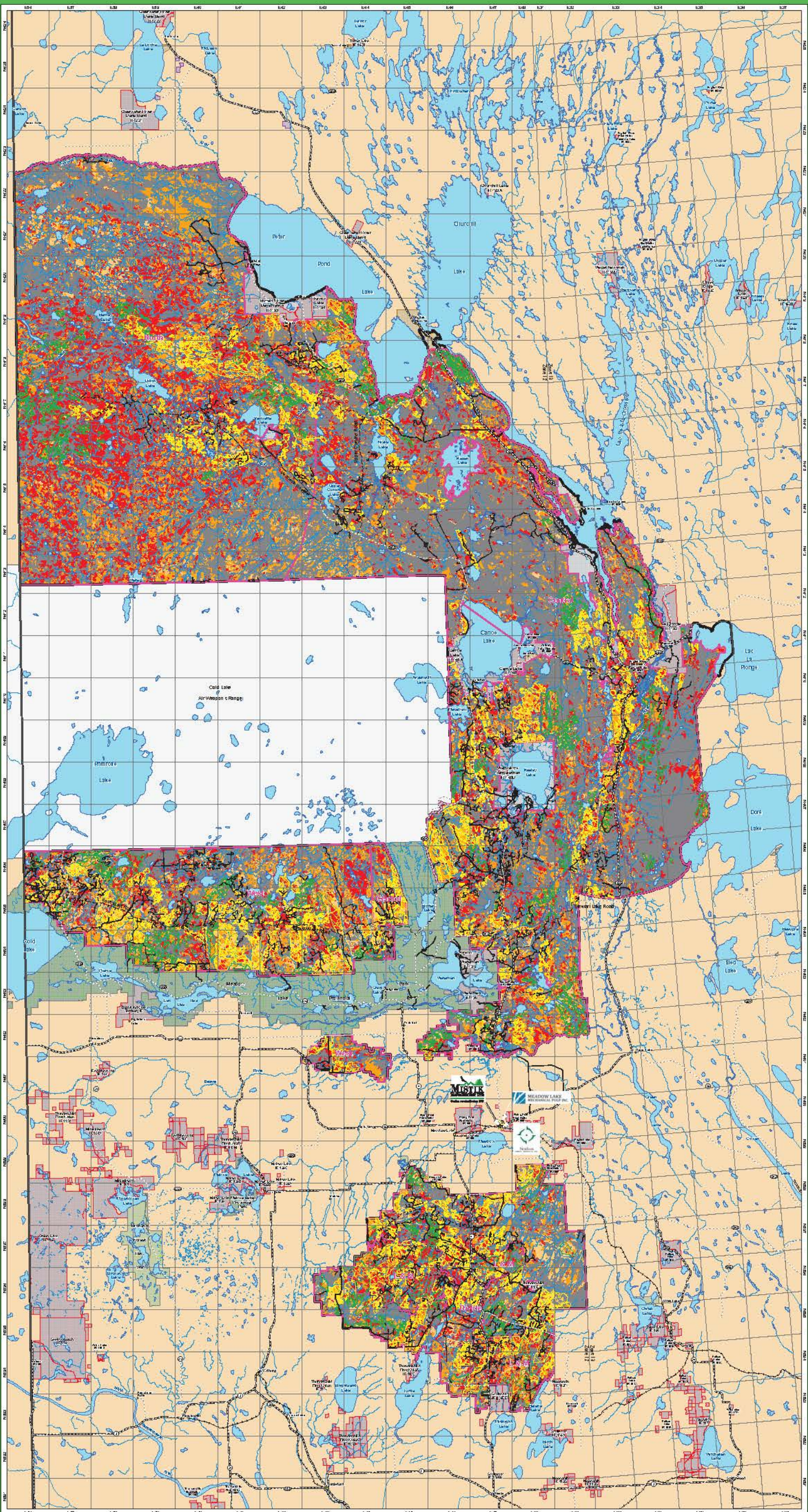
- ### FEATURES OF INTEREST
- Moose Habitat
- High
  - Medium
  - Low
  - Unsuitable Habitat
- Tactical Plan
- T1
  - T2

- ### PLANIMETRIC LEGEND
- Public Road
  - Post Highway
  - Gravel Highway
  - Non-PA
  - Oil Road
  - 3rd Party
  - Provincial Road: Class 1 (Hwy)
  - Class 2 (Hwy)
  - Class 3 (Hwy Road)
  - Railroad
  - Lake
  - Creek
  - Provincial Border
  - UTM Tie Boundary
  - RNA Boundary
  - Provincial Park
  - Recreation Site
  - Indian Reserve
  - Air Weapons Range
  - Settlement
  - Timber Reserve
  - Village
  - Town
  - Village / Hamlet
  - Woodlands Office
  - RNA Site











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**MOOSE YEAR 70 – CRITICAL HABITAT  
AND HABITAT FEATURES**



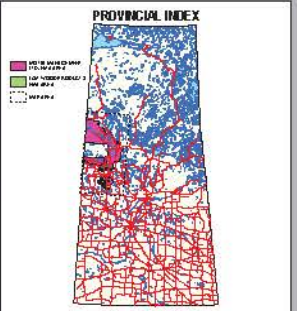
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North arrow

Scale bar: 0 5 10 20

Map created by: MISTIK MANAGEMENT LTD.  
Map data: MISTIK MANAGEMENT LTD.  
Map date: 2010  
Map scale: 1:50,000  
Map projection: UTM  
Map datum: NAD 83  
Map units: Meters



**FEATURES OF INTEREST**

**Moose Habitat**

- High
- Medium
- Low
- Unsuitable Habitat

**Tactical Plan**

- T1
- T2

**PLANIMETRIC LEGEND**

- Public Road
- Post Highway
- Gravel Highway
- Non-PA
- Oil Road
- 3rd Party
- Provincial Roadway Class Road
- Class 1 (Hwy)
- Class 2 (Hwy)
- Class 3 (Hwy Road)
- Railroad
- Lake
- Creek
- Provincial Border
- UTM Tie Boundary
- RNA Boundary
- Provincial Park
- Recreation Site
- Indian Reserve
- Air Weapons Range
- Settlement
- Timber Reserve
- Village
- Town
- Village / Hamlet
- Woodlands Office
- MNI Site





## 2.7.2. CARIBOU

See Appendix A for Mistik's woodland caribou habitat mitigation strategy. *April 2023 Update: Appendix A has been updated based on the changes Mistik has made to the forest management plan to gain alignment with the Range Plan for Woodland Caribou in Saskatchewan (SK2 West Caribou Administration Unit) which was finalized in October 2021.* Appendix A outlines the strategy which was completed based on new data related to spatial boundaries of the SK2 West area provided by the Ministry of Environment.

## 2.7.3. FISHER

Fisher winter habitat quality is determined by a variety of stand structure characteristics. Many of these characteristics cannot be directly derived from the wood supply model. As an important note Mistik is not actively managing for fisher habitat. This work is used to identify and monitor the maintenance of fisher habitat in the annual report.

The following methodology for assessing fisher habitat was based on work by Dr. Gilbert Proulx of Alpha Wildlife aimed at developing predictive criteria for use in the analysis of the current and future habitat supply for fisher. This is the same approach that was used in the 2007 Mistik FMP.

Table 2-9 Fisher Habitat Methodology

Scoring Category	Methodology
Absence of Disturbance	Stands with a development type of S, SH, or HS with a cut flag of 0 and an anthropogenic disturbance value of 0 were given an absence of disturbance score of 4. Stands with an anthropogenic or natural disturbance value were given a absence of disturbance score of 0. Stands identified as water were also given a value of 0.
Age Score	Stands aged less than 60 were given an age score of 0. Stands aged between 60 and 80 were given an age score of 1. Stands aged between 80 and 100 were given an age score of 2. Stands aged between 100 and 120 were given an age score of 3. Stands aged greater than 120 were given an age score of 5. Hardwood dominated stands were given an age score was given of 0.
Shrub Score	No development type and a shrub crown score greater than 5 but less than 20 were given a shrub score of 1. No development type and a shrub crown score greater than 20 but less than 40 were given a shrub score of 2. No development type and a shrub crown score greater than 40 were given a shrub score of 3.
Canopy Score	If the cruz flag (see forest characterization document for further details) equaled 0 and the total crown was greater than 50 a canopy score of 1 was given. If the cruz flag equaled 1 and the crown closure was greater than 50 than a canopy score of 2 was given.
Total Score	The total score was the summation of the absence of disturbance, age, shrub, and canopy score. If the total score



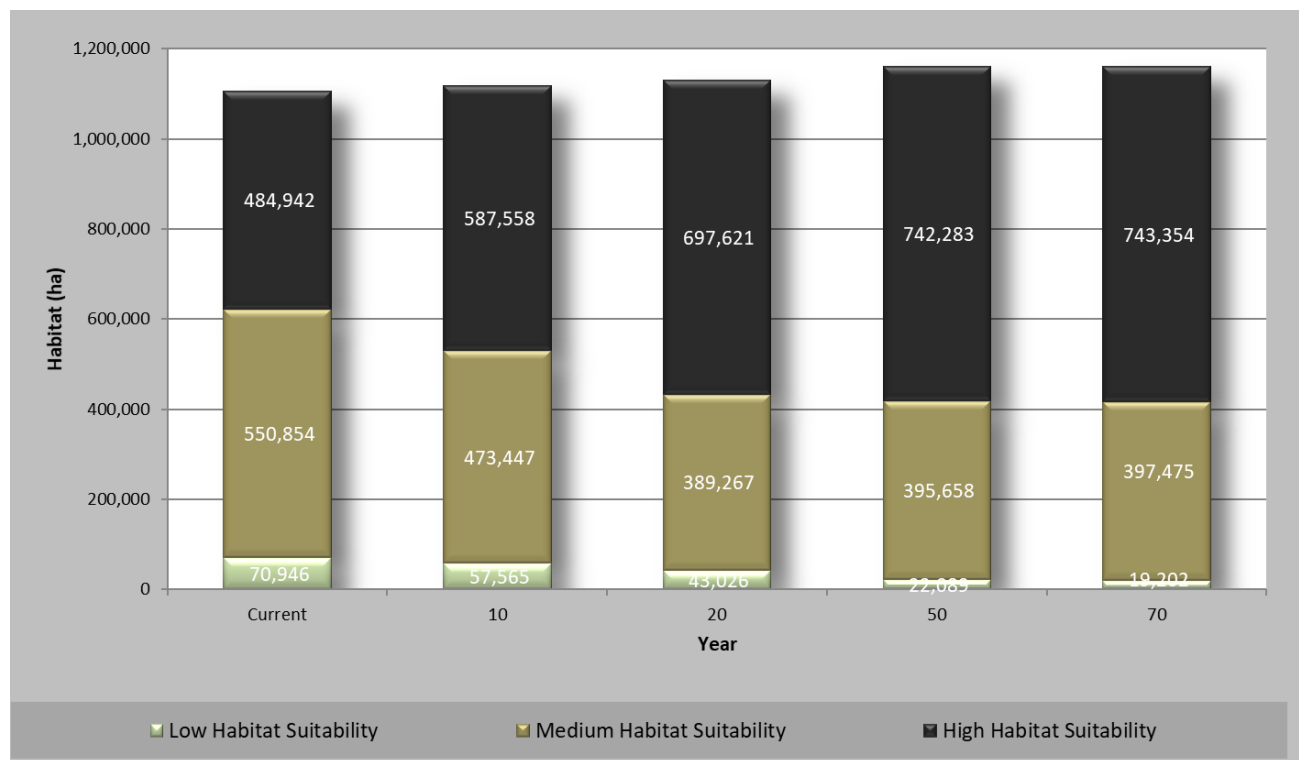


was greater or equal to 8 it was considered “High Quality”, if it was greater or equal to 6 but less than 8 it was considered “Medium Quality”, and if it was greater or equal to 1 but less than 6 it was considered “Low Quality”.

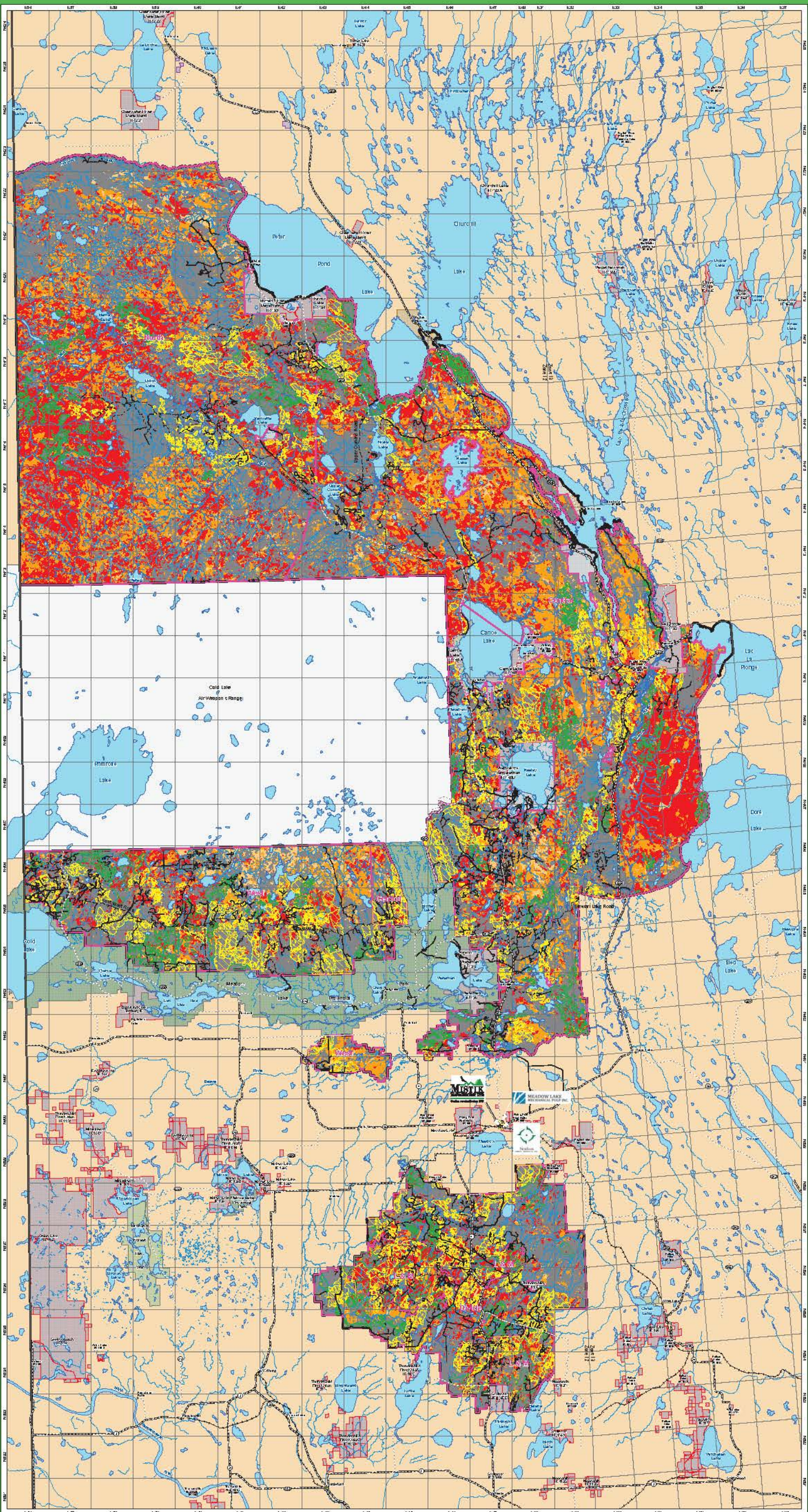
Following Mistik VOIT indicator 7b the fisher habitat should meet the 10-year projection based on the output from the forest estate modeling. This value is a summation of the low, medium, and high-quality habitat. While high quality habitat is better suited for fisher, it is not given a weighted value, as both medium and low quality still count towards total fisher habitat.

Total Fisher habitat is projected to increase by 53,288 ha due over the next 70 years. High quality habitat is projected to increase by 258,412 ha over that same period (Figure 4). For spatial distribution of fisher habitat, now at projected into the future, please refer to Map 33 through Map 37.

Figure 4 Fisher Habitat Features



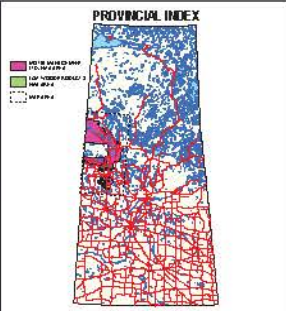




### FISHER YEAR 0 – CRITICAL HABITAT AND HABITAT FEATURES

Scale: 0 5 10 20 Kilometers

Map created by: MISTIK MANAGEMENT LTD. on 10/10/2018. Project: FISHER YEAR 0 – CRITICAL HABITAT AND HABITAT FEATURES. Map scale: 1:50,000. Map projection: UTM Zone 18N. Map datum: NAD83. Map units: Meters. Map format: PDF. Map author: MISTIK MANAGEMENT LTD. Map reviewer: MISTIK MANAGEMENT LTD. Map approver: MISTIK MANAGEMENT LTD. Map status: Final. Map version: 1.0. Map file: FISHER\_YEAR\_0\_Critical\_Habitat\_and\_Habitat\_Features.pdf. Map path: C:\Users\mml\Documents\FISHER\_YEAR\_0\_Critical\_Habitat\_and\_Habitat\_Features.pdf. Map size: 10,000,000 bytes. Map type: Map. Map description: Map of Fisher Year 0 Critical Habitat and Habitat Features. Map keywords: Fisher Year 0, Critical Habitat, Habitat Features, Mistik Management Ltd.



#### FEATURES OF INTEREST

**Fisher Habitat**

- High (Red)
- Medium (Orange)
- Low (Yellow)
- Unsuitable Habitat (Grey)

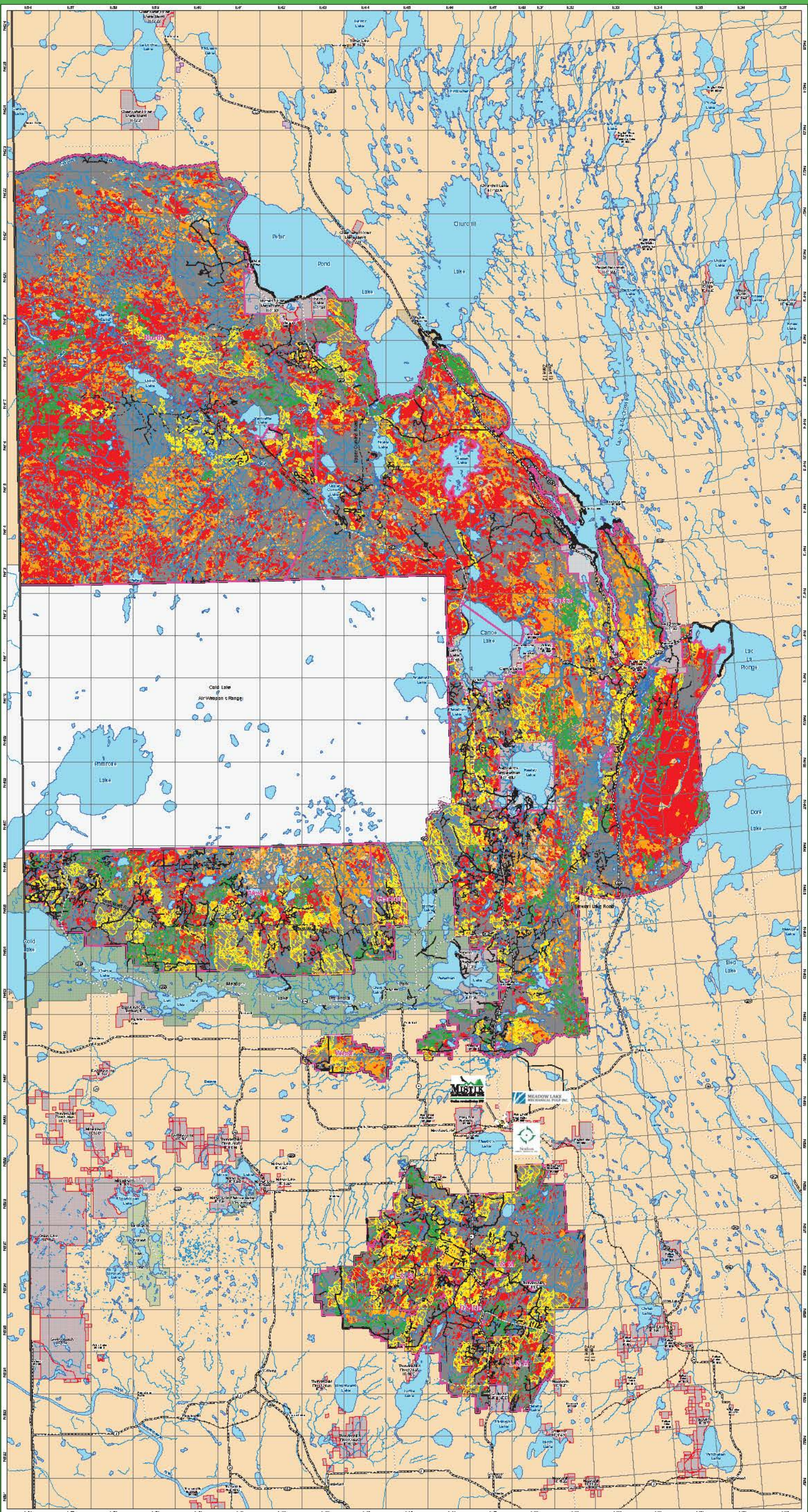
**Tactical Plan**

- T1 (Yellow)
- T2 (Green)

#### PLANIMETRIC LEGEND

Public Road	Provincial Boundary
Post Highway	Provincial Park
Gravel Highway	Recreation Site
Non-Feasible	Indian Reserve
Oil Road	Air Weapons Range
3rd Party	Settlement
Provincial Boundary: Class 1 (Hwy)	Timber Reserve
Class 2 (Hwy)	Village
Class 3 (Rural Road)	Town
Railroad	Village / Hamlet
Lake	Woodlands Office
Creek	Mistik
Provincial Border	
UTM Tie Boundary	







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## FISHER YEAR 10 – CRITICAL HABITAT AND HABITAT FEATURES



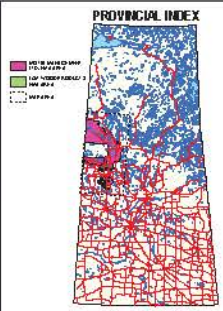
silva.com



North arrow

Scale bar: 0 5 10 20

Map created by: MISTIK MANAGEMENT LTD.  
Map data: MISTIK MANAGEMENT LTD.  
Map scale: 1:50,000  
Map date: 2010  
Map by: MISTIK MANAGEMENT LTD.



### FEATURES OF INTEREST

**Fisher Habitat**

- High
- Medium
- Low
- Unsuitable Habitat

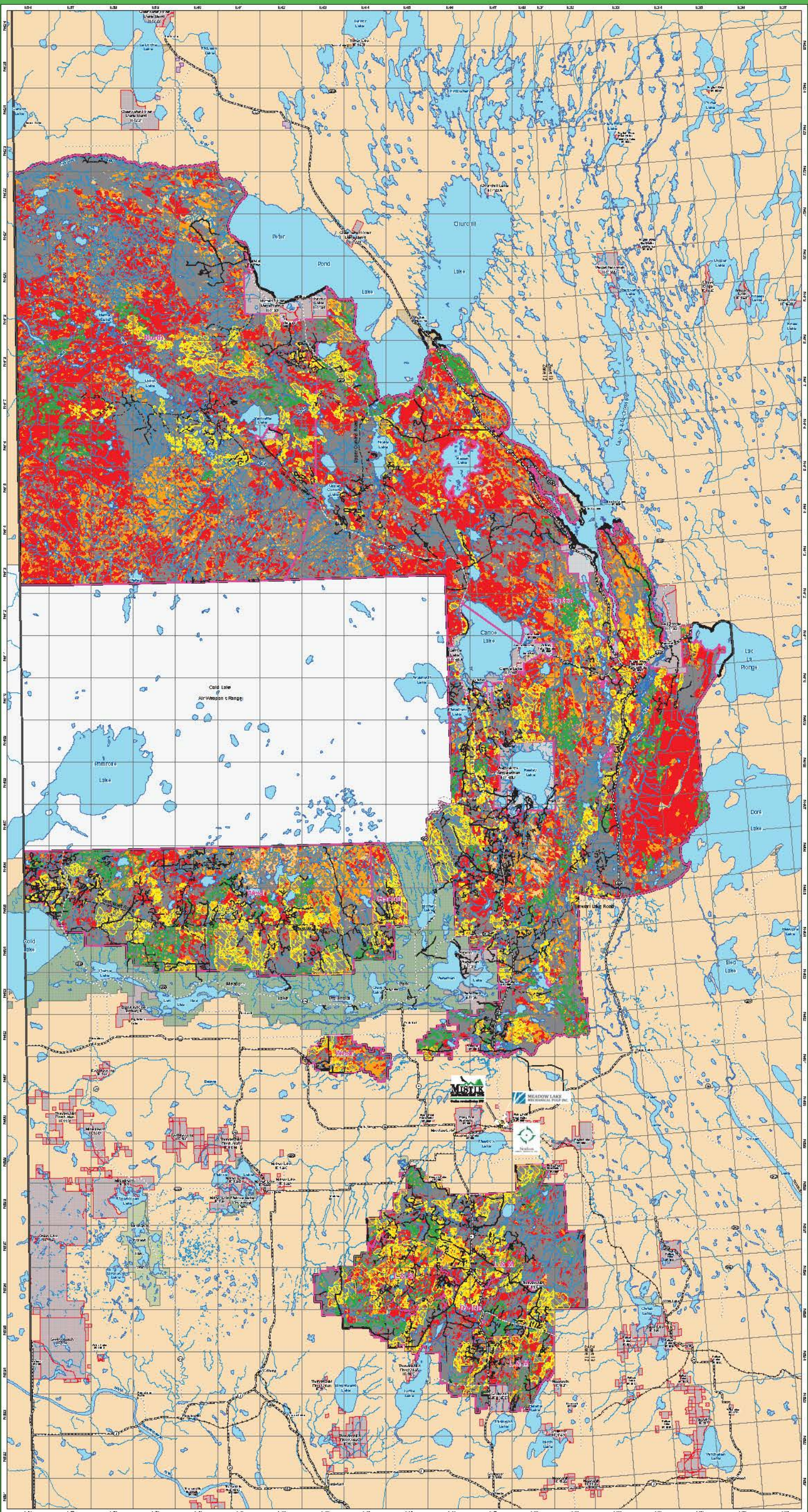
**Tactical Plan**

- T1
- T2

### PLANIMETRIC LEGEND

Public Road	Provincial Boundary
Post Highway	Provincial Park
Gravel Highway	Recreation Site
Non-PA	Indian Reserve
Oil Road	Indian Reserve Range
3rd Party	Settlement
Provincial Boundary: Class 1 (PA)	Timber Reserve
Class 2 (PA)	Village
Class 3 (PA)	Town
Railroad	Village / Hamlet
Lake	Woodlands Office
Creek	MNI Site
Provincial Border	
UTM Tie Boundary	







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### FISHER YEAR 20 – CRITICAL HABITAT AND HABITAT FEATURES



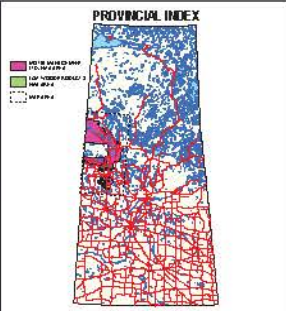
silva.com



North arrow pointing up.

Scale bar: 0, 5, 10, 20 km

Map created by: MISTIK MANAGEMENT LTD.  
Map data: MISTIK MANAGEMENT LTD.  
Map date: 2010  
Map scale: 1:50,000  
Map projection: UTM Zone 18N  
Map datum: NAD 83  
Map units: Meters



#### FEATURES OF INTEREST

Fisher Habitat

- High (Red)
- Medium (Yellow)
- Low (Green)
- Unsuitable Habitat (Grey)

Tactical Plan

- T1 (Yellow)
- T2 (Green)

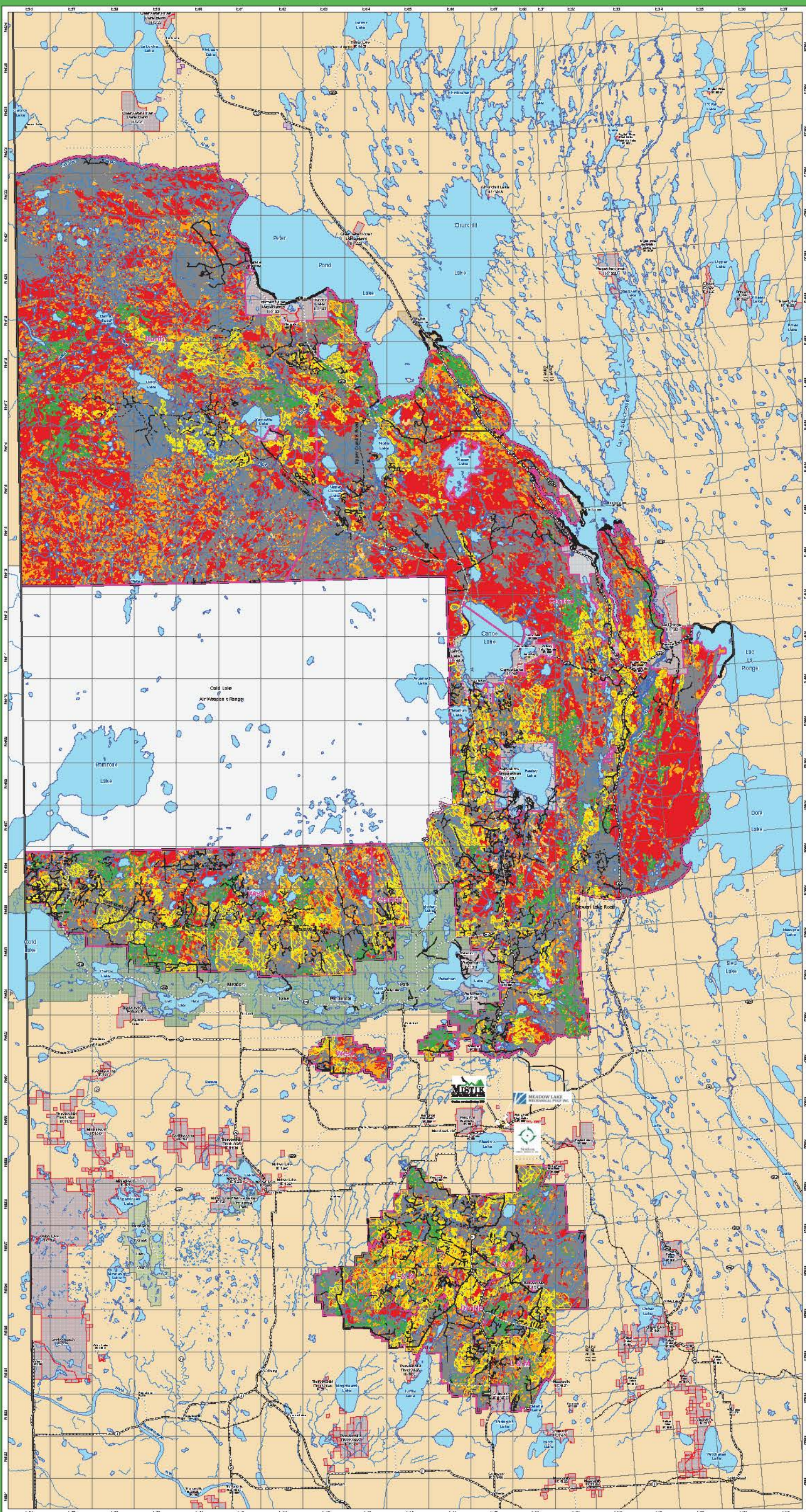
#### PLANIMETRIC LEGEND

Public Road	Provincial Boundary
Post Highway	Provincial Park
Gravel Highway	Recreation Site
Non-Feasible	Indian Reserve
Oil Field	Air Weapons Range
3rd Party	Settlement
Provincial Reserve: Class 1 (U/R)	Timber Reserve
Class 2 (U/R)	Village
Class 3 (U/R)	Town
Railroad	Village / Hamlet
Lake	Woodlands Office
Creek	MNI Site
Provincial Border	
UTM Tie Boundary	







[illegible]





## 2.7.4. SPECIES AT RISK

Some species are naturally rare, have a restricted distribution or are associated with specific environmental conditions making them vulnerable to extinction. Others were once widespread or common, but now occur over a much smaller area. Collectively these species are known as “species at risk”. Successfully managing species at risk depends largely on the ability of industry and the public to recognize these species.

It is therefore necessary to understand the habitat and seasonal requirements of wildlife inhabiting the Mistik’s FMP area in order to develop a management program that will ensure biodiversity conservation. Location and timing of operations take these requirements into consideration.

Mistik & L&M have operating procedures that require annual review and monitoring of Species at Risk in Saskatchewan (High Conservation Value Areas Planning and Implementation EMSOP17). Any new species or changes in status ranking are documented and included in the annual Species at Risk training and the field guide given to Mistik & L&M staff, contractors and contractor’s employees.

Species at risk on the Mistik FMP area are chosen based on the Species at Risk Act (SARA) and the Saskatchewan Conservation Data Centre (SKCDC) and the natural ranges of species listed.

Table 2-10 Mistik FMP Area Species at Risk/Study Species

CLASS	COMMON NAME	SCIENTIFIC NAME	SPECIES STATUS
PLANT	ARCTIC EYEBRIGHT	<i>Euphrasia subarctica</i>	Threatened
	BEAR SEDGE	<i>Carex arcta</i>	Threatened
	BLUNT-LEAVED PONDWEED	<i>Potamogeton obtusifolius</i>	Threatened
	CLINTON'S BULRUSH	<i>Trichophprum clintonii</i> ; <i>Scirpus clintonii</i>	Endangered
	ELEPHANT'S-HEAD	<i>Pedicularis groenlandica</i>	Threatened
	FOX SEDGE	<i>Carex vulpinoidea</i>	Vulnerable
	HAIRY WOODRUSH	<i>Luzula acuminata</i>	Threatened
	HOOD'S SEDGE	<i>Carex hoodii</i>	Threatened
	LABRADOR LOUSEWORT	<i>Pedicularis labradorica</i>	Threatened
	LARGE ROUNDLEAF ORCHID	<i>Platanthera orbiculata</i>	Threatened
	LESSER BLADDERWORT	<i>Utricularia minor</i>	Threatened
	MAY-FLOWERED WOODRUSH	<i>luzula multiflora</i>	Vulnerable
	PURPLE PAINTBRUSH	<i>Castilleja raupii</i>	Threatened
	SELKIRK'S VIOLET	<i>Viola selkirkii</i>	Vulnerable
	STRIPED CORAL-ROOT	<i>Corallorhiza striata</i> var. <i>striata</i>	Vulnerable
	WHITE ADDER'S MOUTH	<i>Malaxis monophylla</i> ssp. <i>Brachypoda</i>	Vulnerable
	YELLOW-RATTLE	<i>Rhinanthus minor</i>	Threatened
BIRD	BANK SWALLOW	<i>Riparia riparia</i>	Threatened





CLASS	COMMON NAME	SCIENTIFIC NAME	SPECIES STATUS
	BARN SWALLOW	<i>Hirundo rustica</i>	Threatened
	BARRED OWL	<i>Strix varia</i>	Mistik Study Species
	BLACK THROATED BLUE WARBLER	<i>Dendroica caerulescens</i>	Mistik Study Species
	BOBOLINK	<i>Dolichonyx oryzivorus</i>	Threatened
	BOREAL OWL	<i>Aegolius funereus</i>	Mistik Study Species
	CANADA WARBLER	<i>Wilsonia canadensis</i>	Threatened
	COMMON NIGHTHAWK	<i>Chordeiles minor</i>	Threatened
	CONNECTICUT WARBLER	<i>Oporornis agilis</i>	Mistik Study Species
	EVENING GROSBEAK	<i>Coccothraustes vespertinus</i>	Special Concern
	GREAT GREY OWL	<i>Strix nebulosa</i>	Mistik Study Species
	HORNED GREBE	<i>Podiceps auritus</i>	Special Concern
	LOGGERHEAD SHRIKE	<i>Lanius ludovicianus</i>	Threatened
	OLIVE-SIDED FLYCATCHER	<i>Contopus cooperi</i>	Threatened
	PIPING PLOVER	<i>Charadrius melodus</i>	Endangered
	RUSTY BLACKBIRD	<i>Euphagus carolinus</i>	Special Concern
	SHORT EARED OWL	<i>Asio flammeus</i>	Special Concern
	SPRAGUE'S PIPIT	<i>Anthus spragueii</i>	Threatened
	WESTERN GREBE	<i>Aechmophorus occidentalis</i>	Special Concern
	WHOOPING CRANE	<i>Grus americana</i>	Endangered
	YELLOW RAIL	<i>Coturnicops noveboracensis</i>	Special Concern
MAMMAL	AMERICAN BADGER	<i>Taxidea taxus</i>	Special Concern
	BISON	<i>Bos bison bison</i>	Threatened
	LITTLE BROWN MYOTIS	<i>Myotis lucifugus</i>	Endangered
	NORTHERN MYOTIS	<i>Myotis septentrionalis</i>	Endangered
	WOLVERINE	<i>Gulo gulo</i>	Special Concern
	WOODLAND CARIBOU	<i>Rangifer tarandus</i>	Threatened
INVERTEBRATE	MONARCH BUTTERFLY	<i>Danaus plexippus</i>	Special Concern
AMPHIBIAN	NORTHERN LEOPARD FROG	<i>Rana pipiens</i>	Special Concern





## 3. FMP IMPLEMENTATION STRATEGIES

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### 3.1. FMP IMPLEMENTATION STRATEGIES

#### 3.1.1. RESOURCES

The implementation of Mistik's 2019 20-Year Forest Management Plan will require a variety of fiscal, human and technical support resources. In association with the 20-Year Forest Management Plan Mistik employs many qualified professionals to complete planning, harvesting and silviculture activities.

##### 3.1.1.1. ADMINISTRATION AND SUPERVISION

Mistik undertakes the delivery of its core services with a professional staff that fluctuates between 13 to 15 individuals. Mistik's General Manager provides top management direction for the company and reports directly to a board of directors comprised of individuals designated by NorSask Forest Products and Meadow Lake Mechanical Pulp. Additional senior management support is provided by Mistik's Operations and Administration managers. Several forest management and administration staff fulfill various key support roles. Operations supervisory staff manages the implementation of silviculture, harvest, and haul-related field activities.

Whereas Mistik is a forest management entity and is the FMA licensee, L&M is a producer of forest products (posts, rails and solid wood dimensional lumber) and an FMA licensee. L&M's General Manager oversees L&M's production facilities and FMA agreement responsibilities and obligations. Mistik, via a Tenure Management Agreement, provides and oversees all of L&M's required operational forest management activities (planning, harvesting, hauling and silviculture).

#### 3.1.2. INFORMATION SYSTEMS

Mistik utilizes several information management systems to assist in efficient delivery of its core services including:

- Mistik's Financial Management System (Contractor and vendor payroll);
- Silvacom's FMS harvest planner, silviculture planner, and maps online.
- Mistik's LOG and Inventory Management System (LIMS) (wood deliveries);
- Log haul and load scaling and tracking system (chain of custody); and
- Truck and loader GPS systems (chain of custody).

L&M utilizes several information management systems to assist in efficient delivery of its core services including:

- L&M's Financial Management System (Contractor and vendor payroll);
- Silvacom's FMS harvest planner, silviculture planner, and maps online.
- Log haul and load scaling and tracking system (chain of custody); and
- Truck and loader GPS systems (chain of custody).





### 3.1.3. CERTIFICATION SYSTEMS

Mistik's forestry operations are currently certified to the:

- CSA Z809 Sustainable Forest Management Standard; and
- FSC National Boreal Standard

L&M's forestry operations are currently certified to the:

- CSA Z809 Sustainable Forest Management Standard.

Voluntary certification to international environmental and sustainable forestry standards is an integral component of Mistik's/L&M's overall approach to demonstrating sustainable forest management in northwest Saskatchewan. A valuable component of voluntary certification programs is the annual verification audits by third party auditors of company compliance with provincial, national and international legal requirements and standards. The third-party audits are significant contributions to ensuring annual monitoring and accountability.

### 3.1.4. ENVIRONMENTAL MANAGEMENT SYSTEMS

In order to effectively implement Mistik & L&M's unique internal Environmental Management Systems and Sustainable Forest Management standards, Mistik & L&M have established a formal training needs analysis which is reviewed annually. All Mistik & L&M staff and contractors are required to attend a formal Environmental and Sustainable Forest Management Awareness Training seminar that addresses environmental and forest management awareness topics and job-specific/regulatory training annually. Additional regulatory required training (TDG, WHMIS etc.) is conducted on an as-needed basis to ensure that all applicable staff and contractors are current with respect to regulatory training.

### 3.1.5. ANNUAL PERFORMANCE TRACKING AND REPORTING

Evaluation of operational implementation of the plan in relation to plan assumptions and commitments is a regulatory requirement and will contribute to improved forest management over time. The timelines and details of the annual reporting process will be handled through the MIT process.

The annual report will address the following items:

- A cumulative assessment of Mistik targets/VOITs;
- Silviculture effectiveness;
- Forest estate modeling assumptions and tactical plan implementation;
- Compliance reporting;
- A summary of variances from targets including reasons for variance and action plan to address the variance;
- Tracking of FMP registry items and approval conditions

These processes reveal actual forest management outcomes based on operational implementation of the FMP. The reporting process provides interpretive commentary (particularly in the case of





deviations from planned outcomes). The annual report and associated maps will be available to the public.

The annual report will also contain data related to reporting/monitoring updates that are not required under the Forest Management Planning Standard. This data is included to facilitate various processes (like forest certification auditing) where annual updates related to Mistik's operations can be presented in a single document. The annual report will clearly identify which sections pertain to the requirements of the Forest Management Planning Standard.

Due to the need for acquiring satellite imagery of harvested areas, Mistik and L&M will require 17 months from the completion of the operating year (March 31) to final report (August 31 of the next calendar year) for all spatial-related performance indicators.

### 3.1.6. PUBLIC ENGAGEMENT

Mistik has established and implemented a public engagement process for the 2019 FMP by building on an existing process. Mistik has eight (8) existing co-management/advisory boards that provide ongoing input into operational plans. Mistik also has significant communication with a range of other stakeholder groups (outfitters, trappers, traditional use, grazing licensees, wild rice growers, cabin owners, etc.) in, and immediately surrounding, the Mistik FMP area.

In October 2004, as part of its CAN/CSA Z809-08 SFM public participation process, Mistik facilitated the formation of a single Public Advisory Group (PAG) with representation solicited from all the major stakeholder groups associated with, or who have an interest in, the Mistik FMP area. At the first meeting of the Public Advisory Group in October 2004, the group was asked to identify any missing stakeholders.

L&M Wood Products was not a part of Mistik's 2007 FMP; however, they are part of the 2019 FMP and attend all PAG meetings. Stakeholder groups from the L&M FMA area broadly overlap the Mistik FMA area so current membership provides adequate representation for the L&M FMA area as well. Additional communities adjacent to the L&M FMA who had not previously been included in the 2007 FMP process, have been included in invitations to participate in the 2019 FMP development process as well as recent Public Advisory Group meetings.

The PAG is intended to be an evolving, dynamic group where membership is not always static. The overall composition of the group will be dictated by the interested public as its purpose is to represent the diverse interests of the public with respect to forestry activities. Mistik will not limit the number of interested parties participating in the PAG. Mistik has requested that only one or two individuals from each stakeholder group attend each meeting. Table 3-1 identifies the current composition of Mistik's Public Advisory Group.

A listing of all public stakeholder groups, local First Nations and communities within and adjacent to the Mistik FMP area who were sent a letter of invitation to participate in Mistik's 2019 FMP process can be found in Table 2 of the FMP Public Engagement Plan. Ongoing review of these tables by the Planning Team and the Public Advisory Group will identify any additional stakeholder groups or communities that may need to be invited to participate. Mistik encourages members of the public to participate in one of the local advisory/co-management boards or the PAG group if they indicate





a desire to do so.

Mistik held a final round of public engagement in the fall of 2018 where FMP updates and changes were reviewed with the co-management/advisory boards listed below. Table 3-2 is an outline of the meetings held. An update was also given at the PAG meeting on November 21<sup>st</sup>, 2018. Details of consultation held during the FMP development can be found in Appendix B.

*Table 3-1 Mistik FMP Area PAG/Stakeholder Groups and Description*

Stakeholder Group	Stakeholder Group Description
1. Advisory/Co-Management boards	<p>Local community-based groups representing a broad spectrum of stakeholder interests including cabin owners, recreational users, environmental groups, outfitters, trappers, elders, contractors, local government officials, wild rice growers, municipalities and traditional resource users.</p> <ol style="list-style-type: none"> <li>1. Divide Forest Advisory Council Corporation (DFACC)</li> <li>2. Waterhen Lake Land and Resources Board (currently represented by Chief and Council)</li> <li>3. Buffalo Narrows Co-Management Board (currently represented by Mayor and Council)</li> <li>4. Sakitawak Resource Management Inc. (Ile-a-la Crosse)</li> <li>5. DeneSuline Co-Management Board (Dillon)</li> <li>6. Canoe Lake Traditional Resources Users Board</li> <li>7. Beauval Co-Management Board Inc.</li> <li>8. Big Island Lake Cree Nation (formal co-management board is under development - currently periodic meetings are held with the band)</li> </ol>
2. Trapping	Zone 8 trappers- northern trappers are represented on each of the co-management boards.
3. Outfitting	A large, loosely organized group (Saskatchewan Outfitters Assoc.) with interest in the provincial forests of Saskatchewan-they have a designated 'forestry' representative.
4. Commercial fishing	There are several commercial fishing co-operatives within the Mistik FMP area. Commercial fishing is a significant economic activity in the local area.
5. Independent Operators	Individual representation on advisory boards but no official or organized representative body.
6. Meadow Lake Mechanical Pulp (MLMP)	All clerical, management, and operations staff at MLMP
7. NorSask Forest Products	All clerical, management, and operations staff at NorSask
8. L&M Wood Products	All clerical, management, and operations staff at L&M
9. Meadow Lake Tribal Council	Represents the leadership of nine of the First Nations in northwest Saskatchewan (in and around the FMP Area).





Stakeholder Group	Stakeholder Group Description
10. Regulatory agency <sup>1</sup>	Represents the local regulatory (provincial government) agencies responsible for administering forestry and other activities on behalf of the province of Saskatchewan
11. Urban municipality	Meadow Lake is the primary service center in northwest Saskatchewan and home to most of the employees of Meadow Lake Mechanical Pulp, NorSask, and Mistik
12. Rural municipality	Rural Municipality (RM) of Meadow Lake #588 has some overlap with the FMP area (Divide and Beaver River MUs).
13. Environmental non-governmental organizations	Represent the interests of the hunting, fishing, and trapping public as well as environmental sustainability issues-habitat protection, conservation, and environmental quality enhancement.
14. Snowmobile association (recreation)	The Northern Lights Snowmobile Club has an extensive network of trails throughout portions of the Mistik FMP Area.
15. Grazing licensees	Portions of the Mistik FMP Area are allocated to individuals that are granted grazing permits by Saskatchewan Ministry of Environment.
16. Forest Workers	Mistik undertakes its activities through a significant # of local contractors.
17. Interested communities	On February 23 <sup>rd</sup> , 2015 Mistik extended a general invitation to all communities within and adjacent to the Mistik FMP area in northwest Saskatchewan (Table 3) to participate in the 2019 20-Year FMP process. Communities who expressed their interest in participating have been included in PAG meeting invitations.

<sup>1</sup>Invitation to participate only required for Mistik's CAN/CSA Z809-02 Public Advisory Group process. The role of regulatory agencies during the development of Mistik's 2019 20-Year FMP will be strictly review and approval of the FMP.

*Table 3-2 Fall 2018 Mistik FMP Update Meetings*

Stakeholder Group	Date of update meeting and noted concerns
1. Divide Forest Advisory Council Corporation (DFACC)	October 23, 2018 No concerns were noted.
2. Waterhen Lake Land and Resources Board (currently represented by Chief and Council)	November 29, 2019
3. Buffalo Narrows Co-Management Board	November 28, 2019 No real concerns at this time. The co-management board recently reactivated and has taken back consultation "duties" from mayor and council.
4. Sakitawak Resource Management Inc. (Ile-a-la Crosse)	Several attempts were made to schedule a meeting. Mistik will contact the group in January to see if a meeting is possible.





Stakeholder Group	Date of update meeting and noted concerns
5. DeneSuline Co-Management Board (Dillon)	Several attempts were made to schedule a meeting. Mistik will contact the group in January to see if a meeting is possible.
6. Canoe Lake Traditional Resources Users Board	November 7, 2018 Discussion around inventory, fire protection on federal lands and renewal. No significant concerns.
7. Beauval Co-Management Board Inc.	November 5, 2018 Discussion around buffer widths, Caribou, and the change in ownership of L&M. There were no significant concerns, however, Mistik did provide some additional information/ feedback to the group after the meeting related to options for communicating the importance of caribou habitat and population management to the public.
8. Big Island Lake Cree Nation (formal co-management board is under development)	Several attempts were made to schedule a meeting. Mistik will contact the group in January to see if a meeting is possible.

### 3.2. APPOINTMENT OF A MANAGEMENT IMPLEMENTATION TEAM

The Management Implementation Team (MIT) will be formed upon approval of the FMP. The purpose of a MIT is to monitor and guide the implementation of the FMP according to the Terms of Reference which will be established upon formation of the team. Membership on the MIT will consist of:

- Mistik and L&M general managers and other relevant staff members;
- Ministry of Environment (Forest Service Branch; Fish, Wildlife & Lands Branch; etc.)
- Public Advisory Group; and
- FMP Advisors as necessary

The Mistik Planning Manager will serve as the chair and primary contact with the Forest Service.

### 3.3. FMP REGISTRY

A summary of 2019 FMP commitments can be found in Table 3-3. The 'measurement criteria' describes the measure that will be used to assess successful completion of the commitment. The 'schedule for completion' describes the completion date for each commitment. The completion dates may change as directed by Saskatchewan Ministry of Environment. Commitments that are required under legislation, provincial codes or standards, or other sections of the FMP are not included in this summary.





*Table 3-3 Summary of Mistik's 2019 20-Year FMP Commitments*

Commitment	Measurement Criteria	Schedule for Completion
<b>Public Involvement (Public Consultation Process)</b>		
Mistik will update the Mistik Register of Public Issues and Concerns on an annual basis	Evidence of the review process and publicly available Register	Annual implementation and reporting (August 31)
<b>Non-Timber Values</b>		
Identify visually sensitive areas and maintain specified visual quality objectives.	Evidence in the annual report of the identification of visually sensitive areas and specified visual quality objectives	Annual implementation and reporting (August 31)
Maintain database of watercourse crossings	Mistik/L&M GIS layer and operating plans maps to illustrate location, type and size of crossing	GIS layer and maps to be updated annually.
<b>Natural Disturbance</b>		
With respect to an incipient outbreak of an invasive insect, Mistik will collaborate with the Ministry of Environment in mapping, monitoring, and assisting in facilitating a control program	Resources allocated to mapping, monitoring and assisting with a control program	As required.
<b>Conformance with Tactical Plan</b>		
With respect to independent operators, Mistik will collaborate with Saskatchewan Ministry of Environment to obtain annual records.	Independent operator "report" (geospatial and attribute data) provided to Mistik by MoE on an annual basis. Independent operator harvest area records retained in Mistik's GIS system.	Annual implementation and reporting (August 31).

### 3.4. TACTICAL PLAN LINKAGE TO OPERATING PLANS

Through the 20-Yr FMP process this is the second FMP tactical plan developed by Mistik. The original 2007 FMP tactical plan was manually derived to be fully consistent with operational implementation. In excess of 50% of the 2007 tactical plan area remained unharvested and formed the basis for the development of the 2019 tactical plan. As per the original tactical plan, the emphasis for the 2019 tactical plan was operational feasibility based on the experience and landbase knowledge of Mistik personnel and various data sources.

The implementation of Mistik's 2019 20-Yr Forest Management Plan will demonstrate linkage of the tactical plan to the operating plan via the following mechanisms:





- conducting forestry activities within the parameters of the selected management strategy (SMS);
- undertaking road and harvest activities within the context of the tactical plan;
- undertaking public consultation to identify any new values associated with proposed operations (visually sensitive areas, heritage resources, etc.);
- integrating and maintaining non-timber values;
- adhering to access management strategies as outlined in the tactical plan;
- responding to natural disturbances (adjusting harvest plans to include salvage areas where possible);
- implementing/maintaining sustainable forest management indicators
- identifying deviations from FMP commitments, where allowed, for approval where necessary

Mistik's operating season commences April 1 and ends March 31 annually. Prior to the commencement of operational activities Mistik will submit and receive operating plan approval from the Saskatchewan Ministry of Environment. The harvest and road construction proposed for implementation in any annual operating year will be consistent with the tactical plan associated with the 2019 20-Yr Forest Management Plan. Under the provincial forest management planning standard, a deviation of no more than 15% of area (ha) outside of the tactical plan is allowed (refer to *FMP Volume II, VOIT section, Mistik Indicator #15*). Such deviations must be identified and approved in an operating plan.

### 3.5. STRATEGY FOR WILDFIRE MANAGEMENT

Natural disturbances, as described by Natural Resources Canada, are an important feature of Canada's forests<sup>2</sup>:

'Forests are complex systems of plants and animals that are shaped by physical features such as soil type, altitude, and aspect and through the effects of "disturbance events". These may be caused by environmental factors such as fire, wind, or snow damage or the activity of living agents such as insects or fungi. Disturbances are a natural and necessary part of forest ecosystem development and contribute to the maintenance of what most consider healthy forests. When, however, insect or fungal population levels are very high, or when prolonged or catastrophic environmental events like major fires or extreme weather events occur, forests can be altered in ways that affect their resource value (e.g. fibre, wildlife, or recreation). Similarly, when alien insect, fungal, or plant species establish in Canada's forests significant ecological and economic damage can result.'

Saskatchewan Ministry of Environment has the legislative authority for protection of forest resources<sup>3</sup>. Through cooperative agreements, other legislation and policies, there is additional collaborative interaction between forest licensees and the ministry with respect to forest protection

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<sup>2</sup> <http://www.nrcan.gc.ca/forests/fire-insects-disturbances/17598>

<sup>3</sup> Refer to the *Forest Resources Management Act (1999)*





efforts. Natural disturbance is an ongoing and frequent process on the Mistik FMP area<sup>4</sup>. Mistik recognizes that natural disturbances are a fundamentally important and integral component of the boreal forest ecosystems in which forestry activities are carried out. Mistik has designed its forestry operations to be flexible in the face of large-scale disturbance patterns (particularly wildfire). Mistik has demonstrated its ability to deviate quickly and efficiently from planned harvest operations, incorporate new equipment/technology into harvest systems and adjust its contractor workforce to undertake economically-viable salvage operations. Mistik seeks to be proactive and responsive to changing environmental conditions related to natural disturbances. The following documentation describes Mistik's planned response, in collaboration with Saskatchewan Ministry of Environment, to the dominant natural disturbances occurring within the FMP area.

### 3.5.1. WILDFIRE

#### 3.5.1.1. DESCRIPTION

*The Wildfire Act, The Forest Resources Management Act* and Mistik's and L&M's Forest Management Agreements reiterate the key responsibilities of the Province and a forest licensee with respect to wildfires. The Saskatchewan Ministry of Environment's Wildfire Management Branch is responsible for wildfire suppression on Crown Land, rural municipal lands within 4.5 km of the provincial Forest, Provincial Park Lands, and DIAND Agreement First Nations Lands.

#### 3.5.1.2. CURRENT EXTENT OF INCIDENCE

Wildfires have been common and extensive within the Mistik FMP area<sup>5</sup>. Mistik anticipates that wildfire will continue to have a significance impact on wood supply within the FMP area during the term of the 2019 20-Year FMP. Due to climate change, the boreal forests of Saskatchewan are forecasted to experience one of the highest increases in extreme fire weather conditions (

Figure 5) in North America<sup>6</sup>. In an attempt to anticipate the potential changes in wildfire behaviour within the Mistik FMP area under various climate change scenarios, Mistik solicited the input of the Saskatchewan Research Council to address this topic<sup>7</sup>. A key finding of these reports is that the area of the Mistik FMP area occupied by high Head Fire Intensity (HFI) indices (10,000 to 30,000 kW m<sup>-1</sup>) shows a significant increase for the period 2040 to 2049 compared to existing conditions.

<sup>4</sup> Refer to Mistik's 2019 20-Year FMP Vol.I- Section 14.0

<sup>5</sup> Refer to Mistik's 2019 20-Year FMP Vol.I -Section 14 (natural disturbance emulation)

<sup>6</sup> <http://cnfjs.cfs.nrcan.gc.ca/home>

<sup>7</sup> Johnston, M. and N. Nicolichuk. 2007. *Assessing future landscape fire behavior potential in the Mistik Management Ltd. Forest Management Agreement Area. Saskatchewan Research Council. Saskatoon, Saskatchewan. 20pp.*



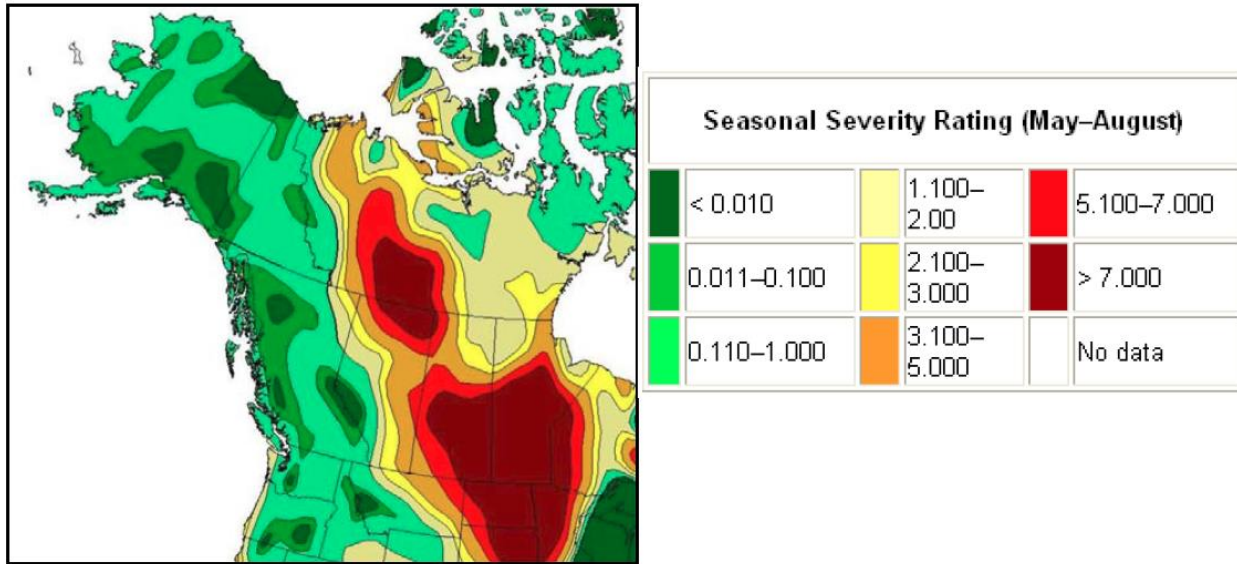
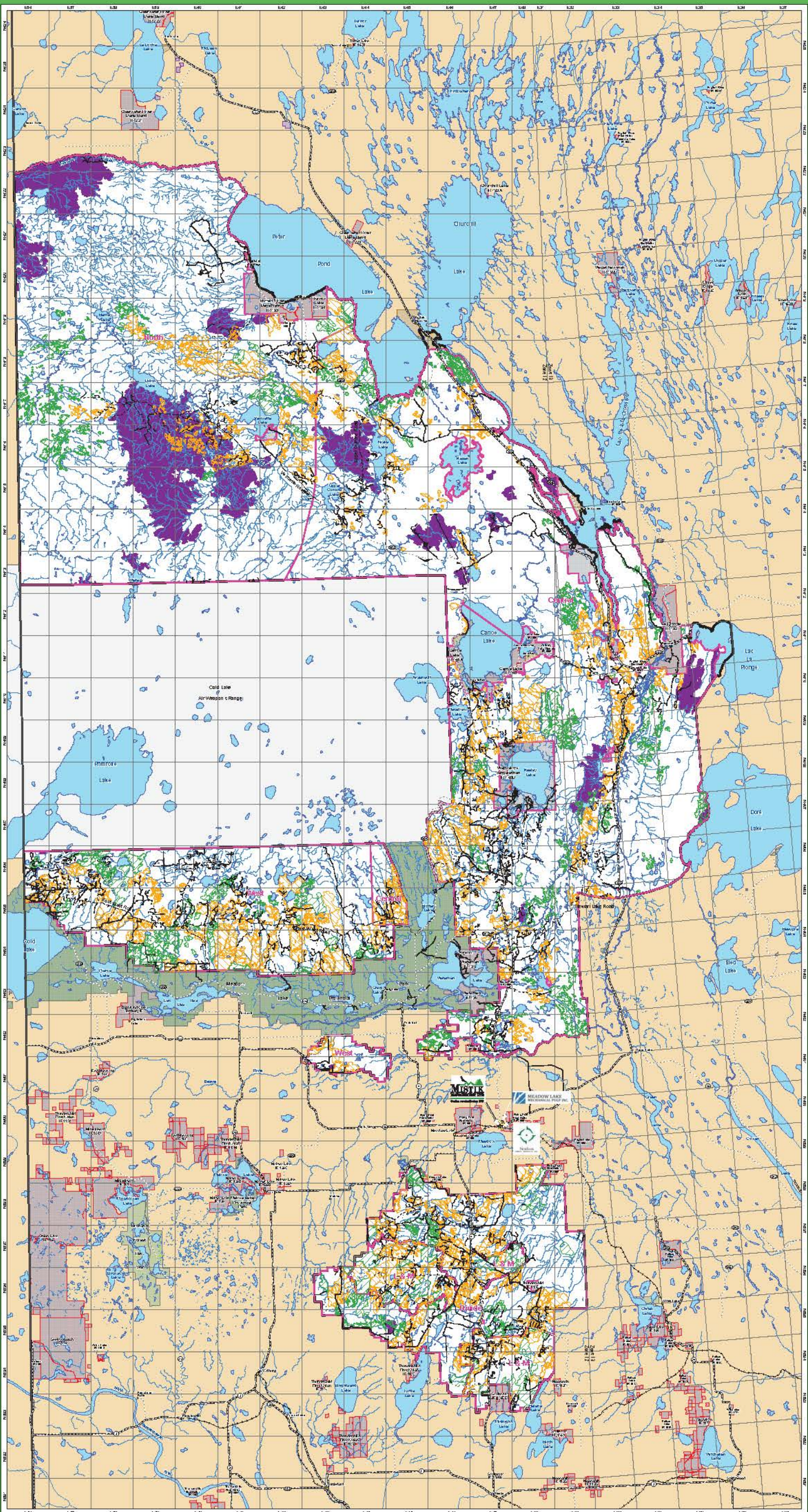


Figure 5 Predicted Seasonal Fire Severity Map for Western Canada for 2040 to 2049 (2X CO<sub>2</sub>)<sup>8</sup>

<sup>8</sup> <http://cnfvs.cfs.nrcan.gc.ca/home>







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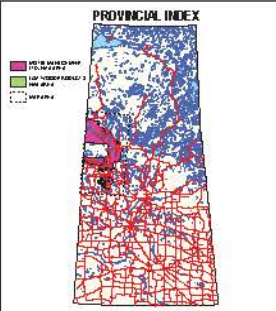
**FIRE BOUNDARIES (LESS THAN 10 YEARS OLD)**



**silva.com**



Map created by: MISTIK MANAGEMENT LTD.  
Map data: MISTIK MANAGEMENT LTD.  
Map scale: 1:50,000  
Map projection: UTM Zone 18N  
Map date: 2018



**FEATURES OF INTEREST**

- Fire Boundary
- Tactical Plan
- T1
- T2

**PLANIMETRIC LEGEND**

Public Road	Provincial Boundary
Gravel Highway	Provincial Park
Gravel Highway	Recreation Site
Gravel Road	Indian Reserve
Gravel Road	Indian Reserve Range
Gravel Road	Settlement
Gravel Road	Timber Reserve
Gravel Road	Village
Gravel Road	Town
Gravel Road	Village / Hamlet
Gravel Road	Woodlands Office
Gravel Road	UTM Tie Boundary





### **3.5.1.3. DETECTION, RISK ASSESSMENT AND MONITORING**

Saskatchewan Ministry of Environment undertakes routine wildfire detection surveys within the provincial forest during the wildfire season (April 1 to October 31) as well as receives assistance from all members of the general public.

### **3.5.1.4. CONTROL AND TREATMENT OPTIONS**

In response to the ongoing presence of wildfire, Mistik will ensure that:

- An annual wildfire prevention and preparedness plan is submitted to the ministry;
- All forestry contractors will be adequately trained and aware of their responsibilities related to control of wildfire and have prescribed firefighting equipment readily available;
- All fire bans and restricted or prohibited forestry operations' directives issued by Saskatchewan Ministry of Environment are respected;
- Forestry-related slash management is conducted according to provincial standards;
- Through regulatory approval of salvage plans, harvesting of burned wood occurs on a priority basis and according to provincial or FMA Standards and Guidelines.

### **3.5.1.5. COLLABORATION WITH SASKATCHEWAN MINISTRY OF ENVIRONMENT (WILDFIRE MANAGEMENT BRANCH)**

Mistik anticipates future collaboration with Saskatchewan Ministry of Environment related to:

- Ensuring ongoing maintenance and update Fire Suppression Priority Area map that is based on commercial timber values and submitted to the province annually. The map will assist Saskatchewan Ministry of Environment in the efficient allocation of resources with respect to fire suppression and timber values at risk. The suppression priority areas depict four categories:
  1. Critical: the most important, currently merchantable timber for the next 20 years - this area consists of the tactical harvest plan areas - a major fire within these areas will have serious impacts to wood availability for the mills.
  2. High: Potentially important (contingency) merchantable timber within the next 20 years and including areas with silviculture-related investments (regenerating planted areas);
  3. Moderate: Area consisting of forests 30 to 60 years of age;
  4. Low: Area consisting of young forests and inoperable area (treed peat lands, etc.).
- In the event of multiple fires occurring simultaneously within the FMP area, it is Mistik's & L&M's desire that areas identified as 'critical' or 'high' be prioritized.





### 3.5.1.6. FUTURE ACTION ITEMS(S)

- Assist with the implementation of Community Wildfire Protection Plans (based on the provincial Community Wildfire Risk Assessment Program). This program is a provincial initiative by the Ministry of Environment. In collaboration with the community(s), the ministry will lead the development of community protection plans. Mistik will participate as a key stakeholder and primary contractor (insofar as there are cost-effective benefits realized by Mistik) in the implementation of forest harvesting activities. Undertaking tree removal and fuel reduction in the creation of fire breaks adjacent to communities deemed “at risk” from wildfire will be the focus of Mistik’s involvement.
- Participate in workshops and meetings related to fire management, particularly landscape level fuel management<sup>9</sup>, within the provincial forest.

## 3.6. STRATEGY FOR MANAGEMENT OF FOREST INSECT AND DISEASE DISTURBANCES

A healthy forest has been defined as<sup>10</sup>:

‘...one that maintains and sustains desirable ecosystem functions and processes. Indicators of healthy forests include ones related to biodiversity change, resilience, wildlife habitat, aesthetic appeal, and resource sustainability. Both natural and human influences can impact on forests in positive and negative ways. In fact, natural influences, such as fire, insects, and disease are essential for the regeneration and succession of forests.’

Most perceived forest health issues in the boreal forest are generally naturally-occurring dynamic components of forest ecosystems. However, when the perceived loss of timber volume or tree mortality exceeds an economic or aesthetic threshold, society describes the impact as a forest health issue. The relative rate, extent and severity of impact results in some forest organisms being identified as forest ‘diseases’ or ‘pests’. The Forest Resources Management Act (1999) and the Pest Control Act (1978) provide the regulatory context for the control of pests in the provincial forests of Saskatchewan. The following documentation describes a few of the key damaging-causing organisms potentially affecting tree growth in the Mistik FMP area and Mistik’s planned response, in collaboration with Saskatchewan Ministry of Environment, to outbreak conditions occurring within the FMP area.

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<sup>9</sup> Only 45% of the Mistik FMP area is considered suitable for undertaking commercial forestry activities (the ‘working forest’). The dominant landscape matrix of the Mistik FMP area is the remaining 55% of the landscape where no forest management activities are scheduled to occur. Decreasing fire risk in the forest landscape through preventative landscape fuels management on the Mistik FMP area is a significant challenge given the extensive nature of the non-operational forest land base (which is dominantly controlled by surficial sediments), the dominant occurrence of high fire-hazard fuel types (conifer-dominated) within the non-operational land base, the lack of access infrastructure to a significant portion of the FMP area, high cost of implementation and the uncontrollable randomness of lightning strikes (ignition).

<sup>10</sup> <http://www.nrcan.gc.ca/forests/fire-insects-disturbances/pest-management/13361>





### 3.6.1. DWARF MISTLETOE

#### 3.6.1.1. DESCRIPTION

Dwarf Mistletoe (*Arceuthobium americanum* Nutt. Ex Engelm) is a naturally-occurring parasitic flowering plant that impacts jack pine within the Mistik FMP area (Figure 6). The most conspicuous feature of dwarf mistletoe infection is the formation of ‘witches brooms’. Dwarf mistletoe causes the most amount of annual loss in merchantable volume in lodgepole and jackpine in the Prairie provinces<sup>11</sup>.



Figure 6 Dwarf Mistletoe Plant (Left Panel) and Characteristic 'Witches Broom' Caused by Dwarf Mistletoe (Right Panel)

#### 3.6.1.2. CURRENT EXTENT OF INCIDENCE

The incidence of dwarf mistletoe is widespread in the Mistik FMP area with over 43,000 ha identified as being severely impacted<sup>12</sup>.

#### 3.6.1.3. FUTURE DETECTION, RISK ASSESSMENT AND MONITORING

Due to the widespread distribution and relatively slow infection rate of dwarf mistletoe within the Mistik FMP area, ongoing routine assessment of forest condition by Mistik staff via aerial or ground access in the course of viewing forestry operations will keep Mistik staff aware of dwarf mistletoe impact. Mistik is committed to:

- The detection of severe dwarf mistletoe incidence by photo-interpreters through implementation of the Saskatchewan Forest Vegetation Inventory (SFVI);
- Undertaking risk assessments when assessing dwarf mistletoe-infected jack pine stands for harvest opportunity;

<sup>11</sup> Hiratsuka, Y. 1987. Forest tree diseases of the prairie provinces. Information Report NOR-X-286. Northern Forestry Centre, Canadian Forestry Service, Edmonton, Alberta. 142pp.

<sup>12</sup> Refer to Mistik's 2019 20-Year FMP Vol. I – Section 12.40





- Assessing for dwarf mistletoe infection in regenerating post-harvest areas through implementation of the provincial Regeneration Assessment Standards.

#### **3.6.1.4. TREATMENT OPTIONS**

No commercially viable preventative or ameliorative treatment options exist for dwarf mistletoe impacts on jack pine. The most common control treatment is eradication of the infected host jack pine tree<sup>13</sup>. Mistik will continue to harvest dwarf mistletoe-infected jack pine stands and undertake sanitation treatments within harvested areas to encourage the renewal of forest stands that are free from dwarf mistletoe.

#### **3.6.1.5. COLLABORATION WITH SASKATCHEWAN MINISTRY OF ENVIRONMENT**

Mistik anticipates future collaboration with Saskatchewan Ministry of Environment related to:

- Ongoing harvest and sanitization of commercially-viable infected jack pine stands through approval and implementation of normal forestry operations.

#### **3.6.2. INSECT DISTURBANCES**

The interaction of insects and forests is described by Natural Resources Canada<sup>14</sup>.

‘In a balanced forest ecosystem, many insects feed on living trees. Some can also speed up the death and decomposition of injured, sick or aging trees. Insects thus participate in the forest’s renewal, which is part of the natural succession process in forest ecosystems. Under certain conditions, insects may attack a very large number of trees over a wide area. This is known as an outbreak. An outbreak often occurs in a vulnerable species when populations of insect predators are too small or when forest and environmental conditions favour population growth. Outbreaks are natural, normal disturbances. They initiate secondary successions and help to rejuvenate stands. However, because of the economic losses caused by the death or weakness of trees during an outbreak, insects are then considered pests.’ Mountain pine beetle, spruce budworm, gypsy moth and Dutch elm disease are all examples of well-known forest pests that have led to significant losses in value of Canadian forests

The following documentation provides a brief description of several of the naturally-occurring insect species found in the Mistik FMP area which may have some amount of measurable impact over the term of Mistik’s 2019 20-Year FMP some of which (e.g. MPB) have a substantial impact. The documentation also describes Mistik’s response in the case of an outbreak of these insect species.

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<sup>13</sup> <http://publications.gov.sk.ca/documents/66/86285-English.pdf>

<sup>14</sup> <http://www.nrcan.gc.ca/forests/fire-insects-disturbances/pest-management/13361>





### 3.6.2.1. EASTERN SPRUCE BUDWORM

#### 3.6.2.1.1. DESCRIPTION

Eastern spruce budworm (*Choristoneura fumiferana* Clem.) is a naturally-occurring insect (moth) that primarily impacts white spruce and balsam fir within the Mistik FMP area. The dominant impact during an outbreak is defoliation caused by the larval stage (Figure 7) of the moth which feeds voraciously on the young needles and buds of white spruce and balsam fir in the spring and early summer. Significant growth reduction and mortality can occur if trees are repeatedly attacked overall several years<sup>15</sup>.



Figure 7 Eastern Spruce Budworm Larvae

#### 3.6.2.1.2. CURRENT EXTENT OF INCIDENCE

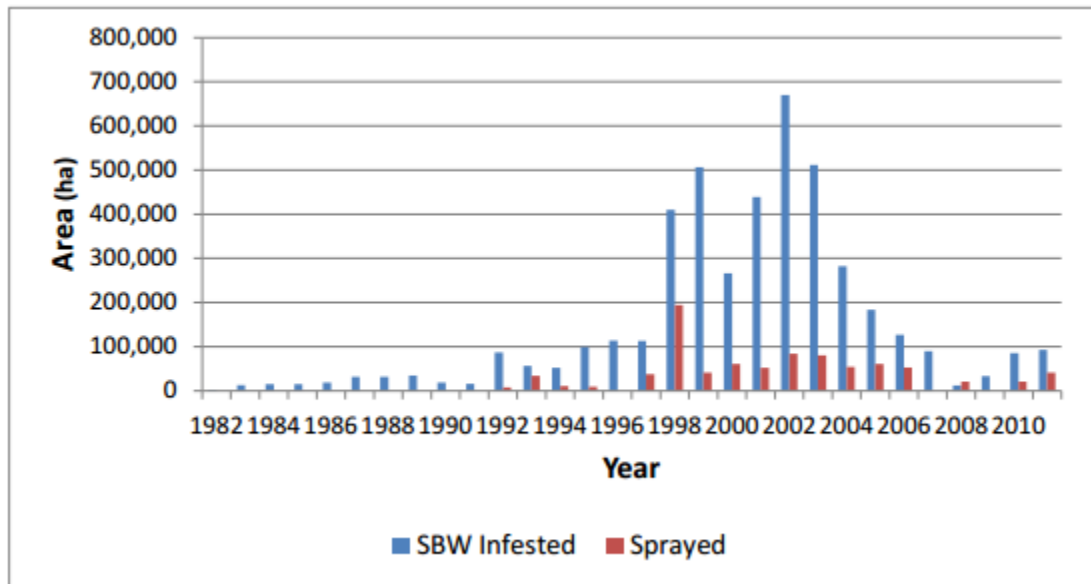
An extensive area (Figure 8) was impacted in the central and eastern portions of the provincial forest from 1982 to 2011. Very few white spruce and balsam fir stands were impacted in the Mistik FMP area during the outbreak.

Figure 8 Eastern Spruce Budworm Impact in Saskatchewan from 1982 to 2011<sup>16</sup>

<sup>15</sup> <http://publications.gov.sk.ca/documents/66/86287-English.pdf>

<sup>16</sup> 2012 Report on Saskatchewan Forests





### 3.6.2.1.3. FUTURE DETECTION, RISK ASSESSMENT AND MONITORING

Mistik will not conduct any formal detection surveys for Eastern spruce budworm. Routine assessment of forest condition by Mistik staff via aerial or ground access in the course of viewing forestry operations will suffice to provide early indications of Eastern spruce budworm outbreak. In the case of an incipient outbreak, Mistik will collaborate with Saskatchewan Ministry of Environment specialists in the mapping and monitoring of the outbreak.

### 3.6.2.1.4. TREATMENT OPTIONS

The biological control agent *Bacillus thuringiensis var. kurstaki* (btk) (a naturally-occurring soil bacterium used as a 'microbial insecticide') is registered for use in the control of Eastern spruce budworm and has been used in controlling the current outbreak in Saskatchewan. Mistik will assist in facilitating a Btk-based pesticide control program under the direction of Saskatchewan Ministry of Environment specialists. Other treatment options that may assist in minimizing the magnitude of an outbreak of Eastern spruce budworm include reduction (forest thinning) or removal (harvesting) of host species (mature white spruce and balsam fir)<sup>17</sup>.

### 3.6.2.1.5. COLLABORATION WITH SASKATCHEWAN MINISTRY OF ENVIRONMENT

Mistik anticipates future collaboration with Saskatchewan Ministry of Environment on the basis of an 'early intervention' approach, related to:

- Assisting in the monitoring of incipient outbreaks of Eastern spruce budworm;
- Assisting in the undertaking of a Btk-based pesticide control program.

<sup>17</sup> <http://publications.gov.sk.ca/documents/66/86287-English.pdf>



- Assisting with mitigating impacts of SBW with directing harvesting to reduce mortality

### 3.6.2.2. JACK PINE BUDWORM

#### 3.6.2.2.1. DESCRIPTION

Jack pine budworm (*Choristoneura pinus* Free.) is a naturally-occurring insect (moth and very closely related to the Eastern spruce budworm) that primarily impacts jack pine (and other pine species if present). The dominant impact during an outbreak is defoliation caused by the larval stage (Figure 9) of the moth which feeds voraciously on the young needles and buds of jack pine in the spring and early summer. Significant growth reduction and mortality can occur if trees are repeatedly attacked over several years<sup>18</sup>. Outbreaks typically last two to three years with an average recurrence cycle of eight to ten years.



Figure 9 Jack Pine Budworm Larvae

#### 3.6.2.2.2. CURRENT EXTENT OF INCIDENCE

There has been no reported incidence or outbreak of Jack pine budworm within the Mistik FMP area. The majority of the major outbreaks of Jack pine budworm in Canada have occurred in provinces to the east of Saskatchewan<sup>19</sup>.

#### 3.6.2.2.3. FUTURE DETECTION, RISK ASSESSMENT AND MONITORING

Mistik will not conduct any formal detection surveys for Jack pine budworm. Routine assessment of forest condition by Mistik staff via aerial or ground access in the course of viewing forestry operations will suffice to provide early indications of Jack pine budworm outbreak. In the case of a

<sup>18</sup> [http://sofjim.gc.ca/admin/datas/pdf/PDF\\_13\\_EN.pdf](http://sofjim.gc.ca/admin/datas/pdf/PDF_13_EN.pdf)

<sup>19</sup> [http://web.forestry.nbc.ca/fetch21/Z-PDF-pest-info-folder/Jack%20pine%20budworm%20\(1\).pdf](http://web.forestry.nbc.ca/fetch21/Z-PDF-pest-info-folder/Jack%20pine%20budworm%20(1).pdf)





perceived incipient outbreak, Mistik will collaborate with Saskatchewan Ministry of Environment specialists in the mapping and monitoring of the outbreak.

#### 3.6.2.2.4. TREATMENT OPTIONS

The biological control agent *Bacillus thuringiensis* var. *kurstaki* (Btk) (a naturally-occurring soil bacterium used as a 'microbial insecticide') is registered for use in the control of Jack pine budworm<sup>20</sup>. Mistik will assist in facilitating a Btk-based or 'reduced risk' pesticide control program under the direction of Saskatchewan Ministry of Environment specialists.

#### 3.6.2.2.5. COLLABORATION WITH SASKATCHEWAN MINISTRY OF ENVIRONMENT

Mistik anticipates future collaboration with Saskatchewan Ministry of Environment on the basis of an 'early intervention' approach, related to:

- Assisting in the monitoring of incipient outbreaks of Jack pine budworm;
- Assisting in the undertaking of a Btk-based or 'reduced risk' pesticide control program.
- Assisting with mitigating impacts of SBW with directing harvesting to reduce mortality

#### 3.6.2.3. FOREST TENT CATERPILLAR

##### 3.6.2.3.1. DESCRIPTION

Forest tent caterpillar (*Malacosoma disstria* Hbn.) is the most common of the insect pests affecting hardwood forests (particularly aspen)<sup>21</sup>. The primary impact is caused by voracious feeding of the larval stage (Figure 10) on aspen foliage which can result in complete defoliation of the tree. Outbreaks are transient, not lasting more than three or four years. Outbreak periodicity is approximately every ten to twelve years on average. Tree mortality rarely occurs as a direct result of an outbreak but repeated defoliation can result in cumulative impacts contributing to the phenomenon of 'aspen decline' and eventual mortality<sup>22</sup>.

<sup>20</sup> [http://web.forestry.ubc.ca/fetch21/Z-PDF-pest-info-folder/Jack%20pine%20budworm%20\(1\).pdf](http://web.forestry.ubc.ca/fetch21/Z-PDF-pest-info-folder/Jack%20pine%20budworm%20(1).pdf)

<sup>21</sup> <http://publications.gov.sk.ca/documents/66/86290-English.pdf>

<sup>22</sup> Personal communication with Rory McIntosh, Provincial Forest Entomologist.





Figure 10 Forest tent caterpillar larva



#### 3.6.2.3.2. CURRENT EXTENT OF INCIDENCE

Forest tent caterpillar likely occurs throughout the Mistik FMP area. Well-documented outbreaks have occurred in the recent past (late 1980s and early 1990s) in the Meadow Lake area<sup>23</sup>.

#### 3.6.2.3.3. FUTURE DETECTION, RISK ASSESSMENT AND MONITORING

Due to the widespread distribution of tree host and relatively transient impacts of forest tent caterpillar<sup>24</sup>, Mistik will not undertake any formal detection or monitoring of forest tent caterpillar within the FMP area. Routine assessment of forest condition by Mistik staff via aerial or ground access in the course of viewing forestry operations will suffice to provide early indications of forest tent caterpillar outbreak. If incipient populations are encountered Mistik will collaborate with Saskatchewan Ministry of Environment specialists in the mapping and monitoring of the outbreak.

#### 3.6.2.3.4. TREATMENT OPTIONS

Several chemical agents and one biological control agent (*Bacillus thuringiensis* var. *kurstaki* (Btk) – a naturally-occurring soil bacterium used as a ‘microbial insecticide’) are registered for use in the control of forest tent caterpillar<sup>25</sup>. Chemical control is not recommended due to the negative impact on natural parasitoids<sup>26</sup>. Mistik will assist in facilitating a Btk-based or ‘reduced risk’ pesticide control program under the direction Saskatchewan Ministry of Environment specialists.

<sup>23</sup> Mistik Management Ltd. 1997. *The NorSask Forest Management Project, Volume VI, the Present Environment (Part B), Appendix E. Meadow Lake, Saskatchewan.* ~200 pp.

<sup>24</sup> <http://publications.gov.sk.ca/documents/66/86290-English.pdf>

<sup>25</sup> <http://publications.gov.sk.ca/documents/66/86290-English.pdf>

<sup>26</sup> <http://publications.gov.sk.ca/documents/66/86290-English.pdf>





### 3.6.2.3.5. COLLABORATION WITH SASKATCHEWAN MINISTRY OF ENVIRONMENT

Mistik anticipates future collaboration with Saskatchewan Ministry of Environment on the basis of an 'early intervention' approach, related to:

- Assisting in the monitoring of incipient outbreaks of Forest tent caterpillar;
- Assisting in the undertaking of a Btk-based or 'reduced risk' pesticide control program

### 3.6.2.4. LARGE ASPEN TORTRIX

#### 3.6.2.4.1. DESCRIPTION

Large aspen tortrix (*Choristoneua conflictana* [Walker]) is one of the most common of the insect pests affecting hardwood forests (particularly aspen)<sup>27</sup>. The primary impact is caused by voracious feeding of the larval stage (Figure 11) on aspen leaf buds and foliage which can result in complete defoliation of the tree. Outbreaks are transient, not lasting more than two or three years. Outbreak periodicity is approximately every ten to twelve years on average. Tree mortality rarely occurs as a direct result of an outbreak but repeated defoliation can contribute to the phenomenon of 'aspen decline' and eventual mortality<sup>28</sup>. Outbreaks of large aspen tortrix often coincided with outbreaks of Forest tent caterpillar.

Figure 11 Large Aspen Tortrix Larva



<sup>27</sup> <http://publications.gov.sk.ca/documents/66/86294-English.pdf>

<sup>28</sup> Personal communication with Rory McIntosh, Provincial Forest Entomologist.





#### 3.6.2.4.2. CURRENT EXTENT OF INCIDENCE

Large aspen tortrix likely occurs throughout the Mistik FMP area. There have been no reported outbreaks or Large aspen tortrix in the Mistik FMP area.

#### 3.6.2.4.3. FUTURE DETECTION, RISK ASSESSMENT AND MONITORING

Due to the widespread distribution of tree host and relatively transient impacts of Large aspen tortrix<sup>29</sup>, Mistik will not undertake any formal detection or monitoring of Large aspen tortrix within the FMP area. Routine assessment of forest condition by Mistik staff via aerial or ground access in the course of viewing forestry operations will suffice to provide early indications of Large aspen tortrix outbreak. If incipient populations are encountered Mistik will collaborate with Saskatchewan Ministry of Environment specialists in the mapping and monitoring of the outbreak.

#### 3.6.2.4.4. TREATMENT OPTIONS

Several chemical agents and one biological control agent (*Bacillus thuringiensis var. kurstaki* (Btk)- a naturally- occurring soil bacterium used as a ‘microbial insecticide’) are registered for use in the control of Large aspen tortrix<sup>30</sup>. Chemical control is not recommended due to the negative impact on natural parasitoids<sup>31</sup>. Mistik will assist in facilitating a Btk-based or ‘reduced risk’ pesticide control program under the direction Saskatchewan Ministry of Environment specialists.

#### 3.6.2.4.5. COLLABORATION WITH SASKATCHEWAN MINISTRY OF ENVIRONMENT

Mistik anticipates future collaboration with Saskatchewan Ministry of Environment on the basis of an ‘early intervention’ approach, related to:

- Assisting in the monitoring of incipient outbreaks of Large aspen tortrix;
- Assisting in the undertaking of a Btk-based or ‘reduced risk’ pesticide control program.

#### 3.6.2.5. TERMINAL WEEVILS (WHITE PINE AND LODGEPOLE PINE)

##### 3.6.2.5.1. DESCRIPTION

White pine (or ‘spruce’) weevil (*Pissodes strobi* Peck) is considered the most serious pest of young conifers (particularly white spruce in Saskatchewan) in Canada<sup>32</sup>. Lodgepole terminal weevil (*Pissodes terminalis* Hopping) impacts young pines and occurs throughout the range of pine from

<sup>29</sup> <http://publications.gov.sk.ca/documents/66/86294-English.pdf>

<sup>30</sup> <http://publications.gov.sk.ca/documents/66/86294-English.pdf>

<sup>31</sup> <http://publications.gov.sk.ca/documents/66/86294-English.pdf>

<sup>32</sup> <http://www.environment.gov.sk.ca/adx/asp/adxGetMedia.aspx?DocID=3630,184,121,104,81,1,Documents&MediaID=4179&Filename=Terminal+weevil.pdf>





British Columbia to Manitoba<sup>33</sup>. The most conspicuous feature of terminal weevil impact is the dead leader of pine or spruce trees caused by the feeding of the larval stage on the inner bark and vascular tissue of the most recent year's growth (Figure 12). Repeated attacks may kill a tree but generally the effects are transient causing only growth reduction and potential stem deformities.

*Figure 12 Terminal weevil larva (left panel) feeding on the stem of a tree and characteristic damage (right panel) to a spruce tree caused by terminal weevils*



#### 3.6.2.5.2. CURRENT EXTENT OF INCIDENCE AND SEVERITY

White pine weevil impact on white spruce has been observed sporadically throughout the Mistik FMP area. The most seriously impacted trees are open-growing white spruce. Lodgepole terminal weevil, although likely present, has not been observed in the Mistik FMP area.

#### 3.6.2.5.3. FUTURE DETECTION, RISK ASSESSMENT AND MONITORING

Mistik conducts forest renewal surveys of all harvest blocks, typically at five and fourteen years post-harvest. Significant incidence of terminal weevil impacts on conifer trees is noted during the surveys.

#### 3.6.2.5.4. TREATMENT OPTIONS

Many of Mistik's regenerating conifer plantations occur in a mixedwood context with over storey aspen. The aspen over storey has been identified as a key factor in reducing the impact of terminal weevils on conifer trees<sup>34</sup>. Under high incidence conditions, pruning and removal of dead tree parts is recommended. Although chemical treatments have been demonstrated to be effective, the cost of implementing a chemical control program is difficult to justify.

<sup>33</sup> <http://www.environment.gov.sk.ca/adx/asp/adxGetMedia.aspx?DocID=3630,184,121,104,81,1,Documents&MediaID=4179&Filename=Terminal+weevil.pdf>

<sup>34</sup> [http://nofc.cfs.nrcan.gc.ca/publications/leaflets/white\\_pine\\_weevil\\_e.html](http://nofc.cfs.nrcan.gc.ca/publications/leaflets/white_pine_weevil_e.html)





### 3.6.2.5.5. COLLABORATION WITH SASKATCHEWAN MINISTRY OF ENVIRONMENT

Mistik anticipates future collaboration with Saskatchewan Ministry of Environment related to:

- Ongoing assessment of young conifers regenerating in post-harvest areas through implementation of forest regeneration surveys.

### 3.6.2.6. MOUNTAIN PINE BEETLE

#### 3.6.2.6.1. DESCRIPTION

In the last several years, the mountain pine beetle (*Dendroctonus ponderosae* Hopkins) (Figure 13) has become the most important pest of pine trees in western Canada<sup>35</sup>. The mountain pine beetle has destroyed millions of hectares of lodgepole pine in western Canada. Mountain pine beetle has not been observed on the Mistik FMP Area to date, however, its eastward expansion is a concern.

Figure 13 Adult Mountain Pine Beetle



Evidence of mountain pine beetle attack (Figure 14) includes mass attack of pine trees, production of pitch tubes from beetle entry holes in the bark, egg galleries above the entry holes and reddish brown needles. The key damage to attacked trees is the combined action of the larval feeding on the tree phloem and blue-stain fungus which can result in tree mortality within one month of initial attack<sup>36</sup>. Normally, the mountain pine beetle attacks old or weakened lodgepole pine trees.

Figure 14 Evidence of mountain pine beetle attack of a pine tree showing pitch tubes (lower panel) and egg galleries under the bark (upper panel) [William M. Ciesla, Forest Health Management International, Bugwood.org]

<sup>35</sup> <http://www.nrcan.gc.ca/forests/fire-insects-disturbances/top-insects/13397>

<sup>36</sup> <http://www.nrcan.gc.ca/forests/fire-insects-disturbances/top-insects/13397>





#### 3.6.2.6.2. CURRENT EXTENT OF INCIDENCE AND SEVERITY

Unusually hot, dry summers and mild winters in central British Columbia during the 1990s, along with forests filled with mature lodgepole pine, have led to an epidemic. The outbreak in British Columbia spread to Alberta into the hybrid zone (the area in Alberta where the natural range of lodgepole pine overlaps that of jack pine. Reports<sup>37</sup> from Alberta indicated that an unprecedented flight of beetles occurred in July 2006 and again in 2009 into Alberta. Both British Columbia and Alberta<sup>38</sup> have enacted major mountain pine beetle management and recovery programs.

#### 3.6.2.6.3. FUTURE DETECTION, RISK ASSESSMENT AND MONITORING

During the 2019, and in subsequent field seasons (June to August) Mistik will maintain periodic contact with forestry staff at Alberta Pacific (AlPac), Alberta Agriculture and Forestry, and the SK Ministry of Environment as to the incidence of Mountain pine beetle in area immediately to the west

<sup>37</sup> <http://forestinvasives.ca/Meet-the-Species/Insects/Mountain-Pine-Beetle#6984-distribution>

<sup>38</sup> <http://forestinvasives.ca/Meet-the-Species/Insects/Mountain-Pine-Beetle#6984-distribution>





of the Mistik FMP area. Routine assessment of forest condition by Mistik staff via aerial or ground access in the course of viewing forestry operations will continue. In the case of detection, Mistik will notify Saskatchewan Ministry of Environment specialists and collaborate in mapping and monitoring the outbreak.

#### **3.6.2.6.4. TREATMENT OPTIONS**

Scientists examining the mountain pine beetle control program in Alberta (and numerous associated publications) have provided the evidence that early and aggressive control action can be cost effective and can significantly reduce the spread, extent and severity of MPB in lodgepole and lodgepole hybrid forests in western and central Alberta<sup>39</sup>. Although there is still uncertainty around how quickly MPB will spread through the boreal jack pine environment, there are clear indications that spread will not be the same as was experienced in the BC interior (pers. Comm. Rory McIntosh). In fragmented boreal forests characteristic of boreal forest landscapes in the leading edge, MPB spread is believed to occur much more gradually<sup>40</sup>. Indeed, Alberta and Saskatchewan's early detection grid shows that beetles were found inside the Cold Lake Air Weapons Range (within 38 kilometers of the AB/SK border) in 2017. However, no beetles were detected in any of the baited trees deployed throughout the Athabasca Forest Region in Alberta or in Western Saskatchewan. Although "absence of presence" does not necessarily mean beetles are not there, but it is fairly strong evidence that the beetles are having difficulty becoming established in pure Jack pine forest.

#### **3.6.2.6.5. COLLABORATION WITH SASKATCHEWAN MINISTRY OF ENVIRONMENT**

In the event that mountain pine beetle should spread into the FMP area, Mistik will collaborate with Saskatchewan Ministry of Environment's broader strategic response plan. Specific actions may include:

- initiatives for early detection;
- 'contain and control' methods that may include the use of pheromones to contain the beetle populations;
- undertaking strategic harvesting to slow the spread;
- sanitation and salvage harvesting to remove infested trees and forest stands.

It is recognized that changes in harvest patterns may require flexibility in the Forest Management Planning Process.

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<sup>39</sup> Hodge et al, 2017 ,Cooke and Carroll, 2017. <https://www.sciencedirect.com/science/article/pii/S0378112716312543>

<sup>40</sup> Pokorny, S., and Carroll, A. 2018. Persistence or extinction? Quantifying the fate of an eruptive herbivore in novel habitats following climate change-induced range expansion. Abstract for a presentation at the Joint Meeting of the Entomological Societies of America, Canada, and British Columbia. 11-14 November 2018, Vancouver, British Columbia, Canada. <https://esa.confex.com/esa/2018/meetingapp.cgi/Paper/132842>





### 3.6.2.7. FUNGAL DAMAGE

#### 3.6.2.7.1. DESCRIPTION

A variety of fungal organisms (generically referred to as root rots, casts, rusts, and blights) impact the roots, foliage, twigs, stems, and cones of coniferous and deciduous trees in the Mistik FMP area on an ongoing basis. Symptoms of fungal impact include wilting of foliage, discoloration of foliage, premature shedding of foliage, blackening and death of twigs and foliage and the presence of cankers, galls, or conks on the stem of trees<sup>41</sup>. In most cases, the impact of fungi on tree growth and wood quality is transient and relatively minor in the Mistik FMP area. Internal stem decay caused by fungi, of both coniferous and deciduous trees, generally increases with stand age.

Armillaria root rot (*Armillaria mellea complexe*) is cited as the most destructive and widespread fungal disease affecting the base and roots of trees in Canada<sup>42</sup>. Armillaria damage is caused by fungal filaments (found in dead organic material) invading living root tissue of trees. The fungus spreads to the root base and into the base of the tree. The fungus induces sapwood decay and eventual death of the tree.

#### 3.6.2.7.2. CURRENT EXTENT OF INCIDENCE AND SEVERITY

Fungi are a key component of natural ecosystems. Tree-associated fungi are found throughout all the forest ecosystems within the Mistik FMP area. Fungal impacts can be identified on virtually every tree within the forest. The severity of impact increases with stand age. Armillaria root rot, although known to be present, has not been noted as a serious impact to forest health in the Mistik FMP area.

#### 3.6.2.7.3. FUTURE DETECTION, RISK ASSESSMENT AND MONITORING

The collection of tree metrics, across a variety of forest stands within the FMP area, through Mistik's temporary sample plot program allows for characterization of tree health and form. Additionally, Mistik's sample scaling program provides a measure of stem decay. Due to the widespread distribution, relatively slow infection rates and slow rate of decay caused by fungi, Mistik will not undertake any formal detection or monitoring of fungal impacts within the FMP area.

#### 3.6.2.7.4. TREATMENT OPTIONS

No commercially viable preventative, treatment or control options exist for most fungal-related impacts. Mistik will continue to harvest fungi-infected trees within the FMP area and ensure forest renewal.

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<sup>41</sup> Hiratsuka, Y. 1987. Forest tree diseases of the prairie provinces. Information Report NOR-X-286. Northern Forestry Centre, Canadian Forestry Service, Edmonton, Alberta. 142pp.

<sup>42</sup> [http://cfs.nrcan.gc.ca/bookstore\\_pdfs/11927.pdf](http://cfs.nrcan.gc.ca/bookstore_pdfs/11927.pdf)





### 3.6.2.7.5. COLLABORATION WITH SASKATCHEWAN MINISTRY OF ENVIRONMENT

Mistik anticipates future collaboration with Saskatchewan Ministry of Environment related to:

Ongoing harvest of commercially-viable fungal-infected stands throughout the Mistik FMP area through approval and implementation of normal forestry operations

## 3.7. MANAGEMENT CHALLENGES ON THE LICENCE AREAS

Key forest management challenges within the Mistik FMP area are summarized in Table 3-4.

Table 3-4 Key Forest Management Challenges

Challenges	Indicator-related	Source	Mitigation
1. Demonstrating future softwood growth/yield based on early successional mixed wood conditions.	Mistik Indicator #6 (VOIT document)	Saskatchewan Ministry of Environment	In the 2007 FMP, establishment survey data was used to demonstrate this relationship. In the 2019 FMP, free-to-grow (FTG) survey data will be used. The results of the FTG surveys are more closely refined in terms of capturing stand type variability within harvest blocks. This level of detail will result in more accurate results with regard to SGR transitions when compared to the pre-harvest condition.
2. Woodland Caribou Habitat Mitigation Plan	Mistik Indicator #7 (VOIT doc.) & Vol III Appendix A	Mistik / L&M	Mistik's Caribou habitat mitigation plan may require an amendment pending the development / finalization of the SK2 West provincial caribou range planning process.  <b>April 2023 Update: Mistik has amended the FMP to gain alignment with the Range Plan for Woodland Caribou in Saskatchewan (SK2 West Caribou Administration Unit) which was finalized in October 2021.</b>
3. Accommodating and working within the context of complex and overlapping Aboriginal traditional territory land claims and	No	Mistik Management Ltd.	Continue to work cooperatively with Aboriginal groups with regard to overlapping traditional territories.





Challenges	Indicator-related	Source	Mitigation
associated disputes with regulatory agencies.			Communicate with the ministry with regard to the location and status of outstanding TLE claims.
4. Maintenance of equitable distribution of forestry employment and economic benefits.	Mistik Indicator #26 (VOIT document)	Northern communities	Adhere to the terms of the co-management agreements (payments to co-management boards); maintain 60% or greater payments to local vendors; and maintain 100% representation from local communities in the workforce.
5. Inventory and Growth and Yield Programs	No	Mistik and L&M	The inventory and growth and yield will need to be updated according to provincial standards or approved alternatives. Mistik anticipates that this process will start around 2023.
6. Maintenance of the diversity of non-timber and traditional use values.	Mistik Indicator #21 and #24 (VOIT document)	Public (all those involved in non-timber use activities within the FMP area)	Continue to solicit input through relationships with the public and other forest users. It is Mistik's intent to "grow the dataset" over time with regard to non-timber and traditional use values.

### 3.8. VULNERABILITY ASSESSMENT TO ADDRESS CLIMATE CHANGE

Climate change is predicted to have significant impacts on sustainable forest management (SFM) in the Boreal Forest. Some examples of these impacts are changes to tree growth and survival rates, increased drought, fire, and severe storms, all of which contribute to losses in forest productivity and biomass. It is important to develop tools and strategies that will help manage these changes. One of these tools is the ability to adapt current practices to account for climate change through technology, government policy and collaboration among academia, government and other stakeholders.

Mistik has participated in a study that focused on the impacts of climate change on sustainable forest management on the Mistik FMP area<sup>43</sup>. The study was based on the conceptual framework developed by the Canadian Council of Forest Ministers (CCFM), and involved:

- describing the current climate and forest condition on the Mistik FMP area;
- developing scenarios of future climate and forest conditions;
- assessing the vulnerability of SFM to current and future climate;

<sup>43</sup> Andrews-Key, S.A. (2018). *Vulnerability and Adaptation to Climate Change in Sustainable Forest Management and the Forest Industry in Saskatchewan*. (Unpublished doctoral dissertation). University of Saskatchewan, Saskatoon, Saskatchewan, Canada.





- and developing and refining options for adaptation.

Approximately 160 CCFM SFM objectives were assessed for specific impacts of climate change, adaptation options, a feasibility ranking and any potential challenges or barriers to the options. For the purposes of the FMP, two indicators have been chosen to monitor and report on annually. The two indicators are:

1. The number of “days frozen” annually for three important lakes in the FMP area and
2. Operational days lost due to “abnormal” weather/environmental conditions.

The three lakes chosen for monitoring are Peter Pond Lake, Canoe Lake and Turtle Lake which are all locally important for fishing/sustenance and recreation within the FMP area. For each lake, the number of “frozen days” will be reported annually and be based on the date when the lake became frozen (no longer thawing) for the winter and the date when the lake was completely thawed in the spring. Local people near each lake will be involved to assist Mistik with monitoring ice conditions. The trend over time may show a decline in each lake’s total number of “frozen days” per year which has impacts to the local people.

For operational days lost due to weather/environmental conditions, Mistik and L&M are interested in how many days are lost during “normal” operations (excluding all other factors) due to weather related conditions. Often in the summer months, shut downs occur due to ground conditions being too wet or forest fire hazard being too high to safely operate. In winter, harvesting or hauling operations may be shut down due to temperatures being too warm. Hauling under full permit weights during the winter season is dependent on temperatures staying cold. When the temperature gets too high, trucks are not permitted to haul full weights, resulting in lower productivity. The following metrics will be monitored:

- In summer (spring start-up until October 31<sup>st</sup>):
  - Harvesting shut down for x days due to high fire hazard
  - Number of times a harvesting operation is moved to an alternate area due to wet conditions.
- In winter (November 1<sup>st</sup> until March 31<sup>st</sup>):
  - Harvesting shut down for x days due to warm temperatures (non-frozen/warm conditions that present risks normally related to all season/summer harvesting)
  - Haul reverts to non-permit weights for x days between winter permit start and end dates due to warm temperatures

In addition to the indicators chosen, Mistik and L&M are committed to working on the implementation of some of the tools and adaptation options identified in the vulnerability assessment project.





## 3.9. INTEGRATION OF FOREST MANAGEMENT ACTIVITIES WITH NON-TIMBER USES

### 3.9.1. STRATEGIES TO INTEGRATE FORESTRY ACTIVITIES AND NON-TIMBER VALUES

Mistik strives to maintain the diversity of boreal forest values and uses throughout its forestry operations in the FMP area through several processes. On an annual basis, Mistik will follow the approaches identified in Table 3-5 in an attempt to ensure that the broadest suite of non-timber and potentially high conservation values is maintained.

*Table 3-5 Specific Measures to be Implemented by Mistik to Minimize Impact to and Maintain Potentially High Conservation and Non-Timber Values*

Non-Timber Value	Mistik Approach to Maintain Value
1. Non-timber forest products: <ul style="list-style-type: none"> <li>• outfitting/trapping (fur)</li> <li>• cabins</li> <li>• wild rice</li> <li>• traditional use areas/spiritual</li> <li>• tourism/recreation</li> <li>• fishing/hunting</li> <li>• berries/mushrooms</li> <li>• aesthetic qualities</li> </ul>	<ul style="list-style-type: none"> <li>• Evidence of the production and the opportunity for gathering of non-timber forest products (e.g., fur, mushrooms, berries, meat, wild rice, etc.) within the FMP area is maintained</li> <li>• Ensure opportunity for involvement in Public Advisory Group and local advisory group processes and public participation and involvement in ongoing forestry planning and implementation</li> <li>• Update, on an annual basis, relevant data archives (outfitting, trapping, wild rice, cabins, special places, range, etc.) with the most recent data from Saskatchewan Ministry of Environment or other relevant sources</li> <li>• Prior to each operating season, issue a letter to all known stakeholders that may be affected by the operating plan</li> <li>• Follow up with a phone call to each individual stakeholder</li> <li>• Undertake one-on-one consultations- office and/or field visits- with individual stakeholder as needed</li> <li>• Arrive at a workable outcome for the stakeholder and Mistik</li> <li>• Ensure that non-timber values/activities are integrated and accommodated as fully as possible into operational plans and implementation of forest harvesting</li> <li>• In the case that a mutually agreeable solution cannot be reached, refer the matter of Saskatchewan Ministry of Environment</li> </ul>
2. Visual resources	<ul style="list-style-type: none"> <li>• Annual identification of operating areas within which proposed harvesting may occur in visually sensitive areas</li> <li>• Identification of visual quality objectives for proposed harvest areas occurring in visually sensitive areas</li> </ul>
3. Watersheds	<ul style="list-style-type: none"> <li>• Maintenance of a partnership with the Saskatchewan Water Security Agency (and other organizations) that includes periodic assessment of Mistik's forestry activities and potential impacts on the watersheds of the FMP area</li> </ul>
4. Lakes and streams	<ul style="list-style-type: none"> <li>• Compliance with federal and provincial legal requirements and conformance with internal standard operating procedures with</li> </ul>





Non-Timber Value	Mistik Approach to Maintain Value
	<p>respect to the installation, maintenance and reclamation of watercourse crossing structures and erosion control</p> <ul style="list-style-type: none"> <li>• Fish habitat enhancement and fish habitat replacement (as requested by the Department of Fisheries and Oceans)</li> <li>• Retention of regulatory-required riparian no-harvest areas adjacent to water bodies</li> <li>• Non-use of herbicides</li> </ul>
5. Wildlife habitat / Species at Risk	<ul style="list-style-type: none"> <li>• Science-based recommendations are solicited from specialists with respect to planning and implementation of forestry activities</li> <li>• Operational implementation of expert recommendations</li> </ul>
6. Archaeological and cultural resources	<ul style="list-style-type: none"> <li>• All planned operational activities are screened by Heritage Conservation Branch of the Ministry of Parks, Culture and Sport.</li> <li>• Activities are rated by the branch for heritage potential and indication is given as to the requirement to complete a Heritage Resource Impact Assessment (HRIA).</li> <li>• High heritage potential areas are typically located to larger rivers and creeks. Road construction and site preparation activities are most likely to trigger the requirement to do a heritage assessment.</li> <li>• Mistik uses only scarification for site preparation with a low-impact disturbance created, this activity does not typically require and HRIA.</li> <li>• For road building, Mistik attempts to design road networks that avoid areas that would require a HRIA and have a high potential for heritage values.</li> <li>• If Mistik is unable to avoid specific areas or uses an alternate site preparation technique, all requirements of the heritage assessment are followed.</li> <li>• Mistik also maintains records of heritage and cultural resource values which have been identified by other forest users, the public and co-management/ advisory boards. Cooperative strategies (such as avoidance or patch retention) often depend on the size of the area affected and the nature of the value identified. Mistik works with the interested party to determine a solution that is most beneficial to both parties.</li> </ul>
7. Petroleum and mineral exploration/development	<ul style="list-style-type: none"> <li>• That opportunities are identified and implemented (i.e., road use agreements) with other industrial users (e.g. petroleum and mining industries) to minimize cumulative environmental impacts</li> </ul>
8. Agriculture	<ul style="list-style-type: none"> <li>• Not applicable - aside from grazing activities, Mistik is unaware of any agricultural activities occurring within the FMP area</li> </ul>





## 4. FMP AMENDMENT PROCESS

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Mistik has developed this FMP using the best information that is currently available. However, it is not possible to cover every eventuality when developing a FMP due to the natural variability of forest ecosystems and the unpredictability of natural events. It is often impossible to account for changing and evolving social values and changing market conditions.

Although Mistik does not anticipate that the FMP will require amendments or revisions before the 10-year timeframe is complete, the FMP will be amended should any of the following circumstances take place:

- Catastrophic events (e.g. mill closures, government changes to or removal of the FMP area) or natural disturbance events (large scale wildfire, wind-throw or mortality due to insect or disease infestations) affecting the forest resource exceeding the re-planning threshold;
- Regulatory changes to Caribou management that severely impact or limit harvesting;
- Utilization standards changing significantly from those used to calculate HVS;
- Deviations to the tactical plan are required beyond the acceptable allowance;
- Unexpected circumstances arising that render the current plan at risk of not meeting the public interest on the FMP area;
- Operational planning or practices significantly deviate from the strategies/assumptions used to determine the HVS and a negative impact on the HVS is expected.

Mistik will maintain a FMP Amendment Log for the duration of the FMP. All amendments, as well as the results of stakeholder consultation associated with the amendments, will be documented in the log.

If consultation on a FMP amendment is required, a work plan and public engagement plan will be developed for approval by the ministry.





## 5. APPENDIX A: WOODLAND CARIBOU HABITAT MITIGATION PLAN

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### 5.1. EXECUTIVE SUMMARY

Woodland caribou (*Rangifer tarandus caribou*) are one of Canada's most widely distributed large mammals with boreal ecotype populations occurring in nine provinces and territories. Populations of boreal ecotype woodland caribou have declined significantly over time and are now protected under the federal Species at Risk Act (SARA) as a threatened species. In conducting its forestry activities, Mistik must consider wildlife and other values. This document describes steps that will be taken to minimize the impact of forestry activities occurring within caribou habitat.

*April 2023 Update: Mistik has updated this section of the FMP to reflect the changes made to the plan to align with the Range Plan for Woodland Caribou in Saskatchewan (SK2 West Caribou Administration Unit) which was finalized in October 2021. With regard to the Values, Objectives, Indicators, and Targets ("VOIT") section of the plan, Indicator #7b (Habitat availability for Caribou – Tiers 1, 2 and 3) has been updated based on changes made to align with the range plan. VOIT 7b can be found in Appendix D of this document.*

### 5.2. WOODLAND CARIBOU BACKGROUND INFORMATION

#### 5.2.1. WOODLAND CARIBOU BIOLOGY, POPULATION DYNAMICS AND LANDSCAPE MOVEMENTS (ARSENAULT 2003, ARSENAULT ET AL. 2006, PROULX 2013, PROULX ET AL. 2017)

Adult woodland caribou are moderately-sized ungulates that are typically brown with cream-colored neck, mane, tail and rump. The species is anatomically adapted to withstand harsh winter conditions with a compact body, well-insulated coat, furred extremities, long legs and large, soft-centered, crescent-shaped hooves to facilitate movement on ice, snow and peatlands. Woodland caribou are uniquely adapted to survive during the winter months on terrestrial and arboreal lichens but thrive on a variety of browse food sources if available. Woodland caribou breed in October and calves are typically born in early May. The species occurs naturally in very low population densities as an adaptive response to predator avoidance. Boreal caribou tend to gather in small bands (likely distinct social units within a larger population). Local bands are generally sedentary (i.e., no seasonal mass migrations over long distances) with movements of only 15 to 80 km that often overlap with the range of adjacent bands or populations. Usage and movements of and between high-quality seasonal habitats remains relatively static from year to year.





### **5.2.2. WOODLAND CARIBOU ECOLOGY AND HIGH-QUALITY HABITAT REQUIREMENTS (ARSENAULT 2003, ARSENAULT ET AL. 2006, ENVIRONMENT CANADA 2005, PROULX 2006, 2013, PROULX ET AL. 2017);**

High-quality habitat of woodland caribou is a mosaic of mature upland coniferous boreal forest and treed peatland complexes. Specifically, lichen-rich treed fens and bogs dominated by black spruce and larch with adjacent mature upland coniferous forests of black spruce and jack pine between the ages of 40 to 100 years and less than 70% crown closure is reported to be the optimum habitat for woodland caribou. Treed peatlands, at both the stand and landscape level, appear to be very strongly correlated with high-quality habitat usage and are significant determinants of critical habitat. Woodland caribou avoid shrub-rich habitat and aspen-dominated sites. Within the habitat mosaic, high-quality habitat needs to be functionally connected and buffered from population limiting factors. Forest ecosystem types that are not considered high-quality habitat function as habitat buffers between other ungulates (moose, white-tailed deer) and predator species (wolves). Boreal caribou require large contiguous tracts of high-quality habitat in order to maintain their unique predator avoidance behavior and associated low population densities. Calving sites are critical in population maintenance. Features of calving sites likely include isolated, raised stands of spruce and pine in treed peatlands and peninsulas and islands in lakes and rivers in high-quality caribou habitat.

### **5.2.3. FOREST ACTIVITIES AFFECTING WOODLAND CARIBOU HABITAT (ARSENAULT 2003, ARSENAULT ET AL. 2006).**

The size and distribution of woodland caribou populations may be affected specifically by habitat change (natural or human-caused), predation, subsistence hunting and vehicle collisions (and other disturbance). Mistik's forest-use activities modify woodland caribou habitat and may affect usage patterns. Primary forestry-related impacts to woodland caribou habitat in the Mistik FMP area are access development (road construction), access use (amount of vehicular traffic), and forest harvesting (change in age class structure).

Access development and ongoing usage of roads has been shown to result in a significant reduction in usage of high-quality habitat in the proximity of the access feature and as a barrier to movement between seasonal use areas. Woodland caribou may be displaced by 0.25 km to 1.2 km from seismic lines, well sites, roads, harvested areas and other industrial activities. Roads may facilitate human access for Aboriginal subsistence hunting of woodland caribou.

Forest harvesting results in abrupt habitat change. While harvesting occurs exclusively in upland coniferous and deciduous forest types, these habitat types may be adjacent to or near peatlands occupied by woodland caribou. High-quality woodland caribou habitat consists of a mosaic of mature upland coniferous forest types and peatland complexes. Harvested upland forest may result in barriers to movement between seasonal use areas, reduction in dispersal areas and concentration of caribou populations which may result in increased mortality due to predation.

Indirect impacts of forest harvesting and associated access may include increased cervid and predator densities (due to enhanced habitat for other ungulates sought by wolves) and increased mobility of predators adjacent to high-quality woodland caribou habitat types that can result in





increased mortality of woodland caribou.

#### **5.2.4. PROVINCIAL OR NATIONALLY PROTECTED WILDLIFE REFUGE AND ECOLOGICAL RESERVES WITHIN OR ADJACENT TO THE MISTIK FMP AREA**

Provincially or nationally protected wildlife refuge and ecological reserve areas (Table 5-1: ) within or immediately adjacent to the Mistik FMP area provide core areas of low anthropogenic disturbance. Maintenance of connectivity between woodland caribou ranges within the Mistik FMP area and protected areas is considered valuable for the purpose of facilitating woodland caribou movement between habitat areas in Mistik FMP area and adjacent protected wilderness areas.

*Table 5-1: Protected and de facto protected wildlife refuge and ecological reserve areas adjacent to the Mistik FMP area*

Protected area	Total area (ha)
1. Cold Lake Air Weapons Range (CLAWR) <sup>44</sup>	635,894
2. McCusker River Ecological Reserve within the CLAWR	139,392
3. Primrose Lake Ecological Reserve within the CLAWR	19,487
4. Primrose Lake Wildlife Refuge within the CLAWR	11,746
5. Caribou Flats Ecological Reserve immediately north of Dore Lake	9,603
<b>Note: Total (excludes #s 2 to 4 above)</b>	<b>645,497</b>

### **5.3. CARIBOU HABITAT WITHIN THE MISTIK FMP AREA**

#### **5.3.1. IDENTIFICATION OF WOODLAND CARIBOU HABITAT WITHIN THE MISTIK FMP AREA**

A detailed assessment using the Saskatchewan Forest Vegetation Inventory (SFVI) data identified landscape-level areas within the Mistik FMP area with a high proportion of contiguous, high-quality woodland caribou winter habitat (Proulx 2006). Contiguous, high-quality woodland caribou habitat queries were defined based on telemetry data collected in the Cold Lake Air Weapons Range (Arsenault 2005), expert opinion (Proulx, Alpha Wildlife Research and Management Ltd.) and guidance from Saskatchewan Ministry of Environment wildlife habitat experts (Arsenault et al. 2006). Due to the timing of plan development, this data was used for the 2019 FMP modelling process.

In 2013 and 2017, additional field studies were undertaken on the Mistik FMP area with the intent of refining these queries based on observed habitat use and thus identifying stands to protect (Proulx 2013, Proulx 2017). The results indicated that late-winter habitat varies according to differing regional conditions such as vegetative characteristics and disturbance type. Large-scale disturbance such as fire may either create favorable habitat or reduce it, depending on the mosaic of stand types and conditions that remain post-disturbance. Prior to the development of the next

<sup>44</sup> Not an officially designated protected area- but serves as a de facto protected area – encompassing approximately 636,000 ha





tactical plan and FMP, and using an updated vegetation inventory, these new criteria will be used to identify contiguous, high-quality woodland caribou habitat within the Mistik FMP area.

### 5.3.2. WOODLAND CARIBOU HABITAT AREAS IDENTIFIED IN THE FINAL RANGE PLAN FOR WOODLAND CARIBOU IN SASKATCHEWAN

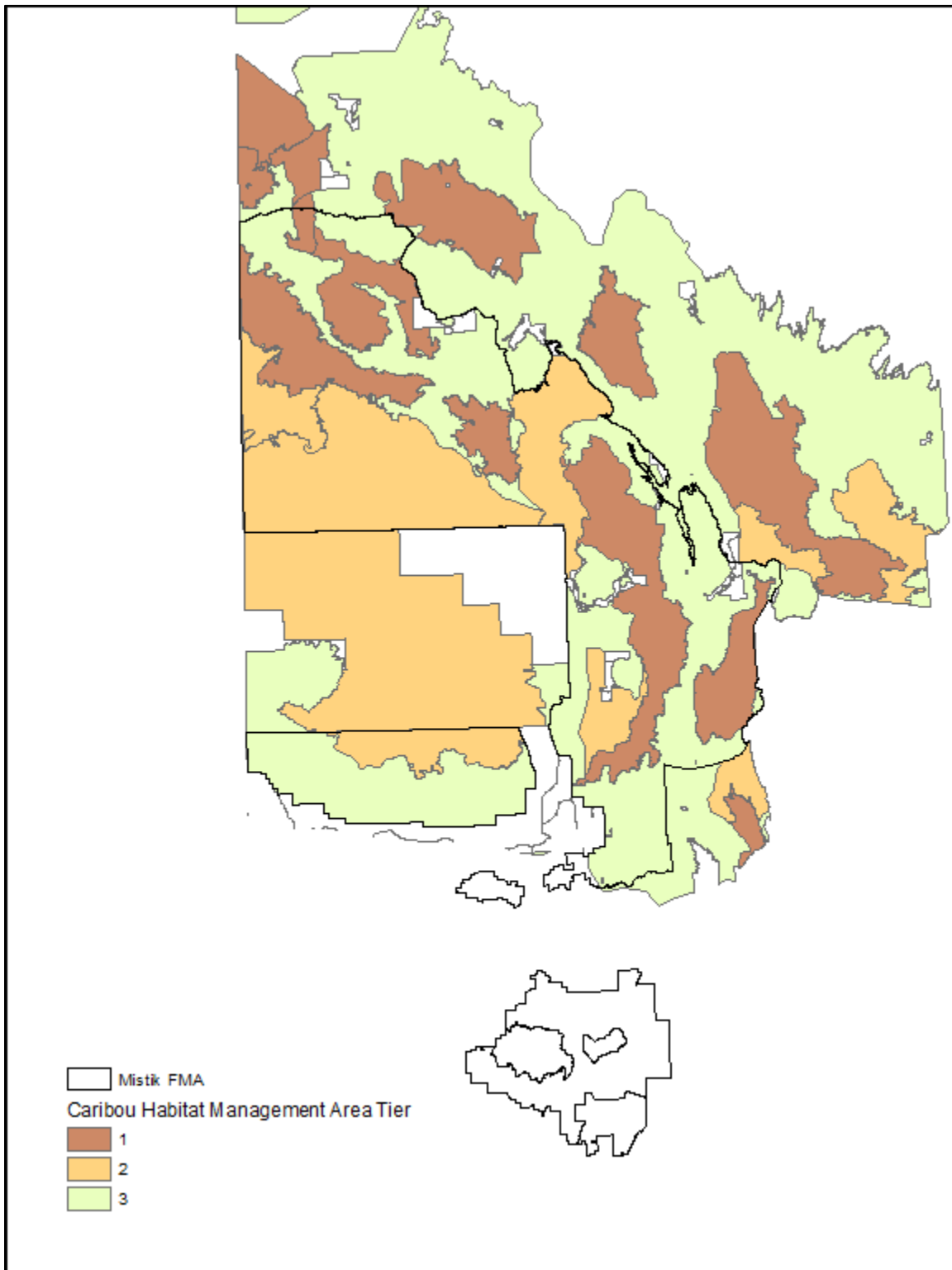
The following table (Table 5-2) outlines the three distinct types (tiers) of caribou habitat management areas (CHMA) identified in the final SK2 West range plan (see map below). *April 2023 Update: This table has been updated based on the final Range Plan for Woodland Caribou in Saskatchewan (SK2 West Caribou Administration Unit)*

Table 5-2: Caribou habitat management areas on the Mistik FMP area

<b>Caribou Tier</b>	<b>Criteria for Selection</b>	<b>Area (ha)</b>	<b>Percent (%) of Mistik FMP Area</b>
<b>Tier 1</b>	Areas of high-moderate caribou habitat potential with high levels of observed caribou use and low levels of human-caused disturbance.	431,837	22.8%
<b>Tier 2</b>	Areas of high-moderate caribou potential with observed caribou use and higher levels of wildfire and human-caused disturbance.	512,968	27.0%
<b>Tier 3</b>	Areas of general caribou habitat between Tier 1 and Tier 2 areas. Tier 3 areas provide general habitat and connectivity between Tier 1 and Tier 2 areas.	732,239	38.6%
<b>Remaining Mistik FMP Area</b>	Portion of Mistik FMP area south of the woodland caribou range boundary.	219,666	11.6%
<b>Total Area</b>		<b>1,896,710</b>	<b>100%</b>

The provincial SK2 West caribou administrative unit (CAU) covers approximately 89% of the Mistik FMP area.









## 5.4. CARIBOU HABITAT MITIGATION PLAN

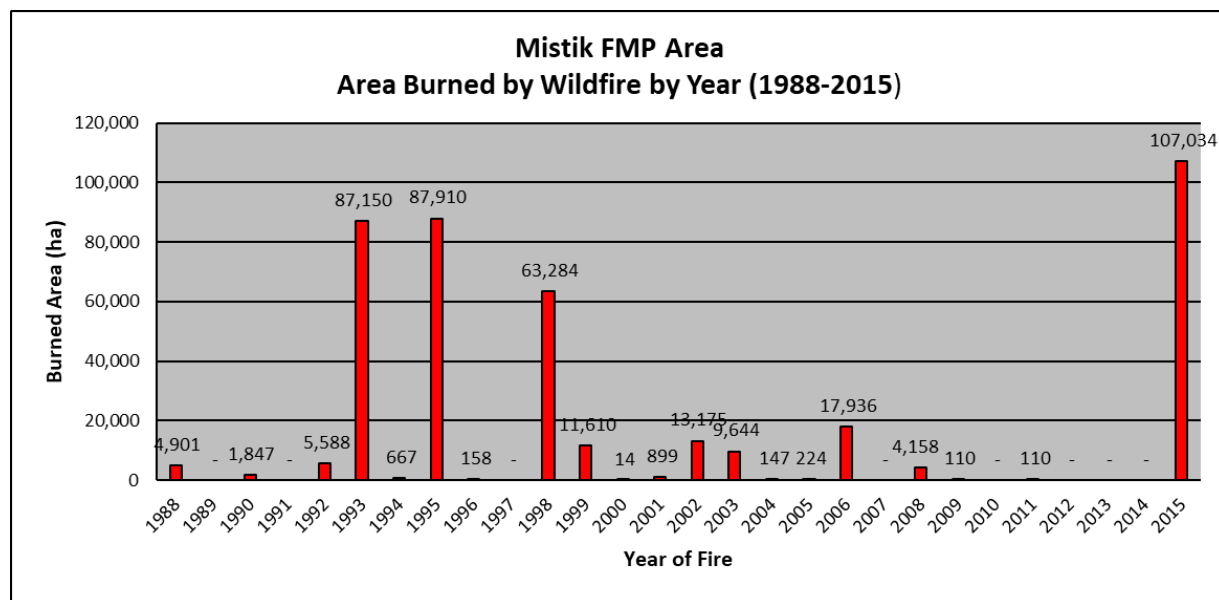
Development of recovery programs and habitat management planning requires a good understanding of caribou habitat use, particularly in late-winter when weather conditions are harsher (Proulx 2013).

*April 2023 Update: This plan is now based on the finalized Range Plan for Woodland Caribou in Saskatchewan (SK2 West Caribou Administration Unit) which was finalized in October 2021.*

## 5.5. PLANNING AND OPERATIONAL ‘LEAST-IMPACT’ FORESTRY PRACTICES

Mistik conducts its forest-use activities within the context of ecosystem-based management. A primary tenet of ecosystem-based management is that because the naturally existing flora and fauna have adapted and thrived within the prevailing natural biotic and abiotic disturbance regimes of the local environment, forestry impacts should as closely as possible emulate the prevailing natural disturbance regimes. The primary natural agent of disturbance in the boreal forest is fire (Figure 15). The extent of wildfire over the last sixty years on the Mistik FMP area has been highly variable and extensive.

Figure 15: Area burned on the Mistik FMP area



Where possible, Mistik plans harvest areas as disturbance events utilizing a ‘one-pass’ system (harvest events). A diversity of harvest block sizes is planned. Natural (irregular) boundaries are used to define the perimeter of harvest areas. Mistik attempts to maintain vertical structure and immature canopies in a natural MOSAIC harvest pattern. By implementing these techniques, Mistik is attempting to emulate the natural, fire-origin patterns and habitats found in the boreal forest landscape.





Landscape management goals in the range plan aim to reduce human-caused disturbance, maintain high potential caribou habitat, increase harvest event sizes, emulate natural forest patterns, and decrease non-permanent linear features such as roads and trails. Mistik's harvest deferrals will help to reach these goals over time as forest harvesting and operations will not occur in the deferral areas. Harvest event planning (one-pass system) as well as minimizing road networks in non-deferral areas will reduce the extent of disturbance and create more natural patterns across the landscape. Previous two-pass harvest systems spread disturbance across the landbase and created larger areas of extensive road networks where access remained open (not reclaimed) for several years. With the one-pass system, roads are closed soon after harvest and hauling activities are completed. As part of this commitment, Mistik attempts to emulate the size of natural disturbance events. By emulating the natural, fire-origin patterns and sizes found in the boreal landscape, important ecological and associated habitat values within the FMA area are maintained (Mistik Indicator #3: Size class distribution of harvest events)

## **5.6. KNOWN SIGHTINGS OF WOODLAND CARIBOU WITHIN THE MISTIK FMP AREA**

Mistik has established a GIS-based map product that depicts all sightings based on input from staff, contractors, local community members and reports of Indigenous subsistence hunting of woodland caribou in the Mistik FMP area. The location of sightings will provide useful context for a variety of purposes. 'High use' forest stands are those identified by a wildlife expert as being of critical value to woodland caribou as evidenced by sightings or sign of high use by woodland caribou.

## **5.7. CONTRIBUTION TO PROVINCIAL EFFORTS RELATED TO WOODLAND CARIBOU**

Mistik is committed to the following regarding the field monitoring of caribou populations in the Mistik FMP area:

1. Maintain a map depicting woodland caribou sightings by Mistik staff, contractors, and the general public. Report the caribou sightings to the provincial caribou sighting report (<http://biodiversity.sk.ca/ReportaCaribou.php>).
2. Participate in provincial efforts of information gathering and field monitoring of caribou populations within the Mistik FMP area;
3. Supply maps to provincial biologists for use during field surveys.

Mistik is committed to working with the Ministry of Environment during the implementation, as well as review and future revisions of the range plan.





## 5.8. REFERENCES

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Saskatchewan Environment 2019. Range plan for Woodland Caribou in Saskatchewan –





SK2 West Appendices

<https://publications.saskatchewan.ca/api/v1/products/103592/formats/114946/download>





## 6. APPENDIX B: SUMMARY OF PUBLIC ENGAGEMENT

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### 6.1. EXECUTIVE SUMMARY

The Public Engagement plan for the 2019 FMP was approved on March 17, 2015. It outlined that Mistik would provide three opportunities (open house sessions held in FMP area communities) throughout the development of the plan. Under the new forest management planning standard (2017), only two such opportunities are required, the first for Volume I and an outline of the FMP process, the second to discuss Volume III and the tactical plan. Mistik also held two public advisory group meetings per year during the development of the plan. This appendix provides the documentation from the open house sessions and PAG meetings.

***April 2023 Update: Mistik has completed public and Indigenous engagement as part of the 2023 Caribou Habitat Amendment, which can be found in Section 6.7 of this appendix.***

### 6.2. INITIAL CONTACT INFORMATION

#### 6.2.1. LETTER OF INVITATION

On March 17<sup>th</sup> a letter and FMP area map were sent to 97 interest groups inviting them to participate in the development of the FMP. The groups included advisory boards, co-management boards, First Nations, Metis locals, tribal councils, communities, rural municipalities, provincial and local interest groups, ministries, agencies and mills.





March 17, 2015

Name  
Address

**Re: Invitation to participate or provide input to Mistik Management Ltd.'s 2017 20-Year Forest Management Plan process**

Dear "name":

Mistik Management Ltd. (Mistik) is a forest management company based in Meadow Lake, Saskatchewan providing forestry services to NorSask Forest Products Inc. (NorSask), Meadow Lake Mechanical Pulp Inc. (MLMP) and L&M Wood Products (L&M). Mistik is commencing work on its 2017 20-Year Forest Management Plan (FMP) for the Mistik Forest Management Agreement (FMA) area (Figure 1). This is a regulatory-required process of forest license holders in the Province of Saskatchewan.

During this process, Mistik seeks input from a wide range of stakeholder groups. Mistik invites your (insert representative group name here) to participate or contribute to the plan. Should you wish to be involved in Mistik's 2017 20-Year FMP process or provide comment please send a letter to the following address by **Friday, April 24, 2015** indicating your interest:

Mr. Roger Nesdoly  
Planning Coordinator  
Mistik Management Ltd.  
Box 9060  
Meadow Lake, SK  
S9X 1V7

Email: [roger.nesdoly@mistik.ca](mailto:roger.nesdoly@mistik.ca)  
Fax: (306) 236-4426

Respectfully yours,





Al Balisky  
General Manager  
Mistik Management Ltd.

## 6.2.2. PUBLIC NOTICE FOR PLAN INITIATION AND COMMUNITY OPEN HOUSE SESSIONS

On a monthly basis, Mistik placed a notice in two local papers (Northern Pride and the Beaver River Banner) indicating that Mistik was in the process of developing its 2017 20-Year FMP. The notice invited the general public to contact Mistik if they had questions or wished to participate in the FMP process. The schedule of open houses was advertised in two local papers (Northern Pride and the Beaver River Banner) for three weeks prior to the commencement of the open houses.



Invitations to participate in the open houses were faxed/emailed to all co-management & advisory groups and local communities within the FMP area three weeks prior to the commencement of the open houses. Local radio stations were made aware of the open houses.



Creating opportunity since 1989

Mistik Management Ltd. is a woodlands management company based out of Meadow Lake, Saskatchewan providing timber procurement and forestry services to NorSask Forest Products Inc., Meadow Lake Mechanical Pulp Inc. and L&M wood Products. Mistik is dedicated to the sustainable use and stewardship of 1.9 million hectares of boreal forest in northwest Saskatchewan.

### NOTICE OF FOREST MANAGEMENT PLAN PREPARATION

Mistik is currently in the process of developing its next 20-Year Forest Management Plan. The new management plan is due for implementation by April 1, 2017. The public is invited to contribute to the development of this plan. If you would like to learn more about the plan, contribute to the development of the plan or provide comment to Mistik regarding the plan or about forestry matters please contact Roger Nesdoly, Planning Coordinator at (306) 236-4431 or [roger.nesdoly@mistik.ca](mailto:roger.nesdoly@mistik.ca) or visit Mistik's website at [www.mistik.ca](http://www.mistik.ca).

Mistik currently consults with the general public through its co-management / advisory boards and Public Advisory Group. If you would like more information regarding participating in any of these groups please contact Roger Nesdoly, Planning Coordinator at (306) 236-4431 or [roger.nesdoly@mistik.ca](mailto:roger.nesdoly@mistik.ca) or visit Mistik's website at [www.mistik.ca](http://www.mistik.ca).

Public information sessions related to key stages in the development of Mistik's 20-Year Forest Management Plan will be held in September 2015, March 2016 and October 2016 in the following communities:

- Meadow Lake
- Buffalo Narrows
- Glaslyn
- Big Island Lake
- Waterhen Lake
- Canoe Narrows
- Beauval
- Ile a la Crosse
- Dillon

Specific dates, times and locations of the information sessions will be advertised in the local media several weeks in advance of the event.





## 6.3. OPEN HOUSE SESSIONS FOR VOLUME I / FMP PROCESS

### 6.3.1. FIRST OPEN HOUSE SESSIONS – INVITATIONS AND NOTICES

Notices were placed in local papers and in local communities inviting the public to attend an open house session where Mistik would give an overview of the forest management planning process and Mistik FMP Volume I.



**Creating opportunity since 1989**

**Come out and tell us what YOU think about the forest...**

Mistik invites you to a community event to learn more about Mistik's 2017 20-Year Forest Management Plan. Please join us for doughnuts and coffee at one of the meetings.

Date of Meeting	Stakeholder Community(s)	Location and Time
Tuesday January 19, 2016	Glaslyn and area L&M Wood Products employees, First Nations and general public are invited to attend and provide input.	Glaslyn Legion Hall 5 to 7 PM
Wednesday January 20, 2016	Meadow Lake Area and area The general public is invited to attend and provide input.	Meadow Lake United Church 5 to 7 PM
Tuesday January 21, 2016	Buffalo Narrows and area The general public is invited to attend and provide input.	Buffalo Narrows Friendship Centre 5 to 7 PM
Wednesday January 27, 2016	Beauval and area The general public is invited to attend and provide input.	Beauval Community Hall 5 to 7 PM
Monday February 1, 2016	Cole Bay / Jans Bay / Canoe Narrows and area The general public is invited to attend and provide input.	Canoe Narrows Band Hall 5 to 7 PM
Tuesday February 2, 2016	Waterhen Lake and area The general public is invited to attend and provide input.	Waterhen Lake First Nation School Gym 5 to 7 PM
Wednesday February 3, 2016	Ile a la Crosse and area The general public is invited to attend and provide input.	Ile A La Crosse Recreation Centre 5 to 7 PM
Monday February 8, 2016	Dillon / St. George's Hill / Michel Village and area The general public is invited to attend and provide input.	Dillon Band Hall 5 to 7 PM
Thursday February 11, 2016	Big Island Lake Cree Nation / Goodsoil / Pierceland and area The general public is invited to attend and provide input.	Big Island Lake Cree Nation Band office 5 to 7 PM





### 6.3.2. FIRST OPEN HOUSE SESSIONS – ATTENDANCE

The following table outlines the attendance at the open house sessions

Table 6-1: Attendance at first open house sessions held in January/February 2016.

Date of Meeting	Individual Name	Group Represented
January 19, 2016 <b>Glaslyn</b> Elks Hall	Roger Nesdoly Zane Delaine Travis Hagel	Mistik Management Ltd. L&M Wood Products L&M Wood Products
January 20, 2016 <b>Meadow Lake</b> United Church	Roger Nesdoly Bernice Alger Brenda Nightingale Jeremy Nightingale Mark Doyle Niska Hodgson Russ Jones	Mistik Management Ltd. Mistik Management Ltd. Mistik Management Ltd. Self Forest Service, Ministry of Environment Mistik Management Ltd. RM 588
January 21, 2016 <b>Buffalo Narrows</b> Friendship Centre	Roger Nesdoly Bill Murray Mark Doyle Claude Hanson Leon McCallum Ken Larson Nap Chartier Leon Thompson Joey Thompson	Mistik Management Ltd. Mistik Management Ltd. Forest Service, Ministry of Environment Contractor Trapper Commercial Fisherman Bear Outfitter Trapping Assistant Trapping Assistant
January 26, 2016 <b>Divide Forest Advisory Council Cor.</b> Dexter Hall (Turtle Lake)	Clifford Mclauchlan Larry Anderson Alden Halseth Marge Cross Paul Hamm Barry Frisk Cordell Cross Wilfred Hamm Roger Nesdoly	Mistik Management Ltd. DFACC DFACC Visitor DFACC DFACC DFACC DFACC DFACC Mistik Management Ltd.
January 27, 2016 <b>Beauval</b> Community Hall	Roger Nesdoly Narayan Dhital Kevin Gillis	Mistik Management Ltd. Forest Service, Ministry of Environment Mistik Management Ltd.
February 1, 2016 <b>Canoe Narrows</b> Band Hall	Roger Nesdoly Vivian West Janine Leach Kathleen Gazey Barry Opikokew Leslie Opikokew David Opikokew Ron Bouvier Kevin Gillis	Mistik Management Ltd. Canoe Lake Co-Management Forest Service, Ministry of Environment Forest Service, Ministry of Environment Canoe Lake Co-Management Canoe Lake Co-Management Canoe Lake Co-Management Canoe Lake Co-Management Mistik Management Ltd.
February 2, 2016 <b>Waterhen Lake FN</b> School Gym	Roger Nesdoly Dennis Martell Tyrell Martell Chris Morin Kevin Gillis Karl Schulz Michael Ernest Richard Fiddler Ernest Fiddler	Mistik Management Ltd. Waterhen Lake First Nation Waterhen Lake First Nation MLTC Mistik Management Ltd. Mistik Management Ltd. Waterhen Lake First Nation Waterhen Lake First Nation





Date of Meeting	Individual Name	Group Represented
	Jasmine Martell D. Vincent Bobby Martell Steven Lasas Norma Martell William Hill Daniel Ratfoot	Waterhen Lake First Nation Waterhen Lake First Nation Waterhen Lake First Nation Waterhen Lake First Nation LRO Waterhen Waterhen Forestry Waterhen Lake First Nation
February 3, 2016 <b>Ile a-la-Crosse</b> Recreation Centre	Roger Nesdoly Karl Schulz Ivan Ayotte Edna Daigneault Vince Ahenakew Beverly McLean Vye Bouvier Marius Paul Fred B Nap Gardiner Ralph Morin Kevin Gillis	Mistik Management Ltd. Mistik Management Ltd. A La Bois Local 21 Ile a-la-Crosse Metis Group Ile a-la-Crosse Village Council Ile a-la-Crosse Village Council Village Resident  La Plonge Reserve Ile a-la-Crosse Ile a-la-Crosse Mistik Management Ltd.
February 8, 2016 <b>Dillon</b> Band Hall	Roger Nesdoly Bill Murray Karl Schulz Joe Billette Don & Kayla Desjarlais Emillion Desjarlais	Mistik Management Ltd. Mistik Management Ltd. Mistik Management Ltd. Buffalo River Dene Nation St Georges Hill Buffalo River Dene Nation
February 11, 2016 (rescheduled) <b>Big Island Lake Cree Nation</b> Band Office	Roger Nesdoly James Daigneault Kevin Gillis Bill Murray Cliff McLauchlan Karl Schulz Mark Doyle Janine Leach Kathleen Gazey	Mistik Management Ltd. Mistik Management Ltd. Mistik Management Ltd. Mistik Management Ltd. Mistik Management Ltd. Mistik Management Ltd. Forest Service, Ministry of Environment Forest Service, Ministry of Environment Forest Service, Ministry of Environment

### 6.3.3. FIRST OPEN HOUSE SESSIONS – RELATED CONCERNS AND ISSUES RAISED

The following is a summary of the questions and concerns that were raised which are related to the forest management plan. Questions that were not FMP-related have not been included (i.e. “What is the process for getting a contract to do work with Mistik”).

*Q = Question; A = Answer; C=Comment*

#### Glaslyn

No members of the public attended

#### Meadow Lake

One member of the public attended, no FMP-related questions were asked.

#### Buffalo Narrows

One concern raised related to fire salvage operation adjacent to the Upper Cummins Road which overlapped with a trapping area. The trapper is elderly and Mistik was of the understanding that he was no longer using his area. Maps were reviewed and no other





concerns were raised. Mistik has had ongoing communications with the trapper who raised the concern.

#### DFACC/Turtle Lake

Discussion around tactical plan concept, extent and rationale. Also, around inventory and the concept of “growing” the forest/inventory for planning purposes. No concerns were raised.

#### Beauval

No community members were in attendance.

#### Canoe Narrows

Q – Does the excluded landbase include water? A – Yes, it is included in the 55% excluded landbase and there will be a slight adjustment to the excluded landbase coming from MoE Forestry Branch.

Q – Has Mistik thought about the small dimension products like what Beauval is currently accessing? A – A better opportunity for these types of products will be when the PA pulp mill starts up again.

Q – How many sawmills are in the area? A – 3- in Meadow Lake, Glaslyn and Big River.

Q – Who owns the pulp mill? A – The mill is owned by a foreign company. Q – So the money is leaving the country then? A – Yes, they are the ones who took the risk to buy it.

Q – Do the targets remain the same after a big fire? A – The numbers are sometimes adjusted.

C – Canoe Lake has participated in Caribou studies with the federal government in the past (2007 & 2008)

C – Grassy Narrows/court cases across Canada including BC re. traditional lands, trapping, hunting, and history of people of the area. Hudson Bay area was left, and people came this way.

C – Roadblock in 1992, then co-management was created with a broad representation of the communities. Now changes have been made (with the 3 communities in the Canoe Lake area). Hunting isn't good anymore, now we have to travel to get our moose.

C – Cabins are being built on Canoe Lake, Fur Block boundaries need to be re-visited, they haven't been updated for more than 20 years.

C – There are less trappers in Canoe Lake due to the price of fur.

#### Waterhen Lake

C – L&M focuses on posts and rails and smaller materials. Roger commented that their market has shrunk due to the oil patch slowdown.

Q – What about the level of pollution from the smoke stacks at the pulp mill? A – It's mostly water vapor, heat and small amount of pulp particulate

Q – Who is your biggest customer? A – MLMP – Asia; NorSask – USA, Canada (9-foot stud market).

Q – Can you comment on amount of money that is spent on government dues and fees, the wealth is not shared. A – dues and fees are paid to the government based on volume harvested. Co-management fees are paid by Mistik based on volume harvested.

C – Selective cutting was the way logging used to be done. Divide isn't cut the same way Waterhen is. Provincial highways are different from the mill road (like the old buffer system that





was in place – i.e. when you couldn't see logging), there are bigger openings in Waterhen and not in Divide.

Q – There is no harvesting in Dillon. What effect does that have on Waterhen and Canoe Lake?

A – It's about 2/3 of the annual cut.

Q – How long can we keep harvesting? A – Perpetually.

Q – Are the spruce numbers down? A – Yes, harvest is down for softwood.

Q – Fur Block boundaries are an issue for most of the units in the north. Can these issues be resolved? A – Mistik is trying to help with resolving these issues.

C – Overlapping traditional territory, it must be respected, overlap does happen. Roger – Mistik is trying to be fair about how it's determined (i.e. for payment of co-management fees).

C – Waterhen territory cannot be respected, are our concerns being respected? We need to get more out of this. We are not consulted with, government has the duty to consult. Who looks after the co-management board process? Sometimes criticism is taken the wrong way. We are supposed to be the owners, but they make a good living. The system is the same old thing, opened cutting is a concern and we need to be listened to. Where there is no national law, the government makes the law. There are no jobs if the law is not followed, you get shut down.

Q – How many trees are being planted and why are they being planted by other contractors (Canoe, Flying Dust)? A – There have been issues in the past with the Waterhen contractors.

Q – Why is there a gate on our traditional area? There was no community involvement in this.

A – MoE put it there.

Q – Can we make suggestions on the 20-year plan? A – Yes.

C – MoE government is supposed to be here today.

C – Statistics are not recorded correctly about trapping, traditional uses and users and don't support Waterhen activities. Waterhen should be involved in a study about the true usage of the land. Our forefathers lived on the trapline. Consultation was side-swept and it's time for direct consultation. Trappers are lost, there's no money in it and you can't make a living that way anymore.

Q – Is any part of the air weapons range in the plan? A – No it is not. Some access is granted to groups for traditional uses.

### Ile a-la-Crosse

Q – Supply for the mills, is that what Mistik does? A – Yes, hardwood goes to MLMP, and softwood goes to NorSask and L&M. L&M has their own FMA area.

Q – How does ML OSB fit in? A – they are a separate company with their own wood supply areas (not associated with Mistik or the plan).

Q – What happens in drought? A – can influence how trees grow and make it harder to operate (i.e. shut down due to fire hazard).

Q – Do the bands benefit directly? A – NorSask pays dividends to MLTC's 9 member nations.

C – We get money from the logging, it's in a trust.

C – ICS4 will be looking after this.

Q – What about economic opportunities? A – The economic downturn has caused much to shrink in the way of opportunities. The mills have reduced volumes.

Q – How was the amount paid for co-management determined? A- it was based on the volume of timber cut in the Ile a-la-Crosse management unit by Niska Lake last year. Roger also outlined the change in co-management fee structure that was implemented by the mills.





Q – Fire kills trees, are they worth less? A – Roger explained burn coding and what the mills can use.

Q- Where does the co-management fee payment go for the Jayleen Fire? A – to Buffalo Narrows.

Q – Can we have input in the plan? A – Yes, at local meetings and the PAG.

Q – What if we had our own plan for the other products? A – Roger outlined the structure/process for 3<sup>rd</sup> party harvest volumes.

C – We need context for the meeting. Roger – Mistik has a license for 20-years which is renewable (ongoing). We have the FMA area, public advisory group, operating plan (year-to-year strategy). The FMP is renewed every 10 years. Both the plan and the FMA agreement are renewed and amended as part of the cycle. Carrier (mentioned earlier) is a different company.

C – A fundamental piece is gathering values and organizing it, so it's understood. We need to own this and have context. May want to request assistance to aid in accumulating values and putting them together. A system of information is required. Consistent conversation regarding habitat, cultural and ecological knowledge. Pinehouse has a written record of historical areas. (Pinehouse dipper land use planning).

Q – How many jobs in forestry and at the mills? A – Mills are about 400, trucking 175, harvesting and road building 150.

Q – How can we have input in the cutting plan? A – We will bring the plan out in the spring for review.

C – Volume would be better explained using an illustration (truck loads).

Q – How will cutting plans be communicated? A – In the operating plan that's presented in the spring.

Q – How about a helicopter tour? A – It's possible, we did three last year.

C – We had a biologist visit from U of S last spring about Caribou. We don't necessarily agree with where they should be.

### Dillon

No questions were asked by the four participants in attendance. Interesting reminiscence about trapping, hunting, youth, commercial fishing, etc.

### Big Island Lake

No members of the public attended.





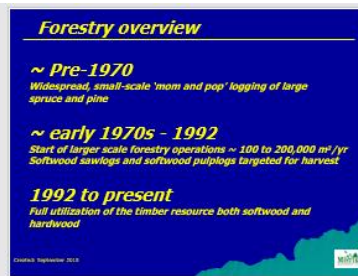
#### 6.3.4. FIRST OPEN HOUSE SESSIONS – PRESENTATION GIVEN







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**Mistik Management Ltd.**

Active Trappers\* (From Ministry of Environment)

Year (Range)	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
2007	2	4	2	1	2	1	0	1
2008	4	12	8	12	22	19	24	42
2009	1	1	4	1	7	1	2	2
2010	2	4	4	4	4	4	4	2
2011	1	2	2	2	2	2	2	2
2012	2	2	1	2	2	2	2	2
2013	1	4	2	2	2	2	2	2
2014	2	4	2	2	2	2	2	2
2015	1	4	4	4	4	4	4	2
2016	1	4	4	4	4	4	4	2
2017	20	21	10	10	11	14	21	10
2018	10	22	12	12	14	10	20	40
2019	10	10	10	6	11	12	10	10
2020	4	4	2	4	2	4	4	10
Total	97	112	79	80	92	97	121	120

\*Nonresident trappers also included up to 2010

23

- Mistik Management Ltd.**
- Number of trappers up
  - Number of pelts sold trending down
  - Value of pelt annual sales down
  - Number of trapper regarding maintenance of 'culture values' unknown

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#### 6.4. OPEN HOUSE SESSIONS FOR VOLUME III / TACTICAL PLAN

#### 6.4.1. SECOND OPEN HOUSE SESSIONS – INVITATIONS AND NOTICES

Notices were placed in local papers and in local communities inviting the public to attend an open house session where Mistik would give an overview of the tactical plan and Mistik FMP Volume III.





### Come out and tell us what YOU think about the forest...

Mistik invites you to a community event to learn more about Mistik's 2017 20-Year Forest Management Plan. Please join us for doughnuts and coffee at one of the meetings.

Date of Meeting	Stakeholder Community(s)	Location and Time
<b>Thursday</b> October 6, 2016	<b>Meadow Lake Area and area</b> The general public is invited to attend and provide input.	Catholic Church Hall 5 to 7 PM
<b>Tuesday</b> October 11, 2016	<b>Buffalo Narrows and area</b> The general public is invited to attend and provide input.	Buffalo Narrows Friendship Centre 5 to 7 PM
<b>Wednesday</b> October 12, 2016	<b>Glaslyn and area</b> L&M Wood Products employees, First Nations and general public are invited to attend and provide input.	Glaslyn Legion Hall 5 to 7 PM
<b>Thursday</b> October 13, 2016	<b>Big Island Lake Cree Nation / Goodsoil / Pierceland and area</b> The general public is invited to attend and provide input.	Big Island Lake Cree Nation Band office 5 to 7 PM
<b>Monday</b> October 17, 2016	<b>Beauval and area</b> The general public is invited to attend and provide input.	Beauval Community Hall 5 to 7 PM
<b>Tuesday</b> October 18, 2016	<b>Cole Bay / Jans Bay / Canoe Narrows and area</b> The general public is invited to attend and provide input.	Canoe Narrows Band Hall 5 to 7 PM
<b>Wednesday</b> October 19, 2016	<b>Waterhen Lake and area</b> The general public is invited to attend and provide input.	Waterhen Lake First Nation School Gym 5 to 7 PM
<b>Thursday</b> October 20, 2016	<b>Ile-a-la Crosse and area</b> The general public is invited to attend and provide input.	Ile A La Crosse Recreation Centre 5 to 7 PM
<b>Monday</b> October 24, 2016	<b>Dillon / St. George's Hill / Michel Village and area</b> The general public is invited to attend and provide input.	Dillon Band Hall 5 to 7 PM

## 6.4.2. SECOND OPEN HOUSE SESSIONS – ATTENDANCE

The following table (Table 6-2) outlines the attendance at the open house sessions





*Table 6-2: Attendance at first open house sessions held in October 2016*

Date of Meeting	Individual Name	Group Representing
October 6, 2016 <b>Meadow Lake</b> Catholic Church Hall	Roger Nesdoly Bernice Alger Brenda Nightingale Jeremy Nightingale Kathleen Gazey	Mistik Management Ltd. Mistik Management Ltd. Mistik Management Ltd. Self Forest Service, Ministry of Environment
October 11, 2016 <b>Buffalo Narrows</b> Friendship Centre	Roger Nesdoly Karl Schulz Bill Murray Kevin Gillis Nap Chartier Leon McCallum Ron Pederson Brent Caissy	Mistik Management Ltd. Mistik Management Ltd. Mistik Management Ltd. Mistik Management Ltd. BNS L26 Trapper Self Trapper
October 12, 2016 <b>Glaslyn</b> Legion Hall	Roger Nesdoly Bernice Alger Shawn Delainey Zane Delainey Terry Edwards	Mistik Management Ltd. Mistik Management Ltd. L&M Wood Products L&M Wood Products Trapper
October 13, 2016 <b>Big Island Lake CN</b> Band Office	Roger Nesdoly Cliff McLauchlan Karl Schulz Mark Doyle	Mistik Management Ltd. Mistik Management Ltd. Mistik Management Ltd. Forest Service, Ministry of Environment
October 17, 2016 <b>Beauval</b> Community Hall	Roger Nesdoly Bill Murray Karl Schulz	Mistik Management Ltd. Mistik Management Ltd. Mistik Management Ltd.
October 18, 2016 <b>Canoe Narrows</b> Band Hall	Roger Nesdoly Bill Murray Karl Schulz Russell Iron	Mistik Management Ltd. Mistik Management Ltd. Mistik Management Ltd. Canoe Lake
October 19, 2016 <b>Waterhen Lake FN</b> School Gym	Roger Nesdoly Bill Murray Karl Schulz	Mistik Management Ltd. Mistik Management Ltd. Mistik Management Ltd.
October 20, 2016 <b>Ile a-la-Crosse</b> Recreation Centre	Roger Nesdoly Bill Murray Karl Schulz Kevin Gillis Mark Doyle Louis Gardiner	Mistik Management Ltd. Mistik Management Ltd. Mistik Management Ltd. Mistik Management Ltd. Forest Service, Ministry of Environment Ile a-la-Crosse
October 24, 2016 <b>Dillon</b> Band Hall	Roger Nesdoly Bill Murray Kevin Gillis Tammy Sylvestre Raymond Billette James Sylvestre Joe Billette Arsene Nezcroche	Mistik Management Ltd. Mistik Management Ltd. Mistik Management Ltd. Buffalo River Dene Nation Buffalo River Dene Nation Buffalo River Dene Nation Buffalo River Dene Nation Buffalo River Dene Nation

### 6.4.3. SECOND OPEN HOUSE SESSIONS – RELATED CONCERNS AND ISSUES RAISED

The following is a summary of the questions and concerns that were raised which are related to the forest management plan. Questions that were not FMP-related have not been included (i.e.





“What is the process for getting a contract to do work with Mistik”).

Q = Question; A = Answer; C=Comment

#### Meadow Lake

Q – Where are the wood chips coming from? A – Chips come from Carrier, L&M and NorSask.

#### Buffalo Narrows

Q – What about consultation with Metis Locals? A – Metis Locals are invited to participate.

C – Trapper still upset regarding activity on trapline. Mistik committed to continue to communicate with him.

Most discussion was business related and about contract opportunities.

#### Glaslyn

Trapper mistakenly thought this was an operating plan meeting. He had no concerns.

#### Big Island Lake

No members of the public attended

#### Beauval

No members of the public attended. Mistik noted that the meeting advertisement was on the “rolling screen” on the local TV channel.

#### Canoe Narrows

General discussion & viewing of tactical plan maps. No concerns noted.

#### Waterhen

Due to a power outage in Waterhen the venue was not available for use. Mistik was not notified of this until staff arrived on site.

#### Ile a-la-Crosse

Maps reviewed, no comments or concerns noted.

#### Dillon

Q – Who owns NorSask? A – MLTC/9 member nations.

Q – Where does your product go? A – MLMP 100% to China, NorSask ~75% to US

Q – Where do chips come from and how are they generated? A – chips are a byproduct of making lumber, they come from NorSask, Carrier and L&M.

General discussion around the requirement to reclaim roads, residents want access for traditional uses.

C – Only now are animals returning to the forest. Roger – the healthiest forest for wildlife is one that provides habitat for all types of animals. Too much of one age class or another may limit the number of animals that can use that area.

Q – What is the benefit from forestry and roads for the community? A – Co-management fees, roads (i.e. Vermette, UCR – long term access).

#### 6.4.4. SECOND OPEN HOUSE SESSIONS – PRESENTATION GIVEN

The image displays a 5x3 grid of 15 presentation slides from Mistik Management Ltd. The slides are as follows:

- Slide 1:** 2017 20-Year Forest Management Plan "The Plan" Volumes II and III October 2016
- Slide 2:** Mistik Management Ltd. Forest Management Planning Standard (July 2016 draft) "The Plan" is composed of - Volumes II and III
- Slide 3:** Mistik Management Ltd. Mistik Management Ltd. is a woodland management services based out of Meadow Lake, Saskatchewan... HOW IS OUR PERFORMANCE?
- Slide 4:** Mistik Management Ltd. Come out and tell us what YOU think about the forest...
- Slide 5:** Mistik Management Ltd. We (Mistik) are going into our 27th Year
- Slide 6:** Mistik Management Ltd. Map of Saskatchewan showing land ownership.
- Slide 7:** Mistik Management Ltd. Map of land ownership in the Meadow Lake area.
- Slide 8:** Mistik Management Ltd. Welcome L&M Wood Products Ltd. into the Mistik 2017 20-Yr FMP "Fold" Long term family based business - Glaslyn Niche market oriented - treated wood products (fence post and timbers) MU 85 - L&M 3 spatially separated land areas embedded within the greater Divide Forest
- Slide 9:** Mistik Management Ltd. Forestry overview ~ Pre-1970 Widespread, small-scale 'mom and pop' logging of large spruce and pine ~ early 1970s - 1992 Start of larger scale forestry operations ~ 100 to 200,000 m³/yr Softwood sawlogs and softwood pulplogs targeted for harvest 1992 to present Increased utilization of the timber resource both softwood and hardwood
- Slide 10:** Mistik's mandate Diagram showing the relationship between Mistik, Meadow Lake Mechanical Pulp Inc., and the forest.
- Slide 11:** Mistik Management Ltd. NorSask - a world-class facility The largest First Nation-owned sawmill in Canada
- Slide 12:** Mistik Management Ltd. MLMP - a world-class facility The highest production BCTMP mill in the world

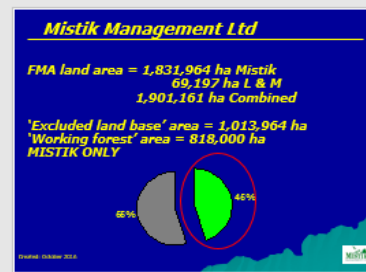




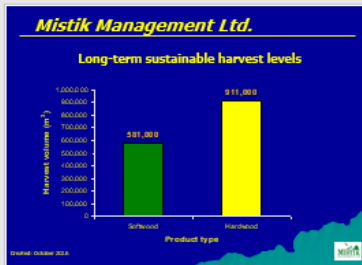
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<p><b>Mistik Management Ltd.</b></p>  <p>Created: October 2022</p>	<p><b>Mistik Management Ltd.</b></p>  <p>Created: October 2022</p>	<p><b>Mistik Management Ltd.</b></p> <p><b>"The Plan" – Volume III</b></p> <ul style="list-style-type: none"> <li>- Management Challenges on the License Area</li> <li>- natural disturbance(s)</li> <li>- structure retention</li> </ul> <p>Created: October 2022</p>
28	29	30
<p><b>Mistik Management Ltd.</b></p>  <p>Created: October 2022</p>	<p><b>Mistik Management Ltd.</b></p> <p><b>"The Plan" – Volume III</b></p> <ul style="list-style-type: none"> <li>- Management Challenges on the License Area</li> <li>- natural disturbance(s)</li> <li>- structure retention</li> <li>- access</li> </ul> <p>Created: October 2022</p>	<p><b>Mistik Management Ltd.</b></p>  <p>Created: October 2022</p>
31	32	33
<p><b>Mistik Management Ltd.</b></p> <p><b>"The Plan" – Volume III</b></p> <ul style="list-style-type: none"> <li>- Management Challenges on the License Area</li> <li>- natural disturbance(s)</li> <li>- structure retention</li> <li>- access</li> <li>- species at risk</li> </ul> <p>Created: October 2022</p>	<p><b>Mistik Management Ltd.</b></p> <ul style="list-style-type: none"> <li>• Species at Risk</li> </ul>  <p>Created: October 2022</p>	<p><b>Mistik Management Ltd.</b></p> <p><b>"The Plan" – Volume III</b></p> <ul style="list-style-type: none"> <li>- Management Challenges on the License Area</li> <li>- natural disturbance(s)</li> <li>- structure retention</li> <li>- access</li> <li>- species at risk</li> <li>- other forest uses/users</li> </ul> <p>Created: October 2022</p>
34	35	36
<p><b>Mistik Management Ltd.</b></p>  <p>Created: October 2022</p>	<p><b>Mistik Management Ltd.</b></p>  <p>Created: October 2022</p>	<p><b>Mistik Management Ltd.</b></p> <p><b>"The Plan" – Volume III</b></p> <ul style="list-style-type: none"> <li>- Management Challenges on the License Area</li> <li>- natural disturbance(s)</li> <li>- structure retention</li> <li>- access</li> <li>- species at risk</li> <li>- other forest uses/users</li> <li>- "uncertainty" (markets, fibre procurement &amp; flow, etc.)</li> </ul> <p>Created: October 2022</p>
37	38	39
<p><b>Mistik Management Ltd.</b></p> <p><b>"The Plan" – Volume III</b></p> <ul style="list-style-type: none"> <li>- Vulnerability Assessment to Climate Change</li> <li>- ongoing work with Sask. Research Council and Univ. of Sask. Graduate student project</li> <li>- Integration of Forest Management Activities with Non-Timber Uses</li> <li>- ongoing, basis for public engagement (e.g. co-mgt, outfitters, cabin, etc.)</li> </ul> <p>Created: October 2022</p>	<p><b>Mistik Management Ltd.</b></p> <p><b>"The Plan" – Volume III</b></p> <ul style="list-style-type: none"> <li>- Amendments to FMP</li> <li>- trigger defined by catastrophic volume loss</li> <li>- Revisions to Tactical Plan</li> <li>- trigger defined by catastrophic volume loss or significant change to baseline (e.g. Business AS Usual) conditions</li> </ul> <p>Created: October 2022</p>	<p><b>Mistik Management Ltd.</b></p> <p><b>"The Plan" – Volume III</b></p> <ul style="list-style-type: none"> <li>- Utilization Standards</li> <li>- defined in plan</li> <li>- Catastrophic Natural Disturbance Events</li> <li>- response in context of economic and ecologic variables</li> </ul> <p>Created: October 2022</p>
40	41	42





<p><b>Mistik Management Ltd.</b></p> <p><b>"The Plan" – Volume II</b></p> <ul style="list-style-type: none"> <li>- Planning Inventory</li> <li>- defined in plan, spatial in Geographic Information System (GIS)</li> <li>- Saskatchewan Forest Vegetation Inventory for entire Mistik and L&amp;M FMA's</li> </ul> <p>Drafted: October 2023</p>	<p><b>Mistik Management Ltd.</b></p>  <p>Drafted: October 2023</p>	<p><b>Mistik Management Ltd.</b></p> <p><b>"The Plan" – Volume II</b></p> <ul style="list-style-type: none"> <li>- Forest Development</li> <li>- entire forest categorized into 17 similar growth types</li> <li>- growth/successional</li> </ul> <p>Drafted: October 2023</p>
43	44	45
<p><b>Mistik Management Ltd.</b></p> <p><b>Mixedwoods</b></p> <p>tA/wS</p>  <p>Drafted: October 2023</p>	<p><b>Mistik Management Ltd.</b></p> <p><b>Mixedwoods</b></p> <p>tA/jP</p>  <p>Drafted: October 2023</p>	<p><b>Mistik Management Ltd.</b></p> <p><b>Jack pine</b></p>  <p>Drafted: October 2023</p>
46	47	48
<p><b>Mistik Management Ltd.</b></p> <p><b>Black spruce</b></p>  <p>Drafted: October 2023</p>	<p><b>Mistik Management Ltd.</b></p> <p><b>"The Plan" – Volume II</b></p> <ul style="list-style-type: none"> <li>- Silvicultural Ground Rules (SGRs) and Transitional Assumptions</li> <li>- defines Mistik's strategy and methods of forest renewal</li> <li>- plant white spruce</li> <li>- leave for natural trembling aspen</li> <li>- scarify and leave for natural jack pine</li> </ul> <p>Drafted: October 2023</p>	<p><b>Mistik Management Ltd.</b></p> <p><b>White spruce trees planted 2007 to 2015 – 13.6 million</b></p>  <p>Drafted: October 2023</p>
49	50	51
<p><b>Mistik Management Ltd.</b></p> <p><b>"The Plan" – Volume II</b></p> <ul style="list-style-type: none"> <li>- Values, Objectives, Indicators and Targets (VOITs)</li> <li>- must be measurable</li> <li>- in place re 2007 FMP, need only minor 'tweaking' for 2017 FMP</li> <li>- Mistik reports all results annually in it's Annual Report</li> <li>- 8 Annual Report (2007 to 2014)</li> <li>- VOITs serve for regulatory and voluntary certification purposes</li> </ul> <p>Drafted: October 2023</p>	<p><b>Mistik Management Ltd.</b></p> <p><b>2013 Annual Report</b></p>  <p>Drafted: October 2023</p>	<p><b>Mistik Management Ltd</b></p> <p><b>~ 33 communities within and adjacent to the Mistik FMA area (~ 20,000 people)</b></p> <ul style="list-style-type: none"> <li>• 14 First Nation (4)</li> <li>• 7 Métis (5)</li> <li>• 12 Agricultural (7)</li> </ul> <p>Drafted: October 2023</p>
52	53	54
<p><b>Mistik Management Ltd.</b></p> <p><b>7 co-management / advisory boards</b></p> <p><b>1 AOP and Special Meetings Only</b></p> <p><b>10 'community forests'</b></p>  <p>Drafted: October 2023</p>	<p><b>Mistik Management Ltd.</b></p>  <p>Drafted: October 2023</p>	<p><b>Mistik Management Ltd</b></p> <p><b>ISO 14001</b></p> <p><b>CSA Z809-08 (PEFC)</b></p> <p><b>FSC</b></p>  <p>Drafted: October 2023</p>
55	56	57



#### 6.4.5. ADDITIONAL PLAN REVIEW SESSIONS HELD WITH CO-MANAGEMENT/ADVISORY GROUPS

The second round of open house events (where volume III and the tactical plan were presented) were held early in the plan development process. Updating sections of the plan to be more in line with requirements in the new FMP planning standard (2017) resulted in additional review and delayed plan completion. Mistik agreed to give an additional overview/presentation at regular co-management / advisory board (community) and the November 2018 public advisory group (PAG) meetings.

#### 6.4.6. ADDITIONAL FMP UPDATE – LIST OF COMMUNITIES/PARTICIPANTS

The FMP update presentation was given at the following meetings:

Divide Forest Advisory Council Corporation    October 23, 2018  
Beauval Co-management Board    November 5, 2018





Canoe Co-management Board	November 7, 2018
Public Advisory Group Meeting	November 21, 2018
Buffalo Narrows	November 27, 2018
Waterhen Chief & Council	November 28, 2018
Goodsoil & Area (open house)	January 10, 2019
Big Island Lake Cree Nation	January 18, 2019

Note: a meeting was scheduled for Buffalo River Dene Nation (Dillon) for January 11, 2019 but was cancelled at the group's request. Representatives from the DeneSuline Co-Management Board attended the PAG meeting in November 2018 where the update presentation was given. Attempts have been made to schedule a meeting in Ile-a-la Crosse, but the group has not responded to date.

#### **6.4.7. ADDITIONAL FMP UPDATE – RELATED CONCERNS AND ISSUES RAISED**

##### Divide Forest Advisory Council Corporation

Presentation was given, no questions related to the FMP were asked.

##### Beauval Co-management Board

Q. – Was an extension given on the FMP deadline and if so, why was consultation not done? A – the FMP follows a workplan, which is revised and approved as needed. It is not uncommon for FMPs to take longer than anticipated (this has happened with other license holders in the province). It's partly due to the new standard that came into effect "mid-process".

Q – What are Caribou migration patterns according to you guys? A – We do ongoing research (3-year project) with Alpha Wildlife to help us better understand this.

Q – Is the annual report available to the co-management board? A – Yes, one can be made available to you. It's also posted on the Mistik website.

Q. – Is Mistik willing to do a video about Caribou and hunting/preservation? A – Mistik can work with the community to get something in place. (Note: Niska followed up by providing the board with information from the Ministry of Environment. There were suggestions for working with local papers, using social media and contacting the FWL branch for more information as to any input they may be able to provide).

##### Canoe Co-management Board

Q – When will Mistik start a new forest inventory? A – In approximately 3-4 years.

Q – Can fire breaks be done on reserve land? A – Yes, if the wood is suitable for the mills Mistik would be interested. Additional approvals would be required.

Q – What site prep is done after harvesting for reforestation? A – We used to do disk trenching, but we've found now that it's unnecessary and we are able to meet the standards for regeneration. We still do some scarification in pure pine stands.

##### Public Advisory Group Meeting

See meeting minutes from November 21<sup>st</sup>, 2018 PAG meeting (section 6.2 of this appendix)



### Buffalo Narrows

The plan was discussed with the new co-management (not officially formed yet) group. Most of their current concerns are around employment and contracts for Buffalo Narrows. There were no FMP-related questions.

### Waterhen Chief & Council

Q – You changed the softwood top size from 5” to 4”? A – Yes, we did, at the mills request.

Q – Are there other species at risk besides Caribou? A – Yes, Mistik has an extensive species at risk program through our certification program. Some of the other species were discussed.

Q – So the idea with Caribou is helping the population with minimal impact to our operations?

### Goodsoil & Area (open house)

No FMP-specific questions were asked. There was some discussion about Caribou in the north.

### Big Island Lake Cree Nation


The plan was discussed with the chief and representatives from council. BILCN is in the process of forming a new co-management board. There were no questions related to the plan at this time. Much of the discussion was around business opportunities for their community.

## 6.4.8. ADDITIONAL FMP UPDATE – PRESENTATION GIVEN











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**What's changed since the last time we talked about the FMP?**

- Mistik staff changes
- Documents updated to more closely meet new standards
- Addition of "new" information related to Caribou and how it's applied to planning
- Strategies to address species at risk and climate change
- Annual report "structure"
- Plan effective dates

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**Volume II (Document 4)– Values, Objectives, Indicators & Targets (VOITs)**

**VOITs in place from the 2007 FMP should only need "tweaking"**

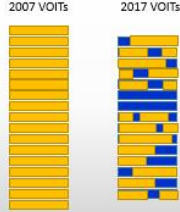
**The forest doesn't grow any different and really isn't managed any differently from 2007 but...**

- Provincial standards have changed
- In some cases, "old" VOITs did not fully meet the new requirements
- Some requirements are brand new

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**2007 VOITs**

**2017 VOITs**



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**Some Targets that have changed:**

1. Harvest Events
2. Measurement of Retention
3. Old and Very old Forest
4. Distribution of Harvest Activity

**Targets that are new**

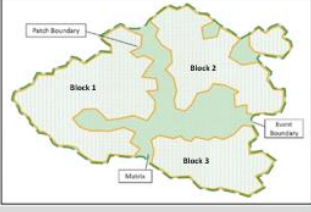
1. Softwood in Hardwood Stands
2. Harvest Event Duration
3. Strategy to lower Wild Fire Risk

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**Harvest Events**


- Old concept - new requirements
- Traditionally many targets were measured at the block level
- A "Harvest Event" is a group of blocks that are located within 500m of one another and are harvested within a 10-year period
- Some old targets are now measured at the harvest event level

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**Mistohay Tower Area – 2001/02 Harvest**




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**Targets that have changed in the way we measure them:**

1. Measurement of block retention  
Now measured by block and by harvest event (9% overall retention, min. 4% "in block")
2. Protection of Old and Very Old Forest  
Will be measured over the entire FMP Area. Old and very old forest moves around over space and time
3. Distribution of Harvest Activity  
Harvest levels are tracked and measured based on "Planning Units"

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**Targets that are New:**

**The softwood component in pure hardwood stands is maintained**

- This is not pertaining to mixedwood stands, only small amounts of softwood found in hardwood stands
- Usually done by leaving patch retention

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**Targets that are New:**






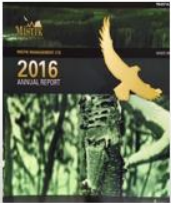

**Strategy to lower wild fire risk to communities**

**Mistik will continue to work with communities to create fire breaks where it is feasible**



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<p><b>Volume 3 – Plan Implementation</b></p> <p><b>What's been added/changed:</b></p> <ol style="list-style-type: none"> <li>1. Updated Plan Effective Date</li> <li>2. Species at Risk</li> <li>3. Vulnerability Assessment to address Climate Change</li> <li>4. Strategy for Management of Woodland Caribou – in development</li> </ol>	<p><b>Volume 3 – Plan Implementation</b></p> <p><b>1. Plan Effective Date</b></p> <ul style="list-style-type: none"> <li>o The 2007 plan has essentially been extended to cover the time period over which the new plan was being developed</li> <li>o 2019 – 2038 will be the effective date of the FMP.</li> <li>o The anticipated approval date is April 1, 2019.</li> </ul>	<p><b>Volume 3 – Plan Implementation</b></p> <p><b>2007 FMP Effective Dates</b></p> <p>2007 2008 2009 2010 2011 2012 2013 2014 2015 2016</p> <p>2007 FMP Start 2019 FMP Start</p> <p>2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038</p>
19	20	21
<p><b>Volume 3 – Plan Implementation</b></p> <p><b>2. Species at Risk (SAR)</b></p> <ul style="list-style-type: none"> <li>o Both Mistik and L&amp;M have extensive Species at Risk programs</li> <li>o Volume 3 has been expanded to include details around these programs</li> <li>o Designations are based on federal and provincial Species at Risk found in the FMP area</li> </ul>	   	<p><b>Volume 3 – Plan Implementation</b></p> <p><b>3. Vulnerability Assessment to address Climate Change</b></p> <ul style="list-style-type: none"> <li>o Mistik has participated in a study that focused on the impacts of climate change and how they effect sustainable forest management on the Mistik FMP area</li> </ul>
22	23	24
<p><b>3. Vulnerability Assessment to address Climate Change</b></p> <p>For the purposes of the FMP, two targets have been chosen to monitor and report on annually. The two targets are:</p> <ol style="list-style-type: none"> <li>1. The number of "days frozen" annually for three important lakes in the FMA area (Peter Pond, Keeley &amp; Turtle)</li> <li>2. Operational days lost due to "abnormal" weather/environmental conditions</li> </ol>	<p><b>Volume 3 – Plan Implementation</b></p> <p><b>4. Strategy for Management of Woodland Caribou</b></p> <ul style="list-style-type: none"> <li>o Under development...</li> </ul> 	<p><b>Volume 3 – Plan Implementation</b></p> <p><b>4. Strategy for Management of Woodland Caribou</b></p> <ul style="list-style-type: none"> <li>o Based on federal and provincial range planning processes</li> <li>o Knowing where Caribou habitat is</li> <li>o Determining how it affects our wood supply</li> <li>o Will likely result in changing plans and deferring harvest in some areas</li> </ul>
25	26	27
<p><b>4. Strategy for Management of Woodland Caribou</b></p> <ul style="list-style-type: none"> <li>o How do we manage for Caribou?</li> <li>o Limiting or deferring harvesting in higher value habitat areas</li> <li>o Follow "event" type harvesting (larger blocks, get in-get out, close roads sooner, etc.)</li> <li>o Reclaim "older" roads where possible</li> </ul>	<p><b>4. Strategy for Management of Woodland Caribou</b></p> <ul style="list-style-type: none"> <li>o Working with the Ministry of Environment</li> <li>o Province has maps of known Caribou areas</li> <li>o Mistik also has really good information about known Caribou areas</li> <li>o These areas generally overlap but the plan has to be "tweaked" to account for the differences</li> </ul>	<p><b>4. Strategy for Management of Woodland Caribou</b></p> <ul style="list-style-type: none"> <li>o What does the ministry expect?</li> <li>o There are designated Tier 1, 2 &amp; 3 areas (highest to lowest habitat value)</li> <li>o Higher value = more restrictive</li> <li>o Commitment by industry to follow provincial habitat management planning processes</li> </ul>
28	29	30
<p><b>Annual Report</b></p> 	<p><b>Annual Report</b></p> <ul style="list-style-type: none"> <li>o Will contain a section specifically to report on FMP provincial requirements</li> <li>o Will still contain most "left over" targets</li> <li>o Will be reporting on Certification targets</li> <li>o Single document reporting</li> </ul>	<p><b>Thank You!</b></p> 
31	32	33





## 6.5. PUBLIC ADVISORY GROUP (PAG) MEETINGS

### 6.5.1. SUMMARY OF PUBLIC ADVISORY GROUP MEETINGS HELD DURING THE 2019 FMP DEVELOPMENT

Development of the FMP was discussed at the following PAG meetings:

*Table 6-3: PAG Meetings with Discussion on FMP Development*

Meeting Date	General Areas of Discussion
October 16, 2014	2019 FMP mentioned as an upcoming project
March 19, 2015	Planning team terms of reference, workplan & consultation plan
October 1, 2015	Volume I
March 31, 2016	Volume I, VOITs
October 27, 2016	Volume III
April 6, 2017	Volume III, wood supply analysis, tactical plan
November 23, 2017	Volume III
May 15, 2018	FMP highlights
November 21, 2018	VOIT changes, volume III and Caribou plan

## 6.6. PAG MEETING MINUTES

PAG meeting minutes capture questions that were raised related to the general operation of Mistik and L&M and development of plans including the FMP. Invitation and attendance lists are included in the minutes.



Topic:

### 6.6.1. MINUTES OF THE MARCH 19, 2015 MEETING OF MISTIK'S PUBLIC ADVISORY GROUP (PAG)

Meeting location:

United Church, 502 6<sup>th</sup> Avenue West, Meadow Lake, SK

Meeting notes/minutes kept and prepared by:

Roger G. Nesdoly RPF, Mistik Management Ltd.

#### Meeting attendees (name and affiliation) were:

Interested Party	Participant Name
Alpha Wildlife Management	Gilbert Proulx
Bandaloop Landscape Ecosystem Services	David Andison
Buffalo River Dene First Nation	Terrence Byhette, Fred Byhette & Allan Noltcho
Canoe Lake Co-management Board	Richard Bouvier & Vivian West
Divide Forest Advisory Council Corporation	Barry Frisk & Harold Kimivaa
Ducks Unlimited Canada	Mark Kornder
Environment Canada – CWS	Steve Van Wilgenburg
Forestry Contractors	Tim Wall & Vicky Pryor
Ile-A-La-Crosse Metis Local #21	Gabriel Daigneault & Brennan Merasty
L&M Wood Products Ltd.	Zane Delainey & Travis Hagel
Meadow Lake & Area Residents	Rosemary Bouzan, Monty Samson, Gladys & George Wood & Jeremy Nightingale
Meadow Lake Mechanical Pulp Inc.	Paula Currie & Dwayne Mysko
MN-S Meadow Lake Local #31	Guy Tourond & Gwen King
MN-S Northern Region #2 (Bear Creek)	Dean Herman
MN-S Northern Region #2 (Buffalo Narrows)	Senator Johnny Woodward
MoE Fish & Wildlife Br.	Gigi Pitoello
Ministry of Environment Forest Service (ML)	Kathleen Gazey, N Caissy





Interested Party	Participant Name
Ministry of Environment Forest Service (PA)	Dwayne Dye & Rory MacIntosh
MoE Parks, Sport & Culture Branch	Bob Wilson
Ministry of Environment Wildfire Management	Landon Parenteau
Mistik Board of Directors	Chairperson Brenda Nightingale
Mistik FMA West District Stakeholder	John (Jack) Purves
NorSask Forest Products Inc. (MLTCRDI)	Erin Duff
NorSask Unionized Employees	Steven Soare
Northwest Communities Wood Prod./Beauval	Jamie Laliberte
Saskatchewan Environmental Society	Allyson Brady
Saskatchewan Trappers Association (Zone 8)	Leonard Greenhough
Saskatchewan Water Security Agency	Abul Kashem
Saulteaux First nation	Walter Lewis
Silvacom	Ryan Spooner
Third Party Softwood Quota Holders	Dean Millard
Tourism Saskatchewan	Tim Ouellette
Town of St. Walburg	Tony & Merrill Leeson
University of Saskatchewan, Department of Soil Science	Professor Ken Van Rees & visiting Prof. Ocan Turgay (U of Ankara, Turkey)
Village of Loon Lake	Ron Waugh
Waterhen Lake First nation	Chief Carol Bernard
Meeting Facilitator	Terry Lamon
Mistik Management Ltd.	Bernice Alger, Al Balisky, James Daigneault, Kevin Gillis, Niska Hodgson, Cliff McLauchlan, Bill Murray, Roger Nesdoly & Wendy Soulsby
<b>Regrets</b>	
Beauval Co-Mgt Board & Commercial Fishers	Participant did not attend
Buffalo Narrows Co-management Board	Participant did not attend
Big Island Lake Cree Nation	Participant did not attend
Canadian Parks and Wilderness Society	Participant did not attend
City of Meadow Lake	Participant did not attend
Northern Village of Green Lake	Participant did not attend
Rural Municipality of Meadow Lake #588	Participant did not attend
Saskatchewan Forestry Association	Participant did not attend
Saskatchewan Outfitters Association	Participant did not attend
Saskatchewan Wildlife Federation	Participant did not attend

**Supporting documents presented/provided to the Public Advisory Group (PAG) members for the March 19, 2015 PAG meeting.**

1. Public Advisory Group Meeting Agenda, Thursday March 19, 2015.
2. Minutes of the October 16 & 17, 2014 Meeting of Mistik's Public Advisory Group.



3. Mistik Management Ltd. 2017 Forest Management Plan, Planning Team Terms of Reference, December 2014 (Rev. #1 March 17, 2015)
4. Mistik Management Ltd. 2017 Forest Management Plan, Workplan, December 2014 (Rev. #1 March 17, 2015)
5. Mistik Management Ltd. 2017 Forest Management Plan, Public Consultation Plan, December 2014 (Rev. #1 March 17, 2015)
6. PP presentation – Climate Variability, Mark Johnston, SRC (Mark was absent due to illness thus Balisky and Nesdoly of Mistik gave Mark's presentation)
7. PP presentation – Boreal Avian Communities, Steve Van Wilgenburg, CWS, EnvCan
8. PP presentation – Ungulates, Furbearers and the Coarse Scale Habitat Mgt Paradigm, Gilbert Proulx, Alpha Wildlife Management
9. PP presentation – Site/Forest Productivity, Ken Van Rees, U of S
10. PP presentation – Pest Management Implications Related to Climate Variability, Rory MacIntosh, MoE FSB
11. PP presentation – "Biodiversity" and "Anthropogenic" Natural Forest Patterns, David Andison, Bandaloop
12. PP presentation – SK Response to the Federal Boreal Caribou Recovery Strategy, Gigi Pitoello, MoE, Fish and Wildlife Branch
13. PP presentation – Plausible Forest Futures 2090 Workshop Outcomes, Dwayne Dye, MoE, FSB

**Proceedings of the March 19, 2015 Mistik Public Advisory Group 'meeting:**

1. **Facilitator Terry Lamon commenced the March 19, 2015 Public Advisory Group (PAG) Meeting at 10:00 a.m. with a welcome, 'round the table introductions' and introduction of the agenda.**

2. **Facilitator Terry Lamon initiated discussion of the meeting minutes from the October 16 and 17, 2014 Public Advisory Group (PAG) Meeting. A motion by Jack Purves and seconded by Tony Leeson to accept the minutes as presented was passed.**

3. **Housekeeping, Roger Nesdoly**

Washrooms, exits, mileage, accommodation, meals and other miscellaneous items.  
Reviewed Mistik's current 11 staff members.

4. **PAG Business 2017-2017 20-Yr FMP Document Review of Planning Team Terms of Reference, Work Plan and Public Consultation Plan, Al Balisky**

Mistik provides services to three mills: L&M Wood Products, Meadow Lake Mechanical Pulp and NorSask Forest Products. This process we are embarking upon is a function of a regulatory requirement which occurs every 10 years. The Forest Management Plan (FMP) was been initiated with the three documents we are to review.

The Planning Team Terms of Reference document was reviewed/discussed.

The Work Plan document was reviewed/discussed. The work plan identifies all known concerns and/or issues. Five 'generic' issues and/or concerns were presented to the PAG. From PAG –





concern as to variance re hydrologic impacts/effects regarding the forest age class and cover types.

The Public Consultation Plan document was reviewed/discussed.

Q: What is the responsibility to the 'greater' PAG group of PAG members serving on the Planning Team?

A: Oversight and communication to the greater PAG group.

Observation: Planning Team PAG members, as required or deemed necessary, to ensure adequate communication with the greater PAG group as needed between meetings. How the PAG Planning Team representatives chose to communicate among/with the greater PAG group is their choice. Mistik may endeavor to help facilitate where possible.

## **5. Mill Updates and Projections for the Next decade.**

### **L&M Wood Products – Zane Delainey**

- is a privately-owned family company
- focus is on value added niche market products
- concentrate on complete use of the wood fibre at their disposal
- wood treatment called is CCA (copper, chromium and arsenic) for agricultural and industrial market and treatment plant has the capacity for 1.8 million posts
- sawmill is a headrig configuration (installed 2008) with an optimized canter line with 20 million board feet capacity
- L&M produces 144 different products
- is the 4<sup>th</sup> or 5<sup>th</sup> largest sawmill in Sask.
- post plant built in 2008 and can produce 750,000 posts/year with a single shift
- upgrades projected within 5 years
  - upgrading the headrig saw decks and adding a scanning component to the trim saws which is projected to increase sawmill capacity from 20 to 30 million board feet
  - improve post plant efficiency from 500,000 to 750,000 posts per year
  - double rail production from 40,000 to 80,000 per year
  - replace treatment plant natural gas boilers with wood fired boilers
  - double to triple firewood production
  - current wood consumption is 115,000 m3 of available 161,000 m3, want to achieve full consumption of 161,000 within 5 years
- upgrades projected within 7 years
  - rebuild planer and remanufacturing area
  - establish a new wood treatment plant in tandem with the existing one
- with all planned modernization/improvements by years 7 to 10 L&M may be able to consume 300,000 m3 of wood which would necessitate accessing additional fibre
- current market area is Manitoba to British Columbia, with all planned modernization/improvements by years 7 to 10 L&M hopes to expand its market reach from coast to coast (east-west) and into the United States (south)

### **Meadow Lake Mechanical Pulp (MLMP) – Dwayne Mysko**



- MLMP production is market driven and thus production for the last several years has been hardwood/softwood blended pulp
- MLMP, beyond several months of 'orders', does not have a longer-term production and marketing strategy
- current log and chip inventory are excellent
- MLMP targets 400,000 ADMT (air dried metric tonnes) annual production, this target has not been hit but it is hoped to be achievable in the near future
- pulp prices have been flat to declining over the past year, but the current value of the Canadian dollar has definitely helped MLMP bottom line
- this winter was a production challenge as one (of three) concentrators failed thus limiting the ability to recycle water and thus reducing pulp production. The evaporator was repaired and running within n two months (would have taken 8 months to get replaced new)
- softwood chip usage has decreased hardwood consumption/deliveries
- power cogeneration: MLMP would like to achieve but there are many hurdles to overcome, evaluation of cogeneration is ongoing
- MLMP has ongoing projects to evaluate production processes to improve/increase energy efficiency
- Paper Excellence, MLMP parent company, owns pulp mills located at Prince Albert, (on hold) and Meadow Lake, Sask., Chetwyn, McKenzie and Howell Sound, B.C., Pictou, N.S. and two mills in France.

Q: What about liquid effluent?

A: MLMP was the first and still is the only zero effluent mill in the world. No liquid effluent is discharged from the site. All water is recycled. The only water loss is steam coming from the pulp flash drying process. Make up water can come from 2 sources – well and/or Meadow Lake.

### **NorSask Forest Products – Erin Duff**

- 2012: \$3 million planer upgrade – reduced labor costs, reduced human error and increased efficiency
- 2014/15: \$3 million kiln project – to eliminate bottleneck at sawmill, kiln currently operating above expectations
- 2015: NorSask pellets: taking pilot project to production scale, based on demand production of pellets can move from one to two shifts in tandem with the planer
- near term global sales outlook:
  - 60% of production to U.S. and with strong dollar short term looks good
  - Increased fibre supply from Russia to China
  - Uncertainly regarding the Softwood Lumber Agreement (SLA) which expires October 2015
- 2015/16 anticipated mill fibre consumption 525,000 m3 (210,000 m3 from Mistik FMA)
- NorSask wants to achieve 200 million board feet annual production – to achieve this need to reduce downtime, create efficiencies and reduce costs
- NorSask goal to create and maintain safe working environment

Q: is NorSask reaching out to more distant Aboriginal regarding employment opportunities at the mill?





A: MLTC initiatives for Aboriginal (near and far) mill employment are 'works in progress'. A current example is the development of a transportation strategy to bring workers from outlying communities.

## **6. Forestry - Northern Community Perspectives**

### **Canoe Lake Co-management Board Perspective – Vivian West**

Vivian reviewed the history and function of the co-management board.

- The board originated as a result of the 1992 blockade.
- There are 4 members each from Canoe Narrows, Cole Bay and Jans Bay.
- The board reviews and comments on forestry operating (harvesting) plans.
- The board interacts with a multitude of stakeholders (e.g. trappers, cabin owners, etc.) and serves to pass on information to stakeholders.
- The board is a non-profit entity and supports community projects.
- The board will furnish Letters of Support to potential forestry related contractor opportunities.

### **Waterhen Forestry Perspective – Chief Carol Bernard, Waterhen Lake First Nation**

Waterhen Lake First nation is adjacent to Meadow Lake Provincial Park, has a population of ~1950 people, half of which reside on the reserve.

Waterhen Forestry started in 1994, obtained its first feller buncher in 1995 and in 1999 expanded with log loading and road building equipment.

Waterhen Forestry purchased a shop and existing truck fleet in 2012.

Waterhen Forestry is a 'stump to dump' operation in that it completes all activities (e.g. harvesting, road building and log hauling) required getting logs to the mills.

Currently harvests ~200,000 m<sup>3</sup> hardwood and 20,000 m<sup>3</sup> softwood.

Employs up to 50 operators in the winter plus an additional 12-14 drivers associated with the log haul.

Waterhen Forestry operated throughout the 2008-2010 downturn.

From a band perspective Waterhen Forestry fulfills the objectives of creating employment and returning profits to the community.

Waterhen Forestry still struggles with maintaining an adequate number of log haul truck drivers.

## **7. Climate Variability, Mark Johnston, Saskatchewan Research Council**

Mark Johnston was unable to attend the meeting due to illness. Mistik (Balisky and Nesdoly), with Mark Johnston's permission, gave the power point presentation in his absence.

## **8. Boreal Avian Communities, Steve Van Wilgenburg, Environment Canada's Canadian Wildlife Service Branch**

Power Point presentation

## **9. Ungulates, Furbearers and the Coarse Scale Habitat Management Paradigm, Gilbert Proulx, Alpha Wildlife Management**

Power Point presentation



**10.Site/Forest Productivity, Ken Van Rees, Dept. of Soil Science, University of Saskatchewan**

Power Point presentation

**11.Pest Management Implications Related to Climate Variability, Rory MacIntosh, Ministry of Environment Forest Service Branch**

Power Point presentation

**12.Biodiversity” and “Anthropogenic” Natural Forest Patterns, David Andison, Bandaloo Landscape Ecosystem Services**

Power Point presentation

**13.SK Response to the Federal Boreal Caribou Recovery Strategy, Gigi Pitoello, Ministry of Environment, Fish and Wildlife Branch**

Power Point presentation

**14. Plausible Forest Futures 2090 Workshop Outcomes, Dwayne Dye, Ministry of Environment, Forest Service Branch**

Power Point presentation

**Motion to adjourn 5:25 p.m. – Tony Leeson.**

**Facilitator Terry Lamon closed the meeting at 5:25 PM.**





Topic:

## 6.6.2. MINUTES OF THE OCTOBER 1, 2015 MEETING OF MISTIK'S PUBLIC ADVISORY GROUP (PAG)

Meeting location:

United Church, 502 6th Avenue West, Meadow Lake, SK

Meeting notes/minutes kept and prepared by:

Brenda Nightingale and Cliff McLauchlan, Mistik Management Ltd.

### MEETING ATTENDEES (NAME AND AFFILIATION) WERE:

Name	Affiliation
Barry Opekokew	Canoe Lake Cree Nation
John Purves	Goodsoil/Pierceland
Dwayne Mysko	MLMP
Zane Delaine	L&M Wood Products
Travis Hagel	L&M Wood Products
Dale Sheppard	Meadow Lake
Ron Waugh	Loon Lake
Leonard Greenhough	Makwa-Zone 8 Trappers
Chris Dallyn	MoE-Prince Albert
Robert Follett	MLTCII/NorSask
Fred Byhette	Buffalo River Band
Larry Anderson	DFACC
Alden Halseth	DFACC
Narayan Dhital	MoE
Mark Doyle	MoE/Forest Service
Simon Imray	MLMP
Kathleen Gazey	MoE-Meadow Lake
Calvin Groot	Northern Lights Snowmobile Association
Bill Thibeault	MoE-Meadow Lake
Paula Currie	MLMP
Allyson Brady	Sask Environmental Society
Terrance Byhette	Buffalo River Band
Norman Martell	Waterhen Lake First Nation
SueAnn Fiddler	Waterhen Lake First Nation
Toney Leeson	St. Walburg
Merrill Leeson	St. Walburg
Sheri Andrews	University of Saskatchewan
Kevin Gillis	Mistik
Brenda Nightingale	Mistik



Cliff McLauchlan	Mistik
Niska Hodgson	Mistik

**SUPPORTING DOCUMENTS PRESENTED/PROVIDED TO THE PUBLIC ADVISORY GROUP MEMBERS FOR THE OCTOBER 1, 2015 MEETING:**

1. Public Advisory Group Meeting Agenda, Thursday October 1, 2015.
2. Minutes of Public Advisory Group Meeting held March 19, 2015
3. Mistik Management 2013 Annual Report - hard copy and power point presentation
4. PP Presentation - ISO, FSC and CSA 2015 Certification update Report
5. PP Presentation - Volume 1 Background Information Document of MISTIK's 2017 20-year FMP
6. PP Presentation - Forest Inventory
7. PP Presentation - Forestry Access Winter Crossings

**PROCEEDINGS OF THE OCTOBER 1, 2015 MISTIK PUBLIC ADVISORY GROUP MEETING:**

1. **Brenda Nightingale, Chair of the Board of Directors of Mistik Management Ltd. called the Mistik Public Advisory Group meeting to order at 10:16 with welcome and round table introductions and introduction of the agenda.**
2. **Minutes of the Mistik Public Advisory Group Meeting held March 19, 2015 were circulated. A motion by Leonard Greenough and seconded by Ron Waugh approving the Minutes as circulated was passed.**
3. **Housekeeping Matters - Brenda Nightingale** - washrooms, exits, mileage, accommodation, meals and other miscellaneous items
4. **Current Affairs**

**a) Mistik Personnel Changes - Brenda Nightingale**

Reported on resignation of Al Balisky as General Manager of Mistik, expressing appreciation for his leadership at Mistik which inspired, guided and supported all Mistik Operations and extending best wishes for his future undertakings in leadership with MLTII.

Reported on appointment of Roger Nesdoly as General Manager and on recruitment for a new Planning Coordinator to replace Roger Nesdoly who formerly held this position.

Spoke of Roger's recent illness and reason for his absence at this meeting. Acknowledgement was given to the impressive effectiveness of Mistik team in going forward with all operations in absence of Roger and deep gratitude was expressed on behalf of the Board of Directors and Shareholders of Mistik to the Mistik staff.

**b) Mistik Harvest Operations - Kevin Gillis**

Operations started up in Jumbo Lake area in pine and hardwood blocks early in the spring.

A new contractor Dean Hermann associated with Buffalo Narrows Management Unit began operations. He will be working as a processor across the FMA.

Further North in the FMA operations in areas which include the communities of Jans Bay, Cole Bay and Canoe Lake and Beauval, a conglomeration of various contractors work with Mistik to bring product to roadside for haul. Contractors are working North of Canoe right now about 135





km North of Meadow Lake on Highway 903. This is the most northerly operations Mistik has undertaken in a number of years, working around areas where there has been fire. Hauling operations come from Waterhen which delivers its own hardwood products and from Canoe and Gravel Express which delivers softwood cut to length products to NorSask.

Almar Limbing were operating on the East West Road starting in June and wrapped up operations there. They are now working in the Divide Forest on the Burness Road. There have been no operations there for quite a few years. Initially there was a challenge to begin operations because of rain, but with good weather over the last few weeks they are now harvesting about 4 km on the Burness Road.

Heppner is hauling on East West road from Km 45 to 60 and is delivering to MLMP.

Communities in the FMA faced various impacts from fire this year and in July Mistik spent time in trying to provide assistance and support to the Keewatin Yathe Health Authority by providing them with maps providing information about forest roads which could facilitate evacuation plans. As many of the local communities use these roads it was important that the Health Authority know the location and conditions of various roads.

Until this summer Mistik had not experienced a lot of fire impact since 2006. This year Mistik will be conducting salvage operations in relation to two fires. The first is the Bob fire which the Mistik PAG will be touring tomorrow located in the Canoe Lake area, along Highway 903.

The other fire which is going to be subject to a salvage plan with MoE is the Jayleen fire on the Upper Cummings Road with a burn area of more than 20,000 hectares.

The Bray fire had a big impact on Vermette Lake and Dillon Lake areas. There were different degrees of burn there. Lots of patches were left behind but jack pine and spruce burnt very hot. Vermette has numerous cabins from surrounding communities.

The Sudden Fire on Highway 155 in Durocher Lake area south of Beauval and north of Green Lake burnt a lot of muskeg and low productivity ground. Not much timber to salvage.

The Pond Fire in the Waterhen area was close to highway 903 and the Waterhen Cut Across road. No timber to salvage.

The Divide Fire started this summer south of Meadow Lake just off Sundance road and burnt a lot of cutover area. It was one of the earlier fires in the year. No timber to salvage.

The David Fire impacted communities of La Loche, Buffalo, and Dillon. This fire burnt a bit of the north end of FMA near community of Garson Lake and is too far north for MISTIK to salvage any timber.

The Mug Fire near Dore Lake burnt a few hectares and is not in MISTIK's FMA, so MISTIK cannot salvage this fire as it will have to be done by the SAKAW shareholders in the PA FMA.



Mistik will be doing a limited salvage plan this year trying to access some of the wood products as insects play a big issue for wood quality.

**Q:** What salvage plans applications have been made to MoE?

**A:** Applications have been made in relation to the Jayleen and Bob Fires. There is no submission for Dillon area yet, nor the Durocher Lake area. These submissions were not made because there was not a lot of salvageable timber available.

**Q:** Can there be a request for salvage operations for part of the Dore Fire off the FMA?

**A:** No, because it is in someone else's FMA and even if it were within our FMA our capacity is limited because of road constraints.

**Q:** How big was Bob Fire?

**A:** Around 2,000 hectares.

**Q:** What about the effect of insects?

**A:** We are time limited, they begin infesting immediately. When we bring infested wood into any mill it will have to be sold as a discounted product. We try to do the most harvest the year of fire and potentially the second year after.

**Q:** What about recruitment for Roger and what will be his presence with planning?

**A:** Roger will be handling recruitment for a Planning Coordinator. Mistik is also working on succession plans for all senior employees who may be leaving Mistik due to retirement in the next number of years and is aware of the fact that it may be necessary to hire an additional forester if operations move further north on the FMA.

While Roger is now GM, he will still be involved with Planning, just as Al Balisky used to work closely with Roger in the past.

**Q:** When there are fires, does low bush cranberry come back and how long for low bush cranberry to come back?

**A:** Yes, they do come back but they usually take an extra year beyond other berry types. Blueberries will grow rapidly in the 2nd and 3rd years, but cranberry take an extra year because they grow as a vine. Blueberries will be dominant initially and so too will mushrooms.

### **c) L & M Harvest Operations - Zane Delainey**

L & M harvest operations are concentrated in Divide Forest Area so not as large a landscape as Mistik, as a result L&M just uses one contractor. The volume harvested is small enough to support one harvester, but not numerous ones.

Had late start this year because of weather, but the late start was planned. When the harvest started in late July and early August then the rain started and couldn't haul. L & M only have had wood coming in last few days.

This year the focus will be on harvesting jack pine for posts and rails and which will also feed the sawmill. L & M will be pushing for full harvest off the L & M land base which is in 3 harvest blocks and operations will be conducted in all of them this year. It will take to the end of March to get all of the wood in.





There were no fires in the Divide Forest which changes their planning, but because of fires on the PA FMA side there is some impact on harvest. L & M is working with Mistik to develop plans and this planning process works very well.

**Q:** What will be harvest this year for full allocation?

**A:** 86,000 softwood and 44,000 hardwood.

**Q:** What is area for harvest operations?

**A:** About 115,000 hectares for whole base, usually under 1,000 hectares for harvest

**Q:** What is the cut block size?

**A:** The cut block size gets bigger and bigger each year to emulate forest fire patterns, now the smallest cut block is 20 hectares.

**Q:** How is the demand for fencing materials right now?

**A:** Because of price of beef coming up demand for fencing material is also up, that is why we are focussing on jack pine because that is what we use for posts. We are harvesting another way too. We used to do tree-length, now the crew in the forest with processors are harvesting into 12- or 13-foot lengths and we are building the infrastructure at L&M to do 6-foot posts.

**Q:** Is Almar working for you this year?

**A:** Not this year, we are working with P & E only, but when we do work on the PA FMA, we will sometimes use other contractors.

**Q:** Any plans to operate in Lavigne area of your FMA?

**A:** Yes, by working with Mistik on planning we can build a road system there to keep us away from water crossings, so we will have a main road and then keep branching off.

**Q:** Why are you looking at doubling production?

**A:** This is partly because of an increase in demand and also because of our capacity to create more posts and treat them. We wanted to make sure that the treating plant could handle the production, then we looked at capacities in the post plant and now we can look at the harvest volumes.

**Q:** Are you doubling harvest?

**A:** Yes, we will go from 20,000 m<sup>3</sup> to 40,000, but that also opens up more saw logs for us too.

**Q:** Do you use hard and softwood for posts?

**A:** We harvest hardwood, but we don't use it. MLMP and Tolko OSB takes our hardwood. We move the right wood to the right mills.

#### **d) MLMP Operations - Simon Imray**

Introduced himself as being involved in pulp industry since 1988, beginning in Whitecourt Alberta then when the decision was made to build this mill, he came to Meadow Lake in 1991 when ground and foundations were being laid for mill. He thought he would be in Meadow Lake for 5 years and is still here. He has been the General Manager of the mill 2011 having worked through production positions at the mill.



The mill has been on shut down since Sept 14 because of the market conditions. MLMP had an over stock of inventory of finished pulp in Canada, and it reached a point where the MLMP shareholders said enough had been produced and was just being warehoused in Vancouver. The timing of the shutdown coincided with a planned outage of the mill in September for a 7-day period to do maintenance, with 2.5 million dollars to be spent on maintenance and repair during the shutdown. MLMP decided to go through with that work, but to reduce reliance on contractors as much as it can by using existing staff. The shutdown now is scheduled to be for four weeks with a tentative start up is October 15, but this is yet to be confirmed as inventory is still too high and there aren't a lot of pulp orders at the present time.

From forestry perspective MLMP has not told Mistik to slow down in operations. Fibre inventory at MLMP was run low intentionally, and with the wet season and slow on delivery it worked out well for the mill.

MLMP continues to buy woodchips from NorSask and Carrier and is trying to divert those chips to other users. As of right now there is a growing stockpile of hardwood roundwood at the mill and a growing pile of softwood chips. But it is business as usual for fibre supply from Mistik.

**Q:** Why is this happening?

**A:** Pulp is all sold to China for a parent company of this mill which will make packaging board with our pulp which is considered a low-cost type of pulp. Better types of pulp come from chemical pulp mills like PA with higher brightness and whiteness. MLMP is a mechanical mill so has low cost fibre. The Chinese economy has slowed down so China usage has decreased on the pulp. MLMP's main customer is in South East China and they have 5 months of MLMP inventory in their warehouse. The game plan is to try to shift market into Europe, but it is hard to break into market when pulp price is so low. We can't run the mill at such low prices. Pricing has to go back up for this mill to run at a profit. The US dollar exchange rate is helping, but pulp prices need to come back up. One side of all of this is price, the other is input cost. Mistik has done a great job to keep cost relatively constant in the face of rising fuel costs and labour costs.

The greater issue is not in relation to wood cost. When we started looking at this, we saw in relation to the cost of goods going into a ton of pulp wood used to be the highest cost item. It is now second highest cost with energy costs, electricity now being the biggest. A 2% increase for a home owner is a lot, but for the mill this 2% increase means 1 million dollars, so the mill is talking to SASK POWER executives about this. They could put the mill out of business by charging utilities at this price. This mill is critical to forestry sector in Saskatchewan and because of use of aspen we support the saw mills by sharing the forest with the softwood users. This makes their cost of getting wood cheaper as they are harvesting mixed forest. We have taken softwood chips from all three saw mills in the past, now we just purchase from Carrier and NorSask.

We have not done layoffs at the mill this summer as we have put all our mill staff to work on the shutdown doing the maintenance, thus we have cut back with contractors. We are in a cash conservation mode at the mill. If there is no start up on the 15th, there will be more changes at the mill.

**Q:** Where did you go with bio-mass power project?





**A:** We have kept it going. It will be about \$100 million to start it. Right now, we are incinerating bark and sludge, but bark production has gone down. We need bark to burn wetter effluent, so we have created a bit of an imbalance between bark and sludge. It is hard to keep up with burning sludge.

**Q:** What would be the payback period for the bio-mass power project?

**A:** That is the key. We have a lucrative power purchase agreement with SASK POWER. But the key is that you can't have any fossil fuels in there to qualify - it has to just be bio-mass. It gets complicated because Paper Excellence owns this mill and also PAPI pulp mill in Prince Albert. They own both power purchase agreements and can divide it up between the two mills. Our power plant in Meadow Lake gets tied in with complexities in PA. MLTC still has their power purchase agreement and plans. I hope that Meadow Lake area sometime will have a biomass plant. The MLMP pulp mill was a world class on environmental standards being a zero effluent mill when it was built; why not take it the next step and not burn? So, the plans are still on the table, with 3 vendors selected, but the prices are so broad we have to bring them down before making a final selection on vendors, financing has to be in place, and we have to have a secure fuel supply before we move forward.

Another option we are looking at is that MLMP build on the fence power generation. If MLMP can't get anywhere on reduction in the electrical rate, we will have to do it ourselves and self-generate so we can choose whatever power options we want. We have visited some other mills that are doing this.

**Q:** Canoe Co-management Board has environmental concerns about pulp mill, concern about poison coming from the pond. There should be more communication annually or quarterly to the stakeholders or communities explaining what goes on out there. With burning dry sludge is that dangerous to the environment?

**A:** There are no particular emissions coming from that. It is a high temperature 1200-degree exhaust. It is a refractory system.

**Q:** MLMP should explain this to stakeholders and communities. How is communication done?

**A:** Specifically, on the incinerator MLMP talked to nearby neighbors, residential occupants where wind might carry particles. MLMP has spoken with them face to face and have sent samples of ash content. Nearby residents seem to be fairly comfortable with their houses.

**Q:** What about poisons from the ponds?

**A:** It needs to be contained and it is contained. We have groundwater monitoring wells which continue to be monitored.

**Q:** Is there one from the lake?

**A:** Yes, we take samples from the lake or drill our own well to the aquifer. We have to report each month to MoE, so it will tell us if there are changes.

**Q:** This needs to be communicated to the public. Perhaps this should be done by MoE or somebody.

**A:** I believe our obligation is to report to MoE, it is then up to MoE to decide if there is anything further to do with communication to the public.



**Q:** With downsizing and money problems, don't you have a big expansion going on in the back of the mill?

**A:** Yes, we are building a new sludge landfill. MLMP had to do that because MLMP didn't want to put sludge in there. We would rather burn it or do a power plant, but we have to be good stewards. We can't put the sludge on unprotected ground, so we are building a landfill which is lined. It is a necessity of our business.

**Q:** Is it done?

**A:** It is two weeks away from being done.

**Q:** Canoe has been trying to get involved with all three mills in hauling the finished product. Who is your hauling contractor?

**A:** We have Edge Transport.

**Q:** Can a guy get in there for work?

**A:** Yes, talk to Brent. We don't have a long-term agreement with any carrier. If you want to haul pulp talk to Brent.

**Q:** How does fire wood impact the mill?

**A:** In 2006 the mill received some. The mill can deal with it, but there can be no burn under the bark. MLMP can't turn char back to original brightness. Pulp brightness or whiteness is measured in a percent. MLMP would have to bleach heavier to bring up to the proper brightness. We will work with Mistik to do as much as we can to sort burnt wood in the field. We don't want to just let it stand and let it be insect ridden, but we have to be careful that we don't through the mill off grade. We manage the risk.

**Q:** About Green Power can there also be natural gas?

**A:** There can be a bit of natural gas assist to get it started, but after that it can't be sold as green power if there is gas. We are looking at various avenues to see if we can get the money to get this started.

#### **e) NorSask Operations - Robert Follett**

Agreed with Simon Imray's comments about co-operation between mills and need for pulp industry to be strong.

Robert Follett came to Saskatchewan in 1999 to work for Mistik and then in 2011 he moved to PA Pulp. In April of 2015 he joined MLTCII (NorSask) as Fibre Manager.

NorSask had a good year with production records of 120 million board feet. But now market conditions have fallen off, the USA isn't buying, the Chinese market has dried up and there is no "super cycle" that the economists talked about. As well BC mills are pumping beetle-killed low-grade product into the market.

As a result, NorSask had to go from 2 shifts to 1 1/2 shifts with the strategy to take some product off the market and get costs down. October 12, 2015 is the date of the expiry of Softwood Lumber Agreement so there will probably another price drop.

Even with this there is the expectation that 400000 m3 will go through the mill this year. This will be back to normal as last year's 500,000 m3 was unusual. For this 150,000 - 200,000 m3 will come off the Mistik FMA and the remainder off the PA FMA.





NorSask started the pellet mill and while it is not up to full production it is operating at about 50 - 60 percent capacity. The hammer mill couldn't keep up to the pelleters, so NorSask is ordering a new hammer mill to have this capacity. Pellets will be sold in bulk about will go to the oil and gas industry for spills and the remainder to market for home owners for furnaces.

MLTCII owns NorSask Transport and has 9 logging trucks which deliver to NorSask, MLMP and Tolko mills and is looking at expanding this over the next few years.

**Q:** It is frustrating that I can't buy NorSask wood locally to build my garage. I have to buy BC wood. Are there opportunities to sell NorSask wood in Saskatchewan?

**A:** You are right, I have to buy Carrier lumber in PA, not from our sawmill. But there is a better return for NorSask to sell to the US market. On the pellet side there isn't a huge local market, but every bag we can sell locally is good for NorSask.

**Q:** How can you sell locally with pellets?

**A:** Many companies use pellet brokers. We are small enough we can sell to individual buyers, around \$5.00 to \$6.00/bag. We will be selling in bulk soon. We hope to sell 30% of the mill production in bulk.

**Q:** That is expensive compared to coal. Will pellet prices ever be comparable to coal?

**A:** I doubt if we will ever be able to compete with coal in cost. But I can say our pellets are made from shavings from the mill with no bark, so they are very high BTU. Pellets are really high quality for burning, but in terms of cost with coal, we probably can't compete.

**Q:** Can you use sludge from MLMP for pellets?

**A:** It was tried, and it cannot hold together to make pellets. MLMP has tried other machines and it doesn't work because of high moisture. There are also residual chemicals in sludge which make it not so useful for pellets, and there is an odor too it too.

**Q:** NorSask used to sell fire wood. Do you still do that?

**A:** Some people get trim blocks where trucks clean log decks. But similar to L&M we might be able to dump some for people buy.

**Q:** What about getting fire logs right from the bush? There is a gate on Chums road, and we can't get in.

**A: Answered by Kathleen Gazey MoE:** The gate is there to protect wildlife populations from extreme hunting pressure and conservation officers are monitoring it. They aren't closed just for the sake of keeping people out, there are important ecological reasons for gates. When the gate is open, people can use the road to get firewood.

**(Adjourned at 11:44 for lunch)**

**(Recommended at 1:00)**

**f) L & M Operations - Zane Delainey**

L & M runs a single shift at its operations and employees between 85 - 90 people. L & M remains in a "niche" market, doing small scale operations consisting of a saw mill, a post and rail



plant, firewood sales, wood treatment and custom work such as building pallets. This gives L&M more flexibility in production as it can do things which other mills which are bigger cannot. In last year's report L&M said it was 2 - 5 years out from optimization project, now it is 6 - 8 months out from that. Producing 144 different products will continue. Optimization is not just about moving more wood through, but the purpose of optimization is better recovery and better-quality products. Typically, through optimization L&M can get more production, it is not just about getting more wood through. L&M remains committed to getting the most product out of each piece of wood.

L&M will be going to a double shift and is just working out the logistics around the post plant, but we are planning to double shift it also, probably by this spring. Demand for posts is strong and the window for post sales is about 5 years.

In the treatment plant L&M went from doing 6 charges a day up to 13 - 14/day, but one of the downfalls of this increase in treated wood production was that the boiler now requires an improvement sooner. Other improvements are all on line too.

L&M was originally a privately-owned family company. In November L&M will become a publicly traded company. We will become part of Jemi Fibre Corporation out of BC. Once that sale is concluded L & M will become Canada's largest producer of agricultural posts and rails. Jemi has been a key player in optimization. As we went through the process of negotiating the sale to Jemi, they found that L & M's system works well, so they want to keep all of L & M's personnel and systems and move their other companies more into line with what L & M has been doing.

L&M is also moving forward more into more firewood marketing especially for jack pine and we hope to work closely with NorSask, through Mistik to look at wood flow and value of wood so that wood is moved to where it is supposed to go.

**Q:** Exciting times.

**A:** Yes, it is. There will be change, but it is positive change, it is not gutting the company or involving job loss. It offers opportunities to expand and do the things L&M always talked about doing but never had the financing to do so like wood optimization.

**Q:** What percentage of product is treated vs. non-treated?

**A:** We treat with CCA (copper chromium arsenic) which is best for agricultural and industrial use. It cannot be used for homes and residences. At one time treated product was 75% of the mills total production but now it is more like about 45%. L&M deals a lot with oil companies for looking for dimensional lumber for wood matting for lease pads. This is still a good market. Production can't keep up to sales right now on posts. L&M has the same issue as NorSask, when the price for studs go down, the price for everything goes down, but L&M picked up sales in different places. In the future L & M will also be doing more treating through Jemi.

**Q:** Once the sale goes through will the name change; will the relationship with Mistik change?

**A:** No. L & M won't change its name, it keeps operating as is. The relationship with Mistik won't change.

**Q:** What is furthest market?





**A:** China and Kansas, but with a drop in the China market, China isn't a feasible market right now. L&M is trying to do more sales directly to the local dealers rather than to wholesalers when trying to sell their product to the local market. In a commodities market we are trying to say, "Why don't we just ship directly?" and cut out the middle man.

## **5. Certification Update - Kevin Gillis**

- a) Update re ISO 2015 audit results**
- b) Update re FSC 2015 audit results**
- c) Update re CSA 2015 Z809 results**

**PP Presentation by Kevin Gillis, Mistik Management Ltd.**

No questions

## **6. Mistik 2013 Annual Report - Al Balisky**

**PP - Presentation Al Balisky, former GM of Mistik Management Ltd., presently of MLTCII.**

**Q:** Could you describe the relationship between Mistik and L & M for this year and in the future?

**A:** L & M and Mistik have been close partners. The pulp mill receives hardwood from L&M on a consistent basis and this has worked well for L & M. Mistik has had a longstanding relationship with them which is very positive. L&M's license is embedded in Mistik's land base and is now formally part of Mistik's FMP renewal process and certification programs.

**Q:** Is this report available to the public?

**A:** Yes, it is, it will be posted on the MISTIK website.

## **7. Volume 1 Background Information Document of Mistik's 2017 20 Year FMP - Niska Hodgson and Kevin Gillis**

**PP Presentation by Niska Hodgson and Kevin Gillis**

**PP Presentation from Silvacom on forest inventory presented by Kevin Gillis**

**PP Presentation on Forestry Access Winter Crossings by Kevin Gillis**

**Q:** Are there trends in trapping related to specific communities showing an increase/decrease in various communities? There is concern that the statistics shown are not the true representation of the active trappers in the northern fur zone, which leads to the misperception that there is no one trapping in the north so there are no concerns by trappers in the north about the forest in the north, which is untrue.

**A:** The Saskatchewan government creates annual trapping stats by tallying the number of licenced Saskatchewan trappers that have sold fur to either of the two fur auction houses in Canada each year. Traditional users do not trap under license or sell through auction. If someone traps and furs for moccasins this would not necessarily be reflected in the statistics maintained by MoE. There is a perceived difference between "community knowledge/statistics" and government statistics and in some areas, there are issues regarding the sharing of this information.

**Q:** Why is there such a sharp increase in the number of trappers in some of the FCA's

**A:** Not sure exactly but some communities there has been an increase in new young trappers.



**Q:** How will harvesting activities be modified for habitat protection for caribou?

**A:** A lot of protected areas (CPA's-Candidate Protected Areas) for caribou habitat were protected voluntarily by Mistik even before the government regulations came into effect for protection of habitat. We will continue to ensure that if we know there are caribou, we will try not to do any harvesting that will impact them negatively.

**Q:** But this wasn't really any modification of harvesting activities because you weren't going to harvest there anyway because it was muskeg. How is exactly is this a "modification" then?

**A:** We try to maintain things in an intact state. We can't go over the threshold so 65% has to remain not impacted, so we do have that parameter in place. But in addition, where we know there is caribou habitat, we will not impact the habitat through avoidance. We will not build roads through the CPA's to access harvesting areas near or adjacent to the caribou habitats as well.

**Q:** What impact is there on certification for pulp being sold in China?

**A - Answered by Dwayne Mysko.** It doesn't matter much at all for China, but as MLMP is looking at European market, it is very important for MLMP. It also matters for US markets.

**MEETING ADJOURNED AT 4:59 P.M.**

***Note: the presentation given at this meeting for Volume I was the same one given at the first open house sessions and can be found in section 3.4 of this document.***





Topic:

### 6.6.3. MINUTES OF THE MARCH 31, 2016 MEETING OF MISTIK'S PUBLIC ADVISORY GROUP (PAG)

Meeting location:

United Church, 502 6th Avenue West, Meadow Lake, SK

Meeting notes/minutes kept and prepared by:

Roger G. Nesdoly RPF, Mistik Management Ltd.

**Meeting attendees (name and affiliation) were:**

Interested Party	Participant Name
Buffalo River Dene First Nation	Terrence Byhette & Fred Bhyette
Forestry Contractors	Tim Wall & Vicky Pryor
L&M Wood Products Ltd.	Zane Delainey & Travis Hagel
Meadow Lake Mechanical Pulp Inc.	Dwayne Mysko & Lexi Gardiner
Ministry of Environment Forest Service (ML)	Kathleen Gazey, Janine Leach
Mistik Board of Directors	Chairperson Brenda Nightingale
Mistik FMA West District Stakeholder	John (Jack) Purves
NorSask Unionized Employees	Larry Boudreau
Northern Lights Snowmobile Club	Calvin Groot
Northern Village of Buffalo Narrows	Estelle Laliberte
Saskatchewan Environmental Society	Allyson Brady
Saskatchewan Research Council	Mark Johnston
Third Party Softwood Quota Holders	Dean Millard
Tourism Saskatchewan	Tim Ouellette
Town of St. Walburg	Tony Leeson
U of S, Department of Soil Science	Professor Ken Van Rees
University of Saskatchewan	Sheri Andrews
Village of Loon Lake	Ron Waugh



Interested Party	Participant Name
Meeting Facilitator	Terry Lamon
Mistik Management Ltd.	Bernice Alger, Kevin Gillis, Cliff McLauchlan, Roger Nesdoly & Karl Schulz
<b>Regrets</b>	
Beauval Co-Mgt Board & Commercial Fishers	Participant did not attend
Buffalo Narrows Co-management Board	Participant did not attend
Big Island Lake Cree Nation	Participant did not attend
Canadian Parks and Wilderness Society	Participant did not attend
Canoe Lake Co-management Board	Participant did not attend
City of Meadow Lake	Participant did not attend
Divide Forest Advisory Council Corporation	Participant did not attend
Ducks Unlimited Canada	Participant did not attend
Ile-A-La-Crosse Metis Local #21	Participant did not attend
MoE Fish & Wildlife Br	Participant did not attend
Ministry of Environment Forest Service (PA)	Participant did not attend
MN-S Meadow Lake Local #31	Participant did not attend
MN-S Northern Region #2	Participant did not attend
MoE Parks, Sport & Culture Branch	Participant did not attend
Ministry of Environment Wildfire Management	Participant did not attend
NorSask Forest Products Inc. (MLTCRDI)	Participant did not attend
Northern Village of Green Lake	Participant did not attend
Northwest Communities Wood Prod./Beauval	
Rural Municipality of Meadow Lake #588	Participant did not attend
Saskatchewan Forestry Association	Participant did not attend
Saskatchewan Outfitters Association	Participant did not attend
Saskatchewan Trappers Association (Zone 8)	Participant did not attend
Saskatchewan Water Security Agency	Participant did not attend
Saskatchewan Wildlife Federation	Participant did not attend
Saulteaux First Nation	Participant did not attend
Waterhen Lake First Nation	Participant did not attend

**Supporting documents presented/provided to the Public Advisory Group (PAG) members for the March 31, 2016 PAG meeting.**

1. Public Advisory Group Meeting Agenda, Thursday March 31, 2016.
2. Minutes of the October 1, 2015 Meeting of Mistik's Public Advisory Group.
3. PP presentation – Climate Variability, Mark Johnston, SRC
4. November 2015 – Mistik management 2013 Annual Report Technical Review Comments, Ministry of Environment
5. Mistik Management Ltd. review comments (dated Feb. 26, 2016) of the Forest Management Planning Standard dated February 19, 2016
6. Table 3. Values, Objectives, Indicators and Targets from a Saskatchewan Perspective from the August 2007 Forest Management Planning Manual (pages 46 to 56)





7. Table 1. Summary of Values, Objectives, Indicators and Targets (VOITs) Requirements – Draft Forest Management Planning Standard (Feb 2016) (pages 24 to 31)
8. Exerts from Vol I of Mistik 2017 20-Yr FMP Background Information Document

#### **Proceedings of the March 31, 2016 Mistik Public Advisory Group 'meeting:**

- 1. Facilitator Terry Lamon commenced the March 19, 2015 Public Advisory Group (PAG) Meeting at 1:00 p.m. with a welcome, 'round the table introductions' and introduction of the agenda. Jack Purves motioned adoption of the agenda – all in favor.**
- 2. Facilitator Terry Lamon initiated discussion of the meeting minutes from the October 31, 2015 Public Advisory Group (PAG) Meeting. A motion by Jack Purves and seconded by Tony Leeson to accept the minutes as presented was passed.**
- 3. Allyson Brady requested PAG meeting minutes (e.g. email) be circulated to PAG members in advance of PAG meetings.**
- 4. The PAG commended Brenda Nightingale on the quality of the last PAF meeting minutes.**
- 5. Housekeeping, Roger Nesdoly**

Washrooms, exits, mileage, accommodation, meals and other miscellaneous items.

Reviewed Mistik's current 12 staff members (2 recent staff additions: Robert Follett and Karl Schulz).

#### **6. Current Affairs.**

- All harvesting operations are now shut down; generally budgeted volumes were achieved.
- The haul is now shut down (year end – termination of permits) as road restrictions are now in place
- Due to warm weather there is some inventory left in the forest (mostly hardwood)
- Fire salvage operations were conducted in the Bob and Jaylene Fires
- Stockpiled ~ 7,000 m3 in Prince Albert (Sakaw) FMA
- Softwood Lumber Agreement is being discussed again – nothing concrete coming from talks.
- Market lumber prices have fluctuated greatly but the value of the Canadian dollar has helped offset some of the lumber market volatility.

#### **NorSask (Larry Boudreau & Mistik)**

- had a rough 2015, personnel and productivity issues
- recently production issues were turned around and the mill is now consuming logs at its' highest rate ever
- raw log quality is good (generally best ever)
- 9-foot stud market yields best financial return
- NorSask will want an increased supply of 18-foot logs for the 2016 year

#### **Meadow Lake Mechanical Pulp (Dwayne Mysko)**

- last year was the first ever 5 week shut down due to market conditions



- cut back budget to save on expenditures
- 99% of pulp going to China
- market competition – their own mills costs must be offset to compete with other mills
- 1/3 of furnish is softwood chips coming from sawmills (e.g. Big River and NorSask)
- hardwood is being utilized from approximately 2/3 of the Mistik FMA

### **L & M Wood Products (Zane Delainey)**

- started year with production issues and are now currently breaking production records
- dimension lumber – lost oil patch business but gained in other markets
- post and rail focus on 7-inch material down to 2.5 inch
- Jemi Fibre is making play to purchase L & M
- CanWell Distributors (Vancouver) has now bought out Jemi Fibre so L & M purchase process has started over
- cost of handling materials have added to overall challenge of running a mill
- fence posts – about 5-7 million a year coming from Sask., L & M supplies about 2 million

### **General Observations (Kevin Gillis)**

- PAG group represents the broad 'north to south' expanse of the Mistik FMA and offered some observations that have occurred over that expanse in the last year
- whooping crane sightings near St. Walburg
- recreational canoeing in and around the Buffalo Narrows area that has been recognized in Canadian geographic
- energy (e.g. oil) exploration in the Dillon Management Unit
- and we (Mistik) had a 'short' winter with not much cold weather and the increased costs associated with warm weather 'poor' conditions

### **7. Climate Change Impacts on Mistik's FMA (Mark Johnston, SRC)**

- dominant theme is greater climatic variability
- some research indicates the treeline will migrate northward in extreme warming scenarios
- increased occurrence and severity of forest fire regime may lead to a 'younger' forest - - predictive scenario planning needed
- Sheri Andrews (U of Saskatchewan PhD Candidate) will be conducting research/working with Mark Johnston/Mistik on the question of 'Management Changes Required to Mitigate Climate Change' using the as yet untested Environment Canada/Canadian Forest Service manual.

### **8. Volume I Background Information Document (Roger Nesdoly)**

- via handout and power point presentation Mistik reviewed ~ 30 themes that were updated for the 2017 20-Yr FMP from the background information document
- the meeting noted that there has been only minimal harvest disturbance in the north (combination of distance, haul cost and MLMP reduced consumption of hardwood)
- trapping activity and economics are lower – reflection of effort and world prices

Q. Why do some of the fish numbers not match?

A. Largely a relic of how the province compiles the commercial fish harvest numbers.

Q. Moose numbers are higher near Yorkton than in the north, why?





A. Combination of habitat, hunting pressure and lack of predators.

Q. Did Mistik do any salvage harvest this past year?

A. Yes, salvage harvesting operations were done in the Bob and Jaylene Fires.

Q. What is the worst time for forest fires?

A. Historically the worst months have been May/June but in 2015 July was the worst month.

### **9. Values, Objectives, Indicators and Targets (VOITs) (Roger Nездoly)**

- Table 3. Values, Objectives, Indicators and Targets from a Saskatchewan Perspective from the August 2007 Forest Management Planning Manual (pages 46 to 56) was compared to the Table 1. Summary of Values, Objectives, Indicators and Targets (VOITs) Requirements – Draft Forest Management Planning Standard (dated Feb 2016) (pages 24 to 31).

- Differences and changes from the 'old' to the 'proposed new' were examined.

**Motion to adjourn 5:05 p.m. – Tony Leeson.**

**Facilitator Terry Lamon closed the meeting at 5:05 PM.**



#### 6.6.4. MINUTES OF THE OCT 27-28, 2016 MEETING OF MISTIK'S PUBLIC ADVISORY GROUP (PAG)

Meeting location:  
United Church, 502 6th Avenue West, Meadow Lake, SK

Meeting notes/minutes kept and prepared by:  
Roger G. Nesdoly RPF, Mistik Management Ltd.

#### Meeting attendees (name and affiliation) were:

Interested Party	Participant Name
Buffalo Narrows Co-management Board	Isadore Desjarlais
Buffalo River Dene First Nation	Terrence Byhette & Fred Bhyette
Canoe Lake Co-management Board	Barry Opekokew
Divide Forest Advisory Council Corporation	Larry Anderson and Barry Frisk
Ducks Unlimited Canada	Mark Kornder
Forestry Contractors	Tim Wall & Vicky Pryor
L&M Wood Products Ltd.	Shawn Delainey
Meadow Lake Mechanical Pulp Inc.	Simon Imray, Paula Currie and Trisha LaCarte
MLTCII	Al Balisky
MN-S Meadow Lake Local #31	Guy Tourond
Metis Local #62	Wes Wilson and Nap Chartier
Ministry of Environment Forest Service (ML)	Kathleen Gazey, Janine Leach
Mistik FMA West District Stakeholder	John (Jack) Purves
NorSask Unionized Employees	Larry Boudreau
Northern Lights Snowmobile Club	Calvin Groot
Rural Municipality of Meadow Lake #588	Dale Sheppard
Saskatchewan Environmental Society	Allyson Brady
Saskatchewan Trappers Association (Zone 8)	Leonard Greenhough
Third Party Softwood Quota Holders	Dean Millard
Tourism Saskatchewan	Tim Ouellette
Town of St. Walburg	Tony and Merrill Leeson





Interested Party	Participant Name
University of Saskatchewan	Sheri Andrews
Waterhen Lake First Nation	Kelly Fiddler
Meeting Facilitator	Terry Lamon
Mistik Management Ltd.	Bernice Alger, Kevin Gillis, Niska Hodgson, Robert Follette, Cliff McLauchlan, Bill Murray, Roger Nesdoly
<b>Regrets</b>	
Beauval Co-Mgt Board & Commercial Fishers	Participant did not attend
Big Island Lake Cree Nation	Participant did not attend
Canadian Parks and Wilderness Society	Participant did not attend
City of Meadow Lake	Participant did not attend
Ile-A-La-Crosse Metis Local #21	Participant did not attend
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Saskatchewan Water Security Agency	Participant did not attend
Saskatchewan Wildlife Federation	Participant did not attend
Saulteaux First Nation	Participant did not attend
Village of Loon Lake	Participant did not attend

### Supporting documents presented/provided to the Public Advisory Group (PAG) members for the Oct. 27/28, 2016 PAG meeting.

1. Public Advisory Group Meeting Agenda, Thursday Thurs & Fri Oct 27/28 2016.
2. Minutes of the March 31, 2015 Meeting of Mistik's Public Advisory Group.
3. PP presentation – Assessing Climate Change in Forest management Areas in Canada: The Mistik Scenario (Sheri Andrews, U of Saskatchewan)
4. August 2016 – Mistik Management 2014 Annual
5. Exerts from Vol III of Mistik 2017 20-Yr Forest Management Plan

### Proceedings of the Oct.27, 2016 Mistik Public Advisory Group `meeting:

- 1) **Facilitator Terry Lamon commenced the Oct. 27, 2016 Public Advisory Group (PAG) Meeting at 1:00 p.m. with a welcome, 'round the table introductions' and**



**introduction of the agenda. Jack Purves motioned adoption of the agenda – all in favor.**

**2) Facilitator Terry Lamon initiated discussion of the meeting minutes from the March 31, 2016 Public Advisory Group (PAG) Meeting. A motion by Jack Purves and seconded by Tony Leeson to accept the minutes as presented was passed.**

**3) Housekeeping, Roger Nesdoly**

Washrooms, exits, mileage, accommodation, meals and other miscellaneous items.

Due to a long stretch of very wet weather the planned forest tour is not feasible (e.g. poor access and contractors not working). As an alternative to the forest tour the PAG will tour the L&M facilities. Eight PAG members committed to the L&M tour.

**4) Current Affairs.**

- All harvesting operations are now basically shut down due to the weather.

- The hauls are shut down due to the weather

Bill Murray – Mistik FMA operations update.

Robert Follett – PAFMA operations update

Q – Is there as much snow on the PAFMA as here?

A – Yes, at least as much snow.

Shawn Delainey – L&M operations and mill update.

**NorSask (Al Balisky)**

- mill update, softwood lumber agreement

- NorSask is 100% First nations owned

Q – is the power plant still on the table?

A – Yes (hoped someone would ask)? It is a big effort, but biomass is an alternative that works (e.g. carbon tax & flexibility). Economics is a big factor. The power purchase agreement could involve multiple mill facilities. Cannot say when it will happen but hopeful.

**Meadow Lake Mechanical Pulp (Simon Imray)**

- last year at this time mill was shut down due to market conditions.

- Gave mill update via power point presentation (equipment and process improvements such as making tonne of pulp with less electricity)

Q – Explanation re activity in the back of the mill?

A- Development of the landfill for the ash byproduct.

Q – Increase in production is attributed to what?

A – Investment in infrastructure and process improvement.

Q – Downward electrical trend is attributed to what?





A – “Drainage” of pulp takes less energy, refiner plate savings, other producers are improving costs so we must do the same to stay competitive.

Q – Don’t understand issue with ‘seamless’ borders on FMA’s?

A – Uncertainty is in the forefront, will be answered better in the next presentation.

### **L & M Wood Products (Zane Delainey)**

- Zane Delainey was not available

### **5) Interconnectedness and Uncertainty Associated with the Saskatchewan Commercial Forest Sector (Al Balisky & Roger Nesdoly)**

- 2006 start of current uncertainty:

Weyerhaeuser shutdown then buyout

MLMP financial problems

Paper Excellence arriving on scene

MLMP use of softwood

Big River saw mill

Tactical Plan

Sask. Environmental Code and expansion of ‘duties & requirements’

FMP strategy – maximum flexibility required to operate into the future

Repercussions regarding long term viability

Q – Who is asking for the baseline thing?

A – Province of Saskatchewan.

Q – Government did have ideas of more utilization?

A – Yes and changes have occurred to meet demands. The economic climate plays the dominant role in determining responses. Other mills may play a role in future opportunities.

### **6) Certification Update (Kevin Gillis)**

- Annual audit process, last year there were no findings,

Power Point presentation regarding Mistik FMA and species at risk.

### **7) Assessing Climate Change in Forest Management Areas in Canada: The Mistik Scenario (Sheri Andrews)**

Power Point presentation on the scope of the research project and work accomplished to date.

Q – Do you have accurate climate data?

A – Yes, we have Environment Canada data from different stations.

Q – Is there interaction with wildfire?

A – The project is focused on working on adaptations not on the biophysical.

Q – FSC, is climate change risk management in the new standard?

A – There are no specifics in the new standard.



Q – Could you do a presentation to co-management?

A – That would be great – a definite possibility. Could be valuable input for the project.

### **8) Mistik 2014 Annual Report (Roger Neddoly)**

Review/recap/highlights of 2014 Annual Report

Q – Geography of retention – point is does it need to change?

A – Adjacent structure retention is often not counted in the current scenario and thus we do not get credit for everything.

Q – Is the % of roads skewed because you are currently not operating in the north?

A – No. The road % numbers are not skewed because the analysis is based on the entire FMA.

### **9) Volume III Forest Management Plan (Roger Neddoly)**

Aspects of Volume III reviewed via power point presentation.

Q – Question about the matrix remnant issue.

A – We are not allowed to count anything as structure retention if it is exterior to the block boundary.

Q – Question asked about hauling on the Matchee-Neeb road when it rains?

A – Mistik (Robert Follette) was in process of answering (we haul not hauled anywhere in the last month because of weather) but before answer completed another question was asked.

Q – What about those that live along this road?

A – There have been no log trucks on the Matchee-Neeb Road for the last 6 weeks due to the weather.

Q – Can the mills make a plan for the safety/saving of the road?

A – Issue – who should they be talking to.

Q – Can we have a meeting (inferred between mills and RM of Meadow Lake)?

A – Yes, anytime, anyplace and with all the players.

Q – How do roads 'status' impact/affect provincial regulations.

A – It is the other way around. Provincial regulations affect/control FMA road status e.g. request must be made to the province to leave a road open if the regulations require Mistik to close and/or reclaim a road.

Q – The 2007 FMP and SGR's regarding tree seed.

A – No more than 5% could be improved and the 95% balance would be 'wild' seed.

Q – Sakaw seed orchard.

A – Mistik is based on 'natural' Canadian Council of Forest Ministers criterion.





**Motion to adjourn 5:15 p.m. – Jack Purves.**

**Facilitator Terry Lamon closed the meeting at 5:15 PM.**

**Friday Oct. 28, 2017**

Eight members of the PAG traveled to Glaslyn and were treated to an L&M facility tour. Thanks to L&M and their staff for a very interesting tour of all of the aspects of their facility



Photos of the PAG going through a safety orientation before commencing the L&M facility tour.



### 6.6.5. MINUTES OF THE APRIL 6, 2017 MEETING OF MISTIK'S PUBLIC ADVISORY GROUP (PAG)

Meeting location:

United Church, 502 6th Avenue West, Meadow Lake, SK

Meeting notes/minutes kept and prepared by:

Roger G. Nesdoly RPF, Mistik Management Ltd.

**Meeting attendees (name and affiliation) were:**

Interested Party	Participant Name
Alpha Wildlife	Gilbert Proulx
City of Meadow Lake	Tom Harrison & Conrad Reed
Divide Forest Advisory Council Corporation	Don Gristwood & Bill Kresowaty
Meadow Lake Mechanical Pulp Inc.	Paul Orser, Trisha LaCarte & Dwayne Mysko
Metis Local #62 Ile A La Crosse	Mervin Bouvier, Larry Gardiner, Fabian Mispounas & Craig Sanderson
Ministry of Environment Forest Service (ML)	Bill Thibeault, Janine Leach
Ministry of Environment Wildfire Management	Chris Dallyn
Mistik FMA West District Stakeholder	John (Jack) Purves
Meadow Lake and area resident	Jeremy Nightingale
NorSask Forest Products Inc.	Regan Beck
Saskatchewan Trappers Association (Zone 8)	Leonard Greenhough
Silvacom	Ryan Spooner
Third Party Softwood Quota Holders	Dean Millard
Town of St. Walburg	Tony and Merrill Leeson
University of Saskatchewan	Sheri Andrews & Brent Key
Meeting Facilitator	Brenda Nightingale
Mistik Management Ltd.	Bernice Alger, Cliff McLaughlan Niska Hodgson, Karl Schulz & Roger Nesdoly
<b>Regrets</b>	





Interested Party	Participant Name
Beauval Co-Mgt Board & Commercial Fishers	Participant did not attend
Big Island Lake Cree Nation	Participant did not attend
Buffalo Narrows Co-management Board	Participant did not attend
Buffalo River Dene First Nation	Participant did not attend
Canoe Lake Co-management Board	Participant did not attend
Canadian Parks and Wilderness Society	Participant did not attend
Ducks Unlimited Canada	Participant did not attend
Forestry Contractors	Participant did not attend
L&M Wood Products Ltd	Participant did not attend
Ile-A-La-Crosse Metis Local #21	Participant did not attend
MLTCII	Participant did not attend
MN-S Meadow Lake Local #31	Participant did not attend
MoE Fish & Wildlife Br	Participant did not attend
Ministry of Environment Forest Service (PA)	Participant did not attend
MN-S Northern Region #2	Participant did not attend
MoE Parks, Sport & Culture Branch	Participant did not attend
<i>NorSask Unionized Employees</i>	Participant did not attend
Northern Lights Snowmobile Club	Participant did not attend
Northern Village of Green Lake	Participant did not attend
Northwest Communities Wood Prod./Beauval	Participant did not attend
Rural Municipality of Meadow Lake #588	Participant did not attend
Saskatchewan Environmental Society	Participant did not attend
Saskatchewan Forestry Association	Participant did not attend
Saskatchewan Outfitters Association	Participant did not attend
Saskatchewan Water Security Agency	Participant did not attend
Saskatchewan Wildlife Federation	Participant did not attend
Saulteaux First Nation	Participant did not attend
Tourism Saskatchewan	Participant did not attend
Village of Loon Lake	Participant did not attend
Waterhen Lake First Nation	Participant did not attend

### Supporting documents presented/provided to the Public Advisory Group (PAG) members for the April 6, 2017 PAG meeting.

1. Public Advisory Group Meeting Agenda, Thursday April 6, 2017.
2. Minutes of the October 27 (in house) and October 28 (forest tour) Meeting of Mistik's Public Advisory Group.
3. PP presentation – Vulnerability and Adaptation to Climate Change in Sustainable Forest Management and the Forest Industry in Saskatchewan (Sheri Andrews, U of Saskatchewan)



4. PP presentation – Late Winter Habitat of The Woodland Caribou (*Rangifer tarandus caribou*) In the Northwestern Region of The Mistik FMA Area, Saskatchewan - 2017(Gilbert Proulx, Alpha Wildlife)
5. PP presentation – Tactical Plan and Wood Supply Analysis – Mistik 2017 20-Yr FMP (Ryan Spooner, Silvacom)

#### **Proceedings of the April 6, 2017 Mistik Public Advisory Group `meeting:**

- 1. Facilitator Brenda Nightingale commenced the April 6, 2017 Public Advisory Group (PAG) Meeting at 1:00 p.m. with a welcome, 'round the table introductions' and introduction of the agenda. Leonard Greenhough motioned adoption of the agenda – all in favor.**

- 2. Facilitator Brenda Nightingale initiated discussion of the meeting minutes from the October 27.28, 2016 Public Advisory Group (PAG) Meeting. A motion by Jack Purves and seconded by Leonard Greenhough to accept the minutes as presented was passed.**

- 3. Housekeeping, Roger Nesdoly**

Washrooms, exits, mileage, meals and other miscellaneous items.

- 5. Current Affairs.**

- All operations are now shut down for spring break up.
- Mistik's operating plan has been approved.
- Mistik is developing/working on the 2017/18 budget.
- Mistik and the mills got through last fall's extended wet weather period, but circumstances had reached a critical juncture as MLMP fibre inventory was down to approximately 4-5 days.
- MLMP set a production record in the 2016 calendar year.
- NorSask Jan 12, 2017 fire (infeed area) will result in less budgeted softwood deliveries for the 2017/18 operating year.

#### **MLMP (Paul Orser)**

- Indonesian paper consumption has gone up, all MLMP production goes to Asia.
- ~35% if MLMP fibre consumption is in the form of softwood chips.
- Discussion of how pulp is made, and the mitigation/reduction of energy required and/or environmental impacts.
- Biomass power plant: joint venture between MLMP/MLTCII/SPC, work is advancing, decision on project expected within 3 months.

#### **NorSask (Regan Beck)**

- Update re Jan 12/17 fire, current lumber production and time frame to get mill repaired and back in full production.

Q (Jack): Comments on lumber (e.g. softwood lumber agreement) issue/





A: Ruling on tariff and application of same expected April 24. Tariff level could be anywhere from 20% to 60%.

Q (Jack): Develop domestic market to offset lumber going to the U.S.?

A: Canadian domestic market too small to offset Canadian lumber production. Much of NorSask lumber sales into western Canadian market have developed from our (e.g. NorSask) relationship with our “customers”.

### **L & M Wood Products (Roger Neddoly)**

- Zane/Shawn Delainey were not available (previous commitments).
- L&M log inventory low
- Market for treated wood products is picking up e.g. some significant orders to the Fort MacMurray area
- L&M has a new Sawmill Manager and this has resulted in better production and recovery
- NorSask and L&M did some log trading this past winter
- L&M, from a strategic perspective, is combined with Mistik’s 2017 20-Yr FMP

Q (Mervin): Is Mistik harvesting in the far north.

A: Basically, none over the last 10 years, there has only been very limited activity in the Buffalo Narrows and Ile a La Crosse MUs. Mistik has not need to access far north as parent mills have allocations on the Sakaw FMA and MLMP now utilizes softwood chips to meet ~ 1/3 of its fibre requirements.

Q (Mervin): 20-Yr FMP?

A: Mistik provided a brief recap of the 20-Yr Forest Management Plan process.

Q (Mervin): What about the Carrier wood coming from the North”

A: Any from the ‘North’ going to the Carrier sawmill is from the Northwest Communities TSL – Carrier has no right and/or allocation from the Mistik FMA.

Q (Dean): Oversize size logs going to L&M, why not trade in the bush with third party softwood operators for oversize logs (like I have been telling you since 2004)?

A: Mistik and the mills will always look at synergies and/or actions that make economic and ecological sense. To date the greatest barrier regarding third party softwood exchanges is that these operators have been hesitant to pay Mistik’s log costs.

### **6. Vulnerability and Adaptation to Climate Change in Sustainable Forest Management and the Forest Industry in Saskatchewan (Sheri Andrews)**

Power Point presentation on the scope of the research project and work accomplished to date.

- climatic variables
- tree growth ring analysis
- regulatory policies and regimes
- Mistik High conservation Value Areas (HCVAs) – this is a proactive approach versus reactive regarding climate change



Q (Mervin): Is the extinction of animals part of what is managed for?

A: For clarification what is managed for is so that animals will not go extinct. There are many attributing factors considered when managing for the persistence of all animals across the landscape.

Q (Mervin): Are you only looking at temperature and precipitation when doing your climate work?

A: Yes, as these 2 are the most accurate. If you use more than these 2 variables the accuracy decreases.

Q (Mervin): When you say 'assisted migration' do you mean the movement of animals?

A: In the context of this research 'assisted migration' means helping or moving plants.

Q (Mervin): Has assisted migration been done?

A: In some areas of the world, yes, but to our knowledge not in Saskatchewan.

Comment (Mervin): is very concerned with caribou, 'movement of trees' with respect to climate change will cause movement of caribou.

Q (Jack): climate change and erratic weather patterns – how to engage a strategy?

A: Looking at the past may inform predictions for the future. First determination is are we dealing with longer term climate change or are we faced with longer term climatic variability with greater extremes and/or intensity.

Q (Jack): Is there any trend to fires identified yet.

A: No specific trend per se but greater confidence in predicting 'bad' years.

Q (Mervin): What are VOITs?

A: "Values, objectives, Indicators and Targets.

## **7. Certification Update (Roger Nesdoly)**

Mistik was to be recertified by June 2017 to a new FSC Controlled Wood Standard but FSC has pushed back the date of this requirement to December 2017. Mistik believes it would not be able to meet the requirements of the new FSC controlled Wood Standard. This year Mistik is to be recertified to the FSC Boreal Standard. There will be in the near future (e.g. 1-2 years) a new FSC Canadian Standard for Certified Wood (e.g. wood from the Mistik FMA) and after an introductory period Mistik will have to be recertified to this new standard. FSC certification is expensive. Mistik's parent mills gain no tangible economic benefit or value from FSC certification. Further if Mistik believes it cannot achieve the requirements of a 'certification' scheme it will recommend to the shareholders that it not be attempted. Due to cost and onerous requirements Mistik may not maintain FSC certification schemes beyond the foreseeable future.

Q (Dwayne): Can PEFC fulfill or take the place of FSC schemes.

A: PEFC came in after FSC and the shareholders do have PEFC status for wood from the Mistik and Sakaw FMAs. PEFC could be obtained for non FMA wood.





Q (Mervin): What are PEFC and FSC?

A: PEFC – Program for the Equivalency of Forest Certifications and FSC – Forest Stewardship Council.

Q (Mervin): Can we go PEFC instead?

A: Yes

### **8. Late Winter Habitat of The Woodland Caribou (*Rangifer tarandus caribou*) In the Northwestern Region of The Mistik FMA Area, Saskatchewan - 2017 (Gilbert Proulx)**

Recap of study from 2009 to 2012.

Recap of work/study done February 2017. Study found 209 caribou tracks and proponents are confident there were at least 190 individual caribou.

Study has shown wolves do not follow caribou into muskegs.

Study has shown caribou will use fringe and/or unburnt areas within recent fires (fires from 2 to 25 years ago).

Management implications – maintaining connectivity between patches of caribou habitat (e.g. muskegs).

Alberta strategy of killing wolves will not work if the caribou still have no habitat.

Q (Mervin): Were the elders talked to about their knowledge of where caribou are?

A: Yes, Mistik (Kevin) talked to and got feedback from the communities.

Q (Mervin): Do fires and climate change disrupt migration patterns?

A: There is evidence this does happen.

Q (Jack): What is the difference of habitat requirements for fisher and martin?

A: Martin has very little fat cover, needs older aged mixed wood forest for warmth. The fisher can handle more cold and stay more active in cold weather catching food so they can use a broader range of habitat types. Fishers are less sensitive to disturbance.

Q (Mervin): What is the difference between certification and our (Mistik) planning?

A: Certification schemes endorse Mistik planning as being economically responsible that is done in an ecological and socially sensitive manner.

### **9. Tactical Plan and Wood Supply Analysis – Mistik 2017 20-Yr FMP (Ryan Spooner)**

Tactical Plan – where Mistik will be conducting activities in the future, more wood is identified than needed and actual yearly activities are identified in the operating plan.

Wood Supply Analysis – quantifies wood supply (e.g. HVS-Harvest Volume Schedule) available after all management considerations/constraints are applied.

The modeling procedure runs different scenarios to be able to quantify outcomes.

Utilization standards – softwood scenarios will be run with 7.5, 10.0 and 12.5 cm top sizes to determine effect on HVS and to better quantify saw log versus pulp wood supply.

Q (Sherri): Can model run outcomes be used for other projects.



A: Depending what data the other projects require, yes.

Q (Jack): Mountain pine beetle, is it here yet.

A: Not that we are aware. Has come east in Alberta to the Slave lake region. Monitoring sites are set up from Slave Lake to the Alberta/Sask border.

Q (Jack): What are the tree planting plans for this year?

A: Mistik will be planting approximately 1 million white spruces this year.

Q (Jack): What is renewal success (e.g. how much NSR-Not Sufficiently Regenerated)?

A: Mistik has harvested ~130,000 Ha since its inception and there is only about 200 Ha of outstanding NSR.

**Motion to adjourn 5:15 p.m. – Jack Purves.**

**Facilitator Brenda Nightingale closed the meeting at 5:15 PM.**





Topic:

### 6.6.6. MINUTES OF THE NOVEMBER 23, 2017 MEETING OF MISTIK'S PUBLIC ADVISORY GROUP (PAG)

Meeting location:

United Church, 502 6th Avenue West, Meadow Lake, SK

Meeting notes/minutes kept and prepared by:

Roger G. Nesdoly RPF, Mistik Management Ltd.

**Meeting attendees (name and affiliation) were:**

Interested Party	Participant Name
A Le Baie Metis Local #21 (ILX)	Brennan Merasty & Brandon McCallum
Buffalo Narrows	Derek Petit & Rodney McCallum
Canoe Lake Traditional Resources User Board	Barry Opekokew
Green lake	Rose Richardson
L & M Wood Products	Zane Delainey & Travis Hagel
Meadow Lake and area resident	Oliver Poitras (& wife)
Meadow Lake Mechanical Pulp Inc.	Simon Imray, Taneal Brucks, Lorne Neale & Dwayne Mysko
Meadow Lake Metis Local #31	Gwen King
Metis Nation – Sask (Northern Region #3)	Mervin Bouvier
Ministry of Environment Wildfire Management	Chris Dallyn
Mistik FMA West District Stakeholder	John (Jack) Purves
<i>NorSask Unionized Employees</i>	Larry Boudreau
Northern Lights Snowmobile Club	Calvin Groot
RM of Meadow Lake #588	Blair Mysko, Russ Jones & Dale Sheppard
Saskatchewan Trappers Association (Zone 8)	Leonard Greenhough
Waterhen First Nation	David Fleury
Town of St. Walburg	Tony and Merrill Leeson
University of Saskatchewan	Sheri Andrews-Key & Brent Key
Wildfire Management Branch	Chris Wilson & Chris Dallyn



Interested Party	Participant Name
Zone 8 Trappers Association	Leonard Greenhough
Meeting Facilitator	Jack Purves
Mistik Management Ltd.	Bernice Alger, Cliff McLauchlan Niska Hodgson, Karl Schulz, Shawn Delainey, Kevin Gillis & Roger Nesdoly
<b>Regrets</b>	
Beauval Co-Mgt Board & Commercial Fishers	Participant did not attend
Big Island Lake Cree Nation	Participant did not attend
Buffalo River Dene First Nation	Participant did not attend
Canadian Parks and Wilderness Society	Participant did not attend
City of Meadow Lake	Participant did not attend
Divide Forest Advisory Council Corporation	Participant did not attend
Ducks Unlimited Canada	Participant did not attend
Forestry Contractors	Participant did not attend
MLTCII	Participant did not attend
MoE Fish & Wildlife Br	Participant did not attend
Ministry of Environment Forest Service (ML)	Participant did not attend
Ministry of Environment Forest Service (PA)	Participant did not attend
MoE Parks, Sport & Culture Branch	Participant did not attend
NorSask Forest Products Inc.	Participant did not attend
Northern Village of Green Lake	Participant did not attend
Northwest Communities Wood Prod./Beauval	Participant did not attend
Saskatchewan Environmental Society	Participant did not attend
Saskatchewan Forestry Association	Participant did not attend
Saskatchewan Outfitters Association	Participant did not attend
Saskatchewan Water Security Agency	Participant did not attend
Saskatchewan Wildlife Federation	Participant did not attend
Saulteaux First Nation	Participant did not attend
Silvacom	Participant did not attend
Third Party Softwood Quota Holders	Participant did not attend
Tourism Saskatchewan	Participant did not attend

**Supporting documents presented/provided to the Public Advisory Group (PAG) members for the November 23, 2017 PAG meeting.**

1. Public Advisory Group Meeting Agenda, Thursday November 23, 2017.
2. Minutes of the April 26, 2017 Meeting of Mistik's Public Advisory Group.





3. PP presentation – Vulnerability and Adaptation to Climate Change in Sustainable Forest Management and the Forest Industry in Saskatchewan (Sheri Andrews-Key, U of Saskatchewan)
4. Excel sheet – Scenario 6 – Same as 5, forcing through the tactical plan
- 5 Table 10-4 Current timber volume requirements by mill, page 175, Mistik 2017 20-Yr FMP Volume I – Background Information Document
- 6 Excel sheets with HVS related to Scenarios 1 through 6
- 7 Graphs – District harvest flows

**Proceedings of the November 23 and 24, 2017 Mistik Public Advisory Group meeting:**

- 1. Facilitator Jack Purves commenced the Nov 23, 2017 Public Advisory Group (PAG) Meeting at 1:00 p.m. with a welcome, 'round the table introductions' and introduction of the agenda. Barry Opekokew motioned adoption (2<sup>nd</sup> Zane Delainey) of the agenda – all in favor.**
- 2. Facilitator Jack Purves initiated discussion of the meeting minutes from the April 26, 2017 Public Advisory Group (PAG) Meeting. A motion by Tony Leeson and seconded by Blair Mysko to accept the minutes, with corrections (e.g. change Metis local to #21 from 62 and correct date in Section 2), was passed.**

Mervin Bouvier: Metis Nation-Sask. wants 'agreements' to be able to engage technical support for the dissemination of Forest management Plan documentation.

Mistik: Mistik tries to accommodate all request but with the nature of the MN-S request Mistik will need some time to respond. Mistik is willing to meet with Mervin in the near future for further discussion.

**3. Housekeeping, Roger Nesdoly**

Washrooms, exits, mileage, meals and other miscellaneous items.

**4. Current Affairs.**

- Roads are now frozen and harvest/haul operations are in full winter mode (e.g. haul going 24 hours)
- The weather turned cold end of Oct and hardwood haul picked up after that.
- MLMP inventory was down to about 2.5 weeks (last year down to ~4 – 5 days) before the haul got going with the cold weather.
- Mistik staff are busy with the preparation of the operating plan which is to be submitted to MoE by the end of Dec 2017.

**MLMP (Simon Imray & MLMP staff)**

- MLMP updated/reported on internal projects to increase efficiency and decrease power consumption.

Q: About power sourcing and power projects?



A (Roger): MLMP/NorSask has a joint proposal for a 40-megawatt biomass plant. SPC has not been receptive due to the anticipated power purchase price required to ensure the project is viable long term.

Q: 'Landfill' site at MLMP?

A (Simon): Construction of the 'landfill' has been completed.

Q: Environmental reports – are they available to the public?

A (Simon): MLMP did not think they were. All required MLMP environmental reporting may be available from the province.

### **NorSask (Roger Nesdoly)**

- The new infeed system has been rebuilt and the mill started operations Oct 2, 2017.
- Currently NorSask is experiencing higher log recovery and production levels and the quality of the inventory in the yard has contributed to these outcomes.
- Mistik, in concert with the harvesting contractors, are focusing on an enhanced and consistent log quality program.
- NAFTA – no noticeable effects regarding export of lumber to the United States.
- Softwood Lumber Agreement expired and cooling off period over. NorSask is currently paying a levy of 20.\*5 for lumber going to the United States (lumber demand is strong, and prices are at all-time highs). Hurricane, fire and flood damages are contributing to the increased U.S. demand for Canadian lumber.

Comment (Mervin B.): Climate change and habitat effect on animals is different from science and cultural aspect, protection of culture is key, and it appears science and culture are not working together.

Comment (Barry O.): Canoe lake Traditional Resource Users Board ensure that Mistik lives up to its' obligations regarding reforestation, sticking to the plan, look at environmental impacts and acknowledges the views of others.

Q (Brennan M.): Are there any reports that will be available?

A (Roger): The 2017 FMP will be completed and approved in a couple of months, all co-managements boards will receive a digital copy. Also, on an annual basis the Annual Report is available on Mistik's website.

Q: Roads – are they all turned into 'Game Road Corridors'?

A (Roger & Kevin): No, but the government does have game corridors on Forest Resource Roads. We (Mistik) close roads in the form of road reclamation.

Comment (Gwen K.): Meadow Lake stampede ground need repairs. We are looking for donations.

A (Roger): Best to ask the mills (e.g. L&M and NorSask) that produce the items you require, I am sure they would give a request of this nature careful consideration.

### **L & M Wood Products (Zane Delainey)**

- Mill production projected to be in the 17 to 20 million board foot measure range.





- The post plant has set a new annual production record.
- L & M invested in mill upgrade equipment.
- L & M has had a treatment plant since 1968/69. Treatment is CCA (copper chromium arsenic) and L & M is ahead of the curve with requirements (e.g. closed vessel treatment system).
- L & M is in the final review stage of EMPA regulations which are to come into effect in 2020.

Q: Harvest and fire impact on caribou?

A (Zane): forest is old on L & M landbase. We (L & M) feel good about we are doing at the mill and on the landbase. We hire apprentices. 65-70 of employees at the mill are aboriginal. As to caribou, there are no caribou on the L & M landbase. As to fire impact, depending on the size it could have severe negative effects on the mill.

### **5. Vulnerability and Adaptation to Climate Change in Sustainable Forest Management and the Forest Industry in Saskatchewan (Sheri Andrews-Key)**

Power Point presentation on the scope of the research project and work accomplished to date.

- climatic variables
- regulatory policies and regimes
- MoE and Mistik major economic sponsors of this project
- Mistik High Conservation Value Areas (HCVAs) – this is a proactive approach versus reactive regarding climate change.
- The project is a “Case Study Review” assessing Mistik’s ability to adept and/or to mitigate changes in response to climate change scenarios.
- The project takes other people’s work (e.g. Ken Van Rees (U of S) and Mark Johnston (SRC)) to form the ‘foundation’ or basis to this projects work.

Q (Mervin B): Who is involved in the policy making with communities and elders, and what about protection of the values like medicinal plant collection?

A (Sherri): The first question asked is not the focus of this project. As to the second question Mistik does have a proactive approach for the value you mentioned (e.g. HCVAs).

Q (Mervin B): Governments change every 4 years so 1) why does project have to recommend changes to forestry, and 2) why is there a 20-Year Plan?

A (Sherri): Changes to forestry may be recommended to enable industry to better respond to a potentially changing environment, and 2) a 20-Year Plan is a regulatory requirement. The 20-year plan is of a strategic nature indicating the management regime of the company preparing it.

Q (Mervin): What about mercury in forestry?

A (Roger): Detection of these types of substance is more advanced and reliable. There is evidence of mercury associated with industrial activity in the shield region of Ontario (e.g. mercury accumulates in the fatty tissue of fish). We are not aware of any mercury issue associated with the commercial forest zone of Saskatchewan.

### **6. Certification Update (Kevin Gillis)**

PowerPoint presentation – update on Mistik’s systems and recent audits.



Q: how do protected areas change/grow/move?

A (Kevin): Look at soils and topography as risks (land facets) then need to look at supply of same and whether they need protection.

Q: Do you have any protected areas in northwestern Saskatchewan?

A (Kevin): Only previously areas such as Mistik's FSC Candidate Protected Areas which are Mistik voluntary no go zones. Mistik is willing to work together with communities in this subject area.

Comment: It is hard to protect trapping areas.

A (Kevin): Areas are only protected from industry (e.g. harvesting trees) as rights holders cannot be denied from trapping.

Q: does the government have protected areas?

A: Yes, parks, RANs, wildlife sanctuary, etc.

Comment: There is Mistik but there also Carrier who have forestry plans.

Response: There is opportunity to include them in processes.

Q (Mervin B.): When you come across caribou trail can you stop harvesting?

A (Kevin): Report and may defer harvest. May also buffer area.

#### **7. Forest Management Plan, Volume III of Mistik's 2017 20-Tear FMP (Roger Nedsoly)**

- Tactical plan maps are posted throughout the meeting room; the tactical plan demonstrates strategic intent as to where wood will be accessed over the FMP term. Actual location of activity is determined through the operating plan process.
- Reviewed the harvest volume schedule (HVS) for six scenarios.
- Hardwood volumes very similar to last FMP, softwood volume will decrease 15-20% by going to a 5-inch top utilization standard versus a 4-inch top.

Comment (Mervin B.): You have a plan for northern Saskatchewan for 10, we also have a plan for you.

Response (Roger): The 10-year plan only applies to the Mistik FMA. We will continue to engage to learn of community concerns and plans.

Q (Mervin B.): If other mills open will there be other agreements?

A (Roger): If the Green Lake mill (e.g. Titan Lumber proposal) opens it comes without a wood supply. For it to acquire fibre there would have to be additional agreements. Also, the area northeast of Dore Lake is not in Mistik's FMA.

Q: Logging for x years, concerned about volumes and number of years in plans.

A (Roger): The tactical plan shows strategic "intent" and there is more wood in tactical plan to allow for flexibility. The operating plan has 1-2 years of detail with years 3-5 less defined as to timing. The FMP purpose is to define sustainable harvest levels.





Q (Mervin B.): What are opportunities for contributions to local communities?

A (Roger): Through the co-management system communities receive funds when harvesting occurs in the fur block. If any community has a specific request, they will have to direct that request to the mills.

**Motion to adjourn 4:55 p.m. – Leonard Greenhough.**

**Facilitator Brenda Jack Purves closed the November 23, 2017 meeting session at 5:00 P.M.**

### **Friday November 24, 2017 Mill Tours**

Seven members of the PAG first toured NorSask with focus on the newly constructed infeed portion of the mill and then the tour moved to Meadow Lake Mechanical Pulp where the focus was the 'wood room'. Thanks to NorSask and MLMP staff for facilitating the PAG mill tours.



Topic:

**6.6.7. MINUTES OF THE MAY 15, 2018 MEETING OF MISTIK'S PUBLIC ADVISORY GROUP (PAG)**

Meeting location:

United Church, 502 6th Avenue West, Meadow Lake, SK

Meeting notes/minutes kept and prepared by:

Roger G. Nesdoly RPF, Mistik Management Ltd.

**Meeting attendees (name and affiliation) were:**

Interested Party	Participant Name
Beauval Co-management Board	Shirley Bell-Morin & Nick Daigneault
Buffalo River Dene First Nation	Travis Noltcho, Wesley Sylvestre & Terrence Billette
Canadian Forest Service (Edmonton)	Jason Edwards
Canoe Lake Traditional Resources User Board	Barry Opekokew & Theodore Bouvier
Ducks Unlimited Canada	Mark Kornder
Green lake	Joe Gardiner
L & M Wood Products	Zane Delainey
Meadow Lake Mechanical Pulp Inc.	Taneal Brucks, Lorne Neale & Dwayne Mysko
Ministry of Environment Forest Service (ML)	Kathleen Gazey, Michael Sleightholm, Natasha Hirschfeld, Meaghan Dieker & Mark Metcalfe
Mistik FMA West District Stakeholder	John (Jack) Purves
NorSask Forest Products Inc.	Regan Beck
Kris McCleary	PAEIA
RM of Meadow Lake #588	Blair Mysko
Saskatchewan Research Council	Mark Johnston
Saskatchewan Trappers Association (Zone 8)	Leonard Greenhough
Silvacom	Ryan Spooner
Third Party Softwood Quota Holders	Dean Millard & Kristopher Millard





Interested Party	Participant Name
Town of St. Walburg	Tony and Merrill Leeson
University of Saskatchewan	Sheri Andrews-Key & Brent Key
Wildfire Management Branch	Chris Wilson & Chris Dallyn
Zone 8 Trappers Association	Leonard Greenhough
Meeting Facilitator	Jack Purves
Mistik Management Ltd.	Tanya Fillion, Niska Hodgson, Karl Schulz, Shawn Delainey, Kevin Gillis, Robert Follett & Roger Nesdoly
<b>Regrets</b>	
A Le Baie Metis Local #21 (ILX)	Participant did not attend
Big Island Lake Cree Nation	Participant did not attend
Buffalo Narrows	Participant did not attend
Canadian Parks and Wilderness Society	Participant did not attend
City of Meadow Lake	Participant did not attend
Divide Forest Advisory Council Corporation	Participant did not attend
Forestry Contractors	Participant did not attend
Meadow Lake Metis Local #31	Participant did not attend
Metis Nation – Sask (Northern Region #3)	Participant did not attend
MLTCII	Participant did not attend
MoE Fish & Wildlife Br	Participant did not attend
Ministry of Environment Forest Service (PA)	Participant did not attend
MoE Parks, Sport & Culture Branch	Participant did not attend
Ministry of Environment Wildfire Management	Participant did not attend
Northern Lights Snowmobile Club	Participant did not attend
Northwest Communities Wood Prod./Beauval	Participant did not attend
Saskatchewan Environmental Society	Participant did not attend
Saskatchewan Forestry Association	Participant did not attend
Saskatchewan Outfitters Association	Participant did not attend
Saskatchewan Water Security Agency	Participant did not attend
Saskatchewan Wildlife Federation	Participant did not attend
Saulteaux First Nation	Participant did not attend
Third Party Softwood Quota Holders	Participant did not attend
Tourism Saskatchewan	Participant did not attend
Waterhen First Nation	Participant did not attend

### Supporting documents presented/provided to the Public Advisory Group (PAG) members for the May 15, 2018 PAG meeting.

1. Public Advisory Group Meeting Agenda, Tuesday May 15, 2018
2. Minutes of the November 23, 2017 Meeting of Mistik's Public Advisory Group
3. Mistik's 2017-20-Yr Forest Management Plan Highlights
4. Mistik's 2015 Annual Report



- 5 Conclusions: Vulnerability and Adaptation to Climate Change in Sustainable Forest Management and the Forest industry in Saskatchewan (PowerPoint Presentation)
- 6 FSC and Mistik's Protected Area Gap Analysis (PowerPoint Presentation)

### **Proceedings of the May 15, 2018 Mistik Public Advisory Group meeting:**

- 1. Facilitator Jack Purves commenced the May 15, 2018 Public Advisory Group (PAG) Meeting at 1:03 p.m. with a welcome, 'round the table introductions' and introduction of the agenda. Leonard Greenhough motioned adoption of the agenda – all in favor.**

- 2. Facilitator Jack Purves initiated discussion of the meeting minutes from the November 23, 2017 Public Advisory Group (PAG) Meeting. A motion by Leonard Greenhough and seconded by Tony Leeson to accept the minutes, all in favor.**

- 3. Housekeeping, Roger Nesdoly**

Washrooms, exits, mileage, meals and other miscellaneous items.

- 4. Current Affairs (Roger Nesdoly)**

Currently operations shut down, will start some operations end of May/beginning of June. Tree plants are starting. Comments re Meadow Lake Provincial Park 'Tuff' fire.

Good end to operating season, weather cooperated till end of March and budgeted volume deliveries to the mills were achieved. Have a small amount of softwood bush inventory and about 65,000 m3 of hardwood in stockpiles.

### **NorSask (Regan Beck)**

Update on mill production and markets. NorSask continues to invest capital to improve mill efficiency and lumber recovery factor. The rebuilt front end is functioning above expectations.

### **MLMP (Dwayne Mysko)**

Update on mill production and markets. MLPP continues efforts to improve processes while decreasing electrical usage. Comment re currency fluctuations. Yard inventory will last till mid-August.

### **L & M Wood Products (Zane Delainey)**

Continued focus on improving wood quality (e.g. logs) and efficiency of processes to garner more product from the same amount of raw material.

- 5. Conclusions: Vulnerability and Adaptation to Climate Change in Sustainable Forest Management and the Forest industry in Saskatchewan (Sheri Andrews-Key, U of S)**

Sherri's PowerPoint presentation recapped her project and provided examples of the climate change project implementation and examples resource maintenance, availability and Mistik adaptability.

- 6. Thoughts on Forest Sector Climate Change Challenges (Jason Edwards)**





Jason gave an overview, from a Canadian Forest Service perspective, on the forest sector climate change challenges. The greatest challenge is uncertainty and to what degree that uncertainty will manifest itself as we proceed into the future. The forest sector needs to be able to be innovative and adaptive to face whatever challenges that arise in the near and long term.

Q. Can you point to any specific carbon impacts from forestry and climate change?

A. Increased forest fire activity will affect the forest from carbon source or sink perspective. A warming climate may cause organic soil complexes to release more methane. Warmer climates may increase disease and pests and limit the forest's annual to store carbon through growth.

## **7. Mistik's 2015 Annual report (Roger Nesdoly)**

Presentation of overall results and review of some specific targets was completed. Non-achievement of some targets is not always a negative outcome.

Q. What about targets not achieved?

A. In some instances a modification of the VOIT may be required. Non-achievement of a target can be OK if the trend over time results indicate that Mistik is making progress to eventually achieving the target. Also, a target on an annual basis may be out of sync due to forces (e.g. mill shut down) beyond Mistik's ability to control and/or anticipate.

Q. Who gets the 'surveys'?

A. The PAG and in the past co-management and advisory boards.

Q. Who gets the telephone call from the auditors?

A. The auditor makes the decision as to who to contact. The auditors use Mistik's PAG and co-management /advisory board's membership as their primary source of information as to whom they may wish to speak with.

Q. Are there government pressures when targets are not achieved?

A. Depending on the nature of the target the government has expressed concern as to the status of the target. Many variables may contribute to the status of a target and Mistik in discussion with the government annually review target status.

## **8. FSC and Mistik's Protected Area Gap Analysis (Kevin Gillis)**

This is a cooperative project between Al-Pac and Mistik with Ducks Unlimited Canada and Canadian Parks and Wilderness Society serving as the 2 cooperators who are doing the majority of the data acquisition and analysis.

This necessary project stems from FSC Principle 6 (6.5 Protected Areas Strategy).

A meeting will be coming up shortly with Canoe Lake/Jans Bay. This is an opportunity for local communities to be involved.

Q. Are Department of National Defense or Gas & Oil sector partners or involved?

A. No, not at this time. The intent is not to be limiting to any particular industry, but time is of the essence – we have to be efficient.



### **9. Mistik's 2017 20-Yr Forest Management plan 'Highlights' (Roger Nesdoly)**

This is Mistik's third Forest management plan effort.

Mistik (Roger) reviewed the FMP 'highlights' on a one-page handout.

Harvest Volume Schedule (HVS): basically status quo for hardwood and with a change in softwood utilization from a 4 inch to a five-inch top softwood HVS will decrease by ~ 20% (to 4676,000 m3 from 581,000 m3).

Vertical structure requirements will increase from 4% to 9% and up to 3% of the 9% requirement can be 'proximate' retention.

The measurement period for harvest level determination has been reduced to 5 years from the previous 10 years.

VOITs – some significant change to requirements.

Caribou – when the SK2 West Caribou Range Plan is completed this will have to be melded into the Mistik Woodland Caribou Habitat Mitigation Plan.

**Motion to adjourn 4:55 p.m. – Nick Daigneault.**

**Facilitator Jack Purves closed the May 15, 2018 meeting session at 4:55 P.M.**





Topic:

**6.6.8. MINUTES OF THE NOVEMBER 21<sup>ST</sup>, 2018 MEETING OF MISTIK'S  
PUBLIC ADVISORY GROUP (PAG)**

Meeting location:

United Church, 502 6th Avenue West, Meadow Lake, SK

Meeting notes/minutes kept and prepared by:

Kevin Gillis RPF, Mistik Management Ltd.

Niska Hodgson, Mistik Management Ltd.

**Meeting Attendees (name and affiliation):**

Interested Party	Participant Name
Silvacom	Ryan Spooner
Zone 8 Trappers	Leonard Greenhough
Mistik Board of Directors	Brenda Nightingale, Jeremy Nightingale
RM of Meadow Lake 588	Blair Mysko, Russ Jones
Third Party Softwood Quota Holders	Dean Millard
Mistik	Robert Follett, Niska Hodgson, Krystina Penner, Steven Hanky, Sherri Gregoire, Kevin Gillis, Karl Schulz, Tanya Fillion
Village of Green Lake	Joe Gardiner
Ministry of Environment	Natasha Hirschfeld, Mark Doyle, Kathleen Gazey, Mike Sleightholm
Meadow Lake Mechanical Pulp Inc.	Taneal Brucks, Lorne Neal
Meadow Lake Mechanical Pulp Inc. Employees	Dwayne Mysko
DeneSuline Co-Management Board	Louie Chanalquay & William Sylvestre
Canoe Lake Traditional Resources User Board	Barry Opekokew
Divide Forest Advisory Council Corporation	Cordell Cross, Larry Anderson
Wildfire Management Branch	Chris Wilson, Chris Dallyn
Town of St. Walburg	Tony & Merrill Leeson
Forestry Contractors	Tim Wahl & Vicki Pryor
U of S	Amanda Lindgren
West District Stakeholders	Jack Purves



Interested Party	Participant Name
Big Island Lake Cree Nation	Jason Wild
Buffalo Narrows Co-Management Board	Bill Pederson
NorSask Forest Products Inc.	Regan Beck
U of S/SRC/UBC	Sheri Andrews-Key
Saulteaux First Nation	Brook Night
NorSask Employees Union	Larry Boudreau
A Le Baie Metis Local #21 (ILX)	Participant did not attend
City of Meadow Lake	Participant did not attend
Meadow Lake Metis Local #31	Participant did not attend
MLTCII	Participant did not attend
Ministry of Environment Forest Service (PA)	Participant did not attend
Northern Lights Snowmobile Club	Participant did not attend
Northwest Communities Wood Prod./Beauval	Participant did not attend
Saskatchewan Environmental Society	Participant did not attend
Saskatchewan Forestry Association	Participant did not attend
Saskatchewan Outfitters Association	Participant did not attend
Saskatchewan Water Security Agency	Participant did not attend
Saskatchewan Wildlife Federation	Participant did not attend
Tourism Saskatchewan	Participant did not attend
Waterhen First Nation	Participant did not attend
CPAWS	Participant did not attend
Ducks Unlimited Canada	Participant did not attend
L&M Wood Products Ltd.	Participant did not attend
Ministry of Government Relations	Participant did not attend
Moosomin First Nation	Participant did not attend
RM of Loon Lake #561	Participant did not attend
University of Saskatchewan	Participant did not attend
Village of Loon Lake	Participant did not attend

### Supporting documents presented/provided to the (PAG) members:

1. Public Advisory Group Meeting Agenda, November 21<sup>st</sup>, 2018
2. Minutes of the May 15<sup>th</sup>, 2018 Meeting of Mistik's Public Advisory Group
3. Mistik's 2016 Annual Report (Presentation)
4. Mistik's 2017-20-Yr Forest Management Plan Highlights (Presentation)
5. Top size: 10 cm vs. 12.5 cm (Presentation)
6. Vulnerability and Adaptation to Climate Change in Sustainable Forest Management (Presentation)
7. Mistik & Meadow Lake Forestry Story (Presentation)
8. FSC and Mistik's Protected Area Gap Analysis (Presentation)
9. High Conservation Values (Presentation)



**Proceedings of the November 21, 2018 Mistik Public Advisory Group meeting:**

Facilitator Brenda Nightingale commenced the May 15, 2018 Public Advisory Group (PAG) Meeting at 10:15 a.m. with a welcome, round table introductions and adoption of the agenda. Ryan Spooner motioned adoption of the agenda, Barry Opikokew seconded – all in favor.

Facilitator Brenda Nightingale initiated discussion of the meeting minutes from the November 23, 2017 Public Advisory Group (PAG) Meeting. A motion by Barry Opikokew and seconded by Ryan Spooner to accept the minutes, all in favor.

**Housekeeping, Brenda Nightingale**

Washrooms, exits, mileage, meals and other miscellaneous items were covered.

**Mistik & L&M Current Affairs (Robert Follett)**

Mistik staff update – introduced new Operations Manager, Steven Hankey. Recent acquisition of L&M Wood Products by MLTC was discussed. L&M will be included in the 2019 20 Year FMP. Currently operations are going well. Roughly 50% of the required wood volume for this year has been delivered. We are also planning a stockpile of hardwood for the pulp mill of 60,000 m<sup>3</sup>.

There is a northern contractor opportunity in the Buffalo Narrows management unit for a processor for the “Northern Group”.

**NorSask (Regan Beck)**

NorSask is currently at 73% indigenous employees this is a MLTC II mandate and the mill is very proud of this number. Update on mill production and markets. NorSask continues to invest capital to improve mill efficiency and lumber recovery factor. NorSask has had record output this fall.

Q. Are you continuing with the graveyard shifts (Tim Wahl)?

A. The graveyard shift is predominantly for the planer. The benefits of the graveyard shift are finishing off the wood cut that day and getting the lines ready for the next day's shift. This does lead to a bottleneck at the kiln, but we are always looking for additional efficiency opportunities.

Q. Are you actively pursuing the Power Plant option (Tim Wahl)?

A. Yes. Talks with the Government are ongoing with regard to this opportunity.

**L & M Wood Products (Regan Beck)**

L&M is now under the MLTC II umbrella. We are currently working on the transition process. Continued focus on improving wood quality (e.g. logs) and efficiency of processes to garner more product from the same amount of raw material.

**MLMP (Dwayne Mysko)**

Update on mill production and markets. MLMP recently had a fire in a debarker (still determining the cause). Cost of running satellite chippers is very expensive but expect to have repairs completed on the debarker by mid-December (parts are manufactured when ordered). No Questions.

**Mistik's 2016 Annual Report (Niska Hodgson)**

Presentation outlined overall "success" related to 2016 forest management indicator measurement, overview of 2016 operations and "on-target" indicators. More in-depth detail presented on "off-target" indicators (33/236).

*Note:* 2016 Annual Report and associated maps can be found on the Mistik website at [www.Mistik.ca](http://www.Mistik.ca)

Comment: (Barry Opikokew) there are other users (i.e. Carrier in the Beauval area). There is the impression that Mistik has the trust of communities and Consultation takes time. There was general discussion about Caribou movements and harvesting after fire as well.

Q. What is the objective of the single trees?

A. To maintain perching sites for birds and biodiversity. Target is 2 trees/ha. Up to 4 trees in a clump are counted as single trees. This helps improve resistance to wind damage and blowdown.

Q. Will the Forest Values Survey continue (Taneal Brucks)?

A. It was discontinued because the PAG felt it was redundant but if the group wishes, we can reinstate the survey. Can decide or discuss it later. Mistik can look at adding it to the website as a voluntary survey also.

Q. Where do the Indicators come from (Taneal Brucks)?

A. They are requirements under the Saskatchewan Forest Management Planning Standard

Q. Are there other opportunities for other mills etc. in the north if Mistik is not harvesting there (asked to the Ministry of Environment)?

A. (Mark Doyle/Kathleen Gazey) There is a general "use it or lose it" stipulation for wood supplies of forest management agreement holders in SK. There are also economic opportunities that the government is always considering. There may be some dialogue with the PA pulp mill for fibre opportunities in the future.

**Open Forum for General Questions**

Feedback – It was noted that others may not have an opportunity to learn about these issues in a meeting sense (other users/Carrier in Beauval).

Q. If Mistik is not harvesting in the North, are you overharvesting elsewhere?

A. No. We stay within the sustainable harvest levels. We also offset with other harvesting on Leased and Private lands.

MLMP (Dwayne Mysko) also noted that the Pulp Mill uses softwood at the mill now.

Q. (Joe Gardiner) Green Lake would like to have Mistik come and share maps and plans with the community. The blocks are getting smaller and there is less cutting. We depend on firewood. Why is that?

A. The harvesting there is done by the ML OSB and is part of the PA FMA harvest plans.





Q. There is blow down in the Dillon area. Is it still harvestable?

A. Mistik will be mapping that area to determine the extent of the blow down, but harvesting is not as likely as it is already two years old. MoE - there are processes in place to apply for reduced or waived dues. If one wishes to cut and sell wood, they must have a permit. There may be opportunity to negotiate the "issues" around this type of harvesting. For personal use, no permit is required for dead or down wood.

Comment (Vicky Pryor) – The Vermette road and UCR are now well maintained. The Dillon band is doing this maintenance (UCR) at their expense. Mistik has contributed to maintaining infrastructure to the healing lodge. It would be a shame if these roads fell apart. Mistik is committed to maintaining other infrastructure for the benefit of communities and future harvesting opportunities.

### **Mistik/L&M 2019 20-Yr Forest Management Plan**

Update given on VOIT document changes, Volume III updates & strategies for management of Woodland Caribou, species at risk, climate change and utilization (top size) changes updates (Niska Hodgson)

Q. What is considered old as opposed to very old for trees?

A. Old is 90 to 100 years and very old is 110-120 years on the FMP area.

Mistik requested a show of interest in noting the number frozen days on the three lakes chosen for monitoring on the FMP area (Peter Pond, Keeley and Turtle Lake). High interest noted for follow up at individual co-management meetings.

### **Top Size Comparison (Ryan Spooner) - Part of FMP Volume III**

Ryan presented the implications of changing the utilization to 10 cm top size in softwood for Mistik and L&M (was previously 12.5 cm top in earlier submissions of FMP documents). This is a change from the original selected management strategy and will involve doing additional analysis for the final FMP submission. The advantage is that there will be better utilization (recovery) of volume from a given area by utilizing a tree down to a 4" top, rather than 5".

### **Climate Change (Sheri Andrews-Key, U of S)**

Presentation 1 recapped the project and provided examples of mainstreaming the climate change adaptation implementation.

Q. How is climate change measured in a logged area versus not logged?

A. We do not really measure it on areas that are logged versus not logged. Research involved looking at growth increment of trees (growth rings) and comparing them to the climatic conditions of the same timeframe to determine how much affect climate change may have had on tree growth.

Canoe Lake Co-Management Board invited Sherri to attend a meeting Canoe Lake is having that involves Highways. A network of key people for information flow and a collaborative approach would be the most beneficial



NorSask: Regan Beck noted that operationally NS has been affected by climate conditions in that the requirement of timber volume the mill has in the yard has increased. Crisis levels of timber in the yard have led to increasing the inventory they keep in the yard overall as a way to mitigate variable weather conditions that may affect harvesting and hauling.

Sherri noted that she is going to be working on her post-doctoral fellowship paper looking at creating a business case for adaption to climate change with a forestry economist from UBC.

In Presentation 2 - Sherri reviewed the first part of a project which she has been asked to participate in. The focus of the study will be looking back on 30 years of Aboriginal forest management and manufacturing in the Meadow Lake area. It will highlight the key benefits for both industry and stakeholders. Sherri stated that she will be back to conduct interviews as part of the project.

Q. (Barry Opikokew) when will you be doing this?

A. Aim is for January.

### **Mistik's FSC Protected Gap Analysis (Kevin Gillis)**

A Power Point Presentation on the Phase 1 Project Report on the NE AB NW SK Protected Areas Gap Analysis and implications for the Provincial target of having 12% of the province under protection. Call for more interested parties to come to the table in aiding in selecting areas for protection, special management areas and other effective area-based conservation methods. (Northern Village of Green Lake and Divide Forestry Advisory Committee).

### **Mistik's FSC Controlled Wood Controlled Wood Specified Risk Control Measure**

Kevin presented Mistik's Intact Forest Landscapes control measure for FSC Controlled Wood in the Risk Assessment Region, and specifically in the Dore/Smoothstone area. An explanation was given for maintaining the area due to the low level of human disturbance. Woodland caribou are also known to inhabit a significant portion to the area. The size of the area was described to the group as being greater than 200 000 hectares. Since the National Risk Assessment has not been completed by FSC Canada and the FSC National Standard is also in transition an Advice Note was sent out of FSC calling for a limit of disturbance of 20% of any IFL and not having the size fall below 50,000 hectares. Mistik showed that both the Dore/Smoothstone and Montreal Lake IFLs were not impacted by more than 20% of the area (map and calculations shown).

Brenda Nightingale called for a motion for the Public Advisory Group to support the principle of maintaining the Intact Forest Landscapes concept and that Mistik's Control Measure is acceptable until the FSC Controlled Wood National Risk Assessment is finalized:

### **Questions prior to vote:**

Q. Where did the IFL idea come from and does everyone have to follow it?

A. FSC International came forward with Motion 65 to maintain IFL on certified land bases. The motion was also applied to Controlled Wood as well. Only companies with FSC certificates are required to recognize IFLs.

Q. Can we get a copy of the presentation as some of the legends / data are hard to read?





A. Yes. Kevin will email or provide a hard copy.

Q. Can Kevin do presentations at the Green Lake Co-management Meetings? We have a strong interest in getting information on things like carbon, peat moss companies are trying to come into our area, and we want to make good decisions on allowing them access.

A. Yes, I would like to come to Green Lake and present to the Village council, Kevin will make arrangements with Joe.

Brenda asked for support votes, all in favor of the Control Measure?

*Dore IFL vote conducted. 22 yes, 0 no*

*Montreal Lake IFL vote conducted. 20 yes, 0 no*

Q. Is it important to report whooping cranes sightings?

A. Yes.

Billy Pedersen noted that whooping cranes have been sighted near Buffalo Narrows.

### **Saskatchewan Forestry Historical Society (Harry Ward)**

Harry informed the group of the formation of the new historical society created with the goal of capturing the diverse history and evolution of forestry in Saskatchewan. Invited interested parties to contact Harry Ward directly or contact Mistik and speak with Niska, Kevin or Tanya.

**Facilitator Brenda Nightingale closed the November 21, 2018 meeting session at 4:10 P.M.**

## **6.7. FMP Amendment Engagement (2022-23)**

### **6.7.1. NOTIFICATION OF FMP AMENDMENT**

On Feb 28, 2022, a Notification of FMP Amendment was sent to the following groups:

- Beauval Co-Management
- Big Island Lake Cree Nation
- Birch Narrows First Nation
- Buffalo Narrows Co-management Board Inc. (Hansen)
- Buffalo Narrows Village Council
- Buffalo River Dene Nation (Dillon)
- Canoe Lake Traditional Resource Users Board
- Cold Lake First Nations
- DFACC
- Flying Dust First Nation
- Goodsoil/Pierceland
- Île-à-la-Crosse/ICS-4
- Métis Nation SK



- Michel Village
- Northern Hamlet of St. Georges Hill
- Waterhen Lake First Nation

In order to gain more public interest and to notify the general public about the caribou habitat amendment, Mistik published a newspaper add on March 3, 2022 in a local newspaper (Northern Pride).

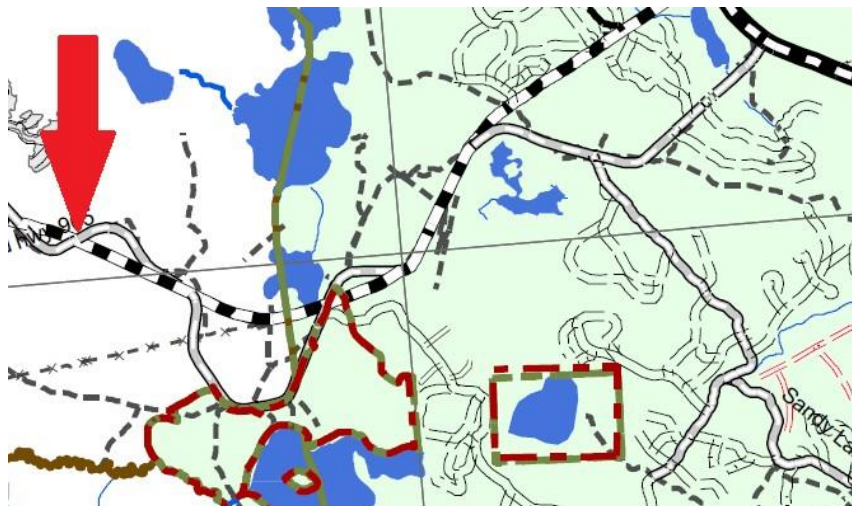
## 6.7.2. PAG MEETINGS

Mistik did presentations related to the 2023 FMP amendment at both the spring and fall public advisory group meetings in 2022.

### 6.7.2.1. PAG SPRING FIELD TOUR 2022

The 2022 spring field tour of Mistik's public advisory group (PAG) was held in the Beauval area. The theme for the tour was woodland caribou and renewal after harvest.

The first tour stop focused on the provincial range management plan for caribou for western Saskatchewan (SK2 West). The location was adjacent to a wetland example of caribou habitat along highway 965. The group discussed how the plan overlaps the Mistik license area the impacts it will have on forest operations as well as how it hopes to improve caribou habitat and populations in the area.







Tour stop location along Highway 965



Mistik staff member Joe Silva outlining caribou habitat tier areas and how they relate to the Mistik license area.

### Caribou Habitat/Wetland (Pringle approx. 8 Km west of Jct.)

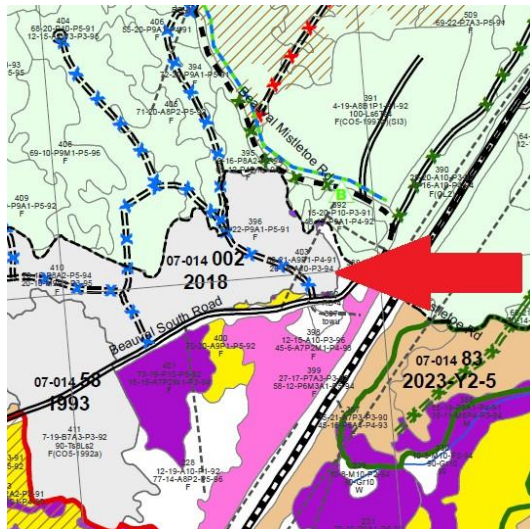
There are many wetlands on the Mistik FMA. Here we have a treed poor fen. The saturated soils mean only certain plants can grow here. Trees are tamarack and black spruce, shrubs include Labrador tea and leatherleaf, ground layer is primarily sphagnum mosses. Due to high soil moisture, decomposition is slowed creating thick peat layers. Peat stores large amounts of carbon- boreal wetlands are major carbon stores. Protecting wetlands is important for regulating water levels and mitigating climate change. Mistik has a partnership with DUC to implement practices that reduce our impacts on wetlands and identify priority areas for protection.

Wetlands are home to many wildlife species including cranes and waterfowl. Treed bogs and fens like the one here are also important caribou habitat. Peatlands are difficult to move through and have relatively poor browse for moose and deer, so they serve as a refuge for caribou to avoid wolves, their main predator. Caribou in the Boreal Plains spend a lot of time in peatlands as a result. In treed bogs and fens, arboreal lichens often cover the trees.

These are an important food source for caribou. Caribou especially like peatlands with patches of upland forest where they can also forage for ground lichens (often jack pine at these sites). Mistik is currently amending the FMP to be consistent with the SK2 West Range Plan (show map of Tier areas).

Tour stops along Highway 155 included a naturally regenerating jack pine block (recent harvest) and a mixedwood block from 1994 where white spruce was planted. Mistik renewal techniques used on different sites were discussed as well as regeneration survey timing and the data collected.

**Block 7-14-02** (newer harvest area just south of the cell tower on the right).



This block was harvested in 2018-19. The majority of the block had jack pine and the renewal method was to leave it for natural regeneration. The jack pine slash is spread throughout the block after harvest so the cones are distributed and they can open in the heat of summer





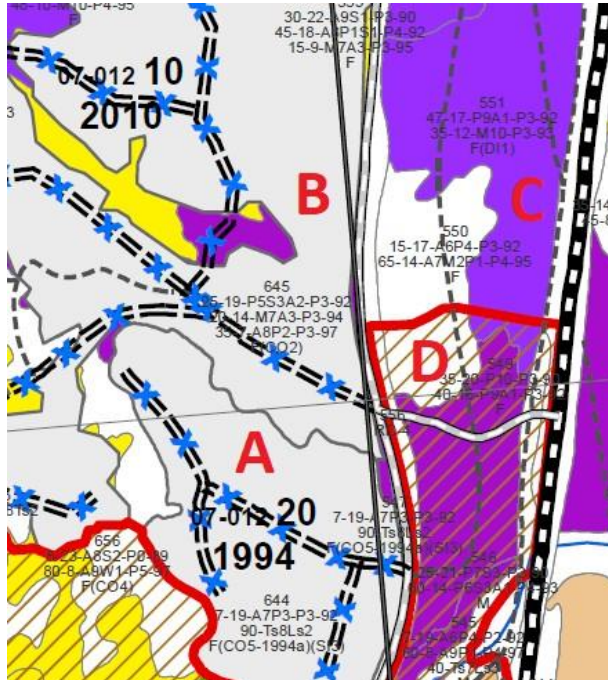
Block 7-14-02 Jack Pine seedling germinating from seed



Looking for jack pine seedlings in a recently harvested area.



### Durocher Area (multiple stops)



#### A – 1994 Harvest Area

Had some tree planting (white Spruce in the north-west part) but was mostly leave for natural (jack pine/trembling aspen). It was surveyed in 2000. Block was sufficiently regenerating. No free-to-grow survey (not required on blocks this old).

#### B – 2010 Harvest Area

Block was leave for natural (trembling aspen). It was surveyed in 2017 and was sufficiently regenerating.

#### C – Jack Pine area (unharvested)

This is another example of Caribou habitat.

#### D – New Harvest (Block )

This block was harvested this past winter.

One of the final tour stops was at a previously cleared area south of Beauval. In the 1970s, a pulp mill was planned for the site but it was never built. We had an interesting discussion about the forest industry of that time.



Mistik would like to thank all participants for taking part in the tour and for the great conversations and perspectives that were shared.





## 6.7.2.2. PAG FALL MEETING MINUTES (OCTOBER 27<sup>TH</sup>, 2022)

**Meeting Location:** Grace United Church, Meadow Lake

**Meeting Facilitators:** Niska Hodgson, Kevin Gillis

**Meeting Attendees (name and affiliation):**

Interested Party	Participant Name(s)
Beauval Co-management Board Inc.	Participant did not attend
Big Island Lake Cree Nation	Participant did not attend
Birch Narrows Dene Nation	Participant did not attend
Buffalo Narrows Co-Management	Bill Pedersen, Ron Pedersen
Buffalo Narrows Metis Local #62	Participant did not attend
Buffalo River Dene Nation	Participant did not attend
Canoe Lake Co-Management Board	Participant did not attend
City of Meadow Lake	Participant did not attend
Cold Lake First Nations	Fran Desjardin, Mike Desjardin
CPAWS	Participant did not attend
Divide Forest Advisory Council Corporation	Participant did not attend
Ducks Unlimited Canada	Mark Kornder
English River First Nation	Participant did not attend
Flying Dust First Nation	Tara Dull, Kole Norman
Forestry Contractors	Participant did not attend
Independent/3rd Party Forestry Operators	Dean Millard
Ile-à-la Crosse ICS4 Group	Participant did not attend
Interested Party – Bob Wilson	Participant did not attend
Junior Forest Wardens	Participant did not attend
Makwa Sahgaiehcan First Nation	Participant did not attend
Makwa/Loon Lake Metis Local #32	Irvin Beaudry
Meadow Lake Mechanical Pulp	Taneal Brucks, Lorne Neale
Meadow Lake Métis Local #31	Participant did not attend
Meadow Lake Tribal Council (MLTC)	Participant did not attend
Métis Nation SK - Environment Minister/NR 3	Participant did not attend
Métis Nation Saskatchewan (Provincial)	Participant did not attend
Ministry of Environment Forest Service ML	Morgan Blenkhorn, Joshua Barnes
Ministry of Environment Forest Service PA	Baburam Rijal, Nadine Penney
Ministry of Environment Wildlife Unit ML	Participant did not attend
Ministry of Government Relations	Participant did not attend
Mistik Board of Directors	Participant did not attend
Mistik Staff	Robert Follett, Max Kurjata, Niska Hodgson, April Lesko, Kevin Gillis, Denise Bayko
Moosomin First Nation	Participant did not attend
NorSask Forest Products - Management	Participant did not attend
NorSask - Union Employees	Participant did not attend
NorthWind Forest Products	Participant did not attend



Northern Hamlet of Michel Village	Tim Laplante, Helena Couillonneur
Northern Hamlet of St. Georges Hill	Philomeme Cummings, Violet Herman
Northern Lights Snowmobile Association	Participant did not attend
Northern Village of Green Lake	Joe Gardiner
Northern Village of Ile-à-la Crosse	Participant did not attend
Rural Municipality of Loon Lake #561	Participant did not attend
Rural Municipality of Meadow Lake #588	Blair Mysko
Saskatchewan Environmental Society	Participant did not attend
Outfitting	Participant did not attend
SK Public Safety Agency, Ops Div. (Wildfire)	Participant did not attend
Saskatchewan Water Security Agency	Participant did not attend
Saskatchewan Wildlife Federation	Participant did not attend
Saulteaux First Nation	Participant did not attend
Silvacom	Ryan Spooner
Thunderchild First Nation	Participant did not attend
Town of St. Walburg	Tony Leeson, Merrill Leeson
Village of Loon Lake	Participant did not attend
Waterhen Lake First Nation	Participant did not attend
West District Stakeholder's	Participant did not attend
Zone 8 Trappers	Leonard Greenhough

### Proceedings of the October 27, 2022, Mistik Public Advisory Group Meeting:

Participants had lunch from 12:00-1:00 before the meeting began

Niska Hodgson gave a welcome, general housekeeping, and an opening prayer was offered by Fran Desjardin from Cold Lake First Nations. A round-table of introductions was also done.

A motion to approve the meeting agenda was made by Ron Pedersen, seconded by Joseph Gardiner. Motion carried.

Note: Questions are designated "Q," answers "A", and comments "C"

### Current Affairs (Robert Follett, Mistik General Manager):

- Logging in Canoe Lake, Beauval, Waterhen...
- Pulp mill gave up their allocation on the PA FMA
- More of a presence on the Mistik FMA and L&M FMA
- On the NorSask side - Bio-energy plant is up and running
- Beehive burner no longer burning
- Expensive to do business
- Struggling for operators in machines and truck drivers
- Working on truck driver training course
- Industry is struggling to find foresters
- Looking at summer students for next year
- Would like to have community students that can partner up with the forestry summer students
- Hopefully will entice more young people to go after a career in forestry
- If you know anyone that is interested in working in the forest industry, let us know

C – Ron Pedersen (Buffalo Narrows Co-Management) - out of all the forestry that happened in the north, he was the only contractor to have to pay for a license. He's the only guy he knows that had to pay it and no other companies were asked to do this. Robert wasn't sure about the history around this and asked Ron to bring it up at the meeting next week (board of directors





meeting).

Q – Bill Pedersen What is the harvest style now? Stump to dump?

A – Robert Follett – We have a mix of contract types. Only Waterhen and P&E Logging are stump to dump. C – Bill Pedersen (Buffalo Narrows Co-Management) - back when he was hauling, NorSask flooded the haul with so many trucks from PA and everywhere else and he was no longer allowed to go to NorSask. With no meeting, they switched to short wood and he was out of the picture. Robert - has apologized for that.

Apologized again. If they were to go back to Buffalo Narrows, he would work with the community to ensure that type of thing wouldn't happen again and that things will look different.

C - Bill also voiced some other concerns he had with what happened in the past. That was 17 years ago and he almost lost everything. What has Mistik done for us in the last 17 years? Meadow Lake is thriving and Buffalo Narrows is struggling. Robert - we need to understand what the community wants. When Mistik and the community can agree, we would want to have as many back stops in place as possible to ensure that those past problems don't happen again. Bill talked about how his kids are looking for opportunities and the forestry opportunity sits there but why would he tell them to work in forestry with his experience

### **Meadow Lake Mechanical Pulp (Lorne Neale)**

- Lorne noted that he was honored to be in this place of change and that we were honoring the creator at the start of the meeting.
- Lorne explained his history with MLMP and how he was one of the first supervisors at the mill.
- They got new evaporators to improve pulp quality, and have had issues with the supply chain
- One of the projects they are working on is around water supply intake. This is to ensure they have enough water coming into the pulp mill. They don't let any water out; they just replace what evaporates
- They have a new general manager
- A lot of the people he started with have retired and there is lots of change
- They used to make pulp for writing paper and now they make board grade pulp
- Quality is much improved, and productivity remains the same
- They want to be able to respond to changing markets and to reduce CO2 emissions.

### **2020/21 Mistik and L&M (NorthWind) Annual Reports (Niska Hodgson, Mistik Planning Manager)**

Note that the Mistik and L&M 2020/21 Annual reports can be found on the Mistik website at <https://www.mistik.ca/forest-management/2019-fmp> (look on the Forest Management page under Annual Reporting).

- No harvesting in the north Management Units in 2020/21
- No new public concerns added to the registry document
- The presentation includes the highlights. Full reports are on the Mistik website
- Niska explained the way the annual report is set up and how to understand the summaries
- For forest management plan (FMP) targets that were formally assessed, 8 of the 9 indicators were on target and the other one was partially on target.
  - The one that was partially on target was Indicator 23 - Aboriginal Community Involvement in the planning processes. Birch Narrows was missed when the invitations for the 2020 fall PAG meeting were sent. Niska confirmed that they were invited to the 2021 and 2022 PAG meetings so the target will be back on track going forward.
- For not formally assessed targets, Niska went through some that were off target



- Indicator #2a - a bit low on the "very old" mixedwood. Good on other species groups (hardwood, softwood). Good on "old" forest in all species groups
- Q – Bill Pedersen had a question about how the harvest timing works and if Mistik comes back to the Buffalo Narrows area will they take everything and not come back for 80 years?
- A – Niska – we plan and distribute our harvest around the license area over time and as the forest grows.
  - Niska explained harvest events and how they try to mimic wildfires and natural disturbances.
- C - Bill expressed concern that clearcutting removes so much of the minerals and nutrients and the forests will grow back there much slower than after a fire. Niska, Ryan, and Nadine talked about the research and monitoring that happens to measure growth rates and that harvest areas are regenerating as expected (meeting provincial growth rate requirements).
- C - Fran Desjardin raised concerns about garbage being left after harvesting occurs. This was noted in the Beauval area where we had the spring PAG tour. Why not close off the roads after harvesting. Niska agreed that there is a lot of garbage and it's unacceptable but it was not from Mistik's operations. Mistik cannot leave any garbage. The ministry of environment does many inspections to make sure nothing is left. Kevin Gillis added that there are multiple cabins at the end of the road in question and the owners need access to them. The road pre-dated Mistik, and even though they used it for a period of time, they can't close it because those folks need the access (it's what's known as a "pre-existing access"). If it's strictly a Mistik-built new road then we have to reclaim it. Bill P. suggested that Mistik put up signs about not dumping. It was agreed that this might be a good idea to help raise public awareness.
- C – Dean Millard – understands this frustration as he is aware of garbage. Open roads can also lead to vandalism of equipment.
  - With regard to harvest events, Mistik now aggregates harvest blocks to ensure disturbance is concentrated in less areas. This helps to minimize road networks. Niska showed an example map and image.
- C - Ron Pedersen brought up a concern around harvesting too close to Niska Lake and that hunting zones are 400m. Niska explained that that Niska Lake has a 200m buffer on it and explained the normal buffer categories they have on different water bodies and watercourses (15/30/90m). The 200m buffer was implemented based on a request from the Community of Buffalo Narrows and it exceeds the minimum requirements of the province (which would normally be 90m on this lake). Ron asked that we speak to Leon McCallum as he is very familiar with and uses this area. Niska said that she had spoken to him several times, including just in the past week or so.
  - An indicator that is a bit off target is tree retention after harvest, Mistik recognizes that they need to do a bit better job of leaving retention in the blocks. Over the last two years, they have been working really hard with operators to leave some larger patches. Kevin added that they are aiming to leave at least one large leave patch about every 100m.
  - Niska went through some examples of non-compliances and what Mistik is going to do to minimize them.
  - The group discussed the indicator that relates to Mistik seedlings not being from "improved" seed sources. They should have worded this indicator differently. It is actually okay to use improved seed. Improved seed just means it comes from a tree orchard, from strong parents. It's the genetically modified seed that we don't want to use.
- C - Taneal Brucks – it makes sense to be open to improved stock. GMO is off the map anyway through our certifications. Kevin - FSC outright disallows GMOs. Niska suggested that we re-word this indicator.
  - Taneal made a motion to revise the wording to: "No tree seedlings planted on the Mistik FMP area shall be from GMO sources, and the amount of seedlings from improved sources will be tracked separately." Seconded by Blair Mysko. Motion carried
  - Softwood HVS is not being fully utilized. About 70% of the softwood the mills need comes from the license areas and the rest from other sources (private land, PA license area). Hardwood HVS is not being fully utilized either.
  - Mistik has a commitment to work with communities to lower wildfire risk if requested by a community. To date, no requests have been made.





- Indicator to ensure that harvest is distributed across the FMA and by forest type.
- Impacts of climate change on Mistik FMP Area. This is done by monitoring ice conditions (length of time frozen) for local lakes. They also monitor operational days lost due to abnormal environmental conditions.
- Using local resources and local workforce. There are 9/13 communities represented in 2020, which is lower than target. This is due to a lack of operations in the north part of the license area.
- Stakeholder engagement is on track.

Q (Ron Pedersen) – I got a letter for Île-à-la-Crosse, where do I send my concerns. A (Niska H) – we take input in any format. You can e-mail, call, meet in person, etc.

Q (Taneal Brucks) – Do you use communication via any other methods like social media?

A (Niska H) – we don't use social media. We use letters, e-mail, and phone calls primarily. The letter going out is just a starting point.

- FMP register is maintained to track various commitments and issues
- Regeneration survey results are good. There are two measurement times - Establishment and Free to Grow surveys done typically in year 5 and 14, respectively. All blocks surveyed in 2020 "passed" and are growing as required. Stem densities and tree heights are above minimums.
- Contractors who have annual environmental training - target is 100% and they were a little low in 2020. A couple of contractors did not have documented training.
- Caribou sightings – Mistik does field monitoring and produces a map of caribou sightings each year. They purchased and installed trail cameras this year and are also monitoring for bison.
- Downed woody debris. It's important to leave some out there.
- Net Carbon uptake (upland and lowland) is reported on.
- Working with Ducks Unlimited Canada to work with a formula to try to assess carbon in the lowland (peatland) areas
- Total area of wildfire is reported annually.

#### **LiDAR and its use in Forestry (Ryan Spooner, Silvacom)**

- Lidar stands for Light Detection and Ranging
- You can think of it like radar or sonar but with light (lasers), used to tell how far something is away
- When a pulse is reflected off the top of the trees, the reflection that is measured by the lidar sensor is called a return
- Portions of the same laser pulse can reflect off branches in the middle of the canopy and even make it to the ground
- Once all of the returns are collected, they are assembled into a point cloud
- Lidar resolution is measured in pulse density - pulses per square metre (PPM)
- Lidar data requires processing
- Two main types of collection are aerial and terrestrial
- Some Lidar derived outputs:
  - Digital Elevation Models (DEM)
  - DEM Hillshades
  - Canopy Height Models (CHM)
  - Canopy Cover
  - Digital Surface Models (DSM)
- Lidar does not replace boots on the ground. Need field data to get quality results.



### Caribou and Mistik's amendment to the 20-year Forest Management Plan (Niska Hodgson, Planning Manager)

- Mistik is amending the 20 year FMP to gain alignment with the provincial SK2 West Caribou Range Plan which was finalized last fall.
- The goal of the range plan is to achieve and maintain a self-sustaining caribou population while allowing for continued economic activity
- Niska went through the map of caribou habitat tiers and Nadine Penney explained that the goal is to minimize disturbance in the Tier 1 areas but still allowing for economic use. Ideally Tier 1 areas would be left undisturbed for longer timeframes (20-50 years)
- We know that forests change so there will be movement in the Tier locations over time
- Will continue to review and revise plans to ensure there will be enough habitat out there
- Mistik is modelling wood supply with deferrals in the Tier areas. They are also modeling to understand habitat disturbance levels.

C (Nadine Penney) – Mistik is working with the province on this (forest service and fish, wildlife, and lands branches). The ultimate goal is to be in alignment with the federal caribou strategy and to make improvements. There is a timeline for industry to get this done.

- Niska walked us through a recent modeling scenario. The next step is to run more scenarios to find the best balance between harvest levels and habitat improvement.

C (Ron Pedersen) – The uranium mines are also affected.

Q (Taneal Brucks) – What is the responsibility of other industries involved?

A (Nadine Penney) - All sectors of industry are considered under the provincial caribou plan. Anything that creates disturbance is addressed. Mitigative offsets are not being considered for forestry at this point, only for smaller scale type operations (such as exploration). Forestry is being asked to avoid Tier 1 (deferrals). Offsets are still under development and the plan will be reviewed regularly.

Q (Kole Norman) – Is it the same for everyone?

A (Niska) Yes, all FMA holders have to amend their plans.

Q (Bill Pedersen) – This is for bigger companies, what about smaller groups?

A (Nadine P) – This applies to all sectors operating in the areas identified in the caribou range plan.

Q (April Lesko) - Has the government used any of the research or information that Mistik had acquired on Caribou in the past.

A (Nadine P) – She doesn't have all of the details but research is being used to identify areas. Mistik has

been helpful and the government is "filling in the gaps" with additional research.

C (Dean Millard) - These constraints will conflict with the push from government to "use it or lose it". You can't say we'll give it to someone else if you don't use it, but then say also you can't use it here or can't use it there at the same time.

Q (Kole Norman) – Could we see something similar for Bison habitat?

A (Nadine P) – Hopefully not. The approach being used is to try to manage habitat biodiversity for all species, rather than implement range plans for individual species.

C (Fran Desjardin) asked if she could get the map or shapefile of the caribou tiers. **ACTION** - Niska will provide that to Fran (done on November 15<sup>th</sup>, 2022).

After the group had some time to review the minutes of the fall 2021 PAG meeting, a motion to adopt the minutes of the October 2021 meeting was made by Leonard Greenhough, seconded by Taneal Brucks.

Motion passed.

### Certification Update/Protected Area Strategy (Kevin Gillis - Mistik Certification Coordinator)

- Kevin showed the group some items before starting the presentation:





- Finger jointed board made in SK by Pivot out of aspen - they are making furniture. NorSask is doing some trials with aspen through the sawmill. They don't get great recovery because you never know where the rot starts so it's tough to make an 8 foot 2x4. That's why the finger jointing option is important.
- A small old chainsaw from the 70s
- Protected Areas –In FSC, there is a requirement that Mistik must conserve at least 10% of their area. This is important also for the betterment of the environment overall.
- Reasons for protected areas:
  - Cultural values
  - High conservation value areas, archaeological finds/historic information
  - Wildlife habitat
  - Caribou and other species at risk
- Mistik partnered with AIPac, DUC, and CPAWS on this exercise. Kevin showed a map of the project area. They did a gap analysis of potential conservation areas. There is good protection along the Alberta/SK border but missing good connectivity between the two areas.

Q (Bill Pedersen) – Is Île-à-la Crosse still part of the Mistik FMA?

A (Kevin G) – that's a good topic to bring up at the board meeting next week. I can't speak to that.

- Lots of moose habitat in this area (high lake edge density)
- OECM = Other Effective Conservation Measures
- Long-term deferral of forestry operations within a defined area such as woodland caribou range plan management strategies
- ICL - Indigenous cultural landscape
- IPCA - Indigenous protected and conserved area
- Migratory birds' convention act - what has changed
- Specific species named whose habitat cannot be impacted
  - Great Blue Heron. Nest in colonies (multiple nests)
  - Black Crowned Night Heron. They might not be around here
  - Pileated Woodpecker. If we find a tree with a cavity nest, we must leave it standing now. Also, other birds' nest in cavities created by pileated woodpeckers

The meeting concluded at 4:50 pm and supper was served.

### 6.7.3. ADDITIONAL MEETINGS

The following additional meetings were held during 2022 and 2023 related to the work Mistik did for the FMP amendment.

- **Beauval Co-management** – 10 November 2022 – Reviewed the map and Mistik's proposed amendment (caribou tiers/deferrals). No specific questions related to Caribou were asked.
- **Buffalo River Dene Nation** – 16 Jan. 2023 – Reviewed map/deferral areas/protected area. General discussion around these topics was held.



- **Canoe Lake Cree First Nation** – 4 April, 2022, 17 June 2022, 8 July 2022 (incl. heli. flight) – Discussion on the nation's proposed heritage area as it relates to Tier 1 Caribou, the impacts of the proposed site on timber values including the context with caribou tier areas and concerns that have been raised by the co-management board.
- **Canoe Lake Traditional Resource Users Board** – 8 Feb. 2022, 7 March 2022, 4 May 2022, 19 May 2022, 12 July 2022 (with FWL branch), 14 Oct 2022, & 9 November 2022 – Several meetings have been held with the co-management board throughout the past year related to the 2023 FMP amendment. Items discussed included the Canoe Lake Cree First Nation proposed heritage area that overlaps Tier 1 in the Canoe area, impacts to the Canoe Lake harvest contractor group, availability of harvest areas in relation to harvest deferrals, and updated harvest levels for Canoe Lake management unit based on new model results.
- **Divide Forest Advisory Council Corporation (DFACC)** – 27 Jan. 2022, 22 March 2022 – General updates given on caribou planning (Divide forest has no caribou tier areas).
- **Île-à-la-Crosse/ICS-4** – 30 November 2022 – Discussed protected areas and Caribou. No specific questions were asked about the FMP amendment.
- **Waterhen Lake First Nation** – 17 January 2023 – Reviewed map/deferral areas/protected area. General discussion with community members around these topics was held.
- **Cold Lake First Nations** – March 27, 2023 — Mistik undertook a meeting with CLFN to review and discuss proposed amendments to its 20 Year Forest Management Plan (FMP). During the meeting, Mistik reviewed the 20 Year FMP planning process, what is contained within the FMP and the importance of various components of the 20 Year FMP. Mistik provided an overview of proposed changes to the 20 Year FMP and why those changes were occurring (to align with the Gov't of Saskatchewan's SK2 Caribou Range Plan). Mistik fielded several questions from CLFN regarding how forest harvesting is planned and executed, re-growth timelines and the potential for re-harvesting of areas, reclamation, replanting and clean-up, management of forest harvesting impacts to caribou, avoidance/protection of medicinal/culturally significant plants, aboriginal cultural values, and seedling storage.





## 7. APPENDIX C: 2023 FMP AMENDMENT

### 7.1. EXECUTIVE SUMMARY

Mistik's 20-year Forest Management Plan (FMP) was approved in May 2019. A Minister of Environment's condition of approval was to adapt the FMP based on the direction provided by the Range Plan for Woodland Caribou in Saskatchewan. In October of 2021, the *Range Plan for Woodland Caribou in Saskatchewan (Boreal Plain Ecozone – SK2 West Caribou Administration Unit)* was finalized by the province. The FMP amendment outlining the proposed plan changes to meet this condition is presented below. This document includes updates to the Selected Management Strategy (SMS), caribou habitat management (Indicator #7b), and harvest distribution (Indicator #22). Mistik is also proposing changes to the silviculture ground rules and seed sources (Indicator #8) which are not related to caribou. There are minor text changes to some other indicators.

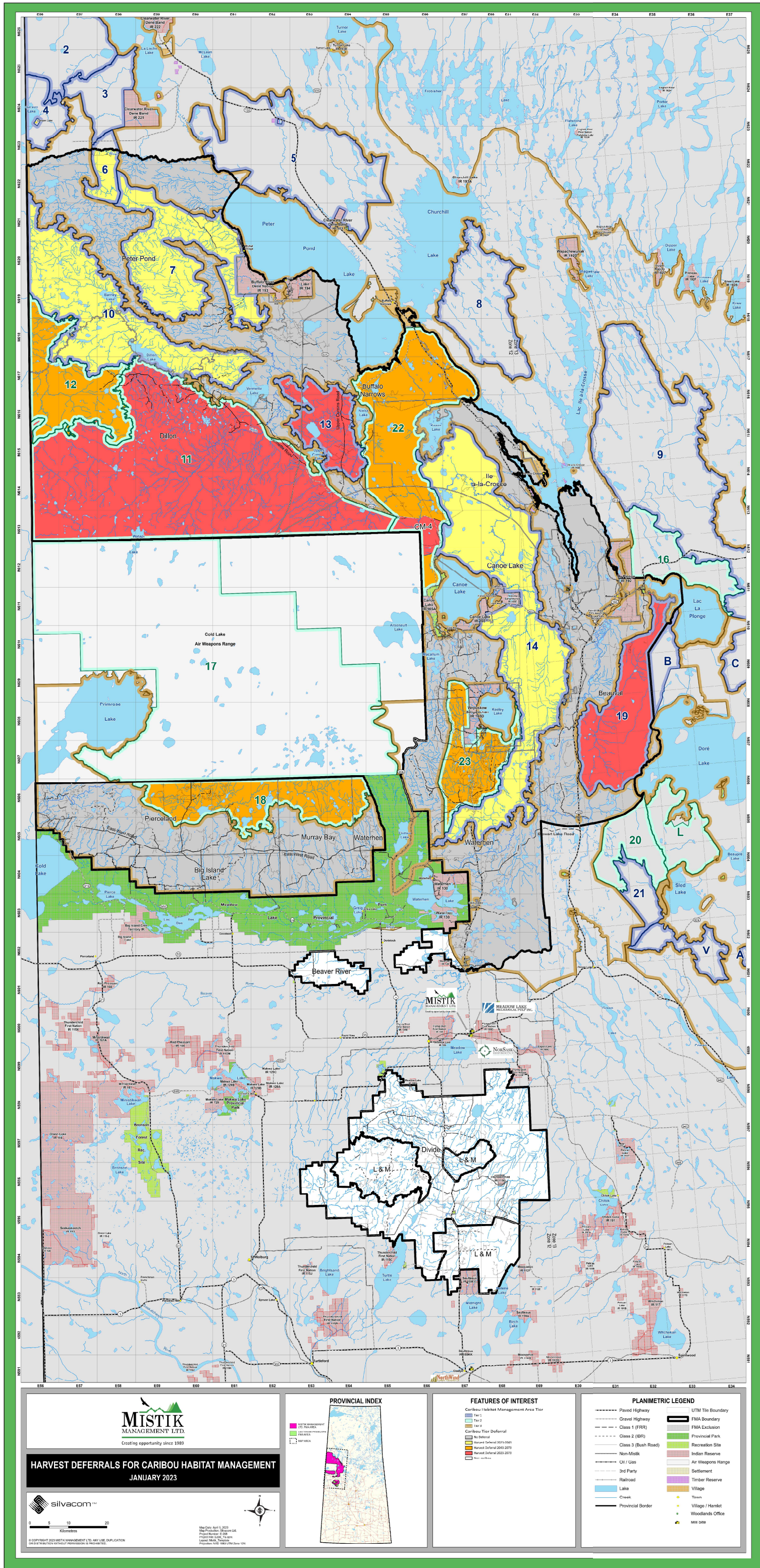
As in the *Range Plan for Woodland Caribou in Saskatchewan (Boreal Plain Ecozone – SK2 West Caribou Administration Unit)*, this amendment focuses on the provisions of caribou habitat during a 50-year timeline into the future. The primary mechanism for ensuring maintenance of caribou habitat during this period is to limit disturbance in high quality habitat areas.

Saskatchewan has adopted a 'tiered' approach to the SK2 West caribou range with harvesting deferred to ensure habitat maintenance, connectivity, and recovery. Table 7-1 details the deferral lengths for the various tier areas used in the final amended SMS, with map 39 showing the spatial distribution of deferred areas. APPENDIX A: Woodland Caribou Habitat Mitigation Plan provides more detail on woodland caribou, the SK2 West caribou range, and the three tiers identified. APPENDIX D: VOITs contains updated VOITs for indicators 7b, 8 and 22.

Table 7-1 Tier, sub-tier and deferral length

Tier	Sub Tier	Area (ha)	Deferral Length (years)
T1	6	9,523	20 (2023-2043)
	7	74,427	
	10	99,284	
	14	155,225	
	13	34,574	50 (2023-2073)
	19	57,911	
T2	11	263,036	50 (2023-2073)
	12	53,025	30 (2043-2073)
	18	61,002	
	22	96,569	
	23	38,450	
	CM-4	8,098	50 (2023-2073)
T3	N/A	731,843	N/A









## 7.2. LANDBASE CHANGES

While the landbase submitted as part of the approved May 2019 FMP was utilized as the basis for this amendment, in recognition of changes that have occurred since the landbase effective date in 2016 two changes were made:

- 1) Harvested areas as reported in Mistik's Annual Reports from 2016 to 2020 were identified in the landbase. These areas were subsequently depleted (i.e. age reset to 0) in the first 5-year period of the timber supply analysis.
- 2) Wildfires, as per the Ministry of Environment spatial layer, were included and depleted (i.e. age reset to 0) in the landbase.

The following tables highlight how these changes have impacted the landbase in the various planning and management units.

Table 7-2 Harvested area for each planning unit and management unit from 2016-2020

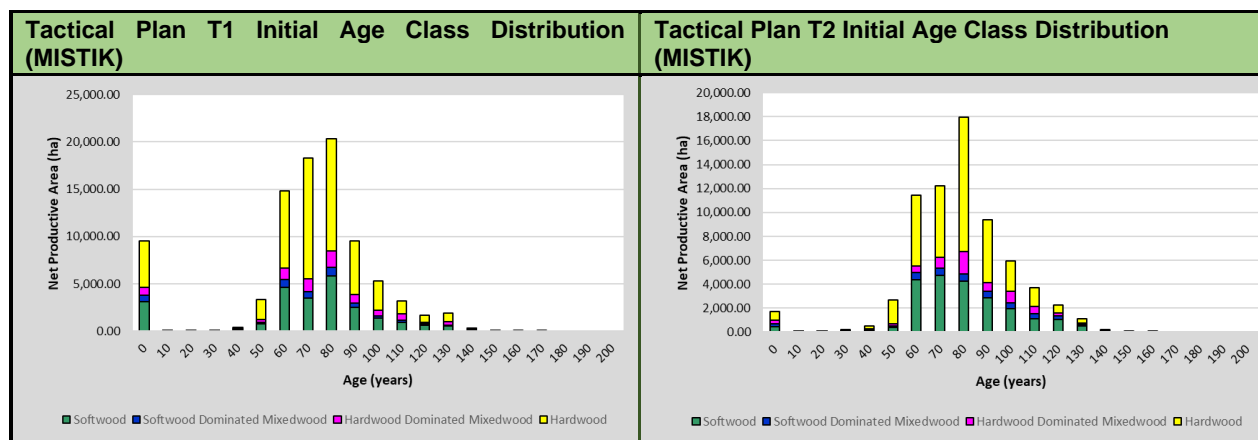
Planning Unit	Management Unit	Harvested Area (ha)					
		2016	2017	2018	2019	2020	Total
West	20-Beaver	0	0	0	0	0	0
	03-Big Island	863	113	0	344	448	1,768
	12-Murray	0	163	0	159	264	586
	02-Pierceland	0	294	1,006	527	265	2,092
<b>Subtotal</b>		<b>863</b>	<b>570</b>	<b>1,006</b>	<b>1,030</b>	<b>977</b>	<b>4,446</b>
Central	09-Ile-a-la	0	0	0	0	0	0
	10-Buffalo	0	0	0	0	0	0
	07-Beauval	129	0	96	190	88	503
	04-Waterhen	532	519	812	749	463	3,075
	08-Canoe	307	307	228	154	316	1,312
<b>Subtotal</b>		<b>968</b>	<b>826</b>	<b>1,136</b>	<b>1,093</b>	<b>867</b>	<b>4,890</b>
North	21-Peter	0	0	0	0	0	0
	11-Dillon	0	0	0	0	0	0
<b>Subtotal</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Divide	01-Divide	876	949	761	1,076	823	4,485
<b>Subtotal</b>		<b>876</b>	<b>949</b>	<b>761</b>	<b>1,076</b>	<b>823</b>	<b>4,485</b>
L&M	85- L&M	777	369	785	446	577	2,954
<b>Subtotal</b>		<b>777</b>	<b>369</b>	<b>785</b>	<b>446</b>	<b>577</b>	<b>2,954</b>
<b>Total</b>		<b>3,484</b>	<b>2,714</b>	<b>3,688</b>	<b>3,645</b>	<b>3,244</b>	<b>16,775</b>

Table 7-3 Burned area for each planning unit and management unit from 2016-2019

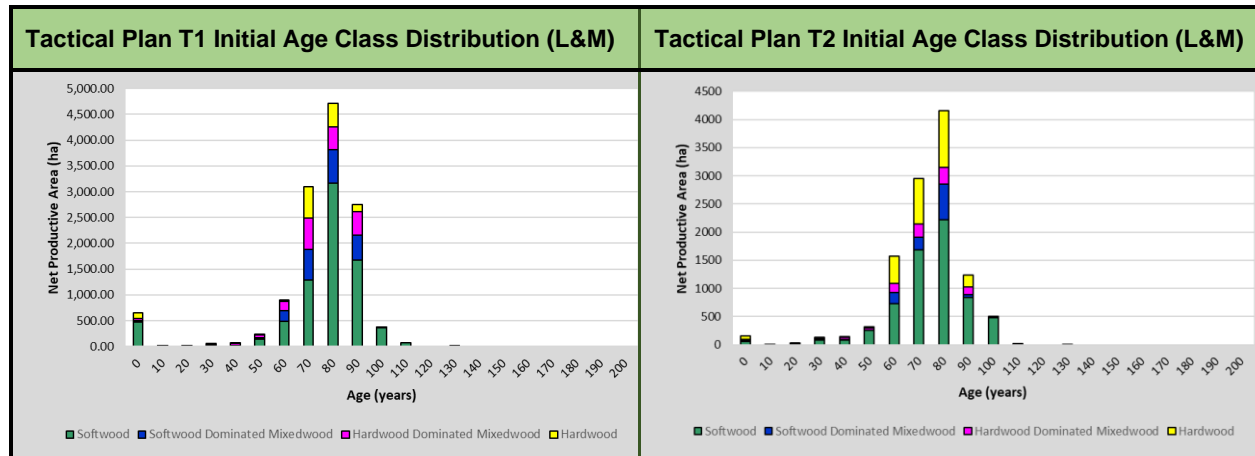
Planning Unit	Management Unit	Burned Area (ha)			
		2016	2018	2019	Total
West	20-Beaver River	0	0	0	0
	03-Big Island Lake	0	0	0	0
	12-Murray Bay	0	0	0	0
	02-Pierceland	0	0	0	0
<b>Subtotal</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Central	09-Ile-a-la Crosse	0	0	70	70
	10-Buffalo Narrows	0	0	0	0
	07-Beauval	0	0	0	0
	04-Waterhen	0	129	0	129
	08-Canoe Lake	59	0	0	59
<b>Subtotal</b>		<b>59</b>	<b>129</b>	<b>70</b>	<b>258</b>
North	21-Peter Pond	5	495	0	500
	11-Dillon	4,744	0	0	4,744
<b>Subtotal</b>		<b>4,749</b>	<b>495</b>	<b>0</b>	<b>5,244</b>
Divide	01-Divide	0	0	0	0
<b>Subtotal</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
L&M	85- L&M	0	0	0	0
<b>Subtotal</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Total</b>		<b>4,808</b>	<b>624</b>	<b>70</b>	<b>5,502</b>

In addition to harvesting and wildfire impacting the landbase generally, the tactical plan was also impacted as 5-years of tactical plan blocks have now been harvested. The following graphs show how 5-years of harvesting has impacted the cover type and age class distributions of tactical plan areas on the Mistik FMP Area. While the bulk of tactical area has remained consistent, T1 and some T2 area has been both harvested and burned in recent years, which is highlighted by the area in the '0' age class bar. This area was left in the bar graphs to show how the age class distribution of tactical plan area has shifted in this amendment.

Table 7-4 Tactical Plan Age Class Distributions







## 7.3. PLANNING TEAM AND STAKEHOLDERS

The planning team for the FMP amendment consisted of Mistik staff, consulting support staff from Silvacom Ltd, public advisory group representatives, Ministry of Environment staff from both the Forest Service and Fish, Wildlife and Lands branches. The planning team chair was Mistik's planning manager, Niska Hodgson.

Name	Title/Responsibility	Representing
Robert Follett	General Manager	Mistik/NorthWind
Niska Hodgson	Planning Manager, Planning Team Chair	Mistik/NorthWind
Steven Hankey	Operations Manager	Mistik/NorthWind
Kevin Gillis	Certification Coordinator	Mistik/NorthWind
Clifford McLauchlan	Planning/GIS Supervisor	Mistik/NorthWind
Joe Silva	Planning/Operations Supervisor	Mistik/NorthWind
Sherri Gregoire	Operations Forester	Mistik/NorthWind
Ryan Spooner	Director, Forest Resource Analysis	Silvacom
Adrian Smith	Lead, Forest Resource Analysis	Silvacom
Sophie Aasberg	Analyst, Forest Resource Analysis	Silvacom
Cam Brown	Advisor	Forsite
Dianne Roddy	Advisor	Sakaw Askiy
Tony and Merrill Leeson	Representatives	Public Advisory Group (PAG)
Vacant	Strategic Planning Analyst	Forest Service Branch
Nadine Penney	Strategic Planning Forester	Forest Service Branch
Morgan Blenkhorn	Forester	Forest Service Branch
Melissa Nordin	Boreal Landscape Specialist	Forest Service Branch
Baburam Rijal	Forest Modelling Analyst	Forest Service Branch
Dean Mamer	Silviculture Specialist	Forest Service Branch
Shawn Francis	Team Lead, Landscape Management	Fish, Wildlife & Lands Branch
Gigi Pittoello	Habitat Ecologist	Fish, Wildlife & Lands Branch
Kelsey Haugen	Landscape Analyst	Fish, Wildlife & Lands Branch



In addition to the planning team members, approximately 20 northern communities exist within or adjacent to the Mistik FMA area. The majority of these settlements are comprised of First Nation and Métis populations. Commercial fishing, ranching, farming, wild rice harvesting, trapping, and other various non-timber extraction activities from the forest contribute to the local economies of these communities.

Mistik works cooperatively with eight local co-management/advisory groups, one regional public advisory group and other interested provincial government, industrial and non-governmental organizations. The eight local co-management/advisory groups are generally open to participation by any member of the community and are comprised of representatives from various forest stakeholder groups. An initial letter inviting each group to engage with Mistik during the amendment development process was sent in February 2022. Updates were given at regularly scheduled meetings with the groups throughout the year. These meetings included discussion and general questions about the provincial range plan, caribou habitat, locations, populations, and the process for amending the FMP. No specific requests were made to change the amendment process or to change or modify deferral areas as of the time of submission of the plan to the ministry.

Mistik's public advisory group was updated on the amendment progress at regularly scheduled PAG meetings (spring and fall). There are two PAG representatives on the planning team who attended meetings as outlined in this workplan. Mistik posted an advertisement in the local newspaper informing the public of the FMP amendment and inviting them to contact Mistik if they wish to provide input.

For a complete list of stakeholder groups and descriptions, refer to Mistik's *2017 Public Engagement Plan* and *Appendix B* of this Volume. The following section 7.4 addresses all public and indigenous engagement that occurred as part of this FMP amendment.

## 7.4. FMP AMENDMENT ENGAGEMENT

The following additional meetings were held during 2022 and 2023 related to the work Mistik did for the FMP amendment.

- **Beauval Co-management** – 10 November 2022 – Reviewed the map and Mistik's proposed amendment (caribou tiers/deferrals). No specific questions related to Caribou were asked.
- **Buffalo River Dene Nation** – 16 Jan. 2023 – Reviewed map/deferral areas/protected area. General discussion around these topics was held.
- **Canoe Lake Cree First Nation** – 4 April, 2022, 17 June 2022, 8 July 2022 (incl. heli. flight) – Discussion on the nation's proposed heritage area as it relates to Tier 1 Caribou, the impacts of the proposed site on timber values including the context with caribou tier areas and concerns that have been raised by the co-management board.





- **Canoe Lake Traditional Resource Users Board** – 8 Feb. 2022, 7 March 2022, 4 May 2022, 19 May 2022, 12 July 2022 (with FWL branch), 14 Oct 2022, & 9 November 2022 – Several meetings have been held with the co-management board throughout the past year related to the 2023 FMP amendment. Items discussed included the Canoe Lake Cree First Nation proposed heritage area that overlaps Tier 1 in the Canoe area, impacts to the Canoe Lake harvest contractor group, availability of harvest areas in relation to harvest deferrals, and updated harvest levels for Canoe Lake management unit based on new model results.
- **Divide Forest Advisory Council Corporation (DFACC)** – 27 Jan. 2022, 22 March 2022 – General updates given on caribou planning (Divide forest has no caribou tier areas).
- **Île-à-la-Crosse/ICS-4** – 30 November 2022 – Discussed protected areas and Caribou. No specific questions were asked about the FMP amendment.
- **Waterhen Lake First Nation** – 17 January 2023 – Reviewed map/deferral areas/protected area. General discussion with community members around these topics was held.
- **Cold Lake First Nations** – March 27, 2023 — Mistik undertook a meeting with CLFN to review and discuss proposed amendments to its 20 Year Forest Management Plan (FMP). During the meeting, Mistik reviewed the 20 Year FMP planning process, what is contained within the FMP and the importance of various components of the 20 Year FMP. Mistik provided an overview of proposed changes to the 20 Year FMP and why those changes were occurring (to align with the Gov't of Saskatchewan's SK2 Caribou Range Plan). Mistik fielded several questions from CLFN regarding how forest harvesting is planned and executed, re-growth timelines and the potential for re-harvesting of areas, reclamation, replanting and clean-up, management of forest harvesting impacts to caribou, avoidance/protection of medicinal/culturally significant plants, aboriginal cultural values, and seedling storage.

## 7.5. SELECTED MANAGEMENT STRATEGY

The Forest Management Scenario (FMS) that has been identified as the Selected Management Strategy (SMS) for the Mistik FMP amendment was chosen based on its ability to achieve specific goals and objectives, particularly related to caribou habitat and disturbance. This section



displays how the amended SMS (2023) harvest sequence and modeled management actions fulfill these goals and objectives as well as the required outputs described in the 2017 Forest Management Planning Standard.

### **7.5.1. SCENARIO DEVELOPMENT**

Starting in June of 2022, Mistik hosted regular planning team meetings to review scenario results and discuss direction for future scenarios before a final amended SMS was delivered to the team in December 2022. In total more than a dozen scenarios were tested and discussed.

A preliminary baseline scenario was run to assess the impact of the 5-years of landbase changes (as documented in Section 7.2). This scenario identified a very slight HVS gain, due to the undercut that occurred in the last 5-years. From the baseline scenario, a handful of scenarios were run to assess the impact of 20 and 30 year harvest deferrals for Tier 1 and Tier 2 areas. This scoping analysis resulted in the planning team agreeing that generally Tier 1 should be deferred for 20-years from current (i.e. 2023) and Tier 2 should be deferred for 30-years thereafter. This was to ensure that there was no time period in which both Tier 1 and Tier 2 were simultaneously deferred, which was tested and showed to have drastic negative impacts to HVS levels due to even flow requirements. It was decided that no deferral was necessary in Tier 3.

Once the general deferral parameters were identified for Tiers 1 and 2, we started exploring additional changes to the deferral lengths to ensure habitat connectivity and permanence. As part of this, Sub-Tier 11, 13, and 19 were identified as candidates to a 50-year deferral beginning at current. In addition, a small area adjacent to the eastern boundary of sub-tier 11 and just north-east of the Cold Lake Air Weapons Range was identified as a 50-year deferral area to ensure connectivity between Tier 1 and Tier 2 habitat areas.

Finally, various modelling parameters were modified to develop an SMS that would result in operationally feasible HVS levels in each management unit and realistic SGR breakdowns (harvest distribution), while also staying within the bounds of the existing tactical plan. The final amended SMS maintained the original SMS constraints and limitations while delivering an operationally feasible scenario that conformed to the caribou tier requirements set out in the range plan and by Ministry of Environment staff. The resulting scenario required no changes to the existing tactical plan. Mistik expects that harvest levels can be met for the duration of the FMP with remaining tactical blocks and deviation allowance.

### **7.5.2. SPATIAL PARAMETERS**

The SMS was implemented spatially in the Spatial Optimizer (formerly Stanley) extension to the Woodstock modelling platform. This spatial harvest assignment was necessary to ensure the tactical plan remained feasible and provided an opportunity to assess caribou disturbance 50-years into the future.

The harvest sequence was constrained in Spatial Optimizer by several factors outlined in Table 2-1.



Table 7-5 Spatial Rules for Stanley Run

HARVEST SEQUENCE ASSUMPTIONS	
<b>Goal:</b>	Assess the spatial harvesting sequence of the timber supply model
<b>SMS Scenario Description</b>	<i>Amended SMS – Maximize Total Volume, Even Flow Harvest, Non-Declining Growing Stock (GS), Force Planned , Seral Stage, Caribou Tier, and Old Forest, and Black Spruce Constraints</i>
<b>Spatial Simulation length</b>	50 years
<b>Minimum block size</b>	5 ha
<b>Target block size</b>	50 ha
<b>Maximum block size</b>	1,000 ha

### 7.5.3. MODEL PARAMETERS

The parameter settings used in the analysis of this scenario are displayed in Table 2-3. The utilization standards used for the SMS model run are presented in Table 2-2.

Table 7-6 Utilization Standards (10cm)- Selected Management Strategy

UTILIZATION PARAMETER	MISTIK + L&M (all other Yield Curves)		L&M Yield Curve # 7	
	Hardwood	Softwood	Hardwood	Softwood
Stump Height (m)	0.3	0.3	0.3	0.3
Minimum Top Diameter Inside Bark (cm)	7.5	10	8	10
Log Length (m)	2.6	2.6	n/a	n/a
Merchantable Minimum Bole Length (m)	5.2	5.2	4.9	5.2

Table 7-7 Control Parameters - SMS Total Volume with Caribou, Seral Stage, Old Forest Constraints and the Planned/Tactical Blocks

SMS: MAXIMIZE TOTAL VOLUME WITH CARIBOU, SERAL STAGE, OLD FOREST AND PLANNED/TACTICAL BLOCKS	
CONTROL PARAMETER	PARAMETER SETTING
<b>Objective:</b>	Maximize total volume harvested over the planning horizon



### SMS: MAXIMIZE TOTAL VOLUME WITH CARIBOU, SERAL STAGE, OLD FOREST AND PLANNED/TACTICAL BLOCKS

CONTROL PARAMETER	PARAMETER SETTING
<b>Model constraints:</b>	<ul style="list-style-type: none"> <li>8) Even flow softwood and hardwood volume harvest for the Mistik FMA area</li> <li>9) Even flow softwood and hardwood volume harvest for the L&amp;M FMA area</li> <li>10) Non-declining softwood and hardwood operable growing stock in the last 50 years in both the Mistik and L&amp;M FMA areas</li> <li>11) Old and Very old seral stage constraints applied based on targets in VOITs 2a and 2b</li> <li>12) No identified old forest will be harvested in years 1-20</li> <li>13) Limit black spruce harvest to <math>\leq 30,000 \text{ m}^3/\text{yr.}</math> in L&amp;M</li> <li>14) Caribou tier deferrals implemented as per Table 7-1</li> <li>15) Minimum of 85% of HVS from Tactical Plan blocks in years 1-20</li> <li>16) Goals to ensure operationally feasible MU and SGR distribution in years 1-20</li> </ul>
<b>Effective Date</b>	2017
<b>Harvest unit:</b>	Mistik and L&M FMA areas
<b>Planning horizon:</b>	200 yrs
<b>Minimum harvest age:</b>	<ul style="list-style-type: none"> <li>100 Years- Black and White Spruce Softwood</li> <li>70 Years- Jack Pine Softwood</li> <li>80 Years- Jack Pine Leading Softwood Mixed wood (SH)</li> <li>90 Years- Spruce Leading Softwood Mixed wood (SH)</li> <li>80 Years- Jack Pine and Spruce Deciduous Mixed wood (HS)</li> <li>70 Years- Hardwood</li> </ul>
<b>Landbase:</b>	2016 submitted landbase (updated as per Section 7.2) which includes both Mistik and L&M FMA areas
<b>Yield curves:</b>	Yield curves (17 yield curves/development types) based on <b>10 cm</b> top diameter utilization standards
<b>Cull deductions:</b>	Applied to yield curves (1.5% Softwood, 7.4% Hardwood)
<b>Regeneration transition:</b>	SGR transition rules
<b>Regeneration lag:</b>	Not applied





## 7.5.4. HARVEST PROFILE

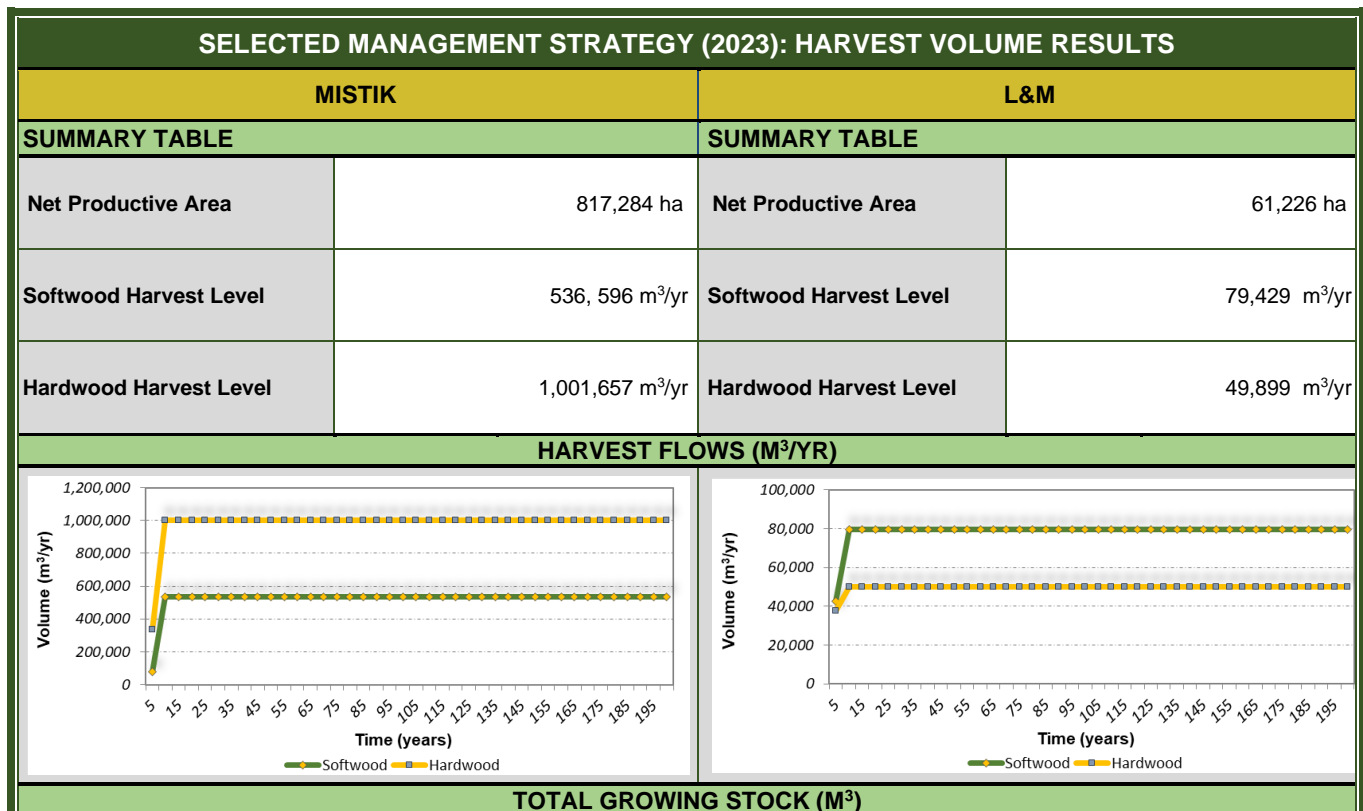
Below are the HVS Summaries with the updated selected management strategy (2023). A minor decline in softwood HVS was observed in Mistik's FMA due to caribou deferrals, while hardwood HVS and HVS in L&M were unaffected.

Table 7-8 Harvest Level Changes from SMS 2019 and SMS 2023 for Mistik and L&M

Scenario	Harvest Levels and Change from SMS							
	Mistik				L&M			
	Softwood		Hardwood		Softwood		Hardwood	
	(m <sup>3</sup> /yr)	(%)	(m <sup>3</sup> /yr)	(%)	(m <sup>3</sup> /yr)	(%)	(m <sup>3</sup> /yr)	(%)
SMS (2019)	549,986	N/A	999,753	N/A	79,429	N/A	49,899	N/A
SMS (2023)	536,596	98%	1,001,657	100%	79,429	100%	49,899	100%

The timber supply model results of the SMS (2023) for both Mistik and L&M are displayed in the tables below.

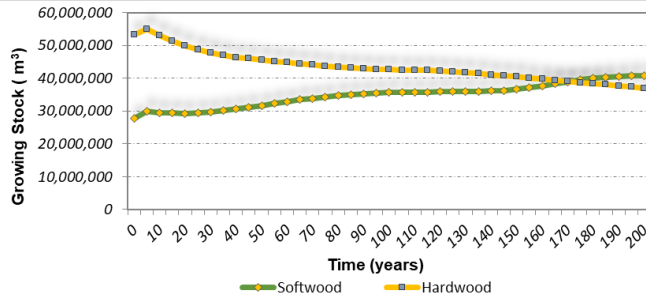
Table 7-9 Harvest Volume Results—Selected Management Strategy with Amendment



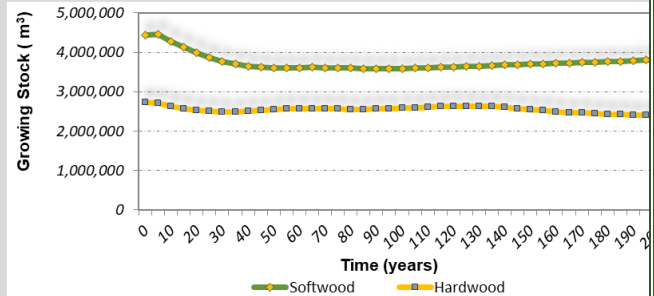


## SELECTED MANAGEMENT STRATEGY (2023): HARVEST VOLUME RESULTS

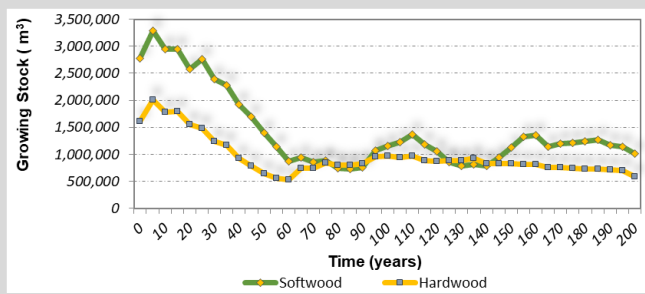
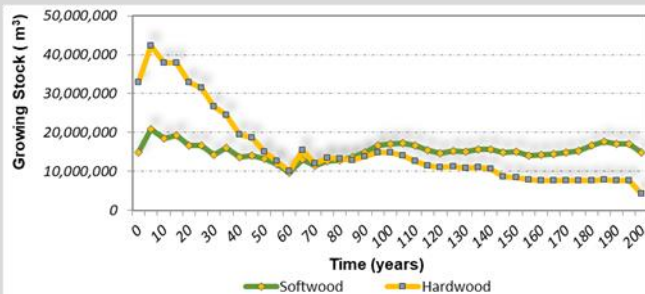
### MISTIK



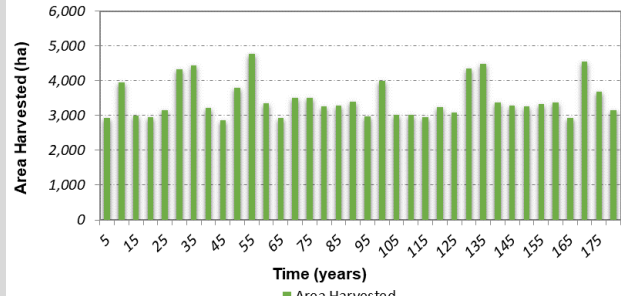
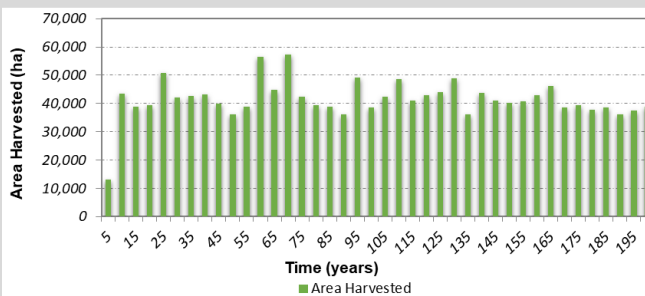
### L&M



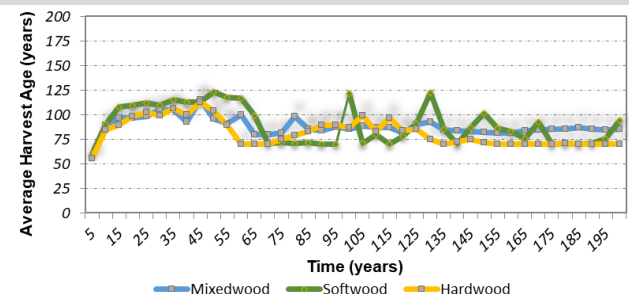
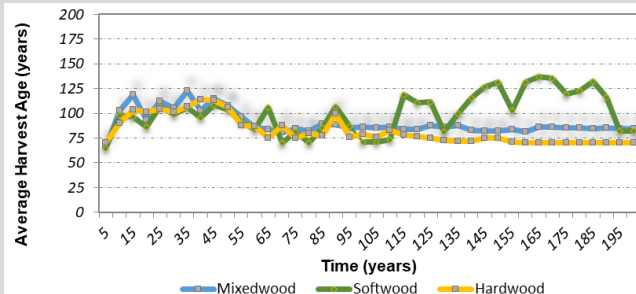
## OPERABLE GROWING STOCK (M³)



## AREA HARVESTED



## AVERAGE HARVEST AGE



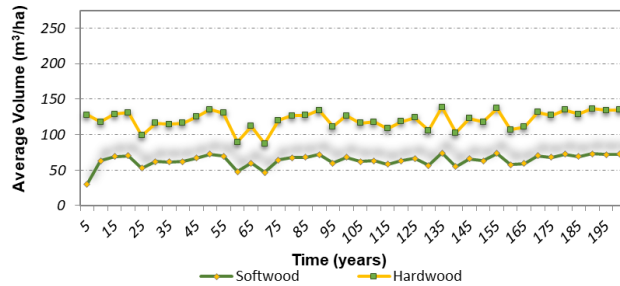
## AVERAGE VOLUME (M³/HA)



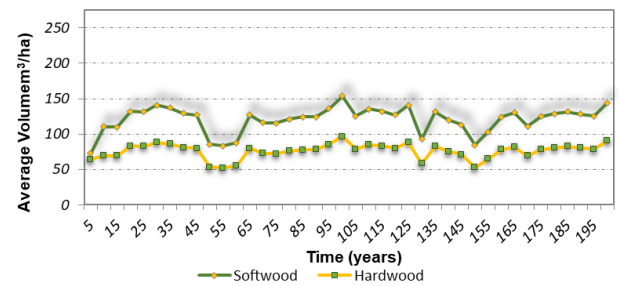


### SELECTED MANAGEMENT STRATEGY (2023): HARVEST VOLUME RESULTS

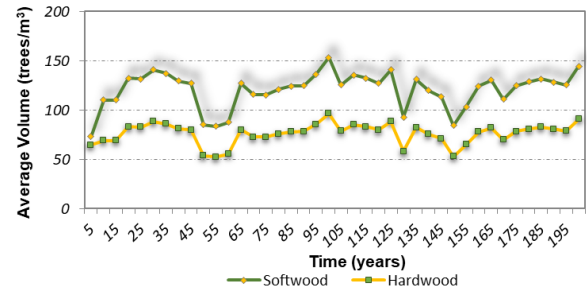
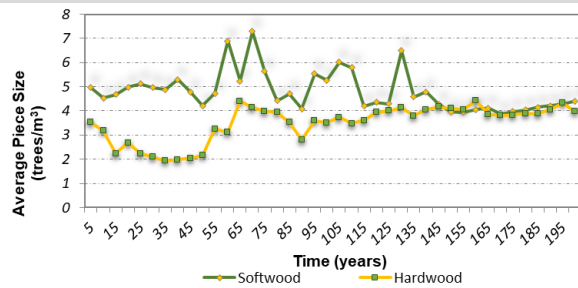
#### MISTIK



#### L&M



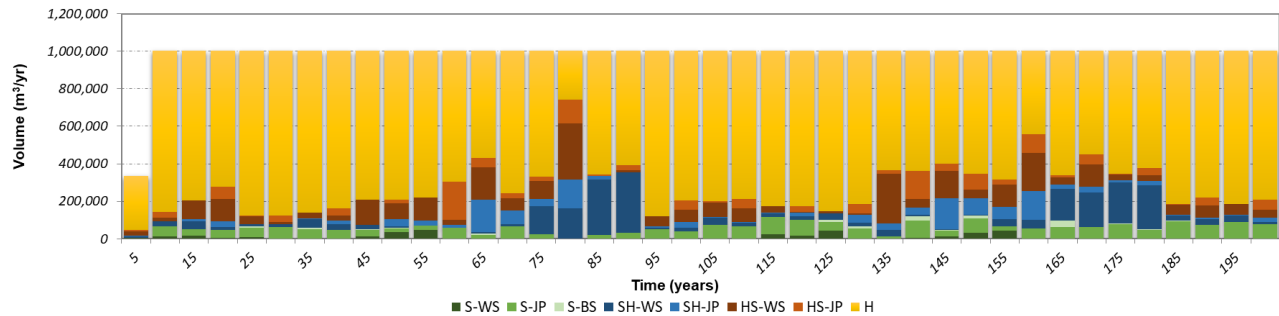
### AVERAGE PIECE SIZE (TREES/M³)



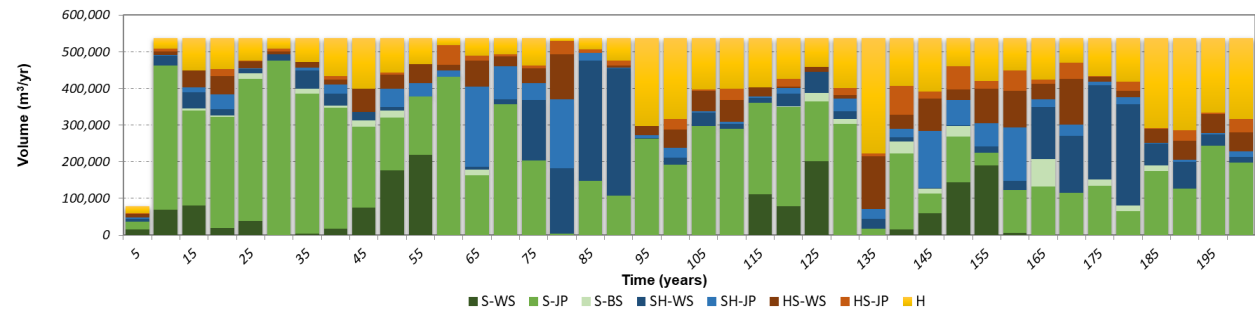


# SELECTED MANAGEMENT STRATEGY: HARVEST VOLUME RESULTS Continued

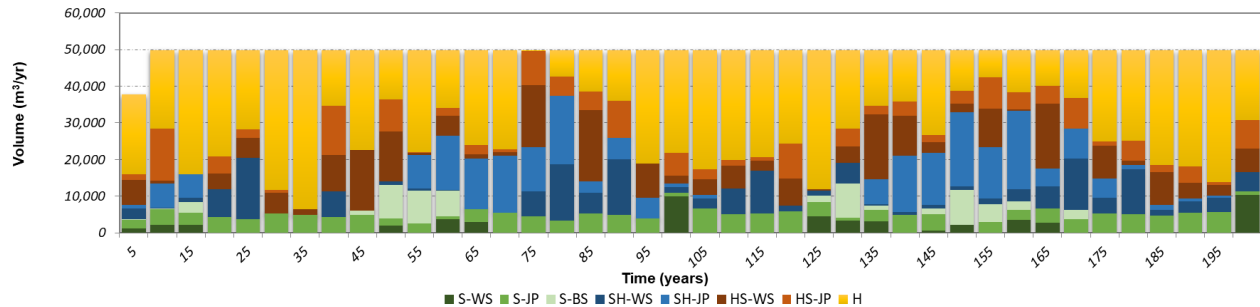
## MISTIK HARDWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



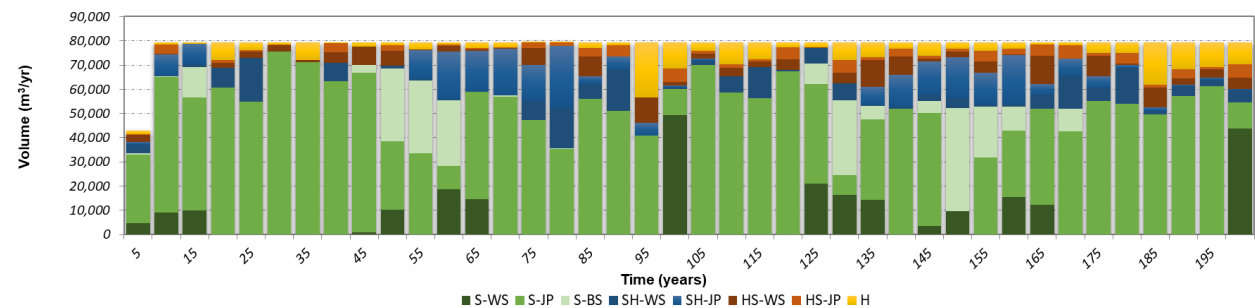
## MISTIK SOFTWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



## L & M HARDWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE



## L & M SOFTWOOD HVS VOLUME CONTRIBUTION BY SGR TYPE







### 7.5.5. HVS AND HVS PULP SUMMARY

As requested by the ministry, the following summary outlines the saw log, pulp, and total volumes for both hardwood and softwood for each company based on the selected management strategy. This process is described in Section 2.3.1. Overall, sawlog and pulpwood proportions have not changed, but total softwood HVS on the Mistik FMA Area is slightly lower. HVS and sawlog/pulpwood breakdowns on the L&M FMA Area are not expected to change as a result of the FMP amendment.

Table 7-10 Saw log and pulp HVS Breakdown

Result	Mistik FMA HVS (m <sup>3</sup> /yr)			L&M FMA HVS (m <sup>3</sup> /yr)		
	Softwood Sawlog	Softwood Pulp	Hardwood	Softwood Sawlog	Softwood Pulp	Hardwood
Amended SMS Model Result	536,596	N/A	1,001,657	79,429	N/A	49,899
Reduction for Insular Retention (4%)	-21,464	N/A	-40,066	-3,177	N/A	-1,996
Weighted Average Degrade (Mistik: 12%, L&M: 9%)	-61,816	61,816	N/A	-6,863	6,863	N/A
Tops (10cm to 8cm) and additional merch. Trees	N/A	121,897	N/A	N/A	12,077	N/A
<b>Final HVS (m<sup>3</sup>/yr)</b>	<b>453,316</b>	<b>183,713</b>	<b>961,591</b>	<b>69,389</b>	<b>18,940</b>	<b>47,903</b>

The table below shows 20-year average HVS volumes projected to be harvested by Management Unit, compared to the SMS (2016), and the proportion of volume from the tactical plan. This table demonstrates how, due to caribou tier deferrals, some MUs have increased or decreased HVS in the first 20-years. In addition, this table highlights how Mistik and L&M can still derive ≥85% of their overall HVS from the existing tactical plan (conforming with Indicator 15), despite some MUs requiring significant volume from outside the tactical plan again due to caribou tier deferrals.



Table 7-11 HVS Volume (20 year average) Harvested by Planning and Management Unit

Planning Unit	Management Unit	Net Area (ha)	HVS (20 yr)						Planning Unit HVS (20 yr)	
			Softwood			Hardwood			Softwood	Hardwood
			m <sup>3</sup> /yr	% of SMS (2016)	% from Current Tactical Plan	m <sup>3</sup> /yr	% of SMS (2016)	% from Current Tactical Plan	m <sup>3</sup> /yr	m <sup>3</sup> /yr
Divide	01 - Divide	99,326	63,785	84%	93%	190,004	136%	59%	63,785	190,004
West	02 - Pierceland	65,597	60,338	111%	78%	156,415	120%	95%	119,352	253,892
	03 - Big Island	26,751	18,588	74%	92%	56,919	71%	98%		
	12 - Murray Bay	37,166	33,613	89%	80%	35,098	60%	94%		
	20 - Beaver River	8,044	6,813	66%	84%	5,460	115%	29%		
Central	04 - Waterhen	106,428	75,972	97%	91%	170,463	95%	96%	251,651	425,557
	07 - Beauval	53,693	50,297	86%	90%	47,851	79%	86%		
	08 - Canoe Lake	60,688	42,720	66%	66%	101,605	132%	87%		
	09 - Ile a-la-Crosse	34,464	40,020	100%	52%	22,518	120%	65%		
	10 - Buffalo Narrows	50,060	42,642	127%	93%	83,119	100%	98%		
North	11 - Dillon	172,488	35,430	74%	96%	72,988	80%	99%	53,979	132,205
	21 - Peter Pond	102,578	18,549	44%	95%	59,217	80%	92%		
L & M	85 - L & M	61,226	70,276	88%	95%	49,899	100%	95%	70,276	49,899
Mistik Total		817,284	488,766	86%	85%	1,001,658	100%	86%	488,766	1,001,658
L & M Total		61,226	70,276	86%	95%	49,899	100%	95%	70,276	49,899





## 8. APPENDIX D: VOITS

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# 2019 FOREST MANAGEMENT PLAN – VOLUME II Values, Objects, Indicators, and Targets (VOITs) (AMENDED April 2023)

for the  
Mistik and L&M Forest Management Agreement (FMA) Areas



**For the 20-year period from April 1, 2019 to March 31, 2039**

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ISBN (Vol II Values, Objects, Indicators, and Targets (VOITs))



## 8.1. EXECUTIVE SUMMARY

*April 2023 Update: Mistik has made changes to the forest management plan to align with the provincial Range Plan for Woodland Caribou in Saskatchewan (SK2 West Caribou Administration Unit) which was finalized in October, 2021. Please see VOIT changes in Table 8.1 that were updated to align with the 2023 FMP amendment (original versions of the VOITs in Volume II). There are also some minor text changes within the VOITs that are not related to caribou.*

This document demonstrates the input of the public and the requirements of the Forest Management Planning (FMP) Standard, Saskatchewan Environment Code (September 5, 2017). Mistik & L&M have identified twenty-seven quantifiable indicators and targets of sustainable forest management that will be monitored and reported on during the term of Mistik's 2019 20-Year Forest Management Plan. Several of the indicators are based on the 2007 Forest Management Plan VOITs with a few applicable changes that were required to meet the new FMP provincial standard. The following twenty-seven quantitative indicators and targets define sustainable forest management attributes within the Mistik FMP area.

Several of the VOITs from the 2007 FMP that are no longer required under the current provincial FMP standard or which had previously been included to meet other standards (i.e. certification requirements), have been removed from this section of the plan. In Mistik's FMP annual report document however, additional sections will continue to be included to provide annual updates related to certification and other monitoring requirements. This additional information in the annual report is not being provided for ministry approval or monitoring, but to have all the information related to Mistik's operations available for the public and other interested parties in a single document.

A summary of provincial standard VOIT requirements & associated indicators can be found on the following page in Table 1, followed by detailed information related to each VOIT in section 2.0





Table 8-1: Mistik Indicator Summary / Table of Contents

FMP Standard Requirement / Mistik Indicator	Page	April 2023 Update
1. Age class distribution	237	
2. Area of old and very old forest		Text edit
a) Percent of the forest landbase that is old and very old	239	
b) Standard deviation of old forest area by management unit.		
3. Size class distribution of harvest events	245	Buffer distance changed
4. Tree retention after harvest	247	
5. The softwood component in hardwood stands is maintained	249	
6. Relative abundance of Cover Species Groups	250	Text edit
7. Habitat availability for forest-dwelling species		
a) Fisher	252	
b) Caribou		
c) Moose		
8. Seedlings are from wild or improved seed sources	255	Text edit re. non-GMO
9. Post-harvest areas are successfully regenerated	258	Date changed
10. Change in the managed forest landbase area	259	
11. Net area disturbed by stand replacing natural events (fire)	260	Text edit
12. Retention in natural disturbance events	261	
13. Yield curve suitability	262	
14. Utilization assumption consistency and implementation	263	
15. Operational adherence to the Tactical Plan	264	
16. Harvesting activities in compliance with all related requirements	265	
17. Crossing activities in compliance with all related requirements	266	
18. Event Duration	267	
19a. Utilization of harvest volume schedule (HVS)	268	
19b. Harvest plans designed to lower wildfire risks to communities	269	
20. Stakeholder and public engagement (Public Advisory Group "PAG")	270	
21. Spatially identified non-timber resources and forest use activities	271	
22. Harvest operations are proportionally distributed across the FMA	273	Updated based on new SMS
23. Percent of 'within-FMA area' Aboriginal communities involved planning processes	275	
24. Spatial Identification and protection of culturally significant Heritage and Aboriginal sites	277	
25. Protection ecological knowledge of Aboriginal communities – optional/not included	N/A	
26. Community resiliency		
a) Contributions to Co-Management Boards	278	
b) % of total annual vendor/contractor payments to local communities		
c) % of "within FMA" communities represented in the workforce		
27. Stakeholder engagement	281	Text edit



## 8.2. VOIT DETAILS

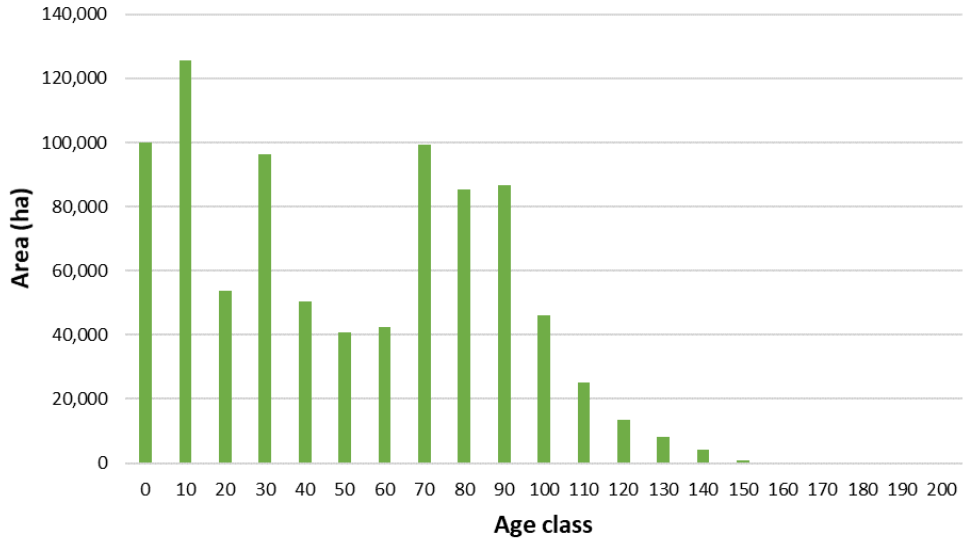
Criterion 1 – Biological Diversity

Element 1.1 – Ecosystem Diversity

Value 1.1.1- Natural Range of Variation

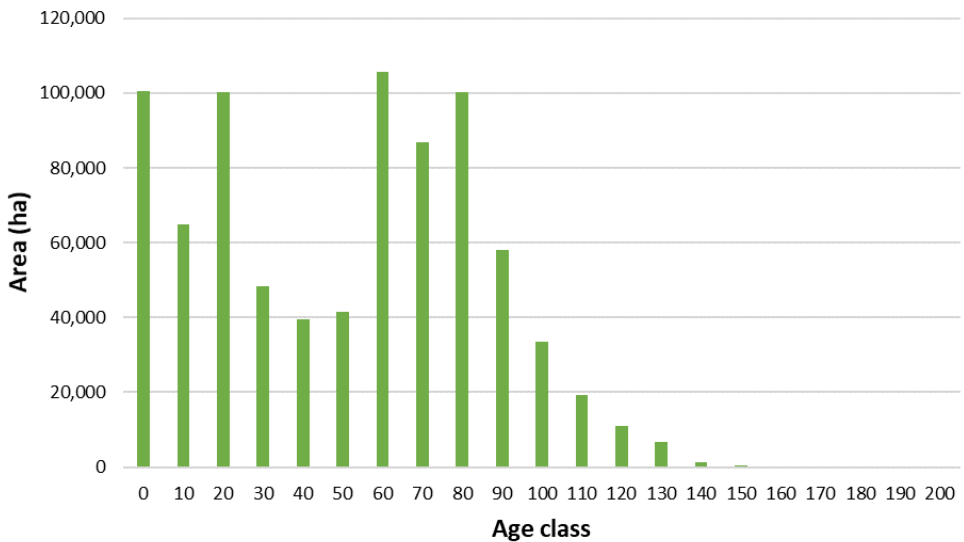
Objective 1.1.1.1- Conservation of the Biological Diversity of Saskatchewan's Forests

### Mistik Indicator #1: Age class distribution

Descriptor	Details																																		
Target / Desired Condition	<p>Monitor the age class distribution of the Managed Forest Landbase compared to the projected distribution in 10-years based on the Forest Estate Modeling, as shown below:</p>  <table border="1"> <caption>Estimated data from Age class distribution chart</caption> <thead> <tr> <th>Age class</th> <th>Area (ha)</th> </tr> </thead> <tbody> <tr><td>0</td><td>100,000</td></tr> <tr><td>10</td><td>125,000</td></tr> <tr><td>20</td><td>55,000</td></tr> <tr><td>30</td><td>95,000</td></tr> <tr><td>40</td><td>50,000</td></tr> <tr><td>50</td><td>40,000</td></tr> <tr><td>60</td><td>42,000</td></tr> <tr><td>70</td><td>100,000</td></tr> <tr><td>80</td><td>85,000</td></tr> <tr><td>90</td><td>88,000</td></tr> <tr><td>100</td><td>45,000</td></tr> <tr><td>110</td><td>25,000</td></tr> <tr><td>120</td><td>15,000</td></tr> <tr><td>130</td><td>8,000</td></tr> <tr><td>140</td><td>4,000</td></tr> <tr><td>150</td><td>2,000</td></tr> </tbody> </table>	Age class	Area (ha)	0	100,000	10	125,000	20	55,000	30	95,000	40	50,000	50	40,000	60	42,000	70	100,000	80	85,000	90	88,000	100	45,000	110	25,000	120	15,000	130	8,000	140	4,000	150	2,000
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Descriptor	Details																																		
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Acceptable Variance	N/A																																		
Most Recent Assessment	August 2017																																		
Source of Measurement Data	GIS forest inventory, harvest activity tracking, tactical plan, and fire update databases																																		
Implementation Requirements	Land base update and age class analysis conducted by Silvacom																																		
Strategy to Achieve	Adhere to tactical plan																																		
Monitoring and Reporting Schedule	Annually by August 31 (10-year assessment cycle) – graph/table format.																																		
Reporting Scale	FMP Area																																		
Rationale for Indicator	Maintenance of age class distribution of the Mistik FMP area is important for a number of ecological values that depend on the full suite of seral stages being present on the landscape																																		
Rationale for Target and Variance	N/A no variance																																		



Criterion 1 – Biological Diversity

Element 1.1 – Ecosystem Diversity

Value 1.1.1 – Natural range of variation

Objective 1.1.1.1- Conservation of the Biological Diversity of Saskatchewan's Forests

### Mistik Indicator #2a: Percent of the forest landbase that is old and very old

Note: Mistik is proposing an alternative solution for Forest Management Planning Standard – Indicator #2. Mistik indicators 2a & 2b outline the proposed solution.

Descriptor	Details														
Target	<p>Forest land base is (managed forest landbase + eligible excluded forest) that is 'old' and 'very old' for the following six forest cover types:</p> <table border="0"> <tr> <td><u>Old</u></td> <td><u>Very Old</u></td> </tr> <tr> <td>1. S-bS (&gt; 100 years);</td> <td>all (&gt;120 years)</td> </tr> <tr> <td>2. S-jP (&gt; 100 years);</td> <td></td> </tr> <tr> <td>3. S-wS (&gt; 100 years);</td> <td></td> </tr> <tr> <td>4. SH-all species (&gt; 100 years);</td> <td></td> </tr> <tr> <td>5. HS-all species (&gt; 90 years);</td> <td></td> </tr> <tr> <td>6. H-deciduous (&gt; 90 years).</td> <td></td> </tr> </table> <p>The minimum thresholds identified below (based on natural range of variability [NRV] analysis for a 74-year fire cycle and the minimum threshold of the 2nd quartile for NRV) for each of the following five forest cover types shall be maintained in age classes that are 'old' or 'very old':</p> <p><b>1.S-bS:</b> Greater than or equal to 5% of the total S-bS working forest area and eligible excluded land base, of which at least 10% of that total (0.5%) will be very old.</p> <p><b>2. S-jP:</b> Greater than or equal to 5% of the total S-jP working forest area and eligible excluded land base, of which at least 10% of that total (0.5%) will be very old.</p> <p><b>3. S-wS:</b> Greater than or equal to 9% of the total S-wS working forest area and eligible excluded land base, of which at least 10% of that total (0.9%) will be very old.</p> <p><b>4. SH and HS-all species:</b> Greater than or equal to 10% of the total mixedwoods working forest area and eligible excluded land base, of which at least 10% of that total (1%) will be very old.</p> <p><b>5. H-deciduous:</b> Greater than or equal to 14% of the total H-all deciduous working forest area and eligible excluded land base, of which at least 10% of that total (1.4%) will be very old.</p> <p><b>Note: The interior old forest strategy for FMA area ensures that a minimum of 20% of the old and very old forest stands in each species group will be in the interior forest condition.</b></p>	<u>Old</u>	<u>Very Old</u>	1. S-bS (> 100 years);	all (>120 years)	2. S-jP (> 100 years);		3. S-wS (> 100 years);		4. SH-all species (> 100 years);		5. HS-all species (> 90 years);		6. H-deciduous (> 90 years).	
<u>Old</u>	<u>Very Old</u>														
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2. S-jP (> 100 years);															
3. S-wS (> 100 years);															
4. SH-all species (> 100 years);															
5. HS-all species (> 90 years);															
6. H-deciduous (> 90 years).															
Acceptable Variance	None														





Descriptor	Details																																																																																																																																																														
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Rationale for Indicator	Maintenance of late seral stand types within the Mistik FMP area is important for a number of ecological values – age class diversity, forest structural diversity, tree species diversity and associated habitat diversity. Industrial timber extraction can, over time, completely remove late seral stand types from the forest landscape. Retention and recruitment of old forest types must be explicitly managed for in order to achieve desired levels of abundance within a landscape.																																																																																																																																																														
	<div><div>QUARTILE RESULTS FOR THE MISTIK FMA AREA</div><div>74 Year Fire Cycle</div><div><div>Table 14. Natural Range Landscape Summaries for the Mistik FMA Area Using a 74-Year Average Fire Cycle.</div><table><tr><th rowspan="2">Vegetation Class</th><th rowspan="2">Seral Stage</th><th colspan="6">Percent Area of Each Vegetation Class</th></tr><tr><th>Below NRV</th><th>Quartile 1 of NRV</th><th>Quartile 2 of NRV</th><th>Quartile 3 of NRV</th><th>Quartile 4 of NRV</th><th>Above NRV</th></tr><tr><td rowspan="4">Pine 325,000 ha</td><td>Young</td><td>0 – 16</td><td>16 – 39</td><td>39 – 50</td><td>50 – 59</td><td>59 – 74</td><td>74 – 100</td></tr><tr><td>Immature</td><td>0 – 18</td><td>18 – 29</td><td>29 – 38</td><td>38 – 45</td><td>45 – 63</td><td>63 – 100</td></tr><tr><td>Mature</td><td>0 – 0.4</td><td>0.4 – 2.7</td><td>2.7 – 4.6</td><td>4.6 – 7</td><td>7 – 16</td><td>16 – 100</td></tr><tr><td>Old</td><td>0 – 1.8</td><td>1.8 – 4.9</td><td>4.9 – 7</td><td>7 – 10</td><td>10 – 22</td><td>22 – 100</td></tr><tr><td rowspan="4">Black Spruce 631,000 ha</td><td>Young</td><td>0 – 19</td><td>19 – 40</td><td>40 – 50</td><td>50 – 57</td><td>57 – 76</td><td>76 – 100</td></tr><tr><td>Immature</td><td>0 – 16</td><td>16 – 29</td><td>29 – 37</td><td>37 – 45</td><td>45 – 83</td><td>83 – 100</td></tr><tr><td>Mature</td><td>0 – 0.5</td><td>0.5 – 2.6</td><td>2.6 – 4.4</td><td>4.4 – 6</td><td>6 – 15</td><td>15 – 100</td></tr><tr><td>Old</td><td>0 – 1.9</td><td>1.9 – 5</td><td>5 – 7</td><td>7 – 9</td><td>9 – 23</td><td>23 – 100</td></tr><tr><td rowspan="4">White Spruce 30,000 ha</td><td>Young</td><td>0 – 17</td><td>17 – 34</td><td>34 – 42</td><td>42 – 50</td><td>50 – 67</td><td>67 – 100</td></tr><tr><td>Immature</td><td>0 – 18</td><td>18 – 31</td><td>31 – 39</td><td>39 – 44</td><td>44 – 65</td><td>65 – 100</td></tr><tr><td>Mature</td><td>0 – 0.6</td><td>0.6 – 3.2</td><td>3.2 – 6</td><td>6 – 8</td><td>8 – 18</td><td>18 – 100</td></tr><tr><td>Old</td><td>0 – 4.0</td><td>4.0 – 9</td><td>9 – 12</td><td>12 – 17</td><td>17 – 28</td><td>28 – 100</td></tr><tr><td rowspan="4">Deciduous 403,000 ha</td><td>Young</td><td>0 – 12</td><td>12 – 30</td><td>30 – 36</td><td>36 – 43</td><td>43 – 57</td><td>57 – 100</td></tr><tr><td>Immature</td><td>0 – 21</td><td>21 – 29</td><td>29 – 35</td><td>35 – 41</td><td>41 – 58</td><td>58 – 100</td></tr><tr><td>Mature</td><td>0 – 1.2</td><td>1.2 – 5</td><td>5 – 8</td><td>8 – 11</td><td>11 – 20</td><td>20 – 100</td></tr><tr><td>Old</td><td>0 – 7</td><td>7 – 14</td><td>14 – 19</td><td>19 – 25</td><td>25 – 40</td><td>40 – 100</td></tr><tr><td rowspan="4">Mixedwood 178,000 ha</td><td>Young</td><td>0 – 15</td><td>15 – 37</td><td>37 – 44</td><td>44 – 51</td><td>51 – 67</td><td>67 – 100</td></tr><tr><td>Immature</td><td>0 – 20</td><td>20 – 29</td><td>29 – 35</td><td>35 – 42</td><td>42 – 63</td><td>63 – 100</td></tr><tr><td>Mature</td><td>0 – 1.1</td><td>1.1 – 4.5</td><td>4.5 – 7</td><td>7 – 9</td><td>9 – 17</td><td>17 – 100</td></tr><tr><td>Old</td><td>0 – 4.9</td><td>4.9 – 10</td><td>10 – 13</td><td>13 – 18</td><td>18 – 28</td><td>28 – 100</td></tr></table></div></div>	Vegetation Class	Seral Stage	Percent Area of Each Vegetation Class						Below NRV	Quartile 1 of NRV	Quartile 2 of NRV	Quartile 3 of NRV	Quartile 4 of NRV	Above NRV	Pine 325,000 ha	Young	0 – 16	16 – 39	39 – 50	50 – 59	59 – 74	74 – 100	Immature	0 – 18	18 – 29	29 – 38	38 – 45	45 – 63	63 – 100	Mature	0 – 0.4	0.4 – 2.7	2.7 – 4.6	4.6 – 7	7 – 16	16 – 100	Old	0 – 1.8	1.8 – 4.9	4.9 – 7	7 – 10	10 – 22	22 – 100	Black Spruce 631,000 ha	Young	0 – 19	19 – 40	40 – 50	50 – 57	57 – 76	76 – 100	Immature	0 – 16	16 – 29	29 – 37	37 – 45	45 – 83	83 – 100	Mature	0 – 0.5	0.5 – 2.6	2.6 – 4.4	4.4 – 6	6 – 15	15 – 100	Old	0 – 1.9	1.9 – 5	5 – 7	7 – 9	9 – 23	23 – 100	White Spruce 30,000 ha	Young	0 – 17	17 – 34	34 – 42	42 – 50	50 – 67	67 – 100	Immature	0 – 18	18 – 31	31 – 39	39 – 44	44 – 65	65 – 100	Mature	0 – 0.6	0.6 – 3.2	3.2 – 6	6 – 8	8 – 18	18 – 100	Old	0 – 4.0	4.0 – 9	9 – 12	12 – 17	17 – 28	28 – 100	Deciduous 403,000 ha	Young	0 – 12	12 – 30	30 – 36	36 – 43	43 – 57	57 – 100	Immature	0 – 21	21 – 29	29 – 35	35 – 41	41 – 58	58 – 100	Mature	0 – 1.2	1.2 – 5	5 – 8	8 – 11	11 – 20	20 – 100	Old	0 – 7	7 – 14	14 – 19	19 – 25	25 – 40	40 – 100	Mixedwood 178,000 ha	Young	0 – 15	15 – 37	37 – 44	44 – 51	51 – 67	67 – 100	Immature	0 – 20	20 – 29	29 – 35	35 – 42	42 – 63	63 – 100	Mature	0 – 1.1	1.1 – 4.5	4.5 – 7	7 – 9	9 – 17	17 – 100	Old	0 – 4.9	4.9 – 10	10 – 13	13 – 18	18 – 28
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	Old	0 – 4.9	4.9 – 10	10 – 13	13 – 18	18 – 28	28 – 100																																																																																																																																																								



Descriptor	Details
<b>Rationale for Target and Variance</b>	<p>Refer to: <b>Andison, D. W. 2006. Natural Levels of Forest Seral-Stage Variability on the Mistik Management FMA Area in Saskatchewan. Bandaloop Landscape-Ecosystems, Belcarra, British Columbia, Canada. 84 pp.</b> Even though all historical evidence points to a ~ 50-year fire cycle for the Mistik FMA area, Mistik has chosen to use the FMA-wide NDE old forest retention thresholds identified for the 2nd quartile of the intermediate fire cycle of 74 years (vs. 55 yr and 100 yr fire cycles). In doing this, Mistik is demonstrating a 'precautionary' approach to the maintenance of old forest within the FMA area. Refer to Volume III – Distribution of Old Forest, for the current distribution of old forest in the Mistik FMA area. Current amounts of old forest exceed targets.</p>



Criterion 1 – Biological Diversity

Element 1.1 – Ecosystem Diversity

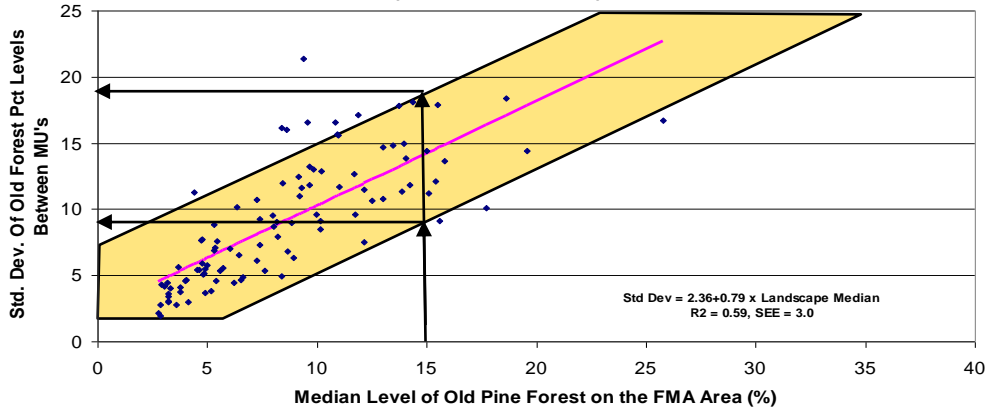
Value 1.1.1- Natural Range of Variation

Objective 1.1.1.1- Conservation of the Biological Diversity of Saskatchewan's Forests

### Mistik Indicator #2b: Standard deviation of old forest area by management unit.

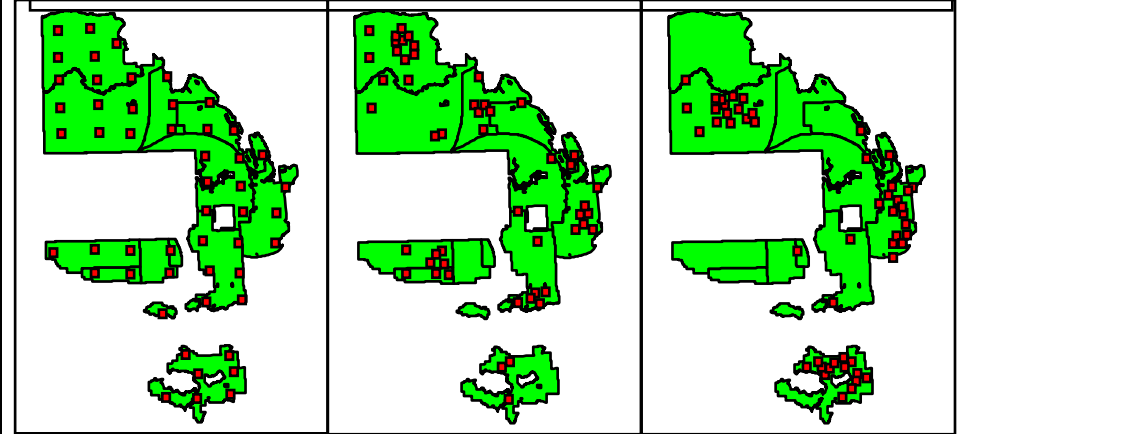
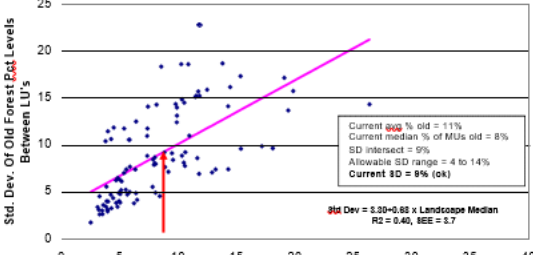
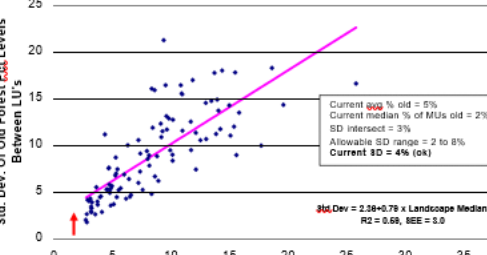
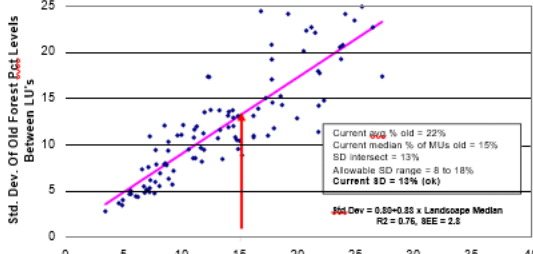
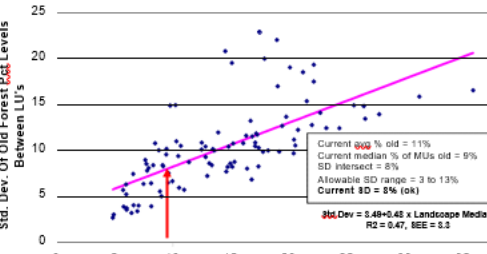
Descriptor	Details																				
Target	<p>The current standard deviation of old forest area among the 13 management units for each of the five forest cover types:</p> <p>1. S-bS (&gt; 100 years); 2. S-jP (&gt; 100 years); 3. S-wS (&gt; 100 years); 4. SH-all species (&gt; 100 years); 5. HS-all species (&gt; 90 years); 6. H-deciduous (&gt; 90 years);</p> <p>associated with any level of old forest amount shall not deviate by more than 5% of the modeled linear relationship of the natural range of variation of standard deviations among management units for a specified old forest amount (and never below 2%).</p>																				
Acceptable Variance	None																				
Current Status	<table><tr><th>Forest Cover Type</th><th>Target Range (%)</th><th>Actual (%)</th></tr><tr><td>S-bS</td><td>7 to 17</td><td>12.0</td></tr><tr><td>S-jP</td><td>2 to 12</td><td>7.1</td></tr><tr><td>S-wS</td><td>16 to 26</td><td>19.2</td></tr><tr><td>SH/HS- all species</td><td>4 to 14</td><td>8.6</td></tr><tr><td>H- deciduous</td><td>7 to 17</td><td>11.6</td></tr></table>			Forest Cover Type	Target Range (%)	Actual (%)	S-bS	7 to 17	12.0	S-jP	2 to 12	7.1	S-wS	16 to 26	19.2	SH/HS- all species	4 to 14	8.6	H- deciduous	7 to 17	11.6
Forest Cover Type	Target Range (%)	Actual (%)																			
S-bS	7 to 17	12.0																			
S-jP	2 to 12	7.1																			
S-wS	16 to 26	19.2																			
SH/HS- all species	4 to 14	8.6																			
H- deciduous	7 to 17	11.6																			
Most Recent Assessment	August 2017																				
Source of Measurement Data	GIS forest inventory, harvest activity tracking and fire update databases																				
Implementation Requirements	Land base update and age class analysis conducted by Silvacom Ltd.																				
Strategy to Achieve	Follow tactical plan																				
Monitoring and Reporting Schedule	Annually by August 31 (10-year assessment cycle) – graph/table format.																				
Reporting Scale	FMP Area																				
Rationale for Indicator	The acceptable range of how old forest levels vary between MU's for pine-dominated forest is shown as the yellow box in the Figure below. So, if the landscape median of pine-dominated old forest on the Mistik landscape is 15% (the green lines extending from the x-axis in Figure A6 below), then the historic average standard deviation of the pine-dominated old forest between the 12 MU's is 14% (the purple line below), which means the target should be 9-19%																				



Descriptor	Details
	<p>(shown by the dark and light green horizontal arrows below, respectively). There are five such relationships, one for each cover-type (see Andison 2006).</p> <p>This is a simple indicator to calculate, and at least begins respecting the fact that old forest is dynamic in time and space. While not MU specific, it very clearly identifies intermediate scale old forest clustering tendencies in space. For example, consider the three distributions of old forest across the Mistik FMA in the bottom figure below. Scenario A depicts an “old forest everywhere” pattern. In this case the average old forest proportions in each MU will be very close to the overall landscape average. So, if the landscape average of old forest is 15%, then each MU will have about 15% old forest within it as well. This will result in a very low standard deviation (two in this case). From Figure A6, we can see that a landscape with an average of 15% old forest has <u>never</u> had a standard deviation as low as two. In other words, a standard deviation of two in this case is below NRV – which means that even spatial distributions of old forest (equal amounts of old forest everywhere) are unnatural.</p> <p>Scenario C on the other hand shows a highly clustered pattern of old forest on the FMA area. In fact, most MU’s have zero old forest, while a small number of MU’s have well over 50% old forest. This translates into a standard deviation of 27 – which is well above the predicted natural range. In other words, highly clustered old forest is also an unnatural phenomenon.</p> <p>A more “natural” distribution of old forest at intermediate spatial scales is shown in Scenario B. Almost all MU’s have some old forest, but a few have moderate to high levels. The standard deviation of the percent of old forest between the MU’s in Scenario B is 11 – which is within the accepted natural limits established by the indicator above.</p> <p>Note: This indicator is not meant to capture old forest patch size distribution.</p> <div> <p><b>Figure A6. Median Old Forest Pine Levels for the Mistik FMA Area Relative to the Standard Deviation of Old Forest Pine Levels Between Management Units (from Andison 2006)</b></p>  </div>





Descriptor	Details
	<p>Scenario A: S.D. = 2      Scenario B: S.D. = 11      Scenario C:</p>
	
	<div> <p><b>Figure A7. Median Old Forest Black Spruce Levels for the Mistik FMA Area Relative to the Standard Deviation of Old Forest Black Spruce Levels Between Management Units</b></p>  <p>Current <math>\sigma_{\text{old}}</math> % old = 11% Current median % of MUs old = 8% SD intersect = 9% Allowable SD range = 4 to 14% Current SD = 6% (ok)</p> <p>Std Dev = <math>5.30 \pm 0.68 \times \text{Landscape Median}</math> <math>R^2 = 0.40</math>, SEE = 5.7</p> </div> <div> <p><b>Figure A6. Median Old Forest Pine Levels for the Mistik FMA Area Relative to the Standard Deviation of Old Forest Pine Levels Between Management Units</b></p>  <p>Current <math>\sigma_{\text{old}}</math> % old = 5% Current median % of MUs old = 2% SD intersect = 3% Allowable SD range = 2 to 8% Current SD = 4% (ok)</p> <p>Std Dev = <math>2.58 \pm 0.79 \times \text{Landscape Median}</math> <math>R^2 = 0.69</math>, SEE = 5.0</p> </div> <div> <p><b>Figure A8. Median Old Forest White Spruce Levels for the Mistik FMA Area Relative to the Standard Deviation of Old Forest White Spruce Levels Between Management Units</b></p>  <p>Current <math>\sigma_{\text{old}}</math> % old = 22% Current median % of MUs old = 15% SD intersect = 13% Allowable SD range = 8 to 18% Current SD = 13% (ok)</p> <p>Std Dev = <math>0.80 \pm 0.35 \times \text{Landscape Median}</math> <math>R^2 = 0.76</math>, SEE = 2.5</p> </div> <div> <p><b>Figure A10. Median Old Forest Mixedwood Levels for the Mistik FMA Area Relative to the Standard Deviation of Old Mixedwood Levels Between Management Units</b></p>  <p>Current <math>\sigma_{\text{old}}</math> % old = 11% Current median % of MUs old = 9% SD intersect = 8% Allowable SD range = 3 to 13% Current SD = 8% (ok)</p> <p>Std Dev = <math>5.48 \pm 0.45 \times \text{Landscape Median}</math> <math>R^2 = 0.47</math>, SEE = 5.3</p> </div>
	<p><b>Rationale for Target and Variance</b></p> <p>Refer to: Andison, D. W. 2006. Natural Levels of Forest Seral-Stage Variability on the Mistik Management FMA Area in Saskatchewan. Bandaloo Landscape-Ecosystems, Belcarra, British Columbia, Canada. 84 pp.</p>

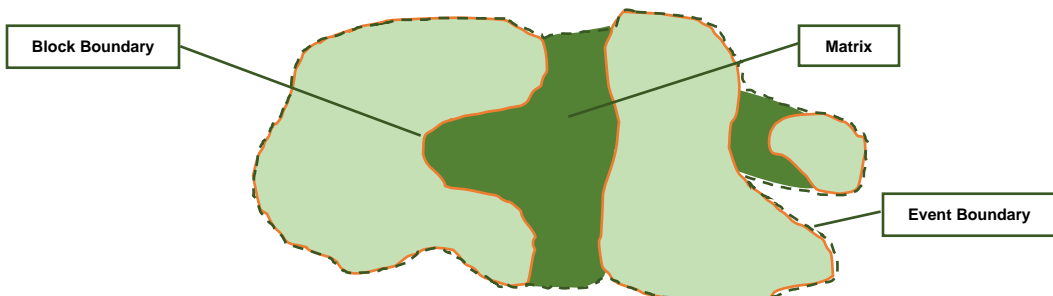
Criterion 1 – Biological Diversity

Element 1.1 – Ecosystem Diversity

Value 1.1.1- Natural Range of Variation

Objective 1.1.1.1- Conservation of the Biological Diversity of Saskatchewan's Forests

### Mistik Indicator #3: Size class distribution of harvest events

Descriptor	Details																		
Target	<b>The targets for harvest distribution by event size class (based on a 10-year event measurement period) over the next 10 years are as follows:</b>																		
	<table><tr><th>Harvest Event Size Class (ha)</th><th>Target % Harvest Area</th><th>Acceptable Range</th></tr><tr><td>0-100</td><td>20%</td><td>10-30%</td></tr><tr><td>101-1500</td><td>64%</td><td>54-74%</td></tr><tr><td>1501-3500</td><td>14%</td><td>10-18%</td></tr><tr><td>3500-8000</td><td>2%</td><td>2-10%</td></tr><tr><td>&gt;8000</td><td>0%</td><td>0-10%</td></tr></table>	Harvest Event Size Class (ha)	Target % Harvest Area	Acceptable Range	0-100	20%	10-30%	101-1500	64%	54-74%	1501-3500	14%	10-18%	3500-8000	2%	2-10%	>8000	0%	0-10%
	Harvest Event Size Class (ha)	Target % Harvest Area	Acceptable Range																
	0-100	20%	10-30%																
	101-1500	64%	54-74%																
	1501-3500	14%	10-18%																
	3500-8000	2%	2-10%																
	>8000	0%	0-10%																
	<p>The target for the harvest event size class distribution for the FMP is that over the next 10 years (2019-forward), This target was developed using Dr. David Anderson’s “Pre-Industrial Forest Condition Analysis” (Anderson, 2007). The study developed the targets using the natural range of variation for the FMA area. As the process for determining the event and overall event size is dependent on GIS processing it is not controlled within the wood supply model.</p>																		
	<p>Harvest event size is the overall disturbance size of harvest events. The purpose of harvest event size targets is to emulate the natural disturbance size distribution across the landscape.</p>																		
<p>The process to determine event boundaries will follow the procedure developed by David Anderson (Anderson 2005, 2006a and 2006b). For this process, only events within a 10 year period (starting in 2019) will be included. Within the specified 10 years, blocks will be buffered <b>by 250m</b> and blocks whose buffers overlap will be grouped together into an event. The outer boundary of the combined buffers will be buffered back inward <b>250m</b> and the resulting boundary will be considered the event boundary (see following figure).</p>																			
																			
<p><b>Clustering of Cutblocks into an Event</b></p>																			
<p>Note: the target for large event sizes are low because it is expected that natural disturbance events will still create larger event sizes on the landbase.</p>																			
<p>These targets are based on gradual and realistic improvement by moving to larger events consistent with what Mistik has shown to be possible over the past 10 years.</p>																			





Descriptor	Details												
Acceptable Variance	See target table above for acceptable range												
Current Status	<p>Event area distribution based on a 10-year event period 2007-2016 and using a 500m inter-block distance, as per the Planning Standard.</p> <table> <tr> <th>Harvest Event Size Class (ha)</th><th>% Harvest Area</th></tr> <tr> <td>0-100</td><td>22%</td></tr> <tr> <td>101-1500</td><td>63%</td></tr> <tr> <td>1501-3500</td><td>13%</td></tr> <tr> <td>3500-8000</td><td>2%</td></tr> <tr> <td>&gt;8000</td><td>0%</td></tr> </table>	Harvest Event Size Class (ha)	% Harvest Area	0-100	22%	101-1500	63%	1501-3500	13%	3500-8000	2%	>8000	0%
Harvest Event Size Class (ha)	% Harvest Area												
0-100	22%												
101-1500	63%												
1501-3500	13%												
3500-8000	2%												
>8000	0%												
Most Recent Assessment	September 2017												
Source of Measurement Data	Mistik's GIS forest inventory, harvest activity tracking, and fire update databases.												
Implementation Requirements	Land base update and NEPTUNE or other GIS event-based analysis												
Strategy to Achieve	Follow HEP concepts where possible (larger harvest areas, get in-get out, less long-term roads, etc.)												
Monitoring and Reporting Schedule	Year 5 and Year 10 (10-year assessment cycle) – graph/table format.												
Reporting Scale	FMP Area												
Rationale for Indicator	<p>Insofar as possible, attempts are made to emulate some of the features and patterns of the dominant disturbance regimes. The primary natural disturbance agent in Mistik's FMP area is fire. Harvest areas are planned and implemented so as to emulate the diversity of landscape patterns created by fire. Historically, Mistik has planned harvest areas as 'disturbance events' utilizing a 'one-pass' system. Mistik also attempts to emulate the size class distribution of natural disturbance events. By emulating the natural, fire-origin patterns and sizes found in the boreal landscape, important ecological and associated habitat values within the FMA area are maintained.</p> <p>The Harvest event planning ("HEP") concept that combines multiple year's harvest areas to define an event is a relatively new concept for Saskatchewan and is still very much in the development stages when it comes to provincial framework. For the purposes of this FMP, HEP will be considered in conjunction with Mistik's and L&amp;M's overall planning principles such as minimizing open/active roads ("get in- get out") and consideration for social and stakeholder concerns to the extent practical. The ministry is currently developing guidelines for HEP at the operational level which Mistik will follow once they are in effect.</p>												
Rationale for Target and Variance	<p>1. The event size classes come from the Forest Management Planning Standard (September 5, 2017). The targets and acceptable variance were arrived at by assessing the results of the forest estate modeling and analyzing the project event size distribution at years 5 and 10 of the plan. There is a desire to move towards larger events, so it's not necessarily considered a negative thing if above target on the large size classes.</p>												

Criterion 1 – Biological Diversity

Element 1.1 – Ecosystem Diversity

Value 1.1.1- Natural Range of Variation

Objective 1.1.1.1- Conservation of the Biological Diversity of Saskatchewan's Forests

#### Mistik Indicator #4: Tree retention after harvest

Descriptor	Details
<b>Target</b>	<p>For harvest events with &gt;20 ha of harvest area, total retention will be an average of 9% made up of at least 4% in insular retention, including</p> <ul style="list-style-type: none"> <li>• clumps (&lt;2 ha)</li> <li>• islands (&gt;2 ha)</li> <li>• individual trees (in groups of 4 trees or less)</li> </ul> <p>The remainder will be made up of proximal retention (connected to the block boundary). This is an alternative solution to the standard which does not have a minimum block size requirement.</p> <p>Salvage areas are excluded from this target as they are covered under Mistik Indicator #12.</p>
<b>Acceptable Variance</b>	<p>Underachievement of the retention target is unacceptable unless for salvage or forest health reasons.</p> <p>Retention levels will be measured when all harvesting in the event has been completed.</p> <p>Overachievement of retention targets is acceptable if for stakeholder or ecological reasons.</p>
<b>Current Status</b>	N/A – retention was previously measured by blocks, not events.
<b>Most Recent Assessment</b>	August 2017
<b>Source of Measurement Data</b>	GIS harvest and inventory related data, aerial photography and field measurements. A sampling process will be used to determine the actual insular retention values.
<b>Implementation Requirements</b>	<p>Land base update and NEPTUNE or other GIS event-based analysis.</p> <p>Based on the previous year's harvest, a random selection of harvest events (minimum 10%) will be measured for retention levels. Islands and clumps will be measured based on updated images of the harvest areas (GIS-based exercise). Field measurements will be conducted for single tree retention and verification of results.</p>
<b>Strategy to Achieve</b>	Contractor training regarding retention selection and retention levels.
<b>Monitoring and Reporting Schedule</b>	Monitored annually by August 31 (5-year assessment cycle) – graph/table format.
<b>Reporting Scale</b>	FMP Area – Overall retention percentage for clumps (<2 ha), islands (>2 ha) and single trees.
<b>Rationale for Indicator</b>	<p>Maintenance of forest structural diversity within the FMA area is important for a number of ecological and associated habitat values. Forest retention will be representative of the forest types existing pre-harvest.</p> <p>The alternative solution based on “events with &gt;20ha” is being proposed because blocks less than 20 ha are not commonly harvested unless the purpose is to develop a gravel pit or clearing for other similar use and leaving the minimum percentage of retention as proposed in the standard may not be possible.</p> <p>The alternative target (<b>at least 4% in insular retention</b>) is being proposed as agreed to at the Planning Team meetings. A study of post fire residuals in the Mistik FMA (Anderson, 2007) found that in a typical large fire event, the total residual area averaged 35% of the event size and only 5% could be considered</p>





Descriptor	Details
	true island (insular) residuals. 4% was considered representative merchantable timber.
<b>Rationale for Target and Variance</b>	Mistik & L&M believe in and have a strong history of managing for a wide range of non-timber values. This target will further contribute to non-timber values in the FMP area.



## Criterion 1 – Biological Diversity

### Element 1.1 – Ecosystem Diversity

#### Value 1.1.1- Natural Range of Variation

#### Objective 1.1.1.1- Conservation of the Biological Diversity of Saskatchewan's Forests

### Mistik Indicator #5: The softwood component in hardwood stands is maintained

Descriptor	Details
<b>Target</b>	Hardwood stands with a white spruce component at the time of harvest will have an average of a minimum of 200 stems/ha of white spruce when measured in an Establishment survey (early FTG) or FTG survey. The population of harvest areas that this target applies to will be those portions of harvest blocks that had a pre-harvest species group of H (80% or greater hardwood component) and a white spruce component (at least 10% cover of WS in the over storey or at least 20% cover of WS in the under storey layer of the SFVI). Only blocks harvested after April 1, 2019 will be assessed.
<b>Acceptable Variance</b>	10%
<b>Current Status</b>	N/A – new indicator
<b>Most Recent Assessment</b>	N/A – new indicator
<b>Source of Measurement Data</b>	Mistik's GIS forest inventory, harvest activity tracking and silviculture information, survey results.
<b>Implementation Requirements</b>	Land base update, pre-harvest species composition, Establishment and Free to Grow survey data
<b>Strategy to Achieve</b>	Maintain small volumes of softwood in hardwood stands by using seed trees or patch retention.
<b>Monitoring and Reporting Schedule</b>	Annually by August 31 (5-year assessment cycle) – graph/table format.
<b>Reporting Scale</b>	FMP Area - The population that will be reported on will be those areas that meet the above description and were surveyed (FTG or Early FTG) in that reporting year.
<b>Rationale for Indicator</b>	Mistik is committed to ensuring the maintenance of the softwood growing stock within the FMP area.
<b>Rationale for Target and Variance</b>	Renewal prescriptions will follow SGR's. Maintaining small amounts of softwood in hardwood dominant stands may be achieved by leaving seed trees, patch retention, or in rare cases, seeding or planting.



Criterion 1 – Biological Diversity

Element 1.1 – Ecosystem Diversity

Value 1.1.1- Natural Range of Variation

Objective 1.1.1.1- Conservation of the Biological Diversity of Saskatchewan's Forests

### Mistik Indicator #6: Relative abundance of CSGs are forecasted to be maintained at next rotation

Descriptor	Details																											
Target	The area by stand type of regenerating stands, as measured at the Free to Grow survey, will be consistent with the transition assumptions used in the Forest Estate Modeling.																											
Acceptable Variance	10%																											
Current Status	N/A – new indicator																											
Most Recent Assessment	N/A – new indicator																											
Source of Measurement Data	Original planning inventory (forest characterization) stand type boundaries and Free To Grow survey data																											
Implementation Requirements	<p>Free To Grow survey polygon calls will be compared to the original SGR stand type designations from the planning inventory. The target will be based on the original area of the original stand types and the transition assumptions that were used in the Forest Estate Modeling. The area of the regenerating stand types will be compared to these target areas. For example:</p> <div><p>5-Year Results</p><table><thead><tr><th>Stand Type</th><th>Target (ha)</th><th>Actual (ha)</th></tr></thead><tbody><tr><td>S-WS</td><td>2000</td><td>2100</td></tr><tr><td>S-BS</td><td>500</td><td>500</td></tr><tr><td>S-JP</td><td>2000</td><td>1900</td></tr><tr><td>SH-JP</td><td>1000</td><td>900</td></tr><tr><td>SH-WS</td><td>3000</td><td>3100</td></tr><tr><td>HS-WS</td><td>2500</td><td>2400</td></tr><tr><td>HS-JP</td><td>500</td><td>400</td></tr><tr><td>H</td><td>4000</td><td>4200</td></tr></tbody></table></div> <p>--Example--</p>	Stand Type	Target (ha)	Actual (ha)	S-WS	2000	2100	S-BS	500	500	S-JP	2000	1900	SH-JP	1000	900	SH-WS	3000	3100	HS-WS	2500	2400	HS-JP	500	400	H	4000	4200
Stand Type	Target (ha)	Actual (ha)																										
S-WS	2000	2100																										
S-BS	500	500																										
S-JP	2000	1900																										
SH-JP	1000	900																										
SH-WS	3000	3100																										
HS-WS	2500	2400																										
HS-JP	500	400																										
H	4000	4200																										
Strategy to Achieve	Manage stand renewal/silviculture practices to promote regeneration of the SGR Forest Types. For example, S-jP will often be scarified and left for natural regeneration of jP.																											
Monitoring and Reporting Schedule	Annually by August 31 (5-year assessment cycle) – graph/table format.																											

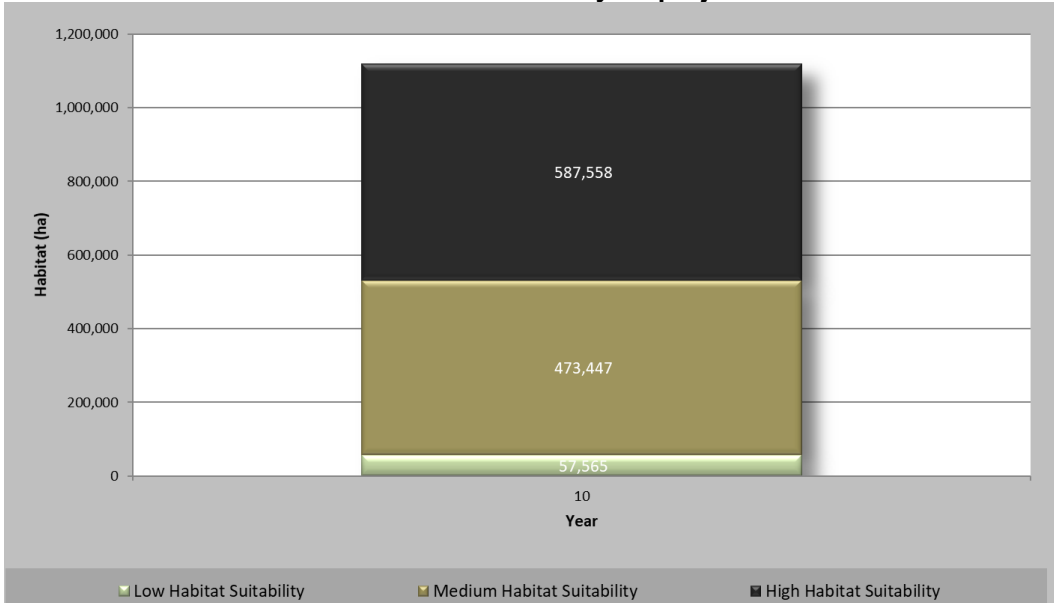
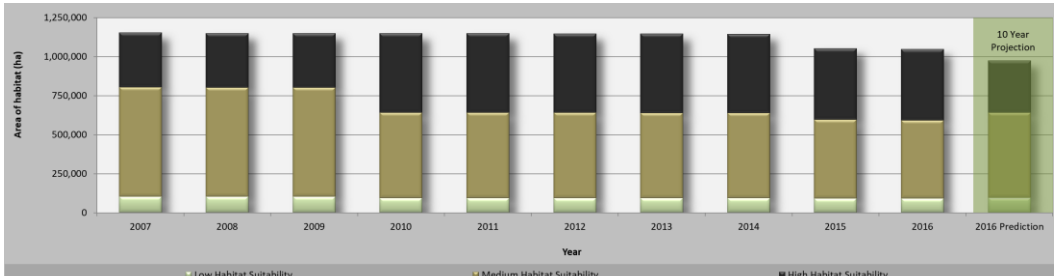


Descriptor	Details
<b>Reporting Scale</b>	FMP Area - The population that will be reported on will be those areas that were surveyed (FTG or Early FTG) in that reporting year.
<b>Rationale for Indicator</b>	Mistik is committed to monitoring their stand transition assumptions
<b>Rationale for Target and Variance</b>	Measuring stand transitions against modelled transition assumptions at the time of FTG survey is the most logical approach. Mistik recognizes that stand types can and will change after the time of FTG survey.



Criterion 1 – Biological Diversity  
Element 1.2 – Species Diversity  
Value 1.2.1- Quantity & Quality of Forest Habitat  
Objective 1.2.1.1- Maintain Habitat for Forest Dwelling Species

### Mistik Indicator #7a: Current habitat availability for Fisher vs. predicted future (modeled) supply

Descriptor	Details						
Target	<div><div>Total Fisher habitat will meet or exceed the 10-year projection:</div><div><table><thead><tr><th>High Habitat Suitability</th><th>Medium Habitat Suitability</th><th>Low Habitat Suitability</th></tr></thead><tbody><tr><td>587,558</td><td>473,447</td><td>57,565</td></tr></tbody></table></div></div>	High Habitat Suitability	Medium Habitat Suitability	Low Habitat Suitability	587,558	473,447	57,565
High Habitat Suitability	Medium Habitat Suitability	Low Habitat Suitability					
587,558	473,447	57,565					
Acceptable Variance	10%						
Current Status	<div><div>Fisher Suitable Habitat</div><div></div></div>						
Most Recent Assessment	August 2017						
Source of Measurement Data	Anthropogenic and natural disturbance data used to update the landbase, habitat model/queries for Fisher						



Descriptor	Details
<b>Implementation Requirements</b>	Forest inventory analysis conducted by Silvacom Ltd.
<b>Strategy to Achieve</b>	Adhere to tactical plan
<b>Monitoring and Reporting Schedule</b>	Annually by August 31 (5-year assessment cycle) – graph/table format.
<b>Reporting Scale</b>	FMP Area
<b>Rationale for Indicator</b>	The ‘coarse filter’ approach to forest habitat maintenance within harvested areas serves to meet the habitat needs of most species within the FMA area.
<b>Rationale for Target and Variance</b>	Mistik seeks to minimize its forestry impacts on ‘species at risk’ and ‘species of concern’. The quantitative analysis of currently available preferred habitat supply (and future maintenance of preferred habitat) and the preparation of interpretive reports by wildlife experts assists in providing context and guidance for minimizing the environmental impacts of forest management activities.



Criterion 1 – Biological Diversity  
Element 1.2 – Species Diversity  
Value 1.2.1- Quantity & Quality of Forest Habitat  
Objective 1.2.1.1- Maintain Habitat for Forest Dwelling Species

### Mistik Indicator #7b: Habitat availability for Caribou – Tiers 1, 2 and 3

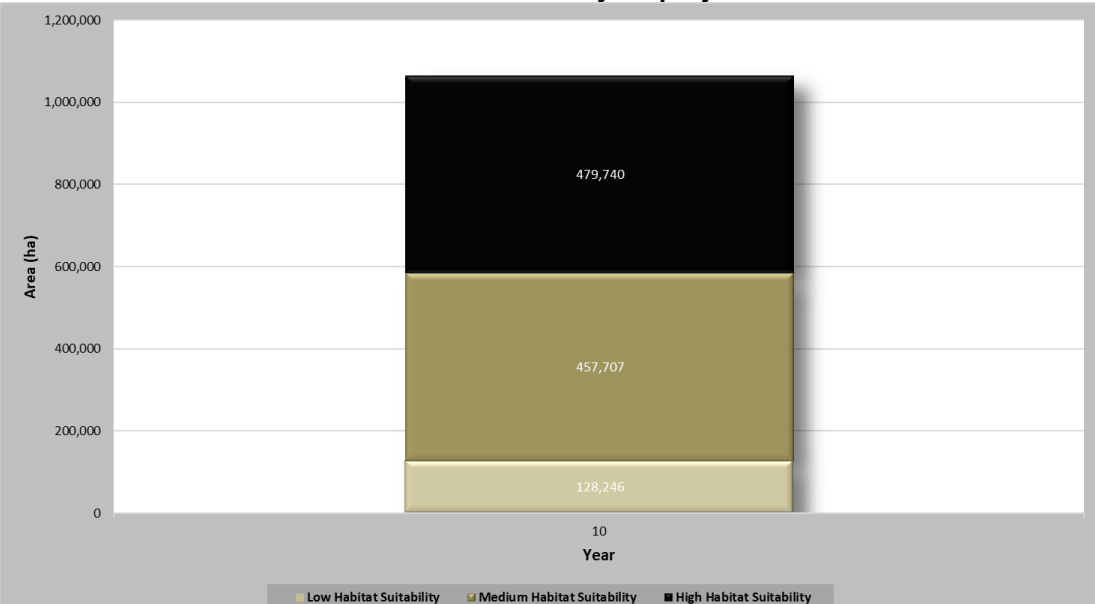
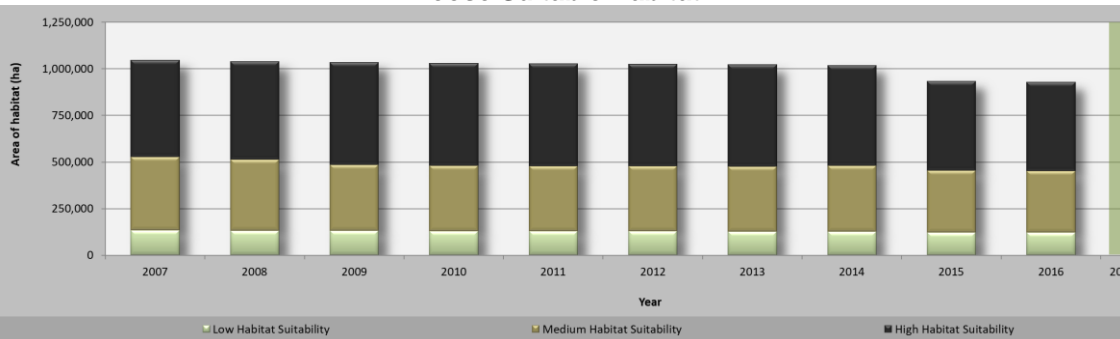
Indicator 7b, previously Part 1 and Part 2, has been combined into a single indicator to reflect the caribou management strategies agreed to as part of the FMP amendment process.

Descriptor	Details																
Target	Follow harvest deferral timelines (tier and sub-tier) as agreed to and approved in the 2023 FMP Amendment.																
Acceptable Variance	None																
Current Status	Tier deferral timelines are as follows: <table> <tr> <th>Tier</th><th>Deferral (Years)</th></tr> <tr> <td>Tier 1</td><td>20 (Current to 2043)</td></tr> <tr> <td>Sub-Tier 13</td><td>50 (Current to 2073)</td></tr> <tr> <td>Sub-Tier 19</td><td>50 (Current to 2073)</td></tr> <tr> <td>Tier 2</td><td>30 (2043-2073)</td></tr> <tr> <td>Sub-Tier 11</td><td>50 (Current to 2073)</td></tr> <tr> <td>Tier 3</td><td>N/A</td></tr> <tr> <td>CM-4 (Old CMHA)</td><td>50 (Current to 2073)</td></tr> </table>	Tier	Deferral (Years)	Tier 1	20 (Current to 2043)	Sub-Tier 13	50 (Current to 2073)	Sub-Tier 19	50 (Current to 2073)	Tier 2	30 (2043-2073)	Sub-Tier 11	50 (Current to 2073)	Tier 3	N/A	CM-4 (Old CMHA)	50 (Current to 2073)
Tier	Deferral (Years)																
Tier 1	20 (Current to 2043)																
Sub-Tier 13	50 (Current to 2073)																
Sub-Tier 19	50 (Current to 2073)																
Tier 2	30 (2043-2073)																
Sub-Tier 11	50 (Current to 2073)																
Tier 3	N/A																
CM-4 (Old CMHA)	50 (Current to 2073)																
Most Recent Assessment	n/a new indicator																
Source of Measurement Data	Mistik GIS																
Implementation Requirements	Assess location of harvest areas annually in Mistik operating plan.																
Strategy to Achieve	No harvesting to occur within the deferral areas within the identified time periods																
Monitoring and Reporting Schedule	Annually by sub-tier																
Reporting Scale	Area harvested by sub-tier																
Rationale for Indicator	Tier 1 and Tier 2 contain current and future high quality caribou habitat, preventing disturbance in them is in alignment with the Range Plan for Woodland Caribou in Saskatchewan (SK2 West Caribou Administration Unit). CM-4 is known to have extensive caribou use and is vital for connectivity between the Tier 1 & Tier 2 areas that exist on the Mistik FMP area.																
Rationale for Target and Variance	Small variances may be required in these areas for addressing forest health, fire salvage, safety, or other non-timber values.																



Criterion 1 – Biological Diversity  
Element 1.2 – Species Diversity  
Value 1.2.1- Quantity & Quality of Forest Habitat  
Objective 1.2.1.1- Maintain Habitat for Forest Dwelling Species

### Mistik Indicator #7c: Current habitat availability for Moose vs. predicted future (modeled) supply

Descriptor	Details		
Target	Total moose habitat will meet or exceed the 10-year projection:		
			
	High Habitat Suitability 479,740	Medium Habitat Suitability 457,707	Low Habitat Suitability 126,969
Acceptable Variance	10%		
Current Status	Moose Suitable Habitat		
			
Most Recent Assessment	August 2017		





Descriptor	Details
Source of Measurement Data	Mistik SFVI, harvest activities spatial data, and spatial fire database
Implementation Requirements	Forest inventory analysis conducted by Silvacom Ltd.
Strategy to Achieve	Adhere to tactical plan
Monitoring and Reporting Schedule	Annually by August 31 – graph/table format
Reporting Scale	FMP Area
Rationale for Indicator	Mistik's 'coarse filter' approach to forest habitat maintenance within harvested areas serves to meet the habitat needs of most species within the FMA area. Moose has been identified by Mistik stakeholders as an important species to northern communities. Maintaining habitat and minimizing impacts to Moose is important to Mistik.
Rationale for Target and Variance	Mistik seeks to minimize its forestry impacts on 'species at risk' and 'species of concern'. The quantitative analysis of currently available preferred habitat supply (and future maintenance of preferred habitat) and the preparation of interpretive reports by wildlife experts assists in providing context and guidance for minimizing the environmental impacts of forest management activities.

Criterion 1 – Biological Diversity

Element 1.3 – Genetic Diversity

Value 1.3.1- Natural Genetic Diversity

Objective 1.3.1.1- No loss of Natural Tree Genetic Diversity through Forest Management Activities

### Mistik Indicator #8: Seedlings are from wild or improved seed sources

Descriptor	Details
<b>Target</b>	No tree seedlings planted on the Mistik FMP area shall be from GMO sources, and the amount of seedlings from improved sources will be tracked separately (Target revised at October 2022 PAG meeting)
<b>Acceptable Variance</b>	0% for GMO
<b>Current Status</b>	Percent of seedlings from GMO sources: 0%
<b>Most Recent Assessment</b>	August 2017
<b>Source of Measurement Data</b>	GIS tree planting and seed lot tracking databases
<b>Implementation Requirements</b>	Availability of seed that is not improved or genetically modified
<b>Strategy to Achieve</b>	Collect seed from the FMP area. Grow seedlings to be planted directly from seed collected.
<b>Monitoring and Reporting Schedule</b>	Annually by August 31 (5-year assessment cycle) – graph/table format.
<b>Reporting Scale</b>	FMP Area
<b>Rationale for Indicator</b>	Mistik & L&M plants ~ 1,000,000 seedlings per year (in total). Significant use of improved seed may result in 'erosion' of the genetic diversity of the tree seedlings planted in the FMP area.
<b>Rationale for Target and Variance</b>	Minimizing the use of improved tree seed ensures that the natural genetic diversity of planted seedlings is maintained throughout all planted areas in the Mistik FMP area.



Criterion 2 – Ecosystem Condition & Productivity

Element 2.1 – The Stability, Resilience and Rates of Biological Production in Forest Ecosystem

Value 2.1.1- Natural Ecosystem Processes

Objective 2.1.1.1- Maintain the Stability, Resilience and Rates of Biological Production in Forest Ecosystem

### Mistik Indicator #9: Post-harvest areas are successfully regenerated

Descriptor	Details
<b>Target</b>	<b>100% of surveyed post-harvest area shall meet provincial stocking requirements according to the provincial Regeneration Assessment Standard (Establishment and Free to Grow surveys).</b>
<b>Acceptable Variance</b>	No variance is accepted
<b>Current Status</b>	Percent of post-harvest area surveyed area that meets provincial Establishment survey stocking requirements: 2016: SR = 100%, NSR = 0% 2018 is the first year that Free to Grow surveys are required on 2004/05 harvest areas (age 14 years) under the current standard.
<b>Most Recent Assessment</b>	August 2017
<b>Source of Measurement Data</b>	Establishment and Free to Grow survey databases / GIS
<b>Implementation Requirements</b>	Conduct surveys and summarize survey data for the year of survey being reported.
<b>Strategy to Achieve</b>	Assess NSR blocks for opportunities to improve regeneration by conducting additional silviculture activities (planting, seeding, etc.). Conduct follow-up surveys to monitor for improvement of stocking.
<b>Monitoring and Reporting Schedule</b>	Annually by April 31 (5-year assessment cycle) – graph/table format.
<b>Reporting Scale</b>	FMA Areas (Mistik/L&M)
<b>Rationale for Indicator</b>	Not sufficiently regenerated (NSR) area within the harvested land base is unacceptable. Monitoring and implementing action plans to address all NSR areas is an important forest management goal. It is Mistik's goal to ensure that all harvested sites are fully stocked with acceptable tree species.
<b>Rationale for Target and Variance</b>	It is imperative that all harvest blocks achieve full stocking with acceptable tree species as soon as possible after harvest. All NSR harvest blocks are tracked and an action plan is developed to ensure full stocking of all NSR blocks.

Criterion 2 – Ecosystem Condition & Productivity

Element 2.1 – The Stability, Resilience and Rates of Biological Production in Forest Ecosystem

Value 2.1.1- Natural Ecosystem Processes

Objective 2.1.1.1- Maintain the Stability, Resilience and Rates of Biological Production in Forest Ecosystem

### Mistik Indicator #10: Change in the managed forest landbase area

Descriptor	Details
<b>Target</b>	<b>Less than 2% of the productive forest land base shall be converted to permanent or currently not reclaimed Mistik- and L&amp;M-related access structures (roads and gravel / borrow pits).</b>
<b>Acceptable Variance</b>	≤10% variance of the targets identified
<b>Current Status</b>	Percent of the productive landbase of permanent (provincial highways) and currently not reclaimed Mistik access-related structure = 1.3% (based on 2007 FMP, actual number will reset to 0 once the 2017 FMP takes effect)
<b>Most Recent Assessment</b>	August 2017
<b>Source of Measurement Data</b>	Mistik's roads database and Surface Lease file for previous operating year
<b>Implementation Requirements</b>	Current data (area in ha) related to non-reclaimed roads and Surface Leases
<b>Strategy to Achieve</b>	Minimize area disturbed by non-reclaimed roads and gravel/borrow pits. Reclaim roads and borrow pits that are no longer required.
<b>Monitoring and Reporting Schedule</b>	Annually by August 31 (5-year assessment cycle) – graph/table format.
<b>Reporting Scale</b>	FMP Area
<b>Rationale for Indicator</b>	Access is necessary in order to conduct forestry activities. However, Mistik & L&M strive to minimize permanent loss to the productive forest land base associated with roads. Additional access is developed by a number of other agencies (gravel pits, highways, bush roads, trails, fire guards, etc.). This additional access development is beyond Mistik & L&M's control.
<b>Rationale for Target and Variance</b>	The amount of open road access can be maintained at less than 2% of the productive landbase over time. All Class 1 roads have been built on the Mistik FMP area. There will still be some Class 2 road to be built. Most of the roads that will be built in the future will ultimately be reclaimed.



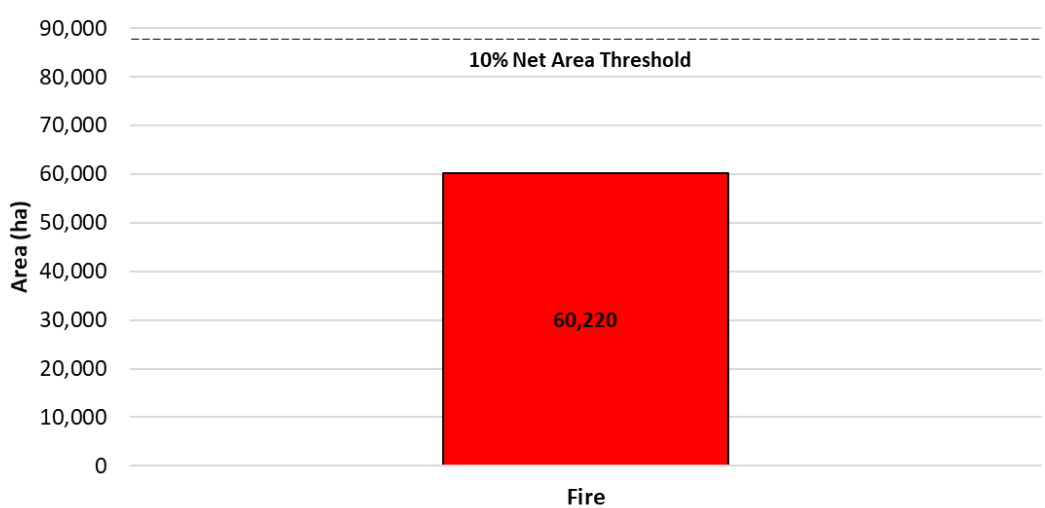
Criterion 2 – Ecosystem Condition & Productivity

Element 2.1 – The Stability, Resilience and Rates of Biological Production in Forest Ecosystem

Value 2.1.1- Natural Ecosystem Processes

Objective 2.1.1.1- Maintain the Stability, Resilience and Rates of Biological Production in Forest Ecosystem

### Mistik Indicator #11: Net area disturbed by stand replacing natural events (fire)

Descriptor	Details
Target	Net area impacted by stand replacing natural disturbance (fire) will not exceed 10% over the 10-year period.
Acceptable Variance	None
Current Status	<p><b>2007-2016 Net Area Impacted by Natural Disturbance</b></p>  <p>Area (ha)</p> <p>90,000</p> <p>80,000</p> <p>70,000</p> <p>60,000</p> <p>50,000</p> <p>40,000</p> <p>30,000</p> <p>20,000</p> <p>10,000</p> <p>0</p> <p>60,220</p> <p>10% Net Area Threshold</p> <p>Fire</p> <p>Values will be reset to 0 once the 2019 FMP becomes enacted.</p>
Most Recent Assessment	August 2017
Source of Measurement Data	2016 Annual Report. Mistik's GIS forest inventory and depletions from natural stand replacing disturbances inventory
Implementation Requirements	Forest inventory analysis conducted by Silvacom Ltd.
Strategy to Achieve	Work with the Ministry of Environment in the event that stand replacing disturbances impact >10% of net area to develop an action plan to re-evaluate the FMP.
Monitoring and Reporting Schedule	Will be monitored against a threshold of 10% over the 10-year period, above which re-evaluation of the FMP would need to occur
Reporting Scale	FMA Areas (Mistik/L&M)
Rationale for Indicator	In the event that a significant portion of the productive landbase is disturbed by stand replacing natural events, it will be necessary to re-evaluate the FMP.
Rationale for Target and Variance	Significant losses to merchantable timber can have an impact of Mistik's HVS. If this re-planning threshold should be exceeded, Mistik will work with MOE to develop an action plan.

Criterion 2 – Ecosystem Condition & Productivity

Element 2.1 – The Stability, Resilience and Rates of Biological Production in Forest Ecosystem

Value 2.1.1- Natural Ecosystem Processes

Objective 2.1.1.1- Maintain the Stability, Resilience and Rates of Biological Production in Forest Ecosystem

### Mistik Indicator #12: Proportion of a natural disturbance event retained un-salvaged

Descriptor	Details
<b>Target</b>	<b>In all salvage harvesting activities occurring in natural disturbance events &gt;100 ha, at least 20% of the disturbance area will be left unharvested.</b>
<b>Acceptable Variance</b>	No variance is accepted
<b>Current Status</b>	From 2007-2016, 93% of the area was left unsalvaged in disturbances where salvage harvest occurred
<b>Most Recent Assessment</b>	August 2017
<b>Source of Measurement Data</b>	SFVI, harvest activities spatial data, and spatial disturbance data
<b>Implementation Requirements</b>	Disturbance boundary data and disturbance event area (ha)
<b>Strategy to Achieve</b>	Salvage harvest planning and contractor awareness training for disturbance retention requirements
<b>Monitoring and Reporting Schedule</b>	Annually by August 31 (5-year assessment cycle) – graph/table format.
<b>Reporting Scale</b>	FMP Area – by event and percent retention
<b>Rationale for Indicator</b>	Insofar as is possible, attempts are made to emulate some of the features and patterns of the dominant disturbance regimes. The primary natural disturbance agent in Mistik's FMP area is fire. Maintenance of post-fire structural diversity and conditions contributes to important ecological and associated habitat values within the FMP area.
<b>Rationale for Target and Variance</b>	The targets are simple, readily measurable and effective in ensuring maintenance of individual disturbance-specific and landscape-level retention of post-disturbance structural attributes and conditions.





Criterion 2 – Ecosystem Condition & Productivity

Element 2.1 – The Stability, Resilience and Rates of Biological Production in Forest Ecosystem

Value 2.1.1- Natural Ecosystem Processes

Objective 2.1.1.1- Maintain the Stability, Resilience and Rates of Biological Production in Forest Ecosystem

### Mistik Indicator #13: Yield curve suitability; measured by actual harvest volume (m<sup>3</sup>/ha) compared to predicted volume

Descriptor	Details
<b>Target</b>	On an annual and five-year basis and based on updated harvest block boundaries, the total actual delivered softwood and hardwood harvest volume from all sources on the FMA area shall deviate by less than the acceptable variance (15% on a five-year basis) from the volume predicted by the yield curve estimates for the same harvested forest stands.
<b>Acceptable Variance</b>	15%
<b>Current Status</b>	Actual SW volume as a % of yield curve predicted softwood volume for 2007/16: 100%. Actual HW volume as a % of yield curve predicted hardwood volume for 2007 - 2016: 87%
<b>Most Recent Assessment</b>	2016 Annual Report
<b>Source of Measurement Data</b>	Mistik's SFVI database, FMP yield curves by development type and delivered wood database
<b>Implementation Requirements</b>	n/a
<b>Strategy to Achieve</b>	Assessment of Mistik's SFVI database and FMP yield curves by development type and delivered wood database
<b>Monitoring and Reporting Schedule</b>	Every 5 years
<b>Reporting Scale</b>	FMA Areas (Mistik/L&M)
<b>Rationale for Indicator</b>	Comparison of actual harvested volume outcomes versus predicted yield outcomes assist Mistik, regulators and the public in understanding and assessing the veracity of the forest yield estimates used in planning processes.
<b>Rationale for Target and Variance</b>	The yield curve estimates of volume for each development type are accurate as an estimate of the population of all stands within the development type. Actual volumes from individual stands within each development type may vary significantly from the average volume estimate for the development type as a whole.



Criterion 2 – Ecosystem Condition & Productivity

Element 2.1 – The Stability, Resilience and Rates of Biological Production in Forest Ecosystem

Value 2.1.1- Natural Ecosystem Processes

Objective 2.1.1.1- Maintain the Stability, Resilience and Rates of Biological Production in Forest Ecosystem

### Mistik Indicator #14: Utilization assumption consistency and implementation

Descriptor	Details
<b>Target</b>	<b>There shall be 0 Notices of Violation or Administrative Penalties for operators not meeting the current or otherwise approved utilization specifications.</b>
<b>Acceptable Variance</b>	None
<b>Current Status</b>	0 NOV or Administrative Penalties related to the 2016/17 operating year for utilization
<b>Most Recent Assessment</b>	August 2017
<b>Source of Measurement Data</b>	Self-inspection compliance report, MoE Report on Forest Operations and any applicable enforcement actions and related corrective action plans
<b>Implementation Requirements</b>	Conduct self-inspections on harvesting activities for consistency with approved wood specs., assess MoE Report on Forest Operations and any applicable enforcement action documentation for the previous operating year
<b>Strategy to Achieve</b>	Harvest according to approved utilization standards
<b>Monitoring and Reporting Schedule</b>	Annually by August 31 – graph/table format.
<b>Reporting Scale</b>	FMA Areas (Mistik/L&M) – number of utilization- related activities assessed vs. compliance, number of Notice of Violation or Administrative Penalties assessed related to utilization.
<b>Rationale for Indicator</b>	The utilization assumptions specified in the yield curves are consistent with the implemented utilization specifications.
<b>Rationale for Target and Variance</b>	This is a compliance indicator related to FMA-approved utilization specifications. Any target less than 100% or any variance is unacceptable. 100% of corrective actions related to utilization are implemented and resolved.





Criterion 2 – Ecosystem Condition & Productivity

Element 2.1 – The Stability, Resilience and Rates of Biological Production in Forest Ecosystem

Value 2.1.1- Natural Ecosystem Processes

Objective 2.1.1.1- Maintain the Stability, Resilience and Rates of Biological Production in Forest Ecosystem

### Mistik Indicator #15: Operational adherence to the Tactical Plan

*The total tactical plan area has been reduced with the Caribou Habitat Amendment, however Mistik expects to maintain the 15% variance target of the area harvested outside of the tactical plan.*

Descriptor	Details
Target	Over the 10-year period, the area harvested outside of the Tactical Plan (T1 and T2 combined) will not exceed 15% of the total Tactical Plan area
Acceptable Variance	None
Current Status	N/A – new indicator
Most Recent Assessment	N/A – new indicator
Source of Measurement Data	Mistik's spatial cut block data and the approved Tactical Plan
Implementation Requirements	Cutover updates are completed on an annual basis. Tracking of Tactical Plan area/variance is current
Strategy to Achieve	Harvest according to approved Tactical Plan and Annual Operating Plans. Assessment of cut block boundaries compared to the approved Tactical Plan and summarizing the area harvested outside of the tactical plan as a percentage of the total tactical plan area.
Monitoring and Reporting Schedule	Annually by August 31 (5-year assessment cycle) – graph/table format.
Reporting Scale	FMA Areas (Mistik/L&M)
Rationale for Indicator	Comparison of actual operational outcomes versus planned or scheduled outcomes assist Mistik/L&M, regulators and the public in understanding and assessing the veracity of planning processes. Mistik & L&M will be attempting to harvest the 'profile' of the working forest area over time. All stands that contribute to the wood supply for the FMP area should be targeted for harvest at some point.
Rationale for Target and Variance	The 15% target is a provincial standard



Criterion 3 – Soil & Water

Element 3.1 – Quantity and Quality of Soil and Water

Value 3.1.1- Minimize Loss of Quantity or Quality of Soil and Water

Objective 3.1.1.1- Maintain and/or Enhance the Quantity and Quality of Soil and Water

### Mistik Indicator #16: Harvesting activities in compliance with all related requirements

Descriptor	Details
<b>Target</b>	<b>100 % of harvesting activities are in compliance with provincial and federal acts &amp; regulations, approved operating plans, and SK Environmental Code.</b>
<b>Acceptable Variance</b>	None
<b>Current Status</b>	2016: 98.8% overall compliance (based on Mistik's self-inspection process which addresses both regulatory requirements and internal EMS certification requirements)
<b>Most Recent Assessment</b>	August 2017
<b>Source of Measurement Data</b>	Self-inspection compliance report, MoE Report on Forest Operations and any applicable enforcement actions and related corrective action plans
<b>Implementation Requirements</b>	Conduct self-inspections on harvesting activities, assess MoE Report on Forest Operations and any applicable enforcement action documentation for the previous operating year
<b>Strategy to Achieve</b>	Follow all applicable standards and legislation related to harvesting activities
<b>Monitoring and Reporting Schedule</b>	Annually by August 31 (5-year assessment cycle) – graph/table format.
<b>Reporting Scale</b>	FMA Areas (Mistik/L&M) – number of harvesting related activities assessed vs. compliance, number of Notice of Violation or Administrative Penalties assessed related to harvesting activities.
<b>Rationale for Indicator</b>	Through its self-inspection process, Mistik & L&M conduct an annual office and field-based assessment of a minimum of 16 aspects related to harvesting.
<b>Rationale for Target and Variance</b>	This is a compliance indicator related to provincial regulatory requirements. Any target less than 100% or any variance is unacceptable. 100% of corrective actions related to non-compliance with regulatory requirements are implemented and resolved.

Criterion 3 – Soil & Water

Element 3.1 – Quantity and Quality of Soil and Water

Value 3.1.1- Minimize Loss of Quantity or Quality of Soil and Water

Objective 3.1.1.1- Maintain and/or Enhance the Quantity and Quality of Soil and Water

### Mistik Indicator #17: Crossing activities in compliance with all related requirements

Descriptor	Details
<b>Target</b>	<b>100% of watercourse crossings are in compliance with provincial &amp; federal acts / regulations / approved operating plans /SK Environmental Code and aquatic habitat protection permits (AHPP)</b>
<b>Acceptable Variance</b>	None
<b>Current Status</b>	0 non-compliant watercourse crossings in 2016/17 operating year
<b>Most Recent Assessment</b>	August 2017
<b>Source of Measurement Data</b>	Self-inspection compliance report, ministry watercourse crossing Inspection reports and any applicable enforcement actions and related corrective action plans
<b>Implementation Requirements</b>	Conduct self-inspections on crossings, assess ministry watercourse crossing inspection reports and any applicable enforcement action documentation for the previous operating year
<b>Strategy to Achieve</b>	Follow all applicable standards and legislation related to crossing activities
<b>Monitoring and Reporting Schedule</b>	Annually by August 31 (5-year assessment cycle) – graph/table format.
<b>Reporting Scale</b>	FMA Areas (Mistik/L&M) – number of crossings inspected vs. number of compliant crossings, number of Notice of Violation or Administrative Penalties assessed related to watercourse crossings.
<b>Rationale for Indicator</b>	Protection of water resources is a critical forest management objective. A number of regulatory agencies claim some jurisdiction with respect to water resources. Established internal standard operating procedures have been made to ensure that all activity related to watercourse crossings are conducted in a manner that meets all regulatory approval conditions and operational requirements. Office and field compliance assessment of watercourse crossing activities that have occurred in the previous operating year are done.
<b>Rationale for Target and Variance</b>	This is a compliance indicator related to provincial regulatory requirements. A target less than 100% or any variance is unacceptable. 100% of corrective actions related to non-compliance with regulatory requirements or Mistik's EMS are implemented and resolved.





Criterion 4 – Role in Global Ecological Cycle

Element 4.1 – Carbon Cycle

Value 4.1.1- Productive Landbase

Objective 4.1.1.1- Mitigate the Impact of the Forest and Forest Activities on the Productive Landbase

### Mistik Indicator #18: Event Duration

Descriptor	Details
<b>Target</b>	<b>100% of harvest events have a duration of 10 years or less</b>
<b>Acceptable Variance</b>	None. Duration may only exceed 10 years with ministry approval.
<b>Current Status</b>	N/A – new indicator
<b>Most Recent Assessment</b>	N/A – new indicator
<b>Source of Measurement Data</b>	Operating plans and harvest activity spatial data
<b>Implementation Requirements</b>	Pre-harvest conditions that allow for Harvest Event Planning (HEP) concepts to be used
<b>Strategy to Achieve</b>	Follow HEP concepts where possible (larger harvest areas, get in-get out, less long-term roads, etc.)
<b>Monitoring and Reporting Schedule</b>	Annually by August 31 and assessed at 5-years
<b>Reporting Scale</b>	FMP Area - number of total completed harvest events by year and number of those events that exceed a 10-year timeframe for completion.
<b>Rationale for Indicator</b>	Traditional “patchwork” harvesting designs do not mimic natural forest patterns and can result in increased levels of access that remain open for many years. Larger, short-term harvest activities promote a “get in–get out” philosophy and lessen the long-term impacts to the area.
<b>Rationale for Target and Variance</b>	The provincial HEP method requirements will be implemented immediately once the ministry determines how to incorporate multi-year events into the OP approval/reporting process. Until that time, Mistik & L&M will continue to plan and harvest as done in recent years where larger-scale, more inclusive harvest areas are designed.

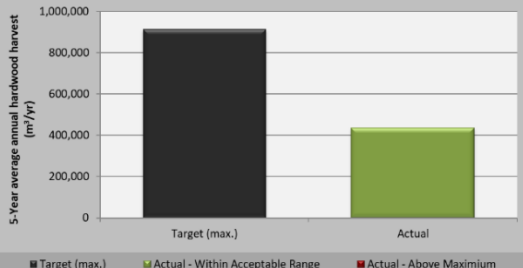
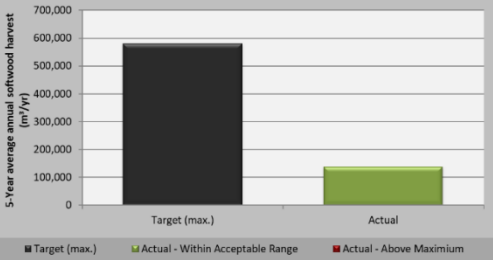
# Criterion 5 – Economic & Social Benefits

## Element 5.1 – Economic Benefits

### Value 5.1.1- Sustainable Economic Benefits over FMP Planning Period

#### Objective 5.1.1.1- Maximize the Economic Benefits without Compromising the Productive Capacity of Forest Ecosystem

### Mistik Indicator #19a: Utilization of harvest volume schedule (HVS)

Descriptor	Details
Target	The annual average harvest (based on a five-year period) shall not exceed the approved HVS for softwood or hardwood.
Acceptable Variance	None
Current Status	<div> <div> <b>Average Hardwood Harvest (2012-2016) vs. 2007 Hardwood HVS</b>  </div> <div> <b>Average Softwood Harvest (2012-2016) vs. 2007 Softwood HVS</b>  </div> </div> <p>*Note: The HVS will be different for the 2017 FMP</p>
Most Recent Assessment	August 2017
Source of Measurement Data	Mistik & L&M operating plan, Ministry of Environment operating plan approval letter, scaling data
Implementation Requirements	Approved budget, contractor availability, favourable environmental conditions
Strategy to Achieve	Harvest according to approved Tactical Plan and Annual Operating Plans
Monitoring and Reporting Schedule	Annually by August 31 (5-year assessment cycle) – graph/table format.
Reporting Scale	FMP Area ( Mistik/L&M)
Rationale for Indicator	A consistent and long-term source of merchantable timber is of profound significance for ongoing sustainability of mills, employment and timber-related economic benefits. Extraction of the timber resource is typically conducted within the context of the growth capacity of the forest. A basic notion is that timber extraction should not exceed the rate at which trees grow.
Rationale for Target and Variance	Assessment of compliance with approved harvest levels is conducted based on a five-year period. The current requirement by the province is that, over a five-year period, the average annual harvest volume shall not exceed the average annual approved harvest volumes. Harvest levels from the FMA area may vary for a number of reasons including market conditions, weather conditions, mill capacities, etc.

Criterion 5 – Economic & Social Benefits

Element 5.2 – Social Benefits

Value 5.2.1- Human Life and Property are protected from Wildfire

Objective 5.2.1.1- Minimize Injury, Loss and Damage Caused by Wildfire

### Mistik Indicator #19b: Harvest plans designed to lower wildfire risks to communities

Descriptor	Details
<b>Target</b>	<b>Work with MOE on 100% of community wildfire risks as identified by and requested by the Wildfire Branch (WFM) or within-FMA communities.</b>
<b>Acceptable Variance</b>	Economic feasibility and merchantability are the key criteria when determining if fuel reduction projects can be undertaken. Operators will not be expected to harvest areas that do not meet these criteria.
<b>Current Status</b>	N/A – new indicator
<b>Most Recent Assessment</b>	N/A – new indicator
<b>Source of Measurement Data</b>	Wildfire Management Branch, GIS/forest inventory data
<b>Implementation Requirements</b>	Identified timber is of sufficient quality and quantity to meet mill requirements. Operation is feasible.
<b>Strategy to Achieve</b>	Assess economic feasibility and merchantability for a specific area once a request is made by either WFM or a community. If agreeable, proceed with planning in a manner which reduces fuel/fire risk and meets ministry/community objectives.
<b>Monitoring and Reporting Schedule</b>	Annually by August 31 (5-year assessment cycle) – graph/table format.
<b>Reporting Scale</b>	FMP Area – number of requests made/harvest plans implemented, number of hectares harvested annually in fuel reduction projects.
<b>Rationale for Indicator</b>	Protection of communities from wildfire by reducing fuel levels adjacent to the community is something that Mistik/L&M can have an influence on. In the past, Mistik has completed harvesting projects resulting from specific requests made by a community to remove some or all adjacent forest cover to reduce the fire risk. As long as economic and merchantability objectives can be met, Mistik/L&M are willing to work with the ministry and communities in these cases.
<b>Rationale for Target and Variance</b>	All activities conducted must be with economics in mind for both the mills and contractors. Harvest activities must be in line with budgets and other company objectives/requirements.



Criterion 5 – Economic & Social Benefits

Element 5.2 – Distribution of Benefits

Value 5.2.1- Fair Distribution of Benefits

Objective 5.2.1.1- To ensure that Other Forest Users are addressed

### Mistik Indicator #20: Stakeholder and public engagement (Public Advisory Group meetings).

Descriptor	Details
<b>Target</b>	<b>Organize a minimum of 2 public engagement meetings (e.g. PAG meetings) annually</b>
<b>Acceptable Variance</b>	-1 meeting
<b>Current Status</b>	Meetings held with t Public Advisory Group (PAG) in 2017: 2
<b>Most Recent Assessment</b>	August 2017
<b>Source of Measurement Data</b>	20-Year FMP Public Engagement Plan, meeting records
<b>Implementation Requirements</b>	Resources to hold 2 PAG meetings per year
<b>Strategy to Achieve</b>	Organize 2 public engagement meetings (PAG) annually
<b>Monitoring and Reporting Schedule</b>	Annually by August 31 – graph/table format.
<b>Reporting Scale</b>	N/A
<b>Rationale for Indicator</b>	To encourage and facilitate detailed involvement and input from the general public into Mistik's 20-Year Forest Management Plan processes, Mistik/L&M will hold regular meetings with the Mistik Public Advisory Group. The meetings will be a forum to disseminate information and discuss forestry-related topics that are relevant to the 20-Year FMP process. Annual report results will also be discussed at the PAG meetings.
<b>Rationale for Target and Variance</b>	Mistik/L&M considers it very important for the public to be involved in the 20-Year Forest Management Plan processes. A well-informed Public Advisory Group (PAG) that has significant involvement in the development of the 20-Year FMP is critical to ongoing forest management performance.

Criterion 5 – Economic & Social Benefits

Element 5.2 – Distribution of Benefits

Value 5.2.1- Fair Distribution of Benefits

Objective 5.2.1.1- To ensure that Other Forest Users are addressed

### Mistik Indicator #21: Spatially identified non-timber resources and forest use activities.

Descriptor	Details
<b>Target</b>	<p><b>On an annual basis, acquire and input into GIS 100% of all known 'special places', non-timber resources and non-timber forest-use activities and produce a thematic map product which can be produced as a single theme or in combination with other map products.</b></p> <p>Note: Mistik will keep a spatial dataset of known special places; however, due to confidentiality issues, specific details on type may not be available to the general public.</p>
<b>Acceptable Variance</b>	None
<b>Current Status</b>	See Special Places map provided in the 2016 Annual Report
<b>Most Recent Assessment</b>	August 2017
<b>Source of Measurement Data</b>	Mistik Geographic Information System (GIS)
<b>Implementation Requirements</b>	<p>Assess Mistik Geographic Information System (GIS)</p> <p>Maintain current 'special places' and non-timber forest resources and non-timber forest-use activities and associated databases annually</p>
<b>Strategy to Achieve</b>	Solicit input by stakeholders and other users related to non-timber resources and forest activities.
<b>Monitoring and Reporting Schedule</b>	Annually by August 31 – graph/table format.
<b>Reporting Scale</b>	FMP Area - includes total number of “new” entries.
<b>Rationale for Indicator</b>	<p>Mistik/L&amp;M conducts its forestry activities in consultation with a number of other non-timber forest resource users. Hunting, fishing, berry-picking, mushroom-picking, nature appreciation, medicinal-plant use, and wild rice harvesting are common non-timber forest resource activities in the Mistik FMP area. Many of these non-timber forest resource activities have developed, to some extent, into commercial or semi-industrial enterprises. In the recent past, significant industries have grown (and in some cases waned) around commercial freshwater fisheries, mink-ranching, blueberry picking, and guided outfitting for deer and bear. Recently, ecotourism has become a business opportunity for several northern communities. Wild rice harvesting has become the most significant non-timber forest use industry in the Mistik FMA area. A number of the small lakes and waterways in the Waterhen, Canoe Lake, Beauval, Ile-a-la Crosse, Buffalo Narrows and Dillon Management Units are actively seeded and harvested on an annual basis. Forestry operations can have significant local impact on non-timber forest resource activities. In order for Mistik/L&amp;M to efficiently undertake meaningful consultation with non-timber forest resource users and incorporate concerns, site-specific values, etc. into operating plans it is necessary to have non-timber forest resources and non-timber forest-use activities identified and mapped to the fullest extent possible. In relation to other 'permitted' non-timber forest users (outfitters, trappers, wild rice growers and grazing permit holders) on the Mistik FMP area, Mistik receives updated hardcopy maps from the province on a periodic basis. Mistik has to manually superimpose the hardcopy maps on its own GIS forestry maps. To acquire or create the provincial maps in digital format and embed the data in Mistik's GIS would facilitate clarity of information and ease of use.</p>



Descriptor	Details
	Mistik will solicit the input of staff, Ministry of Environment and advisory and co-management boards regarding the location of candidate 'special places' in the FMA area.
<b>Rationale for Target and Variance</b>	In order for Mistik/L&M to efficiently undertake meaningful consultation with non-timber forest resource users and incorporate concerns, site-specific values, etc. into operating plans it is necessary to have non-timber forest resources and non-timber forest-use activities identified and mapped to the fullest extent possible. It is important to ensure that all known values are spatially identified.



Criterion 5 – Economic & Social Benefits  
Element 5.3 – Sustainability of Benefits  
Value 5.3.1- No Loss of Benefits  
Objective 5.3.1.1- Maintain or Enhance Benefits

### Mistik Indicator #22: Harvest operations are proportionally distributed across the FMA.

*April 2023 Update: Mistik has updated this target to align with the provincial Range Plan for Woodland Caribou in Saskatchewan*

Descriptor	Details			
<b>Target</b>	<b>Harvest area by species grouping and Planning Unit will not exceed 50% of the 10-year Forest Estate Modeling outputs in either of the first two 5-year periods .</b>			
	<b>Planning Unit</b>	<b>Species Grouping</b>	<b>10-Yr Harvest Area from Forest Estate Model</b>	<b>Maximum Harvest Area (ha) for each 5-Yr Period</b>
	<b>North</b>	H/HS	7,872	3,936
		SH	816	408
		S-WS	518	259
		S-Other	4,906	2,453
	<b>West</b>	H/HS	11,807	5,903
		SH	349	174
		S-WS	335	167
		S-Other	6,122	3,061
	<b>Central</b>	H/HS	17,730	8,865
		SH	1,877	938
		S-WS	1,283	642
		S-Other	14,441	7,221
	<b>Divide</b>	H/HS	8,217	4,109
		SH	439	219
		S-WS	928	464
		S-Other	3,717	1,858
	<b>L&amp;M</b>	H/HS	2,254	1,127
		SH	864	432
		S-WS	432	216
		S-Other	3,661	1,830
<b>Acceptable Variance</b>	None			
<b>Current Status</b>	N/A- new VOIT			
<b>Most Recent Assessment</b>	N/A			
<b>Source of Measurement Data</b>	Planning inventory, tactical plan, harvest activity spatial data			
<b>Implementation Requirements</b>	Assess cumulative harvest area (ha) by species group and planning unit during operating plan review and approval to ensure targets are not exceeded.			
<b>Strategy to Achieve</b>	Adhere to tactical plan. Ensure that annual planned harvest by planning units will not result in exceeding acceptable variance.			
<b>Monitoring and Reporting Schedule</b>	Annually by August 31 (5-year assessment cycle) – graph/table format. The first 5 years of the FMP (2019/20 - 2023/24) will be monitored against the original targets for this indicator. From 2023 to 2028-29), Mistik will use the new target numbers based on the selected model run from the amendment process. This will be completely			



Descriptor	Details
	independent of the first 5 years in the plan or the original targets (i.e., no carrying forward of “unused” area. Therefore, the next 5 years (2024-25 – 2028-29) will be based on half of the new 10-year target.
<b>Reporting Scale</b>	Planning Unit
<b>Rationale for Indicator</b>	One of the major factors associated with total delivered wood costs is the cost of transportation. If harvesting is focused on timber close to mills in the near term, future timber transportation costs may be significantly higher as haul distances increase. Maintaining a balanced haul distance, that reflects both short haul opportunities and longer hauls - based on the location of currently merchantable timber, is desirable in order to minimize sharp increases in timber costs over time.
<b>Rationale for Target and Variance</b>	Significant flexibility is required in achieving the target. A variety of factors - including salvage harvesting, market conditions, weather-constraints, road condition and maintenance, changes in community dynamics – can all conspire to modify predicted haul distance.

Criterion 6 – Society's Responsibility

Element 6.1 – Aboriginal & Treaty Rights

Value 6.1.1 – Aboriginal & Treaty Rights are Respected in regard to Planning and Implementing Forestry Activities

Objective 6.1.1.1 – To ensure that Aboriginal & Treaty Rights are respected in regard to Planning and Implementing Forestry Activities

### Mistik Indicator #23: Aboriginal community involvement in planning processes.

Descriptor	Details
<b>Target</b>	Provide a minimum of two opportunities annually for aboriginal communities to have input in Mistik's 20-Year Forest Management Plan processes and implementation. Provide notification to specific co-management/advisory boards annually if no harvesting is planned in their area. This would be used in the case where a group is inactive due to lack of forestry activity in their area and has chosen not to be in regular contact with Mistik/L&M.
<b>Acceptable Variance</b>	None
<b>Current Status</b>	The following established groups comprise the current co-management/advisory boards and represent communities within the indicated management unit on the Mistik FMP area: Divide Forest Advisory Council Corporation (MU 1) Pierceland/Goodsoil Public Advisory Group (MU 2, 12, 20) <sup>1</sup> Big Island Lake Cree Nation Chief and Council (MU 3) Waterhen Lake First Nation Chief and Council (MU 4) Beauval Co-management Board (MU 7) Canoe Lake Co-management Board (MU 8) Ile a la Crosse - ICS 4 (MU 9) Buffalo Narrows Mayor and Council (MU 10) Buffalo River Dene Nation Chief and Council (MU 11, 21) Birch Narrows First Nation (MU 21) <sup>2</sup>  1. Advisory group has currently voluntarily disbanded so Mistik holds an annual open house in this area. 2. The Turner Lake MU is no longer part of the Mistik FMA. Birch Narrows has requested that they remain involved with Mistik when there is forestry activity planned for their area. They also have a small area of reserve land adjacent to the community of Dillon.
<b>Most Recent Assessment</b>	August 2017
<b>Source of Measurement Data</b>	Records of meetings and meeting invitations/requests of previous operating year
<b>Implementation Requirements</b>	Maintain meeting minutes/notes and records pertaining to meeting invitations/requests.
<b>Strategy to Achieve</b>	Schedule opportunities for participation in planning process. Send letters annually for any inactive groups or groups where no harvest is planned in the upcoming OP for their area. Invite all identified groups to PAG meetings.
<b>Monitoring and Reporting Schedule</b>	Annually by August 31 – graph/table format.
<b>Reporting Scale</b>	FMP Area
<b>Rationale for Indicator</b>	Mistik/L&M is committed to a public consultation process that occurs on a regular basis as part of its annual operations planning and implementation. Specifically, Mistik/L&M facilitates representation from all 'within-FMP area' Aboriginal communities. These local co-management and advisory boards are





Descriptor	Details
	<p>usually comprised of representatives from various stakeholder groups. Membership on these boards is determined by local communities and interest groups. It is very important for all 'within-FMA area' Aboriginal communities to have the opportunity to be involved in a local co-management board process. The boards meet on a periodic basis (some more so than others). Mistik/L&amp;M staff attend each board meeting to which an invitation or notification is given.</p>
<b>Rationale for Target and Variance</b>	<p>Mistik/L&amp;M considers it very important for all 'within-FMP area' Aboriginal communities to have the opportunity to be involved in a local co-management/advisory board. Forestry-related consultation processes are defined, to a significant extent, by the local communities. The leadership in some communities choose not to interact with Mistik/L&amp;M. In these cases, periodic public 'open-houses' are held as a surrogate to the co-management board processes.</p> <p><b>Note: See Indicator #20 for details on Public Advisory Group (PAG) meetings - and Indicator #27 for stakeholder consultation. Both forums also provide the opportunity for aboriginal communities to be involved with FMP development and implementation.</b></p>



Criterion 6 – Society's Responsibility

Element 6.2 – Aboriginal Traditional Land Use and Forest Based Ecological Knowledge

Value 6.2.1 – Protection of Aboriginal Traditional Land Use and Forest Based Ecological Knowledge

Objective 6.2.1.1 – To avoid Impacting Culturally Important Sites

### Mistik Indicator #24: Spatial Identification and protection of culturally significant Heritage and Aboriginal sites

Descriptor	Details
<b>Target</b>	<p><b>On an annual basis, acquire and input into GIS 100% of all known locations of cultural, heritage or traditional Aboriginal forest values and develop operating plans that protect these known sites of heritage, cultural and Aboriginal forest values.</b></p> <p>Note: Mistik will keep a spatial dataset of known special places; however, due to confidentiality issues, specific details on type may not be available to the general public.</p>
<b>Acceptable Variance</b>	None
<b>Current Status</b>	See Special Places Map in 2016 Annual Report
<b>Most Recent Assessment</b>	2016 Annual Report
<b>Source of Measurement Data</b>	Traditional & Aboriginal forest values and uses database and map
<b>Implementation Requirements</b>	Maintain traditional Aboriginal forest values and uses database and map
<b>Strategy to Achieve</b>	Discuss heritage and Aboriginal value locations as part of co-management and consultation processes
<b>Monitoring and Reporting Schedule</b>	Annually by August 31 (5-year assessment cycle) – graph/table format.
<b>Reporting Scale</b>	FMP Area – include number of “new” sites
<b>Rationale for Indicator</b>	<p>Spatial identification of traditional Aboriginal forest values and uses is the first step in protection. Upon spatial identification of these values, operational plans can be created and implemented with confidence. Cabins, sweat-lodges, hunting, fishing, berry-picking, mushroom-picking, nature appreciation, medicinal-plant use, and wild rice harvesting are common ‘traditional forest use’ values and activities in the Mistik FMP area. Many of these ‘traditional use’ activities have developed, to some extent, into commercial or semi-industrial enterprises. In the recent past, significant industries have grown (and in some cases waned) around commercial freshwater fisheries, mink-ranching, blueberry picking, and guided outfitting for deer and bear. Recently, ecotourism has become a business opportunity for several northern communities. Wild rice harvesting has become the most significant non-timber forest use industry in the Mistik FMA area. A number of the small lakes and waterways in the Waterhen, Canoe Lake, Beauval, Ile-a-la Crosse, Buffalo Narrows and Dillon Management Units are actively seeded and harvested on an annual basis. Ongoing identification of sites and activities will be completed by soliciting input from staff, Ministry of Environment and advisory and co-management boards.</p>
<b>Rationale for Target and Variance</b>	Mistik/L&M considers it very important that all known traditional Aboriginal forest values are spatially identified and a level of protection implemented that is agreeable to affected Aboriginal forest users.

Criterion 6 – Society's Responsibility

Element 6.3 – Forest Community Well-being and Resilience

Value 6.3.1 – Sustainable Forest Communities

Objective 6.3.1.1 – To Contribute of the Resiliency of Communities

### Mistik Indicator #26a: Contributions to Co-management Boards

Descriptor	Details
<b>Target</b>	<b>On an annual basis, contribute financially to co-management boards according to the terms and conditions of the co-management agreement.</b>
<b>Acceptable Variance</b>	20% of the 5-year target based on the terms of the agreement
<b>Current Status</b>	Co-management contributions in 2016: \$217,135.
<b>Most Recent Assessment</b>	August 2017
<b>Source of Measurement Data</b>	Mistik's year-end financial statements for previous operating year
<b>Implementation Requirements</b>	Assess Mistik's year-end financial statements to ensure compliance with the terms of the co-management agreement.
<b>Strategy to Achieve</b>	Comply with terms of co-management agreement; make payments accurately and on time.
<b>Monitoring and Reporting Schedule</b>	Annually by August 31 (5-year assessment cycle) – graph/table format.
<b>Reporting Scale</b>	FMP Area – overall contribution under the terms of the co-management agreement & any variances
<b>Rationale for Indicator</b>	Distribution of forestry-related socio-economic benefits occurs through a variety of means. Most economic benefits flow back to local communities through employment or contract-related activities. A unique approach that Mistik has taken to contribute economic benefits back to local communities is to pay to co-management boards a minimum fee for hardwood and softwood harvested within each community forest (management unit) associated with each local co-management board (the actual fee paid is determined by current market product prices). These funds are 'unfettered' in that they can be used for whatever purpose the co-management board deems worthy. There are currently seven co-management boards benefiting from these payments.
<b>Rationale for Target and Variance</b>	Mistik's co-management fee payments are directly linked to total timber volume harvested. Total timber volume harvested may vary for a number of reasons - market conditions, etc.



Criterion 6 – Society's Responsibility  
Element 6.3 – Forest Community Well-being and Resilience  
Value 6.3.1 – Sustainable Forest Communities  
Objective 6.3.1.1 – To Contribute of the Resiliency of Communities

### Mistik Indicator #26b: % of total annual vendor / contractor payments made to local businesses

Descriptor	Details
<b>Target</b>	<b>On an annual basis, 60% of total annual vendor/contractor payments made by Mistik &amp; L&amp;M will be to businesses from local communities in, and adjacent to, the FMA area.</b>
<b>Acceptable Variance</b>	20%
<b>Current Status</b>	2016: 55% of annual payments to local businesses.
<b>Most Recent Assessment</b>	August 2017
<b>Source of Measurement Data</b>	L&M accounting records and Mistik Logging Information Management System (LIMS) data from previous year. Local businesses are from the following communities: Michel Village, St. Georges Hill, Dillon, Buffalo Narrows, Canoe Lake, Jan's Bay, Cole Bay, Beauval, Ile-a-la Crosse, Waterhen, Meadow Lake, Glaslyn (L&M), and Spiritwood (L&M).
<b>Implementation Requirements</b>	Assess L&M accounting records and Mistik Logging Information Management System (LIMS) data
<b>Strategy to Achieve</b>	Source materials from local vendors whenever possible/feasible, hire local contractors where possible
<b>Monitoring and Reporting Schedule</b>	Annually by August 31 (5-year assessment cycle) – graph/table format.
<b>Reporting Scale</b>	FMA Areas (Mistik/L&M) – overall percentage by company
<b>Rationale for Indicator</b>	Communities within/adjacent to, the Mistik & LM FMA areas place high value on local sources of income. This indicator provides a measure of the commitments to facilitating equitable distribution of economic benefits. This is done by working with co-management boards in developing a stable, local contractor workforce. The workforce opportunity is proportional to the harvest level associated with each co-management board's community forest area (management unit).
<b>Rationale for Target and Variance</b>	High rates of unemployment plague a number of communities within the Mistik FMP areas. Mistik/L&M are committed to maintaining an equitable distribution of income opportunities and are choosing to 'set the bar' at 60%. Individual contractors may change (and places of residence) but the % of total payments delivered to local communities will likely remain relatively static.



Criterion 6 – Society's Responsibility

Element 6.3 – Forest Community Well-being and Resilience

Value 6.3.1 – Sustainable Forest Communities

Objective 6.3.1.1 – To Contribute of the Resiliency of Communities

### Mistik Indicator #26c: Percent of 'within-FMA area' communities represented in the workforce

Descriptor	Details
<b>Target</b>	<b>100% of 'within-FMA area' communities shall be represented in the L&amp;M and Mistik-related workforce.</b>
<b>Acceptable Variance</b>	20%
<b>Current Status</b>	2016: 100% of within-FMA area communities represented in Mistik's workforce
<b>Most Recent Assessment</b>	August 2017
<b>Source of Measurement Data</b>	L&M contractor payroll records and Mistik Logging Information Management System (LIMS) data from previous year. Local businesses are from the following communities: Michel Village, St. Georges Hill, Dillon, Buffalo Narrows, Canoe Lake, Jan's Bay, Cole Bay, Beauval, Ile-a-la Crosse, Waterhen, Meadow Lake, Glaslyn (L&M), and Spiritwood (L&M).
<b>Implementation Requirements</b>	Maintain L&M accounting records and Mistik Logging Information Management System (LIMS) data and information derived from supervisory staff related to contractor place of residence
<b>Strategy to Achieve</b>	Work with local communities represented in the FMP area workforce to identify qualified persons/ contractors
<b>Monitoring and Reporting Schedule</b>	Annually by August 31 (5-year assessment cycle) – graph/table format.
<b>Reporting Scale</b>	FMA Areas (Mistik/L&M) – overall percentage by company
<b>Rationale for Indicator</b>	Communities within, and adjacent to, the Mistik FMP area place high value on local employment. This indicator provides a measure of the commitment to facilitating equitable distribution of employment benefits. This is done by working with co-management boards in developing a stable, local contractor workforce. The workforce opportunity is proportional to the harvest level associated with each co-management board's community forest area. Sustainable harvest levels are assessed for each management unit and the workforce is developed around the available work.
<b>Rationale for Target and Variance</b>	Mistik & L&M are committed to maintaining an equitable distribution of employment opportunities by choosing to 'set the bar' at 100%. However, at any given time, representation may be lower due to low work volume to contractor ratios. If contractors are not committed to fulfilling their work obligations, their share of the contract work may go to another individual from another community.

Criterion 6 – Society's Responsibility

Element 6.4 – Fair and Effective Decision Making

Value 6.4.1 – Involvement of Stakeholders in FMP Development and Implementation

Objective 6.4.1.1 – Improve the Engagement and Information Sharing of Stakeholders in FMP Development and Implementation

### Mistik Indicator #27: Stakeholder Engagement.

Descriptor	Details
<b>Target</b>	Engage annually with 100% of known "within-FMP area" stakeholders in areas where harvesting is proposed for the upcoming operating year. The engagement process will include notifying the stakeholder of Mistik/L&M plans to operate in their area and provide the opportunity for the individual to have input in planning process.
<b>Acceptable Variance</b>	None
<b>Current Status</b>	100% of known stakeholders received letters (2016 annual report)
<b>Most Recent Assessment</b>	August 2017
<b>Source of Measurement Data</b>	Operating plan records
<b>Implementation Requirements</b>	Stakeholder database with current information
<b>Strategy to Achieve</b>	Maintain database with current contact information for known stakeholders. Send letters during OP development.
<b>Monitoring and Reporting Schedule</b>	Annually by August 31 – graph/table format.
<b>Reporting Scale</b>	FMP Area – number of known stakeholders from areas proposed for harvest vs. number of letters sent.
<b>Rationale for Indicator</b>	To encourage and facilitate detailed involvement and input from within FMA area stakeholders into Mistik's 20-Year Forest Management Plan processes and implementation
<b>Rationale for Target and Variance</b>	Mistik/L&M consider it very important for other stakeholders on the landbase to be involved in the 20-Year Forest Management Plan processes. Mistik/L&M will respond to 100% of requests for information, input into operating plans, and meetings with stakeholders. <b>Note: See Mistik Indicator #20 for details on Public Advisory Group (PAG) meetings - and Indicator #23 for Aboriginal/Co-management board meetings. Both forums also provide the opportunity for stakeholders to be involved with FMP development and implementation.</b>





## 9. APPENDIX E: SILVICULTURE GROUND RULES

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### 2019 FOREST MANAGEMENT PLAN – VOLUME II SILVICULTURE GROUND RULES

**(AMENDED April 2023)**

for the

**Mistik and L&M Forest Management Agreement (FMA) Areas**



**For the 20-year period from April 1, 2019 to March 31, 2039**

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## Changes Since Previous Submission

This document was previously submitted to Saskatchewan Ministry of Environment on December 5, 2017. The only changes from the version submitted on that date to this current and final version are listed below.

Section	Page	Change Date	Change
N/A	N/A	2019	Headers (changed to "2019 Silviculture Ground Rules")
N/A	ii	2019	Changed date: April 1, 2019 to March 31, 2039
N/A	iii	2019	Removed sign-off sheet and added this description of changes
N/A	N/A	2019	Footers (changed to dates)
1	1	2019	Corrected SGR #8 label. Changed from HS-tA to H-tA
N/A	N/A	2019	Removed the old Section 10 (FTG Surveys) as it no longer applies with the new standard.
14	307	2023	<p>The methods used to forecast the expected rotation-age SGR forest type from FTG surveys (Table 9-11) have been updated to address aerial FTG surveys rather than ground-based performance surveys and establishment surveys. The objective and usage of these forecasts within the SGRs remains the same (i.e., to verify that the stand transition assumptions used in the Forest Estate Modelling are being met). This change was performed due to all performance surveys being completed as aerial surveys rather than ground-based surveys, and these surveys contain no individual plots within a surveyed area from which stocking, plot density, etc. can be determined as per the previous SGR forecast method. No changes to the Forest Estate Modelling are required, as these methods are used only to verify that transition assumptions used in the modelling are being met, and there are no changes to these assumptions themselves. The best available information is used in order to forecast the expected rotation-age SGR forest type as accurately as possible.</p> <p>Succession matrices were based on those developed by Lane Gelhorn (Timberline Natural Resource Group, 2009)<sup>45</sup> for the Saskatchewan Ministry of Environment, as this was considered the most accurate model available to generate predicted successional trajectories for aerial FTG surveys on Mistik's FMA. This model utilized 69 restocked mixedwood harvest openings in the Mistik FMA to model future stand conditions in the Mixedwood Growth Model (MGM), an individual-tree growth model developed at the University of Alberta. Matrices used were based on Mistik's minimum operable ages in order to ensure alignment with Mistik's current operational practices. In the long-term, the creation of a more refined model of future stand condition, using a wider range of monitoring data in Mistik's FMA, will be explored to potentially produce a model that can more accurately predict future SGR classes for surveyed areas.</p>

<sup>45</sup>Gelhorn, L. 2009. *Development of a Regenerating Mixedwood Succession Matrix*. Timberline Natural Resource Group Ltd., Prince Albert, Saskatchewan, Canada.



## 9.1. IDENTIFICATION OF SILVICULTURE GROUND RULE (SGR) FOREST TYPES

Based on assessment of provincial forest type designations, Mistik forest development types (created for volume estimation, yield curves and wood supply analysis) and operational/silvicultural considerations, Mistik has identified eight broad forest types (Table 9-1) that will be used for assessing forest renewal success and associated successional transitions.

Table 9-1 Forest Type<sup>46</sup>, Yield Curve Linkage, And Current Area

Silviculture Ground Rule (SGR) Forest Type	Forest Development Type (Yield Curve)	Current Area (ha)	Current Area (%)
#1 (S-wS)	#1 S-wS-A-A	23,015	3%
#2 (S-bS)	#2 S-bS-A-A	34,579	4%
#3 (S-jP)	#3 S-jP-LD-A-1	94,565	11%
	#4 S-jP-LD-A-2	29,871	3%
	#5 S-jP-HD-A-1	101,108	12%
	#6 S-jP-HD-A-2	57,705	7%
	#7 S-jP-L&M	17,962	2%
#4 (SH-jP/tA)	#8 SH-jP-A-A	54,045	6%
#5 (SH-wS/tA)	#9 SH-wS-A-A	51,773	6%
#6 (HS-tA/wS)	#10 HS-wS-A-A	54,378	6%
#7 (HS-tA/jP)	#11 HS-jP-A-A	42,185	5%
#8 (H-tA)	#12 H-A-LD-A-1	17,195	2%
	#13 H-A-LD-A-2	28,607	3%
	#14 H-A-HD-A-1	64,239	7%
	#15 H-A-HD-A-2	128,017	15%
	#16 H(S)-A-LD-A	31,105	4%
	#17 H(S)-A-HD-A	48,163	5%
Total		878,512	100%

<sup>46</sup> Forests change with time. Mixedwood forests invariably commence as hardwood-dominated stands. Successional changes and other environmental influences result in subtle shifts in species composition with time. The SGR forest types identified in Table 1-1 identify the species composition of stands near rotation age ( $\geq 70$  yrs of age).





## 9.2. DISCUSSION OF SGR FOREST TYPES WITH LOW CERTAINTY OF FUTURE GROWTH PATTERNS

Several of the forest types identified in Table 9 1 can exhibit highly variable growth patterns and successional characteristics. The mixedwood forest types (e.g., #s 4, 5, 6, and 7 in Table 1 1) have been identified as having low certainty with respect to future softwood growth . One of the significant challenges of boreal forestry is forecasting future characteristics of harvested mixedwood stands including transition assumptions, individual tree and stand growth trajectories, successional processes and rotation- age stand characteristics. Boreal forest types, particularly mixedwoods, can exhibit a high degree of variability due to soils and a variety of other biotic and abiotic factors influencing stands from initiation through to maturity and old age (i.e., Senecal et al. 2004 ). In undertaking its' forest renewal obligations,

Mistik accepts the inherent heterogeneity of natural boreal forest stands and attempts to manage the harvested areas within its forest management agreement (FMA) area on the basis of maintaining natural forest stand dynamics. Mistik prefers to let natural successional dynamics prevail (which requires time) in achieving final softwood (SGR forest types 1, 2 and 3), mixedwood (SGR forest types 4, 5, 6, and 7) and hardwood (SGR forest type 8) forest types at maturity. A common, alternative management strategy is to attempt to create final stand outcomes at juvenile stages of stand development through the use of various stand tending options (mechanical, manual, chemical).

The following documentation provides a brief review of some of the forest science literature pertaining to the maintenance of the natural productivity and yield of intimate mixtures of both softwood and hardwood species within a boreal mixedwood context.



### 9.3. MIXEDWOOD ESTABLISHMENT

Johnstone *et al.* 2004<sup>47</sup> observed a large recruitment pulse of white spruce immediately post-fire. The authors observed that the early post-fire species cohorts usually dominated the canopies of mature stands – early establishment patterns are likely strongly suggestive of future stand development. In similar studies, Purdy *et al.* 2002<sup>48</sup> and Peters *et al.* 2002<sup>49</sup> and 2005<sup>50</sup> comment that the establishment of white spruce in mixedwood stands immediately post-fire appears to be a key process in boreal mixedwood succession. Other research (Kabzems and Garcia 2004<sup>51</sup>, Lieffers pers. comm.) has found evidence of significant delay in white spruce recruitment over extended periods of time. A detailed study by Peters *et al.* 2006<sup>52</sup>, comparing initial versus delayed white spruce regeneration in boreal mixedwoods, showed that delayed white spruce regeneration in fire-origin boreal mixedwood stands occurred up to 45 yrs of age. The authors found two ‘pulses’ of white spruce regeneration – between 0 to 5 years and between 35 to 45 years. The study found that overall there was a relatively even distribution of white spruce regeneration between these two time periods. The authors surmise that even-aged mixedwood stands can be expected to develop if there is strong initial white spruce recruitment.

#### Management Implications

- In managing for mixedwood sites- ‘incoculate’ (i.e., plant) the site with softwood immediately post-harvest.

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<sup>47</sup> Johnstone, J.F., F.S. Chapin III, J. Foote, S. Kemmet, K. Price and L. Viereck. 2004. Decadal observations of tree regeneration following fire in boreal forests. *Can. J. For. Res.* 34: 267-273.

<sup>48</sup> Purdy, B.G., S.E. Macdonald and M.R.T. Dale. 2002. The regeneration niche of white spruce following fire in the mixedwood boreal forest. *Silva Fennica* 36(1): 289-306.

<sup>49</sup> Peters, S.V., S. Macdonald and M.R.T. Dale. 2002. Aging discrepancies of white spruce affect the interpretation of static age structure in boreal mixedwoods. *Can. J. For. Res.* 32: 1496-1501.

<sup>50</sup> Peters, S.V., S. Macdonald and M.R.T. Dale. 2005. The interaction between masting and fire is key to white spruce regeneration. *Ecology*: Vol. 86, No. 7, pp. 1744–1750.

<sup>51</sup> Kabzems, R. and O. Garcia. 2004. Structure and dynamics of trembling aspen – white spruce mixed stands near Ft. Nelson, B.C. *Can. J. For. Res.* 34: 384-395.

<sup>52</sup> Peters, S.V., S.E. Macdonald and M.R.T. Dale. 2006. Patterns of initial versus delayed regeneration of white spruce in boreal mixedwood succession. *Can. J. For. Res.* 36: 1597-1609.



## 9.4. STOCKING (SPATIAL DISTRIBUTION) AND DENSITY

In modeled outcomes of white spruce stocking, Feng *et al.* 2005<sup>53</sup> found that for any level of site index, ~ 30% to 40% stocking was the lower threshold to achieve full volume in maturing mixedwood stands. The authors also found that at any site index, maximum softwood volume was achieved at ~ 700 sph. The authors also noted that within their study area there was a high degree of ingress of natural-origin spruce within the planted spruce areas. Greene *et al.* 2002<sup>54</sup> modeled the likelihood of success of various silvicultural alternatives for conifer regeneration in boreal mixed wood stands. The authors strongly endorse underplanting mature aspen stands with white spruce (essentially artificial establishment of an advanced regeneration component) prior to harvest as a preferred silvicultural approach.

### Management Implications

- Moderate stocking and density levels of white spruce result in reasonable softwood volume yields at maturity;
- If there are adjacent stands of mature white spruce – expect some natural ingress of white spruce into the harvested area over time;
- Softwood establishment and stocking to create mixedwood conditions can be achieved in a variety of ways.

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<sup>53</sup> Feng, Z., K.J. Stadt and V.J. Lieffers. 2005. Linking juvenile white spruce density, dispersion, stocking and mortality to future yield. *Can. J. For. Res* (submitted for publication). 32 pp.

<sup>54</sup> Greene, D.F., D.D. Kneeshaw, C. Messier, F. Lieffers, D. Cormier, R. Doucet, K.D. Coates, A. Groot, G. Grover and C. Calogeropoulos. 2002. Modelling silvicultural alternatives for conifer regeneration in boreal mixedwood stands (aspen/white spruce/balsam fir). *For. Chron.* Vol. 78(2). March/April: 281-295.





## 9.5. MORTALITY (TREE DEATH)

Johnstone *et al.* 2004<sup>55</sup> observed that post-fire aspen density peaked at year 10 and then commenced to decline. Self-thinning rates of aspen were significantly correlated with initial aspen densities. The highest mortality occurred in aspen stands with the greatest initial densities. Many mixedwood forest researchers and practitioners have found that aspen densities peak in years one or two post-disturbance<sup>56</sup>. Feng *et al.* 2006<sup>57</sup> found that juvenile (7 to 23 yrs) mortality of white spruce ranged from 0.1% to 0.8% mortality. The authors conclude that 0.7% per year mortality is likely a reasonable estimate for rotation length predictions for planted white spruce. The authors found that mortality in spruce was increased by taller, neighboring spruce. Spruce mortality was reduced when associated with aspen – even with aspen densities up to 35,000 sph. Senecal *et al.* 2004<sup>58</sup> found that canopy position had a significant impact on aspen mortality but not for white spruce. For example, suppressed and codominant aspen had much higher mortality than spruce for a given height class. Aspen also tended to die at a younger age (40 to 60 yrs) than spruce (110 to 150 yrs). Lee *et al.* 1995<sup>59</sup> found that overall canopy tree density decreased with stand age and that aspen density decreased exponentially in relation to stand age. However, canopy white spruce density increased with stand age. Frey *et al.* 2003<sup>60</sup> found that initial juvenile aspen densities, across a broad range of densities, generally converge to a common density. In a long term, well-maintained white spruce provenance trial in Ontario, Morgenstern *et al.* 2006<sup>61</sup> reported that mortality of white spruce in the provenance trial, over 44 years, ranged from 0.4% to 0.6% per year. Kabzems *et al.* 1986<sup>62</sup> generalize the succession of boreal mixedwoods in Saskatchewan in the following terms:

- Immediate recruitment of white spruce post-disturbance;
- 15 to 17 years for spruce to reach a height of 1.4 m with an aspen overstorey of ~ 9 to 10 m in height;
- 50 to 60 years of stand dynamics occurs;
- At 70 to 80 years some of the white spruce become co-dominant with the aspen;
- At 100 to 110 years, the co-dominant white spruce become dominant in the stand (black spruce, jack pine and balsam fir often co-mingled with the aspen and white spruce);
- Only a small percentage of initial softwood cohorts reach saw timber proportions.

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<sup>55</sup> Johnstone, J.F., F.S. Chapin III, J. Foote, S. Kemmet, K. Price and L. Viereck. Decadal observations of tree regeneration following fire in boreal forests. *Can. J. For. Res.* 34: 267-273.

<sup>56</sup> i.e., pers. comm. with Gitte Grover (Alberta-Pacific) and Vic Lieffers (University of Alberta).

<sup>57</sup> Feng, Z. K.J. Stadt and V.J. Lieffers. 2006. Linking juvenile white spruce density, dispersion, stocking and mortality to future yield. *Can. J. For. Res.* (in press). 32 pp.

<sup>58</sup> Senecal, D., D. Kneeshaw and C. Messier. 2004. Temporal, spatial and structural patterns of adult trembling aspen and white spruce mortality in Quebec's boreal forest. *Can. J. For. Res.* 34: 396-404.

<sup>59</sup> Lee, P.C., S. Crites and J.B. Stelfox. Changes in forest structure and floral composition in a chronosequence of aspen mixedwood stands in Alberta. In Stelfox, J.B. (editor) 1995. *Relationships between stand age, stand structure, and biodiversity in aspen mixedwood forests in Alberta*. Jointly published by Alberta Environmental Centre (AECV95-R1), Vegreville, AB, and Canadian Forest Service (Project # 0001A), Edmonton, AB. 308 pp.

<sup>60</sup> Frey, B.R., V.J. Lieffers, S.M. Landhauesser, P.G. Comeau and K.J. Greenway. 2003. An analysis of sucker regeneration of trembling aspen. *Can. J. For. Res.* 33: 1169-1179.

<sup>61</sup> Morgenstern, K., S. D'Eon and M. Penner. 2006. White spruce growth to age 44 in a provenance test at the Petawawa Research Forest. *For. Chron.* Vol. 82(4): 572-578.

<sup>62</sup> Kabzems, A., A.L. Kosowan and W.C. Harris. 1986. Mixedwood section in an ecological perspective. Technical Bulletin #8. 2<sup>nd</sup> Edition. Canada-Saskatchewan Forest Resource Development Agreement. 122 pp.



Based on the results of a modeling study conducted in Mistik Management Ltd.'s Forest Management Agreement area in Saskatchewan, Welham *et al.* 2002<sup>63</sup> conclude that a two-entry harvest system would likely maximize harvest volume within mixedwood stands. A two-entry harvest regime potentially captures aspen mortality and maximizes spruce growth and sawlog volume.

### Management Implications

- Mortality rates for planted white spruce are relatively low – ensure levels of initial stocking and density at stand establishment are adequate to allow for natural mortality rates to occur and result in target stocking and yield at maturity;
- Once established, white spruce is a highly-persistent species – focus renewal activities on maximizing survival and early growth of white spruce;
- Aspen density and proportion of aspen crown decreases and spruce slowly ‘trades places’ with aspen in the canopy over time in a natural successional process;
- Manage mixedwoods on longer rotations to allow for a variety of mixedwood stand attributes to develop;
- Consider utilizing ‘multiple entry’ harvesting regimes<sup>64</sup> to maximize aspen harvest volume and softwood piece size.

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<sup>63</sup> Welham, C., B. Seely and J. Kimmins. 2002. *The utility of the two-pass harvesting system in Saskatchewan mixedwoods: An analysis using the ecosystem simulation model FORECAST.* Can. J. For. Res. 32: 1071-1079.

<sup>64</sup> There are forestry researchers and practitioners who espouse multiple harvest entries into mixedwood stands to maximize harvest volumes. Although Mistik has conducted research and undertaken field trials of multiple harvest regimes in mixedwoods, Mistik does not undertake this approach on an operational basis at the present time. Mistik's current approach to managing for mixedwoods will allow for a variety of harvest options to be exercised in the future.



## 9.6. LIGHT LEVELS

In measurements from a range of natural, aspen-dominated boreal forest stands, Lieffers and Stadt 1994<sup>65</sup> found that hardwood overstories transmit between 14% and 40% incoming light allowing for acceptable rates of growth of white spruce saplings. The authors reported that average annual height increment of white spruce increased five-fold from 14% to 40% incoming light. 40% ambient light conditions resulted in white spruce growth approximately equivalent to 100% light conditions. In a similar study, Lieffers *et al.* 2002<sup>66</sup> modeled the impact of light levels on white spruce growth in mixedwood stands. The time of lowest light levels (referred to by the authors as the 'light bottleneck') in aspen stands is between 15 to 25 yrs. of age. Light transmission increased after 25 yrs. of age. Constabel and Lieffers 1996<sup>67</sup> found that old aspen stands had higher light transmission (32% of above canopy light) than young aspen stands (19% of above canopy light). The authors observed that seasonal changes in light transmission (spring and fall leaf-off periods) likely have an important role in adding additional periods of photosynthesis for understory evergreen tree species. Man and Lieffers (1997)<sup>68</sup> found that understory white spruce became photosynthetically active by early April and remained active until late October. The results of this study demonstrate that spring and autumn are important periods for photosynthesis for white spruce seedlings and that the species takes advantage of seasonal leaf-off conditions of the overstorey hardwood.

### Management Implications

- White spruce can tolerate relatively low light conditions and grows moderately to well in a range of light conditions – white spruce does not have to be 'open grown' in order to achieve its growth potential.
- Light levels beneath an aspen-dominated canopy are at a minimum early in stand development (i.e., around the FTG assessment period). Light conditions improve thereafter. Spruce growth conditions (in terms of light availability) are most limiting early in stand development and improve with time. Softwood tree growth attributes under an aspen canopy are likely at a minimum at the FTG assessment (due to low light conditions). There is a high likelihood that future softwood growth attributes will continue at the same rate, or increase, due to increasing light conditions.

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<sup>65</sup> Lieffers, V.J. and K. Stadt. 1994. Growth of understory *Picea glauca*, *Calamagrostis canadensis* and *Epilobium angustifolium* in relation to overstorey light transmission. *Can. J. For. Res.* 24(6): 1193-1198.

<sup>66</sup> Lieffers, V.J., B.D. Pinno and K.J. Stadt. 2002. Light dynamics and free-to-grow standards in aspen-dominated mixedwood forests. *For. Chron.* Vol. 78(1). January/February. 137-145.

<sup>67</sup> Constabel, A.J. and V.J. Lieffers. 1996. Seasonal patterns of light transmission through boreal mixedwood canopies. *Can. J. For. Res.* 26: 1008-1014.

<sup>68</sup> Man, R. and V.J. Lieffers. 1997. Seasonal variations of photosynthetic capacities of white spruce (*Picea glauca*) and jack pine (*Pinus banksiana*) saplings. *Can. J. Bot.* 75: 1766-1771.





## 9.7. HEIGHT AND DIAMETER GROWTH

Feng *et al.* 2006<sup>69</sup> found that mortality of white spruce trees was not linked to height – short trees survive as well as tall trees. In a retrospective study of natural, mature mixedwood stands, Kabzems and Garcia 2004<sup>70</sup> found that upon reaching 1.3 m height, understory white spruce growth rates were similar across all sites - exhibiting growth rates of 0.2 to 0.3 m per year. In a well-maintained white spruce provenance trial in eastern Canada, which likely represents the ‘top end’ of spruce growth potential (open-grown with no overstorey aspen), Morgenstern *et al.* 2006<sup>71</sup> report that height growth increment ranged between 0.16 to 0.22 m per year in the first 15 years (for a total height of 2.51 m to 3.35 m total height) and 0.34 to 1.40 m (14.8 m to 17.4 m total height) per year over 44 years. In a retrospective study of understory spruce growth, Lieffers *et al.* 1996<sup>72</sup>, found that seedlings recruited more than 20 years after disturbance had reduced initial height growth compared to seedlings recruited earlier. The authors of the study noted a marked increase in height increment as total tree height increased. Maximum growth rates of ~ 0.3 m per year were attained when understory white spruce trees were taller than 2.3 m height. It was noted that height growth rates for understory spruce trees were comparable to growth rates of similar size and age from clearcut sites. The authors concluded that the understory spruce in their study would likely exceed a height of 25 m in 100 years. Regeneration survey data analyses from Alberta (Lieffers *et al.* 2007<sup>73</sup>) and Saskatchewan (Mistik Management Ltd. 2006<sup>74</sup>) show little, if any, relationship between softwood height, softwood height increment, and aspen density. The analyses showed that current overall height was strongly correlated to current height increment – increasing overall height was associated with increased growth increment. The Lieffers *et al.* 2007 study also indicated that current softwood tree height is an excellent predictor of future height. Bokalo *et al.* 2003<sup>75</sup> found that overall height and height increment were not affected by increasing aspen densities but that diameter growth of white spruce was significantly reduced and height to diameter ratio was increased at increasing levels of aspen density. Bokalo *et al.* 2003 reported that a height to diameter ratio of over 60 may be indicative of competitive stress. However, Morgenstern *et al.* 2006<sup>76</sup> reported height to diameter (DBH) ratios for 44-year-old white spruce, grown in a well-tended and spaced provenance trial, of between 70 to 83. A recent study of an alternative ‘tree-based’ free-to-grow assessment commissioned by Alberta-Pacific Forest Industries Inc. (2006<sup>77</sup>) concluded that for jack pine:

- A height to diameter ratio of 1.1 or less and achieving a height of 1.5 m by year six was a reasonable indicator of free to grow for jack pine.

<sup>69</sup> Feng, Z. K.J. Stadt and V.J. Lieffers. 2006. *Linking juvenile white spruce density, dispersion, stocking and mortality to future yield.* Can. J. For. Res. (in press). 32 pp.

<sup>70</sup> Kabzems, R. and O. Garcia. 2004. *Structure and dynamics of trembling aspen – white spruce mixed stands near Ft. Nelson,* B.C. Can. J. For. Res. 34: 384-395.

<sup>71</sup> Morgenstern, K., S. D'Eon and M. Penner. 2006. *White spruce growth to age 44 in a provenance test at the Petawawa Research Forest.* For. Chron. Vol. 82(4): 572-578.

<sup>72</sup> Lieffers, V.J., K.J. Stadt and S. Navratil. 1996. *Age structure and growth of understory white spruce under aspen.* Can. J. For. Res. 26: 1002-1007.

<sup>73</sup> Lieffers, V.J., K.J. Stadt and Z. Feng. 2007. *Free-to-grow regeneration standards are poorly linked to future growth of spruce in boreal mixedwoods.* For. Chron. Vol. 83(6): 818-824.

<sup>74</sup> Mistik Management Ltd. 2014. *Analysis of eighteen free-to-grow mixedwood harvest blocks (14 years post-harvest)*

<sup>75</sup> Bokala, M., P.G. Comeau and S.J. Titus. 2003. *Early development of mixed stands of aspen and spruce: ten years of the Western Boreal Growth and Yield Association long term study.* Can. J. For. Res. (submitted for publication). 35 pp.

<sup>76</sup> Morgenstern, K., S. D'Eon and M. Penner. 2006. *White spruce growth to age 44 in a provenance test at the Petawawa Research Forest.* For. Chron. Vol. 82(4): 572-578.

<sup>77</sup> The Forestry Corp. 2006. *Height to diameter ratio: An assessment of competitive status for white spruce and jack pine.* Prepared for Alberta-Pacific Forest Industries Inc. (G. Grover). Edmonton, Alberta. 25 pp.



For white spruce, the authors of the study concluded that:

- height to diameter ratio does not distinguish between suppressed and non-suppressed white spruce trees;
- A simple height-age indicator was the most useful measure of future success – white spruce trees that reached 1.5 m by 13 years were most likely to be non-suppressed trees in the mature stand;
- Non-suppressed white spruce trees generally exhibited an average annual height increment of 0.2 m per year.

In a study undertaken by Navratil (2000)<sup>78</sup> (commissioned by Mistik Management Ltd.), juvenile spruce growth attributes (survival, height, height increment, diameter, etc.), were measured in a number of regenerating, post-harvest mixedwood sites in Alberta. Navratil's general observations included:

- White spruce survival was highly-varied at low aspen densities;
- Some of the worst spruce growth observed was in open-grown conditions;
- Some of the highest survival of white spruce was in very high aspen densities (> 25,000 sph);
- Spruce height and increment varied widely within a narrow range of aspen density;
- Spruce height and increment were consistently very negatively impacted by very high aspen densities – however, growth reduction versus aspen density was significantly confounded with other onsite factors (water table level);
- Reduced forest health (leader weevil impact, frost damage) was always associated with low aspen densities;
- Other site factors such as grass, shrubs, soil compaction and soil moisture conditions appeared to influence spruce growth far more profoundly than hardwood densities.

Juvenile white spruce growth across all the sites was so varied that the author concluded:

*'My observations are that there are many factors affecting spruce growth – most of them hidden and unquantifiable – the variability and unpredictability of these factors and their strong influence on survival and growth makes any intensive aspen control prescriptions for spruce plantations extremely difficult and erratic.'*

### Management Implications

- White spruce exhibits inherently slow or conservative growth rates. Over the longer term, the average rate of growth (growth increment) of white spruce is generally consistent (0.16 m to 0.40 m) across a broad range of hardwood overstorey densities – when managing for natural stand yields, minimize silvicultural treatments that attempt to 'speed up' softwood tree growth;
- Growth rates (growth increment) of white spruce tend to increase proportionately with overall height – the bigger the white spruce tree gets the faster it grows. Growth attributes measured at the FTG

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<sup>78</sup> Navratil, S. 2000. Strategies for the renewal phase of aspen-white spruce types. Prepared for Mistik Management Ltd. by Silfor Consulting, Hinton, Alberta. 61 pp.



assessment likely represent a lower threshold for softwood tree growth - there is a high likelihood that future softwood growth attributes will continue at the same rate or increase as the trees grow taller;

- White spruce growth is strongly influenced by site factors other than aspen density – minimize silvicultural treatments that attempt to ‘fix’ aspen densities alone when there are likely other site factors that may be exerting a more profound effect on softwood tree growth;
- An overall softwood tree height of between 1.3 to 2.3 m appears to represent a minimum threshold for consistent height growth increment of 0.2 to 0.3 m per year – this range in height is likely an important benchmark for FTG designation;
- Early diameter growth, or height to diameter ratios, of softwood trees (particularly white spruce) may not be useful indicators of tree vigor – softwood trees growing in a variety of natural stand conditions, and seral stages, typically exhibit height to diameter ratios exceeding ‘60.





## 9.8. PRODUCTIVITY

Marsden *et al.* 1996<sup>79</sup> show evidence of a ‘nurse crop’ effect of aspen on white spruce seedling establishment and growth due to reductions in ambient humidity fluctuations. Man and Lieffers 1999<sup>80</sup> show evidence that mixtures of white spruce and aspen are likely more productive than single species stands under certain conditions. Macpherson *et al.* 2001<sup>81</sup> found increased total productivity in mixedwood white spruce / aspen stands versus pure aspen stands in relation to measures of basal area, biomass and periodic annual increment. Similarly, Legare *et al.* 2004<sup>82</sup> reported a positive influence of aspen on stand biomass and diameter growth of black spruce within a range of hardwood abundance (up to proportions of 41% basal area).

### Management Implications

- Managing for mixedwoods may result in greater overall yield (biomass).

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<sup>79</sup> Marsden, B.J., V.J. Lieffers and J.J. Zwiazek. 1996. The effect of humidity on photosynthesis and water relations of white spruce seedlings during the early establishment phase. *Can. J. For. Res.* 26: 1015-1021.

<sup>80</sup> Man, R. and V.J. Lieffers. 1999. Are mixtures of aspen and white spruce more productive than single species stands? *For. Chron.* Vol. 75(3). May/June: 505-513.

<sup>81</sup> MacPherson, D., V.J. Lieffers and P.V. Blenis. 2001. Productivity of aspens stands with and without spruce understory in Alberta's boreal mixedwood forests. *For. Chron.* 77(2): 231-356.

<sup>82</sup> Legare, S., D. Pare and Y. Bergeron. 2004. The responses of black spruce growth to an increased proportion of aspen in mixed stands. *Can. J. For. Res.* 34: 405-416.



## 9.9. MANUAL, MECHANICAL, CHEMICAL TENDING OF HARDWOOD AND ASSOCIATED IMPACTS

A number of studies have shown significant growth-enhancing outcomes of various vegetation control treatments on crop tree yield<sup>83</sup>. Of particular interest in a boreal mixedwood context is the joint production of both softwood and hardwood yield in intimate mixture. Man *et al.*<sup>84</sup> undertook a study of the effects of both woody and herbaceous competition on young white spruce. The authors recommend a two-metre radius of complete vegetation control around white spruce trees to facilitate development of mixedwood stand conditions. A comprehensive assessment of a range of manual and chemical treatments on white spruce growth in a mixedwood context in Ontario has recently been reported (Pitt and Bell 2005<sup>85</sup> and Greifenhagen *et al.* 2005<sup>86</sup>). A variety of assessments were made of eleven-year-old post-harvest mixedwood sites. Silviculture 'release' treatments were conducted at age four. The release treatments were successful in enhancing some measures of spruce growth. For example, seven years after chemical 'release' treatments, the treated plots reflected 1.7 to 2.2 times the basal area for spruce versus untreated plots. Treated plots also showed an average increase in spruce stem volume index of 1.3 to 1.8 times over untreated plots. However, total basal area of all tree species combined was 2 to 3 times more in untreated plots than treated plots and stem volume index of all tree species combined was 2.4 to 5.6 times more in untreated plots than treated plots. Average spruce height (~ 2.5 m) in the 'release' treatments was only slightly greater (~ 10 cm) in treated plots versus untreated plots (in fact, there was no significant difference between treated and untreated sites relative to spruce height). In terms of forest health, there was significant increase (36 to 40%) in living but damaged hardwood and one chemical treatment resulted in a significant increase in unstocked area (34%). All the 'release' treatments generally resulted in reduced aspen health (increased stem decay), reduced stem quality (forks and crooks) and reduced overall volume. The authors state:

*'Much of the aspen regenerating from current broadcast conifer release approaches may have reduced potential to develop into a valuable resource, both in terms of quality and growth.'*

Additionally, herbicide applications have a dramatic impact on carbon sequestration and release in forested ecosystems. In a modeled assessment of the short-term effect of herbicide application (first 20 years of growth) in a juvenile aspen stand, Johnston 2005<sup>87</sup> found that total carbon sequestration was reduced by 90% when applied in year 2 and by 51% when applied in year 13. Additionally, herbicide application in years 2 and 13 resulted in 1 ton and 11 tons of carbon, respectively, being released as a result of herbicide-induced tree mortality.

In modeled outcomes of future white spruce site index based on juvenile height growth, Feng *et al.* (2006<sup>88</sup>) found tended stands had an estimated 1.8 m higher site index than non-tended stands but this difference was not statistically significant.

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<sup>83</sup> Wagner, R.G., K.M. Little, B. Richardson and K. McNabb. 2006. The role of vegetation management for enhancing productivity of the world's forests. *Forestry*. Vol 79 (1): 57-79.

<sup>84</sup> Man, C. D., P.G. Comeau and D. Pitt. 2006. Competitive effects of woody and herbaceous vegetation in a young boreal mixedwood stand. *Can. J. For. Res.* (submitted for publication). 35 pp.

<sup>85</sup> Pitt, D.G. and F. W. Bell. 2005. Juvenile response to conifer release alternatives on aspen-white spruce boreal mixedwood sites. Part I: Stand structure and composition. *For. Chron.* Vol. 81(4). July/August: 538-547.

<sup>86</sup> Greifenhagen, S., D.G. Pitt, M.C. Wester and F.W. Bell. 2005. Juvenile response to conifer release alternatives on aspen-white spruce boreal mixedwood sites. Part II: Quality of aspen regeneration. *For. Chron.* Vol. 81(4). July/August: 548-558.

<sup>87</sup> Johnston, M. 2005. Carbon budget analysis of herbicide control of deciduous tree species. Saskatchewan Research Council (an assessment conducted for Mistik Management Ltd. CSA Z809-02 certification). Saskatoon, Saskatchewan. 3 pp.

<sup>88</sup> Feng, Z., K.J. Stadt, V.J. Lieffers and S. Huang. 2006. Linking juvenile growth of white spruce with site index. *For. Chron.* (in press). 22 pp.



Lieffers 2006<sup>89</sup> has commented that reducing the hardwood component in mixedwood stands is difficult to justify in light of forecasted rapid rates of environmental change associated with climate change impacts. Lieffers proposes that a more reasonable approach is to maintain as much flexibility as possible in terms of maximizing tree species diversity and future volume. Lieffers *et al.* 2008<sup>90</sup> describe the incompatibility of current Alberta regeneration standards with principles of ecological management in an extensive forest management context where maintenance of biodiversity, species composition and forest structure has as much importance as wood production goals.

### Management Implications

- Expect increased overall softwood tree size (particularly basal area) – conduct manual, mechanical or chemical brushing treatments to increase basal area of softwood in as short a period as possible;
- Expect increased carbon emissions and reduced carbon sequestration post-tending;
- Expect significantly reduced hardwood tree health and stem form quality;
- Expect significantly reduced overall site productivity and yield;
- Expect reduced levels of biodiversity and site quality.

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<sup>89</sup> Lieffers, V.J. 2006 (presentation to Alberta Forest Service and forest industry staff, November 2, 2006). What type of forests should we have on public lands: The twisted path of development of Alberta's regeneration standards? University of Alberta. Edmonton, Alberta.

<sup>90</sup> Lieffers, V. J., G.W. Armstrong, K.J. Stadt and E.H. Marenholtz. 2008. Forest regeneration standards: are they limiting management options for Alberta's boreal mixedwoods?. *For. Chron.* Vol. 84(1). January/February: 76-82.





## 9.10. CHARACTERISTICS OF MATURE NATURAL FOREST STANDS ATTRIBUTES IN THE MISTIK FMA AREA

Table 9-2 to Table 9-7 depict natural stand characteristics for forest stands  $\geq 70$  years of age<sup>91</sup> in the Mistik FMA area. The average stand conditions shown below provide a future reference benchmark for various forest stand attributes that are near rotation age.



*Figure 18 :~100 Year-Old Mixedwood Stand in the Mistik FMA Area*

<sup>91</sup> The data shown in Table 9-2 to Table 9-7 are based on tree measurements from Mistik's 1999-2006 Temporary Sample Plot (TSP) program in the Mistik FMA area (encompassing 1.8 million ha and representing 85,230 individual tree measurements sampled from 174 UTM mapsheets, 1,054 forest stands, 5,616 plots). The statistics shown in the tables reflect data for only those trees that contribute to licensee wood utilization specifications.



Table 9-2 Natural Average Stand Density Characteristics For Forest Stands  $\geq 70$  And  $\leq 110$  Yrs Of Age

Silviculture Ground Rule (SGR) Forest type	Hardwood Density (sph)	Softwood Density (sph)	Total Density (sph)
#1 (S-wS)	136	453	589
#2 (S-bS)	59	431	490
#3 (S-jP)	81	639	720
#4 (SH-jP/tA)	330	302	632
#5 (SH-wS/tA)	227	308	535
#6 (HS-tA/wS)	375	195	570
#7 (HS-tA/jP)	442	246	688
#8 (H-tA)	705	66	771

\*Stem density represents the average plot level density (stems/ha) of all stems that are considered merchantable under the licensee specified utilization standards.

Table 9-3 Natural Stand Average Height Characteristics For Forest Stands  $\geq 70$  And  $\leq 110$  Yrs Of Age

Silviculture Ground Rule (SGR) Forest type	Hardwood Height (m)	Softwood Height (m)	Combined Avg Height (m)
#1 (S-wS)	18	19	19
#2 (S-bS)	19	16	17
#3 (S-jP)	17	17	17
#4 (SH-jP/tA)	19	18	19
#5 (SH-wS/tA)	22	20	21
#6 (HS-tA/wS)	20	18	19
#7 (HS-tA/jP)	21	16	19
#8 (H-tA)	21	17	20

\*Average tree height represents the average of all measured stems that are considered merchantable under the licensee specified utilization standards.

Table 9-4 Natural Stand Average Diameter-At-Breast Height (Dbh) Characteristics For Forest Stands  $\geq 70$  And  $\leq 110$  Yrs Of Age

Silviculture Ground Rule (SGR) Forest type	Hardwood DBH (cm)	Softwood DBH (cm)	Combined Avg DBH (cm)
#1 (S-wS)	22	24	23
#2 (S-bS)	20	19	19
#3 (S-jP)	17	19	19
#4 (SH-jP/tA)	20	23	21
#5 (SH-wS/tA)	27	24	26
#6 (HS-tA/wS)	23	21	22
#7 (HS-tA/jP)	23	18	22
#8 (H-tA)	20	21	20

\*Average DBH represents the average of all measured stems that are considered merchantable under the licensee specified utilization standards.



Table 9-5 Natural Stand Average Height To Diameter-At-Breast Height (Dbh) Ratio (Hdr) Characteristics For Forest Stands  $\geq 70$  And  $\leq 110$  Yrs Of Age

Silviculture Ground Rule (SGR) Forest type	Hardwood HDR	Softwood HDR	Combined Avg HDR
#1 (S-wS)	88	85	86
#2 (S-bS)	96	89	90
#3 (S-jP)	103	95	96
#4 (SH-jP/tA)	101	84	93
#5 (SH-wS/tA)	89	85	86
#6 (HS-tA/wS)	95	89	93
#7 (HS-tA/jP)	92	89	90
#8 (H-tA)	106	85	104

\*Average height to diameter-at-breast height (DBH) ratio represents the average of all measured stems that are considered merchantable under the licensee specified utilization standards.

Table 9-6 Natural Stand Average Volume Characteristics For Forest Stands  $\geq 70$  And  $\leq 110$  Yrs Of Age

Silviculture Ground Rule (SGR) Forest type	Hardwood Volume (m <sup>3</sup> /ha)	Softwood Volume (m <sup>3</sup> /ha)	Total Volume (m <sup>3</sup> /ha)
#1 (S-wS)	42	176	218
#2 (S-bS)	17	75	92
#3 (S-jP)	14	120	134
#4 (SH-jP/tA)	93	93	186
#5 (SH-wS/tA)	139	132	271
#6 (HS-tA/wS)	147	51	198
#7 (HS-tA/jP)	162	40	202
#8 (H-tA)	210	15	225

\*Volume represents the average plot level volume (m<sup>3</sup>/ha) considering all stems that are merchantable under the licensee specified utilization standards.

Table 9-7 Natural Stand Average Individual Tree Size Characteristics For Forest Stands  $\geq 70$  And  $\leq 110$  Yrs Of Age

Silviculture Ground Rule (SGR) Forest type	Hardwood Tree Size (m <sup>3</sup> /ha)	Softwood Tree Size (m <sup>3</sup> /ha)	Combined Avg Tree Size (m <sup>3</sup> /ha)
#1 (S-wS)	0.31	0.39	0.37
#2 (S-bS)	0.28	0.17	0.19
#3 (S-jP)	0.17	0.19	0.19
#4 (SH-jP/tA)	0.28	0.31	0.30
#5 (SH-wS/tA)	0.61	0.43	0.51
#6 (HS-tA/wS)	0.39	0.26	0.35
#7 (HS-tA/jP)	0.37	0.16	0.29
#8 (H-tA)	0.30	0.23	0.29

\*Tree size data are based on average plot volumes divided by average stem density.





## 9.11. MISTIK'S APPROACH TO REGENERATING MIXEDWOOD FOREST STANDS

Comeau *et al.* 2005<sup>92</sup> describe a variety of approaches to the management of boreal mixedwoods. They note that there is a strong trend in mixedwood management from 'conifer management' to 'mixed-species management'. They note a need for regulatory flexibility. Clear objectives related to softwood and hardwood growth and final yield expectations must be stated and measured over time. Mixedwood management options range from a low intensity 'do nothing' approach to intensive management aimed at optimizing spruce and aspen yields within a mixedwood context<sup>93</sup>. Within the context of the options described in this paper, Mistik's mixedwood management approach can be characterized as low intensity (natural regeneration augmented with a significant planting program) with final harvest of both hardwood and softwood at age 90 to 100 years of two-storied, intimate mixtures of hardwood and softwood (softwood in the lower portion of the canopy and aspen dominating the upper portion of the canopy).

Mistik will not seek to grow pure stands of the biggest spruce trees in the least amount time at whatever the cost. Mistik's mixedwood management approach is to allow natural stand dynamics prevail to rotation age. Mistik has established rotation ages for mixedwood stands that reflect the growth rates of understory softwood species. This approach will result in a diverse mosaic of varying mixedwood types across the harvested mixedwood land base. Instead of an active 'interventionist' approach early in forest stand development, Mistik adheres to a 'hands off' approach – letting natural successional processes dominate stand development. Due to short fire return intervals and relatively large areas burned in the Mistik FMA area each year, Mistik has tailored its renewal program to minimize risk to silvicultural investment, maximize future forest management and timber product options and allow for flexibility in the face of uncertainty (climate change). In general, Mistik attempts to maximize the area of mixedwood renewal, minimize investment per hectare and accept natural forest succession dynamics. Mistik's approach has received support from FMA-area community advisory / co-management groups, Public Advisory Group, environmental organizations, forest certification auditors, other industry peers and the academic community. The approach is science-based and is consistent with current notions of ecosystem-based management (see for example Simard and Vyse 2006<sup>94</sup>).

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<sup>92</sup> Comeau, P.G., R. Kabzems, J. McClarnon and J.L. Heineman. 2005. Implications of selected approaches for regenerating and managing western boreal mixedwoods. *For. Chron.* Vol. 81(4). July/August: 559-574.

<sup>93</sup> There are forestry practitioners who espouse multiple harvest entries into mixedwood stands to maximize harvest volumes. Although Mistik has had some practical experience with the multiple harvest regimes in mixedwoods, Mistik does not currently undertake this approach on an operational basis. Mistik's current approach to managing for mixedwoods will allow for a variety of harvest options to be exercised in the future.

<sup>94</sup> Simard, S. W. and A. Vyse. 2006. Trade-offs between competition and facilitation: a case study of vegetation management in the interior cedar-hemlock forests of southern British Columbia. *Can. J. For. Res.* 36: 2486-2496.



## 9.12. SILVICULTURE STRATEGIES AND TREATMENT OPTIONS

The range of harvest silviculture treatments to be used for forest renewal of harvested sites is shown in Table 9-8. The silviculture treatments identified are based on current operational practices. No major changes to harvest practices or renewal practices are anticipated for the period 2017 to 2026.

Table 9-8 Silviculture Treatment Options

SILVICULTURE TREATMENT OPTIONS							
Silviculture Treatment Reference	Harvest Method <sup>1</sup>	Slash Management <sup>2</sup>	Site Preparation Method	Regeneration	Tending	Post-Free Growing Tending	General Comments
1	CCWR	S/RB/RS	None	Natural	Nil	Nil	None
2	CCWR	S/RB/RS	Scarification	Natural	Nil	Nil	None
3	CCWR	S/RB/RS	None	Plant	Nil	Nil	None
4	CCWR	S/RB/RS	Scarification	Plant	Nil	Nil	None
5	CCWR	S/RB/RS	Other Mechanical	Plant	Nil	Nil	None

### Notes:

#### 1. Harvest Method Descriptions:

- CCWR=Clearcut with Retention (including shelterwood). When addressing forest health issues such as dwarf mistletoe the predominant harvest method will be clearcut with retention of all non-pine species.

#### 2. Slash Management Descriptions:

- S=Process at Stump;
- RB=Process at Roadside and Burn;
- RS=Process at Roadside and Spread



## 9.13. SILVICULTURE GROUND RULES FOR THE DETERMINATION OF FREE-TO-GROW STATUS

For compliance purposes Chapter D.1.1 of the Forest Regeneration Assessment Code and Standard for surveying and compilation including the definitions of not-sufficiently-regenerated (NSR) areas, takes precedence over Mistik's approach to field surveying and data compilation methods.

The following documentation describes Mistik's approach to assessing silviculture success. Table 9-9 describes a number of measurement attributes to be assessed on a harvest block basis in order to meet Mistik's SGR free-to-grow status. Mistik will also submit survey data to the Ministry of Environment according to the requirements of the Forest Data Submission Code Chapter and Standard.

**\*Update (April 2023):** In order to have additional operational flexibility, Mistik has added another treatment option for SGR #3-jP. Specifically, silviculture option #1 – natural regeneration without scarification - was added to Table 9-9. This was discussed and agreed to at the planning team meetings and Mistik has provided the ministry with free-to-grow survey results supporting this change. The specific option percentages will be revisited during the next FMP development and will be adjusted if required.

Table 9-9 Silviculture Ground Rules

SILVICULTURE GROUND RULES								
Saskatchewan Provincial Forest Type	Mistik Forest Development Type and Yield Curve <sup>1</sup>	Current Landbase Area (ha)	Rotation Age (yrs)	Transition Assumptions (Future Development Type at Rotation Age)	Preferred Species Group and Leading Tree Species	Minimum Height (m)	Perf. Survey Window (Years Since Harvest)	SGR Option Reference # (refer to Table 9-8)
WSF (SGR 1)	#1 (S-White spruce)	23,015	80	#1 = 100%	S-wS	jP ≥ 2.0 m and all other softwood ≥ 1.5 m	8 to 14	#3 = 95% #5 = 5%
BS (SGR 2)	#2 (S-Black spruce)	34,597	100	#1 = 10% #2 = 90%	S-bS / wS	jP ≥ 2.0 m and all other softwood ≥ 1.5 m	8 to 14	#3 = 95% #5 = 5%





## SILVICULTURE GROUND RULES

Saskatchewan Provincial Forest Type	Mistik Forest Development Type and Yield Curve <sup>1</sup>	Current Landbase Area (ha)	Rotation Age (yrs)	Transition Assumptions (Future Development Type at Rotation Age)	Preferred Species Group and Leading Tree Species	Minimum Height (m)	Perf. Survey Window (Years Since Harvest)	SGR Option Reference # (refer to Table 9-8)
JP (SGR 3)*	#3 (S-Jack pine) Low Density Low Productivity	95,565	80	#3 = 35% #5 = 55% #8 = 10%	S-jP	jP ≥ 2.0 m and all other softwood ≥ 1.5 m	8 to 14	#1 = 20% #2 = 70% #3 = 5% #4 = 5%
	#4 (S-Jack pine) Low Density High Productivity	29,871	80	#4 = 35% #6 = 55% #8 = 10%	S-jP	jP ≥ 2.0 m and all other softwood ≥ 1.5 m	8 to 14	#1 = 20% #2 = 70% #3 = 5% #4 = 5%
	#5 (S-Jack pine) High Density Low Productivity	101,108	80	#5 = 90% #8 = 10%	S-jP	jP ≥ 2.0 m and all other softwood ≥ 1.5 m	8 to 14	#1 = 20% #2 = 70% #3 = 5% #4 = 5%
	#6 (S-Jack pine) High Density High Productivity	57,705	80	#6 = 90% #8 = 10%	S-jP	jP ≥ 2.0 m and all other softwood ≥ 1.5 m	8 to 14	#1 = 20% #2 = 70% #3 = 5% #4 = 5%
	#7 (S-Jack pine) L&M Jack pine	17,962	80	#7 = 100%	S-jP	jP ≥ 2.0 m and all other softwood ≥ 1.5 m	8 to 14	#1 = 20% #2 = 70% #3 = 5% #4 = 5%
PMW (SGR 4)	#8 (SH - Jack pine mixedwood)	54,045	100	#8 = 65% #9 = 10% #11 = 20% #17 = 5%	SH-jP / tA	jP ≥ 2.0 m and all other softwood ≥ 1.5 m  Hardwood ≥ 3.0 m	8 to 14	#1 = 10% #2 = 60% #3 = 20% #4 = 10%
SMW (SGR 5)	#9 (SH - Spruce mixedwood)	51,773	120	#1 = 10% #9 = 70% #10 = 20%	SH-wS / tA	jP ≥ 2.0 m and all other softwood ≥ 1.5 m  Hardwood ≥ 3.0 m	8 to 14	#3 = 95% #5 = 5%



## SILVICULTURE GROUND RULES

Saskatchewan Provincial Forest Type	Mistik Forest Development Type and Yield Curve <sup>1</sup>	Current Landbase Area (ha)	Rotation Age (yrs)	Transition Assumptions (Future Development Type at Rotation Age)	Preferred Species Group and Leading Tree Species	Minimum Height (m)	Perf. Survey Window (Years Since Harvest)	SGR Option Reference # (refer to Table 9-8)
HSM (SGR 6)	#10 (HS - Hardwood w/ spruce)	54,378	100	#9 = 40% #10 = 60%	HS-tA / wS	jP ≥ 2.0 m and all other softwood ≥ 1.5 m  Hardwood ≥ 3.0 m	8 to 14	#3 = 95% #5 = 5%
HPM (SGR 7)	#11 (HS - Hardwood w/ jack pine)	42,185	100	#8 = 20% #9 = 20% #10 = 20% #11 = 30% #17 = 10%	HS-tA / jP	jP ≥ 2.0 m and all other softwood ≥ 1.5 m  Hardwood ≥ 3.0 m	8 to 14	#1 = 40% #2 = 20% #3 = 30% #4 = 10%
TAB (SGR 8)	#12 (H – Hardwood) Low Density Low Productivity	17,195	80	#9 = 15% #10 = 15% #12 = 5% #14 = 65%	H-tA / bP	Hardwood ≥ 3.0 m	8 to 14	#1 = 90% #3 = 10%
	#13 (H – Hardwood) Low Density High Productivity	28,607	80	#9 = 15% #10 = 15% #13 = 5% #15 = 65%	H-tA / bP	Hardwood ≥ 3.0 m	8 to 14	#1 = 90% #3 = 10%
	#14 (H – Hardwood) High Density Low Productivity	64,239	80	#9 = 15% #10 = 15% #12 = 5% #14 = 65%	H-tA / bP	Hardwood ≥ 3.0 m	8 to 14	#1 = 90% #3 = 10%
	#15 (H – Hardwood) High Density High Productivity	128,017	80	#9 = 5% #10 = 5% #15 = 90%	H-tA / bP	Hardwood ≥ 3.0 m	8 to 14	#1 = 90% #3 = 10%
	#16 (H – Hardwood) Significant Softwood Incidental Low Density	31,105	80	#9 = 35% #10 = 35% #17 = 30%	H-tA / bP	Hardwood ≥ 3.0 m	8 to 14	#1 = 90% #3 = 10%



## SILVICULTURE GROUND RULES

Saskatchewan Provincial Forest Type	Mistik Forest Development Type and Yield Curve <sup>1</sup>	Current Landbase Area (ha)	Rotation Age (yrs)	Transition Assumptions (Future Development Type at Rotation Age)	Preferred Species Group and Leading Tree Species	Minimum Height (m)	Perf. Survey Window (Years Since Harvest)	SGR Option Reference # (refer to Table 9-8)
	#17 (H – Hardwood) Significant Softwood Incidental High Density	48,163	80	#9 = 25% #10 = 25% #17 = 50%	H-tA / bP	Hardwood ≥ 3.0 m	8 to 14	#1 = 90% #3 = 10%

### Notes:

1. Tree densities vary considerably from one location to another depending on site-specific characteristics. Metrics of natural systems are most usefully described and shown as distributions rather than as simple minimums, means and maximums. The frequency with which a particular metric occurs over the natural range of measured outcomes is of significant importance in reflecting the natural range of variability (NRV). An understanding of NRV for a given metric is of profound assistance in ascertaining management ‘risk’ and prescribing management actions. Mistik’s approach to defining forest renewal success is built on the NRV premise described above. The following points describe in detail the specific stocking thresholds that will be adhered to in determining forest renewal success within harvest blocks on the Mistik FMA area:

- ‘S’-designated harvest blocks are those surveyed blocks with ≥ 80% overall stocking in which pure conifer plots occur in ≥ 80% of all plots measured;
- ‘SH’-designated harvest blocks are those surveyed blocks with ≥ 80% overall stocking in which pure conifer plots + mixed plots occur ≥ 50% and pure conifer plots occur in < 80% of all plots measured;
- ‘HS’-designated harvest blocks are those surveyed blocks with ≥ 80% overall stocking in which pure conifer plots + mixed plots occur ≥ 20% and pure conifer plots occur in < 50% of all plots measured;
- ‘H’-designated harvest blocks are those surveyed blocks with ≥ 80% overall stocking in which pure conifer plots + mixed





plots occur in < 20% of all plots measured.

## 9.14. COMPILATION OF REGENERATION SURVEY DATA AND ASSIGNMENT OF SGR FOREST TYPES TO REGENERATING HARVEST BLOCKS

Mistik will submit survey data to the Ministry of Environment according to the requirements of the Forest Data Submission Code Chapter and Standard.

Based on regeneration survey data, Mistik will compile the data (Table 9-11) and forecast the expected rotation-age SGR forest type. The key question to be addressed in Mistik's compilation process is:

'On average, will the softwood trees within a regenerating mixedwood harvest block have a reasonable likelihood of forming part of the canopy at maturity (rotation age)?'

*Table 9-10 Compilation Process For Establishment Survey Data*

A. Designation of Initial Forest Type Based on Establishment Survey Results			
1. Stock Criteria (softwood/hardwood)- This is likely the single most important factor in that it establishes physical presence and spatial dispersion of trees			
S (softwood plots ≥80%)	SH (softwood + mixed ≥ 50% and softwood <80%)	HS (softwood + mixed ≥ 20% and <50%)	H (softwood + mixed ≤20%)
2. Leading Species Criteria – this step identifies the leading softwood species and hardwood species based on the relative abundance of each species (stocking x density)			
S (bS,wS,jP)	SH (bS/tA, wS/tA, jP/tA)	HS (tA/bS, tA/wS, tA/jP)	H (tA)
3. Forest Type Designation-this step identifies the potential forest type for each harvest block based on steps 1 and 2 above			
S (1-wS, 2-bS, 3-jP)	SH (4-jP/tA, 5-wS/tA)	HS (6-tA/wS, 7-tA/jP)	H (8-tA)

Table 9-11 Compilation Process For Free-To-Grow Survey Data (Aerial Surveys)



## B. Designation of Future Forest Type Based on Aerial Free-to-Grow Survey Results

### 1. Leading Conifer Component (Spruce/Pine)

In order to align stands with the succession matrices developed by Lane Gelhorn (Timberline Natural Resource Group, 2009)<sup>95</sup>, stands are first separated into those with wS as the leading softwood species vs. jP as the leading softwood species, so that they can be assigned the respective successional trajectory projections.

Density (sph) of non-pine softwood species (white/black spruce, balsam fir, tamarack, etc.) > Density (sph) of jack pine  
= **A. Spruce-leading Softwood**

Density (sph) of non-pine softwood species (white/black spruce, balsam fir, tamarack, etc.) ≤ Density (sph) of jack pine  
= **B. Pine-leading Softwood**

### 2. Assignment of Mixedwood Successional Matrices, based on density criteria (sph) (softwood/hardwood)

Successional matrices are then assigned for wS- and jP-leading softwood stands, using the appropriate matrix for the minimum harvest age of each stand (100 years for wS-leading softwood stands and 70 years for jP-leading softwood stands). The matrices for each stand type are based on those developed by Lane Gelhorn (Timberline Natural Resource Group, 2009), with minor modifications made in order to apply these stands to Mistik's FTG survey results.

#### A. Spruce-leading softwood stands

Hardwood	≥30000	≥20000	≥15000	≥10000	≥5000	≥4000	≥3000	≥2000	≥1500	≥1000	≥750	≥500	≥250	<250	0
Softwood															
≥1500	SH	SH	SH	S	S	S	S	S	S	S	S	S	S	S	S
≥1250	SH	SH	SH	SH	SH	S	S	S	S	S	S	S	S	S	S
≥1000	SH	SH	SH	SH	SH	SH	SH	S	S	S	S	S	S	S	S
≥800	HS	HS	HS	SH	SH	SH	SH	S	S	S	S	S	S	S	S
≥600	HS	HS	HS	HS	SH	SH	SH	SH	SH	S	S	S	S	S	S
≥500	HS	HS	HS	HS	HS	SH	SH	SH	SH	S	S	S	S	S	S
≥350	HS	HS	HS	HS	HS	HS	HS	SH	SH	SH	SH	S	S	S	S
≥200	H	H	H	H	HS	HS	HS	HS	HS	SH	SH	SH	S	S	S
≥100	H	H	H	H	H	H	H	HS	HS	HS	HS	SH	S	S	S
<100	H	H	H	H	H	H	H	HS	HS	HS	HS	SH	S	S	S
0	H	H	H	H	H	H	H	H	H	H	H	H	H	H	N/A

<sup>95</sup>Gelhorn, L. 2009. Development of a Regenerating Mixedwood Succession Matrix. Timberline Natural Resource Group Ltd., Prince Albert, Saskatchewan, Canada.





**B. Designation of Future Forest Type Based on Aerial Free-to-Grow Survey Results**

**B. Pine-leading softwood stands**

Hardwood	≥20000	≥15000	≥10000	≥5000	≥4000	≥3000	≥2000	≥1500	≥1000	≥750	≥500	≥250	<250	0
Softwood														
≥20000	SH	S	S	S	S	S	S	S	S	S	S	S	S	S
≥15000	SH	S	S	S	S	S	S	S	S	S	S	S	S	S
≥10000	SH	S	S	S	S	S	S	S	S	S	S	S	S	S
≥5000	SH	SH	SH	S	S	S	S	S	S	S	S	S	S	S
≥4000	SH	SH	SH	SH	S	S	S	S	S	S	S	S	S	S
≥3000	SH	SH	SH	SH	S	S	S	S	S	S	S	S	S	S
≥2000	SH	SH	SH	SH	SH	S	S	S	S	S	S	S	S	S
≥1500	HS	HS	SH	SH	SH	SH	S	S	S	S	S	S	S	S
≥1000	HS	HS	HS	SH	SH	SH	SH	S	S	S	S	S	S	S
≥750	HS	HS	HS	HS	SH	SH	SH	SH	S	S	S	S	S	S
≥500	H	HS	HS	HS	HS	HS	SH	SH	SH	SH	S	S	S	S
≥250	H	H	H	H	H	HS	HS	HS	HS	HS	HS	HS	S	S
<250	H	H	H	H	H	HS	HS	HS	HS	HS	HS	HS	S	S
0	H	H	H	H	H	H	H	H	H	H	H	H	H	N/A



Table 9-12 describes the estimated area planned for forest renewal assessments for the period 2017 to 2026. The area to be surveyed for forest renewal success includes those areas harvested from 2013 to 2022.

*Table 9-12 Summary of Planned Forest Renewal Survey<sup>96</sup> Area by SGR Forest Type<sup>97</sup> for the Period 2017 To 2026*

SGR Forest Type	Percentage	Estimated Free-To-Grow Survey Area (ha) <sup>98</sup>
#1 (S-wS)	2	700
#2 (S-bS)	1	350
#3 (S-jP)	10	3,500
#4 (SH-jP/tA)	11	3,850
#5 (SH-wS/tA)	11	3,850
#6 (HS-tA/wS)	32	11,200
#7 (HS-tA/jP)	7	2,450
#8 (H-tA)	26	9,100
Total	100	*35,000

\*The 35,000 estimated hectares eligible for free to grow surveys may actually be somewhat less depending on the number of blocks (and hectares) meeting early free to grow requirements and declared early free to grow through the establishment survey process.

This document maintains the theme and intent of the original SGR document as submitted and approved for the 2007 20-yr FMP. Information within this document has been updated with the most recent data available (e.g. up to and including Mistik's 2014 Annual Report). This document and the 2007 20-yr FMP process was the first in Saskatchewan formally amalgamating a FMP and an Annual report into a results based process that incorporated values, objectives, indicators and targets (VOITs) into a comprehensive system for the evaluation of the cumulative results of commercial forestry. Mistik's series of Annual Reports indicate that over the term of the 2007 20-yr FMP Mistik has maintained achievement of over 85% of its' VOITs. The FMP process and the associated results based reporting is a system based on continuous improvement where areas of weakness are revisited, revamped and revised to improve results and reduce uncertainty.

It is in this spirit that Mistik proposes that for the balance of the 2007 20-Yr FMP associated Annual Reports that the status quo be maintained – no changes. The desired objective to be achieved for the results reporting associated with the first Annual Report (e.g. 2017 Annual report) of the 2017 20-Yr FMP is a revamping of the process (e.g. data collection, data analysis or a combination of both) to garner more accurate results that confirm Mistik FMP modeling assumptions. Mistik will work cooperatively with the Ministry of Environment Forest Service Branch during the term of the 2017-2018 operating year to develop and implement an acceptable solution to the above described deficiency.

<sup>96</sup> Mistik will not be conducting any formal free-to-grow surveys until 2017.

<sup>97</sup> The % and area indicated for each SGR forest type is based on past harvest history for the period 2007 to 2016. The assumption is that near-term (10-year), future harvest patterns will not deviate significantly from past harvest patterns.

<sup>98</sup> Assuming an average harvest area of ~ 3,500 ha per year x 10 year period = 35,000 ha (encompassing harvest years 2014 to 2023).