Mountain Pine Beetle DFMP - Amendment Plan

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1 INTRODUCTION

Slave Lake Pulp Corporation (SLP) and the quota holders have prepared this plan (referred to subsequently as "the Plan") in response to the Government of Alberta's directive to reduce the amount of Mountain Pine Beetle susceptible stands within the S20 FMU. This should be considered an amendment to the currently approved Forest Management Plan [1].

The Plan will replace the upcoming Forest Management Plan that was scheduled for submission in 2010. The effective date of this plan is November 15, 2008.

The purpose of the Plan is to reduce the risk of Mountain Pine Beetle infestations. If, through the implementation of the Plan, the infestations become significant this Plan will be revised.

This Plan will describe:

- Background
- Goals and Objectives
- Communication Plan
- Technical Analysis
- Conclusion outlining the challenges in the Plan's implementation, and an approach in how they will be resolved.

This document, along with associated maps and analytical outputs are provided on the enclosed digital media.

2 BACKGROUND

Slave Lake Pulp Corporation is currently operating under a Forest Management Plan that was approved in 2003. A condition of the FMA agreement document was a requirement to resubmit a DFMP by November 14, 2010. The onset of MPB infestation in the FMU has prompted SLP and the quota holders to submit an amendment to be in compliance with the MPB Directive aimed at reducing the susceptible pine in S20 by 75% in a twenty year period. The currently approved harvest level in S20 is 541,021 m^3 of deciduous and 586,378 m^3 of conifer on an annual basis under a 15+/10/30cm utilization standard. Table 1 indicates the current fibre allocations in S20.

Table 1 Currently Approved AAC Allocations

Company	Allocation %	Coniferous Sustainable AAC M^3	Deciduous Sustainable AAC
Slave Lake Pulp	98%		530,201
Deciduous MTU	2%		10,820
Alberta Plywood Ltd.	39.06%	229,039	

[1] Slave Lake Pulp Detailed Forest Management Plan – May 15, 2002

Company	Allocation %	Coniferous Sustainable AAC M^3	Deciduous Sustainable AAC
Buchanan Lumber	10.00%	58,638	
Lakeshore	1.77%	10,379	
Millar Western Forest	33.82%	198,313	
Slave Lake MTU	0.77%	4,515	
Vanderwell	14.58%	85,494	
Total	**100%**	**586,378**	541,021

The Terms of Reference for this Plan were developed and approved on February 18, 2009 *(Appendix 1).*

3 GOALS AND OBJECTIVES

The primary objective of the Plan is to reduce the number of highly susceptible pine stands within Forest Management Unit S20 (Prevention Strategy).

The Prevention Strategy focuses on decreasing the MPB spread and outbreak potential by reducing the area of MPB susceptible pine stands.

The primary tactic is to evaluate the feasibility and effectiveness of harvesting to reduce the risk of MPB spread. The target is to do whatever is practical and feasible to reduce the area of susceptible pine stands to 25% of that currently projected in twenty years.

Other objectives include:

- Development of an effective communication strategy in collaboration with ASRD staff, to ensure stakeholders are informed as to the activities to be undertaken as part of the Plan.
- Conservation of long-term forest values by evaluating impacts on Grizzly Bear habitat and risk, Woodland Caribou, water yields and seral stage distributions (mature and over mature).
- Development of a cost effective and practical field assessment program for structure retention monitoring and reporting.
- Development of a Spatial Harvest Variance tracking system.

The following documents were used in the development of the Plan:

- Alberta Forest Management Planning Standard (Version 4.1 April, 2006)
- Mountain Pine Beetle Action Plan For Alberta (September, 2006)
- Interpretive Bulletin – Planning Mountain Pine Beetle Response Operations (Version 2.6 September, 2006)

4 COMMUNICATION PLAN

The Mountain Pine Beetle Communication Plan is separated into several stages

- Statement of objectives
- Development of key messages
- Assignment of responsibilities
- Implementation

4.1 Objectives:

- To present the forest management activities as part of a long-term coordinated plan whose goal is to reduce the potential threat of a MPB infestation.
- To provide timely, coordinated communications to help stakeholders prepare for potential impacts from forest management activities.
- To ensure staff and stakeholders are able to obtain the latest and most accurate information on forest management activities.

Between September 2008 and May 2009, Slave Lake Pulp Corporation and Alberta Sustainable Resource Development, jointly communicated the goals and implications of the Plan to the stakeholders. This included providing a link to the provincial forest health web site.

4.2 Stakeholder Involvement

The Stakeholders consist of:

- Quota Operators – Coniferous and Deciduous
- Commercial Timber Permit Program Operators
- First Nations
- Slave Lake Pulp Corporation Staff
- Sustainable Resource Development Staff

4.3 Key Messages

The consistent message throughout the communication initiative is that the risk to the pine forest in the SLP FMA from MPB will be reduced by the implementation of the Plan.

Key messages were developed to summarize background information, government directives and company response to the threat of an MPB spread into the FMU. These messages are as follows;

- **Alberta's pine[2] forests are threatened by an infestation of Mountain Pine Beetle.**

Currently, there is a major mountain pine beetle infestation in British Columbia and outbreaks along Alberta's Eastern Slopes. The S20 FMU is currently at the leading

[2] Refers to Mountain Pine Beetle Susceptible stands as defined by Alberta Sustainable Resources.

edge of the MPB infestation in the province and has a significant proportion of its productive forest in susceptible pine stands.

- **Alberta has developed an action plan, which will reduce the risk to the pine forests of Alberta.**

In response to the MPB threat, the Alberta Government has developed a Mountain Pine Beetle Action Plan which will guide forest companies in the preparation of future forest plans. Stands have been ranked based on the pine susceptibility, climate suitability and the proximity of current MPB infestations. The government target is to reduce these high ranking stands by 75% over 20 years.

- **Slave Lake Pulp is currently operating under an approved Detailed Forest Management Plan**

SLP and embedded quota holders have prepared this plan in response to the Government of Alberta's directive to reduce the amount of Mountain Pine Beetle susceptible stands within the S20 FMU. This plan should be considered an amendment to the already approved DFMP.

- **Pine on the Slave Lake Pulp Corporation FMA is at risk.**

Mature pine provides prime habitat for the MPB. A large portion of SLP's FMA consists of mature and over mature Pine. Slave Lake Pulp Corporation along with ASRD and other forest companies are working together to reduce this risk.

- **Other resource values will be protected.**

SLP remains committed to its current audited environmental standards which meet or exceed provincial regulations and ground rules. As well, Grizzly Bear habitat, Old Growth requirements and the impacts to water yield have been specifically evaluated in this plan amendment.

As operations are implemented, the effectiveness and long-term impacts of the plan will be monitored by the Alberta Government and Slave Lake Pulp Corporation.

4.4 Responsibilities

Communication of the Provincial Mountain Pine Beetle Action Plan and Interpretative Bulletin is a provincial responsibility. The responsibility to develop an amended Forest Management Plan which meets the intent of the Provincial Mountain Pine Beetle Action Plan is the responsibility of Slave Lake Pulp Corporation, which would include the other timber operators within the FMU.

The SLP FMA has historically engaged substantial stakeholder input on its forest management practices. SLP and ASRD staff have worked together to complete the introduction phase and will continue to work together to deliver the implementation phase and to respond to further communication opportunities if they arise.

4.5 Communication Roll-Out

Table 2 tracks the communications activities associated with the Project Introduction. An important part of the communication plan relates to SLP's public advisory group (SLFPAC). The Slave Lake Forest Public Advisory Committee (SLFPAC) is one cornerstone of Slave Lake Pulp's public involvement process. This committee is a

regional advisory group providing input into a variety of forestry issues arising from the operations of the area's four major wood product facilities.

Briefings to the other identified interest groups are also identified in Table 2. The briefings have been an effective and timely way to communicate both the MPB Plan and the SLP Plan. Communications summary is located in *Appendix 2.*

Table 2 Communication and Input Tracking

Target	Materials Used	Who	Comments
SLFPAC Members	- ASRD Interpretive Bulletin - ASRD MPB Strategy and Action Plan - Plan background and key messages - DFMP Amendment power point presentation - Planned Harvest Schedule Map	SLP Staff	SLPAC Members given the opportunity to comment and provide advise.
Swan Hills	- ASRD Interpretive Bulletin - ASRD MPB Strategy and Action Plan - Plan background and key messages - Planned Harvest Schedule Map	SLP Staff Mayor – Pam Marriott and Dale Holub	General Comments: -Harvest intensity around town -Recreation trails -Firewood All questions were responded to.
First Nations **-Driftpile Cree Nation** **-Sucker Creek First Nation** **-Swan River First Nation** **-Sawridge First Nation** **-Kapawe'no First Nation** **-East Praire Metis Settlement**	- ASRD Interpretive Bulletin - ASRD MPB Strategy and Action Plan - Plan background and key messages - Planned Harvest Schedule Map, Grizzly Bear Habitat Map, Trapper Disposition Map, MPB Ranking Map, Watershed Analysis Map	SRD Staff SLP Staff	General Comments: -Economic concerns -Water quality/sedimentation -Fire -Silviculture/reclamation -Wildlife -Trapping All questions were responded to.

Table 3 Designated Spokespersons

SLP Staff	SRD staff
Gordon Sanders Woodlands Manager Phone 780 805 3705 Gordon.sanders@westfraser.com	Henri Soulodre Senior Resource Management Advisor Phone: 780 849 7403 Email: Henri.soulodre@gov.ab.ca
Terry Kristoff Management Forester 780 805 3715 Terry.kristoff@westfraser.com	Kurt Borzel Resource Management Advisor Phone: 780 523 6560 Email: Kurt.borzel@gov.ab.ca
Todd Bailey FMA Forester 780 805 3720 Todd.bailey@westfraser.com	

5 TECHNICAL ANALYSIS

The technical analysis includes:

- A summary of the land base classification
- A summary of the yield analysis
- A description and summary of the timber supply analyses completed
- A description of the long term road corridor plan
- A description and summary of the non timber value analyses.

5.1 Land Base Classification

Since the approval of the timber supply analysis in the 2002 FMP, Slave Lake Pulp Corporation has completed a land base classification and redefined the AAC land base to be used in the MPB strategy. A revision to the land base has been completed as newer information has become available. Harvest activities have been updated to November 14, 2008. The AAC contributing land base has been increased by 0.74% from 435,379 ha to 438,593 ha.

Table 4 and Table 5 provide a summary of the classification and a comparison to the approved land base. Details of the land base classification[3] are provided in the previously submitted Net Land base submission on March 20,2009 *(Appendix 3).*

The land base that will be operated as part of the Plan is approximately 68% of the gross FMU area (see Figure 1 Active Land base and Figure 2 Passive Land base)

Table 6 provides a summary of MPB rank by land classification.

Figure 3, Figure 4 and Figure 5 provide maps of the MPB Priority Rank - ASRD, MPB Priority Rank – SLP and the Net Land base MPB Priority Ranking, respectively.

[3] Refers to the Agreement-In-Principle – Slave Lake Pulp 2009 Mountain Pine Beetle Amendment Net Land base

Table 4 Original Land base Summary

Code	Name	S1 Inside FMA	S1 Outside FMA	S1 Total	S2 Inside FMA	S2 Outside FMA	S2 Total	S6 Inside FMA	S6 Outside FMA	S6 Total	S20 Inside FMA	S20 Outside FMA	S20 Total
0	AAC	181,615	179	181,794	172,839	635	173,473	78,298	1,814	78,298	432,751	2,628	435,379
0.5	Water	85	-	85	483	-	483	844	1,028	844	1,412	1,028	2,440
0.75	Excluded Dispostions	8	-	8	152	295	447	766	4,048	766	926	4,343	5,269
1	Inoperable	16,014	20	16,034	11,056	11	11,067	2,857	0	2,857	29,927	31	29,958
2	Fish and Wildlife Deletions	-	-	-	4,224	118	4,342	-	-	-	4,224	118	4,342
3	Lake Buffers - 100m	112	-	112	380	-	380	453	123	453	946	123	1,069
4	River Buffers - 60m	4,624	-	4,624	4,285	65	4,349	5,439	185	5,439	14,347	250	14,597
5	Stream Buffers - 30m	4,067	6	4,073	5,364	34	5,398	3,843	33	3,843	13,273	74	13,347
6	Naturally Non-Forested	8,017	18	8,035	4,126	132	4,258	16,603	2,819	16,603	28,747	2,969	31,715
7	Anthropogenic Non - Forested	278	-	278	6,451	2	6,454	2,745	-	2,745	9,474	2	9,476
8	TPR = U	7,319	25	7,344	8,506	-	8,506	21,247	-	21,247	37,072	25	37,097
9	Merchantable Deletions	3,702	-	3,702	3,889	477	4,366	3,678	1,671	3,678	11,270	2,148	13,418
10	Non-Salvageable Burns (1998, 1999)	920	-	920	1,236	-	1,236	24,775	164	24,775	26,932	164	27,096
11	Non-Salvageable Burns (Chisholm)	-	-	-	-	-	-	17,984	-	17,984	17,984	-	17,984
	Totals	226,761	248	227,009	222,990	1,769	224,759	179,532	11,885	179,532	629,284	13,902	643,186

Table 5 Updated Land base Summary

Land Base Code	Name	Land Base Status	S1 Inside FMA	S1 Outside FMA	S1 Total	S2 Inside FMA	S2 Outside FMA	S2 Total	S6 Inside FMA	S6 Outside FMA	S6 Total	S20 Inside FMA	S20 Outside FMA	S20 Total
0	AAC	Active	135,519	161	135,680	127,017	628	127,646	56,382	1,812	58,194	318,918	2,601	321,520
0.5	Water	Passive	85	-	85	483	-	483	844	1,028	1,872	1,412	1,028	2,440
0.75	Excluded Dispositions	Passive	8	-	8	152	295	447	766	4,048	4,814	926	4,343	5,269
1	Inoperable	Passive	15,936	20	15,956	10,850	11	10,860	2,837	0	2,837	29,623	31	29,654
2	Fish and Wildlife Deletions	Passive	-	-	-	4,207	118	4,325	-	-	-	4,207	118	4,325
3	Lake Buffers - 100m	Passive	112	-	112	377	-	377	448	123	571	937	123	1,060
4	River Buffers - 60m	Passive	4,592	-	4,592	4,266	65	4,331	5,425	185	5,610	14,283	250	14,533
5	Stream Buffers - 30m	Passive	4,002	6	4,008	5,289	34	5,324	3,784	33	3,817	13,075	74	13,149
6	Naturally Non-Forested	Passive	7,941	18	7,959	4,077	132	4,210	16,504	2,819	19,322	28,522	2,969	31,491
7	Anthropogenic Non - Forested	Passive	273	-	273	6,305	2	6,308	2,653	-	2,653	9,231	2	9,233
8	TPR = U	Passive	7,270	25	7,294	8,405	-	8,405	21,205	-	21,205	36,880	25	36,904
9	Merchantable Deletions	Passive	3,680	-	3,680	3,851	477	4,328	3,662	1,671	5,333	11,193	2,148	13,341
10	Non-Salvageable Burns (1998, 1999)	Passive	912	-	912	1,188	-	1,188	24,071	164	24,235	26,171	164	26,335
11	Non-Salvageable Burns (Chisholm)	Passive	-	-	-	-	-	-	11,044	-	11,044	11,044	-	11,044
108	Non-Salvageable Burns (After 2002)	Passive	1	-	1	789	-	789	9	3	12	800	3	803
208	Harvested Blocks	Active	13,926	-	13,926	16,599	1	16,600	15,328	0	15,328	45,854	1	45,855
211	Silviculture Liability Waived	Passive	-	-	-	860	-	860	4,152	-	4,152	5,013	-	5,013
201	YC_SP = SB and SP1 = SB and Height <= 14	Active	6,901	10	6,912	11,356	-	11,356	1,554	-	1,554	19,812	10	19,822
202	YC_SP = SB and SP1 = SB and Crown = A	Active	1,892	-	1,892	371	-	371	11	-	11	2,275	-	2,275
203	YC_SP = SB and SP1 = SB and LT in Overstory	Active	38	-	38	0	-	0	0	-	0	38	-	38
204	SP1 = SB and Crown = A	Active	207	-	207	92	-	92	13	-	13	312	-	312
205	SP1 = SB and LT >= 20	Active	3	-	3	14	-	14	16	-	16	33	-	33
206	SP1 = LT	Active	0	-	0	9	-	9	4	-	4	13	-	13
207	Crown = A and UHeight <= 14	Active	19,903	8	19,911	10,018	5	10,023	5,231	-	5,231	35,152	13	35,165
209	Passive Land base within Planned Blocks	Active	72	-	72	169	-	169	51	-	51	292	-	292
210	Planned Harvest Blocks	Active	3,487	-	3,487	6,245	-	6,245	3,535	-	3,535	13,268	-	13,268
	Totals		226,761	248	227,009	222,990	1,769	224,759	179,532	11,885	191,417	629,284	13,902	643,186
	Active Land Base		**181,949**	**179**	**182,129**	**171,891**	**635**	**172,525**	**82,127**	**1,812**	**83,939**	**435,967**	**2,626**	**438,593**
	Passive Land Base		**44,812**	**69**	**44,881**	**51,099**	**1,134**	**52,234**	**97,405**	**10,073**	**107,479**	**193,316**	**11,276**	**204,593**

Table 6 Summary of MPB Rank by Land Classification[4]

Land Base Classification	Status	Rank 1	Rank 2	Rank 3	Rank 4	Total
AAC	Active	62,747	18,342	41,240	199,191	321,520
Water	Passive	-	-	-	2,440	2,440
Excluded Dispositions	Passive	109	6	41	5,113	5,269
Inoperable	Passive	4,339	2,132	4,687	18,496	29,654
Fish and Wildlife Deletions	Passive	317	43	293	3,671	4,325
Lake Buffers - 100m	Passive	158	43	86	773	1,060
River Buffers - 60m	Passive	1,450	574	1,482	11,027	14,533
Stream Buffers - 30m	Passive	1,854	715	1,730	8,849	13,149
Naturally Non-Forested	Passive	3	2	14	31,472	31,491
Anthropogenic Non - Forested	Passive	24	25	152	9,032	9,233
TPR = U	Passive	128	377	2,793	33,607	36,904
Merchantable Deletions	Passive	43	643	2,269	10,387	13,341
Non-Salvageable Burns (1998, 1999)	Passive	8,794	2,552	3,075	11,914	26,335
Non-Salvageable Burns (Chisholm)	Passive	242	121	496	10,185	11,044
Non-Salvageable Burns (After 2002)	Passive	272	155	253	123	803
Harvested Blocks	Active	11,565	2,788	6,362	25,141	45,855
Silviculture Liability Waived	Passive	437	76	247	4,252	5,013
YC_SP = SB and SP1 = SB and Height <= 14	Active	-	1,083	8,112	10,627	19,822
YC_SP = SB and SP1 = SB and Crown = A	Active	-	85	697	1,493	2,275
YC_SP = SB and SP1 = SB and LT in Overstory	Active	-	-	23	15	38
SP1 = SB and Crown = A	Active	-	1	131	180	312
SP1 = SB and LT >= 20	Active	-	-	5	28	33
SP1 = LT	Active	-	-	-	13	13
Crown = A and UHeight <= 14	Active	9,890	2,244	1,807	21,224	35,165
Passive Land base within Planned Blocks	Active	79	22	29	162	292
Planned Harvest Blocks	Active	3,941	1,125	1,358	6,844	13,268
Total		**106,393**	**33,152**	**77,383**	**426,258**	**643,186**

[4] Rankings were applied as per Interpretive Bulletin – Planning Mountain Pine Beetle Response Operations (Version 2.6 September, 2006)

Figure 1 Active Land base

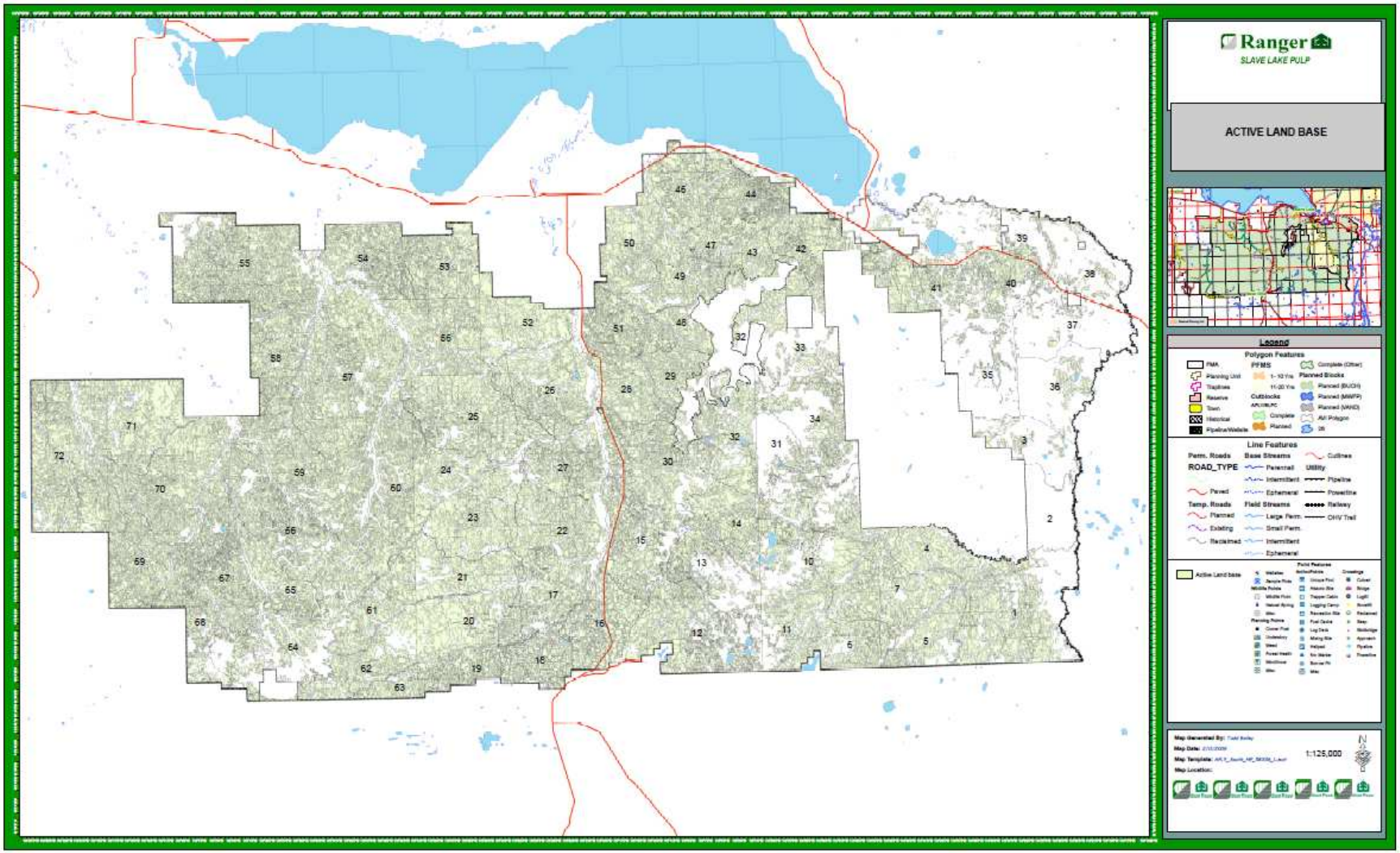


Figure 2 Passive Land base

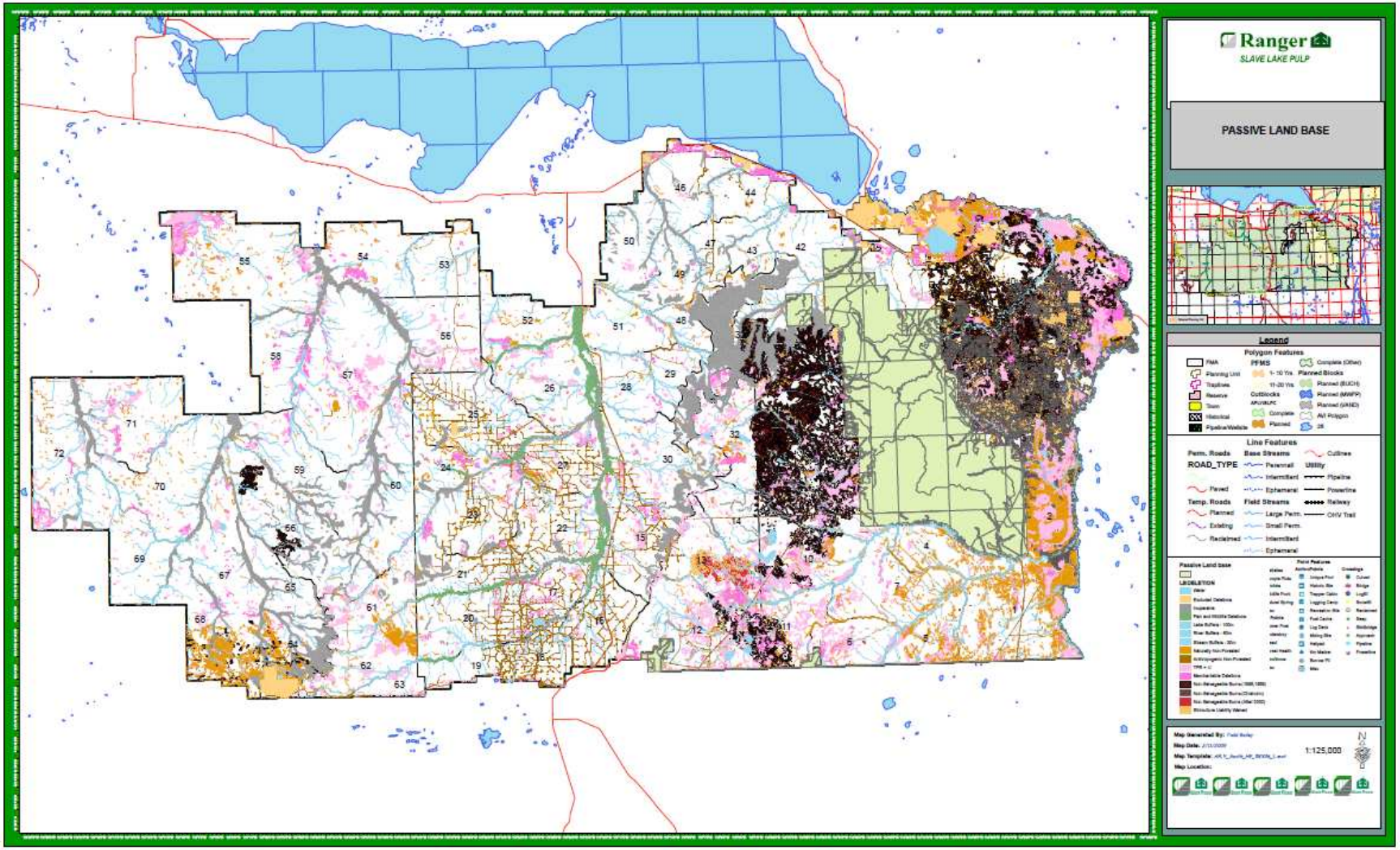


Figure 3 MPB Priority Rank - ASRD

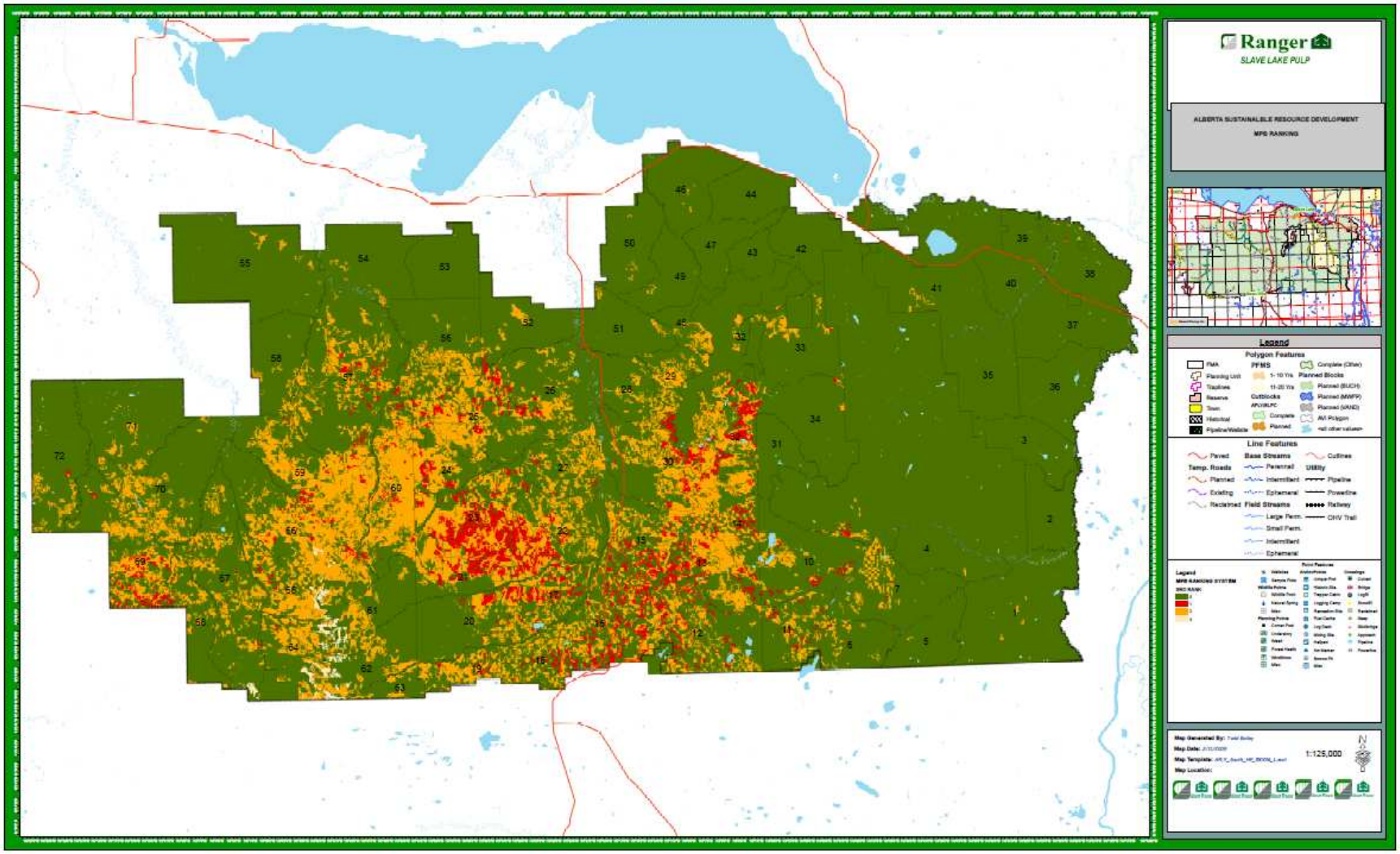


Figure 4 MPB Priority Rank – SLP

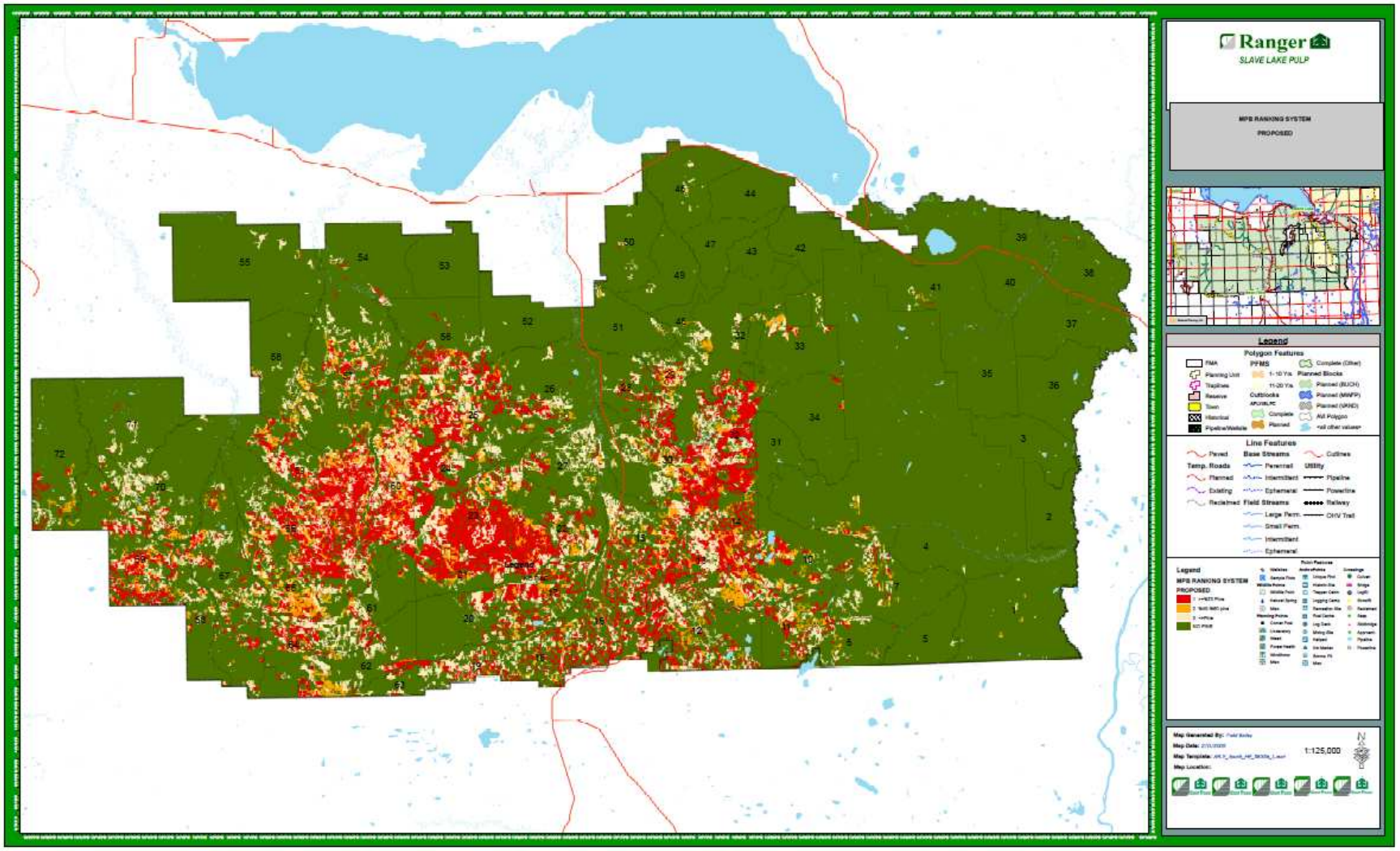
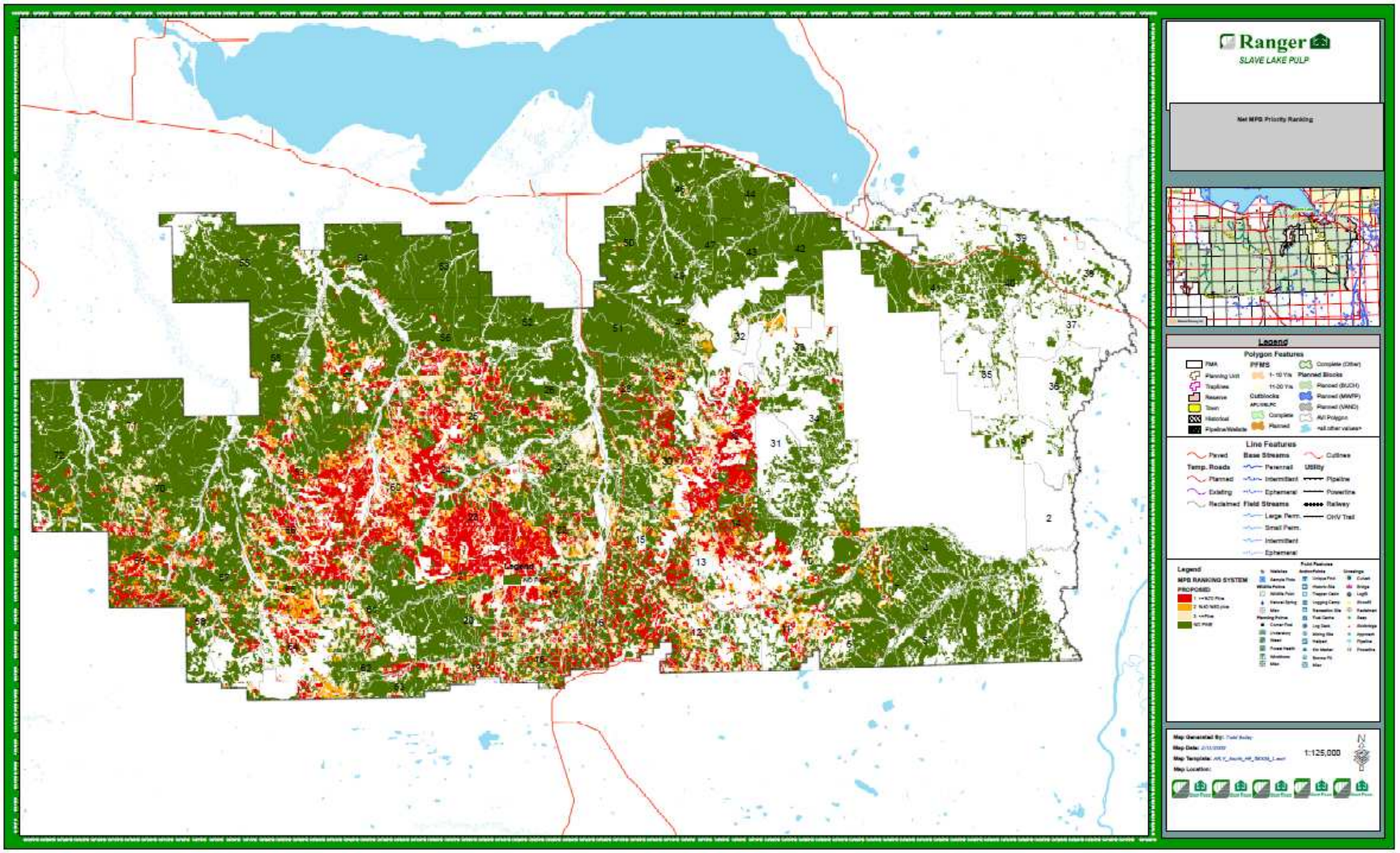


Figure 5 Net Land base MPB Priority Ranking



5.3 Yield Relationships

The approved 2002 yields[5] relationships were used for the timber supply analysis.

17 Yield Classes are used and are defined by:

- Species Group (CONDEC – C, CD, DC, D)
- Leading Species (SW, SB, PL, ALL - DECIDUOUS)
- Crown Closure (A/B and C/D)
- Natural Sub-Region (Upper foothills, Lower foothills/ Mixedwood, All)

Table 7 provides a summary of the yield stratification and Figure 6 provides the area weighted yield relationships for the AAC contributing land base (15+/10/30cm coniferous volume and 15+/10/30cm deciduous volume). The approved yield relationships do not provide for tree size estimates. This was not a requirement in the approved 2002 timber supply analysis. Therefore, no projection of tree size is provided in the timber supply analyses. Detailed yield relationships are provided in the previously submitted Net Land base submission on March 20, 2009 (Appendix 3).

Table 7 Yield Class and Description

Yield Class	Description	Transition
1	C-SW-10	C-SW-10-FS
2	C-SB-10	C-SB-10
3	C-PL-10	C-PL-10-FS
4	C-SW-MX	C-SW-MX-FS
5	C-SB-MX	C-SB-MX-FS
6	C-PL-MX	C-PL-MX-FS
7	CD-AB	CD-CD
8	CD-CD	CD-CD
9	DC-AB	DC-CD
10	DC-CD	DC-CD
11	D-AB	D-CD
12	D-CD	D-CD
101	C-SW-10-FS	C-SW-10-FS
103	C-PL-10-FS	C-PL-10-FS
104	C-SW-MX-FS	C-SW-MX-FS
105	C-SB-MX-FS	C-SB-MX-FS
106	C-PL-MX-FS	C-PL-MX-FS

Long run sustained yield averages (LRSYA) for the FMU have been calculated. Table 8 and Table 9 provides the yield class, transition, net area, maximum mean annual increment culmination age (coniferous and deciduous) and the contribution to LRYSA for standing and regenerated states respectively. LRSYA, Volume and MAI values are net of cull. In addition, area weighted coniferous/deciduous cull percentages are provided.

[5] Timber Supply Analysis – February 28, 2002 Submitted by Slave Lake Pulp Corporation

Figure 6 Area Weighted Coniferous and Deciduous Yield Relationships

Area Weighted Yields **Total Net Area:** 438,593

Age	Coniferous Volume (m3/ha)	Coniferous MAI (m3/ha/yr)	Deciduous Volume (m3/ha)	Deciduous MAI (m3/ha/yr)	Net Area (ha)
10	2.3	0.23	3.3	0.33	91,533
20	9.7	0.49	13.5	0.67	19,546
30	21.5	0.72	28.3	0.94	26,876
40	35.9	0.90	44.8	1.12	15,858
50	51.7	1.03	60.7	1.21	23,708
60	67.8	1.13	74.6	1.24	60,673
70	83.2	1.19	85.7	1.22	30,366
80	97.5	1.22	93.8	1.17	11,953
90	110.2	1.22	99.0	1.10	26,056
100	121.0	1.21	101.6	1.02	5,715
110	130.1	1.18	102.0	0.93	7,653
120	137.2	1.14	100.6	0.84	20,012
130	142.6	1.10	97.8	0.75	27,390
140	146.3	1.04	94.1	0.67	24,450
150	148.5	0.99	89.7	0.60	23,626
160	149.3	0.93	85.0	0.53	17,245
170	149.0	0.88	80.0	0.47	1,775
180	147.6	0.82	75.0	0.42	1,054
190	145.4	0.77	70.1	0.37	746
200	142.5	0.71	65.5	0.33	2,358

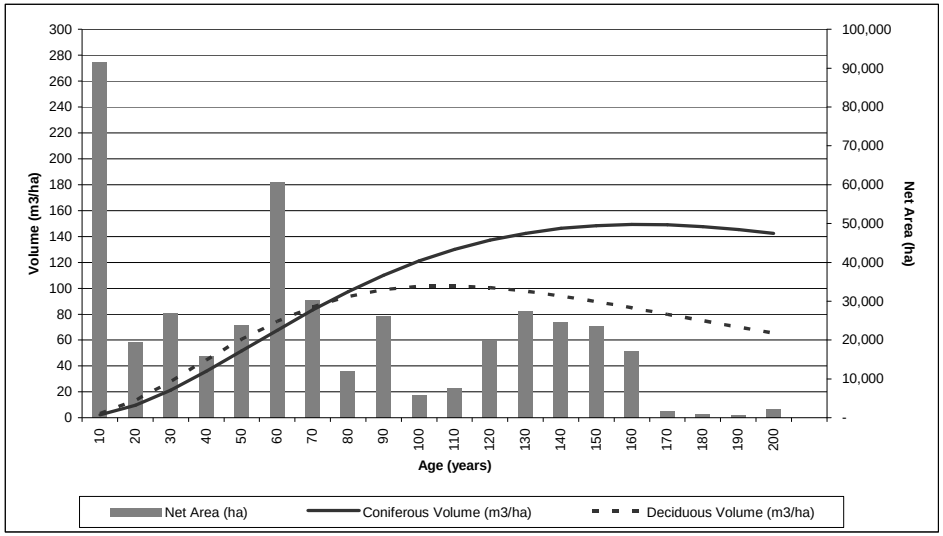


Table 8 Long Run Sustained Yield Average Calculations – Current State

			Coniferous				Deciduous				Average Cull	
Yield Class	Transition	Net Area	Volume	MAI	MAI Age	LRSYA	Volume	MAI	MAI Age	LRSYA	Coniferous	Deciduous
1	1	11,524	161.1	2.30	70	26,526	6.2	0.09	70	1,014	2.00%	10.00%
2	2	17,481	85.0	0.71	120	12,386	0.0	0.00	10	60	2.00%	10.00%
3	3	49,944	183.3	1.83	100	91,567	6.6	0.06	110	2,997	2.00%	10.00%
4	4	21,322	155.8	2.23	70	47,456	35.8	0.51	70	10,898	1.89%	10.00%
5	5	27,978	75.5	0.63	120	17,610	0.4	0.04	10	1,068	1.95%	10.00%
6	6	25,192	180.9	1.81	100	45,583	27.6	0.25	110	6,316	1.90%	10.00%
7	7	10,759	97.0	1.39	70	14,914	65.3	0.73	90	7,812	1.93%	10.00%
8	8	35,444	166.5	1.66	100	59,009	87.6	0.88	100	31,044	1.86%	10.00%
9	9	10,699	96.6	0.88	110	9,398	54.8	0.91	60	9,780	1.90%	10.00%
10	10	17,350	115.1	1.64	70	28,538	125.3	1.57	80	27,180	1.89%	10.00%
11	11	39,982	19.4	0.22	90	8,603	108.8	1.81	60	72,500	1.89%	10.00%
12	12	115,016	62.9	0.42	150	48,239	161.9	2.70	60	310,435	1.87%	10.00%
101	101	13,825	202.6	2.53	80	35,007	19.1	0.24	80	3,292	1.90%	10.00%
103	103	13,485	209.4	2.33	90	31,379	8.0	0.09	90	1,195	1.97%	10.00%
104	104	16,688	195.6	2.44	80	40,796	45.9	0.57	80	9,583	1.79%	10.00%
105	105	251	100.9	0.72	140	181	0.8	0.02	50	4	1.78%	10.00%
106	106	11,650	199.2	2.21	90	25,782	24.8	0.28	90	3,213	1.81%	10.00%
Totals		**438,593**	**114.9**	**1.19**	**108**	**542,974**	**73.0**	**1.11**	**72**	**498,391**	**1.91%**	**10.00%**

Table 9 Long Run Sustained Yield Average Calculations – Regenerated State

			Coniferous				Deciduous				Average Cull	
Yield Class	Transition	Net Area	Volume	MAI	MAI Age	LRSYA	Volume	MAI	MAI Age	LRSYA	Coniferous	Deciduous
1	101	11,524	202.6	2.53	80	29,179	19.1	0.24	80	2,744	2.00%	10.00%
2	2	17,481	85.0	0.71	120	12,386	0.0	0.00	10	60	2.00%	10.00%
3	103	49,944	209.4	2.33	90	116,220	8.0	0.09	90	4,427	2.00%	10.00%
4	104	21,322	195.6	2.44	80	52,124	45.9	0.57	80	12,244	1.89%	10.00%
5	105	27,978	100.9	0.72	140	20,157	0.8	0.02	50	450	1.95%	10.00%
6	106	25,192	199.2	2.21	90	55,751	24.8	0.28	90	6,949	1.90%	10.00%
7	8	10,759	166.5	1.66	100	17,913	87.6	0.88	100	9,424	1.93%	10.00%
8	8	35,444	166.5	1.66	100	59,009	87.6	0.88	100	31,044	1.86%	10.00%
9	10	10,699	115.1	1.64	70	17,599	125.3	1.57	80	16,762	1.90%	10.00%
10	10	17,350	115.1	1.64	70	28,538	125.3	1.57	80	27,180	1.89%	10.00%
11	12	39,982	62.9	0.42	150	16,769	161.9	2.70	60	107,915	1.89%	10.00%
12	12	115,016	62.9	0.42	150	48,239	161.9	2.70	60	310,435	1.87%	10.00%
101	101	13,825	202.6	2.53	80	35,007	19.1	0.24	80	3,292	1.90%	10.00%
103	103	13,485	209.4	2.33	90	31,379	8.0	0.09	90	1,195	1.97%	10.00%
104	104	16,688	195.6	2.44	80	40,796	45.9	0.57	80	9,583	1.79%	10.00%
105	105	251	100.9	0.72	140	181	0.8	0.02	50	4	1.78%	10.00%
106	106	11,650	199.2	2.21	90	25,782	24.8	0.28	90	3,213	1.81%	10.00%
Totals		**438,593**	**131.6**	**1.36**	**115**	**607,030**	**82.3**	**1.24**	**72**	**546,923**	**1.91%**	**10.00%**

5.4 Timber Supply Analysis

This section describes the approach and process of the AAC calculation. The AAC calculation is separated into three sections:

- Calculate the AAC using Remsoft Spatial Planning System Version 2008.12 and MOSEK Version 5.0.0.105.
  - Develop a spatial harvest sequence (SHS) using inputs from above.
  - Assess impacts on water yields and grizzly bear habitat using the Forest Research Institute's Grizzly Bear Model[6] and the University of Alberta's Water Yield Model[7].

Six scenarios are provided as per the interpretive bulletin and discussions in the Plan development team meetings. They include:

- Scenario 1 (2002 - Approved 2002 coniferous and deciduous AACs for comparison purposes.
- Scenario 2 (S20_v10 Status Quo) - The current approved FMP assumptions and land base(Non-spatial TSA only)
- Scenario 3 (S20_v5 Pine Prevention Strategy) - The scenario providing the level of harvest required to meet the ASRD guidelines (Non-spatial TSA only)
- Scenario 4 (S20_v8 Disaster Scenario) Non-spatial TSA only
- Scenario 5 (S20_v22 PFMS Base Run) – Provides the amount of MPB susceptible area after 15 Years
- Scenario 6 (S20_v25) - The proposed Preferred Forest Management Scenario including a spatial harvest sequence (SHS_v10).

In addition, the following concepts are recognized:

- A spatial harvest sequence is provided for both the coniferous and deciduous harvests.
- Stand level MPB infestation management (Level II) will be addressed at an operational level in consultation with ASRD staff.

The following section describes the input and outputs for both the Woodstock and spatial harvest sequencing analysis. A description of the input files (in brackets) specific to each scenario will be described, along with summary output information.

[6] Forest Research Institute's - Grizzly Bear Resource Selection Function and Grizzly Bear Mortality Risk Model. Updated in 2007 and revised in 2008
[7] University of Alberta - Cumulative Watershed Disturbance and Hydrologic Recovery Simulator version 1.0

5.4.1 STANDARD SCENARIO INFORMATION

Woodstock was used to optimize the AACs for each scenario. The standard assumptions are:

- 160 year planning horizon
- 15+/10/30cm coniferous and deciduous utilization in the planning horizon
- Coniferous cull deductions of 1.5% for FMUs S1, S1S, S2, S2S and 2% from FMUs S6 and S6S are applied. Deciduous cull deductions of 9% are applied for all units. This will provide net merchantable volumes used in the optimization
- 300 year life span for all types (Woodstock File S20.lif)
- Minimum harvest age of 70 years for coniferous and 50 years for deciduous
- One sustained yield unit
- Stable Growing stock in the remaining 4 periods (except for the Disaster Scenario)
- Ending average harvest age constraint not applied. Current DFMP constrains targeted average harvest age at the end of the planning horizon at 80 +/- 5 years.

Woodstock Landscape themes used in Scenarios 1 to 4:

This file *(mpb.lan)* provides the land base categories used. Categories are provided in Table 10 . The combination of these categories is referred to as a development type.

Table 10 Landscape Themes

Order	Name	Description
1	Sustained Yield Unit (SYU)	Defines the FMA and Non FMA areas within FMU R10
2	Compartment	Defines the smaller subunits of the FMU
3	Swan Hills Buffer	Identifies the area within 35km of the Swan Hills town site
4	Deletions	Defines contributing vs. non contributing land bases
5	Land Base	Defines coniferous vs. deciduous land bases
5	Dominant Species/MPB Rank	Defines MPB Risk
6	Yield Class	Defines the yield strata
7	Status	Defines standing vs. regeneration areas

Yields (S20_v.YLD)*

This file provides age dependent yield class projection information in 10 year age classes. The estimates are provided for age classes 0 to 200. The yield information file provides estimates by yield class for coniferous volume (yConifVol) and deciduous volume (yDecidVol) at a 15+/10/30cm utilization standard (Appendix 3 provides the individual Yield Relationships).

Actions (S20.act) – Scenarios 1,2,3,5 and 6 only

This file defines the coniferous and deciduous harvest actions applied to the land base. Actions are constrained to the coniferous and deciduous land base, net land base and minimum harvest age. Minimum harvest ages for coniferous harvests are set to 70 years while the minimum for deciduous harvests is set to 50 years.

Transition (S20.trn)

This file defines the yield class transitions after coniferous and deciduous harvest. Yield transitions assume a fully stocked state after harvest (i.e. All A/B stands will move to C/D curves), a 0 year regeneration lag, and 15+/10/30cm coniferous and deciduous volumes. All harvested stands are assigned a regeneration status (RT). A development type that senesces will transition to the same yield class. Table 11 provides a summary of the yield transitions.

Table 11 Yield Transitions

Yield Class	Description	Fully Stocked Transition	MPB Infestation Transition (Scenario 4 Only)
1	C-SW-10	101	1
2	C-SB-10	2	2
3	C-PL-10	103	3
4	C-SW-MX	104	4
5	C-SB-MX	105	5
6	C-PL-MX	106	6
7	CD-AB	8	7
8	CD-CD	8	8
9	DC-AB	10	9
10	DC-CD	10	10
11	D-AB	12	11
12	D-CD	12	12
101	C-SW-10-FS	101	101
103	C-PL-10-FS	103	103
104	C-SW-MX-FS	104	104
105	C-SB-MX-FS	105	105
106	C-PL-MX-FS	106	106

Optimize (S20.opt)

This file defines the objective function and constraints. The objective is to maximize total fibre harvested (coniferous and deciduous) over a 160 year planning horizon, subject to sustainable coniferous and deciduous harvest flow constraints.

Queue (S20.que)

This file provides the stand sequencing priority. The objective is to harvest oldest stands first, subject to other constraints.

5.4.2 SCENARIO 1 – APPROVED 2002 TIMBER SUPPLY ANALYSIS

The approved Forest Management Plan was completed in 2002. Coniferous and deciduous harvest levels are provided for comparison to the subsequent scenarios.

5.4.3 SCENARIO 2 - THE CURRENT APPROVED FMP (S20_V10) STATUS QUO

This scenario provides the AAC based on the assumptions used in the 2002 amended timber supply analysis. The only change was that the updated land base will be used.

The assumptions, in addition to those listed in Section 5.4.1are:

- Even flow harvest over the planning horizon.
- No compartment sequencing
- All yield transitions to fully stocked state
- Areas file - S20_v1.are – 435,379 ha
- Yield file -S20_v1.yld

5.4.3.1 Woodstock files

Areas File (S20_v1.are)

This file provides the age (10 year periods) and area information for each of the development types. This file is created from the land base file and was updated to include more recent information.

Ages where classed into 10 year periods (e.g. Age Class 1 = 0 to 10 years, Age Class2 = 11 to 20 years, etc.).

5.4.4 SCENARIO 3 - ASRD PINE PREVENTION STRATEGY (S20_V5)

This scenario provides the AAC based on the guidelines provided in the Interpretive Bulletin – Planning Mountain Pine Beetle Response Operations (Version 2.6 September, 2006). It used scenario S20_v10 as base.

The assumptions, in addition to those listed in Section 5.4.1are:

- Even flow harvest in the first 20 years and even flow harvest from 21 to 160 years, which will be at different levels.
- Reduce the susceptible area to 75% of that calculated in period 2 of Scenario 2 (S20_v10).
- No compartment sequencing
- All yield transitions to fully stocked state
- Areas file - S20_v3.are
- Yield file -S20_v3.yld

5.4.4.1 Woodstock files

Areas File (S20_v3.are)

This file provides the age (10 year periods) and area information for each of the development types. This file is created from the land base file and was updated to include more recent information.

Ages where classed into 10 year periods (e.g. Age Class 1 = 0 to 10 years, Age Class2 = 11 to 20 years, etc.)

The total active area of FMU S20 = 438,587 ha. This area is 6 ha less than the area provided in the land base document (438,593 ha). This is due the rounding of the area values.

5.4.5 SCENARIO 4 - DISASTER SCENARIO (S20_V8)

This scenario illustrates the effect on AAC levels given a catastrophic Mountain Pine Beetle out break.

The assumptions are:

- Even flow harvest in the first 20 years and even flow harvest from 21 to 160 years.
- Reduce the susceptible area to 75% of that calculated in period 2 of Scenario 2 (MPB_v2).
- Minimum harvest age of 70 years for coniferous and 50 years for deciduous
- No compartment sequencing
- Stands on the AAC contributing land base with <= 60% pine component will have their volumes reduced proportionally after 20 years. When harvested they will transition to a fully stocked state with a 0 year regeneration lag. These stands are assumed to be salvaged. Therefore, salvaged volume contributes to the AAC.
- Stands with >= 70 % are assumed to be killed in the first 10 years. No yield curve transitions are assumed (i.e stands remain on their current yield curves).
- Areas file - S20_v5.are
- Yield file -S20_v3.yld

5.4.5.1 Woodstock files

Information required by Woodstock includes:

Landscape Themes (mpb.Lan)

These are categorized as per Table 12.

Table 12 Landscape Themes

Order	Name	Description
1	Land Base	Defines coniferous vs. deciduous land bases
2	Dominant Species/MPB Rank	Defines MPB Risk
3	Pine Proportion	Defines the proportion of pine as defined by AVI

Order	Name	Description
4	Yield Class	Defines the yield strata
5	Status	Defines standing vs. regeneration areas (2 and 15 year lags)

Areas File (S20_v5.are): This file is created from the land base file It is an aggregation of stands as per Table 12 and age in 10 year periods. Ages where classed into 10 year periods (e.g. Age Class 1 = 0 to 10 years, Age Class2 = 11 to 20 years, etc.).

The total active area of FMU S20 = 438,587 ha.

Yields (S20_v3.YLD)

The yield information file contains age dependent yield estimates by yield class for Coniferous 15+/10/30cm volume (yConifVol) and Deciduous 15+/10/30cm volume (yDecidVol) (Appendix 3 provides the individual Yield Relationships).

Actions S20.act

This file defines the coniferous and deciduous harvest actions applied to the land base.

Two actions have been identified:

- Harvest (aTotalHarv). This action constrains the coniferous and deciduous harvests to the contributing 15+/10/30cm coniferous and deciduous land bases. The coniferous harvests is constrained to the rank of 1 and 2 stands for the first 2 periods and the entire contributing land base for the remainder of the planning horizon. The deciduous harvest is constrained to the entire deciduous contributing land base for the entire planning horizon.
- Total infestation. This action causes mortality on the coniferous land base in the first period of the planning horizon if the stand is not harvested.

Transition (S20.trn)

This file defines the yield class transitions after coniferous and deciduous harvest and total infestations.

Yield transitions assume a fully stocked state after harvest (i.e. All A/B stands will move to C/D curves), a 0 year regeneration lag, and gross merchantable 15+/10/30cm coniferous and deciduous volumes and a 15 year lag after total infestation. All harvested stands are assigned a regeneration status. Any development type that senesce will transition to the same yield class. Table 11 provides a summary of the yield transitions.

Optimize (mpb.opt)

This file defines the objective function and constraints. The objective is to maximize total fibre harvested (coniferous and deciduous) over a 160 year planning horizon, subject to an even flow of net (pine volume removed) coniferous harvest in periods 1

and 2 and net even flow coniferous harvest in periods 3 to 16 and even flow deciduous harvest over the entire planning horizon. The flow volumes are allowed to fluctuate by 5% of the average volume of the planning horizon.

5.4.6 SCENARIO 5 - SLAVE LAKE PULP CORPORATION PREFERRED MANAGEMENT SCENARIO (S20_V22 PFMS BASE RUN)

This scenario provides the AAC based on the assumptions used in the 2002 amended timber supply analysis. The only change was that the updated land base will be used.

The assumptions, in addition to those listed in Section 5.4.1are:

- Even flow harvest over the planning horizon.
- 5 year projection periods
- No compartment sequencing
- All yield transitions to fully stocked state

5.4.6.1 Woodstock files

Areas File (S20_v8.are)

This file provides the age (5 year periods) and area information for each of the development types. This file is created from the land base file and was updated to include more recent information.

Ages where classed into 5 year periods (e.g. Age Class 1 = 0 to 5 years, Age Class2 = 6 to 10 years, etc.).

Yields (S20_v6.YLD)

The yield information file contains age dependent yield estimates by yield class for Coniferous 15+/10/30cm volume (yConifVol) and Deciduous volume (yDecidVol) (Appendix 3 provides the individual Yield Relationships).

5.4.7 SCENARIO 6 - SLAVE LAKE PULP CORPORATION PREFERRED MANAGEMENT SCENARIO (S20_V25 PFMS)

This scenario is the preferred forest management scenario (PFMS).

It outlines proposed harvest levels for Slave Lake Pulp Corporation and other embedded operators. It used Scenario 2 (S20_v22) as a base

Access to the FMU has been constrained at the compartment level. Specific entry to compartments has been restricted to ensure a logical flow of wood and to manage haul distances. Appendix 4 provides the compartment sequence.

A minimum White Spruce harvest has been selected in order to facilitate deciduous volume flow from both mixed wood and pure deciduous stands. It is particularly important for SLP to have a balanced wood flow in order to prevent post surge deciduous volume being generated from primarily mixed wood stands.

The assumptions, in addition to those listed in Section 5.4.1 are:

- Even flow harvest in the first 15 years.

- Constrained to not allow coniferous AAC to drop below 90% of the coniferous AAC defined in S20_v22 for periods 4 to 32 (years 16 to 160)
- Even flow deciduous harvest over the entire 160 year planning horizon.
- Coniferous AAC constrained to be within 5% of the running average of the coniferous AAC for periods 14–32 (66-160 years)
- The total growing stock is maintained at an even flow level for the last quarter of the planning horizon (periods 25 to 32 – years 121 to 160).
- Constraint to ensure all planned harvest blocks are harvested in the first period
- Harvest area constraints for compartments SL50, SL55 and SL41
- Ensure as minimum White Spruce harvest of 120,000m^3 per year for the first 5 periods (25 years).
- Ensure deciduous area harvested does not fluctuate by more than 10% in the first eight periods (40 years)
- Ensure fir volume harvested does not fluctuate by more than 10% in the first three periods (15 years)
- Total old growth is not less than 1% of the active land base
- 3 Period (15 year) surge period

5.4.7.1 Woodstock files

Information required by Woodstock includes:

Areas File (S20_v8.are)

This file provides the age (5 year periods) and area information for each of the development types. This file is created from the land base file and was updated to include more recent information.

Ages where classed into 5 year periods (e.g. Age Class 1 = 0 to 5 years, Age Class2 = 6 to 10 years, etc.).

The total active area of FMU S20 = 438,593 ha.

5.4.7.2 Spatial Harvest Sequence

The intent of this plan was to develop a 70 year spatial harvest sequence. During the spatial allocation, stands were only allowed to be scheduled once and not allowed for re-entry in the second rotation.

The approach is to use, wherever possible, existing designs. Where complete designs exist (i.e. first, second and third pass blocks have been identified) the entire block will define the Sequence.

The process to develop the SHS involved 3 steps:

- Schedule first two periods (10 years) to ensure pre-blocks are scheduled in the first 10 years and lock in the block schedule.

- Schedule periods 3 and 4.
- Schedule periods 5 to 32.

The following parameters are used to develop the SHS.

- Allow 1 period deviation
- 100 m adjacency
- 2.5 ha minimum block size
- 50 ha target block size
- 0 m proximal distance
- 0 yr green up
- 1000 ha maximum block size

This process developed a 70 year coniferous SHS and a 50 year deciduous SHS.

The SHS represents the PFMS that takes into consideration the most current scientific knowledge and economic considerations. It is anticipated that very few changes will be required to the SHS. Most of these changes will be made at the block and stand level. The factors most likely to trigger changes would be variations between inventory and field verifications, changes in mill capacity, weather, and changes to market conditions.

A summary of the Woodstock targets are provided in Appendix 5. Figure 7 provides a map of the final spatial harvest sequence by operator. Figure 8 provides a map of the cover group distributions for the spatial harvest sequence. The plan assumes no cover group transitions other then to fully stocked yield curves, therefore, this distribution applies for the entire planning horizon.

The average score for the 20 year projection is 100.0% (11,638,945 m^3 (SHS) / 11,636,416 m^3 (aspatial) for the deciduous objective and 99.4% (15,424,345 m^3 (SHS) / 15,513,461 m^3 (aspatial) for the coniferous objective. See Appendix 5 for SHS playback results.

The average block size for the 20 year period is 27.65 ha with a maximum size of 1000 ha and a minimum of less than 1 ha. Blocks with an area of less than the minimum criteria (2.5 ha) are the preblocks.

Slave Lake Pulp Corporation will be completing field verification of these areas with regional staff prior to finalization of the operational harvest plans.

5.4.7.3 Spatial Sequence Evaluation

The currently approved SLP DFMP outlines a number of monitoring protocols and commitments that fall within the timeframe of the Stewardship report. Variance from the approved Spatial Harvest Sequence is summarized in this report.

The FMP submission includes a seventy-year spatial sequence with the focus on the first fifteen years being operational. It is recognized that the spatial sequence is intended to be operational but the AVI and volume sampling were undertaken as a broad landscape level analysis. This transition to operational level planning will result

in some deviation from the sequence for a variety of reasons. It is the intent of the forest companies to annually monitor the deviations from the selected sequence. These deviations may be too variable to reconcile on an annual basis and will thus be analyzed on the longer five-year term.

The ASRD variance tracking system as stated under section 4.1 Stand Utilization of the Slave Lake Regional Operating Ground Rules (approval pending) will be used to track variance from the resulting approved 15 year Spatial Harvest Sequence.

Figure 7 10 Year Spatial Harvest Sequence - Operator Allocation

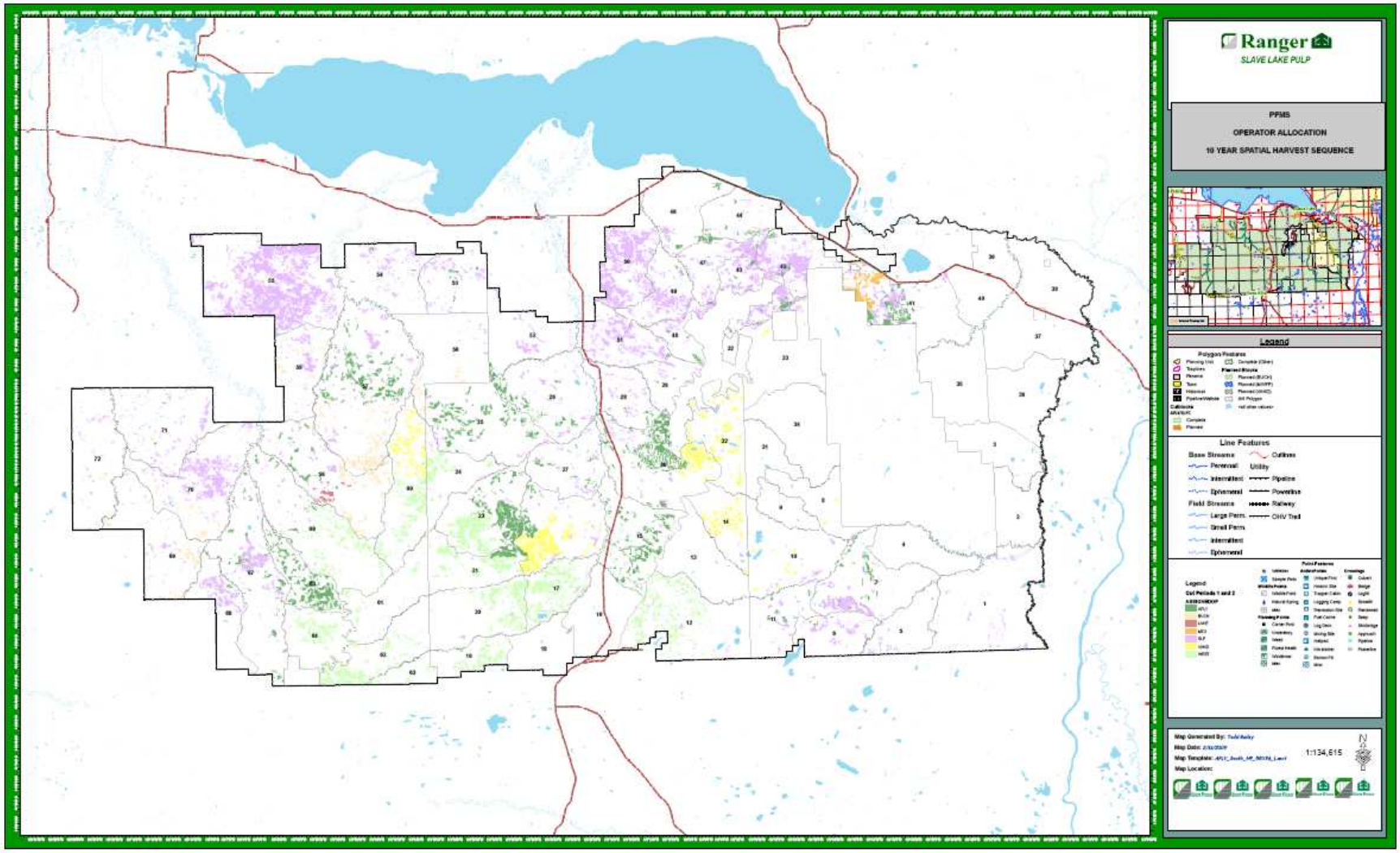
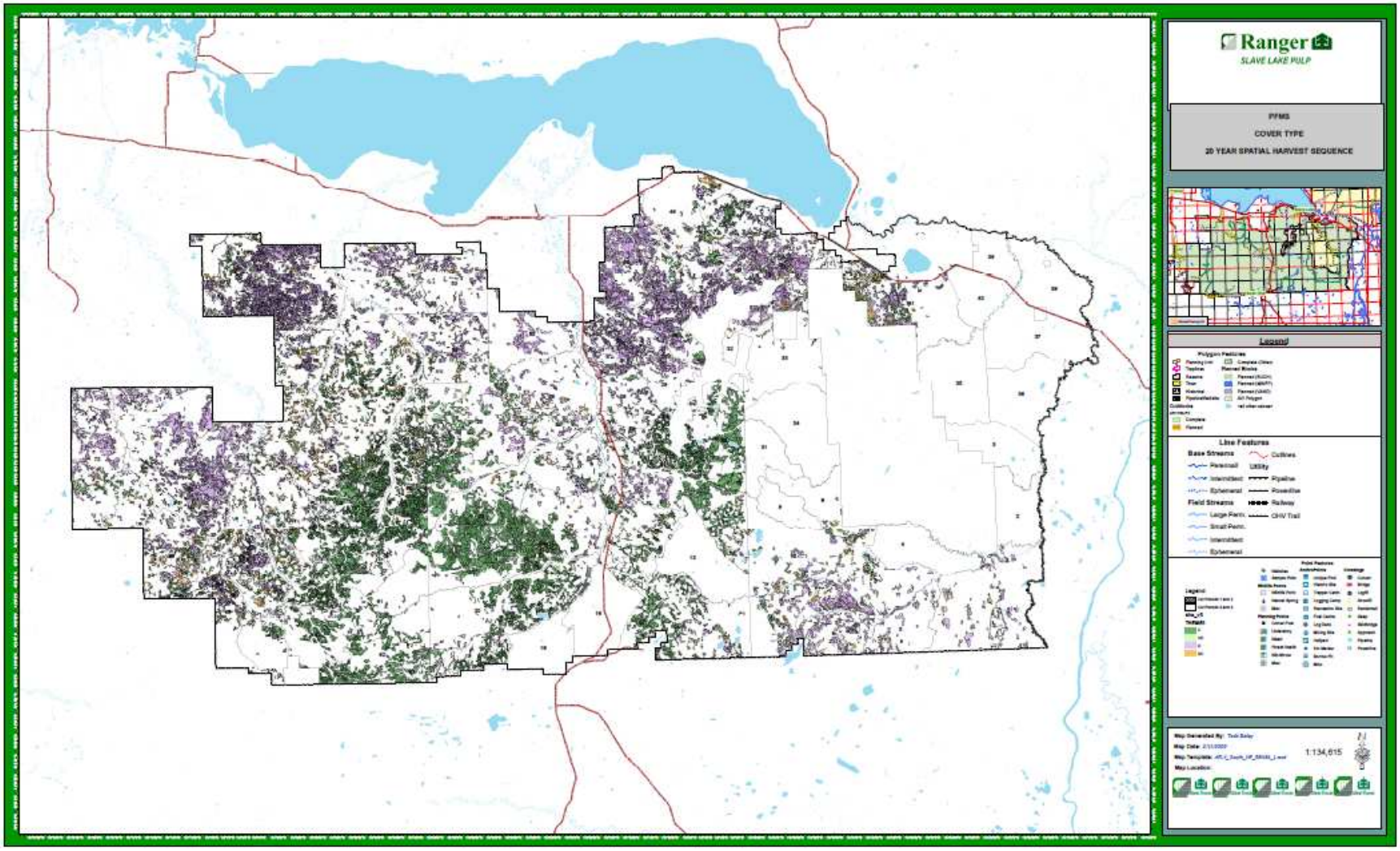


Figure 8 20 Year Spatial Harvest Sequence - Cover Groups



5.4.8 SUMMARY OF RESULTS

Each scenario is compared to the approved AAC. Long run sustained yield averages and 15+/10/30cm net merchantable volume estimates are provided.

A comparison of each of the aspatial scenarios is provided in Table 13. The harvest levels provided by the SHS vary somewhat from the aspatial PFMS. Table 14 provides the SHS harvest levels with a comparison to the aspatial solution.

Table 13 Summary of Results

				Coniferous AAC (Surge Period)		Coniferous AAC (Post Surge)							
Run	**Name**	**Description**	**Comments**	**AAC**	**Change to 2002 FMP**	**AAC**	**Change to 2002 FMP**	**Deciduous AAC**		**Total AAC**		**MPB Risk after 20 years**	
2002	**2002 DFMP**			**593,500**				**543,194**		**1,136,694**			
S20_v10	**Status Quo**	**Duplicate 2002 TSA - One Land Base - Even Flow Total Growing Stock for last 4 Periods**	**Min Coniferous/ Deciduous Harvest Ages = 70/50**	**583,241**	**-1.7%**	**583,241**	**-1.7%**	**555,537**	**2.3%**	**1,138,778**	**0.2%**	**58,311**	
S20_v5	**Pine Prevention Strategy**	**Pine Prevention Strategy - 20 Year Surge**	**Reduce Susceptable Stand area by 75% in first 20 Years**	**755,171**	**27.2%**	**573,080**	**-3.4%**	**566,149**	**4.2%**	**1,321,320**	**16.2%**	**14,578**	**25.0%**
S20_v8	**Disaster Scenario**	**Disaster Scenario**	**Disaster Scenario Landbase - Updated 2002 Land base for harvest, fires and deletions - Net Land base Only**	**682,899**	**15.1%**	**91,979**	**-84.5%**	**558,598**	**2.8%**	**1,241,498**	**9.2%**		
S20_v22	**PFMS - Base Run**	**Preferred Forest Management Scenario - Set Baseline AAC**	**Even flow Coniferous/Deciduous Harvest, No Compartments Sequencing**	**619,229**	**4.3%**	**619,229**	**4.3%**	**577,925**	**6.4%**	**1,197,154**	**5.3%**	**56,650**	
S20_v25	**PFMS**	**Preferred Forest Management Scenario**	**15 year Surge, Reduce MPB Risk Area in Period 2 to 75% of S20_v22 period 4 area, Even flow Deciduous Harvest, Compartments Sequenced**	**848,458**	**43.0%**	**557,303**	**-6.1%**	**581,829**	**7.1%**	**1,430,286**	**25.8%**	**14,729**	**26.0%**
							-10.0%						

Table 14 Spatial Harvest Sequence Harvest Levels

	Scheduled Volume		
Period	**Coniferous**	**Deciduous**	**Total**
1	4,164,951	2,918,529	7,083,479
2	4,241,136	2,908,672	7,149,808
3	4,146,164	2,908,821	7,054,985
Total	12,552,250	8,736,021	21,288,272
AAC	836,816	582,401	1,419,218
Aspatial	848,458	581,829	1,430,286
Variance	-1.37%	0.10%	-0.77%

5.4.9 PFMS HARVEST LEVEL DETERMINATION AND ALLOCATIONS

The ASRD Pine Prevention Strategy (S20_v5) results in a harvest level of 755,171 m^3 (15+/10/30cm) for the 20 year projection. This harvest level will reduce the area of Rank 1 and 2 stands to 25% of that provided in the currently approved FMP.

A modeled coniferous harvest volume of 836,816 m^3 was achieved in the PFMS (S20_v25), based on constraints that were imposed on 15 year surge, even flow deciduous, compartment sequencing, volume flow from compartments SL41, SL50 and SL55, and ending growing stock. This harvest level will reduce the amount of Rank 1 and 2 stands to 26% of that provided at the currently approved FMP. The spatially feasible post surge coniferous AAC (year 16 – 70) will be 518,514 m^3.

A modeled deciduous harvest volume of 562,111 m^3 was achieved in the PFMS (S20_v25). This average deciduous harvest volume is over the spatially sequenced period (50 years).

The PFMS used a total harvest flow constraint of +/- 5% of the running average as opposed to using the average over the entire planning horizon. This resulted in a harvest flow in excess of the +/- 5% as outlined in the planning standard guideline. The primary objective of reducing the mountain pine beetle risk has been met. This variation in harvest flow level represents little risk to other timber and non timber values. Future re-planning will address this flow constraint to ensure consistency with the planning standard.

Table 15 Recommended Harvest Level Allocations

Company	Allocation (%)	PFMS Harvest Level	0.4% Cut Reduction[1] Industrial Timber Salvage	1% Cut Reduction Structure Retention	Sustainable Deciduous AAC (m3/yr)
Deciduous Timber					
Slave Lake Pulp Corporation	98%	550,869	2203	5,509	543,157
Deciduous MTU[3]	2%	11,242	45	112	11,085
Total	**100%**	**562,111**	2248	5,621	**554,242**
Coniferous Timber					
	Allocation (%)	**PFMS Harvest Level**	**1.2% Cut Reduction[2] Industrial Timber Salvage**	**1% Cut Reduction Structure Retention**	**Sustainable Coniferous AAC (m3/yr)**
Alberta Plywood Ltd.	39.0600%	326,860	3,922	3,269	319,669
Buchanan Lumber	9.9625%	83,368	1,000	834	81,534
Lakeshore Timber Co.	1.8075%	15,125	182	151	14,792
Millar Western Forest Products Ltd.	33.8225%	283,032	3,396	2,830	276,806
Slave Lake (S6) MTU	0.7700%	6,444	77	64	6,303
Vanderwell Contractors (1971) Ltd.	14.5775%	121,987	1,464	1,220	119,303
Total	**100.00%**	**836,816**	10,041	8,368	**818,407**

[1] As outlined in the April 3, 2003 Approval Decision document
[2] As outlined in the April 3, 2003 Approval Decision document
[3] Portioned out to Lakeshore Timber Co. and S6 MTU

5.5 Road Corridor Plan

Slave Lake Pulp Corporation has developed a Road Corridor Plan to access compartments that will be sequenced in the next fifteen years (See Table 16 and Figure 9). The road plan is currently the first approximation of the compartment entry points and alignments based on current information. Currently no new permanent, all-weather roads are being developed and existing infrastructure will be utilized.

As more information becomes available and the compartments scheduled access nears, more detailed plans will be developed. In addition to identifying access to the compartments, this information will be used in future modeling to assess impacts on Grizzly Bear habitat.

Fifty seven compartments will be accessed as part of the Plan (See Appendix 4).

Table 16 Road Plan Compartments

Compartment	Compartment
SL1	SL5
SL10	SL50
SL11	SL51
SL12	SL52
SL14	SL53
SL15	SL54
SL17	SL55
SL19	SL56
SL20	SL57
SL21	SL58
SL22	SL59
SL23	SL6
SL24	SL60
SL25	SL61
SL26	SL62
SL27	SL63
SL28	SL64
SL29	SL65
SL30	SL66
SL32	SL67
SL33	SL68
SL41	SL69
SL42	SL7
SL43	SL70
SL44	SL71
SL45	SL72
SL46	SL8
SL47	
SL48	
SL49	

Figure 9 Road Corridor Plan

5.6 Non-Timber Values

Analysis of the impacts the MPB strategy has on non-timber values is required. For the Plan, three values have been analyzed. This analysis was completed on the preferred forest management scenario only.

- Grizzly Bear Habitat
- Water Yields
- Seral Stage

5.6.1 GRIZZLY BEAR

The Foothills Model Forest Grizzly Bear RSF and Risk calculators (release 2007) were used in this analysis. This model assesses the impacts of disturbances (harvest and roads) on the resource selectivity function, mortality risk and safe harbour. Figure 10 provides the areas of core and secondary Grizzly Bear Habitat Zones.

Two time periods (2009 to 2019) have been modelled to assess the impact of harvests and roads. Three input layers have been created to complete the grizzly bear habitat and risk modelling. They include:

- Grizzly Bear Watershed Units define the extent of the analysis
- Harvest blocks including actual approved blocks and blocks created as part of the spatial harvest sequencing.
- LOC and permanent roads.

The modeling was completed in 3 phases:

- Calculate the Resource Selectivity Function (RSF) using the RSF Calculator for spring, summer and fall seasons and determine the maximum RSF of the three seasons. Harvest blocks and constructed roads information was used for each time period as inputs.
- Calculate the mortality risk using the risk calculator, the open road and harvest information for each period as input.
- Calculate the safe harbour by combining the RSF and Risk layers.
- Calculate the road density (km/km^2) for each grizzly bear watershed (GBWU) unit and for the FMU.

Summaries of Mortality Risk, RSF and Safe Harbour are provided by GBWU and for the FMU as a whole Table 17. Figure 11, Figure 12 and Figure 13 show changes in Mortality Risk, RSF and Safe Harbour respectively or two time periods (2009 to 2019).

Table 17 Grizzly Bear Analysis Summary

Area of Interest	Habitat Zone	Area (km^2)	Index	Current (2009)	Future (2019)	Difference +/-	% Change
GBWU 234	Secondary	455	Mean Mortality Risk	4.94	5.68	0.735	14.9%
		455	Maximum RSF	5.42	6.43	1.013	18.7%
		455	Safe Harbour Index	0.84	0.70	(0.141)	-16.7%
		455	Open route Density	0.78	0.78	-	0.0%
GBWU 235	Secondary	911	Mean Mortality Risk	4.28	4.83	0.549	12.8%
		911	Maximum RSF	5.72	6.80	1.087	19.0%
		911	Safe Harbour Index	1.33	1.14	(0.190)	-14.2%
		911	Open route Density	1.03	1.03	-	0.0%
GBWU 236	Core	128	Mean Mortality Risk	3.43	4.14	0.707	20.6%
		128	Maximum RSF	6.72	7.61	0.891	13.3%
		128	Safe Harbour Index	1.87	1.50	(0.363)	-19.4%
		128	Open route Density	0.51	0.51	-	0.0%
GBWU 238	Core	309	Mean Mortality Risk	5.99	6.22	0.230	3.8%
		309	Maximum RSF	8.73	8.94	0.208	2.4%
		309	Safe Harbour Index	0.67	0.60	(0.069)	-10.4%
		309	Open route Density	0.52	0.52	-	0.0%
GBWU 239	Secondary	312	Mean Mortality Risk	3.02	3.97	0.946	31.3%
		312	Maximum RSF	5.37	6.64	1.269	23.6%
		312	Safe Harbour Index	1.71	1.21	(0.494)	-29.0%
		312	Open route Density	0.59	0.59	-	0.0%
GBWU 241	Secondary	561	Mean Mortality Risk	4.65	5.01	0.365	7.9%
		561	Maximum RSF	6.56	7.61	1.049	16.0%
		561	Safe Harbour Index	1.51	1.38	(0.136)	-9.0%
		561	Open route Density	2.14	2.14	-	0.0%
GBWU 243	Core	603	Mean Mortality Risk	7.29	7.58	0.294	4.0%
		603	Maximum RSF	7.22	7.62	0.400	5.5%
		603	Safe Harbour Index	0.47	0.43	(0.046)	-9.7%
		603	Open route Density	0.92	0.92	-	0.0%
GBWU 245	Core	83	Mean Mortality Risk	2.76	3.24	0.480	17.4%
		83	Maximum RSF	6.23	6.73	0.501	8.0%
		83	Safe Harbour Index	2.37	1.74	(0.631)	-26.6%
		83	Open route Density	0.36	0.36	-	0.0%
GBWU 246	Core	774	Mean Mortality Risk	4.61	5.01	0.391	8.5%
		774	Maximum RSF	7.39	8.19	0.793	10.7%
		774	Safe Harbour Index	1.83	1.62	(0.218)	-11.9%
		774	Open route Density	1.27	1.27	-	0.0%
GBWU 249	Secondary	397	Mean Mortality Risk	7.11	7.28	0.165	2.3%
		397	Maximum RSF	7.42	8.38	0.960	12.9%
		397	Safe Harbour Index	0.72	0.82	0.103	14.4%
		397	Open route Density	3.56	3.56	-	0.0%
GBWU 250	Core	7	Mean Mortality Risk	7.74	7.75	0.008	0.1%
		7	Maximum RSF	9.61	9.65	0.036	0.4%
		7	Safe Harbour Index	0.92	0.92	0.001	0.1%
		7	Open route Density	1.08	1.08	-	0.0%
GBWU 253	Secondary	1	Mean Mortality Risk	8.33	8.30	(0.031)	-0.4%
		1	Maximum RSF	9.29	9.35	0.059	0.6%
		1	Safe Harbour Index	0.93	0.95	0.026	2.8%
		1	Open route Density	10.04	10.04	-	0.0%
FMU S20	Core	1,904	Mean Mortality Risk	5.53	5.89	0.358	6.5%
		1,904	Maximum RSF	7.47	8.03	0.565	7.6%
		1,904	Safe Harbour Index	1.23	1.07	(0.166)	-13.5%
		1,904	Open route Density	0.95	0.95	-	0.0%
	Secondary	2,637	Mean Mortality Risk	4.75	5.28	0.531	11.2%
		2,637	Maximum RSF	6.06	7.13	1.068	17.6%
		2,637	Safe Harbour Index	1.24	1.08	(0.162)	-13.1%
		2,637	Open route Density	1.55	1.55	-	0.0%

Figure 10 Grizzly Bear Watershed Units and Habitat Zones

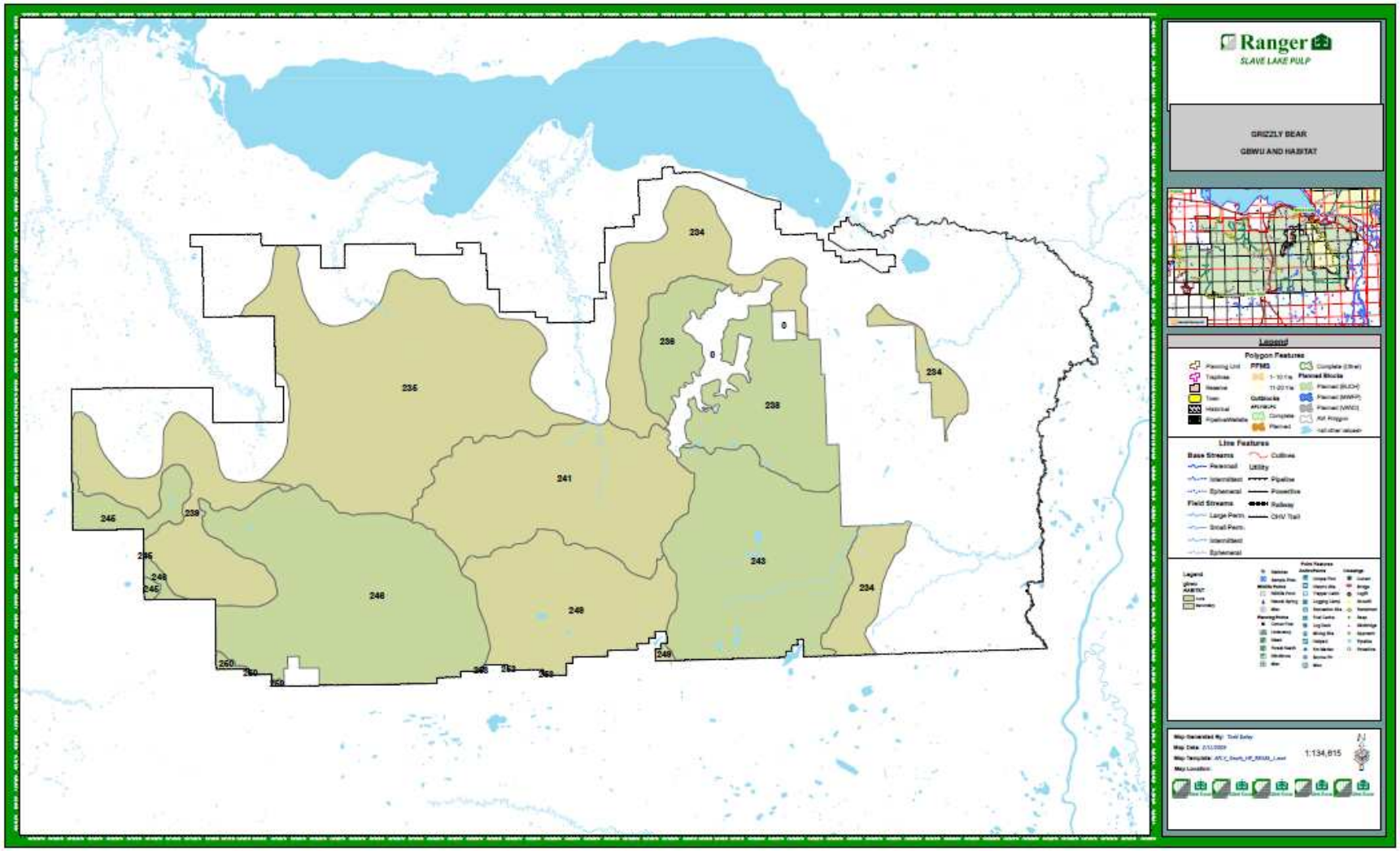


Figure 11 Grizzly Bear Analysis – Mortality Risk

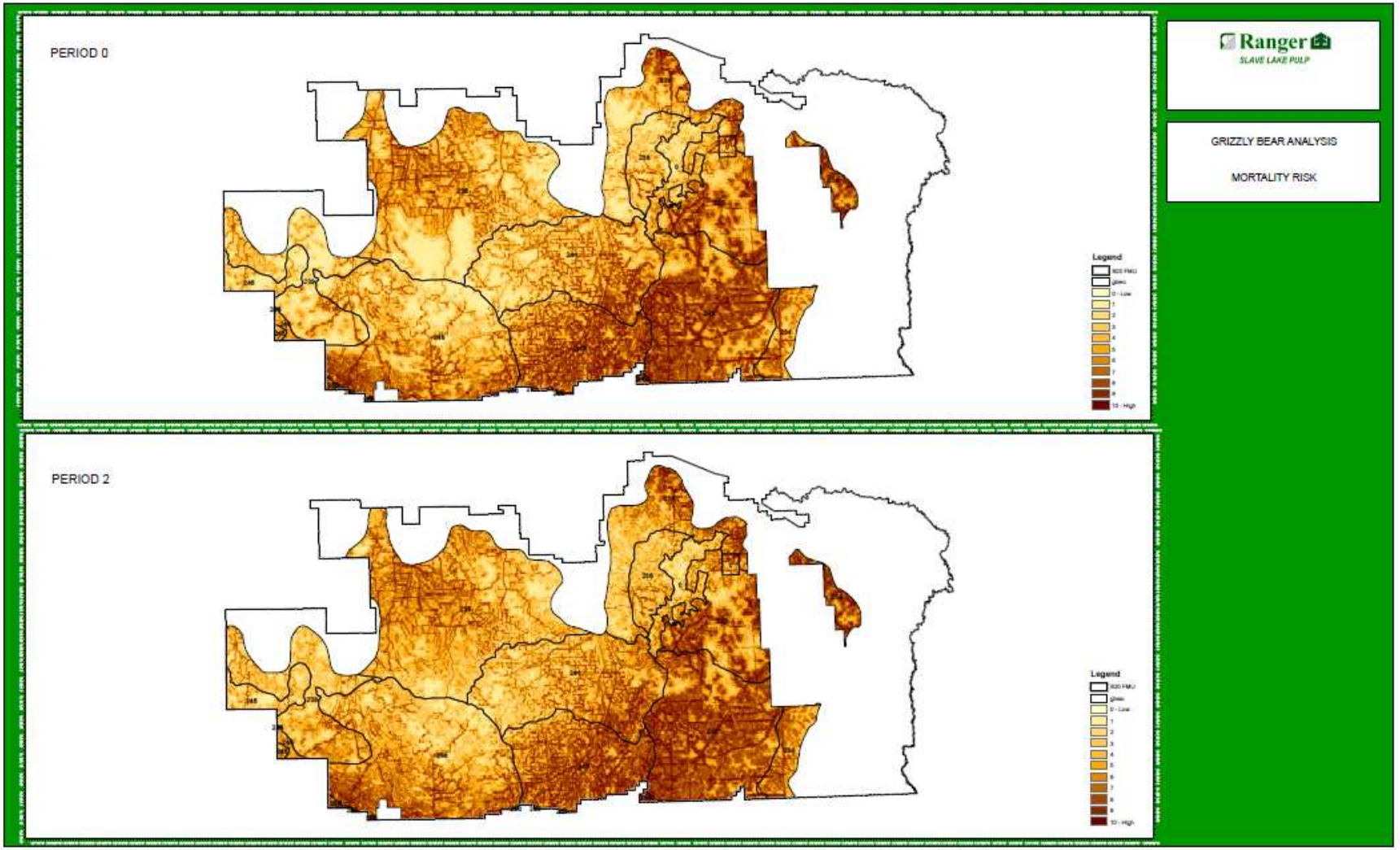


Figure 12 Grizzly Bear Analysis – Resource Selectivity Function (RSF)

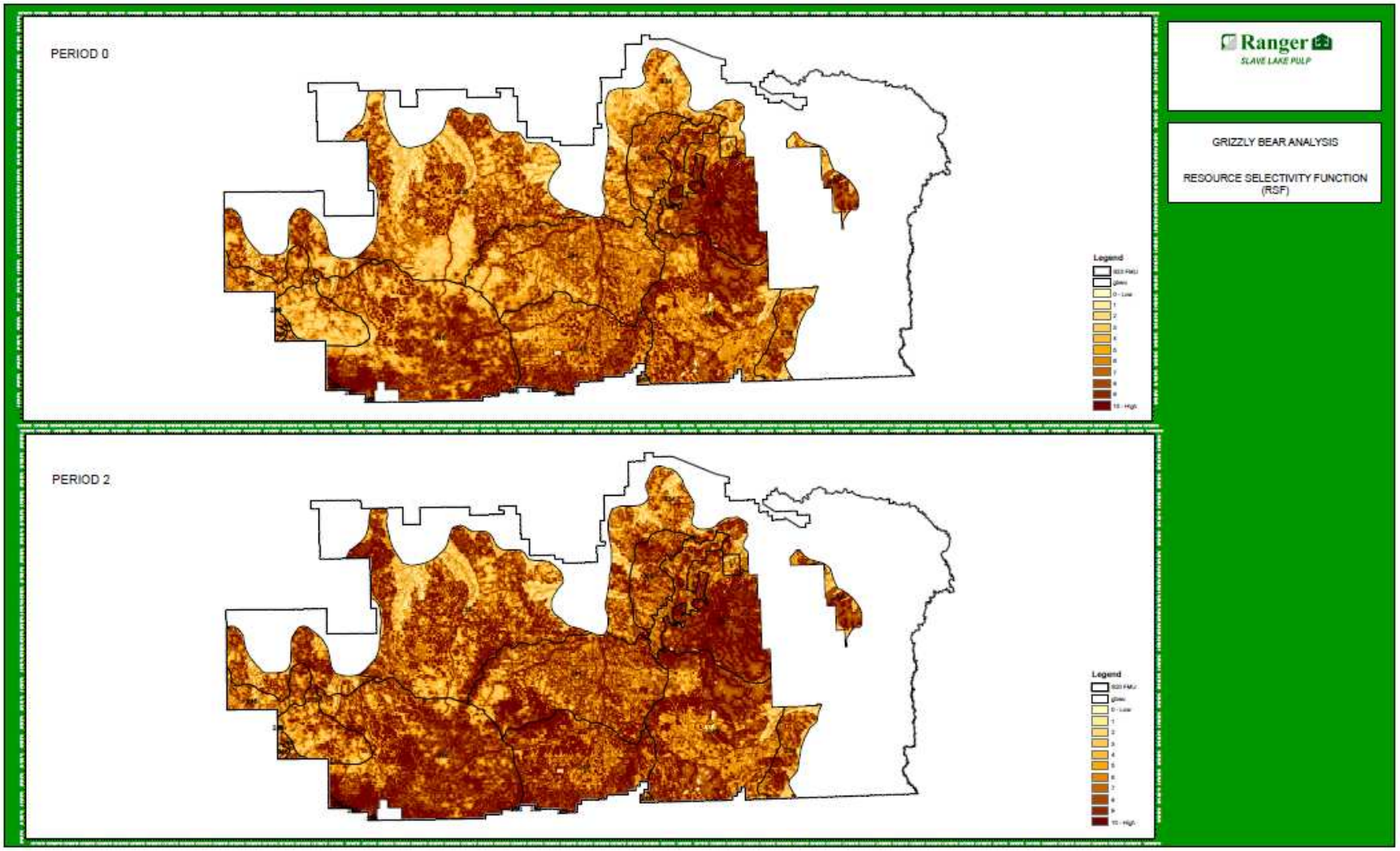
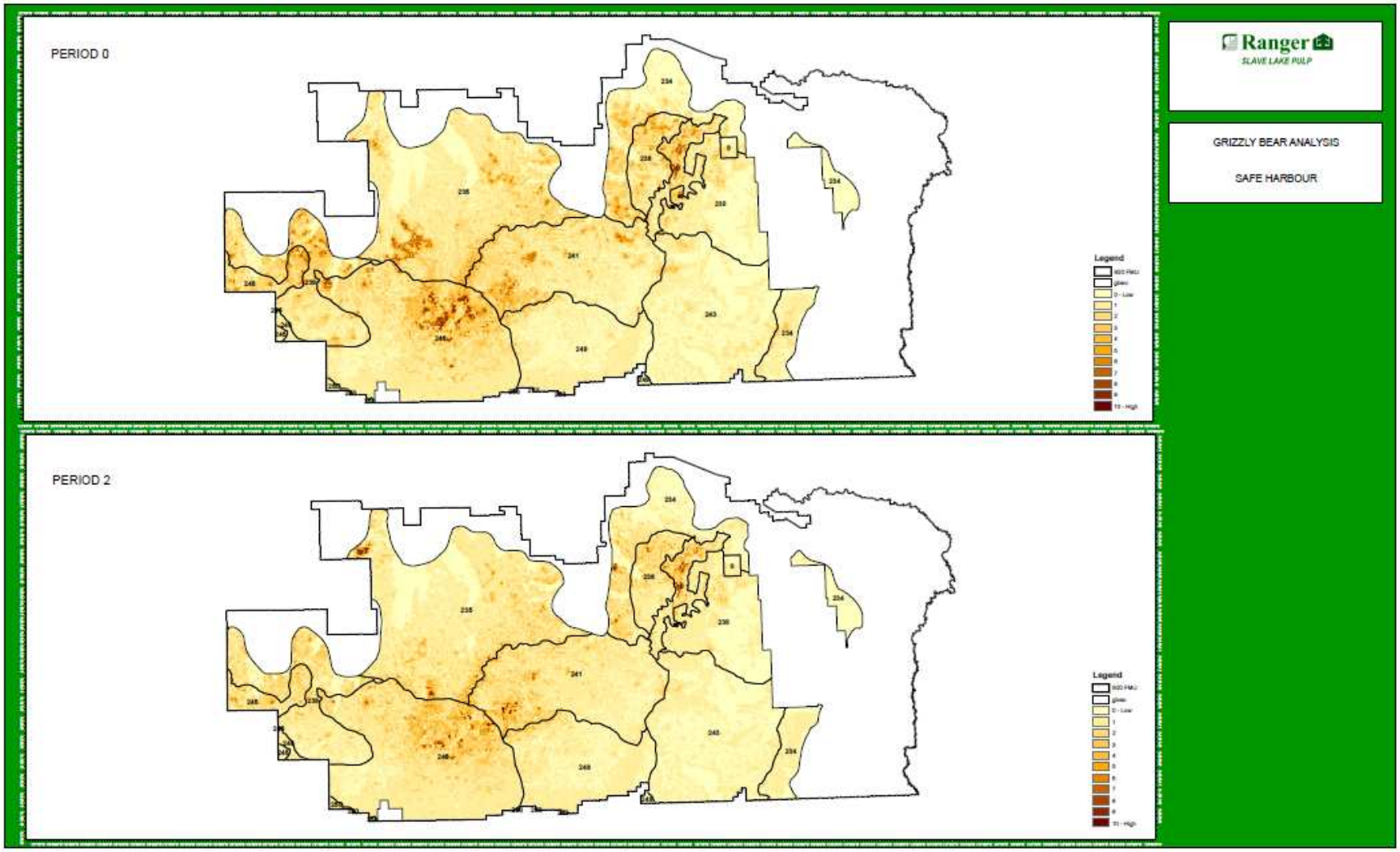


Figure 13 Grizzly Bear Analysis – Safe Harbour



5.6.1.1 Interpretation of Grizzly Bear Analysis Results

Interpretations are provided for the highest values (10, 10 and 10 for RSF, Mortality Risk and Safe Harbour respectively) and time periods 2009, 2014 and 2019.

- The interpretation of the Grizzly Bear analysis focuses on the RSF, Mortality and Safe Harbour results provided in Table 17.
- There are two very small portions of GBWU's (250 and 253) in the S20 FMU. These are only fractions of larger GBWU's which are located outside of the S20 FMU. These Units will be included in the interpretations.
- RSF values increased in all GBWU's. Increases ranged from 2.4% to 23.6%. On average, the RSF increased by 7.6% to 17.6 % for core and secondary habitat areas, respectively. This would indicate a long term improvement in Grizzly Bear habitat.
- Mortality Risk Increased in all units. Increases ranged from 2.35 to 31.3%. On average, the Risk increased by 6.5% and 11.2% for the core and secondary habitat areas, respectively. Since no new roads were developed in the 10 year period, the increases are attributed to increased distance to forest edge as a result of the harvest operations. The largest increases in mortality risk occurred in GBWU's containing greater amounts of deciduous harvest. This can be attributed to greater average block size. Mortality Risk also increased in areas where second pass is being removed.
- Safe harbour decreases for all units with the exception of Unit 249. On average the safe harbour decreased by 13.5% and 13.1% for core and secondary areas respectively.
- There is no change in road densities as no new roads are planned for construction during the 15 year period.
- The open route density results provided in Table 17 were calculated using the access layer provided in the Forest Research Institute's - Grizzly Bear Resource Selection Function and Grizzly Bear Mortality Risk Model and supplemented with Slave Lake Pulp's internal roads data. Combining these data sources resulted in a more comprehensive roads network within the S20 FMU.
- GBWU's 241 and 249 are located in mature oil and gas fields with extensive roading.

During the implementation of this plan Slave Lake Pulp Corporation will work closely with regional SRD staff to ensure that the affects of increased access on mortality are addressed and mitigated.

Integrated access management plans will be explored between companies and industries within the S20 FMU.

Mitigation strategies such as structure retention will be used to reduce the impact of harvest activities on grizzly bear mortality and safe harbours. The Structure Retention Strategy of 1% will be used in addition to Riparian Management areas and residual stands not threatened by Mountain Pine Beetle. Residual structure will reduce visual sightlines and will be generally located away from open access routes. Residual

structure will also be preferentially located nearer to edges of large openings and may vary widely between blocks.

The Grizzly Bear model provided by the Foothills Model Forest is a good first attempt at modeling Grizzly Bear habitat and mortality. However, care must be taken in the length of the projection periods. The model, currently, does not project forest growth. Therefore, it is unknown at what point in the future crown closure will reduce the edge effect and its impact on RSF and mortality risk.

5.6.2 WATER YIELDS

Water yield modelling was completed for the period between 2009 and 2028.

Summarization of the information has been completed for 78 watersheds. Figure 14, Figure 15, and Table 18 provides the watershed and yield increase information. Figure 16 and Figure 17 show yield increase classes by major basin and yield increase class with fire boundaries respectively. Appendix 6 provides detailed output for each watershed.

Figure 14 FMU S20 Major Basins

Figure 15 FMU S20 Sub-Watersheds and Yield Increase

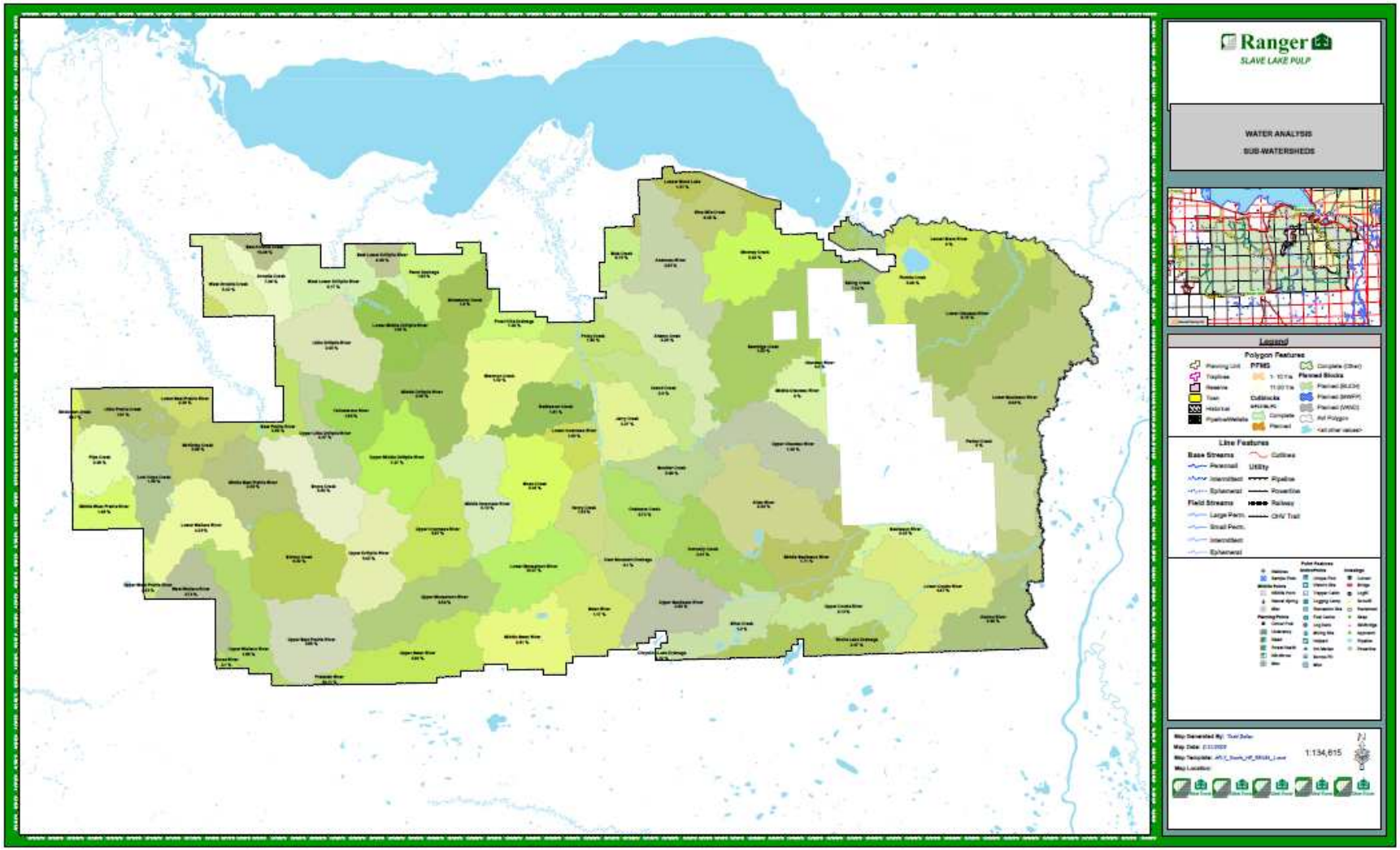


Figure 16 FMU S20 Main Basins and Yields Increase Classes

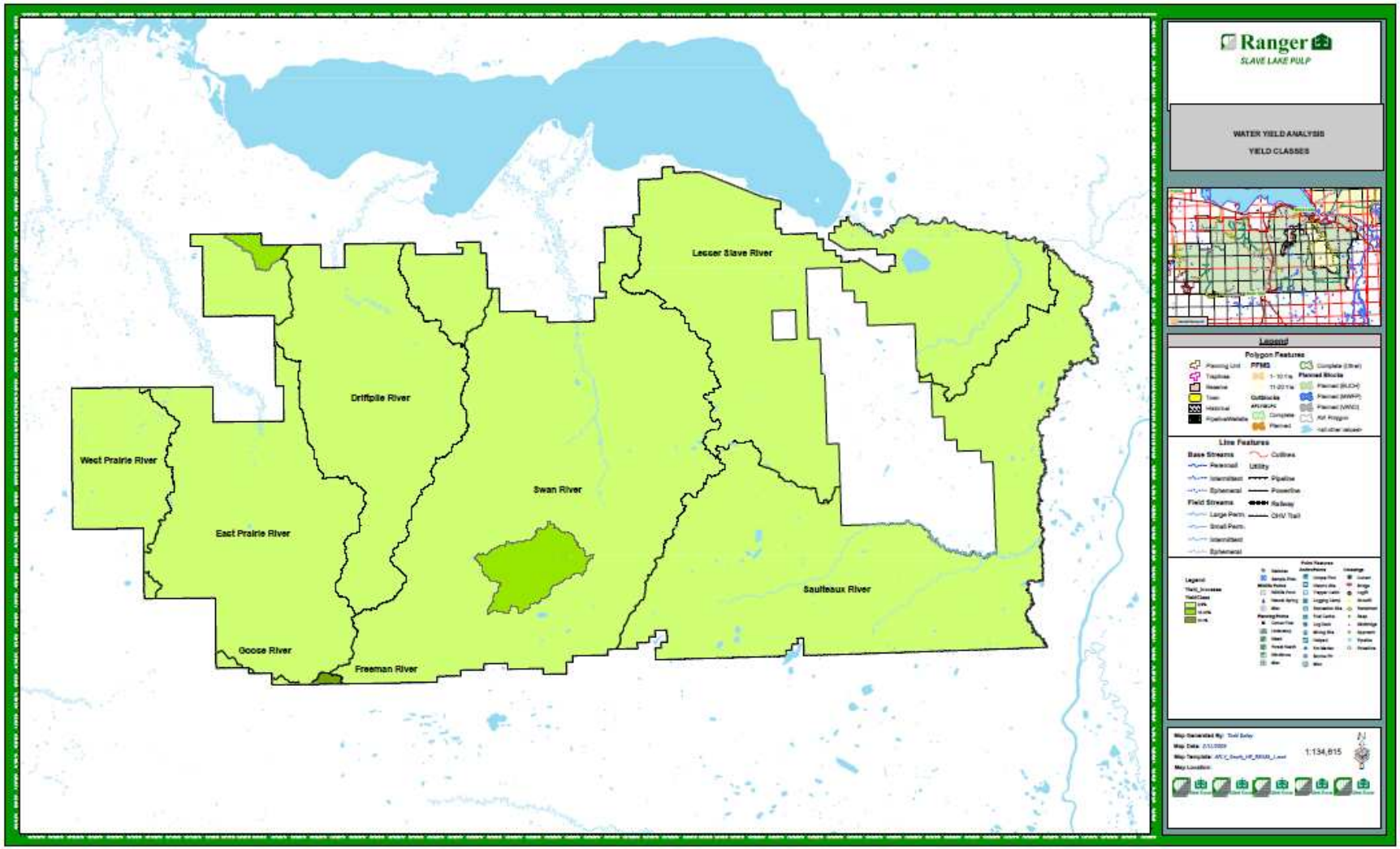


Figure 17 FMU S20 Main Basins, Yields Increase Classes and Fire Boundaries

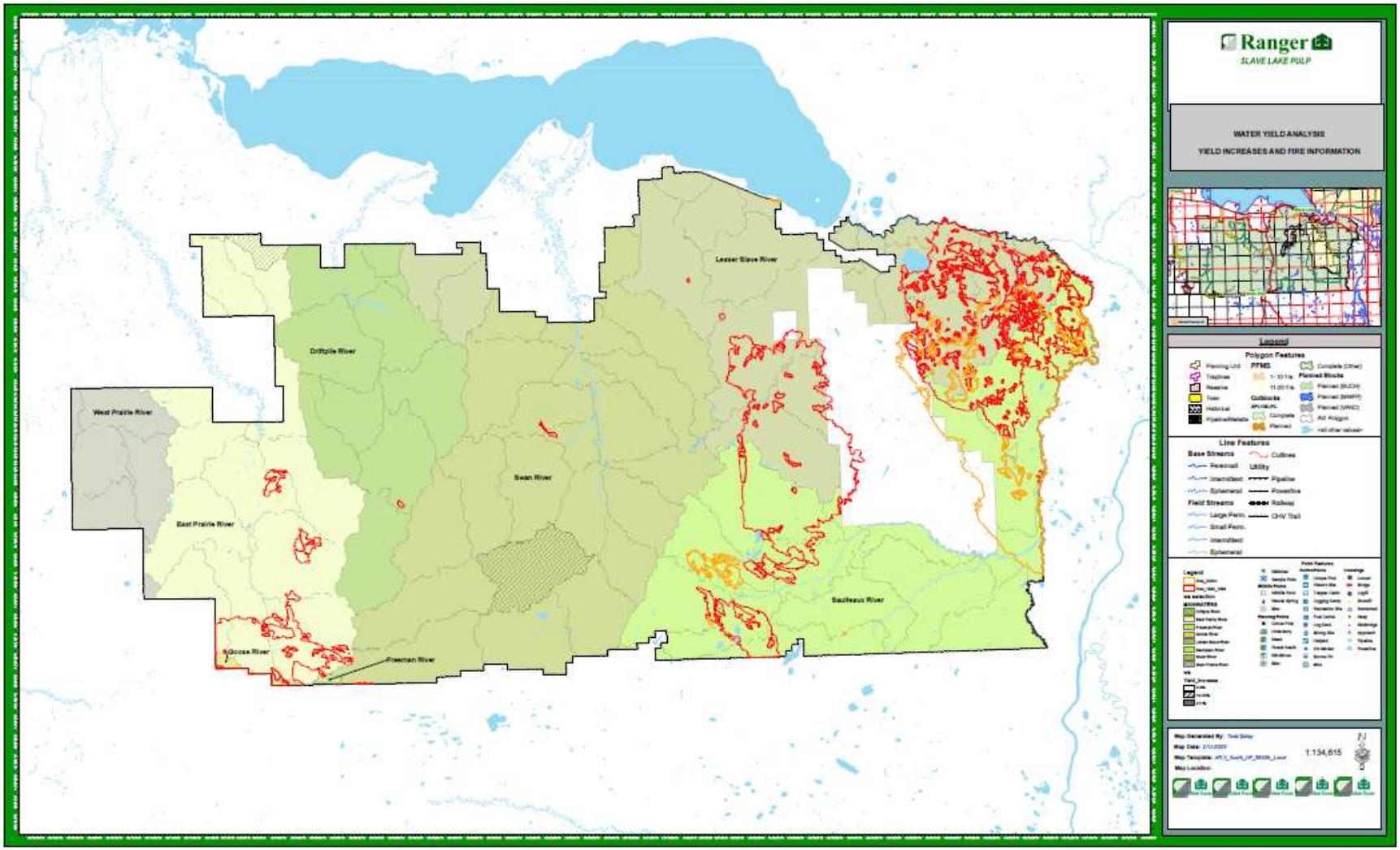


Table 18 Watersheds

				25,697 ha		Maximum Water Yield Increase	
Water Shed	Base Precipitation	Base Water Yield	Total Area	Total Harvest	Percent Harvest	Amount (%)	Year
Adams Creek	476	217	12,980	6,194	48%	4.9%	2024
Akulnu River	430	191	9,560	664	7%	0.9%	2027
Allan River	430	191	16,995	3,574	21%	4.0%	2023
Arcadia Creek	457	186	4,626	2,504	54%	7.9%	2019
Assineau River	428	191	14,026	4,096	29%	2.8%	2024
Boulder Creek	476	217	6,821	3,137	46%	5.9%	2023
Bruce Creek	457	186	10,497	3,911	37%	5.6%	2024
Chalmers Creek	476	217	7,818	1,627	21%	2.7%	2024
Chrystina Lake Drainage	430	191	404	109	27%	4.3%	2025
Deer Mountain Drainage	476	217	5,571	788	14%	3.2%	2014
Donnelly Creek	430	191	9,671	1,167	12%	2.0%	2025
East Arcadia Creek	457	186	2,056	1,178	57%	10.9%	2016
East Lower Driftpile River	452	215	2,123	762	36%	4.1%	2028
East Prairie River	457	186	4,467	729	16%	2.7%	2025
Eating Creek	428	191	3,540	1,144	32%	7.3%	2019
Ethel Creek	430	191	7,975	852	11%	1.3%	2023
Eula Creek	476	217	3,546	2,027	57%	9.1%	2019
Faust Drainage	428	191	6,069	1,056	17%	1.9%	2023
Florida Creek	428	191	7,144	1,454	20%	3.2%	2016
Foley Creek	476	217	7,738	1,839	24%	1.9%	2025
Freeman River	538	186	490	487	99%	38.1%	2019
Frost Hills Drainage	476	217	3,857	465	12%	1.5%	2028
Goose River	530	186	822	37	5%	2.1%	2017
Henry Creek	476	217	6,256	767	12%	1.6%	2014
Island Creek	476	217	7,964	1,701	21%	2.3%	2028
Jerry Creek	476	217	9,140	1,774	19%	2.4%	2014
Lesser Slave Lake	428	191	4,189	441	11%	1.5%	2024
Little Driftpile River	452	215	12,383	3,196	26%	3.1%	2019
Little Prairie Creek	426	294	6,772	1,349	20%	1.0%	2026
Lost Hope Creek	426	186	6,807	930	14%	1.4%	2025
Lower Coutts River	430	191	14,508	618	4%	0.5%	2028
Lower East Prairie River	457	186	4,438	784	18%	2.3%	2024
Lower Inverness River	476	217	3,517	398	11%	1.3%	2028
Lower Middle Driftpile River	452	215	8,871	1,112	13%	1.6%	2024
Lower Moosehorn River	476	217	10,933	7,063	65%	10.4%	2014
Lower Otauwau River	428	191	22,785	130	1%	0.2%	2016
Lower Sauteaux River	430	191	29,589	179	1%	0.1%	2028
Lower Wallace River	457	186	11,017	3,399	31%	4.2%	2027
McGowan Creek	426	186	917	122	13%	3.5%	2027
McKinley Creek	457	186	5,596	1,772	32%	3.7%	2028
Middle Driftpile River	452	215	11,422	3,145	28%	2.5%	2017
Middle East Prairie River	457	186	9,702	2,082	21%	2.3%	2024
Middle Inverness River	476	217	10,376	5,011	48%	5.1%	2021
Middle Otauwau River	428	191	5,749	0	0%	0.0%	2017
Middle Sauteaux River	430	191	9,942	1,328	13%	1.7%	2024
Middle Swan River	476	217	10,734	1,528	14%	2.8%	2014
Middle West Prairie River	426	186	5,054	372	7%	1.5%	2027
Mooney Creek	428	191	12,276	5,867	48%	5.9%	2019
Nine Mile Creek	428	191	6,136	1,747	28%	6.5%	2026
Otauwau River	428	191	330	3	1%	0.2%	2016
Pipe Creek	426	186	6,357	1,296	20%	3.4%	2027
Redbeaver Creek	476	217	6,918	1,228	18%	1.6%	2024
Roche Lake Drainage	430	191	7,324	1,490	20%	2.4%	2028
Sauteaux River	430	191	4,281	54	1%	0.3%	2011
Sawridge Creek	428	191	20,051	3,133	16%	1.8%	2016
Shannon Creek	476	217	12,477	2,083	17%	1.5%	2016
Sidney Creek	457	186	12,575	5,391	43%	6.3%	2024
Sloan Creek	476	217	10,593	3,192	30%	3.3%	2018
Strawberry Creek	428	191	5,994	730	12%	1.6%	2028
Swan River	476	217	9,128	570	6%	1.2%	2014
Upper Coutts River	430	191	10,866	2,449	23%	2.2%	2014
Upper Driftpile River	452	215	10,930	4,459	41%	5.4%	2028
Upper East Prairie River	457	186	12,188	2,769	23%	3.7%	2019
Upper Inverness River	476	217	10,568	5,573	53%	6.0%	2025
Upper Little Driftpile River	452	215	5,771	2,070	36%	4.4%	2026
Upper Middle Driftpile River	452	215	10,361	5,975	58%	7.2%	2019
Upper Moosehorn River	476	217	12,295	1,838	15%	2.6%	2025
Upper Otauwau River	428	191	12,754	1,069	8%	1.5%	2023
Upper Sauteaux River	430	191	10,446	2,186	21%	2.7%	2016
Upper Swan River	476	217	12,246	3,702	30%	5.9%	2025
Upper Wallace River	457	186	9,137	1,337	15%	1.6%	2025
Upper West Prairie River	426	186	571	55	10%	2.3%	2026
West Arcadia Creek	457	186	5,827	2,016	35%	5.4%	2019
West Lower Driftpile River	452	215	8,640	2,678	31%	5.2%	2017
West Wallace River	457	186	5,601	1,909	34%	3.7%	2028
Yellowstone River	452	215	6,417	1,182	18%	1.9%	2023

Interpretation of Water Yield Analysis

Table 18 provides the maximum water yields for the entire simulation period (2009 to 2028).

In general, the Freeman River watershed will realize the greatest water yield increase of about 38.1% by year 2019. This is primarily a function of size, since the Freeman River watershed is only (490 ha). Only a fraction of the Freeman and East Arcadia Creek watersheds are within the S20 FMU. The East Arcadia Creek and Lower Moosehorn River watersheds have water yield increases of 10.9% and 10.4% respectively.

The remainder of the watersheds will see a maximum water yield increase in the future between 1% and 5%. The timing of these events will vary by watershed (See Appendix 9), and is primarily due to the timing of entry into the compartments.

5.6.3 SERAL STAGE AND AGE CLASS

Seral Stages have been previously defined in the 2002 DFMP. They are defined using the yield relationships. Table 19 provides age and period ranges by species and seral stage and Figure 18 provide age class distribution projections by species groups for 0, 15, 80 and 160 years.

Species groups are defined as follows:

- Pine = Yield classes 3 and 103
- Black Spruce = Yield classes 2 and 105
- White Spruce = Yield classes 1 and 101
- Mixedwood = Yield classes 4, 5, 6, 7, 8, 9, 10, 104 and 105
- Pine = Yield classes 11 and 12

In the 2002 DFMP, old growth was defined such that it is deemed to contain characteristics of both mature and over-mature stands and was summarized on the Gross land base. The intent of this FMP amendment is to use the same definitions as the currently approved plan.

Table 19 Seral Stage Summary

Seral Stage	Pine	Black Spruce	White Spruce	Mixedwood	Deciduous
Establishment	0-15 years = Periods 1 to 3	0-15 years = Periods 1 to 3	0-15 years = Periods 1 to 3	0-15 years = Periods 1 to 3	0-10 years = Periods 1 to 2
Juvenile	16-39 years = Periods 4 to 7	16-79 years = Periods 4 to 15	16-39 years = Periods 4 to 7	16-49 years = Periods 4 to 9	11-29 years = Periods 3 to 5
Immature	40-89 years = Periods 8 to 17	80-109 years = Periods 16 to 21	40-59 years = Periods 8 to 11	50-69 years = Periods 10 to 13	30-49 years = Periods 6 to 9
Mature	90-179 years = Periods 18 to 35	110-229 years = Periods 22 to 45	60-129 years = Periods 12 to 25	70-169 years = Periods 14 to 33	50-109 years = Periods 10 to 21
Over Mature	180+ years = Periods 36+	230+ years = Periods 46+	130+ years = Periods 26+	170+ years = Periods 34+	110+ years = Periods 22+

As defined in the 2002 plan, “Old Growth” is determined to be both mature and over mature stands. As such the following age ranges determine “Old Growth” for the purposes of this amendment**.**

- Pine - 90 years +
- Black Spruce - 110 years +
- White Spruce - 60 years +
- Mixedwood - 70 years +
- Deciduous – 50 years +

Using the above definitions, the “old growth” target of 1% as modeled is met on the active, passive and gross land bases. Further to this, a 1% target is in place for structure retention which guarantees that this target is well surpassed.

The approved 2002 plan required that the old growth (as defined) would be addressed with Strategy 1.4.5:

Strategy 1.4.5

“Manage for a range of mature and overmature seral stages on the FMA such that their combined representation on the landscape will not vary from the current range by more than 20 percent during the term of this plan. The assessment will include changes that are a result of forest management practices and will not include natural or anthropogenic disturbances.”

Currently there are 339,660 ha or 57% of “old growth” on the S20 FMU gross landbase. This will be reduced to 271,701 ha or 12% over the next 15 years, well within the acceptable range.

Figure 18 Seral Stage Distributions by Species Group

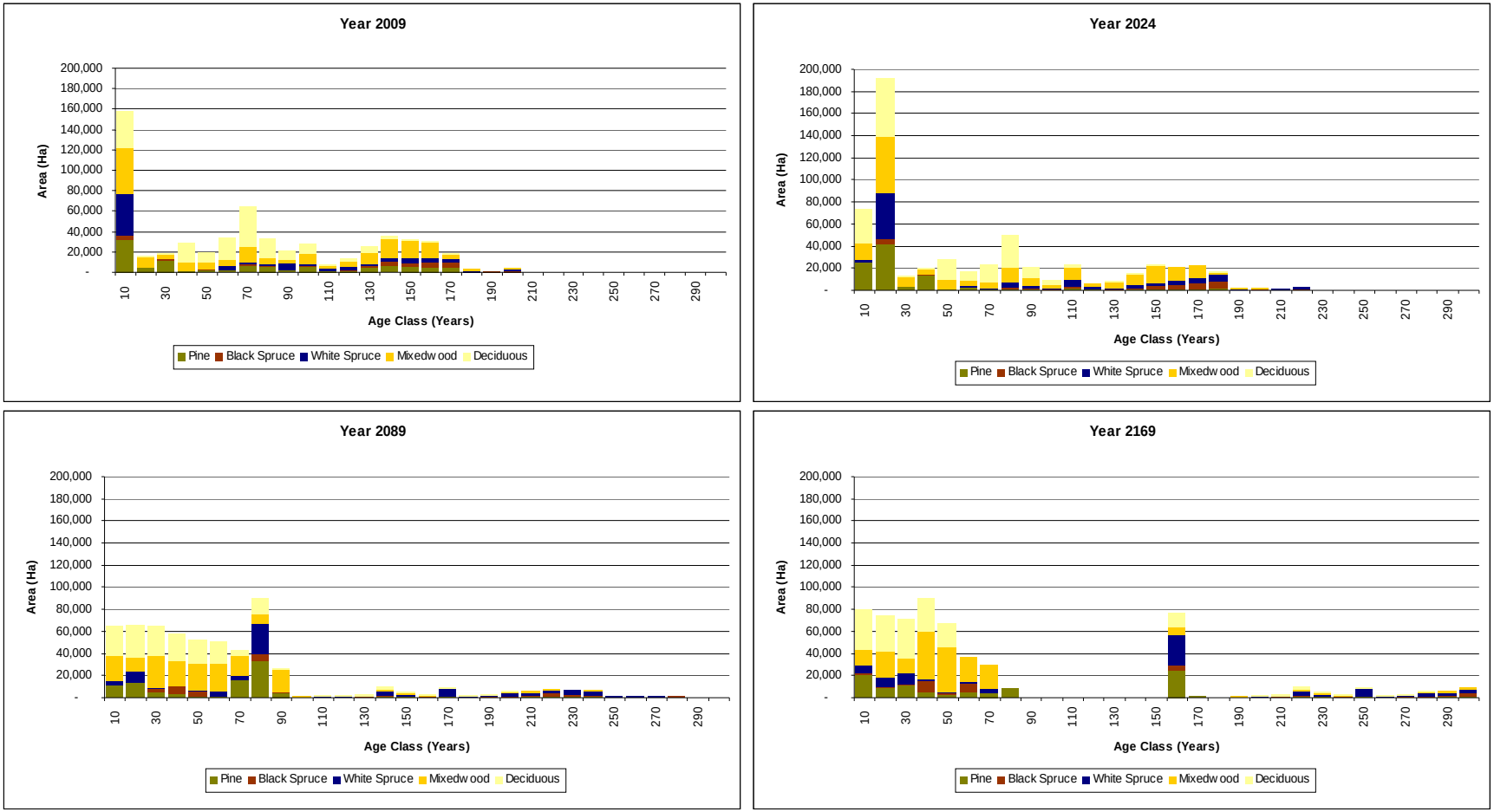


Table 20 Age Class Distributions

		Period (years)															
Age Class	**Initial**	**Period 1 to 10**	**Period 11 to 20**	**Period 21 to 30**	**Period 31 to 40**	**Period 41 to 50**	**Period 51 to 60**	**Period 61 to 70**	**Period 71 to 80**	**Period 81 to 90**	**Period 91 to 100**	**Period 101 to 110**	**Period 111 to 120**	**Period 121 to 130**	**Period 131 to 140**	**Period 141 - 150**	**Period 151 to 160**
10	157,918	71,040	63,886	50,405	52,565	57,962	65,401	66,369	64,622	69,236	60,671	69,395	66,724	90,027	70,640	74,508	80,191
20	16,275	157,918	71,040	63,886	50,405	52,565	57,962	65,401	66,369	64,622	69,236	60,671	69,395	66,724	90,027	70,640	74,508
30	18,721	16,275	157,918	71,040	63,886	50,405	52,565	57,962	65,401	66,369	64,622	69,236	60,671	69,395	66,724	90,027	70,640
40	28,821	18,721	16,275	157,918	71,040	63,886	50,405	52,565	57,962	65,401	66,369	64,622	69,236	60,671	69,395	66,724	90,027
50	19,306	28,821	18,721	16,275	157,918	71,040	63,886	50,405	52,565	57,962	65,401	66,369	64,622	69,236	60,671	69,395	66,724
60	34,502	18,542	27,175	18,658	16,273	157,918	71,040	63,886	50,405	39,473	40,686	35,592	49,623	46,730	44,662	36,357	36,696
70	64,584	31,528	18,542	26,747	18,581	16,273	137,354	44,125	43,043	35,839	31,547	37,795	35,592	37,642	37,939	36,197	29,378
80	33,012	59,657	30,908	18,533	26,394	18,395	10,341	116,489	12,642	7,186	16,769	19,286	18,708	676	2,030	5,041	8,033
90	20,848	26,813	44,028	30,174	18,353	18,373	11,010	1,164	104,193	6,921	3,364	13,141	5,395	0	-	-	0
100	28,137	16,866	17,417	33,614	23,855	6,867	2,358	1,599	1,164	104,193	6,921	3,326	0	-	0	-	-
110	8,109	24,059	12,836	9,892	15,076	11,755	2,610	2,358	1,599	1,164	91,756	0	0	0	-	0	-
120	13,743	7,125	14,232	12,182	7,572	9,451	10,471	2,610	2,358	1,599	1,164	78,936	0	0	0	-	0
130	25,633	11,682	6,947	10,110	10,071	5,556	4,987	10,471	2,610	2,358	1,460	974	78,936	0	0	0	-
140	36,661	16,750	10,388	4,745	7,263	9,481	2,667	4,987	10,471	2,610	2,358	1,460	974	78,936	0	0	0
150	31,383	28,209	12,532	7,533	4,109	3,717	9,015	2,667	4,987	10,471	2,610	2,358	1,460	974	78,936	0	0
160	30,428	21,120	23,350	7,997	7,155	2,904	1,572	9,015	2,667	4,987	10,471	2,610	2,358	1,460	974	78,936	0
170	18,233	22,062	14,010	14,208	7,249	5,953	2,904	1,572	9,015	2,667	4,987	10,471	2,610	2,358	1,460	974	78,936
180	2,916	11,074	18,277	12,344	11,437	5,756	5,953	2,904	1,572	9,015	2,667	4,987	10,471	2,610	2,358	1,460	974
190	1,581	1,797	9,863	17,539	10,850	8,897	5,756	5,953	2,904	1,572	9,015	2,667	4,987	10,471	2,610	2,358	1,460
200	3,943	992	1,797	7,477	11,210	7,307	8,897	5,756	5,953	2,904	1,572	9,015	2,667	4,987	10,471	2,610	2,358
210	-	3,707	992	1,496	988	6,801	7,307	8,897	5,756	5,953	2,904	1,572	9,015	2,667	4,987	10,471	2,610
220	-	-	3,621	971	1,135	988	6,801	7,307	8,897	5,756	5,953	2,904	1,572	9,015	2,667	4,987	10,471
230	-	-	-	1,011	533	1,135	988	6,801	7,307	8,897	5,756	5,953	2,904	1,572	9,015	2,667	4,987
240	-	-	-	-	838	533	1,135	988	6,801	7,307	8,897	5,756	5,953	2,904	1,572	9,015	2,667
250	-	-	-	-	-	838	533	1,135	988	6,801	7,307	8,897	5,756	5,953	2,904	1,572	9,015
260	-	-	-	-	-	-	838	533	1,135	988	6,801	7,307	8,897	5,756	5,953	2,904	1,572
270	-	-	-	-	-	-	-	838	533	1,135	988	6,801	7,307	8,897	5,756	5,953	2,904
280	-	-	-	-	-	-	-	-	838	533	1,135	988	6,801	7,307	8,897	5,756	5,953
290	-	-	-	-	-	-	-	-	-	838	533	1,135	988	6,801	7,307	8,897	5,756
300	-	-	-	-	-	-	-	-	-	-	838	533	1,135	988	6,801	7,307	8,897
Totals	**594,755**	**594,755**	**594,755**	**594,755**	**594,755**	**594,755**	**594,755**	**594,755**	**594,755**	**594,755**	**594,755**	**594,755**	**594,755**	**594,755**	**594,755**	**594,755**	**594,755**

Table 21 Current (2009) Age Class Distribution by Species

Age Class	Species				
	Pine	Black Spruce	White Spruce	Mixedwood	Deciduous
10	31,453	4,747	41,203	44,904	35,612
20	4,426	167	277	10,659	747
30	12,614	80	515	4,103	1,408
40	849	63	689	8,652	18,567
50	2,585	466	703	5,590	9,963
60	2,194	527	4,420	5,365	21,996
70	6,149	1,373	2,223	15,272	39,565
80	5,514	759	1,039	7,156	18,544
90	1,668	716	6,134	4,041	8,288
100	5,130	1,419	1,454	10,246	9,890
110	629	854	1,786	2,968	1,872
120	1,305	860	3,079	5,552	2,946
130	3,912	2,434	1,877	10,468	6,942
140	6,431	4,316	3,069	19,181	3,665
150	5,879	2,511	5,476	16,684	833
160	4,319	5,233	4,741	15,116	1,018
170	4,665	5,700	2,579	4,558	732
180	30	514	1,073	1,178	124
190	27	529	836	186	2
200	172	584	2,975	212	-
210	-	-	-	-	-
220	-	-	-	-	-
230	-	-	-	-	-
240	-	-	-	-	-
250	-	-	-	-	-
260	-	-	-	-	-
270	-	-	-	-	-
280	-	-	-	-	-
290	-	-	-	-	-
300					

Table 22 Future (2024) Age Class Distribution by Species

Age Class	Species				
	Pine	Black Spruce	White Spruce	Mixedwood	Deciduous
10	25,099	598	1,354	15,822	31,588
20	41,301	5,437	41,362	51,090	53,108
30	3,056	145	236	9,030	734
40	13,631	100	523	5,229	397
50	794	21	54	8,947	18,566
60	2,871	121	1,106	5,241	8,148
70	760	499	344	4,997	17,169
80	1,326	1,360	4,560	13,147	29,486
90	1,094	954	2,272	6,777	9,812
100	438	263	873	3,826	4,058
110	1,597	1,642	6,872	9,703	3,763
120	739	701	1,130	3,297	440
130	462	524	1,478	4,676	1,203
140	511	1,677	3,179	8,339	1,903
150	1,147	2,584	1,939	16,602	1,189
160	1,344	3,732	4,533	11,368	230
170	1,268	5,323	4,853	10,421	328
180	2,470	6,156	5,083	2,711	513
190	2	457	546	569	76
200	2	738	680	175	-
210	-	241	882	74	2
220	40	576	2,289	49	-
230	-	-	-	-	-
240	-	-	-	-	-
250	-	-	-	-	-
260	-	-	-	-	-
270	-	-	-	-	-
280	-	-	-	-	-
290	-	-	-	-	-
300	-	-	-	-	-

5.6.4 STRUCTURE RETENTION

A structure retention strategy has been developed (Appendix 7) that is both cost effective and operationally practical. Structure retention monitoring will be conducted annually and reported every 5 years in the SLP FMA Stewardship Report. This volume will be chargeable as AAC production and will be reconciled every 5 years at the end of the cut control period.

5.6.5 WOODLAND CARIBOU

The Slave Lake herd exists along the very eastern edge of the S20 FMU. This area is comprised of both the Chisholm and Mitsue fires. No harvesting is scheduled in this area for the term of this plan.

6 IMPLEMENTATION

Once the Plan is approved, implementation will commence in 2009. The implementation will be consistent with the assumptions laid out in the Plan.

Field verification will be part of the implementation process. This will involve assessment of stands to ensure they meet the assumptions in the Plan. SLP and the regional Forest Health Officer will be responsible to ensure the proper selection and sequencing of stands.

6.1 Level II Treatments

If any level of active MPB infestations is confirmed by a SLP, FHO or Regulated Forestry Professional (RFP), Level II treatments will be engaged, subject to the resolution of economical and logistical issues for the upcoming operating year.

6.2 Access Management

SLP will work with Government of Alberta staff to minimize impacts on known Grizzly bear habitat. Access controls for those areas that have been identified as secure Grizzly Bear habitat will be addressed at the operational level to ensure the logical opening and closure of roads to meet Slave Lake Pulp Corporation operational needs and to mitigate impacts on Grizzly Bear.

7 CONCLUSION

The current FMU approved conifer AAC of 586,378 m^3 (15/10) and deciduous AAC of 541,021 m^3 (15/10) have been increased to recommended harvest levels of 836,816m^3 (15+/10/30cm) and 562,111 m^3 (15+/10/30cm) respectively. The change is primarily due an accelerated harvest in the next 15 years to reduce the area of susceptible stands in the FMA.

The area of susceptible pine stands will be reduced to 26% of that currently projected in twenty years.

Impacts on Grizzly Bear habitat and risk, water yields and seral stage distributions (mature and over mature) were analyzed and reported.

A Structure Retention Strategy has been developed that will help create old growth characteristics in young and mid-aged cut blocks.