Spray Lakes Sawmills FMA 0100038
5 Year Stewardship Report
Years 2007-2012

Prepared by:
Jason Mogilefsky, B.Sc., RPF
and
Matt Denney, RPF

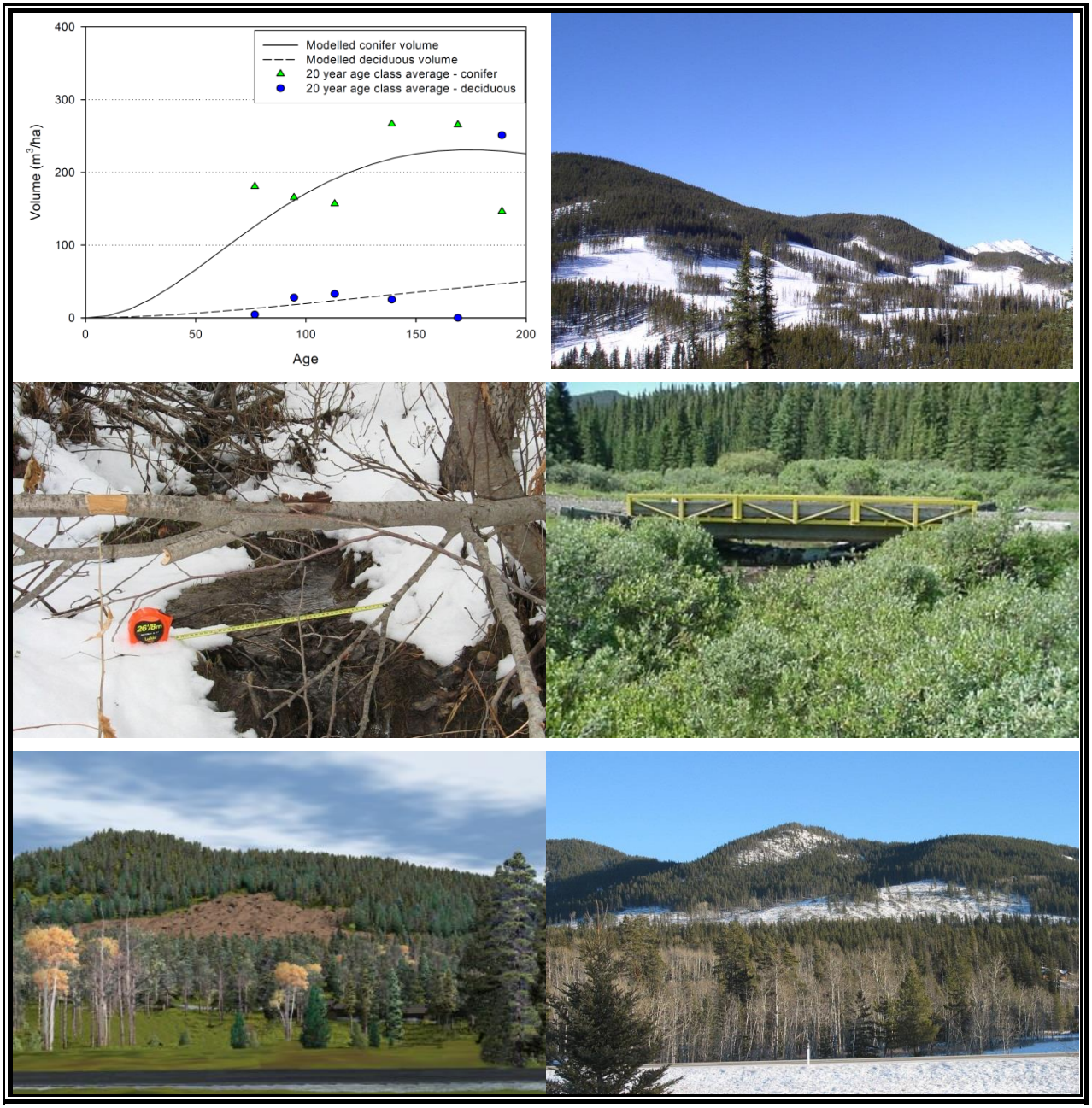


Table of Contents

Spray Lakes Sawmills FMA 0100038
5 Year Stewardship Report
Years 2007 - 2012

Introduction

Spray Lake Sawmills (SLS) is committed to sustainable forest management; a long-term goal to maintain natural ecosystems, communities and native species in balance with social and economic needs. To meet these goals, SLS designed a Detailed Forest Management Plan (DFMP) in 2006. Due to the complexity of managing ecosystems, the DFMP was designed using an adaptive management (AM) process. In essence, adaptive management is a process that initiates changes to plans and operations to improve meeting resource management goals overtime. This approach features a continuous feedback loop that involves:

- Using existing knowledge/information from completed studies;
- Building new knowledge of ecological relationships, habitat supply and regional social values;
- Integrating this knowledge into the forest management planning process and into the development of management strategies and;
- Monitoring aspects of the implementation and its impact on the ecosystem over time.

SLS developed a series of resource management objectives, designed to measure its performance in meeting the stated goals identified in the DFMP. This stewardship report covers timber years 2007 through 2012 (May 1,2007 through April 30, 2012) and summarizes the annual and five year monitoring deliverables in reference to the planning objectives identified in Chapter 5 of the DFMP.

The report is organized by the 16 resource management objectives and monitoring plan detailed in chapters 5 and 10 respectively in the DFMP. Each objective is stated, followed by a narrative of the management strategies used to meet them. The narrative is then supported by specific plan metrics and monitoring results.

The stewardship report has been organized in the same order as the DFMP monitoring plan as outlined in chapter 10. Appendix Table A-1 describes the specific reporting requirements and the location of the corresponding information. Where applicable, an explanation has been provided for any reporting items that have been modified or are not applicable.

List of Acronyms

AAC – Annual Allowable Cut
AM –Adaptive Management
ACIMS – Alberta Conservation Management System
AESRD – Alberta Environment and Sustainable Resource Development
AOP – Annual Operating Plan
ARIS – Alberta Reforestation Information System
ASR – Alberta Regeneration Standards
AVI – Alberta Vegetation Inventory
C – Conifer Timber
CD – Conifer leading mixedwood forest stand
CTP – Community Timber Program
D – Deciduous Timber
DC - Deciduous leading mixedwood forest stand
DEM – Digital Elevation Model
DFMP – Detailed Forest Management Plan
ELC – Ecological Land Classification
ESA – Environmentally Sensitive Area
FHP – Final Harvest Plan
FMA – Forest Management Agreement
FMP – Forest Management Plan
FMU – Forest Management Unit
FRIAA – Forest Resource Improvement Association of Alberta
FSC – Forest Stewardship Council
GDP – General Development Plan
GIS – Geographic Information System
GPS – Global Positioning System
GTA – Grazing Timber Agreement
HCV – High Conservation Value
HCVF – High Conservation Value Forest
HSI – Habitat Suitability Index
ILM – Integrated Land Management
IRP – Integrated Resource Plan
LFPM - Linear Feature Projection Model
LFN – Leave for Natural
LiDAR – Light Detecting and Ranging
LOC – License of Occupation
LUF – Landuse Framework
MAI – Mean Annual Increment
MPB – Mountain Pine Beetle
MTU – Miscellaneous Timber Use
NSR – Not Satisfactorily Regenerated
NRV – Natural Range of Variation
OGR – Operating Ground Rules
OHV – Off Highway Vehicle
PAC – Public Advisory Committee
PFMS – Preferred Forest Management Sequence
PIC – Pre-industrial Condition
PRA – Provincial Recreation Area
PSP – Permanent Sample Plots
QAC – Quadrant Allowable Cut
RSA – Regeneration Standards of Alberta
SHS – Spatial Harvest Sequence
SLS – Spray Lake Sawmills
SRD – Sustainable Resource Development (now AESRD)
TDA – Timber Damage Assessment
TPR – Timber Productivity Rating
TSA – Timber Supply Analysis
TSP – Temporary Sample Plots
U of A – University of Alberta
WH&S – Alberta Workplace Health & Safety

1. Access

Objectives 5.1
"Minimize the impact of access development on the environment and other land uses."

Management Strategies

SLS is committed to developing a mainline road strategy that minimizes the impact to the environment. To accomplish this, SLS contracted Tesera Systems Inc. to develop simulated mainline routes using the Linear Feature Projection Model (LFPM).

The model projects potential road corridor locations for developing FMA access plans. This information is used for stakeholder consultations to minimize the number of access corridors on the landscape. The majority of the harvest areas accessed during the reporting period were accessed by either the corridors identified by the model or by existing roads and trails.

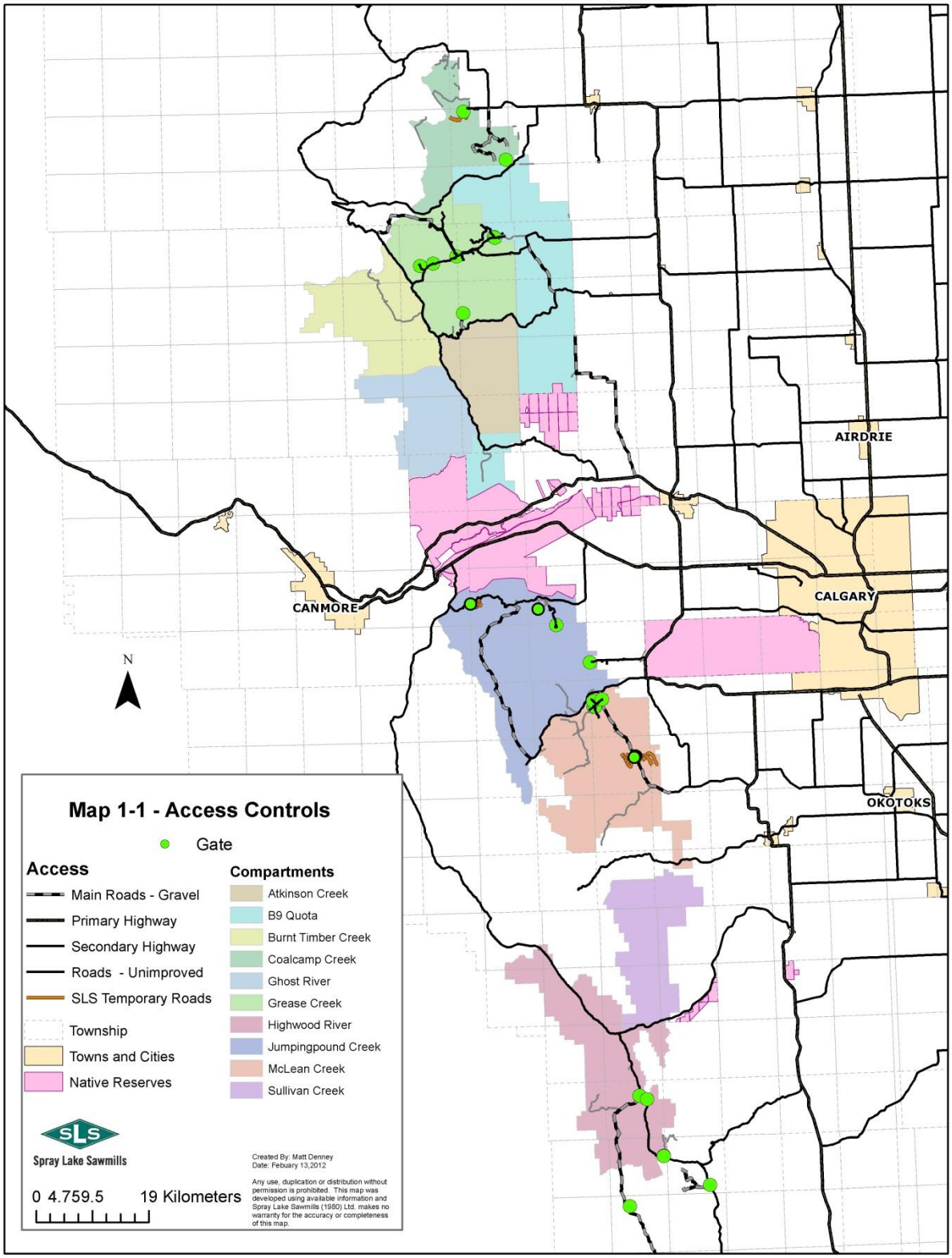
After new roads are constructed, at the direction of Alberta Environmental Sustainable Resource Development (AESRD) SLS may close the road with gates to protect wildlife and the environment. Most roads constructed by SLS are for temporary use only and are fully reclaimed when operations are complete. Table 1-2 describes Spray Lake's road building and reclamation activities for the reporting period.

SLS total road reclamation includes ripping subgrades, replacing the fill slope to match natural contours, replacing top soil and placing course woody debris and vegetation on the reclaimed surface.

- **Access Controls**

Table 1-1: List of Access Closures Timber Year 2007-2012

Compartment	Number of gates
Coalcamp Creek	2
B9	2
Grease Creek	4
Jumping Pound	2
Mclean Creek	5
Highwood	4
Total	19


AIRDRIE
CALGARY
CANMORE
OKOTOKS
N
Map 1-1 - Access Controls
Gate
Access
Main Roads - Gravel
Primary Highway
Secondary Highway
Roads - Unimproved
SLS Temporary Roads
Township
Towns and Cities
Native Reserves
Compartments
Atkinson Creek
B9 Quota
Burnt Timber Creek
Coalcamp Creek
Ghost River
Grease Creek
Highwood River
Jumpingpound Creek
McLean Creek
Sullivan Creek
Spray Lake Sawmills
0 4.759.5 19 Kilometers
Created By: Matt Denney
Date: Febuary 13,2012
Any use, duplication or distribution without permission is prohibited. This map was developed using available information and Spray Lake Sawmills (1980) Ltd. makes no warranty for the accuracy or completeness of this map.

- **Road Construction Activities**

Table 1-2: Road Construction and Reclamation Activities

Timber Year	Road Construction (km)	Road Reclamation (km)	Construction vs. Reclamation activities
2007/2008	51.3	19.85	39%
2008/2009	35.7	68.63	192%
2009/2010	37.74	53.80	143%
2010/2011	51.34	15.72	31%
2011/2012	28.91	36.14	125%
Total	204.99	194.14	95%

Annual road construction and reclamation varies year to year depending operational logistics.

- **Road Density Assessment**

Table 1-3: Total FMA Road Density Summary in Km/km^2 Compared to 2006 baseline

Compartment	2006 Total FMA Road Density*	2012 Total FMA Road Density*	2006 Total FMA Open Road Density**	2012 Total FMA Open Road Density**
Coal Camp	1.10	1.06	1.1	.38
B9 Quota	.98	.61	.73	.24
Grease Creek	.95	1.07	.60	.19
Burnt Timber Creek	.62	.89	.09	.18
Atkinson Creek	.60	.81	.36	.15
Ghost River	.85	.70	.85	.70
Jumpingpound Creek	.56	.43	.22	.24
McLean creek***	.27	1.40	.10	1.40
Sullivan Creek	.26	.12	.01	.07
Highwood River	.49	.53	.15	.14

*Based on government of Alberta 2006 and 2012 base data. Total road density includes all FMA paved, gravel, operational (SLS), trail/truck, designated and non-designated trails and OHV roads.

** Open roads are not closed off to the public.

*** In 2006, OHV trails were not included, as Mclean Creek is a designated OHV area. OHV trails were included in 2012.

Table 1-4: SLS Operations Road Density Summary in Km/km^2 Compared to 2006 baseline

Compartment	2006 SLS Operations Road Density*	2012 SLS Operations Road Density*	Deficit
Coal Camp	.04	.11	+.07
B9 Quota	0	.03	+ .03
Grease Creek	.11	.06	-.05
Burnt Timber Creek	.03	.02	-.01
Atkinson Creek	.08	.01	-.07
Ghost River	0	0	0
Jumpingpound Creek	0	.02	+.02

Compartment	2006 SLS Operations Road Density*	2012 SLS Operations Road Density*	Deficit
McLean creek	.06	.06	0
Sullivan Creek	0	0	0
Highwood River	.07	.04	-.03
Total Change in density			-.04

*SLS operations road data, all of these roads are closed.

SLS has identified the need to improve total FMA road density reporting by re-categorizing AESRD road categories to eliminate redundancy within the AESRD road datasets. SLS is maintaining its operational road densities at slightly lower than 2006 levels.

- **Road inspection Program**

SLS roads and stream crossings are inspected twice a year, once in the fall and once in the spring after spring break-up with the intent to minimize environmental and safety risks. Issues noted during these inspections are summarized and addressed in the Road Use and Reclamation Plan annual submission. Road use and reclamation plans are maintained for all roads, including those required for harvest and hauling, reforestation and future silvicultural treatments. Table 1-5 summarizes the numbers of road inspections.

Table 1-5: Road Inspection Activity

Timber year	Number of inspections	Number of Inspections with Maintenance /Issues Identified
2007/2008	15	5
2008/2009	56	12
2009/2010	27	2
2010/2011	43	12
2011/2012	102	16
Total	172	30

Notes: In 2010, SLS started tracking road inspections events in a central database system. Before this, road inspection information was filed and stored on paper by the area supervisor assigned to perform the road inspection. Because of this reason, some inspections prior 2010/11 cannot be found. Numbers in the table represents information for which we currently have a record.

2. Adaptive Management and Research

Objectives 5.2
"*Incorporate adaptive management philosophy into the management strategy for the DFMP."*

Management Strategies

SLS embraced the adaptive management model of plan implementation, monitoring and revision when it developed the Detailed Forest Management Plan (DFMP) in 2006. SLS is currently developing an evaluation of the monitoring program, on-going research efforts and identifying future research needs. The information will be translated into useable feedback and incorporated into current operations, the monitoring program, and for the development of the 2018 DFMP.

Objectives 5.2
"Continue to support research as a commitment to adaptive management and environmental protection."

Management Strategies:

SLS is committed to utilizing management strategies and practices based on new research and monitoring results. SLS employs a number of funding mechanisms, both direct and indirect through organizations such as the Forest Resource Improvement Association of Alberta (FRIAA), Foothills Growth and Yield Association, Foothills Research Institute and FPInovations (FERIC and FORINTEK). Commitments to research and monitoring through these organizations exceed $2.2million since the inception of the FMA in 2001. Research and committee participation is highlighted in Table 2-1 through Table 2-4 below.

Table 2-1: SLS FRIAA Projects

Baseline Terrestrial Ecosystem Management	High Conservation Value Forest Assessment
Pre-Industrial Forest Condition Assessment	Winter Wildlife Use of Riparian Buffers
Etherington Creek Aquatic Ecosystem Baseline Study	McLean Creek Aquatic Ecosystem Monitoring Study
Fire History/Regime Study – Kananaskis District	McLean Creek Monitoring Program
Forest Value and Condition Assessments	Avifaunal Re-colonization -Effects of Timber Harvest on Breeding Birds
LiDAR-Based Forest Inventory Pilot Project	Etherington/Wilkinson Creek Ecosystem Management Project
East Slope Grizzly Bear Project contribution	Historical Resource Predictive Modeling

Table 2-2: Cooperative SLS Research

Southwest Alberta Montane Elk Study	Foothills Model Forest - Grizzly Bear Research Program
Foothills Growth and Yield Association – Lodgepole Pine Regeneration Trial	Foothills Growth and Yield Association – Comparison of Pre-harvest and Post-harvest Stand Development
Foothills Growth and Yield Association – Cooperative Management of Historic Research Trials	Foothills Growth and Yield Association – Enhanced Management of Lodgepole Pine
Foothills Growth and Yield Association – Regeneration Management in a MPB Environment	Foothills Growth and Yield Association – Regional Yield Estimators
Foothills Model Forest - Managing Disturbance in Riparian Zones Study	

Table 2-3: SLS Committee Participation

The Advisory Board for the U of C Biogeosciences Institute	West Slope Cutthroat Trout Recovery Planning Team
Alberta's Landuse Framework Committee	Various Mountain Pine Beetle Committees
The Forestry Grazing Integration Committee	The Bow River Basin Council
The Regional Advisory Council for the South Saskatchewan Regional Landuse Plan.	

The data from many of these projects has been incorporated into the development of the DFMP. Some of the data also serves as the SLS baseline for evaluating its performance against plan objectives identified in this monitoring report. The data is also routinely used to develop strategic and operational planning. The following table highlights some of the datasets and applications developed and used by SLS.

Table 2-4: SLS FMA Dataset Applications

Habitat Suitability Modeling for Management Indicator Species	Computerized Visual Impact Analysis of Harvest Designs
Historic Resource Modeling and Field Assessments	Wet Areas Mapping
Mountain Pine Beetle Stand Susceptibility Model	Ecological Land Classification

- **Documentation of Ground Rule Changes**

The first set of FMA specific ground rules was finalized in 2009. Before that, Spray Lake Sawmills operated under the Alberta Timber Harvest Planning and Operating Ground Rules, which was approved by the Alberta government. Currently, on an annual basis, the ground rules are reviewed with the AESRD to fine tune items of concern and to make revisions more systematic and to correct any inconsistencies or problems. Changes that have occurred to the ground rules since the first set are documented in Appendix B -.

3. Aesthetic Values

Objective 5.3

"Mitigate the impact of our operations on visual resources".

Management Strategies:

Mitigating timber harvest impacts on visual resources is considered by Spray Lake Sawmills in several ways. The first step was in the development of the current Forest Management Plan (FMP) which integrated aesthetic values overtime throughout the FMA. This was in part accomplished by designating 30% of the total FMA/B9 Quota area as forested retention or *passive land base*. The passive land base is unavailable for harvest and was designed to meet a multitude of important resource values.

Another built in component of the FMP, partly designed to enhance aesthetic values, includes the 20 year adjacency constraint and operational harvest sequencing plan. This approach limits the areas available for harvest by maintaining forested areas adjacent to harvested blocks on the landscape overtime.

SLS has also developed an FMA, scenic values map with direct participation and input from government divisions, the public advisory group and stakeholders. The FMA was stratified into high, medium and low visual sensitivity areas. The FMA is screened for areas with high visual sensitivity during the planning process. Table 3-1 is a breakdown of harvesting activities over the reporting period according to the scenic value layer developed for the forest management plan. The visually sensitive areas were assessed for harvest suitability in the field and tactics employed to mitigate the impact of operations on visual resources. Visualization computer modeling is also used by SLS to minimize the visual impact of harvest operations on other land use interests.

Table 3-1: Blocks harvested for reporting period, by scenic value strata

Visual Sensitivity	2007/2008	2008/2009	2009/2010	2010/2011	2011/2012	Total
Low	12	4	-	-	-	16
Medium	18	21	22	30	14	105
High	26	5	-	1	9	41
Total	**56**	**30**	**22**	**31**	**23**	**162**

In all cases, openings planned for harvest were identified in open houses. Additionally, detailed block plans, identifying block boundaries and in block roads, were submitted for approval before harvesting occurred.

In some cases, visual mitigation is balanced against competing objectives. In 2006, areas with a high threat of mountain pine beetle infestation were identified and targeted for harvesting. Visual mitigation tactics were balanced in consideration of potential large scale MPB losses. Of the 41 blocks that were identified as high, approximately 25 were identified as a Mountain Pine Beetle Priority zone. Table 3-2 describes the mitigation measures for high scenic value harvested blocks.

Table 3-2: Blocks harvested in high scenic value areas

Block Number	Submitted Detailed Block Plan	Harvest plan reviewed at open house	Retention of forest structure	Visual simulation (from identified viewpoints)	Modified Harvest design	High MPB Zone
2007-2008						
0195	☑	☑	☑			☑
0212	☑	☑				*
0221	☑	☑				☑
0228	☑	☑	☑			☑
0232	☑	☑	☑			☑
0234	☑	☑	☑			*
0235	☑	☑	☑			☑
0264	☑	☑	☑			☑
0265	☑	☑				☑
0272	☑	☑	☑			☑
0286	☑	☑	☑			☑
0346	☑	☑	☑	☑	☑	☑
0374	☑	☑	☑			*
0380	☑	☑	☑	☑	☑	☑
0683	☑	☑				☑
0941	☑	☑	☑			☑
1125	☑	☑	☑			☑
1282	☑	☑	☑			☑
3233	☑	☑				☑
3298	☑	☑				☑
3363	☑	☑	☑			*
3428	☑	☑	☑			*
3481	☑	☑				*
3489	☑	☑				☑
3498	☑	☑				*
3526	☑	☑	☑	☑	☑	☑
2008-2009						
0722	☑	☑	☑		☑	*
1220	☑	☑				☑
1222	☑	☑	☑			*
1372	☑	☑				☑
1825	☑	☑	☑			*
2010-2011						
1136	☑	☑	☑			*
2011-2012						
0777	☑	☑	☑			☑
1889	☑	☑	☑		☑	*
1893	☑	☑	☑			☑
1900	☑	☑	☑		☑	*
1953	☑	☑	☑		☑	*
2427	☑	☑	☑		☑	*
2433	☑	☑	☑		☑	*
2494	☑	☑	☑		☑	*
3000	☑	☑	☑		☑	*

* Blocks were in a Rank 2, or Moderate MPB zone.

In the 2007/2008 timber year, 7 blocks were identified in proximity to Barrier lake. Three of these blocks are in the high visual rating and 4 were ranked as medium. Viewpoints along highway 93, Sibald Creek Trail and Barrier Lake were identified and visual impact of timber removal was simulated. Results

were reviewed with the local forest management branch and were a component of the FHP which was approved. The figure below is an example of how the visualization analysis compared to the actual harvest activities.

Figure 3-1: Barrier Lake Opening Before and after Comparison

–Barrier Lake Visual Simulation from Visitor Information Center

–Photograph after logging is completed

4. Biodiversity and Wildlife Habitat Supply

4.1. Vegetation

Objectives 5.4.1 "Gain an understanding of the vegetative diversity across the FMA."

- **Management Strategy**

SLS developed an ecological land classification (ELC) and successional model to better understand the complexities of vegetative diversity on the FMA. Habitat Suitability Models were developed for management indicator species and habitat (based on the ELC) was modeled to establish a habitat baseline. The model was then used to project habitat changes overtime, based on inputs from the spatial harvest sequence (SHS). The spatial harvest sequence identifies spatially and temporarily the stands that will produce the sustainable timber harvest levels (AAC) and desired future forest conditions.

The ELC and successional modeling were originally developed for the McLean Creek and Etherington Creek Study areas by URSUS Ecosystem Management and incorporated in the harvest designs by SLS. Data collection at the plot level included an assessment of the vegetation. This data was used to determine vegetation association and became the basis for the ELC and successional model. SLS will re-assess the habitat suitability data, by comparing current conditions to the projected metrics in 2016.

Objectives 5.4.1 "Maintain the natural vegetation range of variability across the landscape at key points in time."

- **Management Strategy**

The natural disturbance regime for the FMA is dominated by fire. To better understand the role and influence of fire in shaping the forests on the FMA, SLS conducted an extensive fire history and fire regime analysis between 2003 and 2006 conducted by M-P Rogeau. In 2011, this body of work was compiled to evaluate the pre-industrial forest conditions (referred to as PIC). Among components relevant to forest management, the fire regime study documented the historical range of fire size, Mean-Fire-Return-Interval and fire cycle for each natural subregion within the FMA.

Multiple age-class distributions, extracted from computer simulated PIC fire origin maps, provided the range of variability expected to be found in a natural vegetation mosaic. The PIC age-class distributions by fuel type were compared with the seral age classes from the current forest inventory, which included areas most recently harvested (as of 2012).

The study found that currently there is an excess of mature stands and a deficit of young stands for the B10 FMU, when compared to the PIC. FMU B9, shows an excess of old seral stage stands for both pine and spruce classes in the Montane and Upper Foothills/Subalpine and there is a surplus of regeneration stage of pine stands, in the Lower Foothills Subregion. Deciduous and Mixedwood forests all show a surplus of mature and old forests within the FMA. SLS's management strategies are moving forest composition toward a more natural composition identified in the Pre- Industrial Forest Condition Report

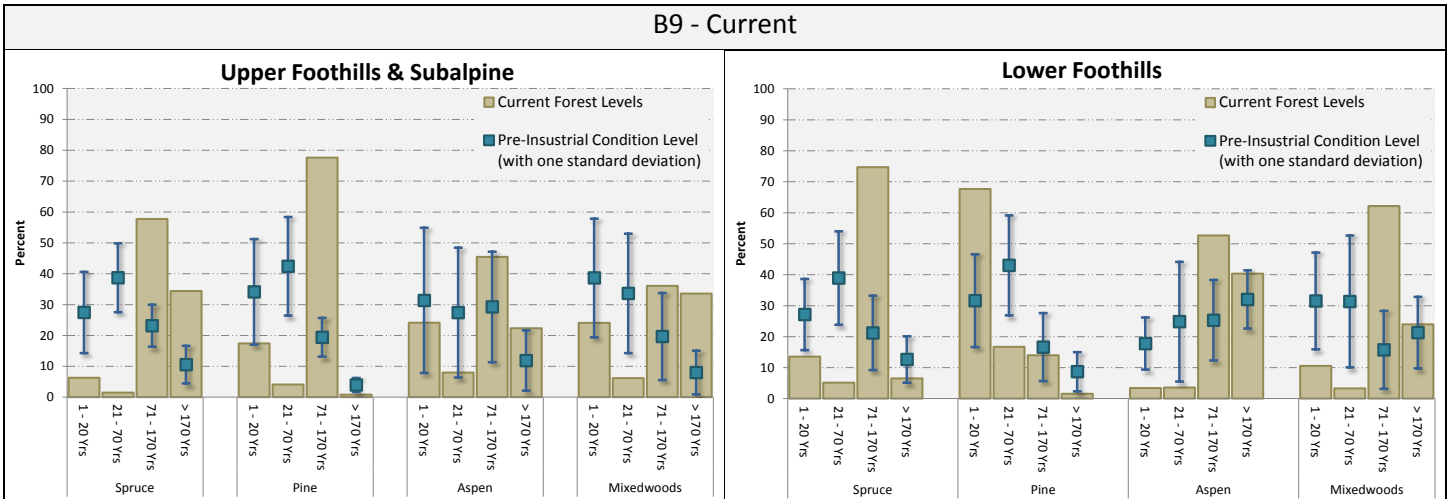
(PIC). This approach of forest management compensates for the lack of natural disturbances as a result of fire suppression.

The PIC study concluded that the size of harvest blocks, currently at less than 100 ha, falls within the natural range of variation. However, under PIC burning conditions, less than 20% of fires would be less than 100 ha. The mean fire size under a fire suppression regime was established at 537 ha for the Subalpine, 1,454 ha for the Upper Foothills/Montane and 800 ha for the Lower Foothills. Under a PIC fire regime, mean fire size would be expected to be much larger.

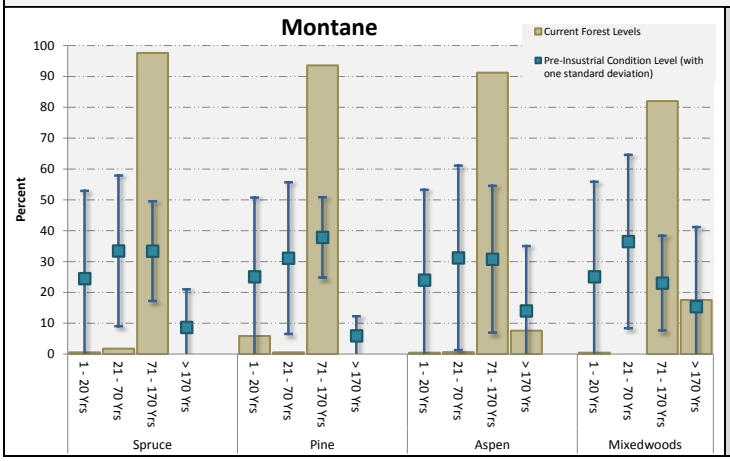
In terms of landscape management, SLS is addressing the findings of the fire disturbance research in several ways. SLS is increasing the size of harvest blocks by adjoining blocks while leaving a patchwork of island remnants and preserving travel corridors and shelter for wildlife. SLS is also increasing the amount of patterning of a harvest block to make them more visually appealing, reminiscent of fire boundaries and increasing edge habitat for a variety of species.

SLS is currently engaged in a fire refugia inventory program to determine the location of old growth forest on the landscape. These remnant old growth forest patches will be retained on the landscape.

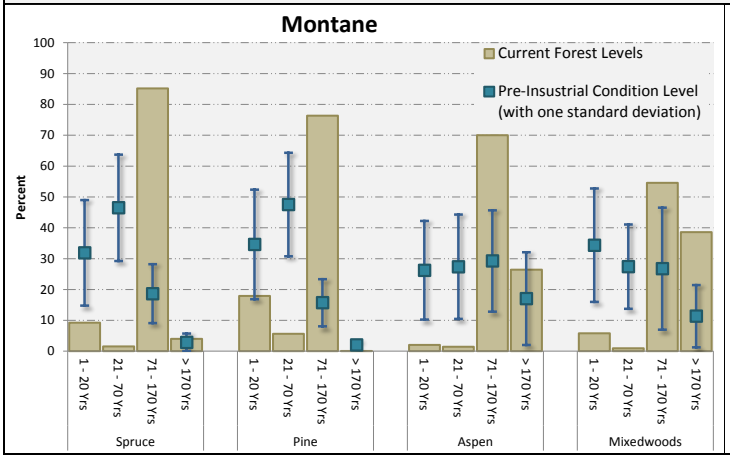
SLS has updated the FMA pre-industrial forest condition report with 2012 data (Figure 4-2 to Figure 4-9), and projected the future forest levels on the forested land base through 2081. The forecast was based on harvesting activities projected for the current spatial harvest sequence. The results indicate that over time, the old growth seral classes increase and in some sub-regions there is a deficit of young age classes as a result of fire suppression.

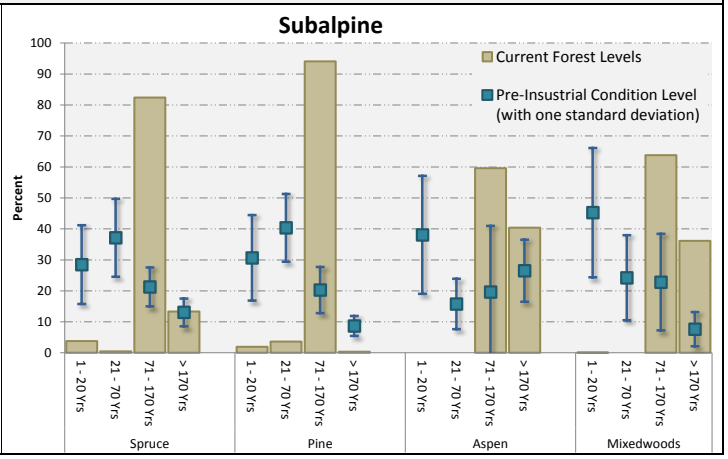


B9 - Current



B10 Upper - Current





B10 Lower - Current

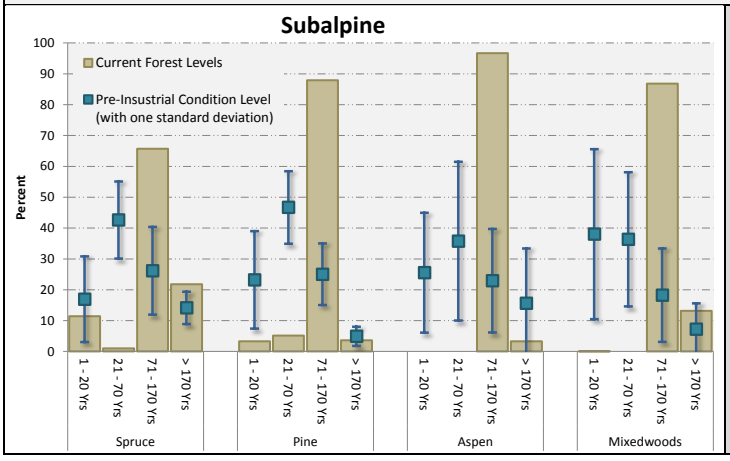


Figure 4-1: Description of future forest projections

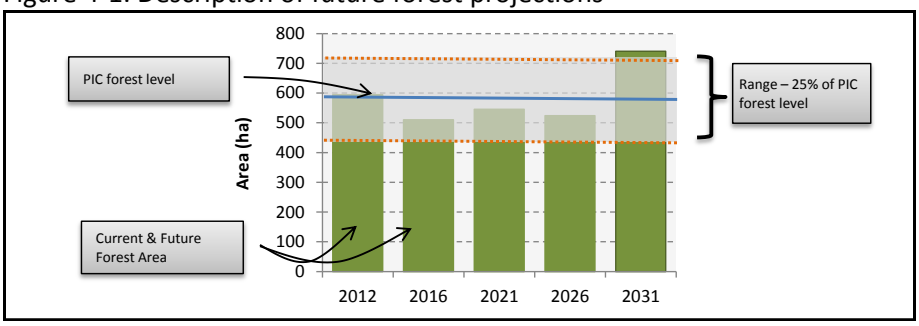


Figure 4-2: Future Forest Projections - B9 Spruce

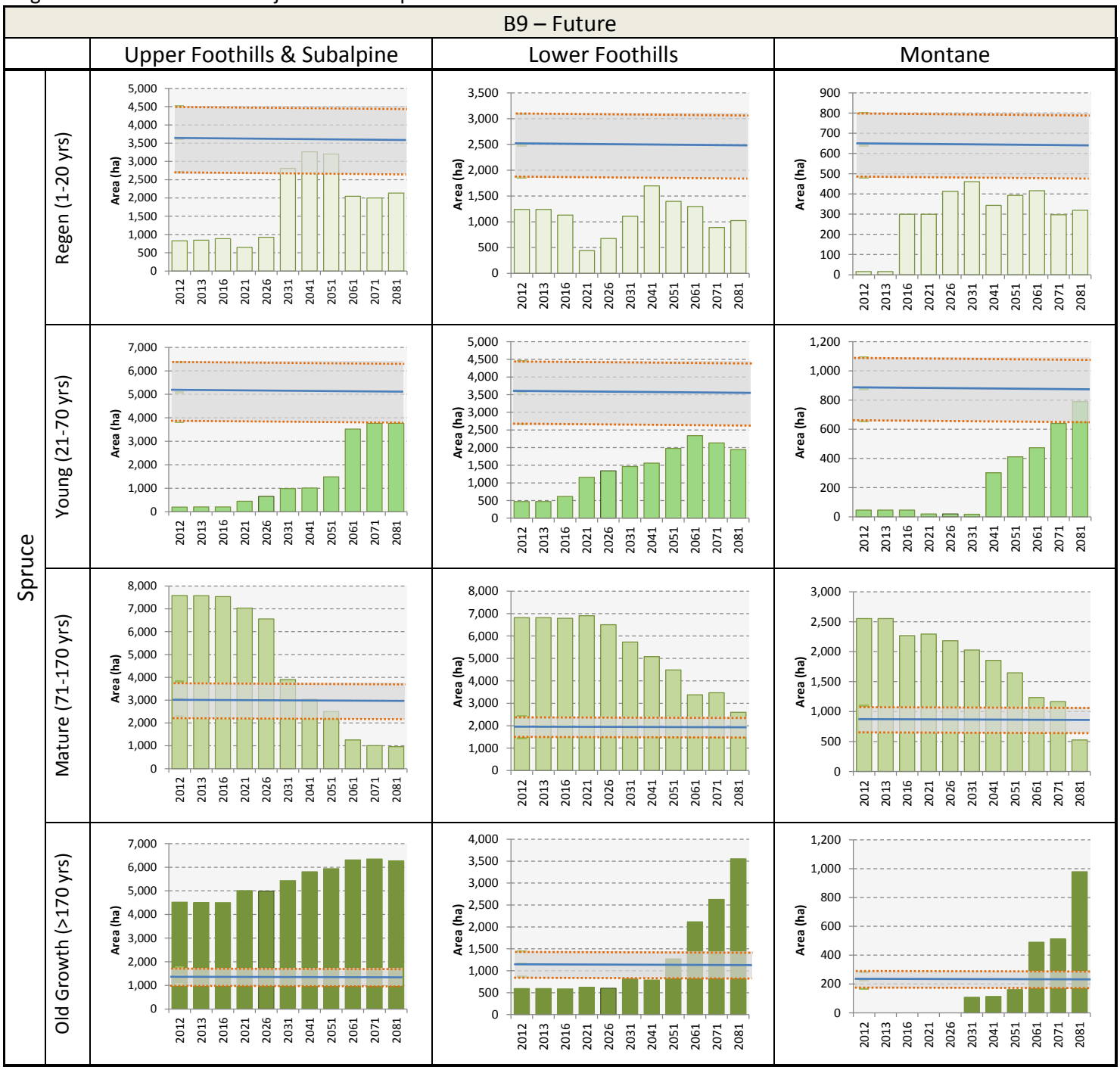


Figure 4-3: Future Forest Projections - B9 Pine

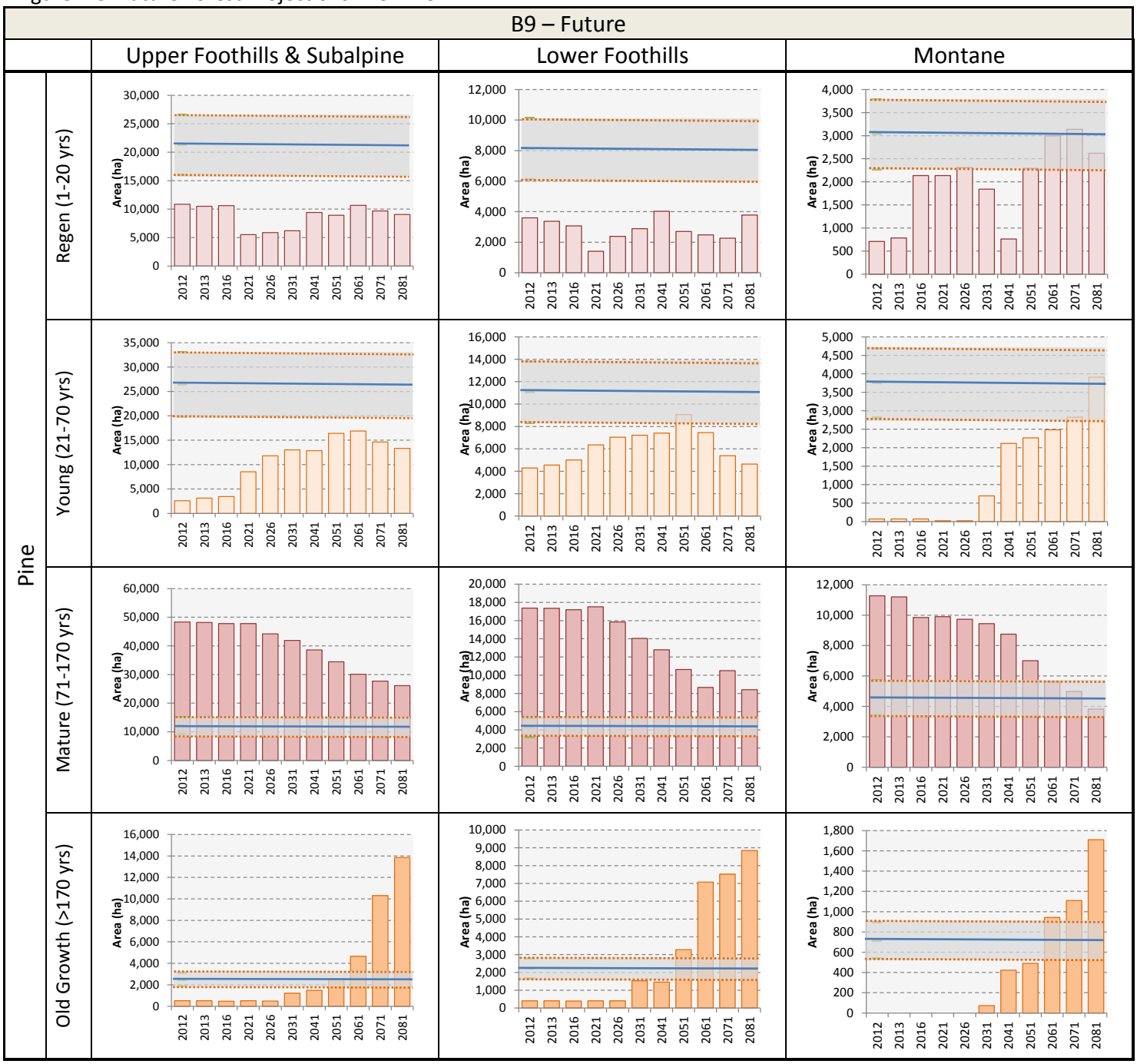


Figure 4-4: Future Forest Projections - B9 Aspen

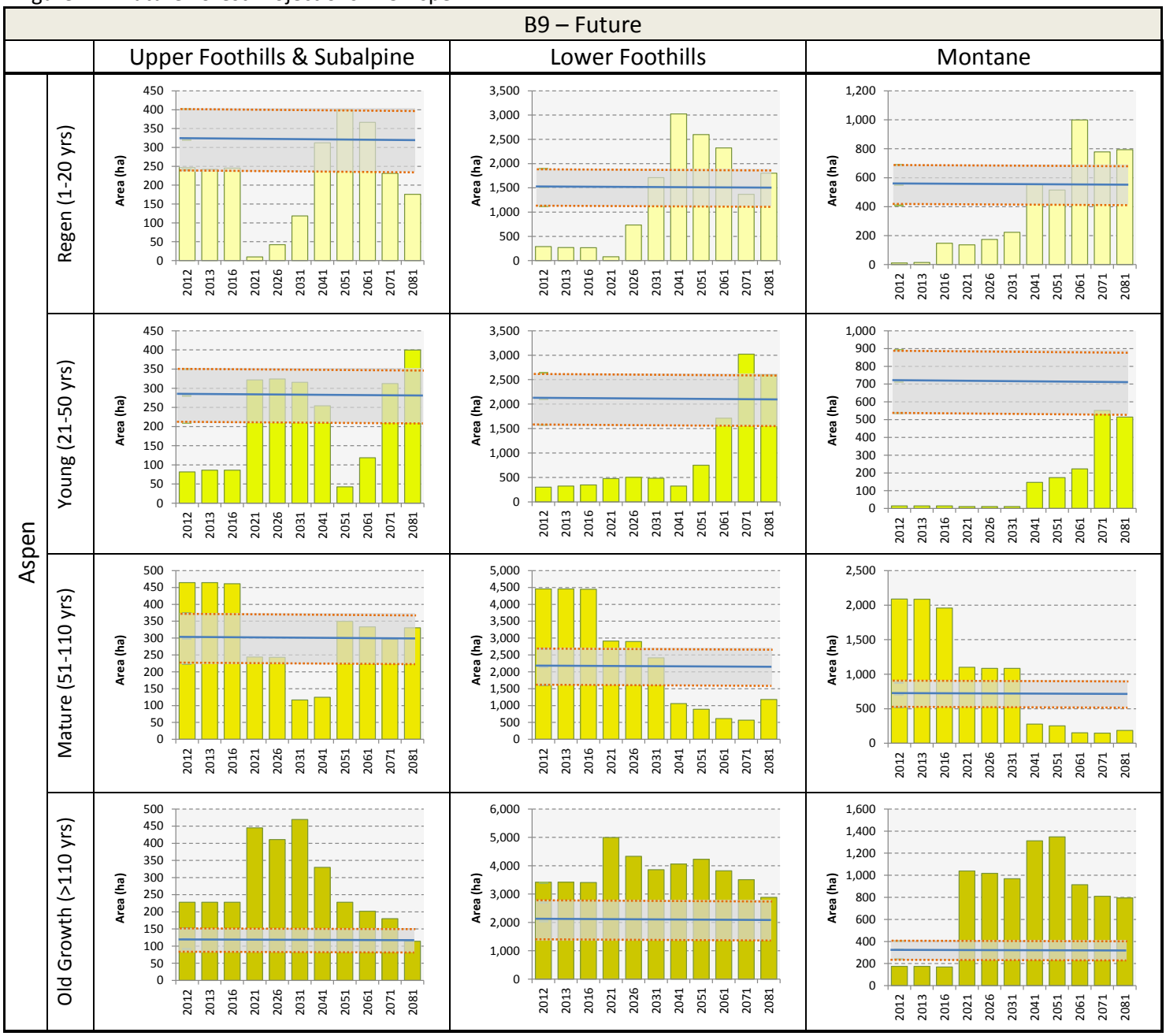


Figure 4-5: Future Forest Projections - B9 Mixedwood

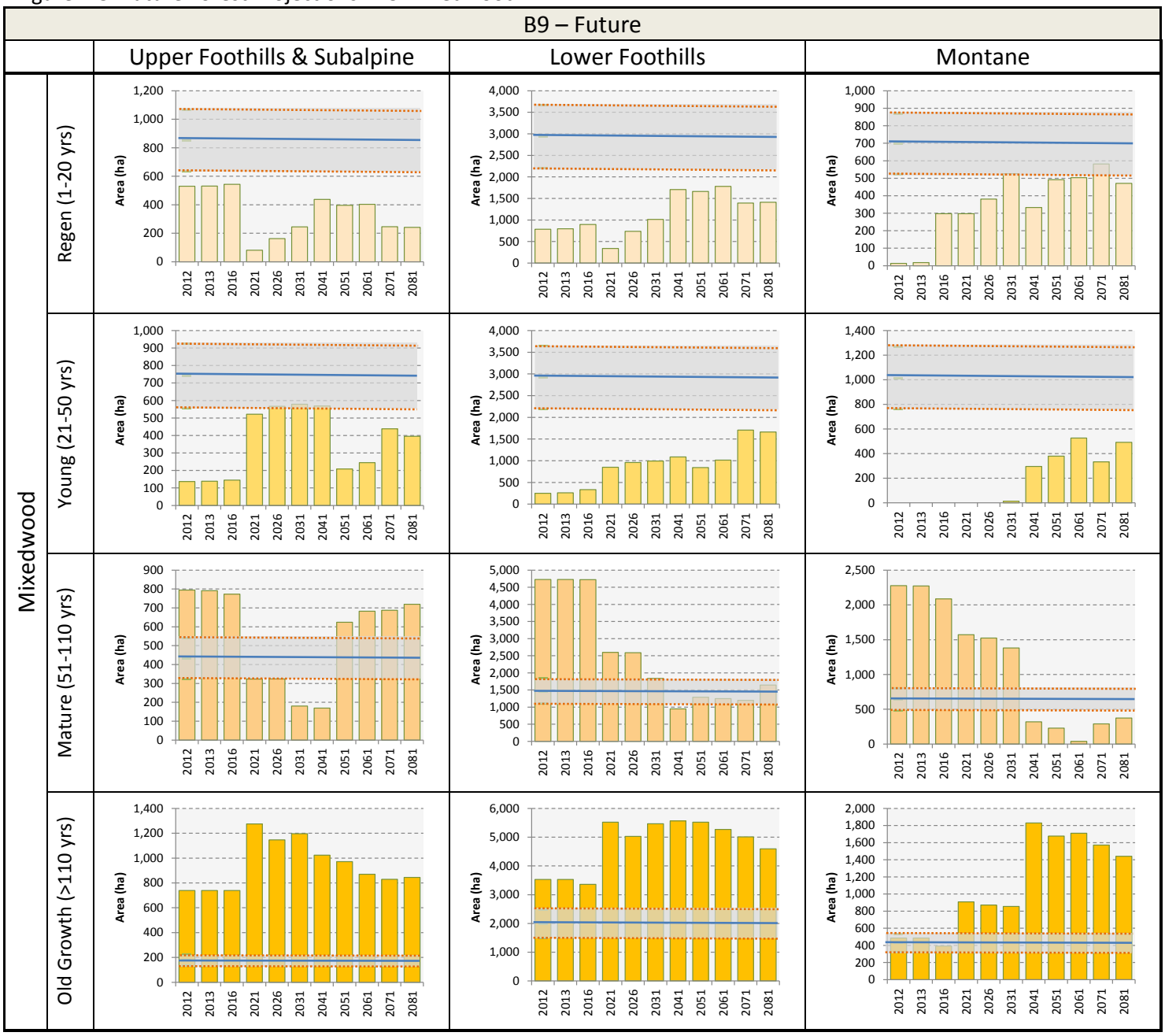


Figure 4-6: Future Forest Projections - B10 Spruce

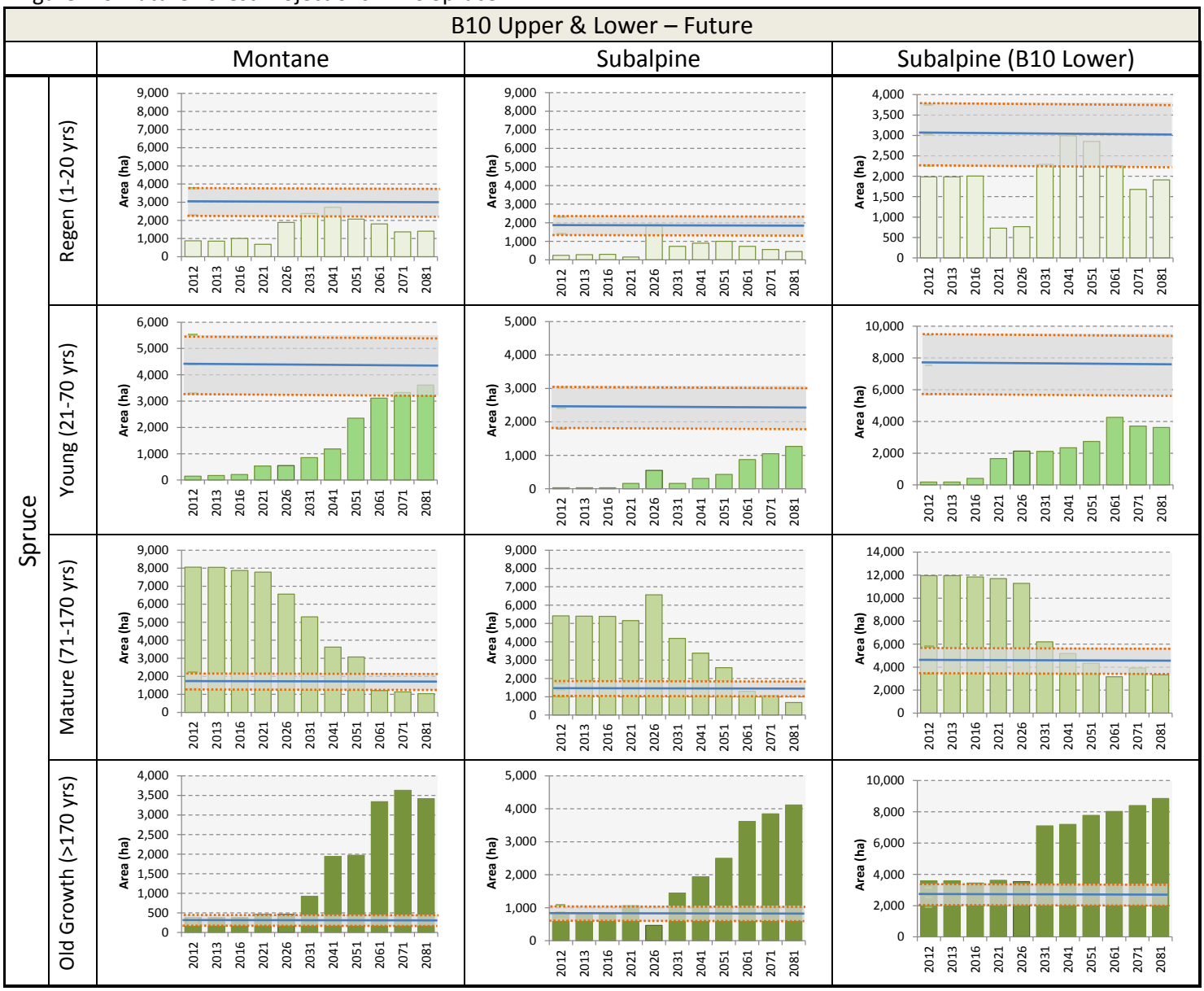


Figure 4-7: Future Forest Projections - B10 Pine

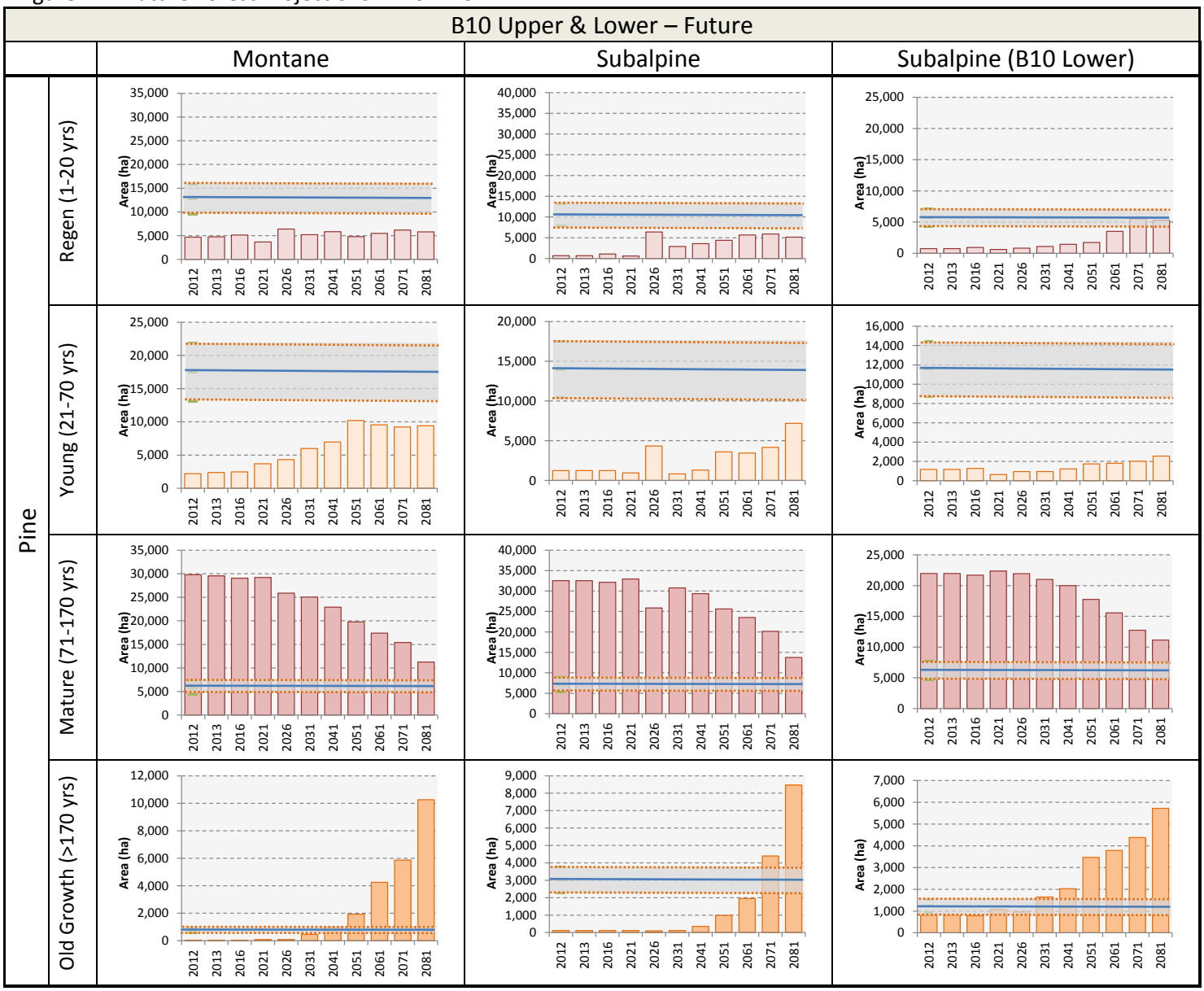


Figure 4-8: Future Forest Projections - B10 Aspen

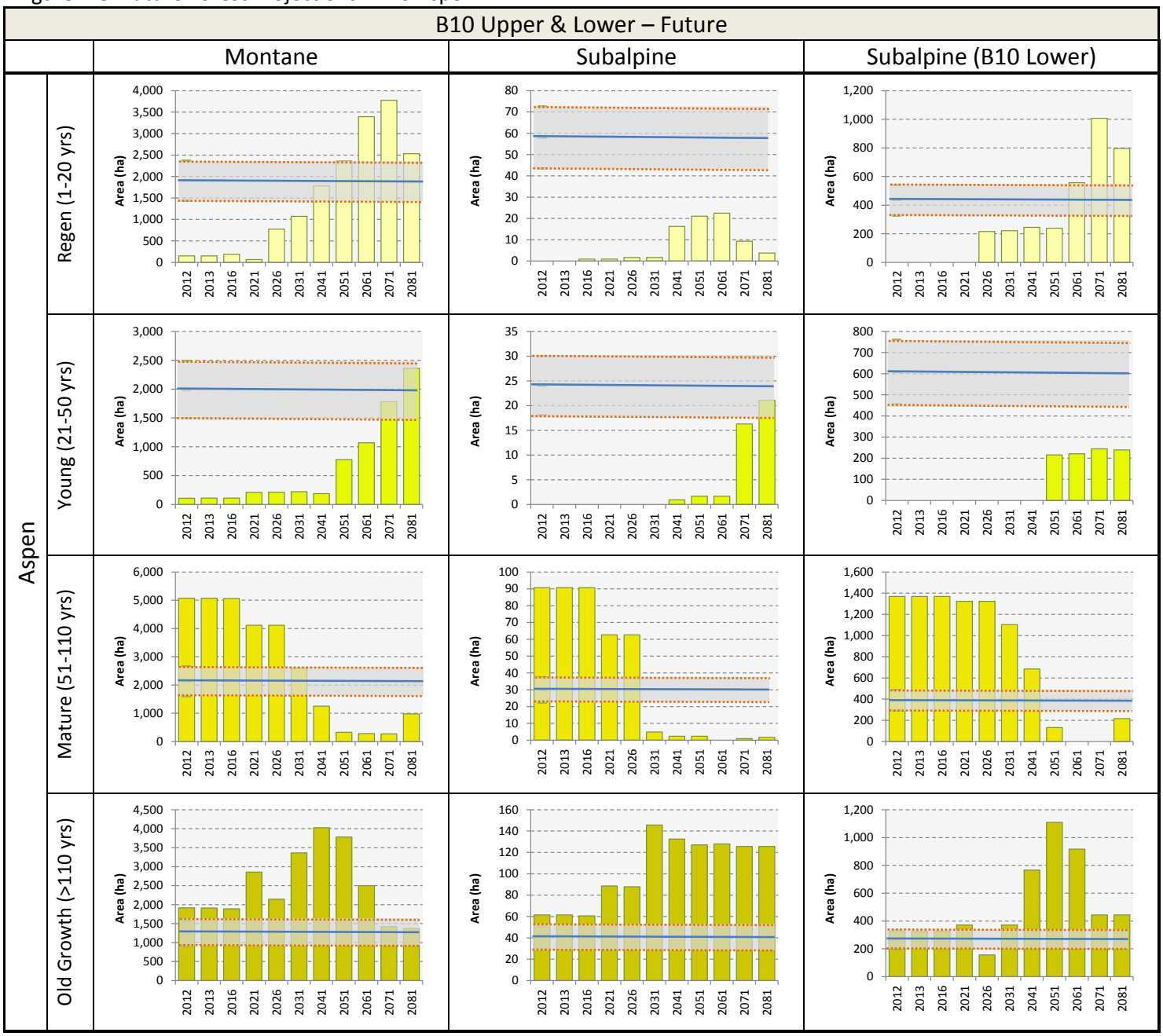
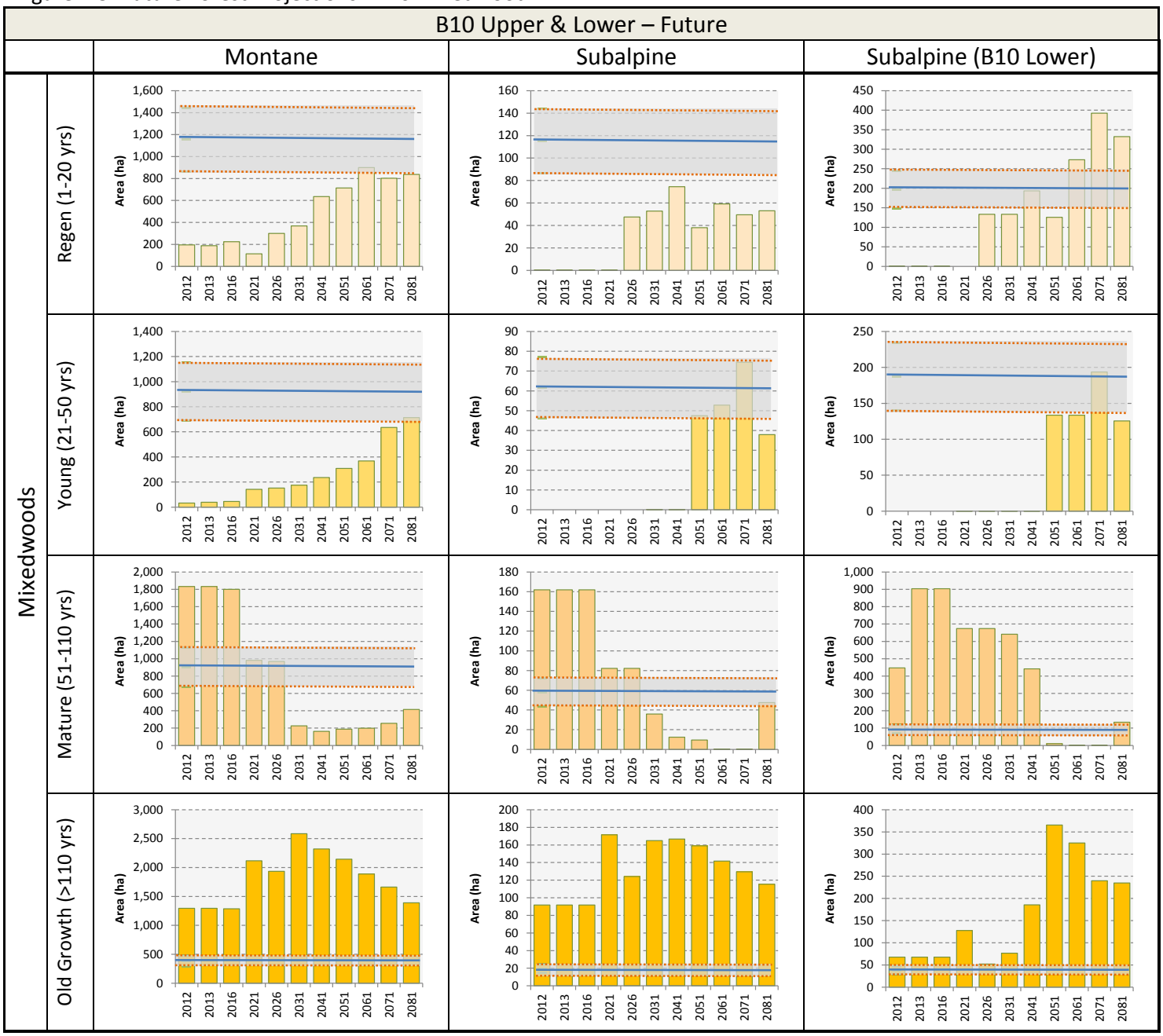


Figure 4-9: Future Forest Projections - B10 Mixedwood



Objectives 5.4.1 "Protect rare ecosections and ecosites."

Management Strategy

Spray Lakes Sawmills updates Alberta conservation management system (ACIMS) Data for the FMA annually and incorporates information into harvest planning.

SLS completed FMA Assessments for rare and scarce ecosites at both the ecosection (1:100,000) and Wildlife Habitat Unit (ecosite) (1:20,000) scales. These sites were mapped and treated as overlay information in operation planning. When an overlap between a potential opening & rare/scarce ecosite arose, a field assessment was conducted to determine its presence. If rare/scarce ecosite did exist, the opening boundary was adjusted to exclude the rare/scarce ecosite. The assessments are designed to focus on ecosite type and operational considerations respectively. A summary of the rare ecosites identified for the reporting period are provided under Objective 5.10.

Objectives 5.4.1 "Retain structural attributes within harvested areas and fire salvage areas."

Management Strategy

- **Structural Retention**

Identifying and maintaining structural components at the landscape and stand level is an important part of ecosystem based management. The dynamic arrangement of living and dead trees and other vegetation has the potential to contribute the necessary habitat elements for a variety of species over space and time.

Structural retention is linked to a number of the DFMP Objectives including biodiversity, aesthetic resources and integration of other values and non-commercial uses. The landscape within and surrounding the FMA contributes to the overall landscape level structural retention objectives. SLS, also retains individual trees, snags, groups of trees and woody debris to promote habitat opportunities, microsite variability and potential for biodiversity within the cut blocks.

Table 4-1 and Table 4-2 describe post-harvest, in block patch area retained on the land base. Additionally, Single stem retention within openings is a component of Spray Lake's operating ground rules and majority of openings have single stems retention post-harvest. However, at this time, a survey to determine in block, single stem retention has not been completed and single stem retention levels are not reported.

SLS's targets for retention are as follows: individual tree and small patch retention of 1% by volume for blocks <100 ha and large patch retention of 4 ha, for blocks greater than 100 ha.

Table 4-1: Block Size - Less than (<) 100 ha.

Timber Year	Harvested Area (ha)*	Total In Block Patch Retention (from photography) (ha)	Percent Retention*** (from photography)
2007/2008	1,182	11.21	0.95%

Timber Year	Harvested Area (ha)*	Total In Block Patch Retention (from photography) (ha)	Percent Retention*** (from photography)
2008/2009	595	7.34	0.72%
2009/2010	430	37.61	3.65%
2010/2011	1,030	37.61	3.65%
2011/2012	436	23.96	5.50%
Totals & Averages	3,673	117.74	2.18%

Table 4-2: Block Size - Greater than (>) 100 ha

Timber Year	Harvested Area (ha)*	Total in Block Patch Retention (from photography) (ha)	Percent Retention*** (from photography)
2007/2008	254	4.67	1.84%**
2008/2009	-	-	-
2009/2010	442	23.04	4.19%
2010/2011	151	10.33	6.85%
2011/2012	-	-	-
Totals & Averages	847	38.04	3.96%

*Notes: Between the period of May 1st 2007 & April 30th 2012 a total of 4,781 ha were harvested (according to spatial records). 4,521ha were harvested at the time of the 2011 photography or have patches laid out that are spatially recorded.
**The harvesting operation was located within the high MPB Zone.
***The percent retention is a weighted calculation, by block area and the associated timber year area harvested. An average percent is a weighted average calculation, weighted by the area harvested for the timber year.

SLS has identified the need to improve meeting and tracking block retention targets for monitoring and reporting purposes.

Objectives 5.4.1 "Retain tree species genetic diversity across the landscape."

Management Strategy

SLS retains tree species diversity by using natural regeneration and planting of native tree species to meet reforestation objectives. Seed, for growing planted trees, originate from natural stands, of identical seed zone. Seed collection protocols the Alberta Forest Genetics Resource Management and Conservation Standards[1]. Trees grown from certified seed orchards are not being used by SLS.

Additionally, 30% of the FMA is designated as passive land base, an area of continuous forested retention. The forested retention within the passive land base is widely distributed across the FMA and mostly includes: primary protection zones, steep slopes, and riparian areas. The passive land base is connected to the active land base, where additional retention has been designated as connective corridors (key wildlife and biodiversity zones), ecosites, green adjacency, and critical wildlife zones.

[1] The Alberta Forest Genetics Resource Management and Conservation Standards can be found at: http://srd.alberta.ca/LandsForests/ForestManagement/documents/FGRMS-AlbertaForestGeneticResourceManagementAndConservationStandards-May2009.pdf

Tree species diversity is also protected within blocks by SLS contractors who are trained to retain rare species such as limber pine or white bark pine. Douglas fir, subalpine fir, larch, all deciduous species, wildlife trees (having signs of nest cavities or nests), and trees located on sensitive sites are also prioritized for block retention by SLS staff and its contractors.

4.2. Wildlife

Objectives 5.4.2
"Develop a landscape level understanding of wildlife habitat needs both spatially and temporally."

Objectives 5.4.2
"Maintain habitat for key species over time at the landscape level."

Management Strategies

- **Landscape Assessment**

In 2006, SLS completed an FMA, landscape assessment, as part of developing the DFMP to establish a benchmark against which current and projected landscape conditions can be measured. SLS, also established Habitat Suitability Models for key indicator species and habitat types. These habitat types were projected into the future, based on the spatial harvest sequence.

Overtime, the spatial harvest sequence creates a shifting mosaic of forest habitats. The size, frequency and diversity of forest habitats are within the natural range of variability, inherent of a fire dependent ecosystem. In 2016, SLS will complete wildlife habitat suitability and fragmentation assessments and compare the data to the landscape assessment benchmark.

Objectives 5.4.2
"Incorporate wildlife habitat needs in operational planning."

Management Strategies

SLS has a forest retention strategy for managing wildlife habitat on the FMA. Approximately 30%, of the FMA is designated as passive land base and was designated as such to meet a variety of resource objectives, including benefits to wildlife. The passive land base, mostly includes areas such as: primary protection zones, steep slopes, and riparian areas.

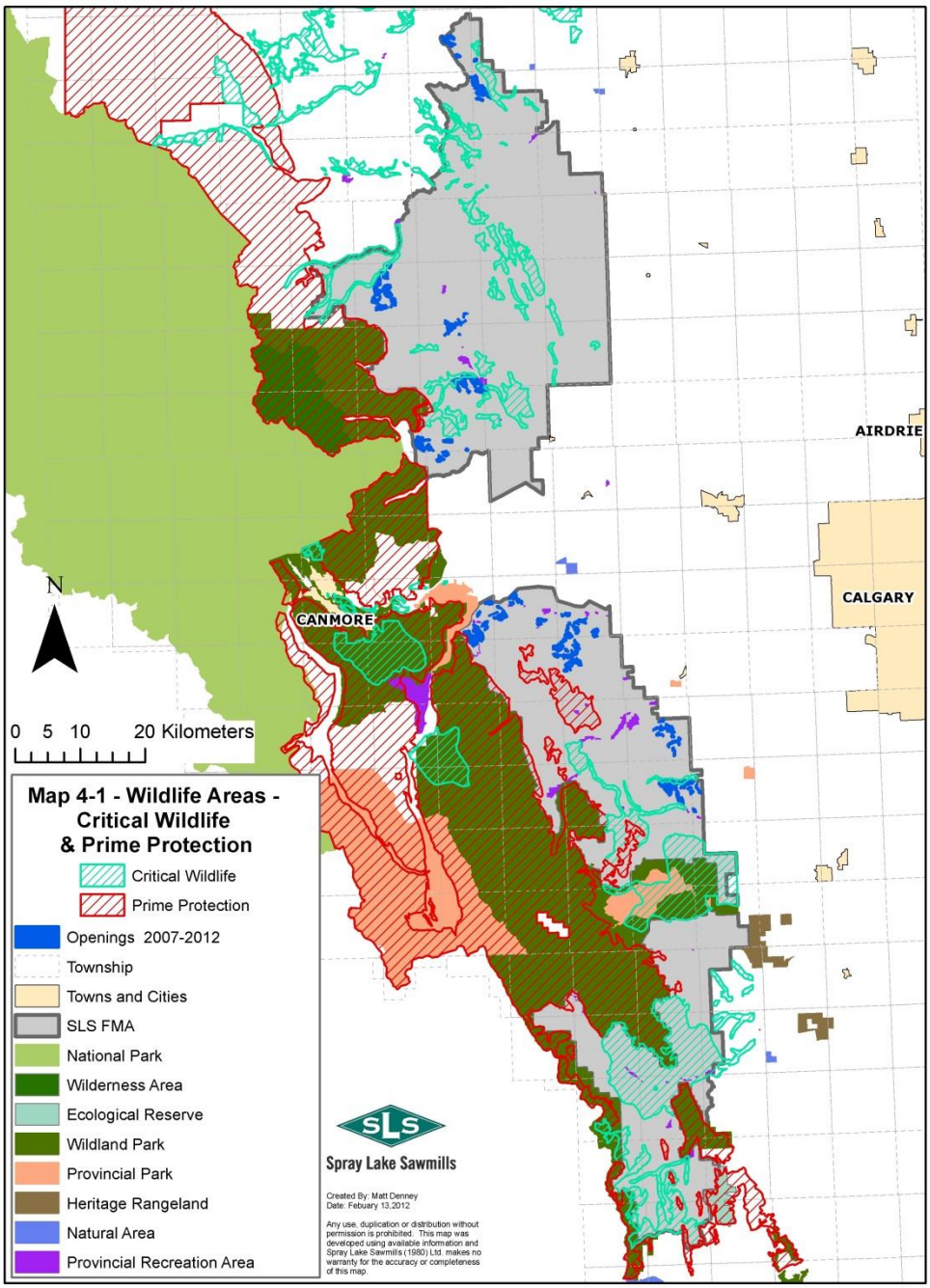
Forest operation considerations have also been designated within the active land base. These areas include: rare & unique ecosites, when verified in the field, critical wildlife areas and connective corridors (key wildlife and biodiversity zones), as illustrated in Map 4-1 and Map 4-2.

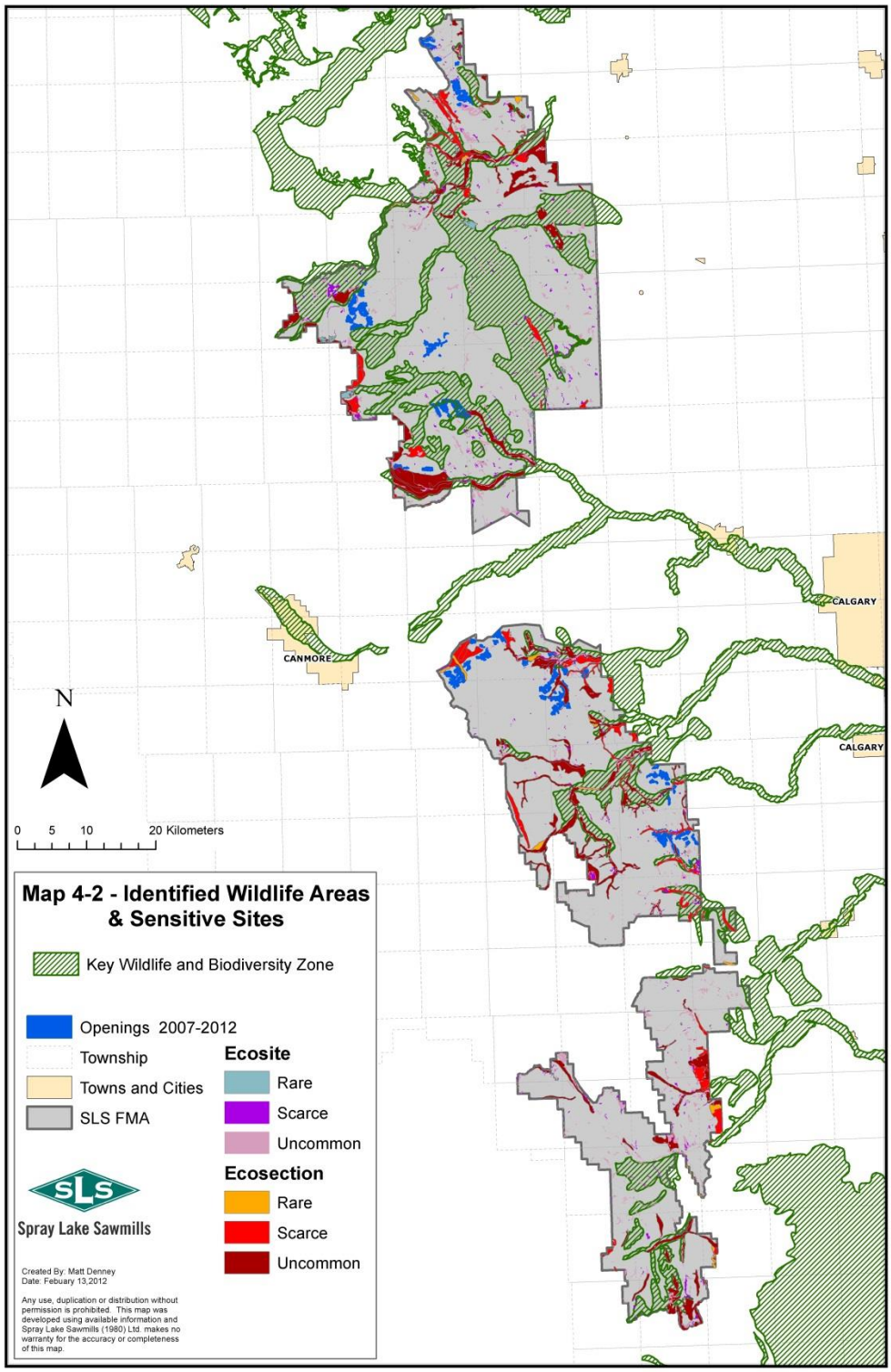
Within openings, SLS retains individual trees, snags, groups of trees and woody debris to promote habitat opportunities, microsite variability and potential for biodiversity. SLS evaluates its harvest blocks for sensitive sites, such as species of concern, or wildlife nesting or denning areas while completing pre-harvest assessments and laying out blocks. SLS contractors are trained to stop work if they encounter species of concern, or any wildlife nesting or denning areas. Table 4-3 documents the sensitive sites

identified by SLS. Key ungulate ranges have also been mapped and are integrated in operations planning into the GIS, to avoid seasonal disturbances and maintain the long term integrity and productivity.

Table 4-3: Sensitive Sites

Timber Year	Sensitive Site	Action Taken
2007-2008	Wallow area Inactive Fox/coyote den Mineral Lick Critical Wildlife Zone	Withdrawn from cutblock Withdrawn from cutblock Installed visual buffer Changed timing of harvest
2009-2010	Critical Wildlife Zone	Changed timing of harvest
2010-2011	Great Grey Owls nest	Installed buffer around nest tree
2011-2012	Old Growth Spruce patch	Removed from cutblock


AIRDRIE
CALGARY
CANMORE
N
0 5 10 20 Kilometers
Map 4-1 - Wildlife Areas - Critical Wildlife & Prime Protection
Critical Wildlife
Prime Protection
Openings 2007-2012
Township
Towns and Cities
SLS FMA
National Park
Wilderness Area
Ecological Reserve
Wildland Park
Provincial Park
Heritage Rangeland
Natural Area
Provincial Recreation Area
SLS
Spray Lake Sawmills
Created By: Matt Denney
Date: Febuary 13,2012
Any use, duplication or distribution without permission is prohibited. This map was developed using available information and Spray Lake Sawmills (1980) Ltd. makes no warranty for the accuracy or completeness of this map.


CANMORE
CALGARY
CALGARY
N
0 5 10 20 Kilometers
Map 4-2 - Identified Wildlife Areas & Sensitive Sites
Key Wildlife and Biodiversity Zone
Openings 2007-2012
Township
Towns and Cities
SLS FMA
Ecosite
Rare
Scarce
Uncommon
Ecosection
Rare
Scarce
Uncommon
Spray Lake Sawmills
Created By: Matt Denney
Date: Febuary 13,2012
Any use, duplication or distribution without permission is prohibited. This map was developed using available information and Spray Lake Sawmills (1980) Ltd. makes no warranty for the accuracy or completeness of this map.

Objectives 5.4.2
"Minimize the impacts of SLS activities on riparian areas."

Management Strategies

SLS Classifies all watercourses encountered during preliminary assessment as per Section 6.0 of the Operational Ground Rules (OGR). All stream buffers are designated, on the ground, to comply with the water course specified, forested buffers and equipment exclusion zones required in the OGR.

Objectives 5.4.2
"Evaluate riparian management opportunities."
In terms of forest management and SLS's operations, riparian management activities refers to the removal of some timber within the designated riparian protected area (i.e. the buffer) while demonstrating that the aquatic and terrestrial objectives are met. Any such proposal for activities of this nature requires a full review by Alberta Environmental Sustainable Resource Development (AESRD) and approval by the Forestry Program Manager within the AESRD. SLS has not developed additional riparian management opportunities and to date has not proposed or conducted any activities of this nature. SLS has been relying on the rules and strategies outlined in the Operating Ground Rules for conducting activities in proximity to riparian areas.

5. Community Timber Program

Objectives 5.5 "Recognize and honor the fixed volume commitments contained in the FMA".

Management Strategies

The Forest Management Agreement outlines the volume commitments and sequencing requirements of the fixed volume allocations for the Community Timber Program (CTP). SLS screens, CTP and quota holder boundaries, to ensure these areas are maintained. The Community Timber Program has mostly been inactive as indicated in the table below.

Table 5-1: CTP volume harvested

Timber year	CTP harvest (m^3)*	CTP QAC balance (m^3)*
2007-2008	13,168	127,591
2008-2009	0	127,591
2009-2010	0	127,591
2010 - 2011	4,873	122,718
2011-2012	11,221	169,279

* Volumes obtained from the Alberta government for FMU's B9 and B10, A new QAC started in 2011/12 timber year

6. Soil Conservation

Objectives 5.6
"Minimize the impact of our activities on soil productivity".

"Minimize soil erosion from our operations".

Management Strategies

SLS promotes harvest operations where tree processing (removal of limbs and tops) is conducted at the stump wherever possible. This approach of harvesting has many benefits to soil productivity. By processing the trees at the stump, tree tops and branches are evenly distributed throughout the block. Important nutrients are retained to leach back into the soil, providing for soil nutrition and development. Soil moisture holding capacity is also enhanced and organic matter is incorporated in to the soil which helps maintain soils productivity. The retention of coarse woody debris and needles and twigs also provides protection from erosion and creates microsites for seedlings and wildlife habitat.

SLS planners minimize road building by optimizing economical skidding distances, planning the most direct access routes, utilizing existing roads and planning joint use corridors. Planned temporary roads, bared landing areas and displaced soils must not exceed 5% of the area, unless justified by SLS and accepted by the AESRD during the AOP approval process.

During non-frozen periods, SLS ceases its operations during intervals of general soil saturation to reduce the risk of rutting. Annually, SLS provides a contractor training. Operators are trained to utilize management practices that protect forest soils and minimize soil disturbance and compaction.

Table 6-1: Average Block Soil Disturbance

Timber Year	Total Blocks	Area harvested (ha)	Average Disturbance (%)
2007-2008	56	1,460	4.62
2008-2009	30	598	4.26
2009-2010	22	873	4.13
2010-2011	31	1,180	3.13
2011-2012	23	670	3.08
Total	**162**	**4,781**	**3.98**

7. Forest Health (forest pest management)

Objectives 5.7

"Assist Sustainable Resource Development (SRD) in assessing the status and control of insect and disease concerns. As examples, concerns identified are Dwarf Mistletoe and Mountain Pine Beetle (MPB). "

"Reduce the spread of insect species that can kill trees within 1 year of infestation."

"Reduce the impact of insects and diseases that cause reduced growth, tree deformities or mortality."

Management Strategies

- **Mountain Pine Beetle**

During October of 2006, MPB susceptibility and Rankings were built into the net land base file to enhance targeting of MPB susceptible stands in the timber supply analysis. The following table outlines the cut blocks prioritized and harvested due to risk of MPB infestation during the reporting period.

Table 7-1: Mountain Pine Beetle blocks Harvested- Timber Years 2007-2012

Compartment	Number of Blocks	Area (ha)
Ghost River	15	979.68
Jumping Pound Creek	30	674.53
Total	45	1,654.21

In 2007, four MPB infested trees (green attack) were identified and disposed of. Two trees were found in the Sibbald Creek drainage and two trees were located in the Lusk Valley. AESRD personnel felled and burned the infested stems.

- **Provincial Mountain Pine Beetle Strategy**

Currently SLS is not operating under a Pine Beetle Strategy. In the process of FMP development, the Mountain Pine Beetle Strategy directive from AESRD was assessed with the intent to meet the target of reducing susceptible pine on the landscape by 75% within 20 years. After reviewing the resulting timber supply analysis and assessing the current MPB infestation status within the context of social expectations, SLS requested that the Mountain Pine Beetle Strategy not be implemented. AESRD accepted SLS's request with the instructions to meet annually with the Southern Rockies Area staff to review the status of the MPB infestation and determine whether the management objectives contained in the FMP are still appropriate. SLS has been meeting annually with the AESRD's Southern Rockies area staff and reviewing the population trends of the MPB which currently are on the decline in Spray Lake's areas of operations[2].

- **Blow Down Salvage**

SLS completed salvage harvesting on 271.4 hectares for blowdown timber during 2007-08. The blowdown was caused by two separate severe windstorms. The storms occurred in November of 2006

[2] See the website below for more details - http://mpb.alberta.ca/AlbertasStrategy/ShortTermStrategy/MPBMortality.aspx

and November of 2007. Salvage harvesting was completed on 106.2 hectares in the Ghost River Compartment and 105.2 hectares in the McLean Creek Compartment.

Objectives 5.7
"Increase forest health awareness among staff and contractors."

Management Strategies:

SLS continues to participate in the Integrated Pest Management Committee and obtains updates on the Insect and Disease status within the region. SLS also reviews forest health concerns and status updates with logging contractors and woodlands staff including training in identification of important insects and diseases. SLS has conducted an annual stewardship training program for its employees and contractors during the reporting period. Relevant forest health issues are discussed to raise awareness.

Objectives 5.7
"Assist in the prevention, detection and control of restricted and noxious invasive plants."

Management Strategies:

SLS has, and is continuing, to participate in cooperative invasive plant management with various municipal districts, AESRD and other disposition holders. SLS reports the location and species of noxious invasive plants to the AESRD Weed Coordinator on an ongoing basis.

SLS has conducted an annual training program for its employees and contractors during the reporting period. Relevant noxious weed issues are discussed to raise awareness and to prevent the spread of noxious weeds. SLS only uses certified weed-free seed for reclamation projects.

SL follows, AESRD Directive 2001-06 "Weed Management in Forestry Operations" which provides guidelines for weed prevention and control, including the practice of cleaning equipment before moving into an area.

8. Forest Land Base

Objectives 5.8

"Identify opportunities for offsetting the impact of other industrial users on the productive forest land base within the FMA."

- **Afforestation opportunities**

For the reporting period, three well sites were identified as candidates for afforestation opportunities. Reforestation plans were established, but activities did not occur because of unfavorable economic conditions.

"Minimize the loss of productive forest land base."

Management Strategies

SLS has an aggressive road reclamation and reforestation program. Roads are generally reclaimed after forest operations are completed (harvesting, hauling, site preparation and tree planting). This is generally 3 years after the road has been constructed. Table 8-1 outlines road construction and reclamation activities. For the 5 year reporting period, road reclamation and construction activities are fairly evenly balanced. SLS conducts road reclamation in order to return these areas to productive land and minimize negative resource issues associated with open access.

SLS has established a cooperative working relationship with other commercial operators on the FMA. SLS routinely consults these commercial users, as part of the standardized planning process, to utilize joint road corridors and minimize land removed from the productive forest land base.

Table 8-1: Road construction and reclamation for reporting period

Timber Year	Road Construction (km)	Road Reclamation (km)
2007/2008	51.3	19.85
2008/2009	35.7	68.63
2009/2010	37.74	53.80
2010/2011	51.34	15.72
2011/2012	28.91	36.14
Total	204.99	194.14

Table 8-2: Commercial Dispositions Withdrawn from FMA for Reporting Period[3]

Disposition Type	Number of Dispositions	Area of Dispositions (ha)
EZE	6	6.1
LOC	26	38.9
MLP	1	0.5
MSL	25	45.3
PIL	3	0.5
PLA	31	79.5

[3] For the reporting period 5 dispositions, all "PIL" were cancelled

Disposition Type	Number of Dispositions	Area of Dispositions (ha)
VCE	1	0.1
Total	**93**	**171.0**

Table 8-3: Other Dispositions Withdrawn from FMA for Reporting Period[4]

Disposition Type	Number of Dispositions	Area of Dispositions (ha)
MLL	1	38.15
Total	**1**	**38.15**

[4] Mountain View Marksman Association withdrew area for purpose is gun shooting range in May of 2011

9. Forest Protection (fire)

Objectives 5.9
"Support the Government of Alberta's forest fire protection activities".

Management Strategies

- **FireSmart Program**

The Alberta FireSmart program helps protect homes and communities from the threat of wildfire. FireSmart uses preventative measures to reduce wildfire threat to Albertans and their communities while balancing the benefits of wildfire on the landscape. SLS partners in the FireSmart program by prioritizing its forest management operations within the AESRD designated Community FireSmart boundaries.

Wildfires burn regardless of boundaries and both prescribed fire and FireSmart programs can reduce the likelihood of large, uncontrollable wildfires that can threaten Albertans and their communities.

SLS has digitized the Community FireSmart areas on the FMA identified as a 10 kilometer radius buffer around communities as outlined by the AESRD. The Community FireSmart boundaries for West Bragg Creek and Waiparous were provided by AESRD in July of 2005.

During the reporting period, a preliminary harvest design was given to SLS by the AESRD that would meet the FireSmart objective for the community of Bragg Creek. SLS, field verified the FireSmart elements and integrated them with an operational plan that would meet both SLS and FireSmart objectives. SLS has provided stakeholder input with regards to refining the data for the Wildfire Threat Assessment for the Bragg Creek FireSmart assessment.

Table 9-1: Burned Area Summary*

Year	Area in Hectares*	Number of Fires
2007	30.21	95
2008	1.35	76
2009	10.91	92
2010	1.64	145
2011	7.64	107
Totals	**51.75**	**515**

*SLS referenced the historical wildfire data set available on AESRD's website, located at: http://srd.alberta.ca/Wildfire/WildfireStatus/HistoricalWildfireInformation/SpatialWildfireData.aspx.

- **Salvage Harvesting**

SLS salvaged 271.4 hectares of storm damaged blowdown during 2007-08. Salvage harvesting was completed on 106.2 hectares in the Ghost River Compartment and 165.2 hectares in the McLean Creek Compartment.

- **Fire Training and Protection**

SLS requires that its staff and contractors are in compliance with fire protection regulations and maintains a fire cache and emergency response trailer for all harvest and road building operations. In

house training in emergency response, which includes both medical and environmental response planning, radio use protocols and fire suppression – tools / Initial Attack / lines of communications and roles is provided to all SLS employees and contractors. SLS routinely sponsors its employees to participate in the AESRD Wildfire Orientation training. During the fire season, SLS staffs a 24/7 fire duty rotation and SLS contracted logging equipment is made available for initial attack emergencies on the FMA.

- **Operations**

SLS developed a draft Fire Control Agreement in 2007 and met with the Crown on several occasions. SLS will continue to work with the crown towards establishing an operationally and financially feasible agreement. Annually, SLS submits a Forest Protection Supplement as part of its annual operating plan as required by the Forest and Prairie Protection Act.

10. Historical Resources

Objectives 5.10

"Protect historical resources across the FMA."

Management Strategies

SLS, developed a Historical Resource Predictive Model to assist with harvest planning and the management of historical resources for the FMA. The model highlights the location of all previously recorded archaeological sites and stratifies the FMA into high, moderate and low potential for locating and protecting potential sites. SLS submits all of it candidate cut blocks to Golder Associates, a company on the Government's list of approved archaeologists, for historical resource review prior to harvest. Golder Associates provides a comprehensive report for all of the blocks submitted by SLS annually.

All known archeological sites have been deferred from harvesting. The following table highlights SLS activities for locating and protecting historical sites using the model. SLS harvesting contractors are also trained to stop work and report any potential archeological sites encountered.

Table 10-1: Blocks submitted to Golder Associates for Historical Value Potential

Timber Year	Blocks Identified	Evaluations Completed	Shovel Tests	Historical Site Mitigation
2007-2008	47	12	159	No sites were found
2008-2009	37	8	14	No sites were found
2009-2010	33	12	82	No sites were found
2010-2011	59	27	597	1 Site confirmed, installed buffer and deferred the block.
2011-2012	29	13	130	No sites were found

11. Historical Resources and Unique Areas

Objectives 5.10

"Identify and protect unique areas."

"Identify and protect rare ecosites within the FMA."

Management Strategies

SLS completed FMA Assessments for rare and scarce ecosites at both the ecosection (1:100,000) and Wildlife Habitat Unit (ecosite) (1:20,000) scales. These sites, were mapped in the GIS and constrained by the spatial harvest sequence model.

Pre Harvest Field Assessments are completed to check for unique areas and validate mapped rare/scares ecosites. SLS consults with important stakeholder groups familiar with the FMA prior to harvest. The assessments are designed to focus on ecosite type and operational considerations respectively.

The Alberta Conservation Information Management System (ACIMS) (formally ANHIC) is also screened to identify the presence of rare ecosites. SLS harvesting contractors are also trained to identify rare plants and to stop work and report unique areas if encountered. Table 11-1 is a summary of the unique areas and ecosites SLS identified for the reporting period.

Table 11-1: Identified Rare Ecosites or Unique Areas

Timber Year	Ecosites		Unique Areas	
	Number Identified	Mitigation Measure	Number identified	Mitigation Measure
2007/2008	3 Identified	Areas Withdrawn*	1 Located (cultural)	Forested Buffer
			1 Located (cabin)	Area Withdrawn
2008/2009	0 Located	-	1 Located (cultural)	Area Withdrawn
2009/2010	0 Located	-	1 Located (cultural)	Area Withdrawn
			1 Located- lookout campsite	Forested Buffer
2010/2011	0 Located	-	2 Located (cultural)	Areas Withdrawn
2011/2012	1 identified	Areas Withdrawn*	2 Water Source	Forested Buffers
			1 Old Growth stand	Area withdrawn

*The ecosite and ACIMS polygon data estimates the location of rare ecosites. When planned blocks are adjacent or intersecting the ecosites, field verification is completed to verify the site location and protect the ecosite.

12. Integration of Other Values and Non-Commercial Uses

Objectives 5.11

"*Minimize the impact of our activities on other values and users".*

"Recognize existing designated recreation facilities and mapped trails in our operational planning."

"Recognize other designated non-commercial sites and non-commercial disposition holders".

Management Strategies

As a starting point to recognizing recreational and other values, SLS identified approximately 172 hectares in facility areas and 1,893 hectares containing formally designated recreation sites outlined in the Integrated Resource Plan (IRP). These areas were removed from the active land base.

General, designated recreation trails are also recorded in the SLS, GIS database. SLS maintains linkages in the existing trail system, through the harvest planning process and subsequent company activities. SLS also works with known stakeholders through a referral process at the preliminary planning stages to identify other values and non-commercial uses.

Some examples of integration actions by SLS include: trail restoration, trail construction, modified harvest design, adjusted timing of operations, and granting road use agreements and consents to other organizations such as outfitters, camps, a gun range and trail use groups. The following table outlines the parties and issues identified for the reporting period.

Table 12-1: Summary of Integration with other Users and Values and Non-commercial Users

Timber Year	Non-Commercial Interests Consulted	Issues Identified	Mitigation Measures
2007-2008	Olds Snowmobile and other off highway vehicle (OHV) Clubs	Snowmobile trails	Integrating trail use with operations
	Historical Preservation Group	Preserving telegraph lines	Provided GPS and mapping support.
	Trail Users	Trail Use	Provided trail maps at trail head kiosks
	Kananaskis Community Development	Trail Use	Solicited comments and provided maps; reclaimed roads to meet community development specifications; Installed signs for public safety and adjusted operation timing to accommodate trail users.
	Tim Horton's Children's Camp	Roads, safety and timing of operations	Road Use Agreement

Timber Year	Non-Commercial Interests Consulted	Issues Identified	Mitigation Measures
2008-2009	Alberta Trail Net	Protection of trails and building new trails.	Adjusted timing of operations and closed reclaimed roads to maintain trails, and constructed a new trail segment.
	Tourism Parks and Recreation	Protection of Provincial recreation areas (PRA).	Conducted consultation, provided maps and operating plans, Adjusted timing of operations.
	Tim Horton Children's Camp	Roads, safety and timing of operations.	Road Use Agreement, Donation to the camp on behalf of Spray lakes sawmills. Helped improving camps Emergency Response Plan (GPSd trails and provided maps and data to camp. Re-seeded camps activity field with Top Spray Seed mixture.
	Stoney Nakoda	Conducted field tour and discussed special sites.	Discussed AOP and traditional sites management.
2009-2010	First Nations	Interest in acquiring Tee Pee Poles and firewood.	Obtained permits and acquired and delivered tee pee poles and firewood.
	Whispering Pines Bible Camp	Road maintenance, preventing road damage, new road construction and reclamation.	Road Use Agreement.
	GAMP OHV Trails Group	Trail protection.	Mapped, signed and restored trails.
	Alberta Trail Net	Signage needed	Collaborated with trail groups and reviewed/edited interpretive signs.
2010-2011	The Alberta Provincial Rifle Association	Selecting an appropriate shooting range to meet the needs of the association.	Located and prepared a site in conjunction with harvest operations.
	Whispering Pines Bible Camp	Road maintenance, preventing road damage, new road construction and reclamation.	Road Use Agreement
	Single track Trail Users	Protect portions of single track trail.	SLS protects designated AESRD trails. This trail was not designated.
	Greater Bragg Creek Trails Association &	Protection of trails and retention of forest along	Started process of modified harvest blocks, remapped harvest blocks,

Timber Year	Non-Commercial Interests Consulted	Issues Identified	Mitigation Measures
	Bragg Creek FireSmart Committee	trails/within FireSmart Protection Zone.	modified road and landing locations, logging system, harvest schedule and reduced harvest levels (operation occurred in the 2012/13 harvest season)
2011-2012	Alberta Fish and Wildlife, Tourism, Parks and Recreation and Community Cultural Spirit.	Protection of PRAs, wildlife management, road closures and cultural resources.	Conducted consultation and shared roads and trails, restored roads and trails to prior condition. Adjusted timing of operations and closed and reclaimed roads.
	Rocky Mountain Dirt Riders, Calgary ATV Riders Association, Second Gear Club, Bow Cycle, Calgary Foothill Wonders, Olds Snowmobile Club, Extreme ATV Adventures, and the Canada Toyota 4WD Association.	Protection, maintenance and use of OHV Trails.	SLS to leave trails as found and schedule operations in the fall after the main trail season. Completed trail repair for Rocky Mountain Dirt Riders.
	MM Ranch	Protection, maintenance and use of horse Trails.	SLS to leave trails as found and schedule operations in the fall after the main trail season.
	Single Tree Ranch	Protection, maintenance and use of horse Trails.	SLS to leave trails as found and schedule operations in the fall after the main trail season.
	Kananaskis Trails Advisory Group	Trails and recreational management concerns-multiple trail types, users and camping sites.	Discuss issues and identify management strategies to protect resources.

Objectives 5.11

"Recognize future tourism opportunities."

Management Strategies

SLS meets with Alberta Tourism and Recreation and the AESRD on an annual basis to review Forest Harvest Plan submissions and to learn of emerging and future recreational opportunities.

Another way SLS recognizes future recreational opportunities is by referencing the East Kananaskis Country Region Tourism Assessment when evaluating harvest designs located in potential future recreation areas.

Alberta Economic Development is also included in the referral process, as coordinated through the AESRD, for areas adjacent to known potential development sites.

13. Integration with Other Commercial Users

Objectives 5.12

"Minimize our impact on the environment to reduce the collective footprint".

"Work with other commercial users to minimize the impact of activities on each other's interests."

Management Strategies

SLS coordinates its plans and operations with other commercial interests to minimize its industrial footprint and to integrate activities with other commercial operators. SLS has frequent contact and integration of its plans with grazing, energy and recreational companies who also operate on the FMA.

Table 13-1: Integration Activities

Timber Year	Commercial Interests Contacted	Road Use and Grazing Timber Agreements (GTA's)
2007/2008	BP, Petro Canada & Trans Alta, Fortis, Atlas, Alberta, West Fraser, Alberta Infrastructure and transportation.	Road use agreements for 14 Energy Company LOC's and 3 Alberta Infrastructure and transportation permits, 1 forestry company road permit and 1 power line crossing agreement.
	7 Trap line holders	Contacted for consultation.
	18 Grazing operators	Approximately 4 GTA's
	Commercial trail rider disposition holder	Contacted for consultation
2008/2009	Petro-Canada, BP Canada, Imperial Oil, Kananaskis Improvement District and Alberta Infrastructure and Transportation.	9 Road use agreements with Energy Company LOC's and 2 road permits from Kananaskis Improvement District and 5 road permits with Alberta Infrastructure and transportation.
	8 Trap line Holders	Contacted for consultation.
	7 Grazing operators	5 GTA's
2009/2010	Husky Oil, Shell Canada, MD Bighorn, Alberta Infrastructure and Transportation.	Road crossing agreements, reciprocal road access agreements, 3 Alberta Infrastructure and Transportation roads use permits.
	1 Grazing operators	1GTA
	Red Rock Sawmills/ Waiparous PRA	PRA yard rental agreement
	3 Trap line holders	Contacted for consultation.
2010/2011	Shell Canada, Husky Oil, Nuvista and CNRL	Road use agreements for 4 Energy Company LOC's and 2 Alberta Infrastructure and Transportation-road and gravel pit permits.
	5 trappers	Contacted for consultation.
	8 Grazing operators	3 GTA's

Timber Year	Commercial Interests Contacted	Road Use and Grazing Timber Agreements (GTA's)
2011/2012	Shell Canada, Imperial Oil, Husky Oil, Fortis, Alberta Infrastructure & Transportation, Kananaskis Improvement District	Road use agreements for 3 Energy Company LOC's and 2 Alberta Infrastructure and Transportation road permits and one power line crossing agreement.
	5 Trap line holders	Contacted for consultation.
	2 Grazing Allotment Holders	3 GTA's

14. Public Involvement

Objectives 5.13
"Continue to provide for public involvement in the development of company plans."

Management Strategy

SLS operates on Crowns lands and people have the right to be involved in decisions affecting them. Interested and affected publics have local knowledge and expertise that can improve how our operations are conducted.

Our promise to stakeholders is to keep them informed, listen to and acknowledge concerns and aspirations and provide feedback on how public input influenced decisions. SLS's public involvement policy is to carefully consider feedback and then respond to stakeholders by addressing their concerns. Changes to a plan or operation as a result of public input are recorded by SLS and communicated to the stakeholder. SLS's record of public input to plans or operations will be accessible to the public for viewing on request.

Countless hours have been invested by SLS staff, communicating its plans to the public and giving consideration to stakeholder issues and concerns to achieve the goal of facilitating meaningful public participation.

Identified stakeholders are invited to provide input at the General Development, Final Harvest Plan and Annual Operations Planning stages. Advertisements are submitted to local papers annually that invite input into our plans.

An annual open house is held every May and provides additional opportunity for the interested public to provide input. SLS maintains an active website that presents information about the company and provides input options. Stakeholder issues and responses are recorded and responded to, by the appropriate SLS representative.

The intent of each response is to provide knowledgeable feedback and properly consider any input provided. SLS public involvement records are accessible to the public for viewing on request. Stakeholder input and government referrals are addressed in the Annual Operating Plan.

Input items often include access strategies for: environmentally sensitive areas; class of road; other user needs; road closure; reclamation; safety; timing and season of use; other resource values; unique finds and scarce resources; historic resources; and joint use options. A list of current stakeholders is maintained and copies of stakeholder lists are readily available to Woodlands staff through Outlook.

Table 14-1: Public Involvement

Timber Year	Public and Stakeholders Outreach and Consultation
2007-2008	Developed communication plan to address SLS and the AESRD, MPB, management strategy and AOP. Contacted MLA's, municipalities, local businesses, ranchers, media and environmental groups. SLS met with community development to discuss integration needs. Initiated a news release regarding the MPB strategy.

Timber Year	Public and Stakeholders Outreach and Consultation
	Advertised the annual open house in the local newspapers. Conducted open house (May 2, 2007), shared plans and collected feedback. SLS met its Public Advisory Committee quarterly. SLS Completed visual analysis with public to address visual resource concerns and produced a series of newspaper articles providing information and soliciting feedback.
2008-2009	Contacted MLA's, municipalities, local businesses, ranchers, media and environmental groups. SLS met with community development to discuss integration needs. Advertised the annual open house in the local newspapers. Conducted meetings with Elbow River Watershed partnership and the Ghost Watershed Alliance. SLS advertised the annual open house in the local newspapers and conducted its annual GDP and AOP open house on May7. SLS met with its public advisory committee Biannually.
2009-2010	Consulted with the 5 First Nations groups showing interest in the FMA. Contacted MLA's, municipalities, local businesses, ranchers, media and environmental groups. Consulted with Municipal District of Bighorn No. 8. And met with the community development to discuss integration needs. SLS posted the 09/10 GDP on the company website. Advertised the annual open house in the local newspapers and conducted open house on May 5th. Scheduled meetings and met with public advisory group for three information sharing sessions. SLS Conducted a meeting with the Ghost Watershed Alliance.
2010-2011	Contacted MLA's, municipalities, local businesses, ranchers, media and environmental groups. SLS met with community development to discuss integration needs. Consulted with the 5 First Nations groups showing interest in the FMA. Met with Bragg Creek trails group. Advertised the annual open house in the local newspapers and facilitated the annual open house, on May 5. SLS Conducted meetings with Ghost Watershed Alliance, Panther River Adventures, Alberta Wilderness Association, Action for Agriculture and the Castle Coalition. SLS also Conducted public consultation/open houses for HCVF forests plan and facilitated 2 public advisory meetings.
2011-2012	Contacted MLA's, municipalities, local businesses, ranchers, media and environmental groups. SLS met with community development to discuss integration needs. Consulted with the 5 First Nations groups showing interest in the FMA. Advertised the annual open house in the local newspapers. Conducted open house on May 4th. Conducted meeting with the Ghost Watershed Alliance. Attended meeting as a member of the Ghost Stewardship Monitoring Group. SLS facilitated the Bragg Creek Open house and 2 public advisory meetings.

15. Public Safety

Objectives 5.14
"Manage our log haul, timber harvesting and other woodlands activities with due consideration for public safety."

Management Strategies

SLS is committed to conducting its operations in accordance with Government of Alberta Workplace Health & Safety (WH&S) Regulations and being a responsible industry citizen. SLS maintains a proactive Health and Safety Program, maximizing employee participation and utilizing a partnership approach with Alberta Forest Products Association.

The primary goal of the program is to operate safely and reduce or eliminate all accidents by respecting the laws and other users of the public roadways. SLS tracks and maintains records and statistics that can be used to continually improve safety and production. The following table summarizes the public safety incidents recorded by SLS.

Table 15-1: Public Safety Incidents

Timber Year	Public Safety Issue	Follow Up
2007-2011	None Recorded	NA
2011-2012	Complaint of SLS log trucks exceeding the speed limit.	The fleet was notified of the complaint. Examination of on board GPS showed no infraction took place and the log truck was within the speed limit. Speeds will continue to be monitored by on board GPS units. Drivers are subject to punitive measures for speeding as outlined in the fleet safety manual.
2011-2012	A near miss was reported by an SLS log truck driver. The driver lost visibility due to a fresh snow and accidently crossed a public highway and ran off the road.	SLS investigated the incident and then reviewed the hours of service legislation and SLS safety policies with the driver. The driver was told to drive for the conditions and to take breaks to avoid fatigue.

FMA, permanent forest roads, public roads and highways, receiving frequent use by company trucks are signed to reveal the potential road use risks. SLS posts signs to notify of *"Radio Controlled Access"* and *"Log Trucks Hauling"*. Other signs such as, "*Log Trucks Turning"* or *"Road Closed"* are also posted as appropriate.

Annually, SLS holds a woodlands contractor training. One of the purposes of this training is to raise the awareness and knowledge of SLS's contractors and employees regarding public safety. Table 15-2 summarizes the public safety topics covered in the annual training.

Table 15-2 Safety Training Topics Relevant to Public Safety

Annual Safety Training Topics	
Occupational Health and Safety Act, Regulation and Code	Hazard Assessments
Inspections	Incident Reports

Two Way Radio Use	Power line Safety
Emergency Response	Oil and Gas Safety

16. Reforestation

Reforestation activities and practices are an important component of forest management activities.

Objectives 5.15

"Meet our obligations in reforesting all harvested areas."

"Identify areas where alternate reforestation strategies may be necessary and where alternate reforestation standards need to be developed."

Management Strategies

- **Silviculture Program**

During the reporting period SLS planted a total of 7,546,309 seedlings. All openings were treated within the two year treatment window. A breakdown of the planting since the DFMP approval is shown in Table 16-1 and Table 16-2 below.

Table 16-1: Planting Activity for Reporting Period[5]

		2007/2008	2008/2009	2009/2010	2010/2011	2011/2012	Total
Pine	# Planted	1,698,160	1,519,005	479,238	1,282,619	639,140	5,618,162
	Area (ha)	1,064	999	314	843	548	3,768
Spruce	# Planted	462,510	375,975	383,272	487,950	218,440	1,928,147
	Area (ha)	274	235	242	333	146	1,230
Total	# Planted	2,160,670	1,894,980	862,510	1,770,569	857,580	7,546,309
	Area (ha)	1,338	1,234	556	1,176	694	4,998

All seed used for planted seedlings is collected from wild stands within the same seed zone of the opening.

Table 16-2: Silviculture Site Preparation Area (ha) for Reporting Period

Site Prep Type	2007/2008	2008/2009	2009/2010	2010/2011	2011/2012	Total
Unscarified	86	28	7	121	149	391
Disc Trench	95	0	0	0	0	95
Drag Scarification	581	954	332	372	261	2,500
Teeth Scarification	563	492	185	49	460	1,749
Total	1,325	1,475	523	542	870	4,734

- **Regeneration Survey**

A total of 13 blocks were declared not satisfactorily regenerated at the establishment survey phase for the 5 year reporting period. All blocks that are NSR are or will be re-treated in order to meet the

[5] Note: Silviculture summaries are for silviculture activities that occurred over the reporting period (2007-2012).

government's acceptable standard of reforestation. Table 16-3 describes the establishment survey activity and Table 16-4 describes the performance surveys completed. Since performance surveys are no longer assessed on a pass fail basis, the compilation of the performance surveys is slightly different than the establishment survey compilation.

The following terms are used to describe regeneration performance for establishment surveys:

- SR – Block is satisfactorily restocked – appropriate trees are present and desired stocking level is achieved.
- NSR – Not satisfactorily restocked – appropriate trees are not present and/or minimum height is not met. An opening is considered NSR if the stocking is below the 80% threshold
- LIT – Let it grow – the opening (or block) is not satisfactorily restocked with acceptable trees and may be in a 'satisfactory restocked like condition' when under height trees are considered and left to grow to meet the minimum height requirements.

Table 16-3: Establishment Surveys by Year

	2007/2008	2008/2009	2009/2010	2010/2011	2011/2012	Total
Completed Surveys	106	56	84	36	42	324
Area Surveyed (ha)	1,716	1,187	1,895	1,349	1,155	7,303
Blocks - SR	103	45	72	31	37	288
Blocks - LIT	1	9	5	4	5	24
Blocks - NSR	2	2	7	2	0	13
SR – Area (ha)	1,667	1,056	1,556	1,223	950	6,451
LIT – Area (ha)	15	95	260	100	206	675
NSR – Area(ha)	35	36	80	26	0	177

Approximately 88% of the establishment surveys conducted were satisfactorily stocked. The target for establishment surveys is that 100% of blocks will be satisfactorily restocked. Blocks that are assessed as NSR, may be re-treated if the block is not on trajectory to meet the growth target which is assessed when the opening is resurveyed between years 8 and 14 (i.e. in the performance survey stage).

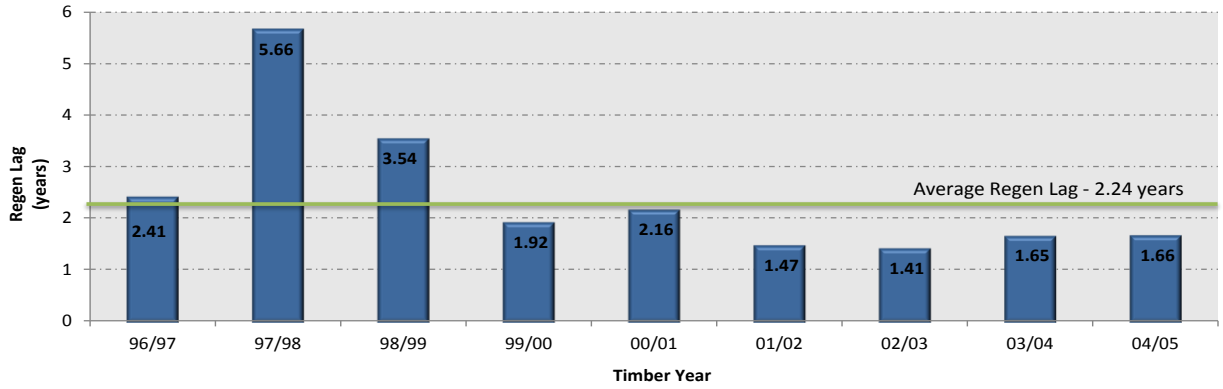
Table 16-4: Performance Surveys by Year

	2007/2008	2008/2009	2009/2010	2010/2011	2011/2012	Total
Completed Surveys	3	16	23	14	201	257
Area Surveyed (ha)	29	203	331	196	2,679	3,437

- **Regeneration Lag**

Spray Lake Sawmills assessed the regeneration lag according to the September 20, 2004 criteria provided by AESRD. Using the AESRD methodology the regeneration lag was determined to be 2.24 years. Figure 16-1 shows the regeneration lag for the blocks that were surveyed between 2007 and 2012. This marks a decrease from the previous calculation of regeneration lag. In the original forest management plan, the regeneration lag was calculated to be 4.62 years which was rounded up to 5 years, for use in the planning process.

Figure 16-1: Regeneration Lag



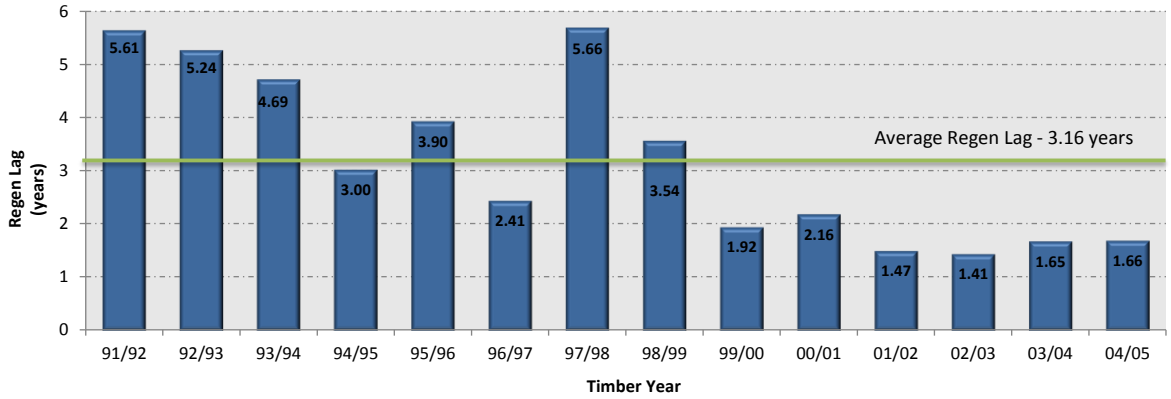
Notes: Regeneration lag calculation is for blocks surveyed from 2004 to 2012. This represents the timber year of 1996 to 2004, as blocks are generally surveyed 7-8 years after reforestation clock start date (reforestation clock start date is the year of the first spring after harvest).

The Regeneration lag assessment is based on the following methodology (provided by the AESRD):

- Individual harvest areas within a stratum are assigned a regeneration lag value
- The individual harvest area regeneration lag values are averaged using area weighting
- The Regeneration lag for the stratum is the area-weighted average value
- The calculated (non-rounded) value is presented in the analysis report.

When the results from this reporting period are added to all of the post 1991 survey blocks, the regeneration lag is 3.16 years (Figure 16-2). For the next stewardship report this same process will be completed with all regeneration surveys available. This information will be used for the next forest management plan to help determine a component of the sustainable timber yield calculation.

Figure 16-2: Regeneration Lag for all Post 1991 Surveys



- **Regeneration performance of interior block Roads and Landings**

Spray Lake Sawmills is in the process of assessing these criteria. Results will be submitted as an addendum to this report. The process to revisit the interior block roads and landings from the 2005/06

and 2006/07 timber year is being developed. SLS will determine the regeneration performance in comparison to the adjacent regenerating areas by establishing a paired-plot trial. The target is to sample 25% of blocks harvested for the given timber year and randomly select regeneration sample points, along in-block reclaimed roads. The plot size will be based on the regeneration and sapling plot sizes established in the SLS permanent sample plot program (both $50m^2$). Reclaimed block roads and landings will be quantified as a percentage of block area.

- **Regeneration Damage Summary**

Damage to regeneration is noted in establishment surveys and performance survey tally sheets. Hardcopies of every survey are submitted to the AESRD as part of the forest management requirement. Using the new performance survey standard[6], damage to the regeneration is reflected in calculations of the blocks growth (i.e. MAI). Results from the performance surveys, and the compilation of regeneration growth, will be incorporated into the next forest management plan and help determine a component of the sustainable timber yield calculation. SLS has been following to the new regeneration standard developed by the AESRD in 2010.

[6] The traditional survey protocol was based on achieving specified tree heights and dominance within a time period post-harvest. The new survey protocol is based on assessing the growth of all openings and determining how the growth relates to assumptions used in the timber supply analysis. More information regarding the new Reforestation standards can be found at:
http://srd.alberta.ca/LandsForests/ForestManagement/ForestManagementManualsGuidelines.aspx

17. Sustainable Timber Supply

Objectives 5.16

"Provide a continuous supply of timber to our mill site."

"Manage the forest land base within the FMA and the B9 Quota area on a sustained yield basis based on a balance of ecological, economic and social values."

Management Strategies

Balancing ecological, economic and social objectives steered the development of the current detailed forest management plan guiding SLS's forest operations. The following components of this section outline the sustainable timber supply operational benchmarks, inputs and assumptions supporting the 2006 DFMP.

- **Volume and Area by Strata**

Table 17-1: Summary of Harvest Area & Volumes for 5 year period

Timber Year	Strata Number	Strata	Calculated Harvest	Sequenced (PFMS)	Difference
2007 – 2012	Area (ha)				
	1	B9B C-PL	1,858	4,862	-3,007
	2	B9B C-SW	406	1,149	-743
	3	B10B C-PL	1,982	1,972	10
	4	B10B C-SW	411	508	-97
	5	FMA - Mx	74	487	-413
	6	FMA - D	16	324	-308
	99	FMA - Comp	7	9	-2
	-	NonForested	27	0	27
	Total		4,781	9,311	-4,533
	Volume (m^3)				
	1	B9B C-PL	343,085	897,738	-554,653
	2	B9B C-SW	74,524	200,146	-125,622
	3	B10B C-PL	374,702	350,550	24,152
	4	B10B C-SW	75,989	86,751	-10,762
	5	FMA - Mx	9,618	60,512	-50,894
	6	FMA - D	1,049	0	1,049
	99	FMA - Comp	7	19	-12
	-	NonForested	0	0	0
	Total		878,974	1,595,715	-716,741

Notes: Volume harvested is calculated from the actual block boundaries and associated yield strata's predicted volumes (from yield curves). Sequenced volume and area is from the timber supply analysis: Run 10 – Spatial Preferred Management Strategy.

Due to unfavorable market conditions, volume harvested has been reduced compared with the calculated AAC value.

- **Volume Variance**

Table 17-2: Summary of Variance between Volume Harvested and Volume Projected

Timber Year[7]	Calculated Volume – Conifer (m^3) [8]	Delivered Volume – Conifer (m^3)	Percent Variance from AVI
2007/2008	258,233	287,994	-11.5%
2008/2009	109,584	175,400	-60.1%
2009/2010	150,678	167,529	-11.2%
2010/2011	232,735	243,053	-4.4%
2011/2012	127,743	191,477	-49.9%
Total	878,973	1,065,451	-21.2%
5 year Average Harvest	175,795	213,090	-21.2%

Notes: The comparison does not include right of way volume that is outside of block boundaries.

The above table is a hectare by hectare comparison. Calculated conifer volume represents the predicted volume anticipated from an opening and the delivered volume represents the actual volume from the same opening. This analysis indicates that opening volumes are generally higher than the predicted values resulting in less area harvested.

These results will be incorporated into future forest management plans to improve the accuracy of yield projections and in turn the location of forest harvesting. This analysis helps to define which strata and age class yield projections differ from the scaled volume. Future management plans will improve yield projections by incorporating a more accurate forest inventory (see Inventory Update Activities section below), including the establishment of PSPs and the use of AESRD approved growth models for yield curve development.

[7] Timber year calculation is based on skid clearance date from ARIS. In some cases, this does not line up with the timber year of the haul clearance (i.e. an opening may be skid cleared in February of 2008 (timber year = 07/08), and not haul cleared until July of 2008 (timber year = 08/09).

[8] Calculated volume is generated from the actual block boundaries and associated yield strata's predicted volumes (from yield curves). Cull or any other reductions were not included in the calculated volume number. For the period of 2006-201,1 the approved annual allowable cut is 1,593,010 m^3 or 318,602 m^3/year.

- **Compartment Variance**

Adherence to the SHS is an important component of sustainable forest management. Changes to the SHS, for operational reasons are unavoidable, because of the nature and scale of the FMP. To ensure that changes are within an acceptable level, variance from the SHS is tracked and reported to the AESRD on an annual basis. Table 17-3 below describes the variance between compartment harvest design and the DFMP spatial harvest sequence.

Table 17-3: Summary of Compartment Variance (2001 to 2012)[9]

	Total SHS within compartment (Period 1-3)	Total SHS Area - Planned in FHPs (ha)	Variance (deletions + Deferrals)	Total Unplanned SHS Area Within Compartment (ha)	Additions (ha)	Actual Harvested Area (ha)
Atkinson Creek						
Total	2,055	676	80	1,299	40	502
Total (%)	-	32.9%	3.9%	63.2%		24.4%
B9						
Total	3,667	310	45	3,312	72	382
Total (%)	-	8.4%	1.2%	90.3%		10.4%
Burnt Timber						
Total	960	421	476	63	661	972
Total (%)	-	43.8%	49.6%	6.5%		101.3%
Coalcamp						
Total	4,258	2,797	229	1,232	370	2,470
Total (%)	-	65.7%	5.4%	28.9%		58.0%
Ghost River						
Total	2,481	795	380	1,306	171	980
Total (%)	-	32.0%	15.3%	53%		39.5%
Grease Creek						
Total	2,788	2,201	307	280	229	2,430
Total (%)	-	79.0%	11.0%	10.0%		87.2%
Highwood River						
Total	3,690	677	121	2892.0	71	748
Total (%)	-	18.4%	3.3%	78.4%		20.3%
Jumpingpound						
Total	5,318	1,337	1,052	2929.4	786	1,591
Total (%)	-	25.1%	19.8%	55.1%		29.9%
McLean Creek						
Total	4,036	1,437	294	2305.2	515	1812.3
Total (%)	-	35.6%	7.3%	57.1%		44.9%
Sullivan Creek						
Total	71	0	0	71.2	0	0
Total (%)	-	0.0%	0.0%	100.0%		0.0%

	Total SHS within compartment (Period 1-3)	Total SHS Area - Planned in FHPs (ha)	Variance total (deletions + Deferrals)	Total Unplanned SHS Area	Additions	Actual Harvested Area (ha)
Grand Total	**29,324**	10,651	2,983	15,690	2,914	11,886
Grand Total (%)		36.3%	10.2%	53.5%	9.9%	40.5%

[9] The calculation represents the variance from the SHS to 2012 which is beyond the time period for the stewardship report. The reporting from 2001 provides a more accurate description of variance that has occurred in each compartment.

Definitions for the table headers area as follows:
Total SHS within the compartment - the total area sequenced in the timber supply analysis.
Total SHS area planned in FMPs – the spatial harvest area that has been planned for harvest and submitted under a FMP.
Variance – Is any deletion from the SHS to the laid out harvest design as shown in the FHP. Variance is the sum of deletions and deferrals. Percent variance is calculated by dividing the area of the deletions & deferrals by the total SHS area which are highlighted in orange in the table above.
Total unplanned SHS area – the non-laid out SHS within the compartment. The total unplanned SHS area is equal to the total SHS within the compartment less the total SHS area planned in the FHP and the variance for that compartment. It shows the amount of SHS within the compartment that could be harvested.
Additions – the area not a part of the 15 year SHS that has been added for harvest.
Actual Harvest Area – the as-built harvest area in the compartment.

SLS will continue the tracking and reporting of variance to the AESRD. Variance information, specifically deletions and deferrals, will be used to improve operational sequencing in the next forest management plan.

- **Growth & Yield Plot Program Activity Summary**

With approval of the DFMP, SLS began establishing permanent sample plots (PSP) . A total of 28 permanent sample plots were established since the initiation of Spray Lake's growth and yield program. Table 17-4 shows the PSP's that have been established to date.

Table 17-4: PSP Establishment to Date

Plot type	Compartment	Number of Plots
Standing Timber PSP	Burnt Timber Creek	4
	Coalcamp Creek	2
	Ghost River	2
	Grease Creek	6
	Highwood River	3
	Total	17
Post-Harvest Stand PSP	B9 Quota	1
	Coalcamp Creek	1
	Grease Creek	5
	Highwood River	4
	Total	11
Grand total		28

In 2008, the growth and yield program was put on a temporary hiatus. SLS received approval from the forest management branch to defer its growth and yield program for an additional 2 years, providing an extension through 2018. Table 17-5 describes the original commitment for PSP establishment and

measurement. SLS has restarted its annual PSP program and is planning to meet the requirement originally outlined in the DFMP by 2018. Table 17-6 outlines a new PSP measurement schedule to complete this objective. New data will lead to an improved sustainable forest yield calculation which will be used in the next forest management plan.

Table 17-5: Original Table 9.1 from DFMP

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
PSP Establishment	8	9	8	9	8	9	8	9	8	8	84
PSP re-measurement						8	9	8	9	8	42
PSP 1991-06 cut blocks	3	4	4	4	4						53
PSP future cut blocks											-
PSP cut block re-measurement						3	4	4	4	4	19

Table 17-6: Updated table to reflect revised timeline

	2006	2007	2008 - 2012	2013	2014	2015	2016	2017	2018	Total
PSP Establishment	-	17	Deferral	13	14	13	14	13	-	84
PSP re-measurement					10	11	10	11	-	42
PSP 1991-06 cut blocks		11		8	9	8	9	8	-	53
PSP future cut blocks					Based on new cut blocks and PSP grid				-	TBD
PSP cut block re-measurement					5	4	5	5	-	19

- **Inventory Updates Activities**

SLS, is undertaking a new approach for acquiring an updated forest inventory. The new process will produce information that is consistent with the Alberta Vegetation Inventory Standard (version 2.1.1) and will utilize LiDAR data, ground plots, aerial photo plots, and colour infrared aerial photography.

Currently SLS, in conjunction with Tesera Systems Inc., is working through a trial phase to demonstrate the feasibility of completing a forest inventory in this fashion. Key documents describing the inventory process have been delivered and reviewed by the FMB, with issues and concerns being identified and worked through.

The trial phase is estimated to be completed in the second and third quarters of 2013. Field work to collect additional plot data will be scheduled for 2014, with the expectation of having a completed forest inventory to be used for the next forest management plan.

- **Monitoring Against the factors contributing to the 7.5% AAC deduction**

When the initial timber supply was completed the sustainable harvested level was reduced by a factor of 10.57; 3.07% for cull material and 7.5% for other factors that were estimated based on previous harvesting in the area. Table 17-7 shows the actual area that was withdrawn from harvest versus the area estimated for withdrawal used in the DFMP.

Table 17-7: Breakdown of Subjective Deletions

Subjective Area Causing Possible Impact	Percent Reduction in Harvest Levels	Volume Reduction[10] (m^3)	Area of Reduction[11] (ha)	Potential Area for reduction[12] (ha)	Actual Area Identified (ha)
Rare Ecosites or rare plants	1%	17,800	104	57	0.53
Structural Retention	1%	17,800	104	57	118.29
Wildlife: Licks, Travel corridors, ect	0.5%	8,900	52	29	
Buffering of unidentified drainages	0.5%	8,900	52	29	50.0
DEM inaccuracies	1%	17,800	104	57	473.8
Inaccessible stands	2%	35,600	208	115	
Historical resources or unique areas	0.5%	8,900	52	29	0.1
Integration with non-commercial forest users	0.5%	8,900	52	29	38
Integration with other commercial forest users	0.5%	8,900	52	29	171
Total	7.5%	133,500	780	429	852

Inaccessible stands and DEM inaccuracies account for majority of the area withdrawn from the spatial harvest sequence. The use of the new Digital Elevation Model (DEM) which is based on LiDAR will greatly increase the accuracy of the spatial harvest sequence in the future.

[10] Volume Reduction is calculated by multiplying the predicted a-spatial AAC volume (1,780,000 m^3/ 5 years) by the percent reduction.

[11] Area reduction is calculated by multiplying the average m^3/ha for years 2006-2011 by the volume reduction. Average m^3/ha was calculated by taking the a-spatial conifer target level (1,780,000m^3) and dividing it by a-spatial area harvested (10,449ha) = 170.35 m^3/ha.

[12] Potential Area Reduction takes into account the reduced activity that has taken place over the last 5 years by multiplying a reduction factor. The reduction factor is calculated by dividing the actual harvest volume (878,974 m^3) by sequenced TSA volume (1,595,715 m^3) = 0.55.

18. Water Quality/Quantity and Fisheries Resources

Objectives 5.17
"*Maintain water quality and quantity by minimizing the effects of SLS activities on watercourses."*
"Protect fish and fish habitat."

Management Strategies

- **Planning/Water Yield Analysis**

Prior to the DFMP implementation, SLS used the "ECA-Alberta" hydrologic model to assess the potential effect of harvest operations on water production within the FMA. Equivalent clear-cut area is an area based representation of the "hydrologically effective disturbance" area that either new or older-recovering disturbances represent on the landscape.

Equivalent clear-cut areas were projected over a 200 year planning horizon. Water yield projections based on ECA estimates outlined in the Spray Lakes DFMP were all below 15% increases in average annual water yield over the 200 year planning horizon. In 2016, SLS will complete a re-assessment of ECA values base on refined data inputs.

- **Operations**

SLS has developed a comprehensive strategy to protect fish, fish habitat, water quality and quantity. SLS classifies all watercourses during preliminary assessment as per Section 6.0 of the Ground Rules. All stream buffers are designated, on the ground, to comply with the water course specified, forested buffers and equipment exclusion zones required in the Operating Ground Rules.

SLS staff and operators are trained annually to identify water course classifications and utilize management practices that protect streams and minimize sediment delivery and disturbance to stream channels. SLS and the government complete field inspections to ensure the stream classifications and the respective buffers and crossings are in compliance with the Operating Ground Rules and the federal Fisheries and Navigable Waters Protection Act. SLS follows roads construction standards detailed in 11.0 through 11.4 in the Operating Ground Rules.

An important component of SLS's water quality protection strategy includes the use of bridges and native timber bridges when crossing most live streams. A box crib stream crossing structure acts similarly to a bridge, whereby the stream bed and banks are protected and stream flow is unrestricted as compared with a typical culvert installation. When crossing intermittent dry streams or ephemeral drainages, log fills and or culverts are used to minimize delivery of sediment into the watershed. Utilizing these structures reduces earthwork and modifications to stream channels. These structures also support fish passage, minimize alteration of fish habitat and sediment delivery.

At the completion of SLS operations and generally less than three years from the road construction date, SLS schedules its roads and stream crossing structures for removal. 95% of the roads constructed during the reporting period have been totally reclaimed by SLS. SLS, total reclamation includes de-compacting subgrades, re-contouring fill slopes to balance natural terrain, replacing top soil and placing course

woody debris and vegetation on the reclaimed surface. SLS, totally reclaimed roads are generally not navigable by ATV's and return to a forested environment.

- **Riparian Management Activities**

In terms of forest management and SLS's operations, riparian management activities refers to selective timber harvest within the designated riparian protected area (i.e. the buffer) while demonstrating that the aquatic and terrestrial objectives are met. SLS has not proposed any harvesting within riparian buffers.

- **Research**

Table below highlights SLS's water quality/quantity and fisheries projects:

Research Projects	
Southern Rockies Watershed Project	The Bow River Basin Council Meetings
Etherington Creek Aquatic Ecosystem Baseline Study	McLean Creek Aquatic Ecosystem Monitoring Study
Fire History/Regime Study – Kananaskis District	McLean Creek Monitoring Program
Foothills Model Forest - Managing Disturbance in Riparian Zones Study	South Saskatchewan Regional Planning Advisory Committee
West Slope Cutthroat Trout Recovery Planning Team	Explored Water Yields and Other Ecological Goods and Services
Designed and Tested Steel Box Crib Structure and Bottomless Culvert Technology	Etherington/Wilkinson Creek Ecosystem Management Project

- **Monitoring of Water Quality**

Spray Lake Sawmills has completed extensive water quality monitoring and watershed analysis[13]. The study took place over 9 years and examined 6 large streams: Fish Creek, Fisher Creek, Mclean Creek, Prairie Creek, Quirk Creek, and Silvester Creek. The sub watersheds studied had varying levels of use; ranging from virtually no activity (the control – Prairie Creek) to high use, including forestry, riparian grazing and heavy ATV, recreational use. The following 6 sections is a summary of the report(s) which took place during the fall of 1996 through the fall of 2007. The following water quality monitoring and summary was completed by Greg Townsend an aquatic ecologist from the Mount Royal College, Institute for applied Scientific Research.

Benthic Macroinvertebrate Analysis

Aquatic benthic macroinvertebrates are ideal organisms for studying aquatic ecosystem health. These organisms are adapted to natural disturbance and have an extraordinary ability to recover. Natural habitat disturbance has always occurred, and if organisms do not have behavioral and physiological strategies to avoid physical change or cannot recover their population quickly, they will not be found in that habitat. Consequently, only organisms' best suited for a specific natural environment will

[13] The name of the final study is: McLean Creek Aquatic Ecosystem Monitoring Study (fall 2007) Submitted by Greg Townsend, from the Institute for applied Scientific Research, Mount Royal College

consistently be found there. In mountain and foothill watercourses, the presence of the benthic macroinvertebrates Ephemeroptera, Plecoptera and Trichoptera (EPT) have become synonymous with "clean" water, aquatic ecosystems. Therefore, the relative abundance of EPT (the number of EPT as a percentage of all aquatic benthic macroinvertebrates in the sample) and the relative abundance of Baetis, a common Ephemeropteran genus, were analyzed statistically for each of the six creeks (Mclean, Fish, Fisher, Quirk, Silvester and Prairie) and all sample dates (1999-2007).

The statistical analysis (ANOVA: $P < 0.05$) identified that there is a significant difference between the relative abundance of Baetis in each of the six streams. This indicates that Baetis population numbers change in a significant way, even over relatively short time periods (e.g. 7 years). For EPT relative abundance, the statistical analysis (ANOVA; $P < 0.05$) identified a significant difference for McLean, Fisher, Silvester and Prairie Creeks. Fish Creek and Quirk Creek EPT population numbers did not change significantly over the duration of the study.

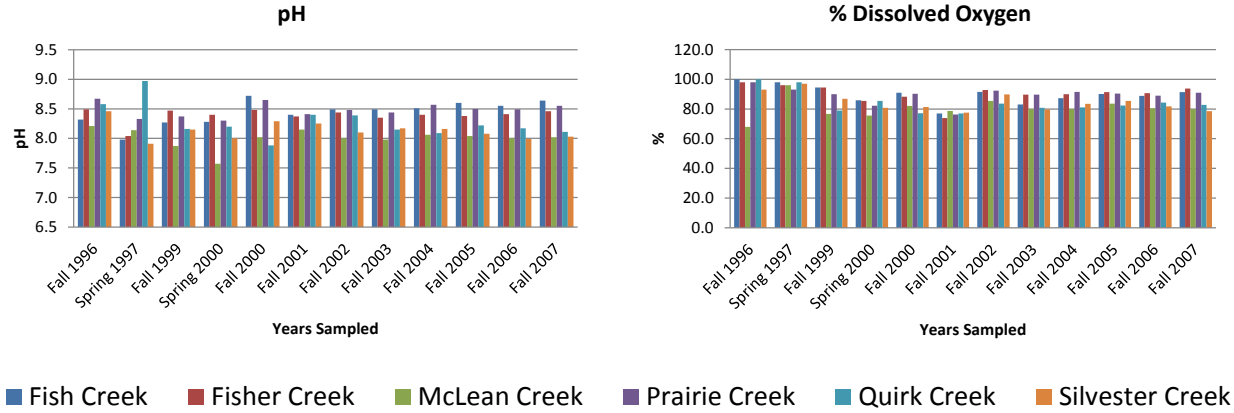
Fisheries

For the duration of the study (1999-2007), sport fish observations and numbers remained fairly consistent for all creeks except for Prairie Creek. From 2005 through 2007, no sport fish were observed in the study reach of Prairie Creek. In the study section of Prairie Creek, one of the few locations suitable for holding sport fish has remained filled with gravel. Material exposed during the flood of 2005 has continued to fill sport fish holding water in Prairie Creek.

Water Quality Analysis

Streams in the project area continue to be slightly alkaline and highly oxygenated (Figure 18-1). When stream current flow is low, like flows measured in the fall of 2001 and 2003, water is not aerated as thoroughly as it flows over and around instream obstacles, and dissolved and percent saturation of oxygen levels can be lower.

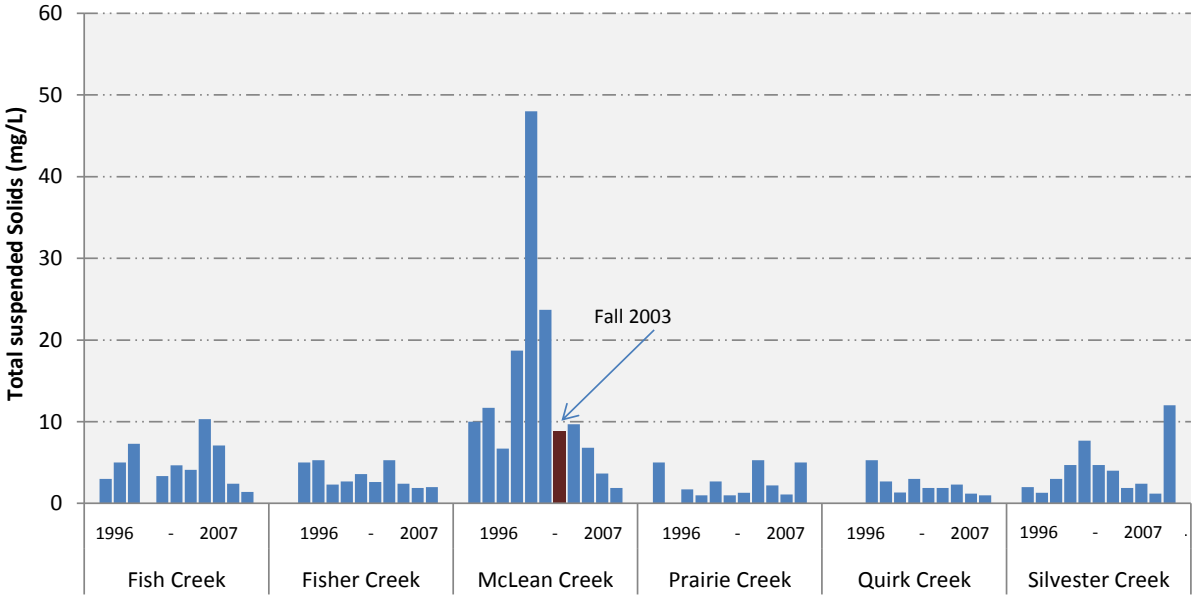
Figure 18-1: pH & Oxygen Levels



The discrepancy in Total Suspended Solids (TSS) concentration levels between the fall sampling dates, especially in McLean Creek, is due in part, to weather conditions. The substrate in most of the streams in the study area contain a large percentage of fine sediment, therefore, precipitation creates an increased

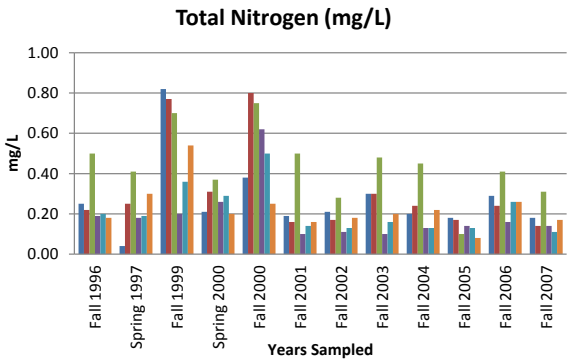
discharge and subsequent suspension of fine sediment. Furthermore, off-road vehicles and cattle have damaged some of the riparian vegetation resulting in erosion of stream banks. The placement of permanent bridges has continued to reduce TSS and sediment loading. For example, at the McLean Creek sampling site, water clarity was again greatly reduced from fall sample collections prior to 2003 (Figure 18-2). The addition of a fence barrier to confine off-road vehicles to the road has further reduced total suspended solids in McLean Creek.

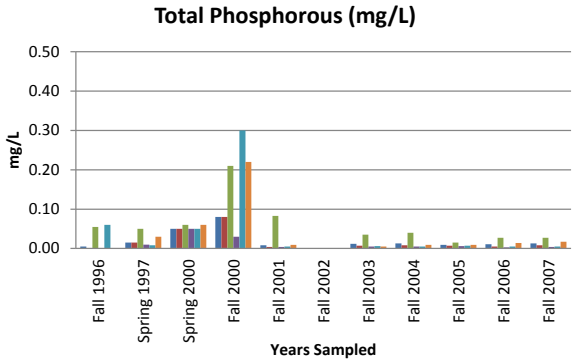
Figure 18-2 Total Suspended Solids (TSS)

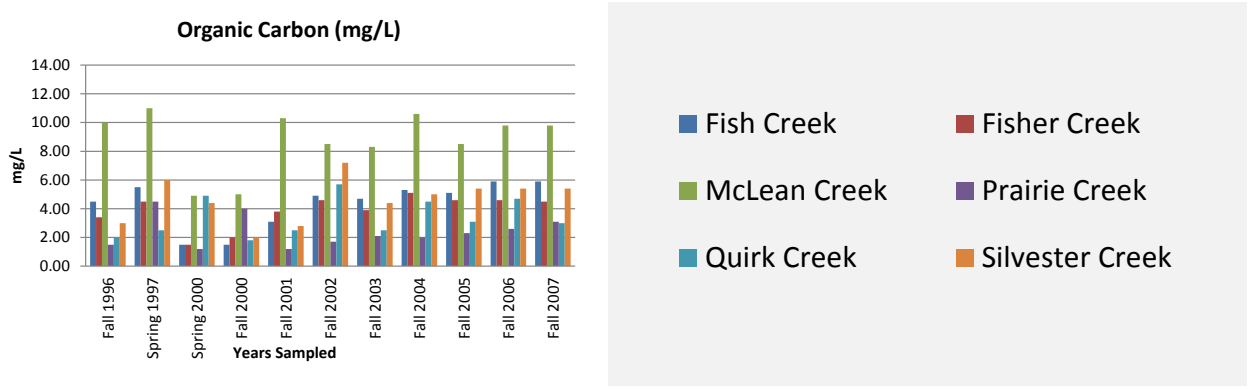


Nitrogen concentrations over 12 dates and six streams have not exceeded 0.82 mg/L (see Total N Graph, Figure 18-3). Similarly, phosphorus levels are low with a maximum concentration of 0.30 mg/L (see Total P Graph: Figure 18-3). Peak dissolved organic carbon (DOC) was measured at 11.0 mg/L in the fall of 1997 (DOC Graph: Figure 18-3). The general decreased nitrogen and phosphorous levels for recent sample dates are due, in part, to a substantial increase in measurement sensitivity (Maxxim Analytics).

Figure 18-3: Nitrogen, Phosphorus & Dissolved Organic Carbon







There is relationship between dissolved organic carbon (DOC), total suspended solids (TSS) and hydrogen ion concentration (pH). An increase in DOC suggests an input of organic (plant) material that will result in an increased TSS and decreased pH. Clearly, this trend is not observed in any of the study stream (TSS, DOC and pH Graph's: Figure 18-2 & Figure 18-3). McLean Creek has obvious elevated DOC's, but like all other streams in the study, these levels are not changing significantly over time and pH is consistent (DOC and pH Graph's, Figure 18-3).

Habitat Analysis

Overall habitat characteristics remained similar but specific locations within the study area changed. For example, since the flood of 2005, the Fish Creek stream course has stabilized, thereby maintaining increased wetted depth, wetted width, bankfull depth, and bankfull width (Figure 18-4 & Figure 18-5). Like Fish Creek, Fisher Creek also had a change in stream course in 2005 resulting in increased wetted depth, wetted width, bankfull depth, and bankfull width for that section of the study reach. Although there was not an overall change in cover, there was a change in where the stream course was located. Some sections of Fisher Creek, although unstable from the flood of 2005 did not change as a result three years of run-off. Fisher Creek had an increase in percent riffles resulting in a loss of pool areas (Figure 18-6). For the most part, Silvester Creek remained intact. However, the stream location where I first identified off-road vehicles running up and down the watercourse has been mitigated by the 2006 bridge installation and bank stabilization. The installation of a confinement fence would further reduce stream bank and bed disturbance by off-road vehicles.

Figure 18-4

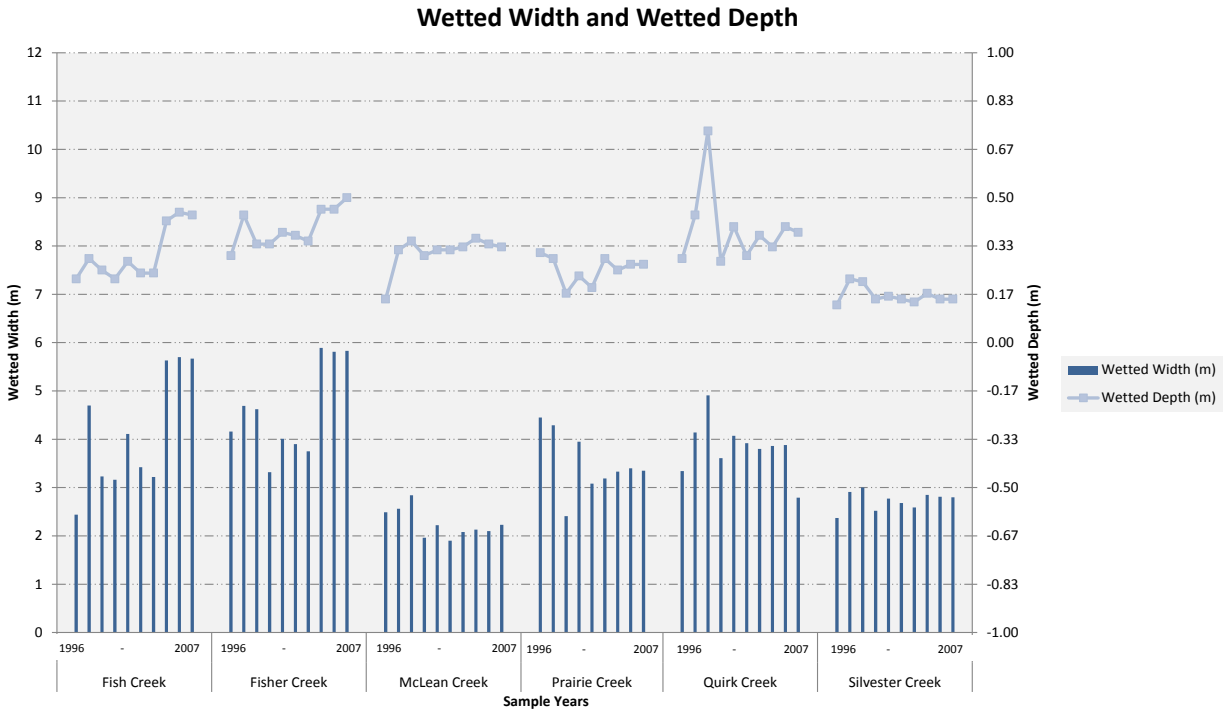


Figure 18-5

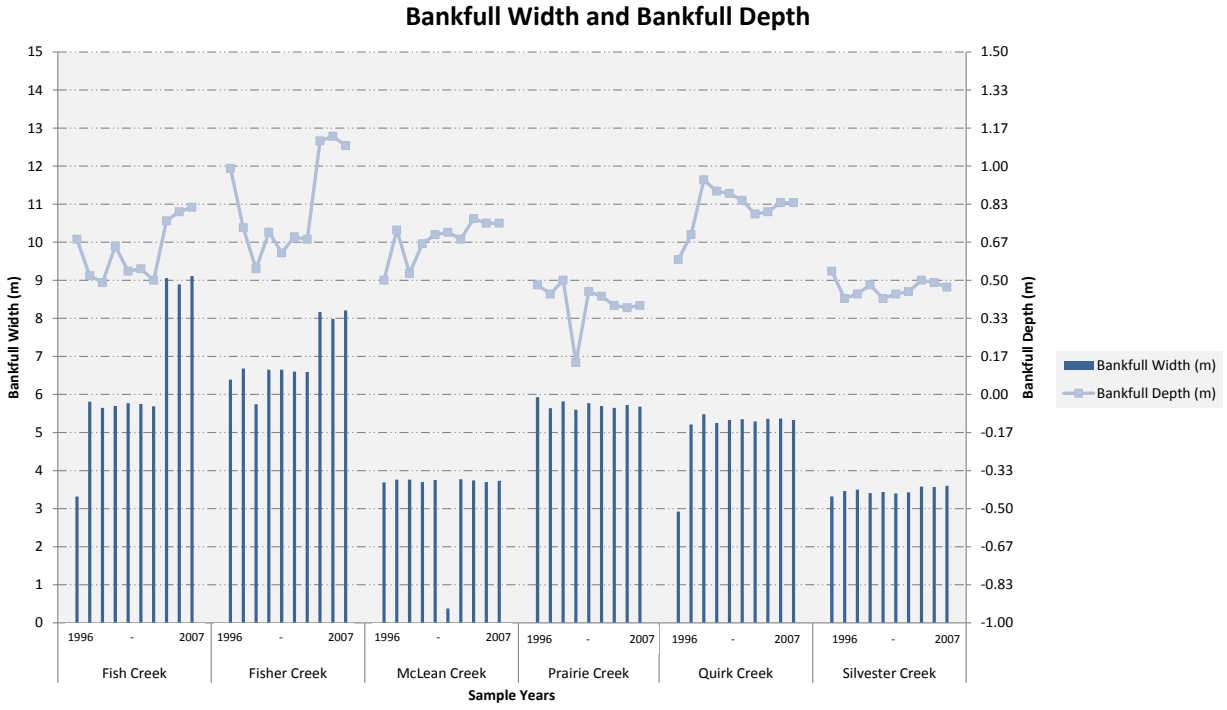
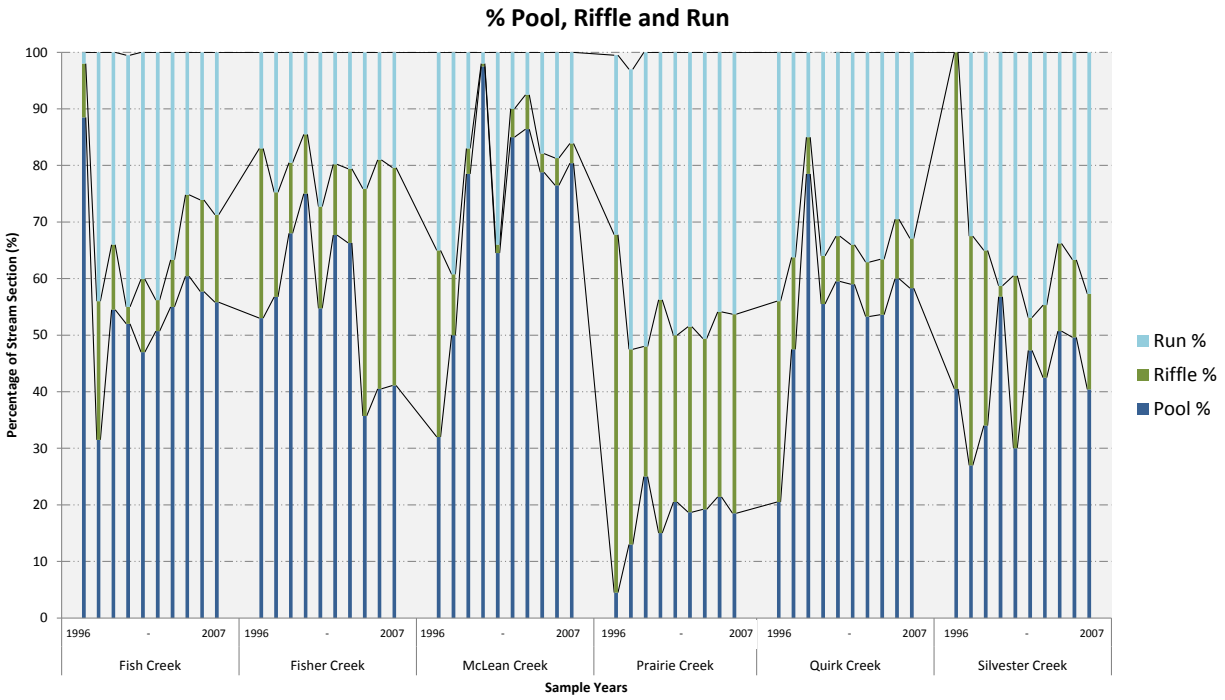


Figure 18-6



Summary

The collected and analyzed data suggests there is no measured, significant difference in the streams (Fish Creek, Fisher Creek, McLean Creek, Quirk Creek, and Silvester Creek) influenced by SLS when compared to the differences measured in the control stream not influenced by SLS (Prairie Creek). For example, the benthic invertebrate data, fisheries data, stream habitat, and water chemistry data clearly indicate that all creeks are different and each creek can have significant measurable variability over the course of the study. In fact, as a result of the exceptional runoff in the spring 2005, Prairie Creek experienced substantially more change in some stream characteristics than any of the other five streams in the study.

Appendix A - DFMP Monitoring and Reporting Requirements

To assist in review, the following table describes the location of specific items that were outline in chapter 10 of the DFPM

Appendix Table A-1: Monitoring Report Requirements (as outlined in the DFMP)

Issue/Value	Monitoring	Monitoring Frequency	Page
Access	• List and map of access controls.	Annual & 5 year	Page 6
	• Km of road constructed by SLS	Annual & 5 year	Page 8
	• Km of road reclaimed by SLS	Annual & 5 year	Page 8
	• Road density assessment – compare to baseline 2004.	5 year	Page 8
	• Highlight results of SLS road inspection program	5 year	Page 9
Adaptive management and research	• Documentation of new information to be addressed in next DFMP (2016).	10 year	–
	• Documentation of DFMP and ground rule changes.	5 year	Appendix B (page 73)
	• Documentation of research projects SLS involved in.	5 year	Pages 10 & 11
Aesthetics	• Post harvest field assessments where mitigation specified to validate field delivery against plan.	5 Year	Page 12
Vegetation biodiversity	• Seral/cover group assessment against baseline (2001) and modeled projections.	10 Year	–
	• Update ANHIC data for FMA.	Annual & 5 year	Page 42
	• Merchantable volume and area of block level structural retention.	5 year	Page 26
	• AVI update activities.	5 year	Page 61
Wildlife biodiversity	• Listing of sensitive wildlife sites – AESRD and SLS identified.	Annual & 5 year	Page 29
	• Wildlife habitat suitability assessment against baseline (2001) and modeled projections.	10 year	–

Issue/Value	Monitoring	Monitoring Frequency	Page
	• Fragmentation assessment against baseline (2001) and modeled projections.	10 year	–
Community Timber Program	• Volume and area of CTP timber harvested.	Annual & 5 year	Page 33
Soil conservation	• Interior block road/landing percentages.	Annual & 5 year	Page 34
Forest health (pest management)	• Document Dwarf Mistletoe management activities.	Annual & 5 year	None
	• Document MPB management activities.	Annual & 5 year	Page 35
	• Document significant insect and disease infestations.	Annual & 5 year	None
	• Document invasive plant control activities	Annual & 5 year	Page 36
Forest land base	• Afforestation opportunity assessment and activities.	5 year	Page 37
	• Summary of land use dispositions.	5 year	Page 37
	• Summary of disposition issuance and cancellations.	5 year	
	• Summary of other (government) land base deletions or additions.	5 year	Page 38
Forest protection (fire)	• Documentation of fire smart initiatives on the FMA.	5 year	Page 39
	• Burned area summaries and salvage and reforestation activities.	Annual & 5 year	Page 39
	• Holding and protection offset projects.	Annual & 5 year	None
Historical resources and unique areas	• Listing of historical resource finds.	Annual & 5 year	Page 41
	• Listing of historical resource protection activities.	5 year	Page 41
	• Listing of unique area (rare ecosite) finds.	Annual & 5 year	Page 42
	• Listing of unique area (rare ecosite) protection activities.	5 years	Page 42
Integration	• Documentation of integration activities with government, commercial and non-commercial interests.	5 year	Page 43

Issue/Value	Monitoring	Monitoring Frequency	Page
Public involvement and safety	• Documentation of public and stakeholder communication processes used.	5 year	Page 49
	• Incident summary from incident reports	5 year	Page 51
Reforestation	• Update Silvicultural Strategy Summary in terms of post-harvest treatments by strata.	Annual & 5 year	Page 53
	• Regeneration survey results.	5 year	Page 54
	• Assess regeneration lag.	5 year	Page 54
	• Regeneration performance on interior block roads and landing.	5 year	Page 55
	• Regeneration damage summaries including grazing damage.	5 year	Page 56
Sustainable timber supply	• Harvested volumes and areas by strata and compartment.	Annual & 5 year	Page 57
	• Assess variance between volume harvested and volume projections from the TSA.	Annual & 5 year	Page 58
	• Assess the variance between compartment harvest design and the DFMP spatial harvest sequence.	Annual & 5 year	Page 59
	• Growth and yield program plot establishment and measurement.	Annual & 5 year	Page 60
	• Inventory update activities.(e.g. AVI, Land Use Activity, Harvest Activity)	Annual & 5 year	Page 61
	• Monitor and adjust the AAC level against the factors contributing to the 7.5% AAC deduction in the TSA.	Annual & 5 year	Page 62
	• Assess cull level for the next DFMP (2016) by assesses scaling records.	10 year	–
Water quality/ quantity and fisheries resource	• Documentation of water quality monitoring for indicators in selected areas.	5 year	Page 64
	• Re-assessment of ECA values base on refined data inputs.	10 year	–
	• Documentation of riparian management activities.	5 year	Page 64

Appendix B - Operating Ground Rule Revisions and Changes

Appendix Table B-1 Revisions from 2009 - 2011

Ground Rule Number	2009 Version of the Ground Rule	2011 Version of the Ground Rule
General	Some edits were made outside of the joint review on Nov 16, 2010, that included deletion of word(s), correction of spelling & grammar, changes to bolded text, etc., that did not change the intent, meaning or requirements of the OGRs, but rather to provide clarification. These changes are not documented in this table.	
3.3.5 2(d)	the timber dispositions to be operated	the C05 timber dispositions and FMA compartments showing the operating period within the 5 years
3.4.5 (j)	as built plan (includes shape files for harvest boundaries and road location as well as road percentages) from the previous year's harvest	Moved to 12.0.4 As built plan (includes shape files for harvest boundaries and road location from the previous year's harvest.) This requirement is met through the SLS and Southern Rockies data sharing agreement
3.4.6 (g) 3.4.8 (j)	identification of watercourse crossing location and crossing structure types;	identification of watercourse crossing location;
3.4.8 (c)	roads crossing grasslands (applicable in C05 FMU);	roads crossing grasslands (applicable in C05 FMU and Rough Fescue PNT);
3.4.9.1 (a and b)	This ground rule does not apply to CTPs and DTPs and all additions to a harvest area must be within the company's disposition and land base and be approved by Alberta.	This ground rule does not apply to CTPs and DTPs.
3.3.1 and 3.5.1	Alberta shall respond with approval or conditions to approval within 30 days.	Alberta shall respond with approval or conditions to approval within 30 calendar days.
5.1.1	If either proponent disagrees with the determination of the Senior Forester, they may appeal the decision to the Area Manager.	If either proponent disagrees with the determination of the Senior Forester, they may appeal the decision to the Program Manager.
5.2.1	Operational tactics to mitigate impacts on recreation and tourism shall be described in the GDP and FHP.	Operational tactics to mitigate impacts on recreation and tourism shall be described in the GDP and FHP. This includes reclamation of recreational trails used during timber operations.
5.2.6	As per the FMP, the company shall meet with Alberta Tourism, Parks and Recreation and AESRD on an annual basis to review FHP submissions. This meeting will include a review of aesthetics, recreational values for the area and mitigation measures.	As per the SLS FMP, the company shall meet with Alberta Tourism, Parks and Recreation and AESRD on an annual basis to review FHP submissions. This meeting will include a review of aesthetics, recreational values for the area and mitigation measures.
5.4.2	Natural meadows and other non forested	Natural meadows and other non forested

Ground Rule Number	2009 Version of the Ground Rule	2011 Version of the Ground Rule
	rangeland areas > .4 ha not identified by AVI but discovered during operations, shall be treated according to 5.4.1.	rangeland areas > .4 ha not identified by AVI but discovered during operations, shall be treated according to 5.4.1 and Appendix 7 - External Information Letter 2009-04 Fescue Grassland Information Letter – Principles for Minimizing Surface Disturbance.
5.6.1	Deleted	Removed as this is an agreement with CCS and Industry and SRD is not involved at any time with the process. Renumbered section.
6.0.13	New	Channels on slopes greater than 20% which only flow during runoff events shall be protected as intermittent watercourses as per Table 2.
Table 1 Headings	Channel Development	Channel width for classification
Table 1 Ephemeral	Often a vegetated draw.	Often a vegetated draw connected to a higher order watercourse.
Table 1 Intermittent	Intermittent < .4m	Intermittent < .5m
Table 1 Transitional	All year but may freeze completely in the winter or dry up during periods of drought. Transitional .4 - .7m	All year but may freeze completely in the winter or dry up seasonally or during periods of drought. Transitional .5m – 1m
Table 1 Small Permanent	Small Permanent >.7m - 5m	Small Permanent 1m – 5m
Table 2 Large Permanent	Added	Watercourses with deeply incised unvegetated banks shall have the buffer start from the top of the incised valley and not the high water mark.
7.3.1	Slash accumulations resulting from timber harvesting, road, and campsite construction shall be disposed of within 24 months.	**7.3.1** Slash accumulations resulting from timber harvesting, road, and campsite construction shall: 7.3.1.1 be disposed of within 24 months; or 7.3.1.2 may be left or spread in a manner that does not inhibit site prep activities or natural seedling development. 7.3.1.3 be partially disposed of where Alberta determines the dispersed slash has created an unacceptable fire risk. Where required, Alberta will provide

Ground Rule Number	2009 Version of the Ground Rule	2011 Version of the Ground Rule
		the company with direction prior to skid clearance.
7.3.2	Slash fuel accumulation is not permitted within 5 m of the perimeter of the harvest area. The bordering undisturbed forest floor shall be used as a benchmark to determine what constitutes a significant accumulation. Unacceptable accumulations include piles of trees or non-merchantable timber, and tops or branches deposited during logging that could create fuel ladders for fire bordering the stand.	Slash fuel accumulation is not permitted within 5 m of the perimeter of the harvest area. The bordering undisturbed forest floor shall be used as a benchmark to determine what constitutes a significant accumulation (blowdown event areas would not be considered undisturbed). Unacceptable accumulations include piles of trees or non-merchantable timber, and tops or branches deposited during logging that could create fuel ladders for fire bordering the stand.
7.4.5 e	Added	pine as required to meet requirements
7.4.8	Deleted	Renumbered
7.7.3	Added	Pure strain West slope Cutthroat Trout has been listed provincially under Alberta's Wildlife Act Regulations as a threatened species. A recovery plan is being developed that will provide direction on the management of this species.
7.7.3.9	Added – moved from 7.4	All clumps and identified single trees of Limber and Whitebark pine shall be protected.
7.7.3.10	Added – moved from 7.4	If the company determines that destruction of Whitebark or limber stems is unavoidable in order to operate then a formal request to AESRD for approval must be made. The company shall provide justification, site description and map including GPS location, photos and description and estimate of the number of stems to be removed.
7.7.4	Trumpeter swans are not found nesting in the C05 FMU however these OGRs cover white zone lands in southern Alberta including the Cypress Hills area therefore this provincial direction will remain.	Trumpeter swans are not found nesting in the C05 FMU or the SLS FMA however these OGRs cover white zone lands in southern Alberta including the Cypress Hills area therefore this provincial direction will remain.
8.1.1 8.1.5 and 8.1.6	Deleted	Renumbered
8.1.4	Added	Where requested by Alberta, the company shall submit a map or shape files showing where genetically improved stock is deployed.
8.2.3 d	Deleted Strata Balancing requirements.	Already covered by RSA and new Directive.
9.1	Deleted and Renumbered	9.1 was a duplicate to 9.2
9.7 now 9.6	Operations shall cease when instances of multiple ruts in a limited area are created that are clearly related to operations during	Operations shall cease when instances of multiple ruts in a limited area are created that are clearly related to operations during unfavourable ground conditions.

Ground Rule Number	2009 Version of the Ground Rule	2011 Version of the Ground Rule
	unfavourable ground conditions. Ruts are defined in the Alberta Soil Conservation Guidelines.	
9.10	Deleted	This was a duplicate to 11.3.4.7
10.2	Purpose: To minimize the impact of non-native, restricted, and noxious weeds in the Green Area.	Purpose: To minimize the impact of non-native, restricted, and noxious weeds.
11.2	Updated to remove requirements covered by the Public Lands Act	See Section 11.2
11.2.3.2	added	Proposed loop roads will be discussed prior to FHP approval
11.3 – numerous places	Cross Ditches	Cross Drainage Structures
11.4	Removed Water Act Code of Practice Green Zone Exemption Table.	Replaced it with a table of acceptable crossing structures for each stream type in frozen and non-frozen conditions. See Section 11.4.
12.0.4	Moved 3.4.5(j) to 12.0.4	As built plan (includes shape files for harvest boundaries and road location from the previous year's harvest.) This requirement is met through the SLS and Southern Rockies data sharing agreement.
12.0.5	Added	Variances to ground rules shall be reported to Alberta within 48 hours.
Appendix 2		Updated to March 15, 2010 Version
Appendix 6	Added	Directive 2006-04
Appendix 7	Added	External Information Letter 2010-02 Fescue Grassland Information Letter – Principles for Minimizing Surface Disturbance

Appendix Table B-2 Revisions from 2011 - 2012

Ground Rule Number	2011 Version of the Ground Rule	2012 Version of the Ground Rule
General	Some edits were made outside of the joint review that included deletion of word(s), correction of spelling & grammar, changes to bolded text, etc., that did not change the intent, meaning or requirements of the OGRs, but rather to provide clarification. These changes are not documented in this table.	
Section 1.0	Added	Authorization of the Annual Operating Plan (AOP) does not constitute waiver or exemption from the ground rules or any statutory requirement, nor is authorization of the AOP verification of compliance with the ground rules or any statutory requirement.

Ground Rule Number	2011 Version of the Ground Rule	2012 Version of the Ground Rule
		The Forestry Program Manager has the authority to approve Annual Operating Plans and may also waive or amend the application of specific ground rules in unusual or special circumstances. However, waivers shall be completed in writing and must conform to departmental policy, the Forests Act, the Timber Management Regulation, the Public Lands Act and all other applicable provincial legislation or statutes. Ground rule waivers identified in the FHP meet the intent of "in writing" as required above.
3.3.3.1	Added new ground rule and removed the following. It is expected that there will be substantial discussion to resolve significant issues with Alberta before the FHP is submitted.	The company and Alberta shall meet prior to layout of the area identified in the GDP to clarify issues such as: start date of field recon, reviewing licence boundary in relation to CTP program, public interest in the area, new resource data, and any other factors that could affect harvest planning and scheduling. The intent is to identify known sites of specific interests, eg, mineral lick, natural barriers, unique habitat feature, known long term random campsites and to proactively mitigate impacts on them. This is not to be used for re-evaluating or amending the SHS or FMP objectives.
3.3.5 1 d)	roads are to be monitored, and all outstanding and anticipated reclamation work related to LOC road and stream crossings, may be submitted under separate cover at a time agreed to by Alberta as a component of the road use and reclamation plan	LOC roads to be monitored, and all outstanding and anticipated reclamation work related to LOC road and stream crossings, may be submitted under separate cover at a future date agreed to by Alberta as a component of the road use and reclamation plan – submitted for information purposes only;
3.4	Added to Discussion	Prior to layout, the company and Alberta will have a discussion of proposed activities/issues that could affect harvest planning and scheduling, see 3.3.3.1.
3.4.5 i	Current information on previously harvested areas, and available existing trails, seismic lines, power lines, pipelines and access routes	boundary and opening number on previously harvested areas, and available existing trails, designated trails, seismic lines, power lines, pipelines and access routes
3.5	Added to Discussion	Individual components of the AOP may be approved without approval of the entire AOP, eg, reclamation plan, reforestation program.

Ground Rule Number	2011 Version of the Ground Rule	2012 Version of the Ground Rule
5.2	Added to Discussion	Many methods of engaging the public during the forest planning process are used by forest operators. For information on Spray Lake Sawmills public consultation process see their website. www.Spraylakesawmills.com.
5.2.2	The forest operator shall work with groups that have raised concerns with the operator or have been identified by Alberta.	The forest operator shall work with groups that have raised concerns with the operator or have been identified by Alberta. When requested, the company shall provide a summary of stakeholder contact.
7.2.5	Roadside vegetation shall be protected in harvest areas to limit the line-of-sight distance across the harvest area, unless otherwise approved by Alberta. To minimize breaks in the vegetation screen, only one road entry point shall be commonly allowed into the harvest area	Roadside lesser vegetation shall be protected in harvest areas to limit the line-of-sight distance across the harvest area, unless otherwise approved by Alberta. To minimize breaks in the vegetation screen, only one road entry point shall be commonly allowed into the harvest area
7.4.9	The following are guidelines for the spatial distribution of structure: a) retain structure near woody debris piles (and vice versa); b) retain structure near the harvest area boundary to create a gradual ecotone between the harvest area and un-harvested forest; c) retain structure in patterns and locations that minimize the potential for blowdown; d) retain structure near ephemeral draws and intermittent streams.	The following are guidelines for the spatial distribution of structure: a) retain structure near woody debris piles (and vice versa); b) retain structure near the harvest area boundary to create a gradual ecotone between the harvest area and un-harvested forest; c) retain structure in patterns and locations that minimize the potential for blowdown; d) retain structure near ephemeral draws and intermittent streams. e) retain structure around known wildlife features eg. occupied black bear dens, bear rub trees etc.
7.7.1.1	Unless specifically addressed in an approved SHS and FMP strategies, a CA must be completed that addresses the following issues within identified grizzly bear core/secondary areas: a) provide an agreed upon habitat effectiveness (including mortality risk) supply forecast including the amount, type, and spatial arrangement of grizzly habitat (completion of this forecast is subject to more technical direction from Alberta); b) the location of all proposed harvest areas c) the amount, alignment, standard (road	Where an approved SHS and FMP strategy is not provided, a CA must be completed that addresses the following issues within identified grizzly bear core/secondary areas: a. provide an agreed upon habitat effectiveness (including mortality risk) supply forecast including the amount, type, and spatial arrangement of grizzly habitat (completion of this forecast is subject to more technical direction from Alberta); b. the amount, alignment, standard (road type) and longevity (tenure) of all access roads;

Ground Rule Number	2011 Version of the Ground Rule	2012 Version of the Ground Rule
	type) and longevity (tenure) of all access roads; d) use of and improvements to existing access roads; e) access road reclamation plan and schedule, which will also consider options for reforestation of roads. This shall take into account options for existing "traditional" access routes; f) effective measures to achieve public and industrial "highway vehicle" access management; g) general operating schedule (road construction, harvesting, silviculture); h) protection of key grizzly bear habitat features (as identified by Alberta and company); i) berry crop management strategies (in relation to both harvesting system and silvicultural prescription); j) proposed summer operations	c. use of and improvements to existing access roads; d. identification of access control methods, road reclamation plan and schedule, which will also consider options for reforestation of roads. This shall take into account options for existing "traditional" access routes; e. protection of key grizzly bear habitat features (as identified by Alberta and company); f) proposed summer operations.
7.7.1.10	Except where identified and agreed upon within the FHP, only temporary access roads or industrial roads (classified as closed) shall be used.	Except where identified and agreed upon within the FHP, only temporary access roads or industrial roads (classified as closed to the public) shall be constructed.
7.7.2.2	Roads shall be built no sooner than one year prior to harvest operations. Temporary roads shall be re-contoured and reclaimed (and potentially reforested) within 18 months of completion of harvesting and hauling operations, unless otherwise agreed to in the operating schedule.	Temporary roads shall be built within one year of harvest operations. Temporary roads shall be re-contoured and reclaimed (and potentially reforested) within 18 months of completion of harvesting and hauling operations, unless otherwise agreed to in the operating schedule.
7.7.2.3	The FMP and SHS shall provide direction on the location/adjacency of harvest areas and retention areas, and on rate of harvest.	Removed as not an operational standard.
7.7.2.10	Timber operations shall be conducted to mitigate the impacts on critical winter habitat and calving areas.	Timber operations shall be conducted to mitigate the impacts on critical winter habitat and calving areas. Priority is to plan to avoid timing restrictions. Where unavoidable, early access to these and being out as early as possible is a priority.
7.7.3	Added to the discussion for pure strain West slope Cutthroat Trout .	Prior to recovery plan approval, the disposition holder will work with AESRD to obtain information identifying sensitive sites for this species consideration in future planning.
7.7.3.9	Added	Bull Trout and Pure Strain Westslope

Ground Rule Number	2011 Version of the Ground Rule	2012 Version of the Ground Rule
		Cutthroat Follow table 2 and section 11 for standards related to protection of habitat values for these species.
7.7.3.10	All clumps and identified single trees of Limber and Whitebark pine shall be protected.	All clumps and identified single trees of Limber and Whitebark pine shall be protected, unless removal is required due to unavoidable road alignment. Written approval is required.
7.7.3.13	Natural Springs, Beaver Ponds with no outflow channel, or other natural ponds -- 20 m- treed buffer	Natural Springs, Beaver Ponds with no outflow channel, or other natural ponds -- 20 m- buffer of lesser vegetation
8.3.3	All forest operators who are responsible for reforesting their timber disposition shall treat all harvest areas within two years from the end of the timber year when the harvest area received skid clearance. Non-stocked openings shall be treated within one year of failing an establishment survey.	Deleted as redundant to legislation.
8.3.4	Establishment and performance regeneration surveys shall be conducted according to the procedures in the Alberta Regeneration Survey Manual, (May 2003 or successors) unless alternate survey methods have been approved by Alberta.	Deleted as redundant to legislation.
9.7	Erosion and soil disturbance must be limited, with effort made to retain organic matter and soil nutrients.	Erosion and soil disturbance must be minimized, with effort made to retain organic matter and soil nutrients.
11.4.4 a)	Added a)	maintain fish passage on fish bearing water;
11.4.18	Culverts for all classes of streams must be designed, properly sized and installed to prevent erosion at both the inflow and outflow ends of the structure. Culverts shall be of sufficient length beyond the fill with the overburden properly backsloped and stabilized to prevent sediment from entering the watercourse, and the ends of the culvert open at all times. Any culvert, that becomes a hanging culvert must be correctly re-installed as soon as possible.	Culverts for all classes of streams must be designed, properly sized and installed to prevent erosion at both the inflow and outflow ends of the structure. Culverts shall be of sufficient length beyond the fill with the overburden properly backsloped and stabilized to prevent sediment from entering the watercourse, and the ends of the culvert open at all times. On a potentially fish bearing watercourse, any culvert, that becomes a hanging culvert must be correctly re-installed as soon as possible.
12.04	As built plan (includes shape files for harvest	As built plan (includes shape files, or other

Ground Rule Number	2011 Version of the Ground Rule	2012 Version of the Ground Rule
	boundaries and road location from the previous year's harvest.) This requirement is met through the SLS and Southern Rockies data sharing agreement.	digital format as approved by Alberta, for harvest boundaries, road location, and crossing locations from the previous year's harvest.) This requirement is met through the SLS and Southern Rockies data sharing agreement.
FHP/AOP Checklists		Updated – see Appendix 5