

SECTION FIVE
RESOURCE MANAGEMENT

DFMP

DETAILED FOREST MANAGEMENT PLAN

TEXT REPORT



BLUE RIDGE LUMBER INC.
A SUBSIDIARY OF WEST FRASER MILLS LTD.

5 Resource Management

5.1 Harvest Planning and Operations

5.1.1 BRL Woodlands Operating Manuals

Blue Ridge Lumber has developed the following handbooks and manuals to assist Woodlands staff and contractors to ensure all woodlands operations are meeting consistent standards. SRD were provided a copy of these manuals.

1. Emergency Response Procedures (ERP) Handbook 5th Edition, May 1, 2005. This edition is valid until May 1, 2006.
2. Health, Safety and Environmental Manual
 - Health and Safety (May 1, 2004).
 - Environmental Manual (October 1, 2005).
 - Waste Minimization Manual (April 1, 2001).

5.1.2 Operating Districts and Units

For administration purposes the Woodlands operations (FMA and Coniferous Timber Quota areas) have been divided into two Districts. The **East District** is comprised of the Judy Creek area and the Swan Hills area. The **Judy Creek Operating Area** is located within the southeast portion of the FMA area south of the Freeman River, and east of Carson and Louise Creeks. The **Swan Hills Operating Area** is located within the northeast corner of the FMA area north of the Freeman River. The **West District** is comprised of the Virginia Hills area and the Fox Creek area. The BRL W6 Coniferous Timber Quota that lies within the Weyerhaeuser Edson FMA area is currently administered as part of the BRL West District. The **Virginia Hills Operating Area** is located within the northwest corner of the FMA area south of the Freeman River, west of Carson and Louise Creeks and east of Range 18. The **Fox Creek Operating Area** is comprised of our W1 Quota area and the Volume Supply Area 1.

With the addition of W2 to the FMA area, the operating area boundaries of Virginia Hills and Fox Creek have been re-defined to follow natural landscape features within the W14 FMU.

Each Operating Area has been sub-divided into Operating Units (or quota licenses). These smaller compartments are subdivisions that usually follow natural landscape features and allow us to plan activities in smaller compartments in a prioritized fashion. Whenever possible, boundaries of the operating areas and units are made to follow significant features such as main road corridors or permanent watercourses. Please refer to the map on the following page that shows the Operating Districts and Units.

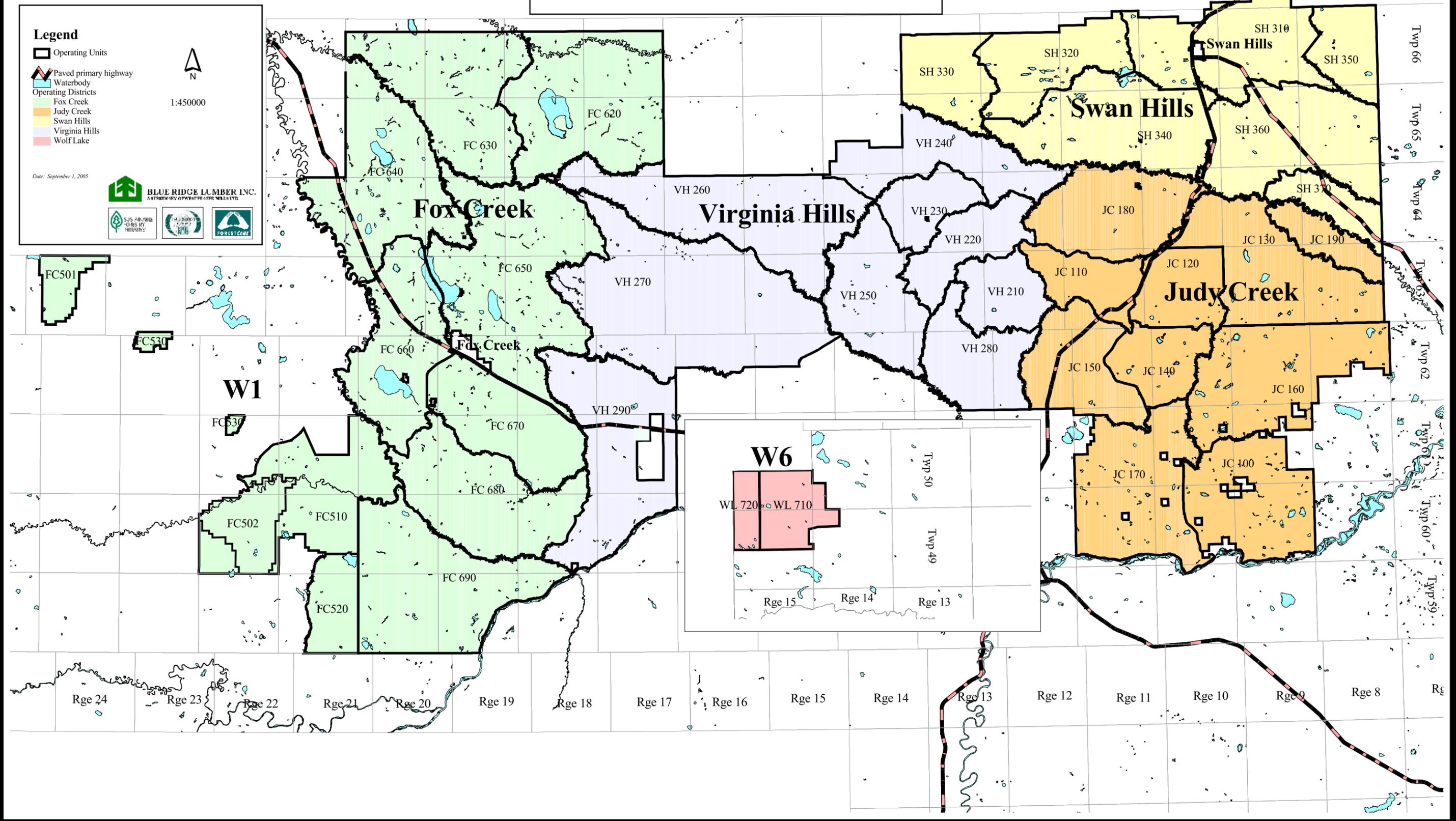
BLUE RIDGE LUMBER INC.
 FOREST MANAGEMENT AGREEMENT AREA
 OPERATING DISTRICTS AND UNITS

Legend

- Operating Units
- Paved primary highway
- Waterbody
- Operating Districts**
- Fox Creek
- Judy Creek
- Swan Hills
- Virginia Hills
- Wolf Lake

Date: September 1, 2005

Scale: 1:450000



5.1.3 Merchantability and Utilization Standards

Blue Ridge Lumber operates a lumber production facility, and the sawlog utilization standards, which are identified in the Operating Ground Rules, are consistent with the current Provincial utilization standards for the industry.

The Conifer Utilization Standard

The utilization standard for a merchantable conifer stand is a stand having 47.5 m³ (50 m³ rounded-off) or more per hectare of net merchantable conifer trees at stump/top utilization of 15/10 cm at a minimum age of 70 years.

The utilization standard for a merchantable conifer tree is a tree having 15 cm butt diameter measured outside bark at 30 cm above ground level and having a minimum 4.88 meter length to a 10 cm top measured inside bark.

A merchantable piece in tree length logging operations contains a minimum usable length of 2.44 meters in length plus 5 cm trim allowance for sawlog operators to a 10.0 cm small end diameter inside bark where rot content or form does not render it unusable.

Conifer butts (or larger ends) greater than 19 cm and having rot greater than 50% in basal area may be bucked at 0.61 meter intervals or less to 50% sound wood basal area. Trees with butts (or large ends) of 19 cm diameter or less, containing soft rot, may be bucked at 0.61 m intervals to 100% clear face.

The Deciduous Utilization Standard

The deciduous utilization standard is 50 m³ per hectare or greater of net merchantable volume. The utilization standard for a merchantable deciduous tree is a tree having a minimum butt diameter of 15 cm outside bark and a merchantable length of 4.88 meters or greater to a 10 cm top inside bark, or to a point where the stem is unusable or there is no central stem due to heavy branching.

A merchantable deciduous piece is one that is 2.44 meters or longer to a 10 cm inside bark small end where rot content or form does not render it unusable.

Deciduous log butts or large ends greater than 19 cm and having advanced decay greater than 50% in area at the cut surface may be bucked at 0.61 (2 foot intervals) or less to 50% sound wood. Trees with butts (or large ends) of 19 cm diameter or less, containing soft rot, may be bucked at 0.61 m intervals to 100% clear face.

Blue Ridge Lumber is concerned with utilization, and the Company has worked hard to encourage the sale of 13/7 cm pulpwood. To date companies have not been willing to pay for the actual cost to harvest this small diameter pulpwood, because residual chips from sawmills are readily available at a very low cost compared to the cost to harvest and haul 13/7 cm pulpwood.

Blue Ridge Lumber will continue to work with other Companies regarding pulpwood and chip sale agreements.

Blue Ridge Lumber has been successful, and will continue to encourage improved utilization of timber by:

- Log and chip exchange agreements with other forest Companies,
- Aspen log sales with other forest Companies,
- Purchased wood from private land owners,
- Industrial salvage of timber,
- Salvage of fire areas,
- Road use agreements,
- Utilization of industrial corridors,
- Encouraging fence post operations,
- Installation of sawmill equipment to increase lumber recovery
 - ◆ Chip ‘N’ Saw in 1976,
 - ◆ Hewsaw in 1994,
 - ◆ Optimizing twin band Headrig in 1994,
 - ◆ Overhead Crane in 1994 to reduce breakage,
 - ◆ 30” Canter saw in 1998,
 - ◆ Construction of the MDF plant in 1986 with major expansions in 1992 and 1995,
 - ◆ Jumbo Canter in 2000 with slew, skew and tilt features in 2003,
 - ◆ Bucking and merchandizing infeed to the sawmill in 2004.

5.1.4 Pre-Harvest Stand Assessment

Blue Ridge Lumber has developed a Pre-Harvest Stand Assessment (PHA) and Prescription form suited to our specific needs. The Company collects pre-harvest stand assessment information at the time of cutblock layout, which is generally one or two years in advance of harvesting. This information is used to determine the proper harvesting and silviculture prescriptions for each cutblock. Silviculture costs are estimated prior to hauling based on these prescriptions and accrued at the time of harvest.

A tool that is used by Blue Ridge Lumber staff and contractors to assist in developing harvesting and silviculture prescriptions are the following two field guides: *The Field Guide to Ecosites of West-Central Alberta, Special Report 9, 1996* covers the Upper Foothills and Lower Foothills Natural Sub-regions of the Blue Ridge Lumber FMA area. *The Field Guide to Ecosites of Northern Alberta, Special Report 5, 1996* covers the Central Mixedwood Natural Sub-region of the Blue Ridge Lumber FMA area. Training in the use of the classification system is offered through the Environmental Training Centre at Hinton in the Pre-Harvest and Prescription courses. Blue Ridge Lumber Woodlands staff attended these training courses in October 1997.

5.1.5 Harvesting Methods

Blue Ridge Lumber uses both tree length and cut to length mechanical logging systems to optimize the efficiency and safety of our operations and the quality of our product. In our tree length systems, trees are fallen with a sawhead feller-buncher, skidded to roadside by grapple skidders and delimbed and decked by track mounted boom delimiters. These decks are later loaded by hydraulic boom loaders and delivered in tree-length form to the mill.

Blue Ridge Lumber is constantly monitoring harvesting methods and their effectiveness in today's environment as we strive to continuously improve our operations. We are currently using understory protection techniques and delimiting on the stumps with conventional boom delimiters when conditions create benefits from using these techniques.



5.1.6 Hauling

Hauling generally commences in June and continues until the following spring breakup, which usually occurs in late March. The timing of the hauling and production schedule is provided in the Annual Operating Plan and the General Development Plan. The hauling schedule may change from time to time because of factors such as weather, mill requirements, demand for aspen etc. Contractors are hired directly by the Company for all loading and hauling, using primarily owner-operated loaders and trucks.



5.1.7 Cut Control and Timber Operating Year

The commencement date of the current FMA is September 1, 1995. This establishes the operating year of September 1 to August 30 and the 5-year cut control periods (cut control period) to control harvest production. The forest management operating year is agreed upon by the Company and the Minister. In accordance with the current Operating Ground Rules, BRL is required to submit an annual operating plan for approval prior to May 1 that details harvesting and silviculture operations for the upcoming operating years. The minimum volume of timber to be harvested during each 5 year cut control period is 90% of the allowable cut volume. If production during a cut control period exceeds the allowable volume, the Minister may reduce the allowable volume during the subsequent period by an amount equivalent to the entire overcut volume.

The BRL Coniferous Timber Quotas are controlled by an authorized volume for each quadrant commencing May 1 to April 30. The 5-year cut control period (quadrant) dates are 1986-1991, 1991-1996, 1996-2001, and 2001-2006 etc.

The FMA is currently being renewed to allow BRL to harmonize the operating years and the quadrant dates for both the FMA and the Coniferous Timber Quotas.

5.1.8 Scaling

Loaded log trucks are weighed as they cross the scales entering and leaving the sawmill site. A predetermined random sample of one half of one percent is taken of the loads coming from each harvest area. Populations are established with SRD once a year. Generally a minimum target of 30 sample loads for each operating area is required. Tree length loads are segregated, spread and bucked into useable log lengths. Company or contractor licensed scalers then measure each log in the load to determine the net volume. Weight/volume conversions are calculated for each load and monthly summaries of these conversions are applied to the total monthly weight hauled. This determines the harvest volume that forms the basis for payment to contractors, and the harvest volume (timber drain) that is reported to Alberta Sustainable Resource Development.

5.1.9 Stumpage (Crown Dues)

Stumpage rates for conifer timber vary according to a market index price, converted to Canadian dollars per thousand board feet of lumber (MFBM) payable when lumber is sold. A portion of this stumpage rate is paid into a Forest Resources Improvement Program (FRIP) fund to be used by the forest industry for non-legislated programs and projects. Activities that enhance the forest resource are considered for approval. For additional information please refer to the section on the Forest Resource Improvement Program.

Several opportunities are available for marginal timber dues relief when a Company chooses to operate at a higher utilization standard than normal. There are several methods that can be chosen by the Company (depending on the situation) to monitor this volume according to Directive 97-05 Calculation of Marginal Timber Dues for Softwood Timber and Directive 97-03 Quota Holder Chargeability. These directives are periodically updated and they can be found on the web at <http://www3.gov.ab.ca/srd/>.

5.1.10 Annual Cutover Photography

The FMA requires that Blue Ridge Lumber assess, on an annual basis, all Company harvesting operations.

To accomplish this task Blue Ridge Lumber obtains aerial photography of harvested areas within the FMA area and BRL quota areas. The photography is flown at a scale of 1:20,000 and obtained as close as possible to the end of the current operating year of May 1. The aerial photography is reviewed for quality and one set of prints and photo index maps is sent to SRD.

A general overview of the process for updating harvested areas is:

- Review Company harvest operations and other Quota/DTA operators within the FMA area. Prepare initial photo coverage maps and obtain aerial photography by contract.
- Upon receipt of the aerial photography the images are reviewed and selected for scanning to a digital source.
- Scanned images are then corrected to the township-range digital ortho image.
- Block boundaries are delineated on screen using the HPSIS spatial program.
- Upon completion of the block boundaries, maps with the scanned image as a background are sent to quota operators for verification of boundaries.
- ARIS base data is requested from Quota/DTA operators within the FMA area. Upon receipt of this information it is entered into the HPSIS program.

5.2 Silviculture Planning and Operations

5.2.1 General Overview

Blue Ridge Lumber recognizes the importance of prompt reforestation, and proper silviculture practices as major factors in sustained yield forest management. The Company is therefore regenerating all cutovers as quickly as possible following harvesting. Cutovers are treated within one or two years of harvesting.

Initial reforestation of our cutovers has been very successful with 97% of all cutovers surveyed to date meeting pre-1991 Provincial stocking standards. Blue Ridge Lumber is making major strides toward meeting or exceeding the current “*establishment*” and “*performance*” reforestation standards to ensure sustainable forest management.

Lodgepole pine, white spruce, and black spruce are the three principal conifer species harvested by Blue Ridge Lumber. Different silviculture techniques must be used with each different site and different species to ensure adequate regeneration.

Balsam fir and some minor amounts of sub-alpine fir occur naturally throughout the FMA area. These species are utilized by the mill under the spruce, pine, fir grading rules and represent approximately 5 % of the volume harvested. The Company does not encourage the stocking of balsam fir and sub-alpine fir, but the Company strategy is to utilize these species because they occur naturally and to use them as acceptable species in our regeneration surveys as per the SRD Directive 2001-01. This strategy also applies to Quota blocks harvested and reforested by Blue Ridge Lumber.

Lodgepole pine cutblocks can usually be reforested by drag scarification that scatters the pine cones for natural seeding. The Company intends to rely on drag scarifying and natural seeding of pine cutblocks. Delimiting “on the stump” is used where feasible, to increase the available cone supply for dragging. Where cones are inadequate, supplementary aerial seeding or planting is utilized to bring stocking up to acceptable levels. Heavy dragging was re-introduced in 1997 to improve the scattering of the cones. Heavy dragging is also being utilized as a site preparation technique for planting.

The Company is planting all white spruce sites, mixed-wood sites, and high productivity lodgepole pine sites that will not regenerate satisfactorily by natural means. Black spruce seedlings are planted in sheltered areas on lowland sites. Aerial seeding and natural seeding of black spruce is used on specific sites.

Regeneration of mixed-wood sites is a problem because of the rapid suckering of aspen and the in-growth of competing vegetation that is often increased by mechanical site preparation. The Company is currently planting some of these areas with no mechanical site preparation, or planting in combination with chemical site preparation, in order to reduce the impact of

competing vegetation. Other sites that are planted with no site preparation are understorey protection areas, steep slopes, and sites with erosion potential.

Brush and grass competition severely restricts growth and survival of conifers on many of our best growing sites. The Company intends to continue the operational use of herbicides to control this competition. The Company also intends to maintain our program of manual spacing and cleaning in juvenile plantations to protect our reforestation investments. Manual cleaning is also used as a follow-up tending treatment to ensure the best likelihood of meeting the current Provincial Performance Standard.

Blue Ridge Lumber is continuing to investigate other alternative methods to the use of chemical treatment, but experience to date has shown that these other methods are ineffective and expensive. The first operational sheep grazing trial in Alberta was conducted on the BRL FMA area in 1993-1997 and this study proved to be expensive and ineffective. Various other alternative methods of vegetation control have also been conducted by BRL over the years, and these too were proved to be expensive and ineffective. These methods include manual applications, hack and squirt, stump treatments, girdling, and tree injections.

Blue Ridge Lumber promptly reclaims and reforests roads, landings, gravel pits, borrow pits, etc. and planting of siberian larch, which has proven to be successful, was occasionally used for this purpose. The May 2003 edition of the “Standards for Tree Improvement in Alberta” currently prevents the use of siberian larch as a reforestation species in Alberta and Blue Ridge Lumber now uses Lodgepole pine for reclamation purposes.

5.2.2 Strategies for Successful Reforestation

During the 1995-2005 period Blue Ridge Lumber made many changes and improvements in silviculture strategies and tactics. In 1995 there was a reorganization of silviculture staff and responsibilities. This included the assignment of two experienced foresters as silviculture supervisors in the operations group. This change effectively integrated harvesting and silviculture operations, as well as planning. Operational use of herbicide was also granted that year and has been used judiciously, along with manual tending, to ensure the best chance of meeting regeneration standards.

In 1996 the Company adopted a new strategy of “**Site Specific and Timely Silviculture.**” This new strategy went far beyond species selection and prompt planting of cut blocks. The fundamental guideline was to assess all of the sites from an ecological perspective, including past and present disturbance. All factors were to be looked at with the goal of meeting the provincial establishment and performance standards. The target minimum for establishment was set at 90% stocking to ensure all blocks have a good chance to make the performance standard.

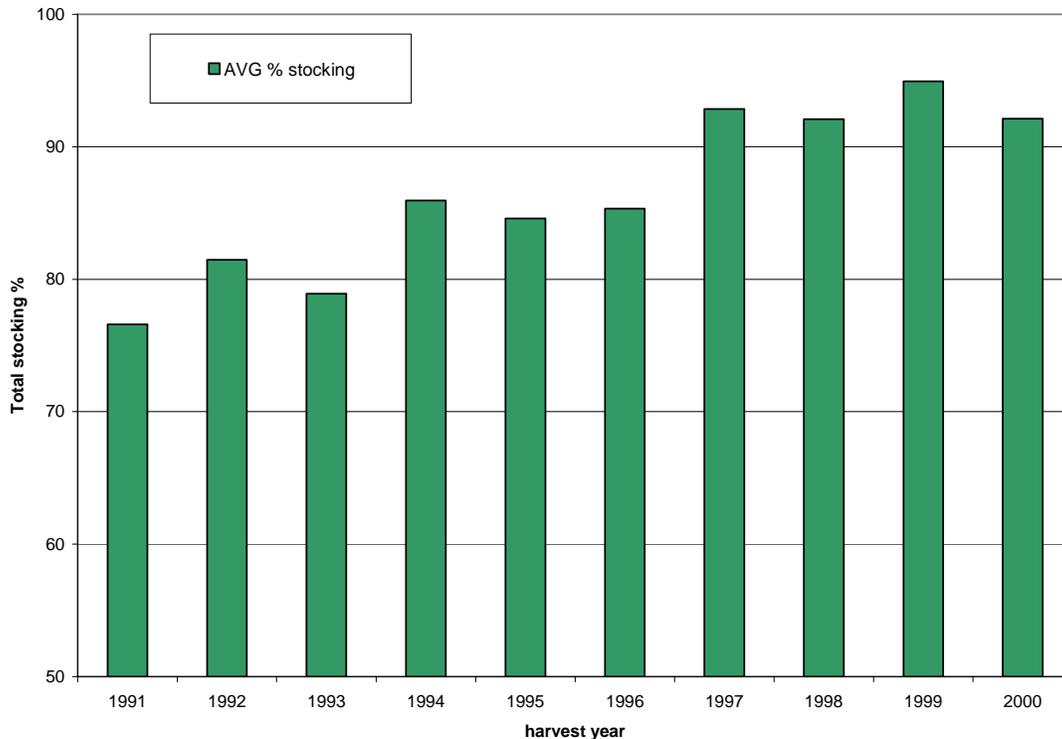
Site preparation became site specific with the direction that it was only to be used to alleviate a site constraint. The constraints, if any, are assessed first and general methods of site preparation are considered (i.e. prescribed burn, mechanical, manual and chemical). Then the specific tools are assessed for suitability to the condition, site, season and access. Natural and artificial renewal is then considered. The most appropriate and cost effective method(s) are chosen that will best ensure meeting the current regeneration standard. These include seeding, cone scattering, planting, coppicing, and protection of suitable advanced regeneration.

“Microsite specific silviculture” was adopted as a critical component of this overall strategy. This included the introduction of planter spot and species selection, with the organic/mineral soil interface being the preferred medium.

Species selection is also based on site factors and limitations (e.g. no white spruce (Sw) in Labrador tea) and with an eye towards immediate and future tending requirements. All blocks are assessed for timely tending treatments. Most blocks were found to require at least two tendings to make the current standards. Prompt re-treatments, where necessary, are prescribed and carried out. Clear feedback mechanisms were put in place to ensure timely and effective review of survey results.

Evidence of the success of this strategy appeared quickly in our stocking survey assessments and more importantly in the establishment surveys of the blocks since 1995. The following chart illustrates the continuous improvement that is being realized. The 90% minimum target has been consistently met from the 1997 harvest to present.

Graph 8: Average Establishment Survey % by Harvest Year



The Blue Ridge Lumber silviculture operations strategy and tactics are summarized as follows and the table on the following page also provides a summary of the silviculture strategy (generic prescriptions).

- To conduct site specific prescriptions for each cutblock which are based on gathering information on pre-harvest and post-harvest phases. Different sites and different species require a variety of silviculture treatments.
- To scarify and encourage natural seeding wherever possible and practical.
- To plant white spruce sites, mixed-wood sites and high productive pine sites that will not regenerate satisfactorily by natural means.
- To tend by spacing, manual cleaning and herbicide treatment.
- To conduct ongoing surveys and monitoring programs to continually assess reforestation performance.
- To use balsam fir and sub-alpine fir as acceptable conifers in regeneration surveys on Company FMA and Quota areas, as this species is being utilized in the manufacturing facilities. It is the Company’s objective to continue managing fir as a minor species.
- To use balsam fir as and acceptable species for conifer understorey protection cutblocks and cutblocks where retention of existing fir stocking is required to achieve other non-fiber resource management objectives.

- To use siberian larch as an acceptable species for regeneration surveys when it is encountered in the field (i.e. areas planted prior to the current ban).

Blue Ridge Lumber has been participating since 1977 with Alberta Sustainable Resource Development and other forest companies in a Cooperative Genetic Tree Improvement Program. Four lodgepole pine and one white spruce progeny test plantations have been established on the Blue Ridge Lumber FMA area. The Company has established a lodgepole pine seedling orchard and a white spruce clonal seed orchard to improve future growth and quality of timber. Maintenance of the four pine progeny plantations and the seed orchard are annual ongoing tasks. A small amount of genetically improved white spruce seed from the Region D seed orchard was planted in 1995, and another 100,000 seedlings were planted in 1997.

Blue Ridge Lumber is currently reviewing the tree improvement programs to ensure that they meet the new “Standards for Tree Improvement in Alberta.” The new policy requires that we enter into new agreements with Alberta Sustainable Resource Development. The Company also intends to maintain our interest in all of the new “D” and “D1” white spruce breeding regions. To date we have not assumed any gains from Tree Improvement or any other enhanced silviculture in our AAC assumptions or calculations.

Table 11: Silviculture Strategy (General Prescriptions by Cover Type)

Actual Leading Species (at Harvest)	Yield Stratum	Site Preparation*	LFN	Seed	Normal Plant			Fill Plant ***			Competition Control (Chemical and/or Manual)
					Stems/ha	Species	Stock Type**	Stems/ha	Species	Stock Type**	
Pl	C,CD	M, NIL, PB, CH	Y,N	N,Y	0 - 1800	Pl, Sb, Sw	M,L,S	as necessary	Pl, Sw, Sb	M,L,S	Y,N
Pl (Sb)	C,CD	M, NIL, PB	Y,N	N,Y	0 - 1800	Pl, Sb, Sw	M,L,S	as necessary	Pl, Sw, Sb	M,L,S	Y
Pl (Fb)	C,CD	M, NIL, PB	Y,N	N,Y	0 - 1800	Pl, Sb, Sw	M,L,S	as necessary	Pl, Sw, Sb	M,L,S	Y
Pl (Sw)	C,CD	M, NIL, CH, PB	Y,N	N,Y	0 - 1800	Pl, Sw	M,L,S	as necessary	Pl, Sw, Sb	M,L,S	Y
Pl (Aw)	C,CD, DC	CH, M, NIL, PB	N,Y	N,Y	0 - 1800	Pl, Sw	M,L,S	as necessary	Pl, Sw, Sb	M,L,S	Y,N
Sb & (SbLt)	C,CD	M, NIL, PB	Y,N	Y,N	0 - 1800	Sb, Pl, Lt	M,L,S	as necessary	Sb, Pl, Lt	M,L,S	Y,N
Sb (PL)	C,CD	M, NIL, PB	Y,N	Y,N	0 - 1800	Pl, Sb	M,L,S	as necessary	Pl, Sb, Sw	M,L,S	Y,N
Sb (Fb)	C,CD	M, NIL, PB	Y,N	N,Y	0 - 1800	Pl, Sb, Sw	M,L,S	as necessary	Pl, Sw	M,L,S	Y
Sw	C,CD	M, NIL, CH, PB	N	N,Y	1400 - 1800	Sw, Pl	M,L	as necessary	Pl, Sw	M,L,S	Y
Sw	DC,D	M, NIL, CH, PB	Y,N	N,Y	0 - 500	SW, (Pl limited)	M,L	as necessary	SW, (Pl limited)	M,L,S	Y,N
Sw (Pl)	C,CD	M, NIL, CH, PB	Y,N	N,Y	1400 - 1800	Pl, Sw	M,L,S	as necessary	Pl, Sw	M,L,S	Y
Sw (Pl)	DC,D	M, NIL, CH, PB	Y,N	Y,N	0 - 500	Pl, Sw	M,L,S	as necessary	Pl, Sw	M,L,S	Y,N
Sw (Fb)	C,CD	M, NIL, CH, PB	N	N,Y	1400 - 1800	Sw, Pl	M,L,S	as necessary	Pl, Sw	M,L,S	Y
Sw (Fb)	DC,D	M, NIL, CH, PB	Y,N	N	0 - 500	Sw, Pl	M,L,S	as necessary	Pl, Sw	M,L,S	Y,N
Sw (Pb)	C,CD	M, CH	N	N	1400 - 1800	Sw	M,L	as necessary	SW, (Pl limited)	M,L	Y,N
Sw (Pb)	DC,D	M, CH	Y, N	N	0 - 500	Sw	M,L	as necessary	SW, (Pl limited)	M,L	Y,N
Sw(Aw)	C,CD	CH, NIL, M	N	N	1400 - 1800	Sw, Pl	M,L,S	as necessary	SW, (Pl limited)	M,L,S	Y,N
Sw (Aw)	DC,D	M, NIL	Y,N	N	0 - 500	SW, (Pl limited)	M,L	as necessary	SW, (Pl limited)	M,L,S	Y,N
Aw	D,DC,CD,C	NIL, M, CH	Y,N	N	0 - 1800	Sw, Pl	M,L	as necessary	Sw, Pl	M,L,S	N,Y
Aw (Pl)	D,DC,CD,C	NIL, M, CH	Y,N	N,Y	0 - 1800	Pl, Sw	M,L	as necessary	Pl, Sw	M,L,S	N,Y
Aw (Sw)	D,DC,CD,C	NIL, M, CH	Y,N	N,Y	0 - 1800	Sw, Pl	M,L	as necessary	Sw, Pl	M,L,S	N,Y
Aw (Pb)	D,DC,CD,C	NIL, CH, M	Y,N	N	0 - 1500	Sw	M,L	as necessary	Sw, Pl	M,L,S	N,Y
Fb	C,CD, DC	M, NIL, PB, CH	N,Y	N,Y	0 - 1800	Pl, Sw	M,L,S	as necessary	Pl, Sw, Sb	M,L,S	Y,N

This Table outlines the range of treatments BRL would use for original stand compositions. All prescriptions are fine tuned or adjusted on a site-specific basis.

Where more than one option is listed they are ranked as to the likelihood of each choice occurring. The first option is most likely and so on.

Any significant deviations (e.g. new technology) from these prescriptions will be hi-lighted in the silviculture AOP.

Deviations could result from, but are not limited to: ecosite, regeneration standards, strata balancing, re-classification, understorey protection, slash loading, terrain, residual overstorey, season of harvest, cone crops, seed availability, seedling availability, season of access, adjacency, available microsites, weather, climatic factors, disease and insect, other resource values, drainage, new tools & technology, seed zone limitations, survey results, etc.

It is important to understand that this table is a snapshot in time, and changes are an integral component of our philosophies of continuous improvement and site-specific silviculture.

- * M = Mechanical
- NIL = No Site Prep
- CH = Chemical
- PB = Prescribed burn (or pile & burn)
- ** S = Small
- M = Medium
- L = Large
- *** Fill Plant = any planting intended to bring stocking up to acceptable levels.

5.2.3 Cone and Seed Collection

Blue Ridge Lumber’s goal is to collect the highest quality seed possible for our reforestation programs including the production of high quality seed from the Company seed orchards. The Company follows the current version of “Standards for Tree Improvement in Alberta”. The Company objective is to maintain a 10 year seed supply of quality seed for sowing and for aerial seeding.



Spruce cones open and release their seed each year when the cones mature which is usually mid-August to mid-September. Good spruce cone crops are not reliable and usually occur every five to seven years or more. The Blue Ridge Lumber white spruce seed inventory is currently in excellent shape with approximately 10 years of supply. The Company in cooperation with Conicone Resources Inc. have developed and successfully tested a new seed harvesting system for white spruce. This method will ensure successful and timely collections into the future.

Over the past decade the Company has also increased the number, quality and quantity of black spruce and lodgepole pine seedlots for the seed bank. Record quantities of lodgepole pine, black spruce and white spruce have been successfully collected over the last five years, allowing us to reach our goal of a 10 year supply. The vast majority of this seed is wild (stream 1) material. Appropriate usage of this seed in the current seed zones and breeding regions, will ensure maintenance of wild genetic populations throughout the FMA area. The establishment of “in situ” populations, as required under the Stream 1 requirements will also ensure the maintenance of long term genetic diversity.

In 2001 an excellent white spruce cone crop resulted in a collection of 264.25 hectoliters. Approximately 1,791.5 hectoliters of lodgepole pine cones and 60.5 hectoliters of black spruce cones were also collected in 2001.

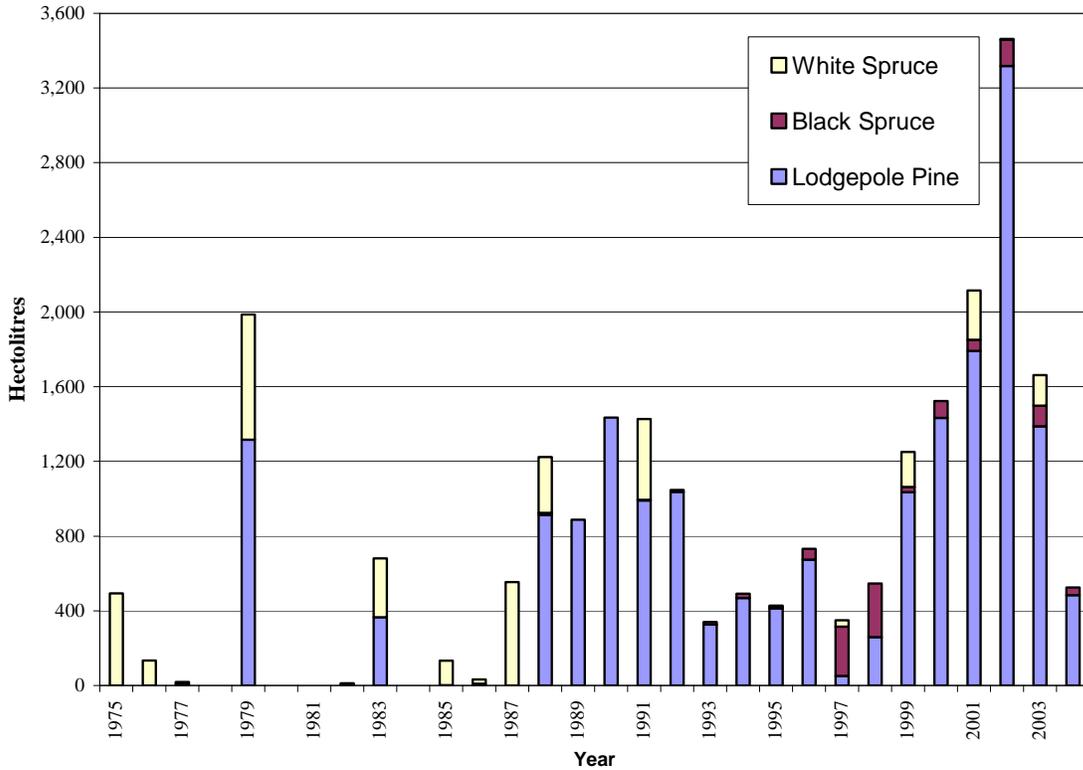
In 2002 a record of 3,317 hectoliters of lodgepole pine cone were collected. Approximately 141 hectoliters of black spruce were also collected.

In 2003 1,388 hectoliters of lodgepole pine, 110 hectoliters of black spruce and 165 hectoliters of white spruce were collected.

In 2004, after meeting our 10 year objective the collection program was scaled down to a maintenance level. The volumes collected in 2004 were 484 hectoliters of lodgepole pine and 42 hectoliters of black spruce.

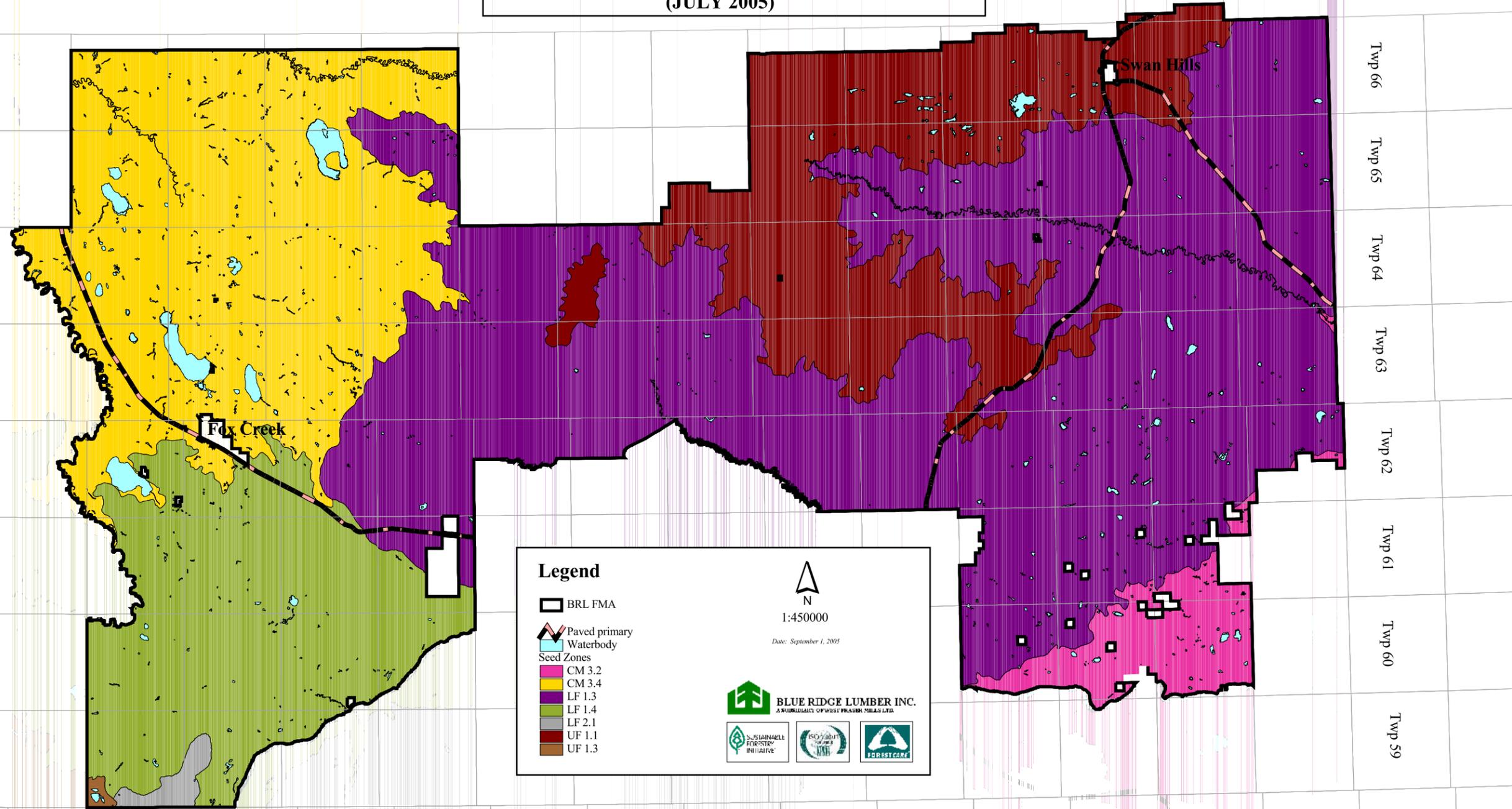
The following graph highlights the Blue Ridge Lumber cone collection from 1975 to 2003 and the map on the following page shows the Seed Zones of Alberta July 2005.

Graph 9: Total Cone Collection from 1975 to 2003



In addition to meeting the new seed zone guidelines, Blue Ridge Lumber follows stricter “in-house” seed movement guidelines based on species-specific elevation ranges (i.e. 200 meters for white spruce, 100 meters for lodgepole pine and 75 meters for black spruce).

BLUE RIDGE LUMBER INC.
 FOREST MANAGEMENT AGREEMENT AREA
SEED ZONES OF ALBERTA
 (JULY 2005)



Legend

- BRL FMA
- Paved primary
- Waterbody
- Seed Zones**
- CM 3.2
- CM 3.4
- LF 1.3
- LF 1.4
- UF 2.1
- UF 1.1
- UF 1.3



1:450000

Date: September 1, 2005

BLUE RIDGE LUMBER INC.
 A DIVISION OF WEST PRADER, SLEAS LTD.

Rge 23 Rge 22 Rge 21 Rge 20 Rge 19 Rge 18 Rge 17 Rge 16 Rge 15 Rge 14 Rge 13 Rge 12 Rge 11 Rge 10 Rge 9 Rge 8 Rge 7

Twp 66
 Twp 65
 Twp 64
 Twp 63
 Twp 62
 Twp 61
 Twp 60
 Twp 59

5.2.4 Seedling Supply

Blue Ridge Lumber purchases its seedling requirements from private contract nurseries in Alberta and British Columbia. The Company has been continuously striving to produce improved seedling stock types for planting heavy grass and aspen competition sites and drought prone sites. In the past several years, major progress has been made in the nursery culture and field performance of lodgepole pine seedlings through copper treated containers to increase root development. Seedling requirements in 1999 surpassed 10 million because of the reforestation of the Virginia Hills fire.



5.2.5 Planting

The Company is currently planting all cutovers that will not regenerate satisfactorily by natural means, such as spruce sites, steep slopes, erosion potential areas, wet and grassy areas, mixed-wood sites, and lodgepole pine sites with inadequate cone supply. These sites represent approximately three-quarters of our annual cutover area.

During the period of 1975 to 1995, Blue Ridge Lumber planted a total of 38 million seedlings on the FMA and Coniferous Timber Quota areas. An additional 1 to 1.5 million seedlings were planted in the inherited reforestation responsibility (4,625 hectares) from the Quota backlog areas of Meunier, Mulyk, McCorkle, Swan Valley, and Revelstoke.



In 1987 Blue Ridge Lumber commenced an increased harvesting of mixed-wood sites which also necessitated an increase in planting. Blue Ridge Lumber planted over 10 million seedlings in 1999 and over 12 million seedlings in 2000 in an effort to reforest the Virginia Hills fire as quickly as possible. During the period of 1975 to 2000 Blue Ridge Lumber has planted over 75 million seedlings.

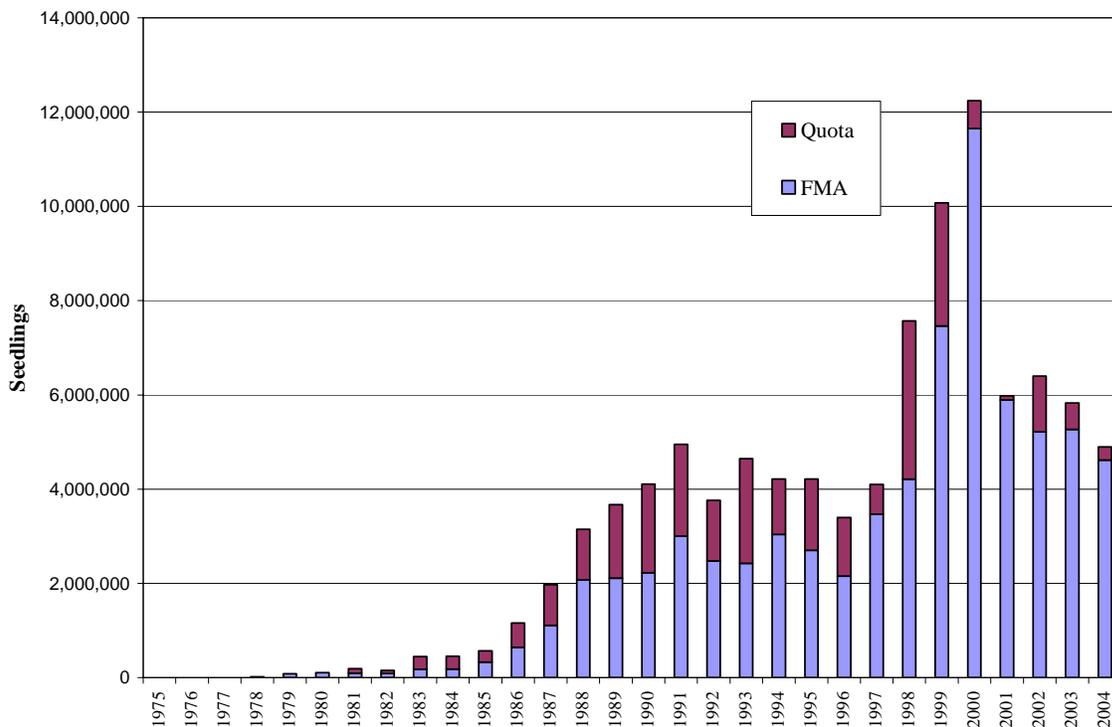
Reforesting mixed-wood sites and productive conifer sites is a problem because of the rapid suckering of aspen and the in-growth of competing vegetation which is greatly increased by mechanical site preparation. The Company is currently planting many of these sites with no mechanical site preparation wherever possible in order to minimize the competing vegetation problem. New reforestation techniques and research are continually being investigated by the Company to improve the reforestation success. Blue Ridge Lumber has been continuously

striving to grow better seedling stock types for planting the heavy grass and aspen competition sites.

The Company concentrated efforts in 1996 towards improving microsite selection for planting while at the same time increasing the number of seedlings planted on each hectare to approximately 1,700 trees per hectare. The planting of black spruce seedlings has increased over the past several years on the wet and frost prone sites. Lodgepole pine seedling stock has improved dramatically over the past several years and so has the success of pine planting. The planting of lodgepole pine has therefore increased to approximately 85% of all planting. Blue Ridge Lumber has made considerable efforts toward cut block and site specific treatments, with changes to site preparation prescriptions and treatments.

The following graph highlights the history of the Blue Ridge Lumber planting from 1975 to 2004. Record seedlings were planted in 1998 to 2001 in an effort to reforest the disastrous Virginia Hills Fire which created a significant increase in the BRL silviculture programs. In 2005 Blue Ridge Lumber planted the 100,000,000th tree on our operations. Sixty five million seedlings were planted in the period from 1995 to 2004.

Graph 10: Total Seedlings Planted 1975 to 2004



5.2.6 Seeding

Blue Ridge Lumber relies on drag scarifying and the natural seeding of pine cutblocks wherever possible. The aerial seeding program over the past several years has been small. Aerial seeding is occasionally used to supplement the natural seed source on some sites to increase stocking and to increase stocking on roads and landings.

5.2.7 Site Preparation

The Blue Ridge Lumber objective in using mechanical site preparation equipment is to improve limiting site factors to seedling growth such as deep duff, heavy slash, vegetation competition, cold and wet sites, etc.

Harvested cutblocks are generally treated with various site preparation techniques including winter plowing, disk trenching, light mounding, heavy (hoe) mounding, shear blading, dragging, and chemical site preparation. Winter plowing is used for planting wet sites that are accessible only under frozen ground conditions. A rip and drag technique is used for winter access dry pine sites. Hoe mounding is used on site-specific areas such as cold and wet sites and frost pockets.



Donaren Disk Trencher

Blue Ridge Lumber has been a leader in the testing and construction of site preparation equipment such as the Craig Simpson (C&S) ripper tooth plow, shark finned barrel drags, Terra Technology light moulder, seeding drums, and mechanical seeding behind the disk trencher. Blue Ridge Lumber has also been instrumental in developing chemical site preparation techniques and operational prescribed burning.

In 1976 to 1978 Blue Ridge Lumber developed the ripper tooth plow for planting wet sites that are accessible only under frozen ground conditions. The ripper tooth plow has a rolled moldboard design that is fitted to the ripper tooth on a D8 or D9 caterpillar. The plow has removable cutting edges that can be replaced in the field when they are worn down. Other forest companies are using the ripper tooth plow and it has been continuously modified and improved since 1978.

Blue Ridge Lumber has developed a heavy anchor chain drag and shark finned barrel drags for naturally reforesting lodgepole pine sites.

In 1996, the Company’s main site preparation contractor George Butler developed a “Terra Technology light moulder” which does an excellent job of preparing micro-sites for planting. The moulder is pulled behind a skidder. This equipment is now in demand by other forest companies because it is stronger and performs better micro site preparation, than similar equipment imported from Sweden or Finland.

5.2.8 Vegetation Management

Introduction

Blue Ridge Lumber is required to meet the Provincial 2000 regeneration standards until the Company develops an FMA specific Alternative Regeneration Standard or an enhanced forest management program. Vegetation management techniques are required on almost all sites to meet the Provincial 2000 regeneration standards.

Blue Ridge Lumber has developed a Vegetation Management Procedures Manual that is concert with the Provincial *Forest Management Herbicide Reference Manual February, 2004*. A copy of the Provincial Herbicide Manual can be found on the website at <http://www3.gov.ab.ca/srd/>.

Regeneration on some of the best mixed-wood sites are being taken over by various grasses, weeds and shrubs as these unwanted species compete with young conifer seedlings for moisture, light and nutrients.

Controlling unwanted vegetation by herbicides is required in order to give the young seedlings a chance to become established and grow at acceptable rates. If these stands remain in an unmanaged state, they could produce less than half the volume that is currently projected for these stands in the second rotation. With proper vegetation management these stands will produce projected growth and maintain the annual allowable cut.



Aspen Competition

An average single tree has a root system diameter of 30 meters. A single tree produces 15-20,000 suckers and 1.5 million seeds per year.

Vegetation competition is the largest single factor that restricts development of the forest and continues to rob the land base of valuable conifer growth. The use of herbicides is essential to control vegetation competition and protect initial reforestation investments.

Herbicide vegetation management is a sensitive public issue and Blue Ridge Lumber has a carefully planned program of public education.

The Company commenced vegetation management in 1984 with the treatment of 2.5 hectares.

In 1986, in response to public concerns about herbicide use in forest management, Alberta adopted a go-slow research only policy that included a public involvement and notification process. At this time Alberta unlike other provinces, did not allow operational herbicide use to manage vegetation competition.



Aerial Vegetation Management

From 1987 to 1993 small-scale trials in the use of forest herbicides were undertaken to provide forest managers and the public the opportunity to gain more experience and confidence with its use.

In 1992, Blue Ridge Lumber herbicide treatment increased to 470 hectares, which was an outstanding achievement by Blue Ridge Lumber. This was the largest herbicide program conducted in Alberta in the past 10 years and represented a historic step in forest management in Alberta. Alberta Environment has been most impressed with the professional manner in which this program was undertaken and completed. This work has since helped to shape a new herbicide use policy in Alberta for the forest industry with a “go-slow approach”. The operational use of herbicides is required in order for the forest industry to meet the new free to grow reforestation policy and to maintain provincial annual allowable cuts. Many alternatives to the use of herbicides have been attempted and have proved to be ineffective and expensive.

During the summers of 1993 to 1995 Blue Ridge Lumber participated in a three-year operational research trial using 1,000 sheep as an alternative to chemical vegetation management. This was Alberta’s first operational forestry sheep grazing trial. The trial proved to be ineffective and expensive. The trial was funded under the Canada-Alberta Partnership Agreement in Forestry. The Sheep and Wool Commission (ASWC) co-operated with Provincial Agriculture and Environmental Protection and Blue Ridge Lumber Inc. Alberta Sustainable Resource Development prepared a report on this research project.



Sheep Grazing Research

In 1994 operational herbicide treatments in Alberta were allowed and annual limits defined in the guidelines, were placed on individual forest companies. The following limits were set in the first three years of a Company’s herbicide program.

- Year 1 – 100 hectares
- Year 2 – 300 hectares
- Year 3 – 700 hectares

After the 3rd year, companies were able to apply for herbicide use greater than 700 hectares, on a “as need basis” taking into consideration the specific site conditions and judicious use for survival, establishment and free-to-grow status of the crop trees and impact on other values. This go-slow approach helped forest managers to develop expertise in the use of herbicides as a tool in vegetation management before allowing larger scale treatments. In Alberta, only *Vision* and *Vantage* (glyphosate) and *Release* (triclopyr) are approved for silviculture use. Blue Ridge Lumber is currently involved in research to assess the suitability of other herbicides and techniques for mixed-wood management in Alberta.

In 1994 operational limits were placed on the total herbicide use in Alberta. To date the actual amount of area treated annually has been less than the annual allowable limit to be treated. The actual amount of area treated is affected by weather, crop readiness and reassessed use. The following table is a summary of the Provincial limit and actual use since 1994.

Table 12: Provincial Vegetation Management Use by Year

<u>Year</u>	<u>Provincial Limit</u>	<u>Actual Treated Area (hectares)</u>
1994	N/A	537
1995	7,000	6,418
1996	11,000	9,754
1997	17,000	12,730
1998	25,000	18,390
1999	35,000	30,030
2000	53,000	30,412
2001	55,000	32,117
2002	55,000	29,823
2003	55,000	30,912 *
2004	No limit set	29,683 *

* Figures not audited

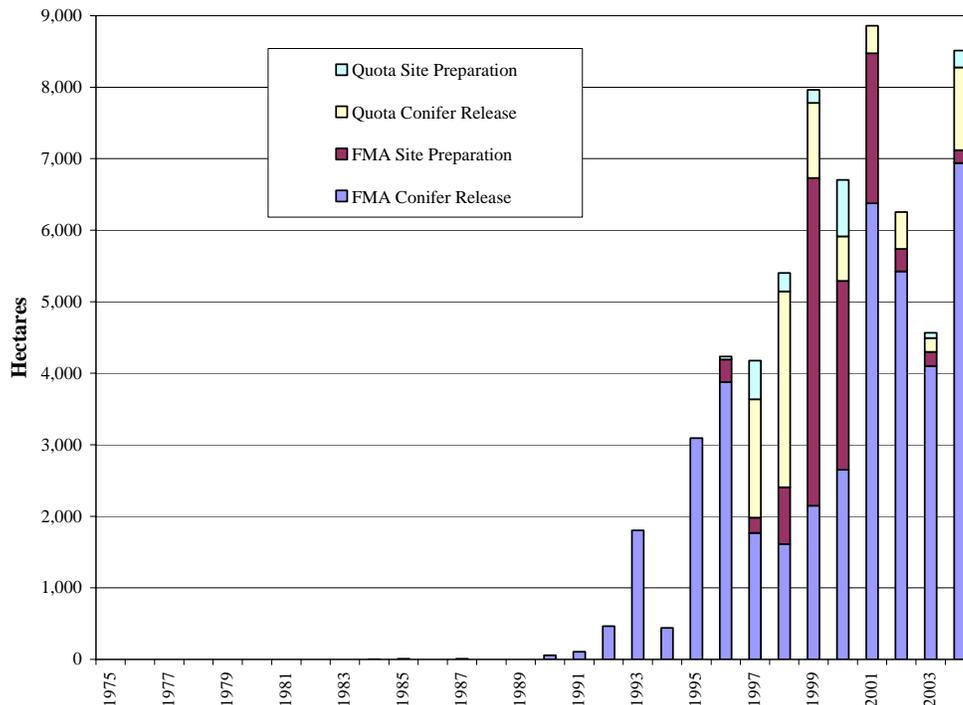
The following graph highlights Blue Ridge Lumber herbicide treatment from 1975 to 2004.

In 2001 the Company completed 6,764.4 hectares of herbicide application for conifer release and an additional 2,096.3 hectares for site preparation, of which 1,017.7 hectares were in burnt cutblocks.

In the period from 1995 to 2004, a total of 59,772 hectares were treated with vision (roundup) to control unwanted vegetation competition, improve conifer growth, and protect reforestation investments on both the FMA area and Coniferous Timber Quota areas.

Herbicide treatment in the next several years is expected to remain close to current levels and then will gradually decrease as Blue Ridge Lumber catches up to the accelerated salvage harvesting and reforestation in the Virginia Hills fire and treats the backlog of reforestation in the Coniferous Timber Quota areas.

Graph 11: Total Herbicide Treatment – 1975 to 2004



The following is a summary of the current procedures used by Blue Ridge Lumber for its herbicide application program.

Goals and Objectives:

- To maintain conifer cover types on BRL’s FMA landbase for the benefit of the citizens of Alberta,
- To accomplish this task in a safe manner,
- To minimize the potential for off-site herbicide impact,
- To minimize the rate/ha of herbicide required and use the most appropriate herbicide to accomplish our silviculture objectives,
- To promote the creation of quality nesting and feeding habitat for cavity nesting bird species, and
- To promote the maintenance of diverse plant communities on harvested areas.

Properly timed tending with herbicide has the potential to maintain the conifer cover types that have been harvested on the BRL FMA area. Blue Ridge Lumber applies herbicide as early as operationally feasible following harvest in order to minimize disturbance of cutover sites.

Various safety procedures along with vital equipment such as bird-dog aircraft will be used to ensure that the herbicide application operations are accomplished in a safe and incident-free manner. The potential for off-site herbicide impact due to drift will be minimized mainly with the use of low-drift nozzle technology where appropriate.

Herbicide has long been a tool to manage populations of various vegetations for the benefit of wildlife. Quality nesting and feeding habitat for cavity nesting bird species is created on cutover sites as a result of aerial herbicide application activity.

Blue Ridge Lumber promotes the maintenance of diverse plant communities on harvested areas by the suppression of extremely aggressive site colonizers such as *Calamagrostis canadensis*, *Rubus idaeus* and *Populus tremuloides* among others.

The herbicide most commonly used by Blue Ridge Lumber is Vision® which is a modern, environmentally sound herbicide.

Planning

Prescriptions follow a multi-step process where refinements are made at each step, until finally the proposal is submitted. This includes:

- Area supervisors propose a list of cutblocks in the Annual Operating Plan (AOP) following pre-harvest layout and/or post harvest cutblock walk-through.
- Helicopter reconnaissance and “ground-truthing” facilitates the delineation of potential treatment areas within blocks on photos.
- Area supervisors are consulted regarding refined treatment plans
- The proposal is developed.

- Submission of the proposal.
- Final treatment areas are created on ortho-photos just prior to treatment to provide the most up-to-date information for pilots to use in their application.

After submittal of the original proposal, further planning is carried out using the ortho-photos and maps to group areas and plan fieldwork. Older blocks, in excess of one year from planting and not previously surveyed for stocking are checked as soon as possible in the spring. Concurrently, the project supervisor may walk and/or do an aerial survey of the proposed blocks.

In addition, summer staff verifies locations of open bodies of water as well as public land dispositions not previously identified. Following these surveys, compilation of survey data is done and additional photo interpretation and revisions to ortho-photo mapping of treatment areas is carried out. All maps are updated and ortho-photos are prepared with final treatment areas delineated.

Landscape Planning

Blue Ridge Lumber uses various aerial photographs, orthophotography and maps (of various scales) in the planning process. The intent is to ensure that the most up-to-date information is available to applicators and monitors prior to application of herbicide on a cutblock. Our 1:10,000 Herbicide Application Operations Maps represent state-of-the-art mapping and information technology in the forestry herbicide application industry. The accuracy of detail provided by these maps leads to more accurate calibration and application.

“Guidelines for Wildlife Protection and Maintenance of Biodiversity” in the February, 2004 Version of the *“Forest Management Herbicide Reference Manual”* states that the objective behind landscape planning is to “ensure that adequate amounts and patterns of all representative and unique vegetation/habitat types are maintained throughout the larger forest landscape over time.” Habitat diversity on a landscape level is increased by virtue of the fact that areas in a forest landscape are harvested. New habitats or microhabitats are created by this major disturbance that occurs across a given landscape over time. The harvest sequence across a forest unit as well as across a FMA, License or FMU area greatly impacts the timing of all silviculture treatments including herbicide use. Factors such as access, terrain, seedling availability, competitive nature of the vegetation within individual blocks, logistics, physiological nature of the crop tree seedlings, susceptibility of the competing vegetation to a particular herbicide, and completion and efficacy of a preceding year’s herbicide program, all affect the temporal and spatial distribution of block treatment across a landscape.

One of the most important factors affecting timing and distribution of cutblock treatment is the competitive nature of the vegetation within a block. Blocks containing highly competitive vegetation (especially those that have already been planted) must be treated as soon as possible in order to ensure that forests in the province are being regenerated successfully and to ensure sustainability.

The degree of completion of the previous year’s herbicide program has an effect on the amount of current work to be done in a forest unit. During years with low productivity (typically caused by excessive rainfall, lammas growth of conifer seedlings, or early leaf fall), untreated cutblocks will be carried forward to subsequent programs. However, this is not preferred, since the target is to treat an area as soon as possible during plantation establishment.

Treatment of concentrated areas is more economical. The cost of tending widely scattered blocks increases dramatically due to increased ferry times, the increased number of mix/load sites needed, and the ensuing reduction in productivity. Due to unstable weather patterns, the operational “window” for application of glyphosate herbicide in Alberta is limited.

Competing Vegetation

Herbicide treatment areas are assessed for competing vegetation in a variety of ways. Assessments include a walk-through by silviculture staff, analysis of color infrared photography and multi-spectral satellite images, aerial observations, and systematic stocking/competition surveys.

Vegetation complexes vary greatly between cutblocks across Blue Ridge Lumber’s quota and FMA operating areas, but there are a number of plant species that are considered primary competitors with the conifer species BRL attempts to regenerate on areas that it harvests. Canada blue joint grass, hairy wild rye, willow, alder, honeysuckle, raspberry, fireweed, labrador tea, trembling aspen, balsam poplar and white birch are vigorous competitors for scarce resources (nutrients, water, and light) essential for conifer seedling growth and survival. These are the major competing species, although our areas contain many others. Most of these competing species also cause mechanical damage to conifer stems by whipping in the wind or pressing under a snow load. Some of these competing species create an insulating layer that slows soil warming and therefore promotes frost events and slows growth of crop trees due to low plant metabolic rates.

Most plantations proposed for conifer release at least two years from their establishment have been or will be surveyed to determine crop tree characteristics, including stocking.

Public Involvement and Notification

Blue Ridge Lumber provides the public with the opportunity to review our proposal and offer input or communicate concerns at our annual woodlands open houses that are held annually in five locations. The locations are Swan Hills, Fox Creek, Fort Assiniboine, Niton Junction, and Whitecourt.

For the two weeks leading up to the open houses, advertisements inviting the public to attend open houses appear in the Whitecourt Star, Mayerthorpe Freelancer, Barrhead Leader, Swan Hills Grizzly and Fox Creek Times. In addition, all of the open houses are advertised on YR radio one to two days before they occur.

Local commercial (i.e. forest industry), stakeholders receive written invitations to attend. Any concerns received from stakeholders will be addressed and documented.

Blue Ridge Lumber will notify the public in the Whitecourt Star, Swan Hills Grizzly Gazette, Mayerthorpe Freelancer, and possibly the Fox Creek Times, a minimum of 72 hours before the start of the program. All private land holders and public land disposition holders (including oil and gas, pipeline, utility, forest industry, trappers, town municipal offices, local recreation users, etc.) that may be directly affected or whose activities are in or adjacent to the proposed treatment areas will receive phone, letter or facsimile notice of SRD approval of our program a minimum of 72 hours prior to the start of the project.

Wildlife and Biodiversity Considerations

Untreated Leave Strips

During the herbicide application operation in a treatment block, many unplanned areas that are not treated will fulfill the guideline for “untreated leave strips.” The size and shape of the cutblock, along with the distribution of the competing vegetation all affect the design and layout of the treatment. Often, to allow the pilot to fly straight and at a constant speed, block “edges” are straightened resulting in untreated indentations along the block perimeter. Reducing the number of turns increases operational safety and decreases the potential for drift. In addition, groups of dense standing deciduous and /or conifer residuals are typically untreated. Due to the “shadow effect”, treatment of areas with scattered residuals will typically create patches of vegetation that are not affected by the herbicide application. Finally, uncut roadside buffers, utility and pipeline rights-of-way and riparian areas will add to the amount of untreated area in each block.

Herbicide has long been a tool to manage populations of various vegetations for the benefit of wildlife. The maintenance of diverse plant communities on harvested areas is promoted by the suppression of extremely aggressive site colonizers such as *Calamagrostis canadensis*, *Rubus idaeus* and *Populus tremuloides* among others. The Herbicide Monitor Plots that have been established in treatment areas by BRL are providing valuable preliminary trend information. These plots are indicating that there is no significant difference in species richness between treated and untreated portions of the monitor plot three to four years after treatment. In fact, due to the control of aggressive colonizers such as *C. canadensis*, *P. tremuloides*, and *R. idaeus*, growing space is being made available to other herb, shrub and moss species.

Blue Ridge Lumber uses low-drift nozzle types that increase the amount of unplanned “untreated areas” due to the lower degree of overlap (fewer “fines” are created by low-drift nozzles) between the resulting swaths. Blue Ridge Lumber believes that the amount of untreated area in planned buffers on open bodies of water, residual areas, roadside buffers, pipeline screens, pipeline areas, understorey protection and unintentional missed areas will serve as sufficient “untreated areas” on a block level for short term (1- to 4-year) wildlife concerns. In the longer term, successful, vigorous reforestation to the conifer cover types that were initially harvested will produce habitat that will meet typical forest wildlife needs. Therefore, additional planned “no-treatment” areas are not incorporated into the operational design. Encouraging the vigorous growth of conifers with herbicide treatment within the first two or three years of harvest will provide prompt development of year-round cover for a wide variety of wildlife (i.e. moose, deer, elk, birds, rodents, etc.) as opposed to the limited summer cover provided by deciduous species.

Snags and Other Trees Protected for Wildlife

Herbicide application increases the amount of snag habitat when single residual deciduous trees or residual deciduous trees within a partial cut are treated. The outcome of this activity is that many deciduous stems are killed leading to immediate (i.e. short-term) recruitment as snags, some are partially damaged (i.e. top mortality and/or half of the crown defoliated) and provide mid-term recruitment as snags, and some are either not controlled by the herbicide at all or are missed (and are thereby available for long-term snag recruitment) due to the inter-swath distance at a 30 m height between successive swaths during aerial application. Not treating over-top of living residuals in the cutblock will only produce a condition that typically does not occur naturally (or occurs very sparingly), and will only produce snags in the cutblock as the residual un-sprayed trees reach their maximum age.

Standing living residual trees will remain untreated if in the tending forester’s opinion they are “clumped” enough to reduce the effectiveness of herbicide treatment. Scattered individual residuals will be treated with the remainder of the cutblock. This practice will result in varying amounts of living and dead standing deciduous residuals. The applicator may at times be instructed to feather the swath into the vegetation under the canopy of clumped residuals from which conifer had been harvested. This will be done where there are conifers in need of release and also for the purpose of herbicide site preparation. This approach, as used in the past (i.e. Judy Creek 140, Block 32), generally results in the creation of high-quality snag habitat in the short-term, as well as leaving living residuals for long-term snag recruitment.

Riparian Management Zones and Watercourse Protection

The “Guidelines for Riparian Management Zones and Watercourse Protection Buffers” in the February, 2004 Version of the “*Forest Management Herbicide Reference Manual*” objective is “to ensure that any use of herbicides to manage vegetation in riparian zones reflects the fact that priority resource values and objectives are usually related to non-fiber values such as water, fish, wildlife and recreation.” The term “open body of water” is clearly defined in the Pesticide Sales, Handling, Use and Application Regulation (AR 24/97) and in the Environmental Code of Practice for Pesticides. An “open body of water” is defined in the regulation as:

- The “bed and shore” of an irrigation canal, drainage canal, reservoir, including lakes, streams, rivers, creeks, marshes, or other body of water but does not include the following:
 - Waterworks systems, reservoirs, lakes, marshes or other bodies of water that are completely surrounded by private land, that have an area of less than 4 hectares and have no outflow of water beyond the private land,
 - Reservoirs, lakes, marshes or other bodies of water that are located on public land, that have an area of less than 0.4 hectares, and have no outflow of water,
 - Irrigation and drainage canals that are completely surrounded by private land and have no outflow beyond the private land,
 - Roadside ditches,
 - Wastewater systems

- Storm drainage systems, or
- Dry streams having a bed and shore averaging 0.5 meters or less in width within the boundaries of the treatment area; Where, a “bed and shore” means land that is or has been covered by water to the extent that:
 - No vegetation grows on the land,
 - The vegetation that grows on the land is aquatic vegetation that must be partially submerged in water for part of its life cycle to survive.

Blue Ridge Lumber procedures will adhere to this regulation.

Open Bodies of Water (Watercourses and Water Bodies)

According to the Environmental Code of Practice for Pesticides, a registered applicator in Alberta can apply glyphosate by air within 30 horizontal meters of an “open body of water” in a manner that does not create observable impact on vegetation within 5 meters of the “open body of water.” In addition, application of glyphosate is permitted in dry (at time of application) streambeds having a “bed and shore” averaging 0.5 meters or less in width within the boundaries of the treatment area.

Permanent streams have a minimum of 30 meters of standing timber or brush buffer remaining after harvesting that will remain untreated. For dry intermittent streams averaging more than 0.5 m in width within the boundaries of the treatment area and flowing intermittent streams, the amount left untreated will vary from block to block depending on their orientation and the reforestation objective. However, the 5 meter no observable impact zone adjacent to the open body of water will be maintained. Non-target vegetation bordering dry intermittent streams averaging less than 0.5 meters in width within the boundaries of the treatment area may be left untreated where practical. The applicators may be instructed to boom-off or fly parallel to dry intermittent streams, feathering the swath into the alder or other brush if present. Ephemeral and intermittent streams having a “bed and shore” averaging 0.5 meters or less in width within the boundaries of the treatment area that are flowing (at the time of application) are treated as “open bodies of water”.

Treatment Timing

The timing of herbicide site preparation and conifer release treatments during a given year depends on a variety of factors such as the development of competing vegetation, physiological state of crop trees, physiological state of competition, seedling scheduling, and logistics. Generally, herbicide site preparation will occur between July 16 and July 31. Some additional herbicide site preparation may occur during the August 22 to September 21 conifer release treatment window.

Blue Ridge Lumber intends to treat plantations that require vegetation control as early after harvest as is silviculturally prudent. This approach will parallel the guideline in the FMHRM of applying herbicide within the first year or two after harvest to minimize impacts to open habitat, ground- and shrub- nesting birds.

Pre-Work Start-up of Operations

Before start-up of herbicide application operations a pre-work briefing is carried out for all Company and contract personnel involved. This briefing includes:

- an overview of the entire program
- safety procedures
- communications
- logistics
- personnel structure for both the Company and the applicator
- daily operating procedures

A herbicide program operating procedures training session for Company personnel takes place either before or after the contractor pre-briefing. Seasonal and permanent Blue Ridge Lumber employees involved in herbicide programs in Alberta receive a one-day training session that will discuss topics such as glyphosate toxicity, effect on vegetation, crop tree response, risk management and public/media relations.

Mixing and Loading Sites

Blue Ridge Lumber attempts to locate all of its required mix and load sites on its own dispositions. However, where BRL needs to make use of another disposition holder's site, BRL obtains approval (either verbal or written) from them.

Off-Target Quality Control

The goal of our risk management plan is to minimize the potential for off-target herbicide impact. Application technologies, equipment and procedures appropriate to treatment area conditions and silviculture objectives are utilized to achieve effective on-target application of the herbicide.

Nozzle Application Technology

Application technologies include low-drift Accu-Flo™ radial nozzles with orifices of .016, .020, .028, and .047 inches, and conventional CP nozzles. Dependent on block characteristics (i.e. snags, shape, open bodies of water, adjacent stands) and weather parameters (i.e. wind speed, relative humidity, temperature), these nozzles can be interchanged to achieve effective vegetation control with very low risk of off-target impact.

Rates

For the conifer release program Vision® herbicide (PCP# 19899) is applied at a rate of between 5 and 6 liters per hectare dependent on vegetation conditions. Based on past experience and trials, species such as balsam poplar, certain grasses (i.e. *C. canadensis*), sedges, willow, raspberry, Labrador tea, fireweed, birch, rose, currants, and honeysuckle, require maximum rates for effective control.

The rates of Vision® herbicide used in the herbicide site preparation program will vary between 5 and 12 liters per hectare dependent on the species and amount of competing vegetation. The

surfactant (assists herbicide translocation into the plant) Sylgard 309® (PCP# 23078) may be mixed at label rates (between 0.25 % and 0.375 % of mix volume (250 ml in 100 liters of mix)) with reduced rates of Vision® on blocks scheduled for herbicide site preparation. This additional surfactant accelerates the uptake of the Vision® by the plant thereby reducing the rain-free period necessary to ensure control from between 2 to 4 hours to about 15 to 45 minutes. Previous to 1999, BRL used between 6 and 12 liters per hectare of Vision® for site preparation. Our 1999 and 2000 herbicide site preparation program almost exclusively used 5 to 6 liters per hectare of Vision® with Sylgard. The results of these programs were as or more successful than using the higher rates of Vision® thereby meeting our goal of using the minimum amount of herbicide to achieve our silviculture objectives on our herbicide site preparation areas. For example, if 9 L/ha of Vision® had been used for site preparation in 1999 without Sylgard, an additional 15,000 liters of herbicide would have been used. As well, if 9 liters/ha of Vision® had been used for site preparation in 2000, an additional 9000 liters of herbicide would have been used.

Vision® herbicide may be mixed with label rates of carrier (between 20 to 100 liters of clean water per hectare) as a broadcast spray. As vegetation density increases the application volume may also increase, within the recommended range, in order to ensure uniform coverage and adequate penetration through the vegetation canopy. Blue Ridge Lumber will use between 35 and 50 liters of total mix solution unless conditions warrant otherwise.

Manual Tending

Blue Ridge Lumber has one of the largest manual tending programs in the Province of Alberta. BRL will be continuing a large program of manual spacing and cleaning with brush saws on approximately 2,500 ha of pre-1991 plantations.



Manual Tended Cutblock

Eventually, BRL’s manual-tending program will shift from these backlog areas to post-1991 cutblocks where in many cases a second aerial herbicide treatment is not a logical option due to high conifer densities (the result of a timely herbicide treatment) in association with higher deciduous tree and shrub densities (ingress following herbicide treatment).

Instead, on some of these sites a brush-saw herbicide applicator may be used that applies approximately one-fifth to one-third the amount of Vision as aerial application (on a rate per hectare basis) to individual competing stems.

Although manual tending is very important to meeting our vegetation management objectives, it does have limitations. The silviculture effectiveness and cost efficacy of manual methods is severely limited by the high re-suckering potential of competing tree, shrub, and grass species. Competition control is most critical for the success of conifer seedlings during the first 3 years following planting or natural seed germination. In older regeneration areas the large size of the competing trees and shrubs makes the cost of tending with brush saws both unproductive and unacceptably expensive.

5.2.9 Spacing and Cleaning

Lodgepole pine often regenerates abundantly following fire or harvesting. This results in over stocked dense stands that have a high harvesting cost due to small tree size and poor wood quality.

Properly managed by spacing and cleaning, pine stands can yield significant increases in merchantable sawlog volume. Spacing does not increase gross volume, but does significantly increase merchantable volume per tree. When a stand is spaced and cleaned at an early age, the volume that would normally be lost through natural mortality and unmerchantable trees is concentrated on the



remaining trees resulting in a greater merchantable volume. The amount of increase in merchantable volume is dependent on site quality. A wide range of yields can occur with increases greatest on the best sites. A review of research literature reveals that merchantable sawlog volume can be increased by 40 - 70 % by spacing and cleaning.

Overstocked pine stands should be thinned at approximately 10 - 15 years of age because:

- Stands have not deteriorated as a result of stagnation
- Sufficient time will have passed for them to express dominance

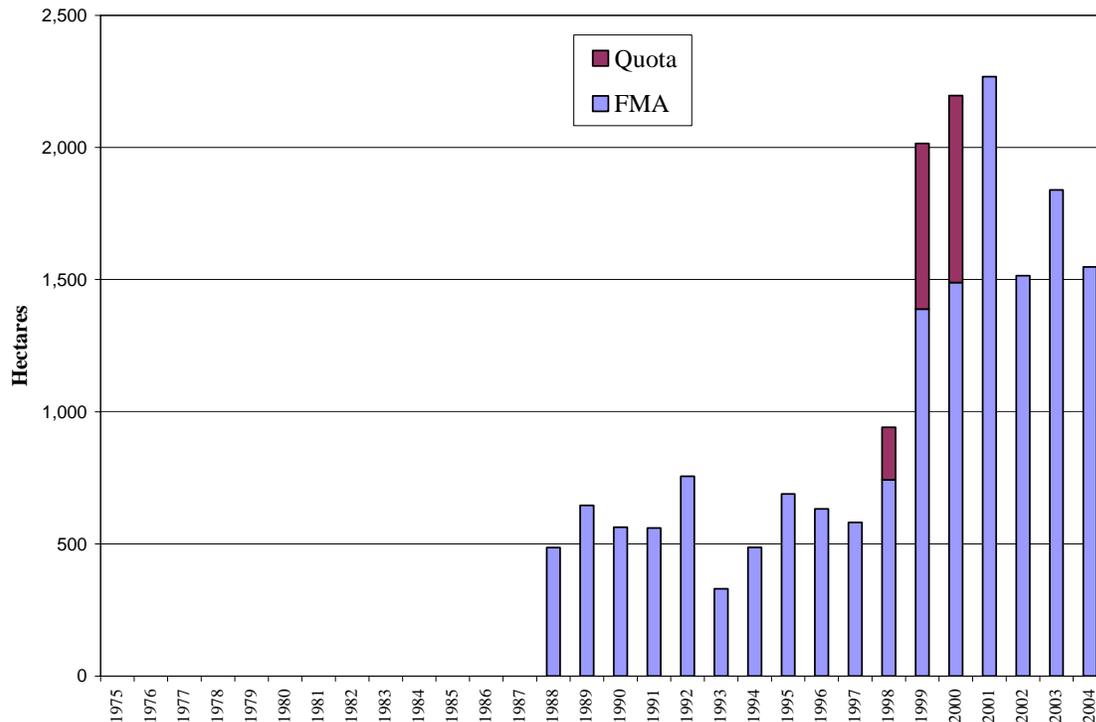
- The threat of disease and damaging agents such as rabbits and root rot will be apparent and these trees can be removed in the spacing program.

The number of trees per hectare after thinning has an important effect on merchantable volume and tree size. The evidence available to date suggests that densities of 1,800 to 2,200 stems per hectare of 10 - 15 year old lodgepole pine will minimize mortality and maximize diameter growth.

Blue Ridge Lumber commenced a spacing and cleaning program in 1988, averaging approximately 600 hectares per year. In 1999 and 2000 the spacing and cleaning program increased to well over 2,000 hectares per year. In the 1995 to 2004 period a total of 14,225 hectares were manually spaced and thinned on the better growing pine sites. Over the next several years the spacing and cleaning program is expected to be maintained at approximately 2,000 hectares per year.

The following graph highlights the Blue Ridge Lumber manual spacing and cleaning from 1975 to 2004.

Graph 12: Total Manual Space & Clean – 1975 to 2004



5.2.10 Regeneration Standards and Monitoring

Blue Ridge Lumber is responsible for reforesting all areas harvested by the Company to Provincial stocking standards. The Company conducts regeneration surveys on all cutovers and submits them to the Alberta Sustainable Resource Development to prove that regeneration standards are being met. Cutblocks that are below stocking standards are immediately scheduled for re-treatment and re-surveying two or three years later. Regeneration surveys submitted by the Company are checked by the Alberta Sustainable Resource Development. Blue Ridge Lumber has supported the Provincial **“Regeneration Survey Certification Program”** and has ensured that Company staff, summer students, and regeneration survey contractors are properly trained and certified.

Since 1975 there has been a steady improvement in Provincial Regeneration Stocking Standards, with three different regeneration surveys conducted under authority of the Timber Management Regulations as summarized below:

- May 1, 1966 to April 1979
- May 1, 1979 to February 28, 1991
- March 1, 1991 to May 1, 2000

The Provincial 2000 Reforestation Standard received some changes as a result of concerns raised by the Forest Industry and recommendations made by the Alberta Reforestation Standards Science Council. The new Alberta Regeneration Survey Manual comes into effect May 1, 2003. The new standards will allow for a better definition of free to grow in regard to the measurement of deciduous species around conifer trees. The new manual is posted on the department website at: <http://www3.gov.ab.ca/srd/forests/fmd/manuals/index.html>.

In addition to the legal Provincial regeneration surveys requirements, Blue Ridge Lumber is also conducting separate stocking and competition assessment surveys to monitor and improve reforestation success.

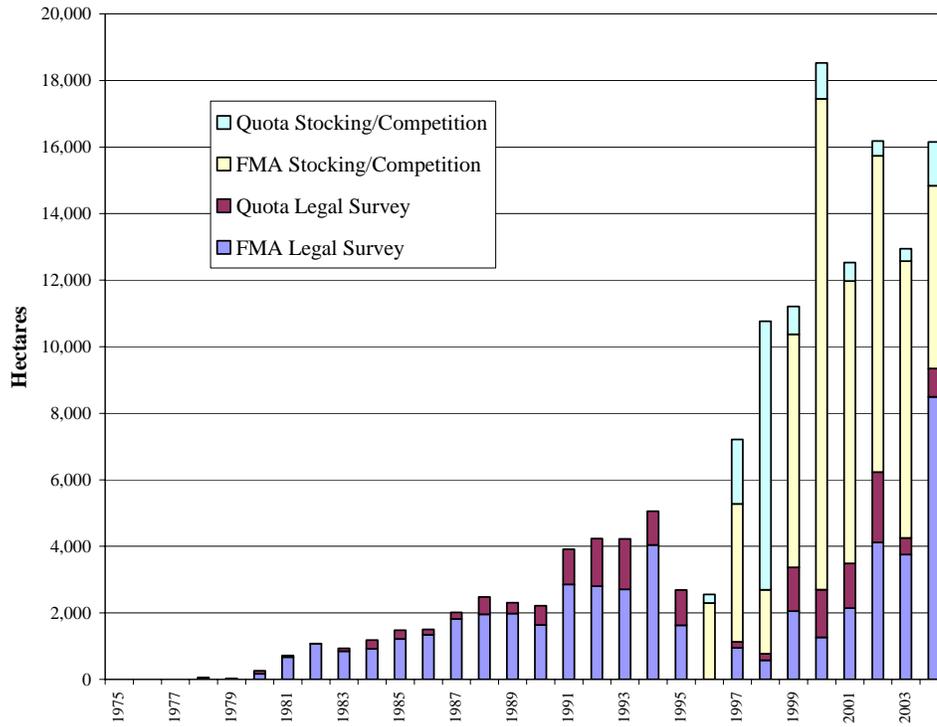
Blue Ridge Lumber has been a leader in improving silviculture success in the Province. In 1995 the Company completed the majority of regeneration surveys that applied to the pre-1991 harvested areas. In the same year a system of in-house stocking surveys was developed and tested to monitor the early success of the blocks reforested under the new 1991 reforestation standards. The system was refined and fully implemented in 1996 and has continued to be a critical link in our silviculture program. To date 79,000 hectares have been assessed and reviewed. Areas that required further treatments, such a fill planting and tending have been acted upon.

In 1998 the Company began establishment surveys on the post 1991 blocks. To date approximately 88 % (20,400 ha) have been assessed satisfactorily restocked (SR) areas. The remaining 12 % (3,170 ha) have all been fill planted or retreated and we anticipate these to be SR after the next survey. Performance surveys were started in 2002 with 68 blocks being assessed to date. Thirty three of these blocks have met the current performance standards. It is anticipated that the majority of the remaining blocks will pass FMA specific standards currently being developed.

Approximately 162,102 hectares of stocking competition and regeneration surveys have been completed from 1995 to 2004.

The following graph highlights the Blue Ridge Lumber regeneration surveys from 1975 to 2004.

Graph 13: Total Silviculture Ground Surveys – 1975 to 2004



5.2.11 Silviculture Records Management

Blue Ridge Lumber’s strategy is to use balsam fir and alpine fir as an acceptable regeneration species in all cutblocks on the FMA and Quota areas where it naturally occurs. The Company will continue to minimize or prevent a significant increase in fir on the landscape as it is not the preferred species for forest products, and is a high-risk fire prone species. Fir is also maintained in areas where the retention of existing fir stocking is required to achieve other non-fiber resource management objectives such as aesthetics, watershed and wildlife protection.

As a component of this strategy balsam fir and alpine fir has been utilized in our manufacturing facilities since 1975. To date approximately 5% of our harvested and processed volume is fir. Our regeneration surveys indicate an average of approximately 2% fir as crop trees.

Both the 1990 DFMP and this DFMP include balsam fir in the timber supply analysis. This DFMP places all regenerated cutblocks on natural yield curves. This is consistent with the Directive No. 2001-01 policy conditions 1 and 3.

5.2.12 Silviculture Records Management

Blue Ridge Lumber has maintained a silviculture record management system since operations commenced in 1975. The Company has provided annually all of the silviculture records information to Alberta Sustainable Resource Development with the submission of the Annual Silviculture Plan. This enabled Alberta Sustainable Resource Development to maintain their Table I and Table II reforestation status reports. The silviculture records were periodically audited to ensure accuracy between the Company records and the Alberta Sustainable Resource Development records.

In the Annual Operating Plan, Blue Ridge Lumber submits an “*Annual Silviculture Report*” detailing the silviculture work that is completed annually on the FMA and Quota areas.

In 1996, Blue Ridge Lumber purchased a copy of the *Provincial Silviculture Records Management System (SRMS)*, and assisted the Whitecourt Alberta Sustainable Resource Development in bringing this computer record system up to date. Blue Ridge Lumber maintained this silviculture record management system, and provided an updated digital copy of all silviculture records to the Alberta Sustainable Resource Development.

In 1999 the SRMS system was replaced with the *Harvest Planning Silviculture Information System (HPSIS)* system, which was available from Timberline Forestry Consultants Ltd. The advantage of the HPSIS system was the ability to link harvesting and silviculture records spatially to Geographic Information System. This assisted site specific planning and tracking of silviculture treatments.

The HPSIS data is uploaded to the *Alberta Reforestation Information System (ARIS)* database on a regular basis. Blue Ridge Lumber updated all of our silviculture and harvesting records and submitted these to the Province on May 15, 2003 based on the new Provincial record system. Following an SRD audit of our Company records in August 2003, Blue Ridge Lumber submitted minor corrections in January 2004.

5.2.13 Genetic Tree Improvement

Blue Ridge Lumber has been participating with Alberta Sustainable Resource Development and other companies in the development of a “Cooperative Genetic Tree Improvement Program” for lodgepole pine and white spruce since 1977.

Costs and work sharing agreements have been developed among the participants for various activities. Alberta Sustainable Resource Development has provided the technical and scientific support and the forest industry cooperators have carried out the fieldwork and the management responsibility for the seed orchard.

Blue Ridge Lumber is a cooperator in Tree Breeding Region C for Lodgepole pine and Region D for White spruce. In the late 1970’s the Company selected 224 open pollinated seedlots from phenotypically superior lodgepole pine throughout the breeding region, and 8 bulk seedlots collected from adjacent stands. Four progeny test plantations have been established within the FMA area to evaluate the genetic performance of the half-sib families. The lodgepole pine progeny plantations were established in 1982. All four pine progeny sites have been re-measured at year 22 from planting.

A seed orchard site for Region C and D has been developed in the Blue Ridge area. The seed orchard is located 20 kilometers east of Blue Ridge and 12 kilometers north of Mayerthorpe in NW 1/4 of section 17, Township 59 Range 8 West 5th Meridian. The seed orchard was planted in 1994 with approximately 3,400 lodgepole pine and 600 grafted white spruce seedlings. The area has been seeded with a cover crop to prevent compaction, and the site is protected with a chain link fence. Rows of hybrid poplar have been planted along the fence as a windbreak. An internal road system and a dugout and irrigation system were constructed in 1995. Electrical power was also added in 1995. Internal roads were upgraded in 1996 along with a storage building and workshop. An additional 100 white spruce grafted trees were planted in 1998 and 1999. White spruce planting was completed in 2000 with the planting of approximately 30 additional trees. This planting increased the white spruce to approximately 800 grafted trees.

The seed orchard is expected to produce approximately 600,000 genetically improved lodgepole pine and 1,800,000 white spruce seedlings by the year 2006. Planting genetically improved seedlings is expected to raise volume growth by 10% from seed produced in the first cycle of selection and breeding. A further gain of 10% in volume growth is expected in the year 2016 from seed produced through the second rouging of the first cycle of selection and breeding.

BRL has continued to develop and manage the seed orchards and have completed re-measurement of the four pine progeny sites. A significant crop was harvested from each orchard in 2003. Currently we are in the process of meeting the requirements for registration of these seedlots for use on the Blue Ridge Lumber FMA area. We have also agreed to develop a “Controlled Parentage Program Plan” for each of the programs.

A Forest Genetics Standards document has been developed by a number of committees including representatives from the forest industry, the Forest Management Branch and forest genetics. The document is titled “*Standards for Tree Improvement in Alberta*” and it was released July, 2005. Blue Ridge Lumber is currently reviewing its Tree Improvement Programs to ensure compliance with the new policy.

The document can be found on the Alberta Sustainable Resource Development website at <http://www3.gov.ab.ca/srd/> and follow the links to Forest Management Manuals and Guidelines. The standards are focused on the activities of tree seed and vegetative material collection, registration, and processing and the reforestation of tree seedlings on public forestland.

5.2.14 Forest Resource Improvement Program

The Forest Resource Improvement Program (FRIP) was developed in 1995 with a mandate to enhance the forest resources of Alberta. As a committed member of the program, Blue Ridge Lumber has completed a number of projects that aim to improve the forest and forest activities within our FMA area and Quota Licenses.

The Forest Resource Improvement Program provides a means to initiate projects that may not be completed otherwise. Contributions to the FRIP fund have been through a portion of crown dues royalties paid to harvest conifer timber for the manufacture of softwood lumber. Funding can not be used for projects that are legal requirements of the Company. Funding is available for projects that meet the guidelines of FRIP as outlined by the Forest Resource Improvement Association of Alberta (FRIAA). The Company submits written proposals that must be approved by the Forest Improvement Association of Alberta before work can commence. The program has a rigid audit procedure.

Through the FRIP program the Company has carried out reconnaissance of various forest resources. The program has allowed the Company to carry out significant manual tending stand improvement projects.

Please refer to Appendix 5 for a list of Blue Ridge Lumber FRIP projects.

5.2.15 The BRL Growth and Yield Program

Blue Ridge Lumber is to establish a growth and yield program in accordance with Paragraph 27 (1) (2) and (3) of the FMA. Blue Ridge Lumber submitted a growth and yield program to SRD and received approval of this program on July 15, 2003. The overall goal of the BRL growth and yield program is to provide for the long term monitoring of forest growth projections and sustainability. The basic layout and data collection of the growth and yield program is similar to other companies (ANC, MWFP and SLPC) which will allow data to be shared between companies.

The BRL growth and yield program is divided into data collection from permanent sample plots of fire origin and pre and post harvest cutblocks (managed stands.) The initial selection of permanent sample plots for developing and improving growth projections are based on a grid pattern of 778 m² or 1 plot per 60 hectares. The grid was intersected with the 1993 AVI forest cover to obtain the yield strata for each grid point and with the HPSIS (Harvest Planning and Silviculture System) to obtain harvest and silviculture information. Every fifth grid point falling within the net land base will be established for a total of 338 plots. Plots for the pre-harvest plots are randomly selected from areas to be harvested in the upcoming year of operations. As data is collected and reviewed, additional plots will be established as required.

In general each plot consists of a tree canopy plot measuring 11.28 meters in radius, four regeneration/vegetation plots measuring 1.78 meters in radius and one soil plot.

Blue Ridge Lumber plans to establish approximately 35 fire origin plots, 25 post harvest plots and 20 pre-harvest plots each year for the next 5 years. A review of this schedule will be done in the 5th year and revised if required.

Table 13: Actual Number of Growth & Yield Plots Established

	Fire Origin Plots	Post Harvest Plots	Pre-harvest Plots	Total
2002*	31	13	24	68
2003	25	70	29	124
2004	41	52	25	118
2005**	35	25	26	86
Total	132	160	104	396

*Program Commenced

** Planned

BRL is a member of the Foothills Growth and Yield Association. This Association is a cooperative growth and yield program involved in the assessment of growth and yield of lodgepole pine in managed stands. Members include ANC, Blue Ridge Lumber Inc., Canfor, Millar Western Forest Products Ltd., Sundre Forest Products Inc., Weyerhaeuser, Hinton Wood Products, U of A, and CFS. This cooperative program will supplement the Blue Ridge Lumber growth and yield program.

BRL was a participant in the CFS/Foothills Model Forest Chronological Sequence Growth and Yield Study. This study describes the seral plant communities and their productivity on second growth forest stands (managed stands) in west central Alberta and this study will be used to develop a field guide of seral ecosites.

5.2.16 Enhanced Forest Management Opportunities

Blue Ridge Lumber has been a leader in the implementation of enhanced forest management. However the Company has not included the gain in annual allowable cut for enhanced forest management activities in this DFMP. It is the intention of the Company to work closely with SRD staff in upcoming years to gain defensible AAC credit for past and future enhanced forest management efforts. The Company is installing and re-measuring growth and yield plots that will be necessary in order to support increases in AAC. The Company is also working on an alternative reforestation standard which will help to provide a link between reforestation programs and TSA assumptions.

This section documents some of the enhanced forest management programs that are already operational, and also forecasts future programs. These enhanced forest management programs help to offset the timber supply impacts of expanding oil and gas exploration and the 1998 Virginia Hills Fire. Most of the programs focus on treatments that shorten rotation ages.

The Company works pro-actively with energy companies in order to minimize oil and gas impact on the productive timber landbase. With ongoing significant oil and gas landbase withdrawals, it is a high priority to continue to divert oil and gas companies (wherever reasonable) away from young productive stands and into areas of older or unproductive timber.

As described earlier in Section 5.2.9 manual spacing and cleaning has a dramatic effect on diameter development of crop trees, resulting in increased net merchantable volumes at younger ages. This allows for final felling at significantly decreased rotation ages. It is also worth noting that density management of lodgepole pine has been shown to decrease susceptibility to mountain pine beetle and is thought to decrease forest fire susceptibility. In the past 10 years the manual tending program has averaged approximately 1,500 hectares annually. This is projected to increase over the next few years to 3,000 hectares per year by 2007. This increase is primarily due to the cutblocks associated with the 1998 Virginia Hills Fire, which will soon be an appropriate size and age for density management.

There are many burns (i.e. Windfall Burn, Imperial Tower Burn, etc.) in the Whitecourt area where densities were not managed, and the opportunity for silvicultural response has been lost because the pine is now too old to respond to release. SRD silvicultural personnel recognized the opportunity in the 1972 Swan Hills Burn. They carried out some work with the use of a cable strung between two dozers. This cabling was carried out in order to bring down the

standing residuals, allowing for future manual tending. Unfortunately many of these areas were not subsequently manually tended due to funding limitations. Similarly, there is an opportunity for stand improvement in unsalvaged portions of the Virginia Hills burn. These stands were not salvaged, primarily because they were younger stands with smaller timber. In many areas these unsalvaged stands have 50,000 stems per hectare of lodgepole pine regeneration, making them prime candidates for density management. It is estimated that there are 10,000 hectares that would be appropriate for treatment. In order to manually space these stands it may be necessary to knock the standing residuals to the ground. The Company is currently carrying out various trials to determine the optimum method of managing the densities of these stands. Some of the trials include

- walking the timber to the ground with a large skidder and,
- carrying out early manual tending (before significant blowdown) under the standing residuals.

The Company plans to carry out basal spraying. Basal spraying will be carried out in older plantations where conifer (primarily white spruce) has significant response potential, but the stocking is low enough that aerial spraying is not appropriate. Approximately 2,000 hectares have already been identified for this treatment.

As described in Section 5.2.2 the Company is carrying out strategies for successful reforestation. In order to improve upon the timber supply situation, it is important that cutblocks are reforested with timber supply objectives in mind. Reforestation treatments are constantly refined in order to improve upon stocking and growth. The Company is currently investigating technological changes for improving early plantation performance. Some of these initiatives include:

- Facilitating and supporting research aimed at gaining approval for a limited use label for Imanzapr herbicide. The use of this herbicide will greatly enhance the effectiveness of site preparation treatments, as it is far more effective than glyphosate, particularly for control of grasses.
- Improving processes and technology of planting container stock to ensure optimum root development after planting.

In upcoming years the Company intends to work with SRD in proposing appropriate areas for buffer management. Historically, policies of fire suppression and no harvesting have limited the amount of disturbance in riparian areas. Buffer management plans will propose special management of buffers, with the goal of preserving ecological function while introducing disturbance. This will allow, where appropriate, a careful introduction of a more natural range of seral stages in riparian zones.

There are some opportunities for commercial thinning within the FMA area. The largest potential exists in decadent AB density conifer stands with significant advanced regeneration of white spruce and balsam fir. Rather than clearcutting, commercial thinning may be used in these stands in order to salvage the decadent conifer while also thinning the remaining advanced

regeneration, thereby shortening the rotation age. The Company has carried out a few commercial thinning trials, and continues to investigate opportunities for the future.

As described in Sections 5.20 and 5.21, understory protection is also a component of the Company's strategy to improve upon the timber supply situation. Young and thrifty stands of white spruce are protected from harvest, shortening the time to the next rotation.

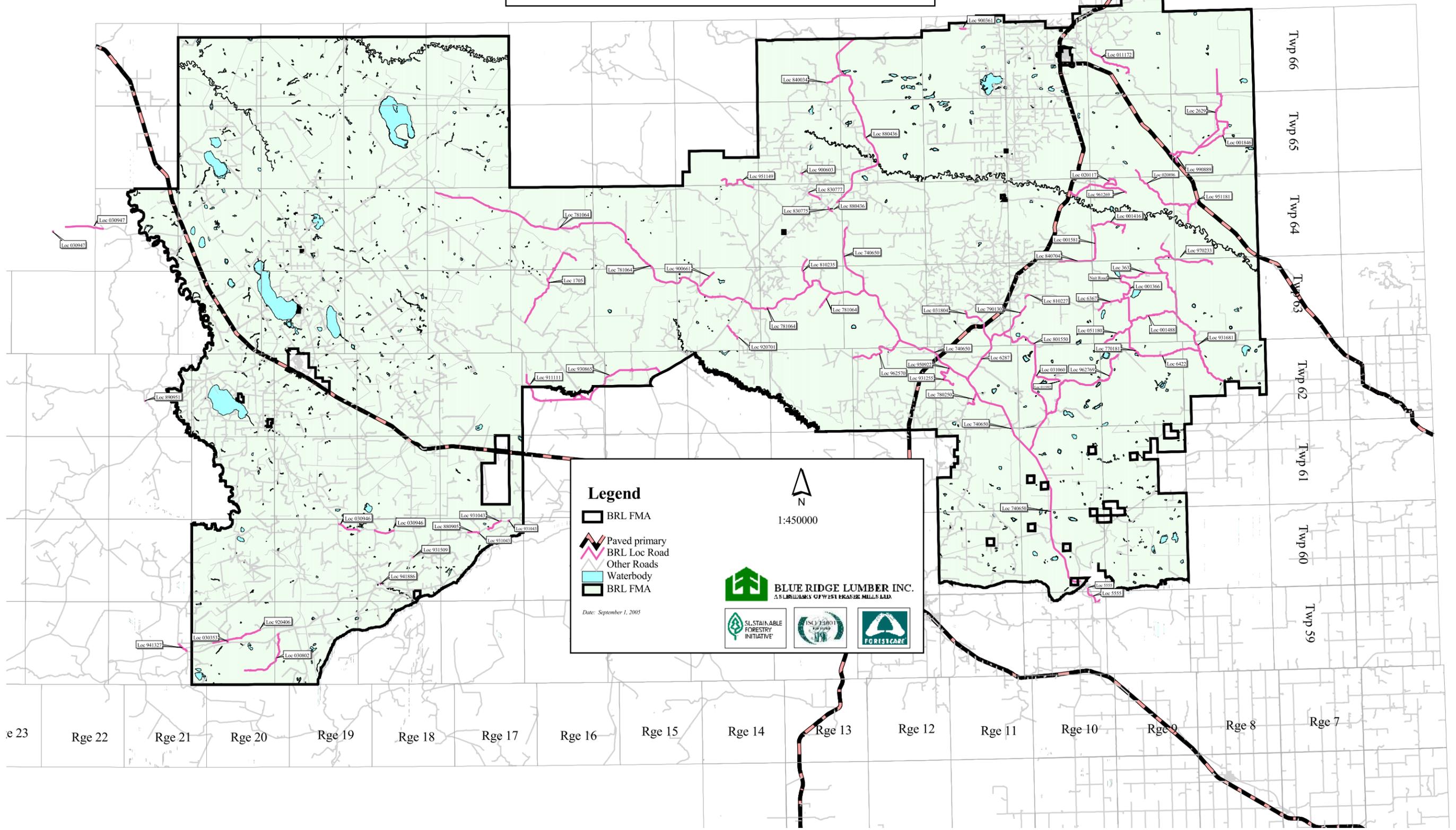
5.3 Roads, Watercourse Crossings and Access Management

5.3.1 The BRL Road System

The FMA area has an excellent road and transportation system, which was built primarily to service the oil and gas industry. Blue Ridge Lumber road construction is carefully planned to take advantage of existing road systems wherever possible. The Company has road use agreements with these commercial users. In the past, Blue Ridge Lumber used the energy industry roads and they used our roads, generally free of charge, but recently the trend has been towards charging for the use of roads. Numerous pipeline crossing and road use agreements are in place to access and remove timber. The Company’s road system is used extensively and free of charge by the general public for recreational purposes especially for hunting, fishing, and camping.

To access the forest resource north of the Athabasca River a bridge was constructed in 1975-76 to link the FMA area with the millsite. The bridge replaced the “old ferry.” The 800-foot, 100-ton capacity bridge across the Athabasca River was built under a joint use agreement between the Company and Alberta Transportation and Utilities, and the Municipal District of Woodlands. The Company contributed towards the cost of upgrading the bridge design for wider loads up to 91,000 kilograms. Blue Ridge Lumber has an agreement with the Province, which allows the Company to haul over dimension and over weight loads across the Athabasca River. This agreement was renewed in 1996 between Blue Ridge Lumber, Transportation and Utilities, and the Municipal District of Woodlands.

BLUE RIDGE LUMBER INC.
FOREST MANAGEMENT AGREEMENT AREA
FMA ROAD ACCESS



Legend

- BRL FMA
- Paved primary BRL Loc Road
- Other Roads
- Waterbody
- BRL FMA

Date: September 1, 2005



1:450000

BLUE RIDGE LUMBER INC.
A SUSTAINABLE FORESTRY INITIATIVE

AS A MEMBER OF WEST FRANKS MILLS LTD.





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5.3.2 Road Planning

Road requirements are identified for the next 5 years in the annual operating plan. During this planning process, other commercial stakeholders are consulted.

The annual operating plan includes the five-year development schedule that provides information on the projected harvest and road building requirement for the upcoming 5-year period in accordance with the Operating Ground Rules.

The BRL FMA area has tremendous oil and gas road development that is used by BRL wherever possible. The Company does not have any significant class III road developments in the next 20 years as shown in the spatial harvest sequence and road corridor development plan that is included in the Timber Supply Document.

5.3.3 Road Safety

Blue Ridge Lumber is very active in providing safety information on their roads. An example of road signage and safety information includes kilometer, speed and caution for active logging, log haul in progress, log trucks entering/turning, one way, light traffic and overhead powerline. The Company has annual radio announcements to make the public more aware of road safety when the log haul is in progress. Pull out areas have been constructed on narrow roads to allow empty traffic to pull over and give the right-of-way to the loaded traffic.

The AFPA ForestCare Program focuses on log hauling under the Alberta legal summer loads and winter weights program in a manner that protects both the safety of the public and Company contractor employees. This program ensures the compliance with all the government standards, public information on the log haul schedules, log haul monitoring, training of drivers, implementation of hazard controls, compliance with weights program and the mechanical check inspections of the log haul fleet.

BRL attempts to maintain a safe network of road by:

- Planning a safe design to minimize the need for sharp corners and steep hills.
- When a new road is being constructed BRL contacts the users sharing the road to discuss safety issues.
- Signs are placed to notify users of potential danger areas.
- Logging trucks use two-way radio system to communicate their locations with each other as well as locations of others using the road that may not have a radio.
- Road maintenance equipment diligently maintains sanding, grading and dust control watering on actively used roads.
- BRL monitors posted speed limits.
- Road use agreements and proactive communication and cooperation with all other commercial road users.

5.3.4 Construction, Maintenance & Reclamation - Roads & Watercourse Crossings

To assist the Company in meeting compliant standards and to ensure that the operations have a minimal impact on the environment, all road construction, maintenance and reclamation activities comply with an ISO 14001 Environmental Management System. This system ensures that the procedures are properly followed by implementing a training session, pre-work and final inspections program for all work programs. If any non-conformances/complaint issues are noted during these inspections, additional work may be required to ensure that the proper standards are achieved. In these situations, remedy work would be carried out to insure that environmental impacts are minimized. All three activities, construction, maintenance and reclamation have separate controls for each activity.

ISO construction controls include watercourse identification & classification, field procedures and watercourse installation field procedures. These procedures ensure that the proper watercourse structures match the stream classification and that watercourse crossings are installed properly.

In most situations, cutblock road corridors are pre-logged and roads are constructed in advance of harvesting to reduce construction costs and to improve access so crews can be easily reached in case of an emergency or to service and repair logging equipment. The equipment used for most road construction is a heavy ripping cat and a finishing cat. Medium sized excavators are sometimes used to perform more specialized construction activities. Pre-logging of road corridors allows for maximum drying of the road surface in summer operating areas, which greatly improves operations.

To properly manage the Company’s roads and watercourse crossings, “*a road and watercourse monitoring program*” has been implemented and coupled to the BRL ISO 14001 Environmental Management System. This monitoring program assists with the planning and road & watercourse maintenance activities. All License of Occupation (LOC) and summer block roads and bridges are annually inspected, and if problems are noted at the time of inspection, it is prioritized and follow up work will occur. This monitor program ensures that the Company uses proper planning and that the road and watercourse maintenance practices are done in an efficient manner that has the least impact on the environment. All the road and watercourse crossing information from the monitoring program is stored in a Forest Access Management System (FAMS). This GIS information is used to generate maps and records are kept of all the roads and watercourse crossings within Blue Ridge Lumber’s area of operations.

The ISO controls used for road and watercourse crossing maintenance includes the maintenance of blocked culverts and the removal of debris off of the bridge decks.

In the Annual Operating Plan, Blue Ridge Lumber maintains a *Branch and Main Road Record and Plan*. This plan describes the maintenance activities carried out over the past three years on

all Company Class I, II and III as well as major Class IV roads that have a License of Occupation (LOC). The road maintenance plan describes the annual planned maintenance and reclamation and also indicates each roads intended period of use.

Blue Ridge Lumber also provides “*as built road plans*” to SRD for each Operating District after completing the construction of spur roads for timber harvesting.

ISO controls have been implemented for road and watercourse crossings reclamation, road & culvert reclamation field procedures and pile burning field procedures. Road reclamation includes the complete, partial or modified partial reclamation of block roads. The reclamation of watercourse crossings includes the removal of native timber decks, log fills, steel or plastic culverts, pipeline crossings, snow fills and portable / permanent bridges.

The reclamation of native timber bridges and log fills is handled in the following manner. Native timber bridges and log fills are constructed with a separation layer of burlap and twigs/branches that are placed on top of the logs. On top of this separation layer is approximately 3 feet of dirt. The separation layer keeps the dirt from entering the watercourse. When the bridge is no longer required, the separation layer of twigs / branches and the dirt cap are then removed and the native timber or log fill structure is left in place for ATV access.

In areas where hunting pressure are of concern or in key wildlife areas, the entire watercourse structure is removed.

Properly placed logs fills on temporary roads are placed parallel in ephemeral watercourses during dry periods and in intermittent watercourses during frozen periods to protect the bottom of the draw. Sometimes these are covered with a dirt cap with a separation layer. When these log fills are no longer required the dirt cap is removed but the bottom layer of log fills are left in place to protect the bottom of the watercourse during ATV access by hunters, fishermen, and for Company staff for continued silviculture and forest management work. Log fills installed during frozen periods are removed before the spring thaw.

The environmental field procedure (EFP) developed by BRL for continued access is to remove all of the parallel logs and replace them with clean logs perpendicular to the watercourse. The perpendicular logs have no contact with the watercourse and this procedure has less impact and provides increased protection to the watercourse.

The general procedure for all block roads is to reclaim ditches, scatter slash and dirt strippings back onto the road surfaces, install erosion ditches on slopes, re-contour slope cuts, remove watercourse crossings that are no longer required for continued access, and apply grass seed or scatter slash on bare areas that slope down to watercourses to reduce the risk of erosion. Any crossing structures left in place to allow watercourses to be crossed by ATV’s in the future, will have dirt caps removed. An exception to this is if the road is still required for future silviculture access with road vehicles. Short dead end spur roads are completely abandoned while main spur roads usually have a narrow “quad trail” left open for future silviculture access by ATV’s. Roads that are heavily compacted during summer use will be sub-soiled before final reclamation

activities are completed. Some of our summer roads will be reclaimed using tracked excavators because this equipment is useful in re-establishing topsoil back onto the bared road surface.

Accumulated slash at roadside that is not put back on the roads is piled, burned and scanned the following spring for holdover fires. Any slash accumulated in the block will be reduced where necessary. Our annual fire control plan deals with this in detail. During reclamation, abandoned roads are ripped and are occasionally planted to return the area to production as quickly as possible.

All main roads, branch roads, and block roads are monitored and problems corrected as required. A section in each AOP outlines both the roads that have been left open for continued access and our annual post harvest erosion follow up.

To minimize the loss of soil and site productivity, erosion control is performed during construction, maintenance and reclamation. Back slopes, ditch blocks and creek crossings are seeded to suitable grass mixtures. To minimize excessive soil disturbance from road construction, maintenance and reclamation, a 5% soil disturbance guideline is actively managed by the ISO Environmental Management System. Company employees, contractors and their employees receive training in procedures to minimize erosion and soil disturbance. Procedures and training are also implemented for the remedy of impacted areas.

5.3.5 Access Management

Hunting pressure and other disturbance to wildlife is a concern in the key wildlife areas or sensitive areas as defined by the Northern East Slopes Wildlife Referral Map. In most cases these zones are Class "B" key moose area or Class "C" key elk areas, where the Alberta Sustainable Resource Development Fish and Wildlife Division would like to protect ungulate populations. Where access management has been identified as an objective in the Compartment Assessment or Compartment Design, the Department and Blue Ridge Lumber will jointly decide upon the access control method. The objective is to limit access by highway or four wheel drive vehicles.

BRL has been taking a proactive approach by identifying the access control method early in our planning process so that access management issues can be discussed with stakeholders.

Common access control methods include:

- Gates
- Deep ditches at key locations.
- Barricades, logs, large rocks etc.
- No snow removal
- Berms
- Partial reclamation

- Crossing removal
- Pilings
- Rollback of woody debris
- Timing restrictions
- Signage indicating road closures.

The following is a list of gate control located along BRL’s License of Occupation (LOC) road system, which are locked with combination locks to prevent unauthorized motor vehicle traffic. These gates have been established at the request of Fish and Wildlife Division for wildlife management purposes. It is recommended that the combination to the locked gates be kept confidential, and that the public contacts the Alberta Sustainable Resource Development at (780) 778-7112 for any inquiries.

Table 14: Blue Ridge Lumber Roads with Gate Control

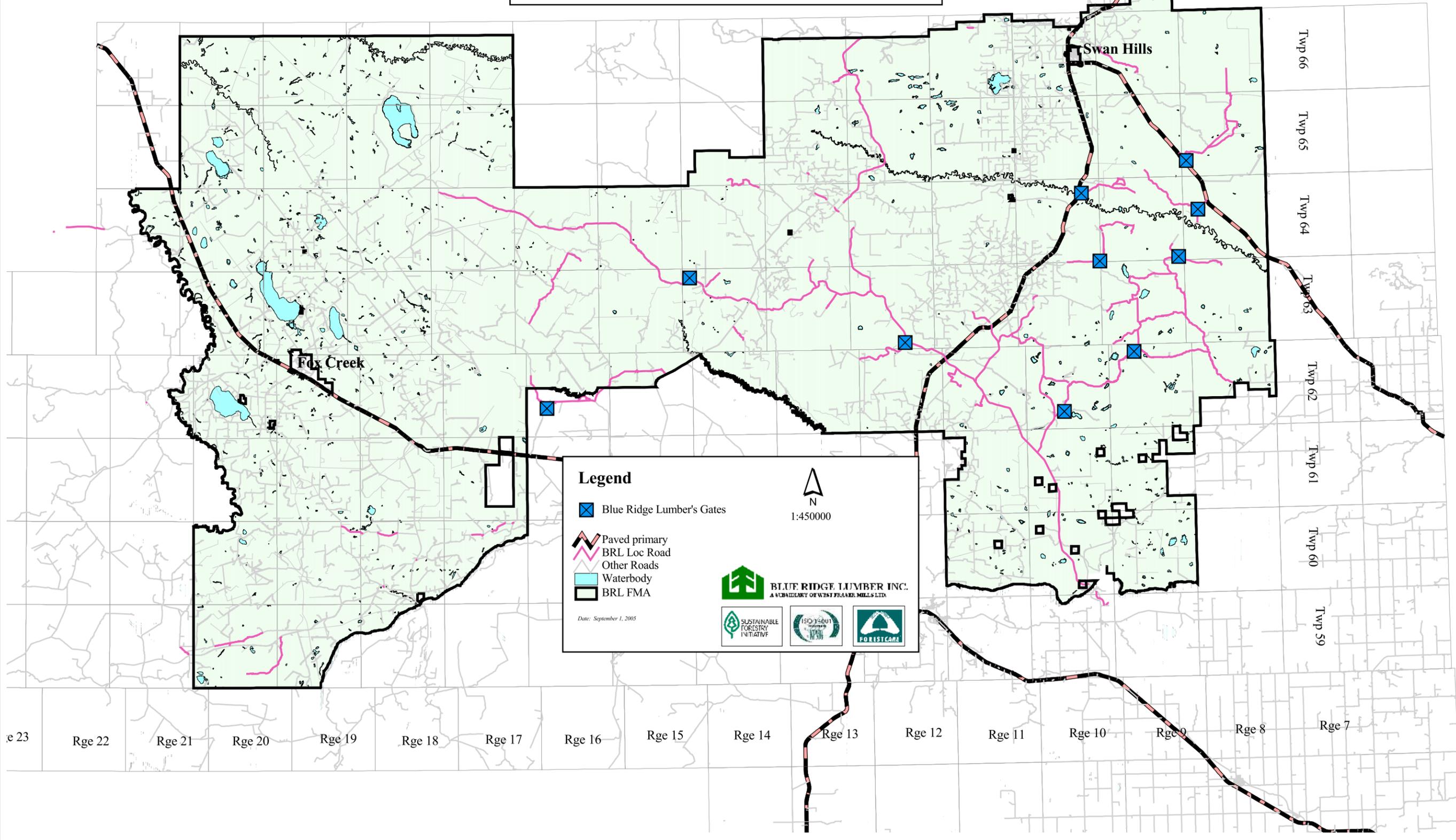
LOC NUMBER	Legal Description	NAME OF ROAD
LOC 962769	09-62-10	J.C. Winter Haul Road (South)
LOC 770181	33-62-09	J.C. Winter Haul Road (North)
LOC 001581	06-64-09	Omen Road
LOC 970233	01-64-09	Unit 19 Road
LOC 911111	17-62-16	Unit 270 Rd.(Two Creeks Bridge)
LOC 781064	31-63-14	Unit 260 Winter Rd.(Eagle River)
LOC 962570	03-63-12	Carson Road Gate
LOC 020896	20-64-08	Boy Scout Road
LOC 961269	35-64-10	Unit 360 Road (Freeman River)
LOC 990889	07-65-08	Rainbow Road.
n/a	Fox Creek	Talisman Gates
n/a	36-61-11	Shinning Bank gate
n/a	28-63-16	Paramont Road Gate.
n/a	22-63-10	Tri 7 Road

Table updated September 2, 2005

Please refer to the map on the following page showing the location of gate control for access management.

The BRL FMA area has a tremendous oil and gas road development that is used by BRL wherever possible. The Company does not expect any significant class III road developments in the near future.

BLUE RIDGE LUMBER INC.
 FOREST MANAGEMENT AGREEMENT AREA
GATE CONTROL FOR ACCESS MANAGEMENT



Legend

-  Blue Ridge Lumber's Gates
-  Paved primary
-  BRL Loc Road
-  Other Roads
-  Waterbody
-  BRL FMA

Date: September 1, 2005



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BLUE RIDGE LUMBER INC.
 A SUBSIDIARY OF WEST FRANK MILLS LTD.





5.4 Cultural and Heritage Resource Values

5.4.1 Protecting Community/Heritage Values

A co-operative cultural/heritage resource study was initiated in mid-1996 by ANC Timber Ltd., Blue Ridge Lumber Inc., Millar Western Forest Products Ltd., and Slave Lake Pulp Corporation. The cultural/heritage resource study is titled “*Heritage Management System for the Forest Industry in the Whitecourt/Slave Lake Region, Alberta (February 1999)*”. This study was completed by Western Heritage Services Inc. of Saskatoon, Saskatchewan, who has a strong background in heritage and archaeology services and management. The study was submitted to Alberta Sustainable Resource Development as part of the Blue Ridge Lumber. Detailed Forest Management Plan and presented to the Regional Forest Advisory Committee on June 29, 1999 for review and comment.

This joint study was initiated to incorporate social, cultural and heritage concerns into the management planning process so that significant locations can be properly documented and adequately protected. The four Companies wanted to move toward developing methods and processes for integrating heritage management into forestry practices, and to be in self-compliance with the Alberta Historical Resources Act which is administered by Alberta Community Development.

The study is composed of four components, which provide specific data for the development of a forest industry heritage management process. One component consists of a compilation of existing known cultural historical information for the region, including registered Alberta site data, Alberta Archaeological Permit report summaries and published archaeological and historical documents. A second component consists of a digital model of “heritage potential.” The model was created from a combination of quantifiable environmental and geographic information, and then manipulated statistically using a GIS-based process. To generate the model digital elevation, hydrology, soils and surficial geology, forest cover and ecological/landform data was used. A third component includes a detailed summary of the range of heritage impacts that theoretically could be produced by forestry practices. The summary identifies six classes of impact. The fourth component combines information about existing heritage resources, potential heritage resources and the effects on these resources by Alberta forestry practices. A detailed self-compliance approach is presented.

A review of the archaeological work that has been undertaken in the Whitecourt/ Lesser Slave Lake area show that only 36 archaeological surveys have been found, with the earliest taking place in 1975. The majority of this work has been done for the oil and gas industry (14 projects). There has also been some work undertaken by government agencies for road development, recreation area surveys, and reservoir maintenance. A few subdivisions have been examined on the south shore of Lesser Slave Lake, and a few industrial plants for energy refinery developments. There have also been a few research excavation projects undertaken, primarily through university research.

The number of surveys undertaken tends to be clustered in a few areas. Nearly 200 sites have been discovered with very few sites actually located within the boundaries of the FMA area. The Blue Ridge Lumber FMA area contained 37 pre-contact archaeological sites and only the eastern part of the Blue Ridge Lumber FMA area contained anywhere near an adequate number of sites for accurate heritage potential modeling.

On September 25, 1998 the four Companies and Western Heritage Services Inc. met with Dr. John Ives, Assistant Director, and Barry Newton, Resource Management Planner of Alberta Community Development Provincial Museum of Alberta. The purpose of the meeting was:

- To present the draft cultural/ heritage report by the four companies and to request comments and suggestions from Alberta Community Development.
- To get an understanding of the new proposed self-compliance regulation of the Alberta Historical Resources Act by Alberta Community Development, and to determine how this new regulation will affect the forest industry.
- To obtain a copy of the February 1998 Report on “Cultural Resource Management and the Energy Industry - New Perspectives and Partnerships.” This document was prepared as a guideline for the Oil and Gas Industry because of their extremely short planning requirement prior to developing dispositions such as geophysical survey programs, pipelines, compressor stations, processing facilities, oil and gas batteries, well leases, and associated access roads. The forest industry operates differently than the oil and gas industry. The forest industry prepares long-term plans and has public input into the planning process, which the oil and gas industry does not.
- To indicate that a “one window” approach is required by the forest industry. It was suggested that the Alberta Forest Products Association set up a committee to work with the Alberta Provincial Museum to develop a self-compliance process. Alberta Sustainable Resource Development should also be on this committee. The “Heritage Management System for the Forest Industry in the Whitecourt/Slave Lake Region, Alberta” could be used as a starting point for discussions.

In the meantime, Blue Ridge Lumber intends to continue with the following strategy and tactics to manage the community cultural/heritage resource values by:

- Developing a GIS cultural/heritage layer of “known” resource site locations. Many of these locations will be taken from the study, as well as actual site locations that Blue Ridge Lumber is already currently aware of.
- Continuing to involve the general public and the Regional Forest Advisory Committee in the management planning process.

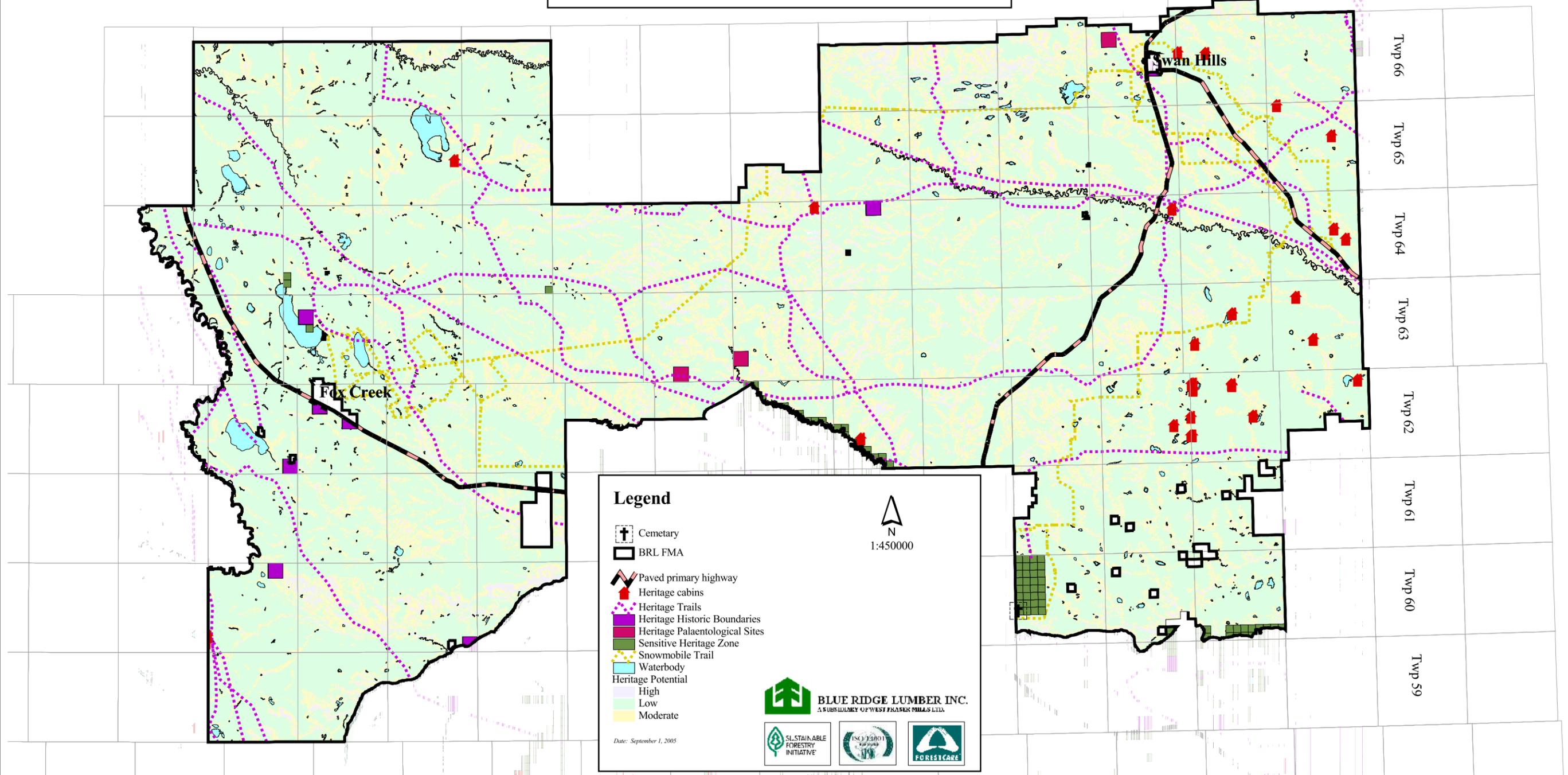
- Continuing to host annual Woodland Open House Meetings in Whitecourt, Fox Creek, Swan Hills and Fort Assiniboine and request public input into our preliminary harvest design layout which is generally three years in advance of harvesting, as well as the Annual Operating Plan.
- Continuing to actively seek out and address information on locally scarce resources from commercial and non-commercial stakeholders. The Company requested assistance in identifying any significant rare or unique discoveries or scarce resource sites by mailing the January 5, 1999 letter to our current Commercial and Non-Commercial Stakeholder List. Examples of scarce resource sites are endangered or threatened wildlife nests, salt licks, flora, archaeological sites, or unique geological sites such as eskers and moraines. There were two responses from these letters. Both of these sites were located outside the Blue Ridge Lumber FMA area.
- Continuing to make key employees and contractors aware of the Blue Ridge Lumber Inc. Reporting Policy for Rare and Unique Discoveries and Scarce Resources. This policy is included in Appendix 6.
- Continuing to use the heritage potential model as a planning tool. The model must be used with discretion until there is more information to gain confidence in the accuracy of the model, which will continue to be improved over time.
- Many of the historic campsites and artifact sites are located immediately adjacent to rivers and lakes where current operating ground rules restrict harvesting operations.

Blue Ridge Lumber is also in receipt of another important reference report titled “*Significant Ecological Features Inventory of the Whitecourt-Swan Hills Integrated Resource Planning Area.*” This report was prepared for the Resource Information Division Alberta Environmental Protection in March 1994 by Jerry A. Bentz and Armit Saxena of Geowest Environmental Consultants Ltd.

The Alberta Community Development has recently asked the forest industry to develop a self-compliance process to be in compliance with the regulations by July 1, 2001. Blue Ridge Lumber Inc. and Slave Lake Pulp Corporation have retained the services Terry Gibson of Albert Western Heritage Inc. to assist in the development of a Heritage Management Plan that was submitted June 20, 2001 to Alberta Community Development for approval. A copy of the “*Heritage Compliance Plan for West Fraser Mills Ltd. Alberta Forestry Operations – May 2001*” is included in Appendix 7.

Please refer to the map on the following page showing the cultural heritage features.

BLUE RIDGE LUMBER INC.
 FOREST MANAGEMENT AGREEMENT AREA
CULTURAL HERITAGE FEATURES



Legend

- Cemetery
- BRL FMA
- Paved primary highway
- Heritage cabins
- Heritage Trails
- Heritage Historic Boundaries
- Heritage Palaeontological Sites
- Sensitive Heritage Zone
- Snowmobile Trail
- Waterbody
- Heritage Potential**
 - High
 - Low
 - Moderate

Date: September 1, 2005

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BLUE RIDGE LUMBER INC.
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SUSTAINABLE FORESTRY INITIATIVE

ISO 14001

FOREST CARE

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Twp 66
 Twp 65
 Twp 64
 Twp 63
 Twp 62
 Twp 61
 Twp 60
 Twp 59

5.5 Rare and Endangered Plants

Blue Ridge Lumber Inc. contracted Geographic Dynamics Corp. (GDC) to review the current status of rare and endangered plants within their FMA area. The main objectives of this project are as follows:

- To produce a list of the rare vascular and non-vascular plant species known to be within the FMA area and the immediate surrounding area,
- To provide the current status of rare plants known to be within the FMA area and immediate surrounding area, and
- To map the known locations of rare plants within the FMA area and immediate surrounding area.

The review of rare and endangered plants within the FMA area was based on information currently available through related databases, as well as the plot data used to produce the ecosite classification of the FMA area.

A list of all vascular and non-vascular plant species currently on the Alberta Natural Heritage Information Centre (ANHIC) tracking and watch lists were obtained in June 2002 from their web page (<http://www.gov.ab.ca/env/parks/anhic/anhic.html>). Plants on the tracking list include elements (plants) that are rare or of conservation concern. They are generally ranked S1, S2 and occasionally S3. See the following table for an explanation of ranking system. Plant species on the watch lists are typically taxa that have restricted distributions within the province, but are common within their range. Plant species that were found in the FMA area through GDC or ASRD (Alberta Sustainable Resource Development) field plots were compared with these tracking and watch lists to identify those plants that may be rare in the FMA area.

GDC also requested a search of the ANHIC database for plants on the provincial tracking list that have been previously found in the area in order to see if other plants were found near or in the FMA area not associated with GDC or ASRD field plots. The query was performed in June 2002 including an area approximately 20 km wide around the FMA area.

From a combination of GDC and ASRD plots in and around the FMA area, and the ANHIC database query for the region, a total of 165 rare or endangered occurrences were reported, representing 96 rare or endangered plant species (53 vascular and 43 non-vascular). A list of all 96 species is presented in the following table along with the number of occurrences, and their provincial and global ranks from ANHIC. A brief summary of rare plant findings by source is also provided in the following table. Locations of GDC, ASRD and ANHIC plots with known rare plants were separated by source and mapped over the natural sub-region boundaries in and around the FMA area (please refer to the following maps).

Provincial (S rank) status of the 96 rare plant species in the region were also reported. Sixty-eight of the rare species were categorized as being S1 or S2 (or both) at the provincial level.

These plants are considered to be rare (less than 20 occurrences) in the province. In addition, 26 plants were classified as being rare or uncommon (S2, S3) with fewer than 100 occurrences in the province but with at least more than 5. Two plant species were reported as being rare or uncommon (S3) with 21 to 100 occurrences, but may be abundant in some locations.

Global status (G Rank) was also reported for the same 96 plants. The majority of these was apparently abundant and secure with many occurrences throughout the plants known range (G4 or G5). Information on the global status of the remaining plants was unavailable.

A rare plant species is one that either occurs in a limited area or in small numbers over a large area. The practical application of this definition is based on a combination of geographic and demographic criteria, which can render a decision as to the rarity status of a species rather subjective (Harms et al. 1992). For rare vascular plants in Canada, information on population size is either unavailable or scarce, so the main criteria for acceptance as a rare taxon on a national scale is its occurrence in only a small geographic area (Agrus and Pryer 1990). On a provincial basis, a rare species is one that has a small overall population or is highly restricted to specific habitats and may be susceptible to human changes to the environment (Harms et al. 1992).

There is a variety of reasons why a plant species is rare, either naturally or due to anthropogenic factors. Natural factors that contribute to the rarity of a species (taken from Scholfield 1998) include:

- plants can have very specific environmental site requirements and these conditions are themselves uncommon or rare in the landscape;
- invasive species out-compete the native species;
- plants that suffer from reproductive inefficiencies or a low reproductive output (i.e., a rarity in the required seed dispersal agents such as insect pollinators; limited asexual reproduction);
- taxonomic expansion is limited due to environmental conditions (i.e., there is an inability to speciate);
- species that are naturally moving into an area lack the necessary adaptations to flourish in the new habitat; and
- climatic variations (such as climate change) affect the plants' population.

Human factors that can contribute to the rarity of the species (taken from Scholfield 1998) include:

- newly described plant species that have not yet been recognized in an area (i.e., some plants are overlooked due to either their small size or their presence in small, obscure habitats);
- habitat loss that has resulted in small, isolated populations of a species;
- ongoing habitat destruction;
- inadequate herbarium collections for an area; and

- field personnel with inadequate training in field botany and/or plant systematics.

The definition of a rare species in Alberta follows that of the ANHIC. This system is based primarily on the number of occurrences of a given element (*i.e.*, taxonomic rank – usually species) within the province and, to a lesser extent, by factors that influence their ability to sustain the population (*i.e.*, life history factors, responses to disturbance, *etc.*).

The factors that can contribute to the rarity of a species are consistently changing, thus the list of plants considered to be rare or endangered within the province also changes. Plants on the ANHIC tracking and watch lists are consistently updated to reflect the most current status. As such, the list of rare and endangered plants presented in the following table represent the status of the plants at the time the research was conducted. New discoveries or changes to the lists will influence the number of occurrences and species of rare plant found within the Blue Ridge Lumber FMA area. Periodic updates of the list of rare plants found within the FMA area would be useful in maintaining an accurate account of their location and status.

BRL will continue to train and make key employees and contractors aware that any rare and endangered plants encountered in the field will be reported according to the “***BRL Scarce Resource Reporting Policy***”. The Blue Ridge Lumber Inc. Scarce Resource Reporting Policy addresses the strategies for the discovery of locations of any class of endangered, threatened and vulnerable species.



Capitate Sedge (*Carex capitata* L.)

Capitate Sedge (*Carex capitata*) belongs to the Cyperaceae family (the sedges) and is considered a provincially rare species (ranked S2 by the Alberta Natural Heritage Information Centre). Capitate sedge is a circumpolar species that is most often found in fens throughout the boreal forest. There is one known occurrence of this species reported within the Blue Ridge Lumber FMA area. It is identified by its tufted flower cluster, and has flower spikes that are male above and female below.

Table 15: Alberta Natural Heritage Information Centre Ranking System for Rare Plants

Rank	Frequency/Distribution	Concerns/Comments
S1/G1	5 or fewer occurrences or only a few remaining individuals	May be especially vulnerable to extirpation because of some factor of its biology
S2/G2	6-20 or fewer occurrences or with many individuals in fewer locations	May be especially vulnerable to extirpation because of some factor of its biology
S3/G3	21-100 occurrences, may be rare and local throughout it's range, or in a restricted range (may be abundant in some locations)	May be susceptible to extirpation because of large scale disturbances
S4/G4	Typically >100 occurrences	Apparently secure
S5/G5	Typically >100 occurrences	Demonstrably secure

Table 16: Summary of Rare Plant Findings by Source

No. of Rare Plant Species	Where they were found
94	ANHIC database query (160 occurrences total)
0	ASRD plot database query
1	GDC plot database query (5 occurrences total)

Table 17: Rare Vascular Plants in the Blue Ridge Lumber FMA Area

Scientific Name	Common Name	Occurrences	S Rank	G Rank
<i>Barbarea orthoceras</i>	American winter cress	2	S2	G5
<i>Cardamine oligosperma</i> var <i>kamtschatica</i>	Mountain cress	1	S2	G5
<i>Carex adusta</i>	Browned sedge	1	S1	G5
<i>Carex arcta</i>	Narrow sedge	2	S1	G5
<i>Carex capitata</i>	Capitate sedge	1	S2	G5
<i>Carex heleonastes</i>	Hudson Bay sedge	3	S2	G4
<i>Carex houghtoniana</i>	Sand sedge	4	S2	G5
<i>Carex lacustris</i>	Lakeshore sedge	1	S2	G5
<i>Carex rostrata</i>	Beaked sedge	1	S2	G5
<i>Carex umbellata</i>	Umbellate sedge	1	S1	G5
<i>Coptis trifolia</i>	Goldthread	5	G3	G4?
<i>Cystopteris montana</i>	Mountain bladder fern	3	S2	G5
<i>Deschampsia elongata</i>	Slender hair grass	1	S1	G5
<i>Diphasiastrum sitchense</i>	Ground fir	1	S2	G5
<i>Eleocharis tenuis</i>	Slender spike-rush	1	SU	G5
<i>Epilobium leptocarpum</i>	Willowherb	1	S1	G5
<i>Glyceria elata</i>	Tufted tall manna grass	2	S2	G3G5
<i>Heterodermia speciosa</i>		2	S2	NA
<i>Huperzia selago</i>	Mountain club-moss	1	S1	G5
<i>Juncus brevicaudatus</i>	Short-tailed rush	2	S2	G5
<i>Juncus filiformis</i>	Thread rush	3	S2S3	G5
<i>Juncus stygius</i> var <i>americanus</i>	Marsh rush	3	S2	G5T5
<i>Lactuca biennis</i>	Tall blue lettuce	4	S2	G5
<i>Luzula acuminata</i>	Wood-rush	1	S1	G5
<i>Luzula rufescens</i>	Reddish Wood-rush	1	S1	G5
<i>Monotropa hypopithys</i>	Pinesap	2	S2	G5
<i>Parnassia parviflora</i>	Small northern grass of parnassus	1	S2	G4
<i>Phegopteris connectilis</i>	Northern beech fern	4	S2	G5
<i>Placynthiella uliginosa</i>		3	S2	NA
<i>Potamogeton foliosus</i>	Leafy pondweed	1	S2	G5
<i>Potamogeton strictifolius</i>	Linear-leaved pondweed	1	S2	G5
<i>Prenanthes alata</i>	White lettuce	1	S1	G5
<i>Pseudevernia consocians</i>		2	S1	NA
<i>Ranunculus uncinatus</i>	Hairy buttercup	3	S2	G5
<i>Salix commutata</i>	Changeable willow	1	S2	G5
<i>Salix sitchensis</i>	Sitka willow	1	S1	G5
<i>Sparganium hyperboreum</i>	Northern bur-reed	2	S1	G5
<i>Stellaria crispa</i>	Wavy-leaved chickweed	3	S2	G5
<i>Streptopus streptopoides</i>	Twisted stalk	1	S1	G5
<i>Tayloria serrata</i>	Slender splachnum	2	S2	G4
<i>Trichophorum clintonii</i>	Clinton's bulrush	1	S1	G5
<i>Trichophorum pumilum</i>	Dwarf bulrush	1	S2	G5

Rare non-vascular plants in the Blue Ridge Lumber FMA area

Scientific Name	Common Name	Occurrences	S Rank	G Rank
<i>Aloina brevirostris</i>	Short-beaked rigid screw moss	1	S2	G3G5
<i>Aloina rigida</i>	Aloe-like rigid screw moss	1	S2	G3G5
<i>Aongstroemia longipes</i>		1	S2	G3G5
<i>Baeomyces rufus</i>		1	S2	NA
<i>Brachythecium rutabulum</i>		1	S2?	G5
<i>Bryobrittonia longipes</i>		1	S3	G3
<i>Bryoria nadvornikiana</i>		2	S2	NA
<i>Bryoria simplicior</i>		2	S2S3	
<i>Bryum algovicum</i>		1	S2	G4G5
<i>Bryum pallens</i>		2	S2	G4G5
<i>Bryum uliginosum</i>		1	S1	G3G5
<i>Buxbaumia aphylla</i>	Bug on a stick	1	S2	G4G5
<i>Chaenotheca chrysocephala</i>		1	S2	NA
<i>Cladonia bacilliformis</i>		2	S2S3	NA
<i>Cladonia bellidiflora</i>		1	S2S3	NA
<i>Cladonia metacorallifera</i>		2	S2	NA
<i>Cladonia umbricola</i>		1	S1	NA
<i>Collema nigrescens</i>		1	S1	NA
<i>Dicranella crispa</i>	Curl-leaved fork moss	1	S2	G3G5
<i>Dicranella heteromalla</i>	Silky fork moss	2	S1	G5?
<i>Dicranella subulata</i>	Awl-leaved fork moss	3	S2S3	G5?
<i>Discelium nudum</i>	Naked weissia	1	S1	G3G4
<i>Fontinalis antipyretica</i>		1	S1	G5
<i>Fontinalis dalecarlica</i>		1	S1	G3G5
<i>Fontinalis neomexicana</i>		5	S2	G3G5
<i>Herzogiella turfacea</i>		1	S1	G4G5
<i>Hygroamblystegium tenax</i>		1	S1	G5
<i>Hypogymnia enteromorpha</i>		1	S2	NA
<i>Lecania dubitans</i>		1	S2	NA
<i>Lecanora cateillea</i>		1	S2	NA
<i>Melanelia multisporea</i>		2	S2?	NA
<i>Mycoblastus affinis</i>		1	S2	NA
<i>Mycoblastus sanguinarius</i>		3	S2	NA
<i>Orthotrichum affine</i>		1	SU	G3G5
<i>Pogonatum dentatum</i>	Hair like pogonatum	8	S2S3	G3G5
<i>Pogonatum urnigerum</i>	Urn like pogonatum	3	S2S3	G5
<i>Pohlia atropurpurea</i>		1	S1	G4G5
<i>Pohlia sphagnicola</i>		1	S2	G2G3
<i>Polytrichum longisetum</i>	Slender hairy-cap	1	S1	G5
<i>Physcia tenella</i>		2	S2	NA
<i>Ramalina dilacerata</i>		3	S2	NA
<i>Ramalina farinacea</i>		1	S2S3	NA
<i>Ramalina obtusata</i>		1	S2	NA
<i>Ramalina sinensis</i>		1	SU	NA
<i>Rhizomnium magnifolium</i>		1	S2	G4G5

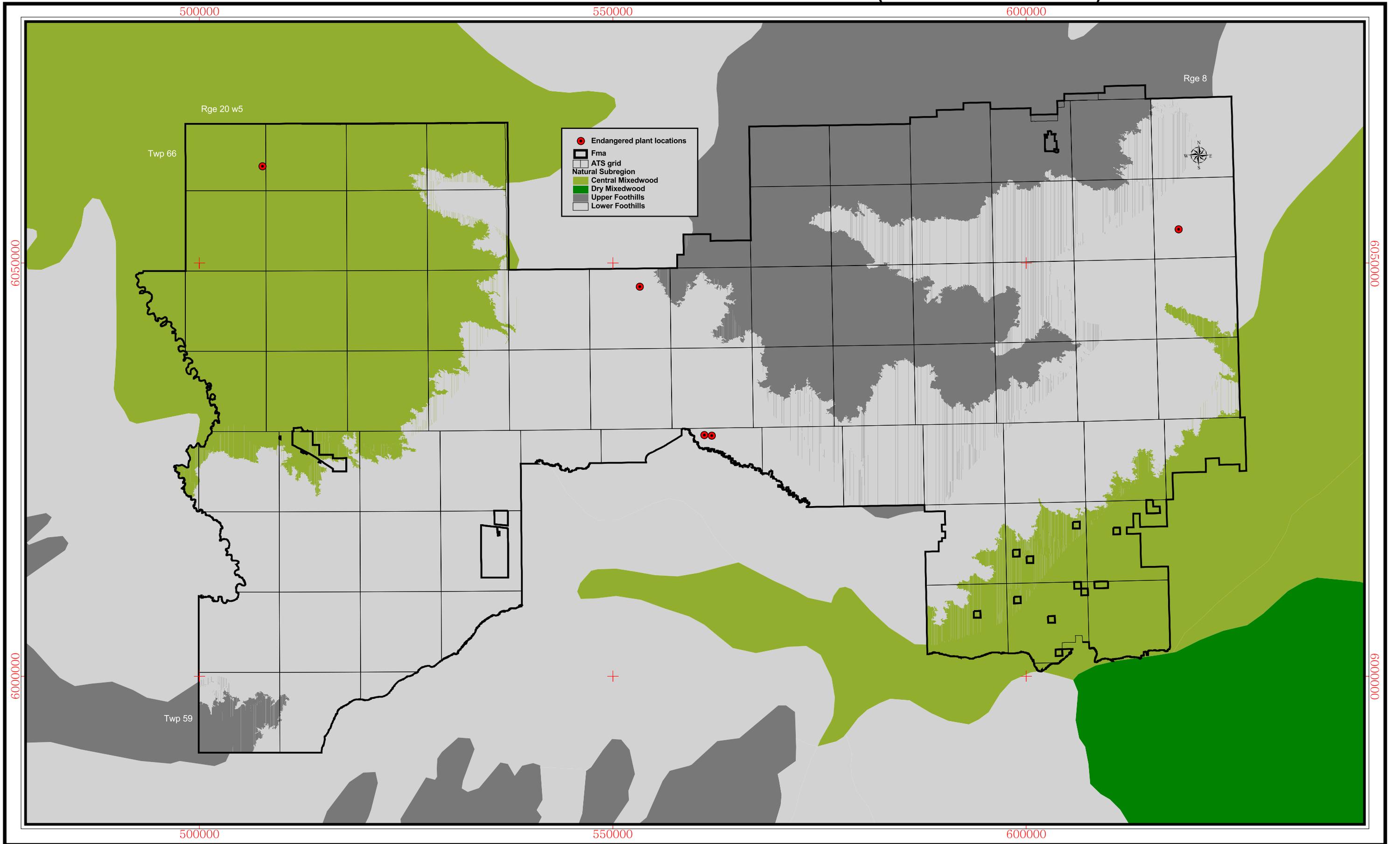
<i>Schistostega pennata</i>	Luminous moss	4	S1S2	G4
<i>Solorina spongiosa</i>		1	S2	NA
<i>Sphagnum compactum</i>	Neat bog-moss	1	S1S2	G5
<i>Sphagnum lindbergii</i>	Lindberg's bog moss	3	S2S3	G5
<i>Splachnum luteum</i>	Yellow collar moss	1	S2	G3
<i>Splachnum rubrum</i>	Red collar moss	1	S2	G3
<i>Splachnum vasculosum</i>	Large-fruited splachnum	2	S1S2	G3G5
<i>Varicellaria rhodocarpa</i>		1	S2	NA

- S Subnational level (status in a province, *i.e.*, Alberta)
- G Global level (status throughout its global range)
- S1/G1 Critically imperiled due to extreme rarity (5 or fewer occurrences)
- S2G2 Imperiled because of rarity (6 to 20 occurrences)
- S3/G3 Rare or uncommon (21 to 100 occurrences)
- S4/G4 Apparently secure, with many occurrences
- S5/G5 Abundant and secure, with many occurrences
- SR Reported but without persuasive documentation to either accept or reject the report
- SU Uncertain status, possibly in peril; more information is required
- T Rank for subspecific taxon (subspecies or variety)
- Q Taxonomic problems involved; more information is required
- HYB Hybrid taxon that is recurrent in the landscape
- ? Rank tentatively assigned; no information is available or the number of occurrences is estimated

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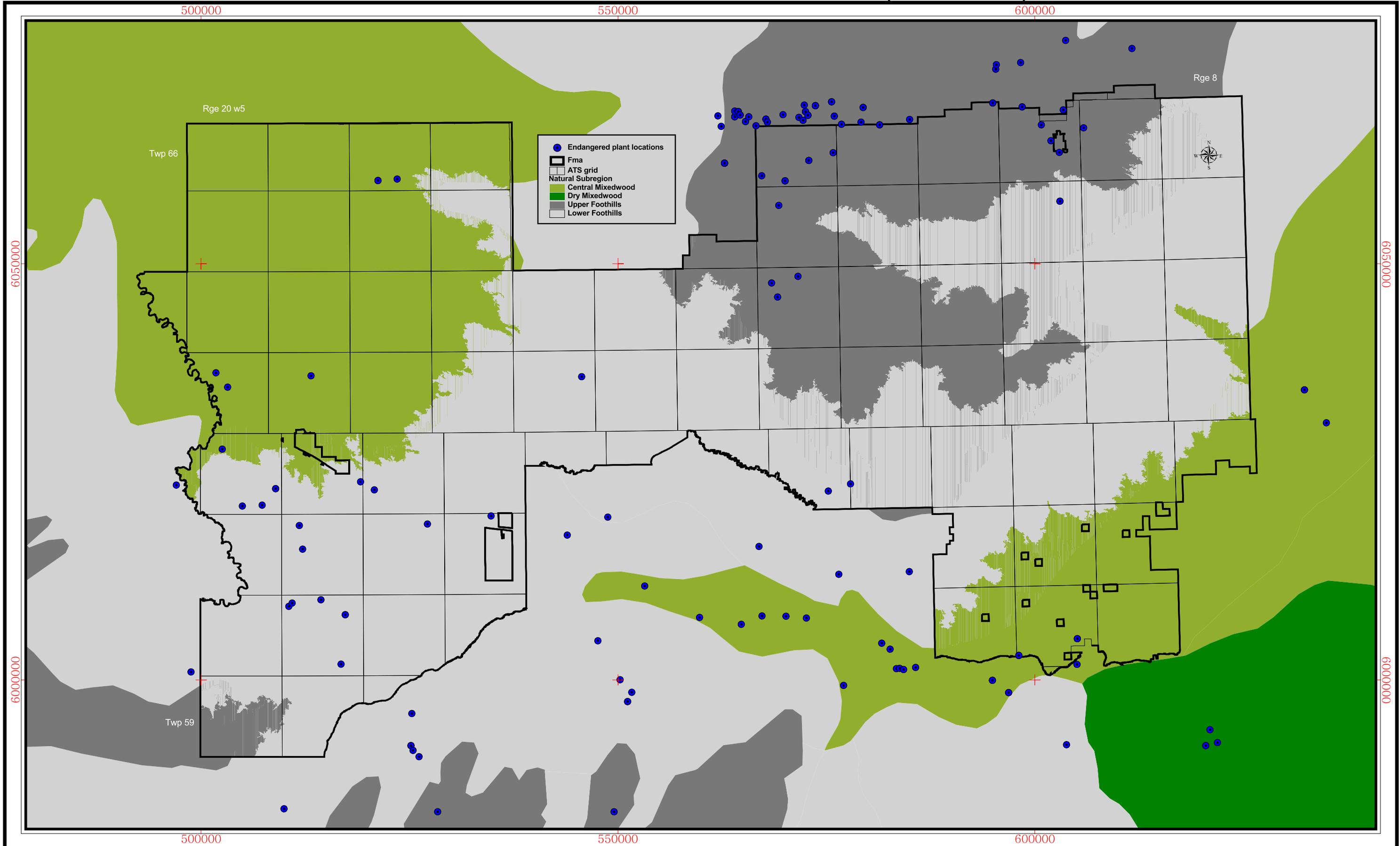
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DISTRIBUTION OF ENDANGERED PLANT SPECIES (GDC and ASRD PLOTS)



Scale 1:425,000
20 Kilometres

DISTRIBUTION OF ENDANGERED PLANT SPECIES (ANHC PLOTS)



20 Scale 1:425,000 20 Kilometres

5.6 Insects and Disease and Weeds

5.6.1 General Overview

Forests are dynamic ecosystems. They are constantly changing following cycles of renewal, growth and eventually death. The health and management of a forest are critical to sustainable forest management. Disturbances and stress strongly influence the health, vigor, vitality and productivity of forests. Sources of disturbance and stress include insects and disease, fire, birds and animal damage, chemical pollutants, etc. These sources may act alone or together to influence the development, structure and functioning of ecosystems. Climate change also interacts with these disturbances to further impact the condition and productivity of forests. There is uncertainty with regards to climatic change called the “greenhouse effect”, but some experts predict the temperature will rise by 2.5°C by the middle of the 21st century (Harrington, 1987).

Insect and disease infestations however, remain one of the dominant causes of natural disturbance in our forests. Insects are the most diverse group of terrestrial animals in terms of species richness and functional roles (Evans, 1981). Insects play an indirect role in regulating the forest productivity of forested ecosystems in that they are often an important regulator of herbivore populations, are an important food items for vertebrate populations and significantly accelerate the early stages of nutrient cycling and community development (Schowalter et al. 1980).

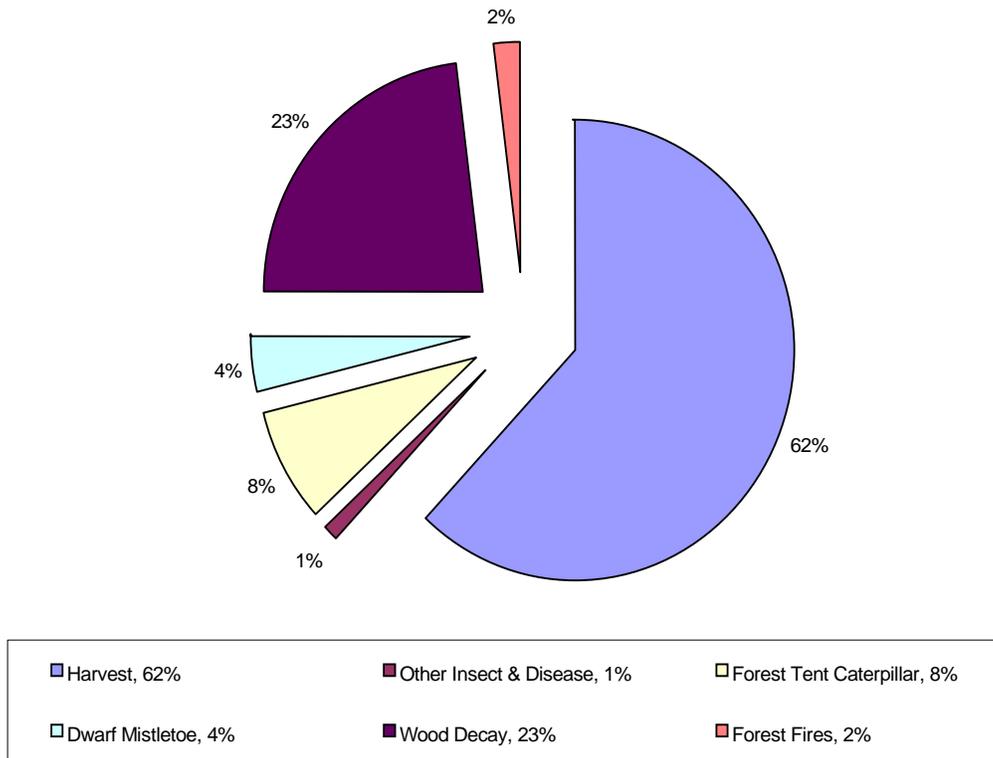
The responsibility of monitoring forest health was formerly the responsibility of the Canadian Forest Service. Forest fire losses have been well documented since 1931 and more thorough documentation has occurred since 1966. In the early 1980’s, the Canadian Forest Service began determining the impact of insects and diseases on mature forests, but has made no attempt to estimate the losses of the younger aged stands. Volume loss estimations have only been limited to a selection of the major forest pests. No attempts have been undertaken by the Canadian Forest Service or Alberta Sustainable Resource Development to determine the potential forest losses due to weather, birds and animals, or chemical pollutants.

Within the past several years the Canadian Forest Service has relinquished the responsibility of monitoring insect and disease infestations to Alberta Sustainable Resource Development. SRD performs annual overview aerial surveys, monitors populations of major pests, provides extension services and training and coordinates Integrated Pest Management Committees through out the Province. BRL is a member of the Northern East Slopes Integrated Pest Management Working Group.

During the period of 1988 to 1992, the average annual insect and disease loss in Alberta was 7,300,000 cubic meters, which is equivalent to 57% of the annual timber volume harvested in Alberta during the period.

The following graph shows that wood decay accounted for 23% of the total loss, insects and disease 13% and forest fires was 2% of the total volume loss in Alberta 1988 to 1992.

Graph 14: Forest Volume Loss in Alberta, 1988 to 1992



A major potential threat to Canadian Forests is the introduction of exotic insects and disease from other countries such as Europe, Asia and North Africa etc. The Canadian Forest Service and the Canadian Food Inspection Agency have intercepted many potentially harmful insects such as the Brown Spruce Longhorn Beetle, the Asian Long-Horned Beetle, the Pine Shoot Beetle, and the Eight-spined Spruce Bark Beetle. These insects have entered North America in wooden packing material in shipments of metal pipe, and wooden spools used for shipping cable or wire rope.

Although there is no current evidence available that these species are well established in Canada, the detection of them signifies a serious potential threat to Canadian forests. The invasion of Brown Spruce Longhorn Beetle has recently been found at Point Pleasant Park, in the Halifax Regional Municipality where a high priority eradication program is currently taking place. The Eight-spined Spruce Bark Beetle is a very cold hardy species and they have the potential to

spread rapidly in Canadian forests. The Pine Shoot Beetle is one of the most destructive shoot feeding species of pines in Europe.

The Mountain Pine Beetle has destroyed the pine forests of British Columbia and this insect is currently threatening to make its way into Alberta. Many governments, industry and other agencies are working together to monitor this destructive insect and to put programs in place to suppress the spread of the Mountain Pine Beetle into Alberta.

There is significant risk that the spread of these harmful insects has the potential to destroy valuable timber resources in Canada that could seriously affect the economic, social, recreation, ecological, and aesthetic values.

Other introduced insects such as the Gypsy Moth and the Dutch Elm Disease have resulted in coast to coast dispersal and continent to continent dispersal, and the cost of control has been in the millions of dollars.

5.6.2 Northern East Slopes Integrated Pest Management Working Group

Alberta Sustainable Resource Development has developed a Provincial Integrated Pest Management Committee as well as regional working groups. The Northern East Slopes Integrated Pest Management Working Group (NES IPM) has recently been formed with representatives of Government and the forest industry. Blue Ridge Lumber is a member of the working group. The group meets quarterly or as required. The working group identifies and monitors insect and disease issues within the region and communicates these issues to other stakeholders. The group also develops long term and short term strategies for dealing with pest management issues.

5.6.3 BRL Insect and Disease Training and Reporting Policy

Blue Ridge Lumber Woodlands staff are trained to recognize insect and disease problems and to report them. The Company retained the services of Bug Busters Pest Management Inc. to develop a “Forest Health Training Manual” and to conduct a Forest Insect and Disease Training Course on April 20, 1999. The Company maintains information and identification of pertinent insect and diseases in the Woodlands library.

Another excellent source of insect information and identification is the Canadian Forest Service, Pacific Forestry Centre new web site, Conifer Defoliating Insects of British Columbia at <http://www.pfc.cfs.nrcan.gc.ca/entomology/defoliators>. The website describes both damaging and non-damaging insects that feed on the foliage of the 24 species of conifers native to the

province. Thirty years of working with forest stakeholders in government, industry the scientific community and the general public has gone into producing this guide. The guide identifies defoliating insects not only by common and scientific name, but also by family and host tree. The guide is helpful for anyone interested in forest health, biodiversity, environmental or conservation issues.

The Alberta/B.C. Intermountain Forest Health is a group that promotes communication among federal, provincial, university and forest industry agencies on research and management initiatives. Their website homepage contains information on upcoming workshops, information and presentations and can be found at: <http://cricket3.cricketworks.com/cricket/abbc/index.html>.

The Alberta Sustainable Resource Development forest health website is: <http://www3.gov.ab.ca/srd/forests/health>.

It is the responsibility of all BRL woodlands staff and seasonal staff to promptly report any unusual insect and disease sightings for identification. BRL will report any major outbreaks of insects and diseases to SRD as well as other stakeholders in the surrounding area.

Any major outbreaks will be monitored and mapped. If necessary, a management plan will be developed to properly manage the problem.

Please refer to Appendix 8 for a copy of the Blue Ridge Lumber Inc. *Reporting Policy for Insect and Disease Infestations* that includes a list of the major insects and diseases in the FMA area.

5.6.4 Virginia Hills Fire & Expected Insect and Disease Problems

Historically, the Blue Ridge Lumber FMA area has been relatively free of large insect and disease infestations. However, the large disastrous 1998 Virginia Hills Fire is expected to initiate some dramatic ecological changes. Bark beetle populations have increased dramatically. The Company has initiated a bark beetle monitoring and management program in the log yard.

Blue Ridge Lumber is very concerned that an explosive population of bark beetles will infest the older mature timber along the lakes, streams and riparian areas. Salvage operations and careful logging may be required in these watercourse areas that have traditionally been left unmanaged. The Company is working with Alberta Sustainable Resource Development to develop a program to manage timber along streams and rivers. The Northern East Slopes Integrated Pest Management Working Group is monitoring bark beetle populations for potential problems.

Black army cutworm infestations were identified in the Virginia Hills Fire area in June 1999. These devastating cutworms threatened the 12 million seedlings planted early in 1999 and the 7 million seedlings in 2000. Blue Ridge Lumber is cooperating and communicating with Buchanan Lumber, Millar Western Forest Products Ltd., Mostowich Lumber Ltd. to monitor this

infestation. Black army cutworm populations crashed in the second year after the fire and seedling damage has since recovered mainly due to the excellent quality of seedlings and the first year survival of seedlings.

Rhizina root rot is expected to increase the first and second years following the Virginia Hills Fire. Rhizina root rot affects the roots of young seedlings. Blue Ridge Lumber is therefore considering the cycle of this disease in scheduling planting in the Virginia Hills fire.

5.6.5 Managing Forest Health

Historically the BRL FMA area has been relatively free of epidemic insect and disease infestations. There is always some evidence of insect and disease throughout the Blue Ridge Lumber FMA area. Insect and disease at an endemic level is part of the normal ecosystem process. Major outbreaks that threaten to reach epidemic levels are to be controlled so that other natural processes are not disrupted. Insects and disease affect different forest species at different ages – young stands, mature stands, conifer species and deciduous species. Insects and disease also affect cones and seeds. Forest health is also negatively affected by weather, and chemical pollutants.

Blue Ridge Lumber has retained the services of Bug Busters Pest Management Inc. to assist in the development of “*Forest Health Strategies*”. This report was submitted to Alberta Sustainable Resource Development for review on September 21, 1999.

The following is a list of strategy and tactics that will be used to maintain a healthy forest depending on the circumstances:

- To continue to be a member of the Northern East Slopes Integrated Pest Management Working Group.
- To update Woodlands staff at regular meetings with minutes and information notes from the NES IPM Working Group.
- To communicate any major insect and disease issues to the Regional Forest Advisory Committee.
- To continue to monitor and report insect and disease outbreaks to Federal and Provincial agencies and other forest industry and stakeholders.
- To harvest the oldest mature timber as a first priority.
- To salvage any large fires, or epidemic insect and disease areas.
- To plan block layout in a manner that will minimize blowdown.
- To continue to liaison with SRD to minimize unmanaged areas, as they become “sinks” for insects and disease.
- To maintain a balance of age and species classes.

- To continue good forest management practices such as natural seeding, planting mixtures, spacing and cleaning, vegetation control, understory protection etc. while considering other resource values.
- To provide some post-harvest access to monitor and manage for epidemic insects and disease, fires and reforestation.
- The Province is working to develop a Riparian Management Policy.

5.6.6 Weed Control

Blue Ridge Lumber is aware of the Weed Management Directive issued by the Forest Management Division. Blue Ridge Lumber has developed an annual weed control program to monitor and control the introduction and spread of restricted and noxious weeds on the millsite and on the FMA area. Weed control on the FMA area is a difficult job and requires awareness and cooperation due to the numerous other users of the land, and the numerous road right-of-ways, pipelines, powerlines and wellsites etc.

The Northern East Slopes Integrated Pest Management Committee and the five Municipal Districts jointly sponsor an annual weed awareness workshop. A booklet titled “*Weed Identification in Alberta*” has also been developed. Several Blue Ridge Lumber staff members attended the weed awareness workshop on April 1, 1999 for training and weed identification. Woodlands staff have also been provided with weed identification booklets and encouraged to report any occurrences of problem weeds. In May 2001, Blue Ridge Lumber conducted weed identification and control training sessions for woodland permanent staff, seasonal staff, and contractors. The sessions are instructed by an Agriculture Canada Weed Specialist and provide essential information for weed identification, control and prevention.

Alberta’s Weed control Act was enacted to enforce the control of weeds in order to protect landowners and the environment. Weeds are designated into three categories: *Restricted Weeds*, *Noxious Weeds and Nuisance Weeds*.

Restricted weeds are usually found in small numbers in Alberta and are designated restricted to prevent their establishment. Restricted weeds must be eliminated. The four key restricted weeds that are found in the Northern East Slopes Region are:

- Diffuse knapweed
- Spotted knapweed
- Nodding thistle
- Yellow star-thistle

Other restricted weeds are Dodder and Eurasian Milfoil.

Noxious weeds have the ability to spread rapidly, and cause severe crop losses and economic hardships. These weeds must be controlled to prevent further establishment and spread. The six key noxious weeds that are found in the Northern East Slopes Region are:

- Scentless chamomile
- Common tansy
- Yellow toadflax
- Ox-eye daisy
- Tall buttercup
- Canada thistle

Other noxious weeds include: Russian Knapweed, Perennial Sow Thistle, Common Tansy, Field Blindweed, White Cockle, Bladder Campion, Knawel, Cleavers, Hoary Cress, Dalmation Toadflax, Leafy Spurge, Stork’s Bill, Blue Weed, Spreading Dogbane, Field Scabious, Hound’s Tongue, Purple Loosestrife, and Persian Darnel.

Blue Ridge Lumber has developed a weed control program that includes:

- Weed identification and reporting
- Pre-Treatment Prescription
- Control
- Post Treatment Assessment (Monitoring)

Preventive measures include reporting any significant occurrences of weed problems, using certified grass seed for reclamation, and spray washing trucks and ATV’s frequently.

Blue Ridge Lumber staff and contractors will be provided with Weed Identification Reporting Forms. Location of weed outbreaks will be catalogued spatially and linked to a database in our GIS system where pertinent information will be stored.

Where problem weeds are found on another owner’s disposition BRL will send a letter informing them of this. The Sustainable Resource Development will be sent a copy of the letter to keep them advised.

Following the identification of a problem weed in the BRL FMA area a treatment will be prescribed and appropriate action taken to eradicate the noxious and restricted weeds, or to control the spread of nuisance weeds. The treated areas will be monitored until the weed is completely eradicated (noxious and restricted weeds) or controlled (nuisance weeds). A post treatment assessment form will be completed the year following the control treatment. A Weed Infestation Control and Status Report will be included with the AOP each year.

For additional information please refer to the Forest Management Directive 2001-06 on Weed Management in Forestry Operations, which is available on the website at <http://www3.gov.ab.ca/srd/forests/fmd/directives/weed.html>.

5.7 Fire Protection

Fire protection, detection and suppression on the Blue Ridge Lumber FMA area are mainly the responsibility of Sustainable Resource Development. Blue Ridge Lumber supplements the efforts of the government in accordance with the Forest Management Agreement Section C Paragraph 28 (1) (2) (3) and (4).

The annual allowable cut will be reviewed on a regular basis to ensure that the acceptable limit of annual fire loss does not exceed 2.5% of the AAC. The annual allowable cut will be recalculated when the annual fire loss exceeds this limit.

5.7.1 Blue Ridge Lumber Fire Control Program

The Blue Ridge Lumber Fire Control Program includes the following:

Fire Control Agreement

Describes the respective responsibilities of Blue Ridge Lumber and the Province of Alberta for the detection, fire suppression, training, manpower and the fire equipment to be maintained on hand. The current Fire Control Agreement was signed on October 7, 1991.

Holding and Protection Charges

Effective in 1999, the annual holding and protection charges payable to the Province of Alberta was set at a fixed rate of \$212,617. This charge is adjusted annually in accordance with the Annual Implicit Price Index for government current expenditure in goods and service as published by Statistics Canada.

The March 2000 Holding and Protection Charges Task Force Recommendations have been developed as an interim process to address those companies that have FMA holding and protection charge reduction clauses. The task force assembled a short list of activities that qualify for holding and protection reduction charges. The intent of the process is to encourage companies to supplement the current SRD protection system and not as a replacement for existing SRD programs.

Fire Protection Plan

The annual Fire Protection Plan (FPP) describes the specific fire fighting equipment on hand, training and manning schedules, the Blue Ridge Lumber Woodlands organization, personnel, mobile radio communication systems and other fire protection initiatives of Blue Ridge Lumber. Staff certification and equipment listings are included. The annual FPP is submitted prior to March 1 of each year for the fire season, which is generally April 1 to October 31.

Forest Fire Training for Blue Ridge Lumber Woodlands Employees and Contractors

Key Blue Ridge Lumber Woodlands staff and Contractor employees have knowledge of their roles in the event of a forest fire. All staff and contractor foreman receive fire suppression training before work commences in the spring or summer of each year. Staff training will consist of cat boss courses for some people and standard annual fire suppression training or refresher courses. Summer students also receive fire training in May.

Establish a Type 2 Initial Attack Crew

BRL has established an agreement to provide a Type 2 Initial Attack crew from our manual cleaning and spacing crews. This crew is trained to SRD standards, maintains the required fire equipment and performs specified exercises throughout the summer to stay in compliance with the Type 2 standard. SRD audits the crew periodically throughout the summer. The crew is paid an hourly rate agreed to by SRD when they are on standby or performing compliance or practice exercises.

Establish 4 Ground Tanker Support Crews

BRL has established 4 ground tanker support crews from the harvesting contractor work force. These crews are trained and equipped to provide initial cat guard support.

Blue Ridge Lumber Woodlands Employees and Contractors are Equipped for Forest Fire Suppression. Blue Ridge Lumber maintains a list of both Company and Contractor fire fighting equipment. All Company and Contractor vehicles are equipped with water backpacks, polaski, shovel and axes for fire fighting. Additional fire fighting equipment is available at each contractor operation. Blue Ridge Lumber conducts an annual equipment inventory review and inspection.

Fire Proofing the FMA Area

BRL staff is working in cooperation with SRD to develop plans to fire proof the FMA area especially around the community of Swan Hills. BRL is also working with SRD to develop maps that show access, values at risk, fire threat assessment, known water sources, etc. SRD and BRL have been working with Alberta Power and TransAlta to assess all power lines and identify candidate areas for tree freeing operations to reduce the risk of power line ignition. BRL has been cooperating with Alta Power in the Freeman Lake area.

5.7.2 Alberta Forest Fires 1998

Forest fires ran wild over much of Alberta in 1998 causing this to be one of the most devastating and disastrous fire years in history. Approximately 1,672 fires burned 758,000 hectares. The cost of fighting these fires was reported at \$250 million. Despite the best efforts of both Alberta Sustainable Resource Development and industry, losses were severe. West Fraser suffered significant losses in the Whitecourt and Slave Lake FMA areas, and the Blue Ridge Lumber Coniferous Timber Quota areas. Only the very determined and heroic effort of the Slave Lake employees saved the pulp mill as fire raged around the mill site and even spread to and burned

65,000 m³ of logs decked in the mill yard. The following is a summary of fires within the Whitecourt and Slave Lake FMA areas and the Blue Ridge Lumber quota spheres of interest.

Table 18: Summary of 1998 Fires Affecting Blue Ridge Lumber and Slave Lake Pulp

Fire	Hectares
Mitsue Fire (SLP)	49,670
Agnes Lake Fire (SLP)	34,802
Roche Lake Fire (SLP)	4,875
Virginia Hills Fire (BRL)	*168,821
Chip Lake (BRL – Quota)	10,886
Total	269,054

* The total area of the Virginia Hills fire is 168,821 of which 112,700 hectares of the fire lies within the Blue Ridge Lumber FMA area. This total compares to the 1986 to 1995 10-year history of 178 fires and a total burned area of 446 hectares on the Whitecourt FMA area (W3 and W4 Management Units). The 112,700 hectares represents 25.5 % of the BRL FMA area and is made up of the following:

Regenerated cutovers	15,914 hectares
Productive area	72,298 hectares
Non-Productive area	24,488 hectares
Total	112,700 hectares *

* This figure was derived from the SRD May 22, 1998 black and white aerial photography of the fire boundary. When this photography was interpreted for unburned patches this figure was reduced to 90,603 hectares. Blue Ridge Lumber took 1:20,000 false color infrared aerial photography in July and August of 1998 and re-interpreted this photography for complete burn, partial burn and ground fires.

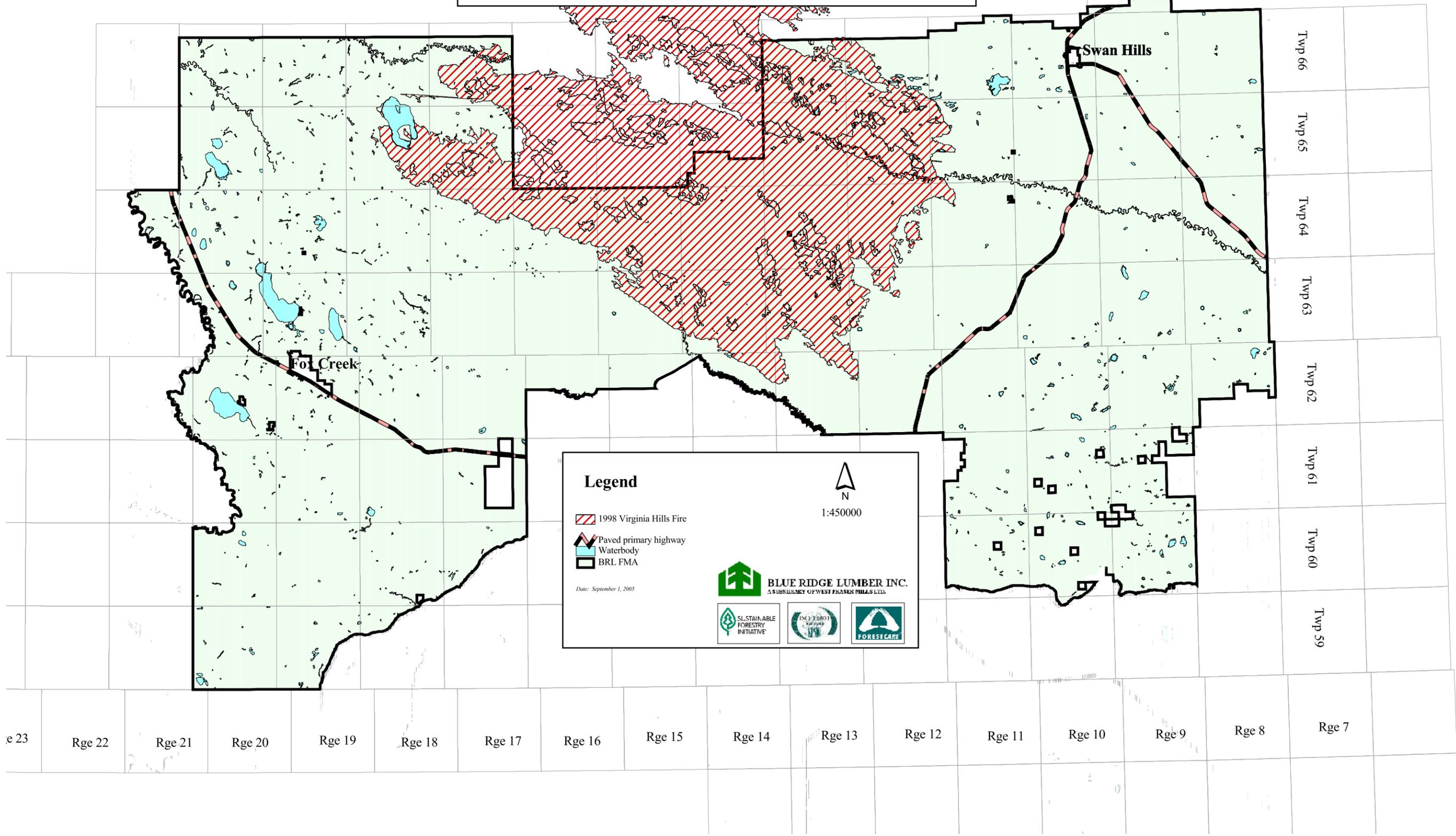
Both Slave Lake Pulp and Blue Ridge Lumber conducted aggressive salvage operations to utilize as much of the burned timber as possible. Slave Lake Pulp commenced salvage operations in June 1998. Blue Ridge Lumber commenced their salvage operations in early July and commenced manufacturing fire-salvaged timber by October 1, 1998. Blue Ridge Lumber installed tandem debarkers on all three infeed lines and produced high quality chips from the burnt salvage timber for sale to pulp mills in both Alberta and British Columbia. Blue Ridge Lumber entered into contract arrangements with other companies including Chetwynd Forest Industries to assist in the salvage of timber from the Virginia Hills fire.

Blue Ridge Lumber salvaged a total of approximately 2.7 million m³ from the Virginia Hills fire and reforested this area to Provincial Reforestation Standards. The Company also reforested the 16,000 hectares of burnt plantations resulting from the Virginia Hills fire, and has planted this area with approximately 20.7 million trees. The Company completed the reforestation of the burnt plantations in 2002.

Any impacts to the annual allowable cut greater than 2.5% require a recalculation of the AAC, as a result the 1998 fires requires a recalculation of the AAC. The post-fire recalculated the annual allowable cut at 540,000 m³ per year effective May 1, 1998. The Virginia Hills fire resulted in a loss of annual allowable cut of approximately 62,610 m³ per year available to Blue Ridge Lumber. The post-fire AAC allows companies to carry over the unused green portion of their dispositions into the next quadrant. Fire-killed and industrial salvage volumes produced in these management units since May 1, 1998 will be non-FMA chargeable.

Please refer to the map on the following page showing the Virginia Hills fire boundary and the fire salvage cutblocks.

BLUE RIDGE LUMBER INC.
 FOREST MANAGEMENT AGREEMENT AREA
**VIRGINIA HILLS FIRE BOUNDARY
 AND FIRE SALVAGE CUTBLOCKS**



Legend

-  1998 Virginia Hills Fire
-  Paved primary highway
-  Waterbody
-  BRL FMA

Date: September 1, 2005



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BLUE RIDGE LUMBER INC.
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5.7.3 History of Forest Fires on the FMA Area

Fire has exerted a major influence on the forests of the Blue Ridge Lumber FMA area. Evidence of repeated fires can be seen in even-aged conifer and deciduous stands, and by the common occurrence of charcoal in the upper soil horizons.

In 1998, M.P. Rogeau completed a Fire History Study of the Blue Ridge Lumber FMA area for Blue Ridge Lumber to gain a better understanding of the historical natural range of variability in fire size, frequency and patterns that dominate the landscape. Results of this study can be used as a model to improve ecological and biodiversity planning at a landscape level.

In the Fire History study the database from Sustainable Resource Development fire statistics was used for the period 1961 to 1995. Additional information for 1996 to 1998 has been added to develop the following graph showing the total fire loss that have occurred in the past 67 years on the Blue Ridge Lumber FMA area for the W3 and W4 FMU's.

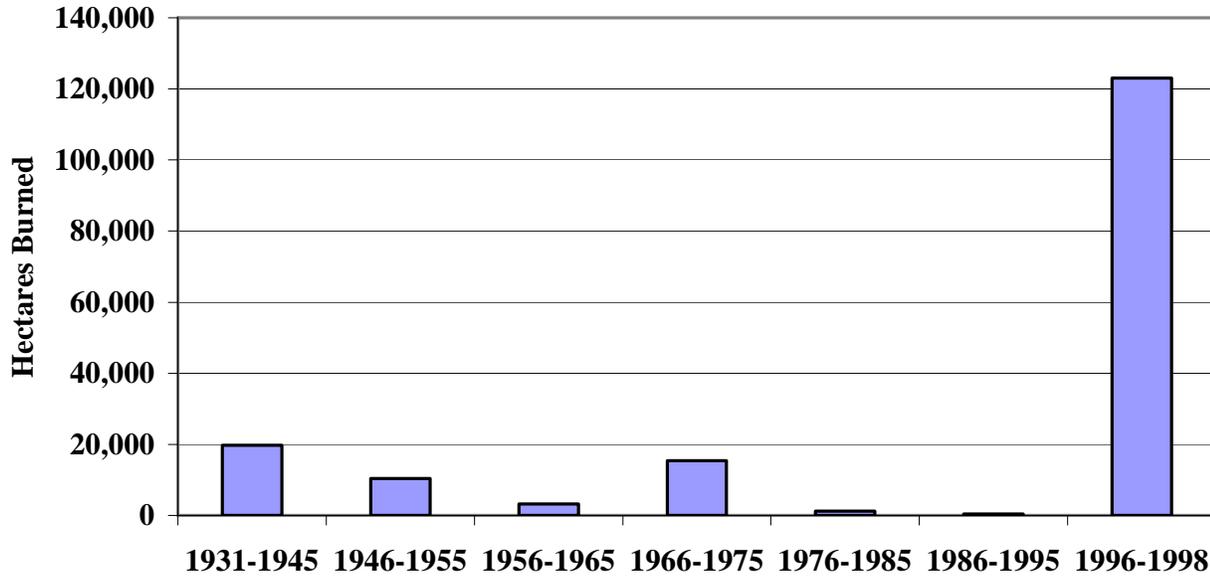
The following table shows the total fire loss from 1999 to 2005 for the BRL FMA (W14 FMU).

Alberta Sustainable Resource Development, Fire Protection Division will provide fire statistics annually to Blue Ridge Lumber for the FMA area. Some of these statistics are available on the web at <http://www.gov.ab.ca/env/forests/fpd/downloads/historical>.

Since 1931 there has been a decreasing trend in the hectares lost due to wild fires on the Blue Ridge Lumber FMA area. The exception to this was in the summer of 1998, which was one of the most devastating fire seasons in the history of the Province. This was a result of only a light snowfall during the winter of 1997-98 and an extreme dry period in the spring of 1998. A small area that had multi-lightning strikes developed into five high intensity fires that grew into one large fire by very windy conditions that destroyed 168,821 hectares and became known as the Virginia Hills fire.



Graph 15: Total Fire Loss in Hectares on BRL FMA Area 1931 to 1998 (W3, W4 FMU's)



The following table is a summary of the number of fires and hectares burned over the past 10 years. The data is collected from the Alberta Sustainable Resource Development website and as a result the hectares of the 1998 Virginia Hills fire differs from the BRL forest inventory figure. The Alberta Sustainable Resource Development shows the 1998 Virginia Hills fire in the W2 Management Unit because this is where the fire started, even though the fire actually burned across the W2, W3 and W4 Management Units.

Table 19: Fire History 1995 to 2005

Fire Year	FMU - W2 Area Burned (ha)	No. of Fires (W2)	FMU - W3 Area Burned (ha)	No. of Fires (W3)	FMU - W4 Area Burned (ha)	No. of Fires (W4)	Total Area Burned (ha)	Total No. of Fires
1995	1.00	5	0.10	5	164.90	5	166.00	15
1996	0	0	0.01	1	0.00	0	0.01	1
1997	1.51	2	0.51	7	0.01	1	2.03	10
1998	165,336.34	30	7.96	17	10.06	29	165,354.36	76
1999	1.92	6	39.71	26	12.61	18	54.24	50
2000	16.82	9	0.27	7	0.30	2	17.39	18
2001	33.61	9	0.92	9	3.26	5	37.79	23
2002	3.17	16	6.73	20	2.55	9	12.45	45
2003	0.93	5	0.89	13	5.32	11	7.14	29
2004	0.34	6	1,003.65	6	0.53	6	1,004.52	18
2005 *	0.20	2	0.20	2	0.10	1	0.50	5
Total Area Burned (ha)	165,395.84		1,060.95		199.64		166,656.43	
Total No. of Fires		90		113		87		290

* Information to June 3, 2005

5.7.4 General Description of FMA Landscape Fire Mosaic

There are four regions of different complexity and composition of vegetation mosaic in the Blue Ridge Lumber FMA area. The first region is characterized by homogenous conifer stands that are older than the rest of the management unit and are located along the northern boundary of the FMA area. The second region is located in the middle of the FMA area and is dominated by younger conifer stands that have been overlapped by numerous fires. The third region in the western portion of the FMA area is dominated by mixed stands of deciduous and conifer species. The fourth region is located in the south and southeast corner of the FMA area and mainly contains mixed-wood stands of conifer and deciduous or pure deciduous stands that are sprinkled with numerous muskegs. Most of the past fires have traveled in a NW to SE direction.

The W2 FMU contains pure conifer and mixed-wood stands in the south and southeast corner of this management unit. The remaining portion of the W2 FMU represents a patchwork of mixed-wood stands with scattered conifer understorey, pure deciduous stands or small stands of conifer.

5.7.5 Causes of Forest Fires

There are two sources of ignition; lightning and man caused or anthropogenic. The following table shows the causes of forest fires from 1961 to 1998 for the W14 Forest Management Unit. Lightning, other industries and recreationists are the three largest causes of forest fires. Lightning caused 61.4% of the fires on the W3 and W4 FMU versus 37% on the W2 FMU. The W2 FMU had a lot higher incidence of man caused fires than the W3 and W4 FMU. Recreationists caused 20.8% of the fires on W2 FMU as versus 10.9% in W3 and W4 FMU. Industries other than the Forest Industry caused 19.4% of the fires on W2 FMU as versus 10.7% in the W3 and W4 FMU.

Table 20: Causes of Forest Fires for former W2, W3 and W4 FMU's from 1961 to 1998

Fire Cause	Number of Fires W3 & W4	% of Fires W3 & W4	Number of Fires W2	% of Fires W2	Total Number of Fires	Total % of Fires
Lightning	678	61.4	176	37.1	854	54.1
Forest Industry	53	4.8	27	5.7	80	5.1
Other Industry	118	10.7	91	19.4	209	13.2
Railroad	4	.3	4	.8	8	.5
Resident	30	2.7	19	4	49	3.1
Recreation	120	10.9	99	20.8	219	13.9
Incendiary	23	2.0	7	1.5	30	1.9
Miscellaneous	56	5.1	38	8	94	6.0
Unknown	23	2.1	12	2.5	35	2.2
Total	1,105	100%	475	100%	1,578	100%

5.7.6 Season of Fires

The following table classifies fire occurrences by month and identifies which months were more conducive to larger sized fires, Class E fires (> 200 hectares), and to lightning caused fires.

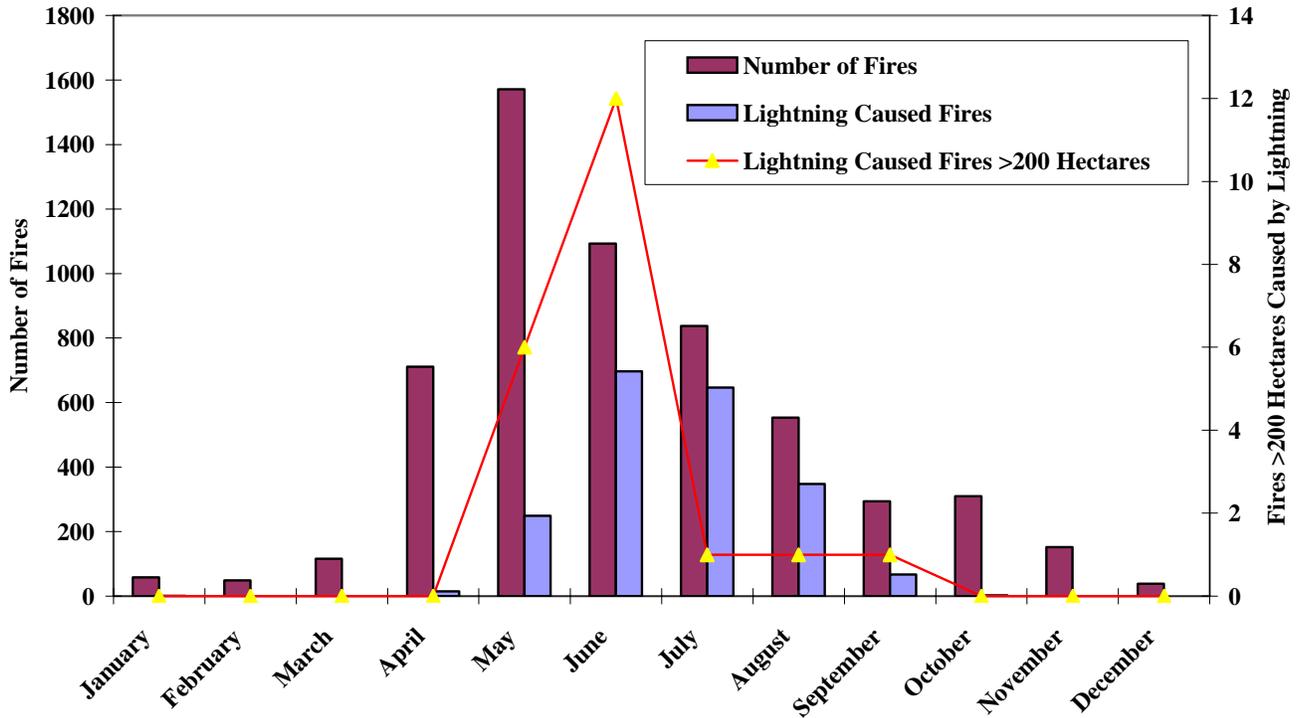
As shown in the following table, May and June are clearly the most fire prone months with 1,571 and 1,086 fires respectively in the Blue Ridge Lumber FMA area. Lightning accounts for approximately one third of the total number of fires during the months of June and July. Approximately 86% of the Class E fires occur in May and June.

Table 21: Monthly Occurrence of Class E Fires Caused by Lightning 1961 to 1998

Month	Number of Fires	Lightning Caused	Fires >200 Hectares Caused by Lightning
January	58	1	0
February	49	0	0
March	116	0	0
April	711	15	0
May	1,571	249	6
June	1,093	697	12
July	837	646	1
August	553	348	1
September	294	67	1
October	310	3	0
November	152	0	0
December	39	0	0
Total	5,783	2,026	21

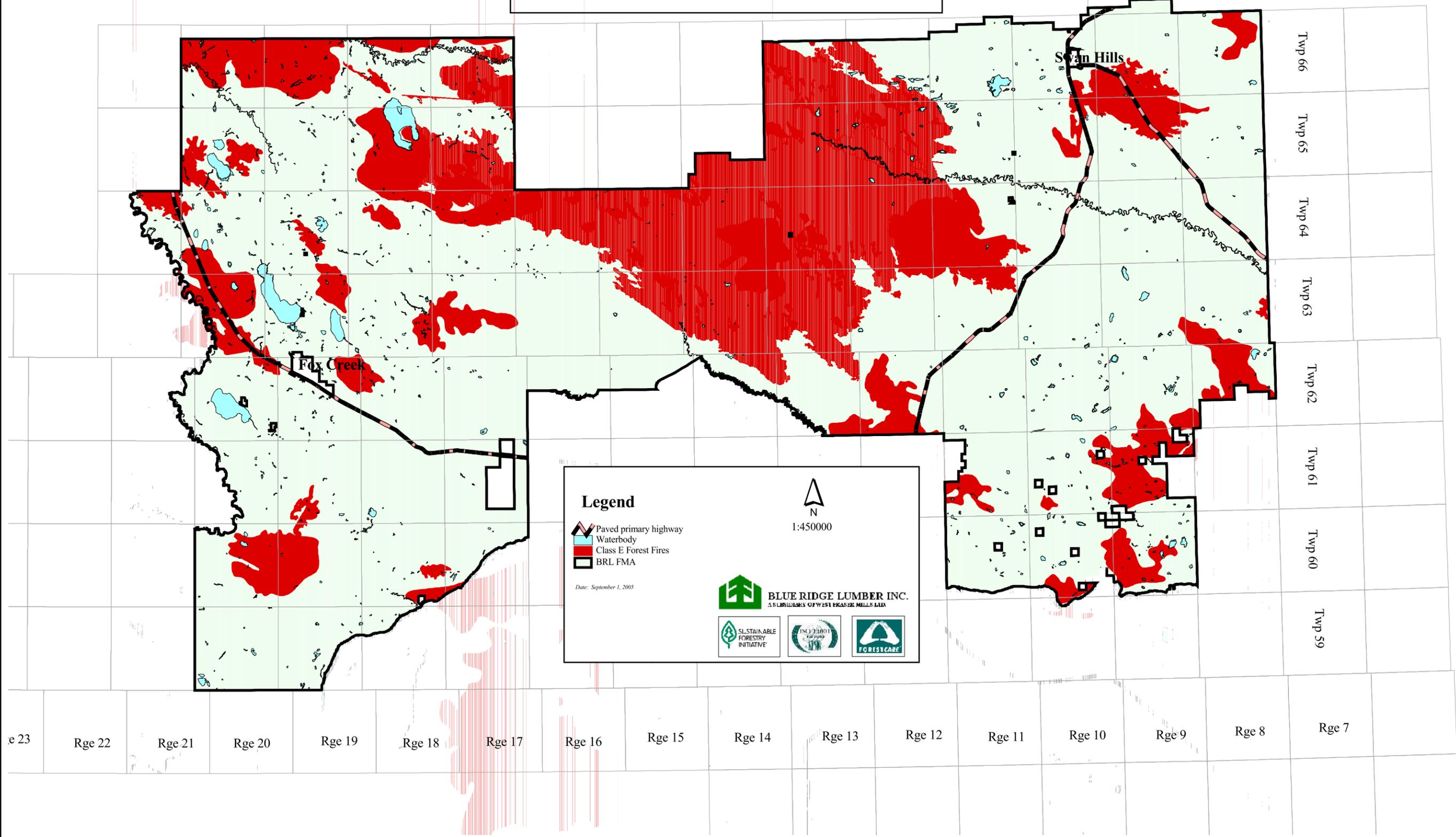
The following graph represents the monthly occurrence of Class E (>200 hectares) fires caused by lightning.

Graph 16: The Monthly Occurrence of Number of Fires, Lightning Caused Fires and Fires >200 Hectares Caused by Lightning – BRL FMA Area



The map on the following page shows the location of the Class E forest fires (1931 – 2001) on the Blue Ridge Lumber FMA area.

BLUE RIDGE LUMBER INC.
 FOREST MANAGEMENT AGREEMENT AREA
 CLASS E FOREST FIRES - 1931 - 2001



Rge 23

Rge 22

Rge 21

Rge 20

Rge 19

Rge 18

Rge 17

Rge 16

Rge 15

Rge 14

Rge 13

Rge 12

Rge 11

Rge 10

Rge 9

Rge 8

Rge 7

Twp 66

Twp 65

Twp 64

Twp 63

Twp 62

Twp 61

Twp 60

Twp 59

Svan Hills

Fox Creek

Legend

-  Paved primary highway
-  Waterbody
-  Class E Forest Fires
-  BRL FMA

Date: September 1, 2005



1:450000

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5.7.7 Lightning Strike Density and General Locations

In general, all of W2 FMU receives a yearly average of 100 to 175 lightning strikes per 100 km², which qualifies this FMU as a high fire risk region. The region west of Whitecourt and southwest of Swan Hills is similar to W2 with a lightning strike density ranging from 100 to 150 strikes per 100 km². There is a cluster of high lightning strike density of 150 to 175 strikes close to the northwest boundary. This high concentration of lightning strikes in conjunction with the prevailing northwesterly winds causes this northwest region of the FMA area to be very vulnerable to fire. The eastern portion of the Blue Ridge Lumber FMA area, east of Swan Hills and Whitecourt is an area with lesser lightning strike activity with a mean of 75 to 100 strikes per 100 km² which means it is less vulnerable to fire than the northwest region of the FMA area.

In the Fire History Study M.P. Rogeau analyzed the probability of ignition and concluded that on an annual average, 10 to 13 lightning causing fires will likely occur on the entire Blue Ridge Lumber FMA area.

5.7.8 Spatial Distribution of Man Caused Fires

In the Fire History Study M.P. Rogeau analyzed the data of the density of man caused fires per km² over a period of 34 years (1961 to 1995). This data shows that man caused fires are mainly concentrated in highly used and traveled areas. The high risk of fire ignition zones is determined to be about 500 meters on either side of a road.

Recreational use of land is the secondary source of ignition after lightning. Recreationists often frequent remote areas where access is a lot more difficult which delays quick fire detection and suppression. The following table shows the annual number of fires that are associated with human travel corridors on the Blue Ridge Lumber FMA area during a 34-year period from 1961 to 1995.

Table 22: Annual Number of Fires Associated with Human Travel Corridors and Recreational use Over a 34-Year Period from 1961 to 1995.

Number of Fires	Highways	Towns	Secondary	Gravel	Unimproved	Well Sites
Total Fires in 34 Years	161	86	48	305	412	44
Number of Fires per Year	4.7	2.5	1.1	9	12.1	1.3

Based on 34 years of information in the Fire History Study, M.P. Rogeau concluded that on average Blue Ridge Lumber can anticipate that an average of 30 man caused fires will occur within the FMA high risk areas and that 68% of these fires will occur in the close proximity to gravel and unimproved roads.

Although there is a risk of increased fires with increased public access there is also the advantage that the public travelling on roads will report fires quickly. Various types of access is required for forest management activities such as regeneration assessments, spacing and cleaning, research, fire protection, and insect and disease protection.

5.7.9 Proportion of Large Fires

The Alberta Sustainable Resource Development defines a large sized fire as being a Class E if it has burned an area greater than 200 hectares. Most of the Class E fires that have affected the FMA area have originated outside of Blue Ridge Lumber operations. While studying the effects of fire, a larger land base covering an area 30 kilometers east, west, north and south of the FMA boundary was incorporated into the study. This larger area was referred by M.P. Rogeau as the Swan Hills area and totals an area of approximately 43,000 km².

The following table represents the Class E fires that have occurred in the Swan Hills area from 1961 to 1998. No Class E fires have occurred on the FMA area from 1999 to 2003. Since 1961, as the result of improved fire protection, the number of forest fires per 10 year period has been decreasing as well as the larger fires in sizes of >200 hectares and >1,000 hectares. The 1998 Virginia Hills fire was an exception to this trend.

Table 23: Total Number of Class E Fires 1961 to 1998

Period	Number of Fires	Number of Fires > 200 ha	Number of Fires >1000 ha	Maximum Fire Size	Year of Occurrence
1961-1970	1445	45	19	31,501	1968
1971-1980	1429	8	3	10,163	1974
1981-1989	1940	5	2	14,202	1981
1990-1998	972	3	3	168,821	1998

5.7.10 Fire Implications for the BRL FMA Area

Based on the historical fire occurrences from 1931 to 1998, M.P. Rogeau concluded that only 1 to 2% of the fires in the Blue Ridge Lumber FMA area would become larger than 200 hectares. The range of these larger Class E fires will vary in size from 300 hectares to the size of the 1998 Virginia Hills fire which was 168,821 hectares of which 112,700 hectares was within the BRL FMA area.

5.7.11 Fire Tower Visibility

There are four fire towers (Eagle, Imperial, Pass Creek and Swan Dive) located at strategic vantage points within the FMA area. Nine additional fire towers are located adjacent to the Blue Ridge Lumber FMA area. The following table lists the fire towers within and adjacent to the FMA area. These towers are manned throughout the fire season (April 1st to October 31st) by the Alberta Sustainable Resource Development. During periods of high hazard conditions the towers are supplemented by fixed-wing aircraft and helicopter patrols.

Table 24: Fire Towers Within and Adjacent to the FMA Area

Tower	Location	GPS Longitude & Latitude
*Berland Tower	NE-08-59-23-W5	54° 5.4138 – 117° 24.3632
Carrot Creek Tower	SW-33-51-13-W5	53° 26.76 – 115° 51.9
Chisholm	SE-02-69-01-W5	54° 56.46 – 114° 2.34
Deer Mountain Tower	SW-28-68-08-W5	54° 54.79 – 115° 9.66
*Eagle Tower	NW-13-63-17-W5	54° 24.2384 – 116° 26.3462
Flat Top	SW-14-71-06-W5	55° 8.748 – 114° 48.8
*Goose Mountain Tower	SW-34-66-14-W5	54° 45.1346 – 116° 2.1501
House Mountain Tower	NW-10-70-11-W5	55° 2.837 – 115° 36.0
*Imperial Tower	NE-22-63-11-W5	54° 28.1087 – 115° 34.2003
Mayberne	SE-30-56-18-W5	53° 51.67 – 116° 39.8
*Pass Creek Tower	SW-31-60-19-W5	54° 13.7091 – 116° 50.6161
Snuff Mountain	SE-03-66-24-W5	54° 40.69 – 117° 32.2
*Swan Dive Tower	NW-19-66-09-W5	54° 43.8200 – 115° 21.3368
Sweat House	SE-24-68-19-W5	54° 53.88 – 116° 45.0
Tom Hill	NW-16-57-16-W5	54° 55.77 – 116° 19.7
*Tony Tower	SW-35-62-24-W5	54° 24.1839 – 117° 39.6021
Vega Tower	NW-05-63-05-W5	54° 25.70 – 114° 25.6
*Whitecourt Tower	NE-21-58-12-W5	54° 1.9164 – 115° 43.0239

* Fire towers administered by Woodlands Forest District within the FMA area.

Alberta Sustainable Resource Development also operates an air tanker base, which is located at the Whitecourt Airport. This fire retardant mixing station helps provide fast efficient fire protection to the Woodlands Forest District and surrounding areas with the use of “air bombers”.

The effectiveness of fire lookout coverage is excellent, however, there are several small areas in the FMA area that are blind or are outside of the visible 25 mile (40 kilometer) limit. Refer to the following table for the list of the blind areas and the areas that are outside of the visible 40-kilometer limit.

Table 25: Fire Tower Blind Areas

Township	Range
64	14 & 15
63	14
62	13
62	15
61	17
60	17

5.7.12 Whitecourt Fire Management District Landscape Fire Assessment Project

The disastrous May 1998 fire season reinforced the need by the Province and industry for landscape level fire management planning. Several meetings and workshops have been initiated to encourage discussion. Blue Ridge Lumber attended the July 3, 1998 meeting in Edmonton and the June 22, 1999 meeting in Whitecourt. The message from these meetings was that Sustainable Resource Development must take the lead role for developing a landscape protection plan with the cooperation of the forest products industry and other organizations.

In the fall of 1999 a “pilot project” was launched to carry out a “wildfire threat analysis” in the Woodlands Forest Area. Information gathering was initiated to help land and resource managers evaluate wildfire threat. The strategy at that time included the use of Forest Management activities to manage fuels, thereby reducing wildfire threat. FMA holders including Blue Ridge Lumber, ANC Timber Ltd. and Millar Western Forest Products Ltd. participated with SRD staff in the planning process.

In December 2000 a team consisting of FMA representatives and Government land management staff were selected to complete a landscape fire assessment for the Whitecourt Fire Management District.

In February 2001, a Term of Reference for the Whitecourt Fire Management District Landscape Assessment Project was drafted by SRD with the participating FMA holders.

In November 24, 2003 BRL staff attended the SRD Wildfire Threat Model Workshop in Edmonton and received the manual and the Wildfire Threat Models.

The following is a brief description of the Whitecourt Fire Management District Landscape Fire Assessment project.

Ideally, landscape objectives will help define locations and time periods where fire would be considered beneficial or detrimental. Team members will collaborate and participate in all phases of the assessment process. The responsibility for establishing provincial priorities remains with the government. The initial task for the Landscape Fire Assessment Team will be

to identify locations and time periods where fire is undesirable, and desirable. The team task will develop a “preferred fire profile.”

This fire profile will characterize preferred fire attributes (e.g. exclusion areas, proportions of watersheds in various locations, size, distribution, connectivity, etc). The framework, data, and technology are expected to adapt to new knowledge as it is acquired in this quickly evolving science. The ability to achieve landscape goals and objectives depends largely on the effectiveness of wildfire management. Recognizing the negative and positive economic, ecological and social impacts of wildfires is an important component of sustainable forest management. Wildfire is an integral part of a healthy Boreal Forest ecosystem, and is a dominant force affecting both ecosystem structure and function. The challenge for land and resource managers is to maintain ecosystem integrity while securing a continuous flow of products and values from our forests. In order to accomplish these desires, management activities must consider fire at many spatial and temporal scales.

The landscape fire assessment process involves the evaluation of both negative and positive impacts of forest fires. The “wildfire threat assessment” process is used to identify the potential negative impacts. The positive impacts are revealed through a “fire regime analysis”. Both processes are intended to increase our understanding of the fire environment, which will lead to “FireSmart Forest Management.” In the absence of clearly defined landscape objectives, the assessment process will initially focus on wildfire threat. Early implementation of key strategies is a critical step towards reducing the risk and uncertainty due to wildfires. An adaptive forest management framework will allow the inclusion of additional land management objectives (including biodiversity, watershed, soils, public recreation, special places, etc), as this information becomes available.

Therefore the primary objective of the Whitecourt Fire Management District Landscape Fire Assessment is to support land management objectives by identifying areas of unacceptable wildfire threat, and to suggest strategies to reduce wildfire threat within the study area. Examples include reducing fire risk around forest communities such as Swan Hills and Fox Creek. Blue Ridge Lumber is working cooperatively with the Whitecourt Forest Fire Protection Division, and the Town of Swan Hills to develop a long-range harvesting plan around the Town.

A FireSmart landscape assessment will help resource managers understand the positive and negative impacts of wildfire, and provide a framework for addressing wildfire in both strategic and operational plans. Collaboration between Government and non-Government resource and land management staff is essential to the development of relevant objectives and strategies that will be included and made operational through future forest and other resource management plans. The landscape assessment process will be a dynamic framework and approach, which will rely on periodic adaptations and updates based on data availability and technological advancements.

“FireSmart” (Hirsch et al., 2000) is an approach to the integration of forest management activities in a wildfire disturbance-based ecological system. A fundamental shift in our approach to fire management is essential to achieve landscape-level goals and objectives. Proactive

identification of fire management “engineering” options will enhance our fire suppression efforts, including strategic placement of barriers to fire spread. Key components of assessment will include analysis of potential fire behavior, fire risk-occurrence, values, and suppression capability. Various scales of assessment will occur, and both spatial and temporal projections will be required. An understanding of the fire environment will contribute to the protection of Provincial priorities including human life, communities, watershed & soils, natural resources, and infrastructure.

“**Fire Smart: Protecting your Community from Wildfire**” is published in Edmonton Alberta by Partners in Protection, an Alberta based coalition dedicated to raising awareness and providing information that will reduce the risk of wildfire losses in the wildland/urban interface.

The address for Partners in Protection is:

P.O. Box 45047

Landsdowne Postal Station

Edmonton, Alberta

T6H 5Y1

Phone (780) 435-7283

Web <http://www.partnersinprotection.ab.ca>.

5.7.13 Fire Prediction Models

To reduce the incidence of forest fires in Canada, the Canadian Forest Service has developed two excellent fire tools: *Canada’s Fire Weather Index and Fire Behavior Prediction System (FBP)*. The Fire Behavior Prediction System groups all the forest fuels in Canada into 17 national fuel types. The Blue Ridge Lumber FMA area contains 14 of these fuel types. Each fuel type in the model has a certain rate of spread, fuel consumption, head, fire intensity and fire growth description.

Recently a prototype *Wildfire Threat Rating System (WTRS)* was developed to assist land managers to determine how different land use decisions will affect the wildfire threat in a given area. Wildfire threat is a function of the following four main components: ignition risk, protection of values, suppression capability and fire behavior. Incorporating the WTRS into landscape management planning assists resource managers with decision making in examining the implications of a major shift in harvesting or silviculture activities or in assisting in fire fighting activities and will lead to a reduction in the risk of wildfires. The Alberta Vegetation Inventory (AVI) data from the Blue Ridge Lumber FMA area was converted into the fuel types. Blue Ridge Lumber has also been assisting Alberta Sustainable Resource Development to develop a “*Values as Risk*” assessment to help develop long-term fire protection strategies.

Please refer to the following table for specific fire fuels that are present on the FMA area. The WTRS can also be used to prepare a map from AVI showing the location of the high risk, highly flammable timber types.

Table 26: List of Fuel Types that are Common to the Blue Ridge Lumber FMA Area

Fuel Type Group	Fuel Type Abbreviation	Timber Type
Conifer	C-1	Spruce – lichen woodland
Conifer	C-2	Boreal spruce
Conifer	C-3	Mature Jack or lodgepole pine
Conifer	C-4	Immature Jack or lodgepole pine
Conifer	C-6	Conifer plantation
Deciduous	D-1	Leafless aspen
Mixedwood	M-1	Boreal mixedwood – leafless
Mixedwood	M-2	Boreal mixedwood – green
Mixedwood	M-3	Dead Balsam Fir/mixedwood – leafless
Mixedwood	M-4	Dead Balsam Fir/mixedwood – green
Slash	S-1	Jack or lodgepole pine slash
Slash	S-2	White spruce/Balsam slash
Open	O-1a	Matted grass
Open	O-1b	Standing grass

The Fire History Study, which was completed for the Blue Ridge Lumber FMA area January 1999, is also a useful management-planning tool, which identifies:

- Fire causes and season of fires
- Lightning caused fires, and lightning strike density map
- Probability of ignition map and implication for the BRL FMA area

The Province offered an “*Integrated Fire and Forest Management*” course through the University of Alberta Faculty of Extension in 1999 and at the Environmental Training Centre in Hinton in the year 2000. BRL also attended the Wildfire Treat Model Workshop in Edmonton on November 24, 2003 and received the following materials:

- Alberta Vegetation Inventory Fire Behavior Prediction Model (FBP)
- Crowning Susceptibility Model (CroSuM) Application and Users Guide
- Fire Smart Landscape – A Discussion Paper
- DFMP Manual – Fire Smart Landscape Annex
- Wildfire Threat Assessment Model and Users Guide

The Wildfire Threat Assessment Model can be used to create various maps such as:

- Fire Behavior Potential – Spring, Summer, Fall
- Fire Occurrence Risk – Spring, Summer, Fall
- Wildfire Threat – Spring, Summer, Fall
- Values at Risk
- Suppression Capability
- FBP Fuel Types

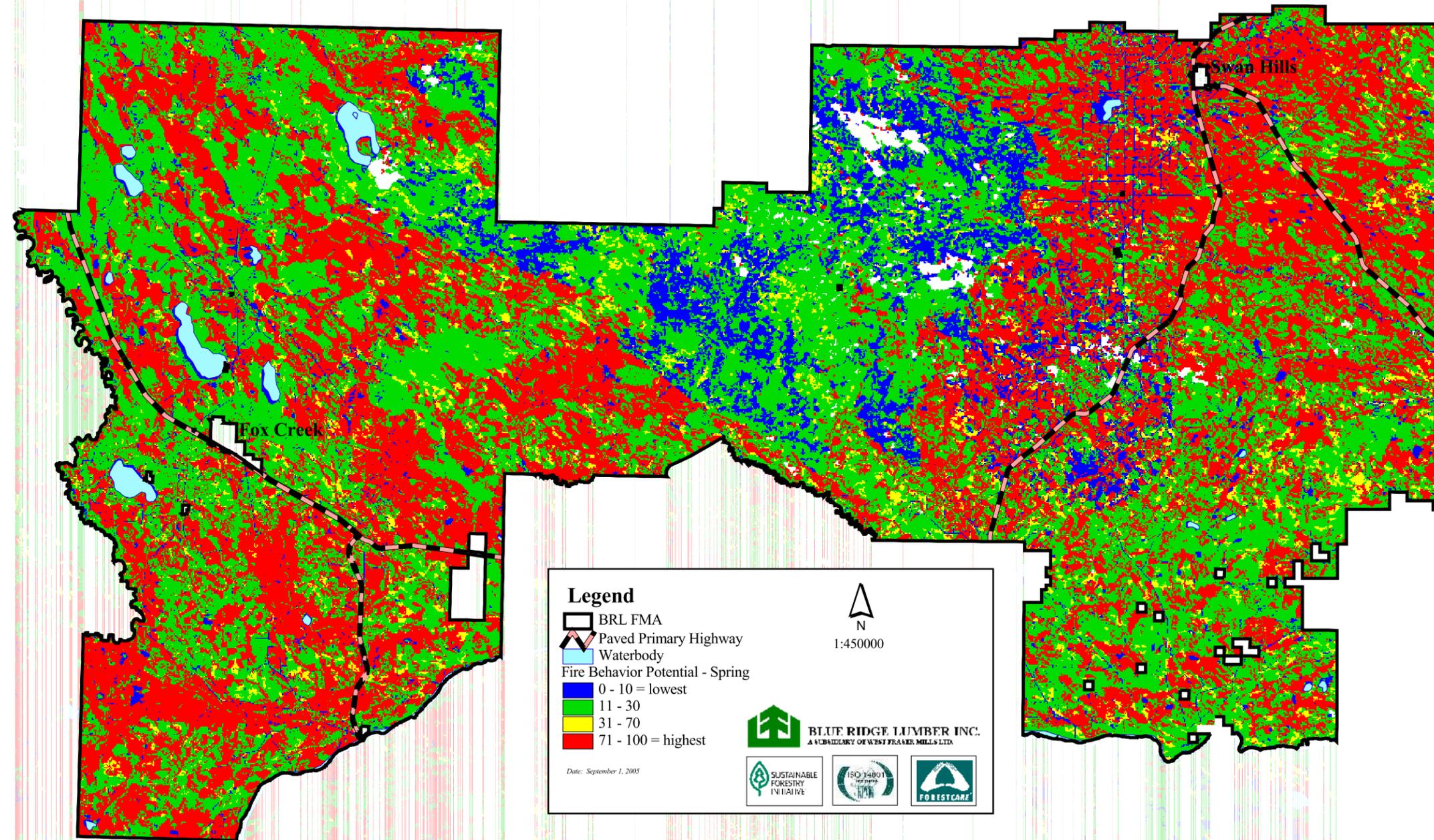
Please refer to the 5 maps on the following pages that show Fire Behavior Potential (spring), Fire Occurrence Risk (summer), Wildfire Threat (spring), Values at Risk and Suppression Capability for the FMA area.

The models (maps) show that the Town of Swan Hills is at very high risk due to the high lightning probability and the large amount of old timber located along the entire ridge. The Town of Swan Hills has been evacuated, or put on standby alert on numerous occasions over the past several decades because of large campaign forest fires. Records from Disaster Services show that the Town of Swan Hills was evacuated in 1973 (no month or day known), August 10, 1981, August 17, 1981, May 5, 1998 and May 13, 1998.

BRL will continue to work with SRD and the Town of Swan Hills to reduce the Wildfire Threat for the Town.

The Province is currently working on a fire prediction model of susceptibility to crowning to predict crowning potential. This model will overlay the FPB model. The Province is also working on a Fire Growth Model using the Foothills Model Forest as a template. The Canadian Forest Service and Sustainable Resource Development are developing a *Crown Susceptibility Model*, and the Canadian Forest Service is developing a *Wildfire Growth Model*.

BLUE RIDGE LUMBER INC.
FOREST MANAGEMENT AGREEMENT AREA
FIRE BEHAVIOR POTENTIAL (SPRING)



Legend

-  BRL FMA
-  Paved Primary Highway
-  Waterbody
- Fire Behavior Potential - Spring
-  0 - 10 = lowest
-  11 - 30
-  31 - 70
-  71 - 100 = highest



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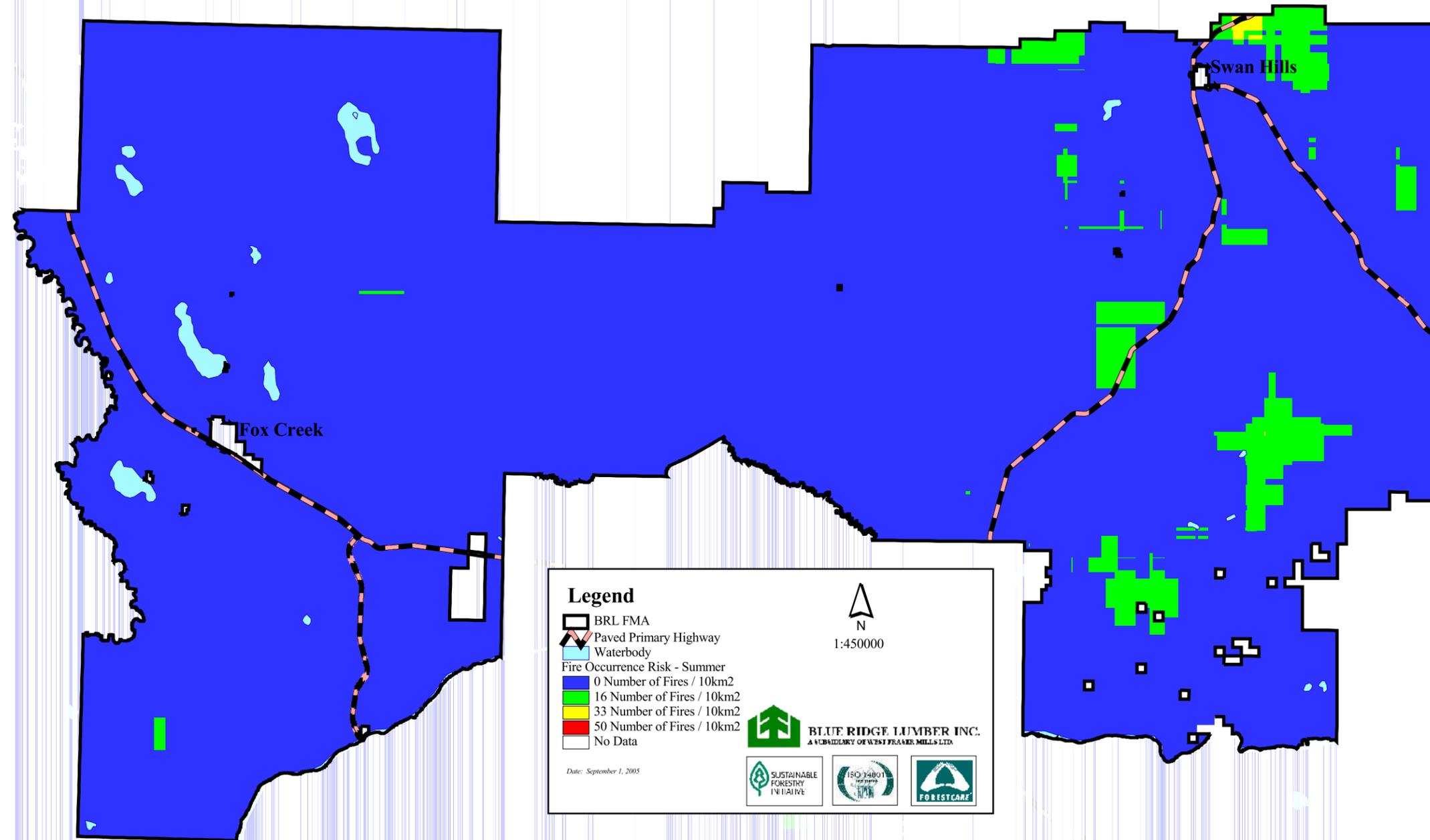
Date: September 1, 2005



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BLUE RIDGE LUMBER INC.
FOREST MANAGEMENT AGREEMENT AREA
FIRE OCCURRENCE RISK (SUMMER)



Legend

- BRL FMA
- Paved Primary Highway
- Waterbody
- Fire Occurrence Risk - Summer**
- 0 Number of Fires / 10km²
- 16 Number of Fires / 10km²
- 33 Number of Fires / 10km²
- 50 Number of Fires / 10km²
- No Data



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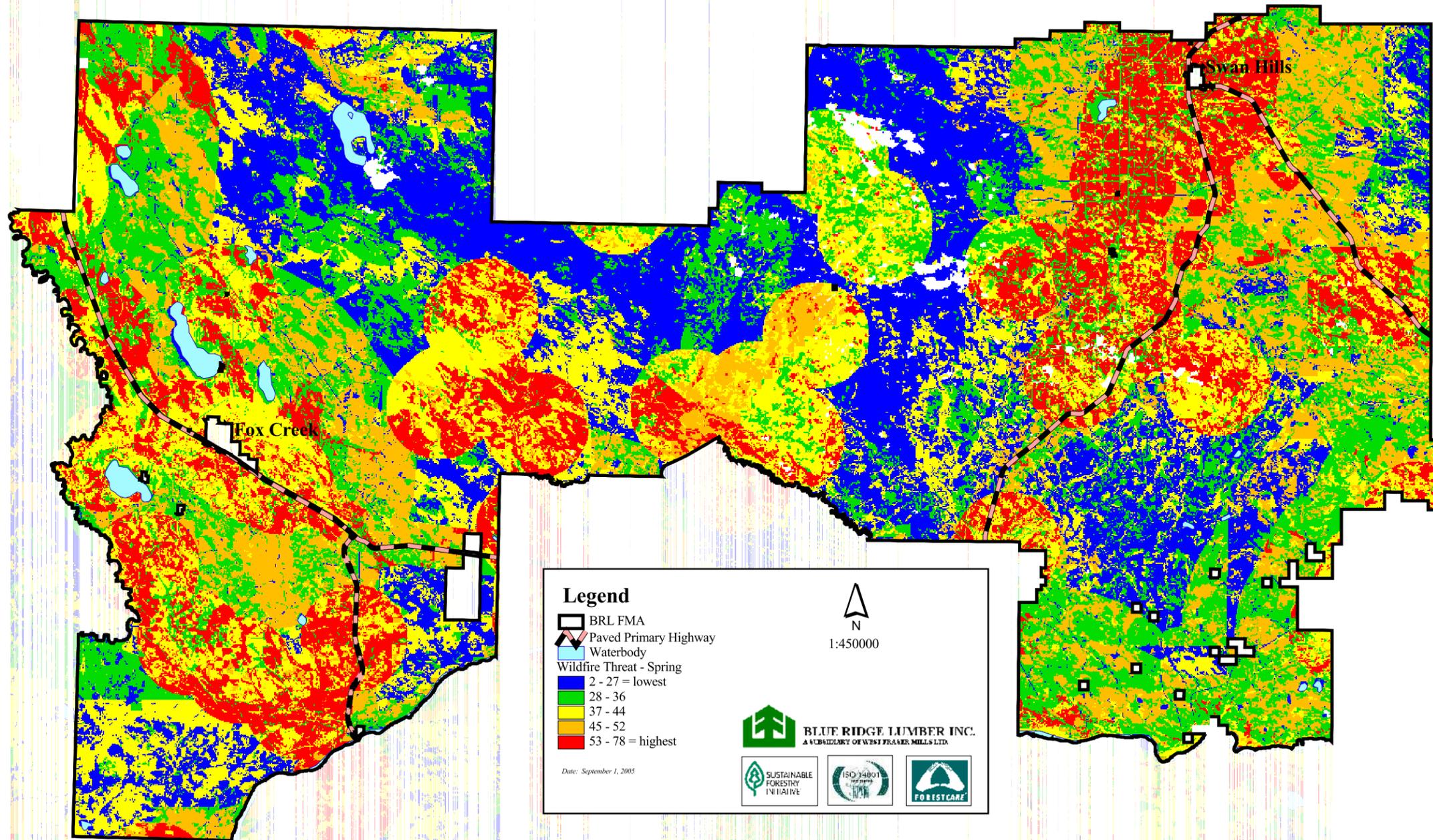
Date: September 1, 2005



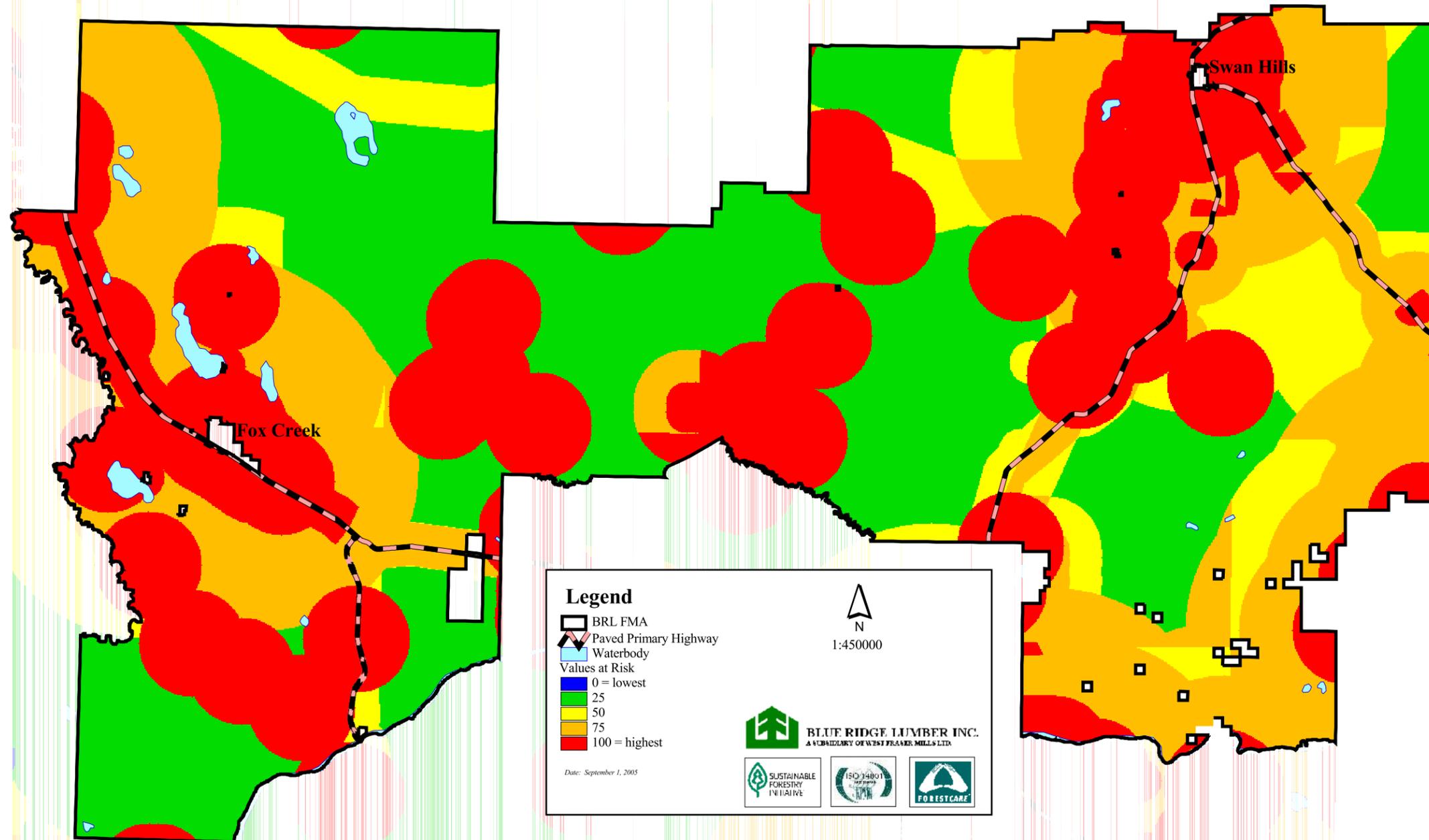
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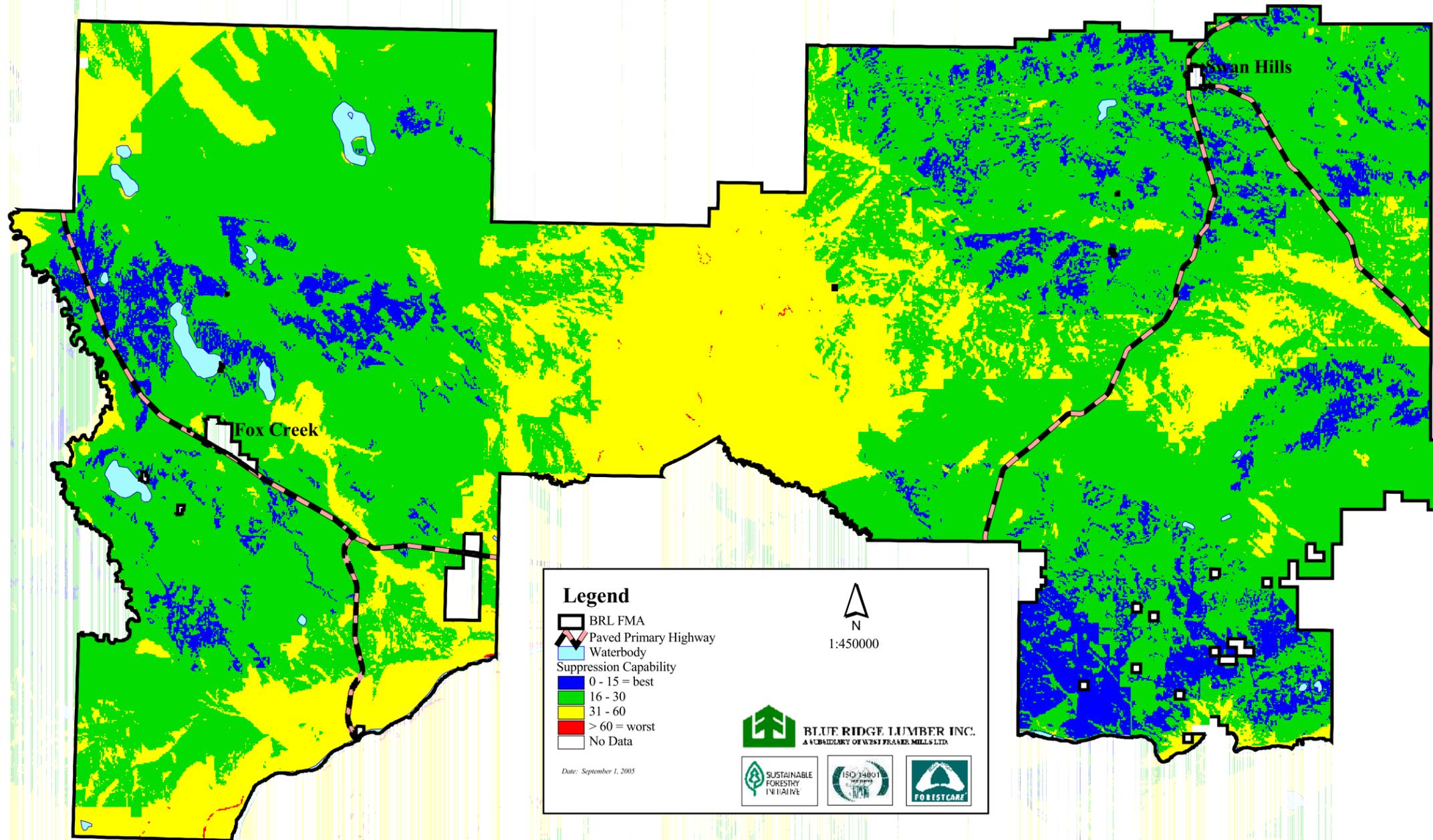
BLUE RIDGE LUMBER INC.
FOREST MANAGEMENT AGREEMENT AREA
WILDFIRE THREAT (SPRING)



BLUE RIDGE LUMBER INC.
FOREST MANAGEMENT AGREEMENT AREA
VALUES AT RISK



BLUE RIDGE LUMBER INC.
FOREST MANAGEMENT AGREEMENT AREA
SUPPRESSION CAPABILITY



Legend

- BRL FMA
- Paved Primary Highway
- Waterbody
- Suppression Capability
 - 0 - 15 = best
 - 16 - 30
 - 31 - 60
 - > 60 = worst
 - No Data

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Date: September 1, 2005

5.8 Fish and Wildlife

5.8.1 General Overview

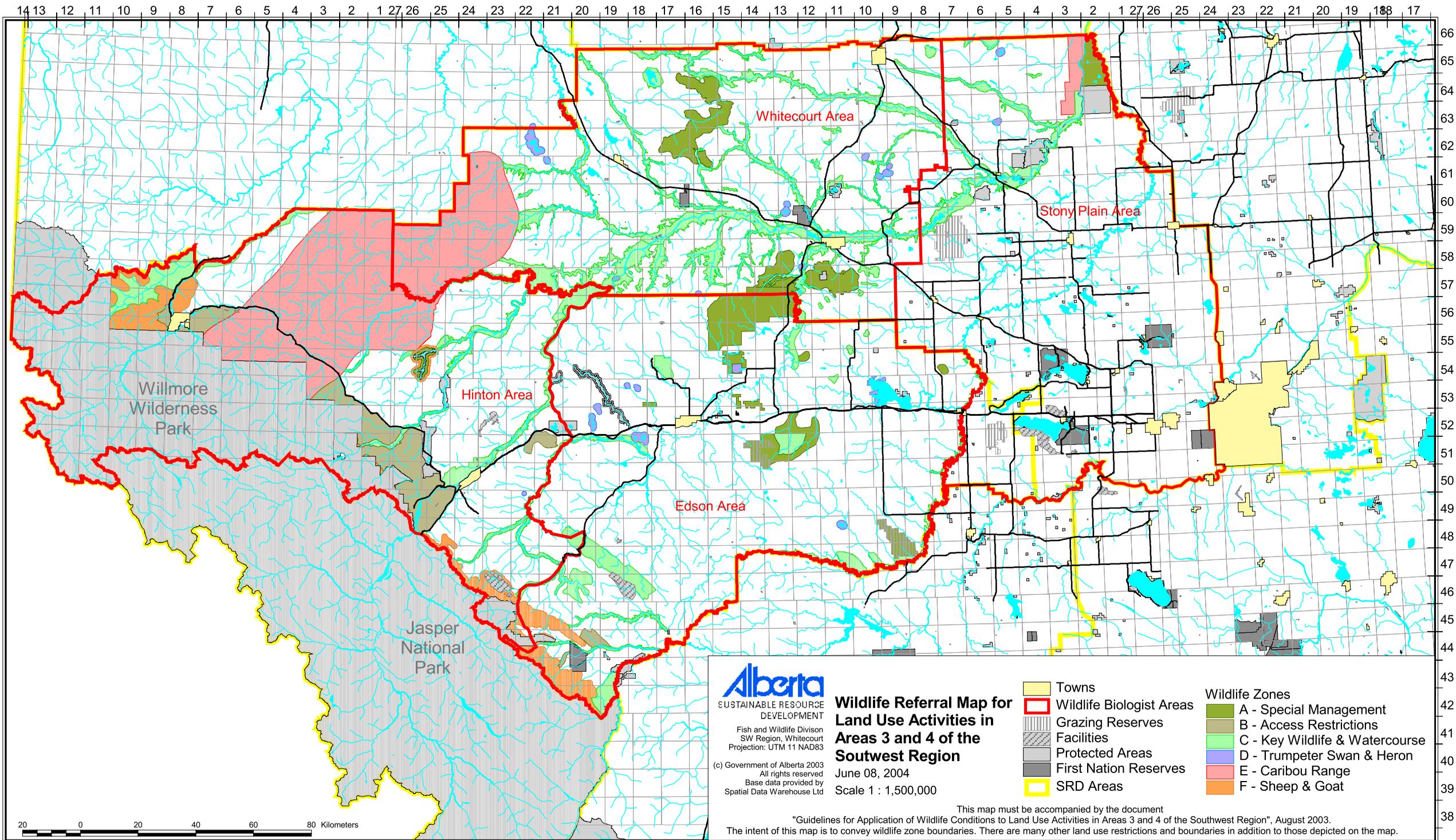
Blue Ridge Lumber internally manages its activities so that it mitigates or reduces the impact on the fisheries resource. This is accomplished by Company staff having a sound knowledge of pertinent water regulations and operating ground rules. All construction and maintenance of roads and bridges are consistent with provincial guidelines, legislation and authorizing documents. Once water crossings have been established they are annually monitored until they have been sufficiently stabilized.

Prior to any road building or harvesting in a new operating area, the Company checks for any wildlife concerns that are identified in the *“Wildlife Guidelines for Land Use Activities in Areas 3 and 4 of the Southwest Region – Fish and Wildlife Division, September 15, 2005.”* These guidelines are included in Appendix 9 and the wildlife referral map (June 8, 2004) is shown on the following page. Updates for these Provincial guidelines can be found on the web at <http://www3.gov.ab.ca/srd/fw/landuse>.

This map assists staff to determine the key wildlife species, season of harvesting, layout constraints and any access constraints that may have to be considered during operations within the specific area.

To further the Company’s understanding of wildlife habitat requirements, a habitat matrix has been developed by BRL for all the mammals that are found in the FMA area. The mammal habitat matrix is included in Appendix 10.

Blue Ridge Lumber will continue to train Woodlands planning staff to ensure that they are current with the latest information on fish and wildlife habitat requirements.



Alberta
SUSTAINABLE RESOURCE DEVELOPMENT
Fish and Wildlife Division
SW Region, Whitecourt
Projection: UTM 11 NAD83

Wildlife Referral Map for Land Use Activities in Areas 3 and 4 of the Southwest Region

June 08, 2004
Scale 1 : 1,500,000

(c) Government of Alberta 2003
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Base data provided by Spatial Data Warehouse Ltd

- Towns
- Wildlife Biologist Areas
- Grazing Reserves
- Facilities
- Protected Areas
- First Nation Reserves
- SRD Areas

- Wildlife Zones**
- A - Special Management
 - B - Access Restrictions
 - C - Key Wildlife & Watercourse
 - D - Trumpeter Swan & Heron
 - E - Caribou Range
 - F - Sheep & Goat

This map must be accompanied by the document "Guidelines for Application of Wildlife Conditions to Land Use Activities in Areas 3 and 4 of the Southwest Region", August 2003. The intent of this map is to convey wildlife zone boundaries. There are many other land use restrictions and boundaries in addition to those depicted on the map.

5.8.2 Endangered, Threatened and Vulnerable Species in Alberta

Federal species with population concerns are grouped into categories of endangered, threatened or vulnerable. Endangered species are those which are facing extinction. Threatened species are those, which could become endangered if limiting factors are not reversed. Vulnerable species are those which are extremely sensitive to human activity or any other type of disturbance. The Committee on the Status of Endangered Wildlife in Canada carefully watches species, which fall into these categories, for any changes in the population.



Alberta Environmental Protection has established lists of species within Alberta, which are at risk of decreasing populations. These lists are based on research on abundance, breeding distribution, security of habitats, status in other areas, and current population trends of each species. The status categories differ from the ones used for species throughout Canada and are known as green, yellow, red (at risk) and blue (may be at risk) lists.

For a list of endangered, threatened and vulnerable species in Alberta please refer to the web at: <http://www3.gov.ab.ca/srd/fw/speciesatrisk>. The status of Alberta's wildlife is continually being assessed and the goal is to recognize a population problem before the species is at serious risk.

Lisa Wilkinson is the Regional Endangered Species Specialist, Alberta Fish and Wildlife Division, Box 27 Provincial Building, #203, 111 – 54 Street, Edson, Alberta, T7E 1T2 telephone (780) 723-8556 fax (780) 723-7963 or email Lisa.Wilkinson@gov.ab.ca.

Projects in the Northern East Slopes for the 2001-2002 and 2002-2003 fiscal years include the following:

- Long-toed salamander and frog monitoring (Hinton area)
- Western grebe literature review (Stony Plain area)
- Rare plant inventory (White zone between Edson, Whitecourt and Stony Plain)
- Wolverine inventory (DNA analysis winter 2001)
- Caribou monitoring and habitat rehabilitation (Little Smoky)
- Grizzly Bear Research (Hinton area)

Species at risk in the Northern East Slopes Region are summarized in the following table:

Table 27: Species at Risk in the Southwest Region, Woodlands Area

At Risk (Threatened)	May be at Risk	Status Undetermined
Woodland Caribou	Grizzly Bear	Long-eared Bat
Trumpeter Swan	Long-tailed Weasel	Brown Lemming
Peregrine Falcon	Northern Long-eared Bat	Taiga Vole
	Wolverine	Black-billed Cuckoo
	Swainson’s Hawk	Yellow Rail
	American Bittern	Yellow-bellied Flycatcher
	Short-eared Owl	Pacific-slope Flycatcher
	Columbia Spotted Frog	Cordilleran Flycatcher
	Canadian Toad	Pearl Dace
	Pygmy Whitefish	Finescale Dace
	Spoonhead Sculpin	
	“Athabasca” Rainbow Trout	

Source: Regional Endangered Species, Alberta Fish and Wildlife Division, January 2002

Blue Ridge Lumber will continue to make key employees and contractors aware of the ***Blue Ridge Lumber Reporting Policy for Rare and Unique Discoveries and Scarce Resources*** (Appendix 6). The Blue Ridge Lumber Scarce Resource Reporting Policy addresses the strategies for the discovery of locations of any class of endangered, threatened and vulnerable species.

Additional information on species at risk can be found at:

- <http://www3.gov.ab.ca/srd/fw/speciesatrisk> - Provincial Species at Risk
- Provincial Wildlife Act – provides a legal designation for threatened, endangered species in Alberta.
- www.sararegistry.gc.ca – Federal Species at Risk
- COSEWIC – an independent scientific Committee on the Status of Endangered Wildlife in Canada.
- <http://www.iucn.org/themes/ssc/redlists>
- Endangered Species Conservation Committee (ESCC) and Scientific subcommittee (SSC)

5.8.3 Fish Surveys

The Blue Ridge Lumber FMA area was surveyed by RL and L Environmental Services Ltd. in 1995. A copy of their report titled “*Fisheries Inventory for Swan Hills Whitecourt Integrated Resource Area*” is used by Blue Ridge Lumber. The information that is contained in this document has been input into our GIS system as a resource information layer to assist with annual operating plan development and fish timing constraints for stream crossings.

5.8.4 Fishing

Sportfishing has become a popular pastime of Albertans and many people enjoy this outdoor recreation within the FMA area. However, currently the pressure on fish populations is increasing in Alberta. According to Environmental Protection, angling pressure in the Eastern Slopes streams has more than doubled since 1990. Because of this increase in sportfishing, there has been a growing emphasis placed on preserving the fishing habitat, as well as the variety of species of fish found in Alberta.

The following is a list of common species of sport fish, which can be found within the FMA area:

- Rainbow Trout – *Oncorhynchus mykiss*
- Brook Trout – *Salvelinus fontinalis*
- Arctic Grayling – *Thymallus arcticus*
- Mountain Whitefish – *Prosopium williamsoni*
- Lake Whitefish – *Coregonus clupeaformis*
- Northern Pike – *Esox lucius*
- Walleye – *Stizostedion vitreum vitreum*
- Yellow Perch – *Perca flavescens*
- Burbot – *Lota lota*

The FMA area lies within the Provincial Fish Management Unit 4, which includes the Districts of Edson, Fox Creek, Swan Hills and Whitecourt, and fish management zones ES3 Athabasca/Pembina River Watershed, ES4 Smoky River Watershed and NB2 Athabasca/Lesser Slave River Watershed.

In order to enhance angling enjoyment, several popular sport fishing lakes and streams have been stocked within and adjacent to the BRL FMA area as summarized below.

Table 28: Lakes Stocked with Fish Within and Adjacent to the BRL FMA Area

Name	Legal Location
Thunder Lake	04-45-19 W5
Trout Creek Beaverpond	
Crystal Lake	SE 31-59-18 W5
Fox Creek Trout Pond	N 13-63-20 W5
Marigold Lake	32-65-11 W5
Schuman Lake	35-61-08 W5
Corebett #1	06-01-61-08 W5
Corbett #2	14-01-61-08 W5
Emerald Lake	SW 5-62-11 W5
Pine Point Borrow Pit	22-63-20 W5
McLeod (Carson Lake)	30-61-11 W5
Stone Lake	22-63-09 W5
Tamarack Lake	10-66-12 W5
Thunder Lake	04-45-19 W5
Freeman Lake	66-11 W5
Emerson Lake	NW 05-62-11 W5

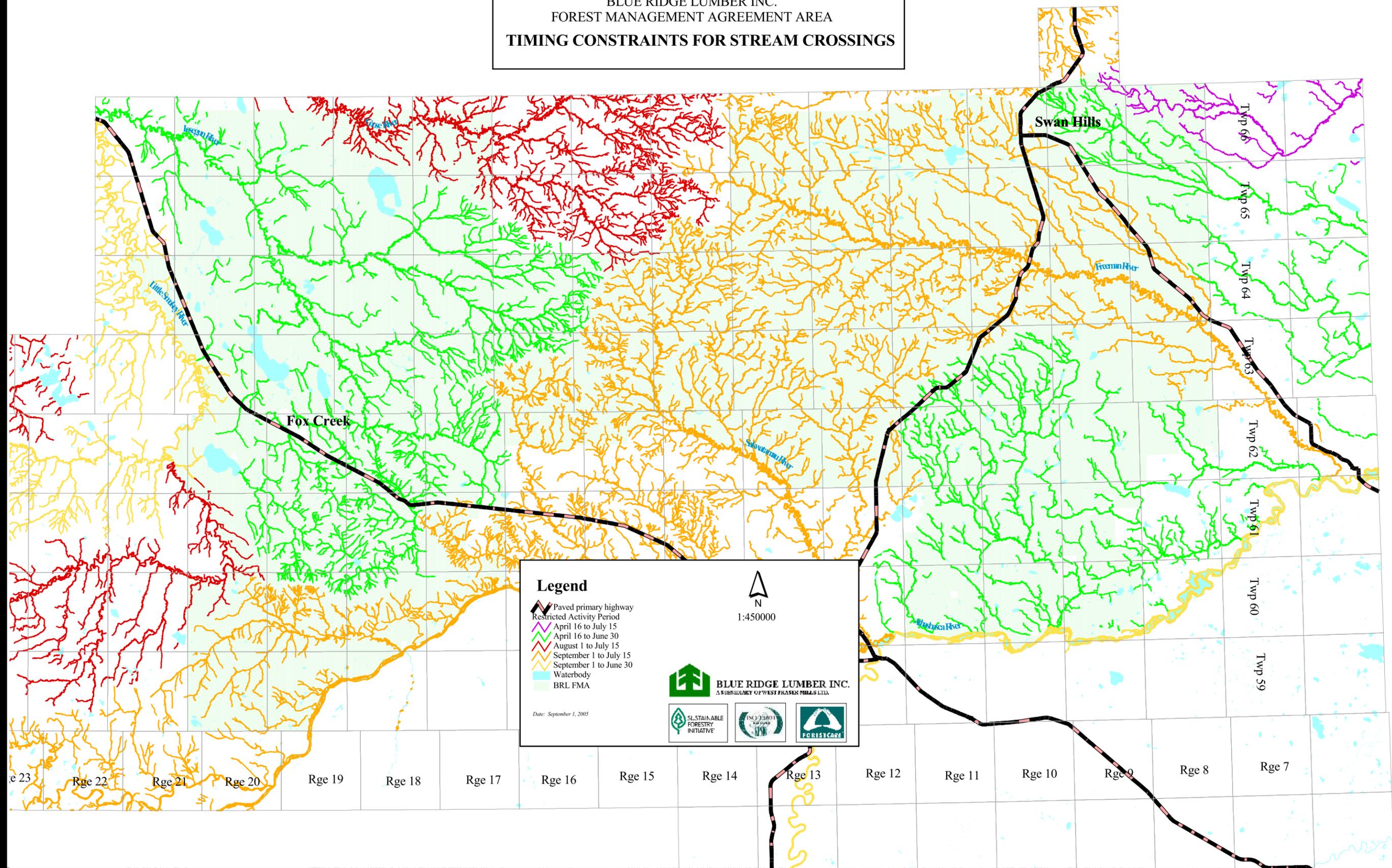
During the inventory of the streams in the **“Swan Hills Whitecourt Integrated Resource Plan Area”** conducted by RL & L Environmental Services Ltd., they noted that there was very little fishing activity in some of the streams in the FMA area. A possible explanation for this could be that Carson-Pegasus fishing is very good because of the high annual numbers of rainbow trout fingerlings that are added to McLeod Lake and also the close proximity of this lake to Whitecourt.

Blue Ridge Lumber has implemented management practices within the FMA area to protect and secure the fish resource. This includes taking special care to conduct operations in a manner, which minimizes soil disturbance and surface flow of water over exposed mineral soil and to minimize the volume of sediment entering watercourses. All stream crossings will be properly installed using culverts or bridges in order to maintain fish passage and to minimize stream bed and bank disturbance. Construction of culverts and bridges and harvesting is restricted during fish spawning, egg incubation and fry emergence.

Blue Ridge Lumber is sensitive to the important needs of fish species in the FMA area and takes care to ensure operations are in compliance with fish and wildlife guidelines. In addition, watershed protection and watercourse crossing guidelines are clearly stated in the “Timber Harvest Planning and Operating Ground Rules” and these will be strictly adhered to by all staff and contractors at Blue Ridge Lumber.

Please refer to the map on the following page that shows the timing constraints for stream crossings.

BLUE RIDGE LUMBER INC.
 FOREST MANAGEMENT AGREEMENT AREA
TIMING CONSTRAINTS FOR STREAM CROSSINGS



Legend

- Paved primary highway
- Restricted Activity Period**
- April 16 to July 15
- April 16 to June 30
- August 1 to July 15
- September 1 to July 15
- Waterbody
- BRL FMA

Date: September 1, 2005

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BLUE RIDGE LUMBER INC.
 A SUBSIDIARY OF WEST FRASER PULP LTD.

SUSTAINABLE FORESTRY INITIATIVE

ISO 26001

FOREST CARE

5.8.5 Laura Lake Aeration Project

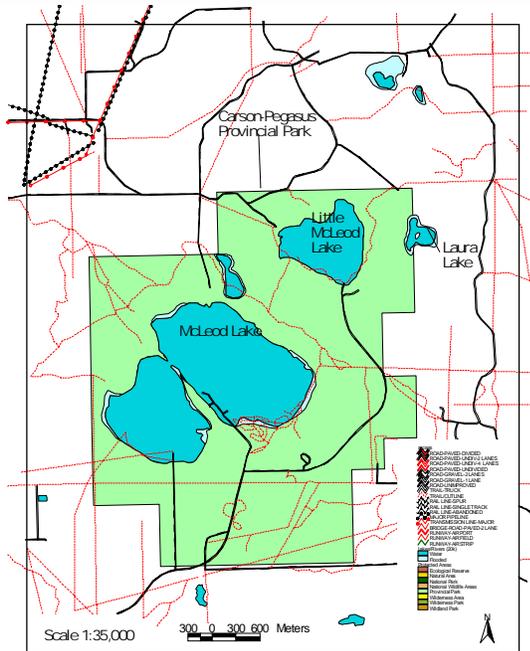
Blue Ridge Lumber is a funding partner of the Laura Lake Aeration Project.

The Alberta Conservation Association, Alberta Sustainable Resource Development / Fish and Wildlife Service and the Whitecourt Fish and Game Association have been working collectively on the development of an aeration project at Laura Lake. The goal of the Laura Lake aeration project is to increase oxygen levels so that a lake fishery can be developed which will create new angling opportunities in the Northern East Slopes.

Laura Lake is located in Township 61, Range 11, W5M approximately 18 kilometres north of Whitecourt and straddles the boundary of Carson-Pegasus Provincial Park. Laura Lake lies in a depression area surrounded by conifer covered hills. It is approximately 8 hectares in size and has a maximum depth of 25+ feet. The lake is fairly shallow in most areas with a few deep locations. The lake was stocked with Arctic grayling in 1985 and 1987, but results from test netting in 1989 revealed that all grayling had died, likely a result of winterkill. Brook trout were also stocked in the lake in the 1970's, and they also were unable to survive the winters on a regular basis due to low oxygen levels. The lake is currently not stocked, but if the aeration project is successful, plans will be made to stock the lake with fish. The initiation of an aeration project at Laura Lake will provide anglers with another angling opportunity in an area that has relatively few lakes.

A hydro line will be installed along an existing roadway in order to supply power to run the aerators. A reclaimed road and lease site exist at the end of the existing road which is used for providing access, as well as for extending the hydro line. The remaining 150-200 meters will be trenched either through the trees or along the existing walking path so that the aesthetic values of the area are not compromised. A walking trail exists from the reclaimed lease to provide access to the lake, which will result in no motorized traffic at the lake. A staging area will exist near the lake where a picnic table, dock and a kiosk can be installed.

The end result of the efforts will be that a new lake will be stocked with fish in the Whitecourt area, which will provide anglers with another fishing opportunity in the region. Aeration in the winter months will prevent winterkill from occurring and this will likely result in trophy-sized trout being produced at this lake. Only foot access will be allowed to the lake, which will result in different type of angling experience than nearby McLeod Lake. A sign describing the project and the contributing partners will be installed near the access point.



Map of Laura Lake

Laura Lake looking from the height of land

5.8.6 Northern Moose Management Program

Wildlife management units 347, 349, 350 and a very small portion of 353 and 507 fall within the Blue Ridge Lumber FMA area. WMU 350 is considered one of the prime moose producing areas within the province.

In 1993 the Northern Moose Management Program was initiated by Fish and Wildlife Division to gather information on the moose populations in Northern Alberta. Biologists set out to determine population, size, sex, and age composition of herds as well as reproductive performance and moose mortality factors. The survey was conducted by flying the area, darting the moose and fixing a radio transmitter collar to the animal. Moose collared in previous years are also relocated to ensure their survival. Wildlife Management Units (WMU) were determined and all units were surveyed in 1993/1994 in order to identify areas of concern. From this point on, specific wildlife management units were targeted each year. The survey was carried out by flying the WMU in a fixed wing twice a month to record the locations of radio tagged moose as well as an autumn and spring helicopter flight to determine the number of calves which will begin the winter.

The Northern Moose Program has been an excellent source of data for industry and government to use when planning forest activities. In summary the moose survey results for WMU's 347, 349, and 350 for the period 1993 to 1997 show that there was a general downward trend in the number of moose observed in the WMU's except in WMU 350 where there was a 21% increase in the number of moose.

The 2000 Moose Survey in WMU 349 indicated that the moose population was $3,277 \pm 605$, with 578 bulls, 1966 cows, and 733 calves. This survey suggests the population has not changed much since 1997 (2976 ± 585 moose). Approximately 3.4% of the surveyed moose had light hair loss and .2% had moderate hair loss due to ticks.

The 2000 Moose Survey in WMU 347 indicated that the moose population was 1068 ± 173 , with 90 bulls, 678 cows, and 300 calves. This survey suggests that the moose population has decreased 45.6 % since 1998 (1965 ± 383 moose). The decrease is suspected to be due to ticks brought in by white tail deer from the agriculture area. Approximately 7.2% of the moose had light hair loss and 1.1% of the moose had moderate hair loss due to ticks.

Prior to harvesting in a new operating area, the Company checks for any wildlife concerns or key moose zones that are identified on the “*Wildlife Referral Map and Guidelines.*” Objectives will be developed at the Compartment Assessment stage (CA) in accordance with the new Operating Ground Rules.

These objectives will be consistent with the assumptions in the timber supply analysis. This will allow the planner to incorporate a wide range of block sizes and to take into account line of sight, distance to hiding cover and distance to thermal cover, residual structure, wildlife

corridors, topography, presence of understorey, location of roads, pipelines and power lines and potential blowdown.

Direct sight distances will be managed where cutblocks are immediately adjacent to accessible permanent Class I, II or III roads. Generally targets for the limits of sight distance will be 400 m but the Department and the forest operator will be able to justify different targets during the harvest planning stage in the Compartment Assessment. Various features such as roadside vegetation, topography, protected understorey, structure retention, and block shape are used to limit line of sight.

Proposed harvest areas that are contained within the identified moose zone on the Referral Guidelines Map require managed access either through the use of gates, or other means such as pulling out significant watercourse crossings. There is also an attempt to minimize the distance to thermal cover within these zones. Generally distance is targeted to be not greater than 200 m but flexibility is essential in order to achieve other design objectives.

5.8.7 Hunting

Hunting is common throughout the FMA area. Fish and Wildlife issue licenses. Big game hunting is a popular sporting activity within the FMA area for moose, deer, and black bear. Popular game bird hunting in the area includes goose, sharp-tailed grouse, ruffed grouse, and spruce grouse, all of which are commonly found in the area.

The present patch harvesting method alters the environment for wildlife, which can be beneficial for some species of wildlife and detrimental to others. Generally, moose, elk, and deer browse and benefit greatly from the increased vegetation available on cutblocks following harvesting.

The following lists the wildlife management unit estimates of animals harvested and hunter success in 1995 in the FMA area. Estimates are based on Fish and Wildlife Division information.

Hunter success by animal species in 1995 for Wildlife Management Units 349 and 350 was the highest for whitetail deer at 27%, black bear at 25%, moose at 25%, cougar at 10% and 0% for grizzly bear and elk hunting. The largest total for any one species successfully harvested in 1995 for Wildlife Management Units 349 and 350 was whitetail deer at 2,365 animals. The worst hunter success was that no grizzly bears were harvested even though it was estimated that 14 individuals in 1995 hunted for grizzlies in Wildlife Management Units 349 and 350.

Table 29: Estimated Harvested Animals & Hunter Success by Wildlife Management Unit in 1995

Big Game Species	Estimations of Total Animals Harvested					Estimated Hunters	Hunter Success
	Management Unit	Male	Female	Young	Total		
Cougar	CMA 11	0	1	0	1	10	10%
Grizzly bear	WMU 349	0	0	0	0	9	0%
Grizzly bear	WMU 350	0	0	0	0	5	0%
Black bear	WMU 349	29	12	0	41	219	19%
Black bear	WMU 350	48	14	0	62	186	33%
Elk	WMU 349	0	0	0	0	102	0%
Elk	WMU 350	0	0	0	0	65	0%
Moose	WMU 349	324	3	0	327	1304	25%
Moose	WMU 350	287	0	0	287	1116	25%
White tail deer	WMU 349	258	52	4	314	1200	26%
White tail deer	WMU 350	290	23	4	317	1165	27%
Mule deer	WMU 349	188	0	0	188	842	22%
Mule Deer	WMU 350	69	0	0	69	586	12%

5.8.8 Grizzly Bear Conservation in the Alberta Yellowhead Ecosystem

The Northern East Slopes Environmental Resource Committee (ERC) introduced a Federal-Provincial initiative entitled *Working Framework for Integrated Grizzly Bear Conservation*. This initiative is a result of the approval recommendations of the Joint Review Panel (Alberta Energy Utilities Board and the Canadian Environmental Assessment Agency) of the Cheviot Coal Mine Project. The initiative extends over approximately 20,000 km² extending from the Kakwa to the Brazeau.

It covers all of Jasper National Park, Willmore and Whitegoat Wilderness Areas, all of the Hinton Wood Products, ANC, and Sundance FMA areas, and part of Millar Western's, Weyerhaeuser's, and Blue Ridge Lumber's FMA area (south of Highway 43).

The purpose of the proposed framework is to ensure the conservation of Grizzly Bears by adapting a cooperative, integrated approach by all land managers and land use stakeholders in the region. The approach is intended to restore or maintain those landscape conditions necessary to ensure the long-term persistence of a viable, regionally connected population of carnivores.

Grizzly Bears are considered to be an umbrella and indicator species. An umbrella species has large area requirements and general habitat use. By maintaining the habitat and area requirements of an umbrella species, it is thought that many other wildlife species will have the food and space required to live a healthy and productive life.

Mr. Rick Bonar of Hinton Wood Products is the forest industry representative for the development of the Grizzly Bear Conservation Framework.

“The Grizzly Bear Conservation in the Alberta Yellowhead Ecosystem – A Strategic Framework” was developed February 2000. The framework identifies five critical areas that are recognized by grizzly bear experts as the indicators of suitable landscape conditions. The five indicators are:

- Habitat Effectiveness
- Security Area
- Total Human-Caused Mortality
- Road Density and
- Habitat Connectivity

The concern over road density has been identified as one of the major focus of the Foothills Model Forest research program. Previous research in other grizzly bear ranges has shown that a road density of all weather active roads greater than 0.3 kilometers per square kilometer has an adverse effect on grizzly bear populations. The Foothills Model Forest Grizzly Bear 5-year Research Project is conducting research to answer these management questions, and to develop guidelines.

5.8.9 Foothills Model Forest Grizzly Bear Research Project

Blue Ridge Lumber along with many other partners is providing generous support to the 5-year Foothills Model Forest Grizzly Bear Research Program.

Important comprehensive and innovative research information have been gathered over the past three years and the scientific knowledge of grizzly bear behavior and response to human activities has steadily increased.



The study area covers 9,700 km² and is currently the home to a large number of bears with approximately 66 to 147 bears roaming the area. To date, 63 grizzly bears within the study area have been captured and radio collared. From this data, researchers have learned that bears exhibit a great deal of home range fidelity.

Recent research has shown that the grizzly bears within the study area continue to find mates, reproduce, gain weight, and establish den sites. These are all very positive indicators for the grizzly bear population. While this is not conclusive evidence that the grizzly bear population has increased over this period, it does support the idea that bears continue to live in the same general areas, year after year. Approximately 500 samples of bear scat for DNA have been collected during the 2001 field season for stress and reproductive hormone analysis. Other studies on habitat mapping and remote sensing, resource selection function modeling, micro-habitat selection, and mortality are continuing. All of this information will assist managers in better understanding grizzly bears, which is essential for more effective management and conservation of the species.

The most up to date list of publications from the Foothills Model Forest Grizzly Bear Research Project is located on the web at: <http://www.fmf.ab.ca/programs.html>.

For additional information contact the Foothills Model Forest or Gordon Stenhouse, Wildlife Carnivore Biologist, Alberta Sustainable Resource Development, Fish and Wildlife Division, Box 6330, Hinton, Alberta, T7V 1X6, phone (780) 865-8388.

5.8.10 Caribou

There are no caribou in the Whitecourt FMA area. This is mainly because the FMA area has abundant access throughout as a result of development by the oil and gas industry, and there are no relatively large contiguous habitat areas that caribou require.



There are caribou within the BRL W1 Coniferous Timber Quota sphere of interest, but BRL does not have any harvesting operations within the caribou zone.

Blue Ridge Lumber has been an industry member of the Alberta West Central Caribou Standing Committee since 1992 and has supported research for the years 1999 and 2000 through the Alberta Conservation Association to learn more about the special habitat and management needs of caribou.

Woodland Caribou are listed as a threatened species both provincially and nationally. In the past two decades there has been extensive research and studies on caribou. In addition many multi-stakeholder committees have been formed to develop operating guidelines. The most recent being the “Strategic Plan and Industrial Guidelines for Boreal Caribou Ranges in Northern Alberta” ratified in 2001, the “Operating guidelines for Industrial Activity in Caribou Ranges in West Central Alberta” released by the West Central Caribou Standing Committee in 1996 and the “Alberta Caribou Recovery Plan” ratified by the Alberta government in June 2005.

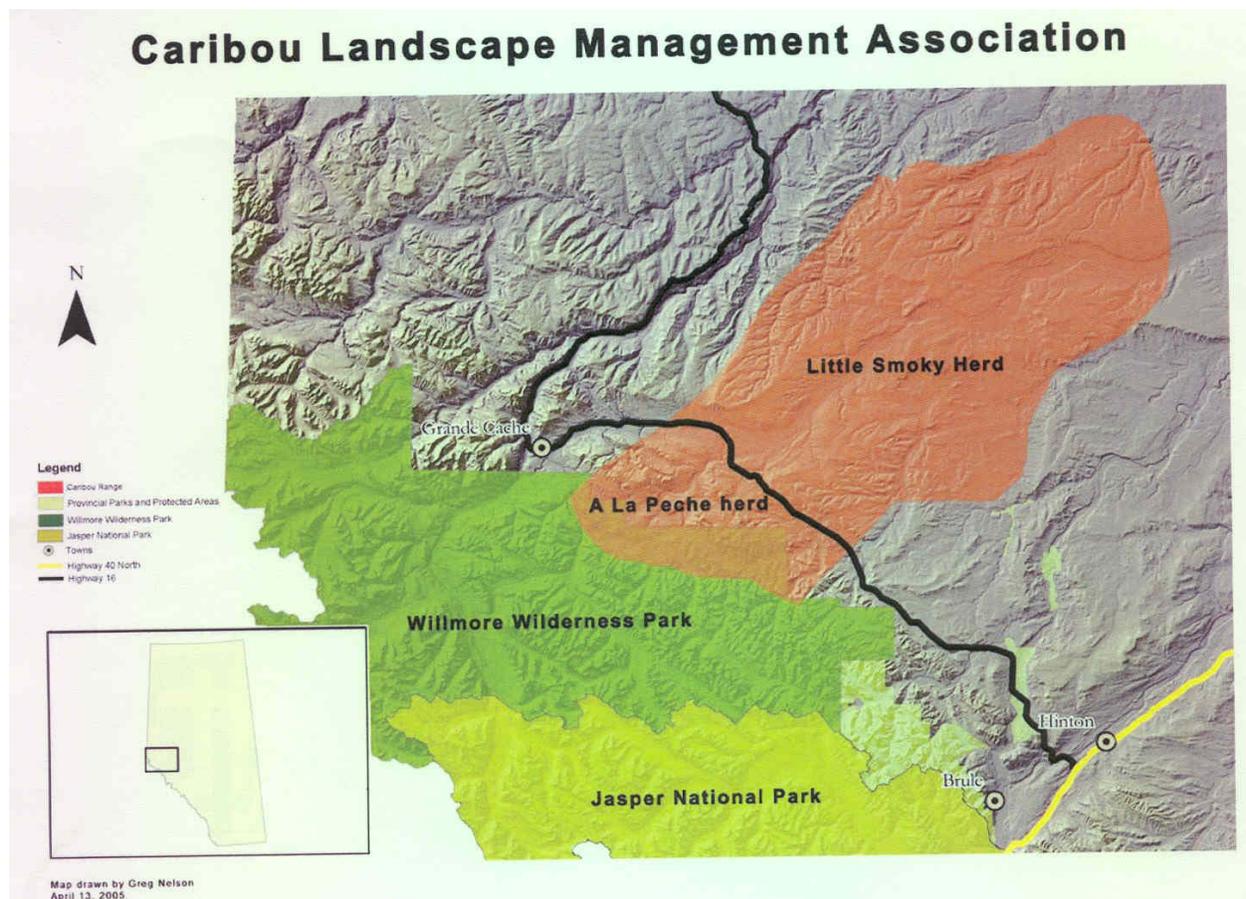
In 2005 West Fraser Mills Ltd. along with ten other companies has agreed to form a new independent non-profit partnership for the conservation of the Little Smoky and A La Peche caribou herds in west-central Alberta. Through the newly established Caribou Landscape Management Association (CLMA) members will facilitate implementation of proposals for integrated landscape management and conservation actions for the two caribou herds in the Alberta Foothills. The CLMA will develop and promote industrial activities that mitigate the impact on Caribou habitat focusing on integrated landscape management.

The CLMA management efforts will focus on:

- Cooperating to reduce the future industrial footprint in Caribou habitat.
- Reclaiming the industrial footprint to restore Caribou habitat.
- Supporting applied research to increase knowledge about Caribou and Caribou habitat for the purpose of Caribou conservation.
- Partnering and supporting Alberta government initiatives to manage Caribou recovery through the Alberta Caribou recovery plan.

The Alberta Caribou Recovery Plan envisions developing one Caribou Committee for the province to coordinate, lead, and develop Caribou recovery initiatives for the whole Province. The Alberta Caribou Recovery Plan proposes a merger of the West Central and Boreal Caribou Committees into a single Caribou Committee to coordinate caribou conservation at a strategic level. The CLMA will contribute to and coordinate with Alberta Caribou Committee activities.

The Caribou Landscape Management Association will be coordinated by the Foothills Model Forest, and the Government of Alberta is an advisory partner through Alberta Sustainable Resource Development.



5.8.11 Trumpeter Swan Nesting Observations

Fish and Wildlife Division conducts periodic surveys to gather information on trumpeter swans. This information was obtained from Mr. David McKenna, Provincial Fish and Wildlife Data Management Specialist, Fish and Wildlife Division, 9920 – 108 Street Edmonton, Alberta, T5K 2G8, telephone (780) 415-8145 or fax (780) 422-9559.

The following table summarizes the observations on trumpeter swans nesting sites within the Blue Ridge Lumber FMA area from 1981 to 2000. There are 5 nesting sites that have been observed and all sites are located in Township 62 Range 10 W5th M.

Blue Ridge Lumber will strictly observe the standards and guidelines for operating beside watercourses as per the Whitecourt/Yellowhead Zonal Ground Rules.

The current Fish and Wildlife Division guidelines for timber harvesting on identified Trumpeter Swan waterbodies are:

- No harvesting operations April 1 to September 30 within 800 m of the high water mark
- No long term development (roads, etc.) within 500 m of the high water mark.
- No timber harvesting within 200 m of the high water mark.
- Timber harvesting is allowed with a detailed plan within the special management zone between 200 m and 500 m.

To protect trumpeter swans while they are nesting, Blue Ridge Lumber will only conduct harvesting operations beside those water bodies in the fall and winter.

Table 30: Trumpeter Swan Nesting Site Observations 1981 to 2000

Location	Waterbody	Date
NW 12-62-10 W5	Unnamed Lake	April 1, 1981
NW 12-62-10 W5	Unnamed Lake	April 1, 1982
NW 12-62-10 W5	Unnamed Lake	September 6, 1985
NW 12-62-10 W5	Unnamed Lake	September 6, 1988
NW 12-62-10 W5	Unnamed Lake	September 12, 1989
NW 12-62-10 W5	Unnamed Lake	September 13, 1990
NW 12-62-10 W5	Unnamed Lake	September 5, 1991
NW 12-62-10 W5	Unnamed Lake	September 3, 1992
NW 12-62-10 W5	Unnamed Lake	September 14, 1993
SE 31-62-10 W5	Unnamed Lake	August 22, 1995
NW 12-62-10 W5	Unnamed Lake	May 30, 1998
NE 3-62-10 W5	Christmas Creek	September 25, 1998
SE 24-62-10 W5	Coyote Lake	September 25, 1998
NE 3-62-10 W5	Christmas Creek	September 5, 2000
SE 12-62-10 W5	Christmas Creek	September 5, 2000

5.9 Watershed Protection

Blue Ridge Lumber is committed to minimizing the impacts of forest operations on water quality, flow regime, watercourse structure, soils, and riparian habitat. The objectives are to conduct timber harvesting, road building, silviculture and reclamation activities in a way that will:

- minimize the potential for soil erosion,
- prevent soil, logging debris and deleterious material from entering the watercourse, and
- ensure that the capability of the site to support healthy forest tree growth is maintained.

Watercourse classification system, and standards and guidelines for operating beside watercourses have been developed in the BRL Operating Ground Rules.

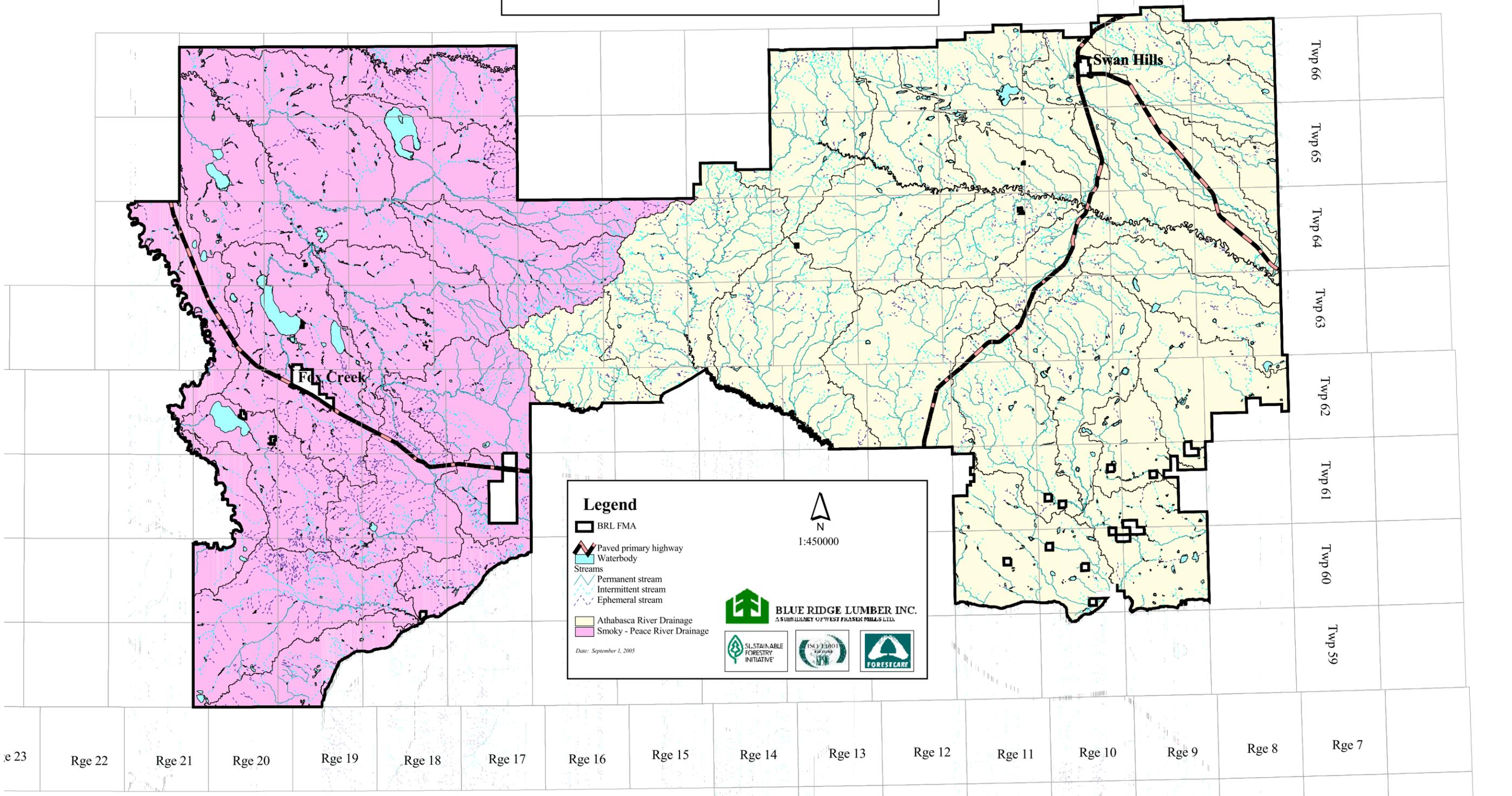
Blue Ridge Lumber has developed ISO 14001 Environmental Operating and Field Procedures to minimize the impact of operations on the watershed resource value, and to ensure that the regulations are being met. Procedures are in place to ensure that the watercourse is properly classified, and that there is proper installation and monitoring of watercourse crossings such as culverts, logfills, native timber decks, bridges, snow fills and ice bridges. The Environmental Operating Procedures are currently part of the Woodlands Operations Policy and Procedures Manual January 2002.

The Code of Practice for Watershed Crossings is incorporated in the Water Regulation under the Act and became effective on May 1, 2000. The Code of Practice for Watershed Crossings and the Guidelines for complying with the Code of Practice can be found on the website at: <http://www.gov.ab.ca/env.water.legislation>.

The map on the following page shows the primary watersheds of the BRL FMA area. The northeastern portion of the BRL FMA area flows into the Smoky and Peace Rivers and the balance of the FMA area flows into the Athabasca River.

The Province is currently undertaking a program to coordinate the guidelines for the coding, digitizing and GIS mapping of the watershed base map. This project will ensure that watercourse line work will be consistent for industrial users and that watershed standards are in place for the next DFMP. The contact person for this program is Kathaleen Jacques-Bennett at email address Kathaleen.Bennett@gov.ab.ca.

BLUE RIDGE LUMBER INC.
 FOREST MANAGEMENT AGREEMENT AREA
PRIMARY WATERSHEDS



Legend

- BRL FMA
- Paved primary highway
- Waterbody
- Streams**
 - Permanent stream
 - Intermittent stream
 - Ephemeral stream
- Athabasca River Drainage
- Smoky - Peace River Drainage

Date: September 1, 2005

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BLUE RIDGE LUMBER INC.
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5.9.1 Canadian Heritage River System

The Canadian Heritage Rivers System (CHRS) is a program developed by designated departments of the federal, provincial and territorial governments to give national recognition to those rivers which best exemplify aspects of Canada’s natural and human heritage and recreational opportunities. The program was established in 1984 and is administered by the Canadian Heritage Rivers Board, of which Alberta is a member. Twenty-eight rivers or river sections totaling 6,349 kilometers were nominated or designated to the system in February 1996.

When Alberta joined the CHRS program a study was undertaken to evaluate Alberta’s rivers based on natural heritage, human heritage, and recreation values. A total of 72 rivers were identified and this list was further evaluated to develop a shortlist of 39 rivers. The Athabasca River is one of these. The list as developed is by no means intended to exclude any river from being nominated. In the nomination process the CHRS Board specifies that local authorities will serve as the lead agencies in recommending a river or river segment for nomination to the CHRS.

There is not general support along the segments of the Athabasca River recommending the river for nomination. The Municipal District of Woodlands #15 has been supportive of the Athabasca River as a CHRS.

A Draft Athabasca River Background Study was submitted June 22, 1999 to the Steering Committee by Randal Conrad and Associates.

The CHRS program is not expected to impact Blue Ridge Lumber. Only a small portion of the Athabasca River forms the southern boundary of the BRL FMA area. The Athabasca River currently has a 60-meter protective watershed buffer along it, and harvesting by Blue Ridge Lumber is not scheduled along the Athabasca River for many years.

5.9.2 Northern River Basins Study

The Northern River Basins Study (NRBS) was initiated to address the impacts of pulp mill effluents on Alberta’s Boreal Rivers. The study does not address logging impacts on the Athabasca River and the report is being mentioned in this DFMP as a reference document. The study examines the relationship between industrial, municipal, agricultural users and other development on the Peace, Athabasca and Slave River basins.

Approximately 150 projects have been or are in the process of being completed. These projects are under eight component categories that include contaminants, drinking water, nutrients, traditional knowledge, hydrology/hydraulics, synthesis and modeling, food chain and other river uses. Results of these studies are provided in a series of synthesis reports.

5.9.3 Sustainable Forest Management Centres of Excellence

Blue Ridge Lumber cooperated with the Sustainable Forest Management Network Centre of Excellence (SFMN) and other partners in a watershed study related to the Virginia Hills Fire. The following is some background information on the research project.

In the Boreal Plain, fire is currently the major natural disturbance agent (Johnson 1992). Fires are episodic, with large ones occurring periodically. Fire control has likely doubled the fire return interval in Alberta and in the current dry cycle, with an unusual amount of over-age fiber, the fire potential is great. Large catastrophic fires will have an impact on aquatic systems.

In 1995-96 the Western Aquatic Group (WAG) proposed to investigate heterogeneity of water quality and biodiversity in Boreal Plain lakes relating to watershed characteristics, natural disturbance (fire) and forest harvesting. At that time they designed the program to include the 1995 fire that burned the watersheds of the Mariana Lakes in the Boreal Plain, and selected other lakes recently harvested in upland watersheds. Over the two years of the study it was realized that there were clear differences between predicted responses to watershed disturbances in upland versus wetland dominated watersheds. The 1995 fires burned primarily wetland watersheds and burned only a relatively small portion of upland watersheds (average 18.5%).

The 1998 Virginia Hills fire offered another unique opportunity to collect more significant research data, and compare the outcome of natural disturbance and forest harvesting practices on surface waters. The Virginia Hills fire included some 170,000 hectares in primarily vast upland watersheds and the area was slated for salvage logging by Blue Ridge Lumber and Millar Western Forest Products Ltd. The headwaters of one of the major streams (Sakwatamau) were severely burnt (+90%). The Sakwatamau and the Freeman Rivers have continuous flow measurements monitored by Environment Canada. Both companies are interested in the opportunity to study the aquatic response to fire.

WAG began work in 1998 in cooperation with Blue Ridge Lumber, Millar Western, Alberta Health and Environmental Protection and National Water Research Institute, to examine the effects of the Virginia Hills fire on the water quality of the Sakwatamau, Two Creeks, Freeman and Louise Rivers and 5 lakes. The name of the research project is ***The Virginia Hills Fire: Once-In A Lifetime Opportunity to Evaluate the Impact of Natural versus Forestry – Related Disturbance on Water Quality, Contaminants and Biodiversity in Surface Waters on the Boreal Plain of Alberta.***

The work from this research project is being used to build on the FORWARD Research Project.

5.9.4 FORWARD Research Project

Blue Ridge Lumber is participating with other forest industry companies, Lakehead University, University of Saskatchewan and the University of Alberta in a 5-year research project to model watershed disturbance impacts and to integrate them with landscape management. Other forest industry partners include Millar Western Forest Products, Alberta Plywood, and Vanderwell.



The research project is the largest in North America. It is called the **FORest WAtershed and Riparian Disturbance Research Project**. The acronym for this project is **FORWARD**.

The intent of the project is to develop a modeling framework to explore various logging strategies to prevent water quality deterioration and to model approaches for watershed management which supplant the static and unsupported imposition of buffer strips across the forested landscape.

Blue Ridge Lumber believes that these buffers should be managed with careful planning and harvesting techniques in a manner that will provide protection to the watershed as well as the other resource values. It is hoped that this research will provide direction to the Province and the Federal Department of Fisheries and Oceans to resolve the issue of riparian buffer and watershed management.

Initial work had involved sampling headwater portions of three third order (medium-sized with drainage basins of 100 to 300 km²) streams (Freeman, Goose tributary and Sakwatamau), where the topographically defined watersheds were greater than 75% burnt during the 1998 fire. The portion of the Sakwatamau watershed burnt was upstream of the same reach studied in 1983 for phosphorus dynamics and loading (Munn and Prepas 1986). To contrast with this hot ground fire the industrial partner and other participating companies will proceed with logging at various intensities and patterns in previously undisturbed tributaries to these same and similar streams.

Harvesting will be done initially in winter when the ground is snow covered and frozen and thus represents perturbations that are above ground. The harvesting is taking place in the Toby and Pierre watersheds (Pass Creek compartment), Millions watershed (Two Creeks compartment) and Kashka watershed (Sakwatamau compartment).

The types of patterns being considered for harvesting include intensities similar to fire (1) with and (2) without a buffer strip of vegetation along the stream, (3) spatial patterns which involve considerable debris or standing trees in the cutblock, and cutting focused on (4) deciduous, (5) conifer and (6) near wetland sites. The intent is to build swiftly on the body of information being accumulated on watershed surface water interactions on the Boreal Plain, with a direct linkage through watershed soils to water quality, manageable biodiversity indicators, and forest planning tools and policy.

The project will have three components: A) collecting appropriate data on watershed soils and surface water quality and bio-indicators, B) modeling the effects of watershed disturbance, and C) linkage of components A and B.

The first major objective of modeling watershed disturbance research project is to use an integrated hydrologic/water quality simulation model for predicting the effects of disturbance upon runoff and water quality from upland watersheds. The goal is to simulate the initial effects of a major disturbance and changes in these effects as the forest regenerates over time.

The second major objective is to investigate the use of an integrated simulation model for predicting the effects of progressive disturbance such as staged logging, distributed disturbance, or the use of riparian buffer zones, upon runoff generation and water quality in upland watersheds. If an integrated simulation model can accurately predict the effects of these harvesting approaches, then the model can be used as a management tool to help formulate harvesting strategies, which can mitigate environmental effects of logging operations. For example, it may be possible to use the model to explore different logging strategies to prevent detrimental water quality effects upon benthic communities in streams.

Many hydrologic and water quality simulation models for watersheds have been developed by research organizations. The intention of this proposal is not to develop a new model from first principles, but rather to select and use an existing integrated hydrologic/water quality modeling package. The model will be calibrated to simulate the effects of fire and logging disturbances upon forest watershed runoff and water quality. The calibration will require data from field investigations.

The principal investigator for this project is Dr. Ellie E. Prepas, a limnologist who has extensive experience conducting interdisciplinary research teams and studies on nutrients, bio-indicators, and watershed disturbance linked with surface waters. From 1994 to 2001, she directed the TROLS program that evaluated harvesting impacts on terrestrial and aquatic organisms and ecosystems in aspen dominated portions of the Boreal Plain. Other persons involved with the project also have considerable expertise:

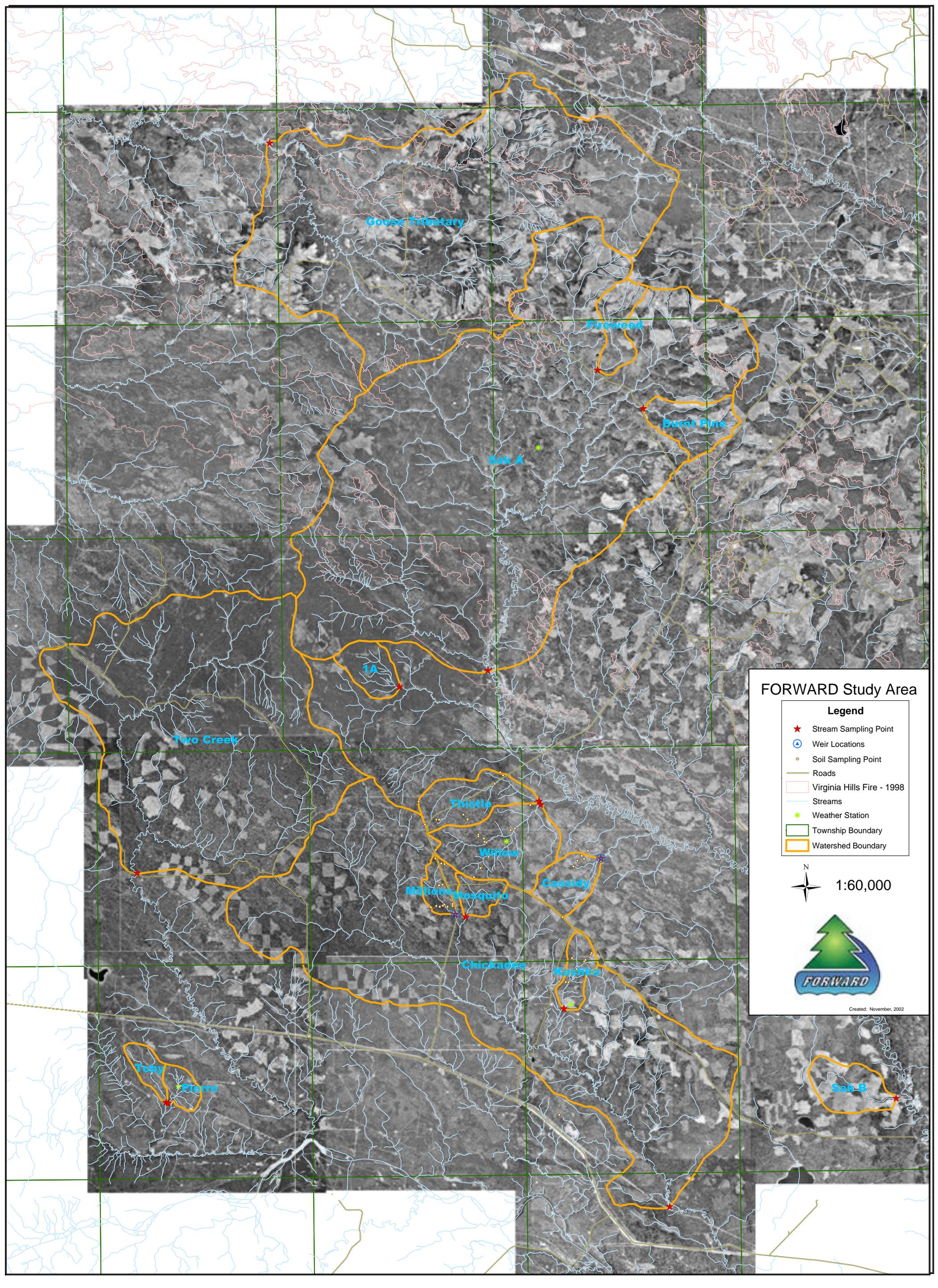
- Dr. Daniel W. Smith, who has been an active researcher in the field of water quality modeling for nearly 30 years,
- Dr. Gordon Putz, who is an environmental engineer with over a decade of experience in modeling effluent mixing and reaction in rivers,
- and numerous M.Sc. and Ph.D. students.

As part of the FORWARD Research project BRL is partnered with NSERC to sponsor a graduate student towards her Masters Degree from the Faculty of Forestry and the Forest Environment at Lakehead University, Thunder Bay, Ontario.

Please refer to the map on the following page showing the watersheds and streams that are included in the FORWARD study area on riparian buffer management, as well as the locations

of the weather stations, water monitoring sites, weirs, and soil and vegetation plots. Stream 1A is a small stream located within the BRL FMA area. It is a reference site or a control site for the research project and it is to be “protected” with no operational activity.

Additional information for this research project is available on the web at <http://forward.lakeheadu.ca/index.html>.



FORWARD Study Area

- Legend**
- ★ Stream Sampling Point
 - ⊙ Weir Locations
 - Soil Sampling Point
 - Roads
 - ▭ Virginia Hills Fire - 1998
 - Streams
 - ★ Weather Station
 - ▭ Township Boundary
 - ▭ Watershed Boundary

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5.9.5 Watershed Assessment of Freeman River

Blue Ridge Lumber submitted a watershed assessment in August of 1995 to evaluate the potential effects of the Company’s proposed harvesting in Operating Units Judy Creek 19 and Swan Hills 37 on water discharge into the Freeman River. The reason for conducting this evaluation was because of public concern that had been expressed to Alberta Sustainable Resource Development that new harvesting along the Freeman River may cause flooding of farm lands near the community of Fort Assiniboine.

Operating Units Judy Creek 19 and Swan Hills 37 are located approximately 35 kilometers upstream from Fort Assiniboine along the Freeman River. The total combined area of Units 19 and 37 is 11,988 hectares, which are approximately 7% of the total 171,458 hectares of the Freeman River watershed. The report documented the various activities that have occurred in the past, documented precipitation and recorded water discharge, and predicted the amount of water yield increase due to planned harvesting.

In summary the report concluded that all types of activities (harvesting, oil and gas development, agriculture etc.) have the potential to increase water available for stream flow but not cause flooding. It is the excessive amount of precipitation, which greatly exceeds the water storage capacity of the soil that causes flooding. Summer rains have the greatest potential for causing flooding. Blue Ridge Lumber will conduct its harvesting operations in a manner that minimizes the opportunity for overland water flow and the movement of silt into watercourses.

5.10 Grazing

The Blue Ridge Lumber FMA area is immediately adjacent to settlements along the south east and east boundaries of the FMA area. These areas have a history of grazing and there are currently four Forest Grazing Licenses (FGL), and one Grazing Lease (GRL) which extend into the FMA area. These licenses and leases are summarized in the following table.

The total domestic grazing carrying capacity for the licenses/leases located on the FMA area is approximately 420 animal unit months (AUM) for the months of June 1 to October 31. An animal unit month is equal to a one thousand pound cow/calf pair and a bull is rated at 1.5 AUM's. Leaseholders are required to maintain present grazing capacities by controlling restricted weeds so as to minimize the in-growth on improved sites.

Table 31: Grazing Licenses and Leases within the BRL FMA Area

Grazing License & Leases	Location	Effective Date	Expiry Date	Area [ha]
GRL 39769	S½ -6-61-09W5M, SW-31-60-09W5M	Sept. 1, 1972	Aug. 31, 2006	193.419
FGL 000006	All that portion of SW-01-61-10W5M that lies west of Christmas Creek	June 1, 2000	May 31, 2005	4.711
FGL 780008	SW-35-061-09W5M that lies to the South and East of the southeasterly limit of a road as shown on plan 5006RD	March 1, 1979	March 31, 2008	27.009
FGL 850013	NW-11-60-10W5M that lies to the east of a seismic line and to the southeast of the southeasterly limit of a pipeline right-of-way as authorized under a file PLA 3306 and shown on Plan 3657P and excluded is 1.2 acres for a road as authorized under provisional roadway reservation on file RDS 900031 NE-11-60-10W5M Excluded is 4.7 acres for a road as authorized under provisional roadway reservation file Rds 900031 and 0.2 acres for a channel diversion	Sept. 1, 1985	Feb. 28, 2009	96.437
FGL 900015	S½-25 & NE-25-61-9W5M S½-26-61-9W5M SE-36-61-9W5M - Excluded is 3.06 acres for a road as shown on plan 6645 RD	Aug. 1, 1990	July 31, 2010	388.474
Total				710.050

Table updated September 20, 2005

FGL – Forest Grazing License (short term grazing license).

GRL – Grazing Lease (occupied land, conveys an estate of interest sufficient to prevent access by others).

In 1977-78 numerous requests for homesteads and grazing licenses were received. A review of these requests indicated that the proposed licenses were concentrated in the south east portion of the FMA area around Goose Lake and a checker board pattern was being developed. This

pattern had isolated some of the forested land and to properly manage these lands approximately 950 hectares were withdrawn from the FMA area for the purpose of homesteads and grazing areas.

There is an obvious conflict between forest management and cattle grazing on the same site. Cattle grazing in forests results in tree seedlings being damaged by being foraged or trampled. Less obvious is the damage done by the compaction of forest soils which inhibits the establishment and growth of tree seedlings. Cattle on logging haul roads are unsafe for both the cattle and the truck driver.

Blue Ridge Lumber does not support further development of grazing or homesteads within the FMA area. Blue Ridge Lumber feels that there is sufficient grazing land available outside the FMA area in the white zone to satisfy present and future demands for grazing without infringing on forested lands. However BRL would consider grazing licenses that are issued on powerlines, pipelines, or road right of way allowances to reduce the impact on forested areas.

The following procedure will be followed for each proposed grazing license, lease or application:

- BRL will participate with SRD in the assessment of any existing grazing license or lease renewals.
- BRL will participate with SRD in the development of the conditions for any proposed grazing license, lease or permit prior to advertising.
- BRL will participate with SRD in the assessment of each new grazing application as it is received.
- BRL will participate with SRD in the assessment, management and inspection of the grazing lands and the conditions of any new issuance of a grazing license, lease or permit within the FMA area.

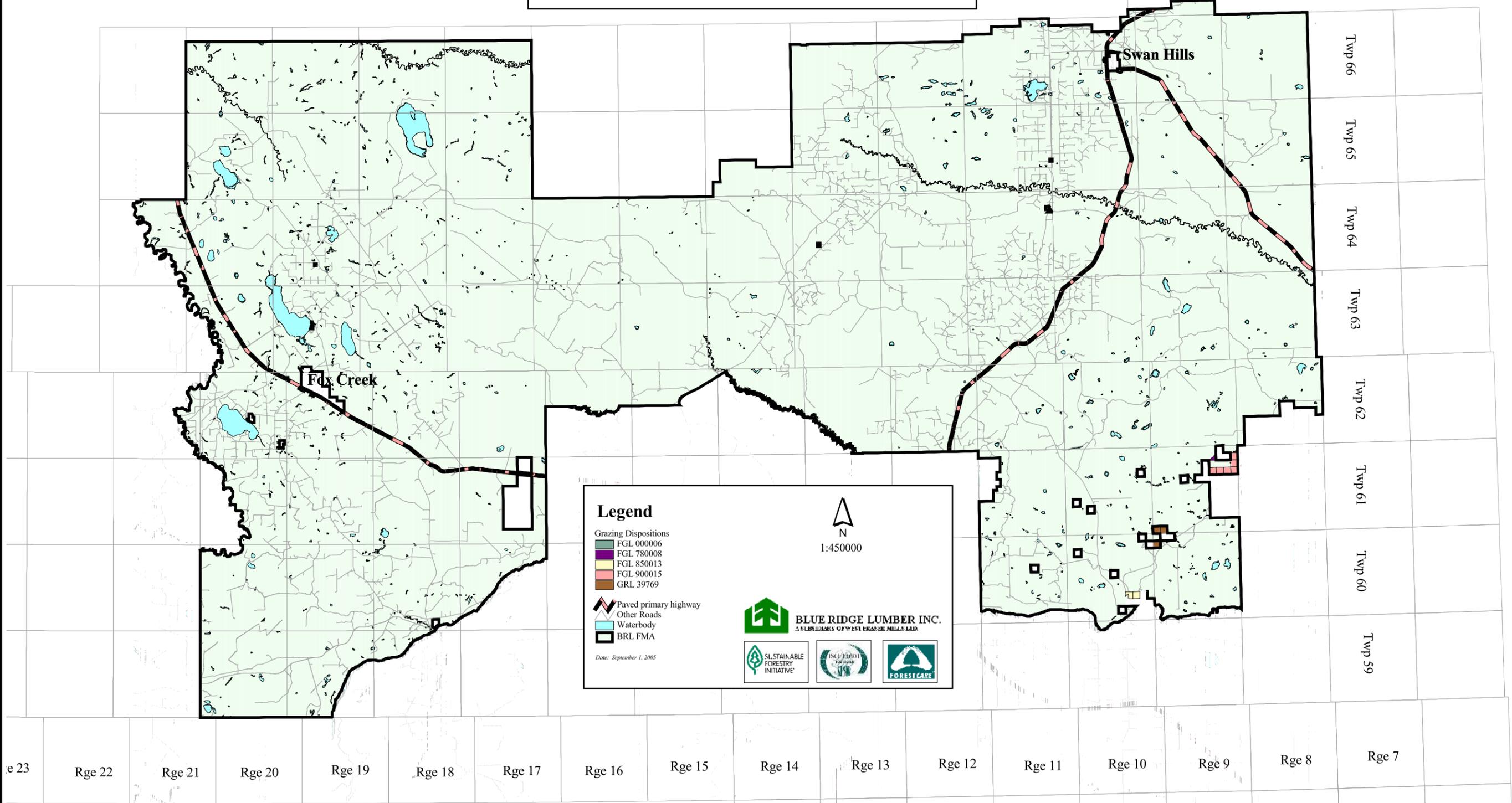
The Whitecourt Regional Forest Advisory Committee wrote a letter to Mr. Craig Quintilio on July 7, 2003 and expressed a number of concerns on the matter of integration of rangeland and forestry in the areas where BRL, MWFP, ANC and Mostowich conduct their operations. The Whitecourt RFAC is aware of the initiative within SRD to develop a Rangeland-Forestry Integration Plan for the Woodlands and Foothills Areas. This initiative is intended to be a proactive approach to deal with future requests for new grazing applications by carrying out a broad inventory of suitable range resources, developing a clear and effective policy for allocation of these range resources, developing strategies to effectively integrate grazing with other resource values, and to implement clear compliance assurance requirements such as monitoring, inspections and enforcement. There is an urgent need to get ahead of the range demand and carry out strategic planning to minimize conflict with other resource users. The Whitecourt RFAC asked to be kept informed of the Rangeland-Forestry Integration Plan and requested an opportunity to participate locally in the development of this plan.

Representatives of the beef and timber industries met between September 2003 and September 2004 to discuss planning and operational requirements to support the integration of existing and

future grazing dispositions on timber allocations, and timber harvesting on grazing dispositions. The participants developed recommendations in a report titled “The Provincial Timber Integration Committee Recommendations to Alberta Sustainable Resource Development August 2004.”

Please refer to the map on the following page that shows the location of current grazing dispositions on the BRL FMA area.

BLUE RIDGE LUMBER INC.
 FOREST MANAGEMENT AGREEMENT AREA
GRAZING DISPOSITIONS



5.11 Private Land

There are several parcels of private farmland within the FMA area. These lands are within the boundary of the FMA area but are not part of the land base. Private farmland totals 1,286.66 hectares and is concentrated in the southeast portion of the FMA area around Goose Lake.

Two quarter sections within the FMA area (Township 61, Range 10, SE Section 18 and NE Section 8) are owned by Blue Ridge Lumber and are used to grow timber. Previously pastured areas have been planted to trees.

There are also two townsites within the FMA area, which total 1,224.04 hectares. The Town of Swan Hills is 303.74 hectares, and this area is included in the gross land base. The Town of Fox Creek is 920.3 hectares, which includes the Fox Creek Airport. This area is excluded from the gross land base.

Special considerations for harvesting and reforestation of stands adjacent to these sites may be required such as:

- Leaving buffers to reduce visual impacts or delaying the harvesting second pass blocks.
- Consultation with the individuals or companies to discuss safety concerns.
- Reducing the block size along the fringe area.

The FMA area has numerous small industrial plant sites scattered throughout. One of the major industrial gas plants is located in Judy Creek. It is operated by Pengrowth and is 25.15 hectares in size. The second major gas plant located in Virginia Hills is operated by Shell Canada Resources Limited and is 16.2 hectares in size. The Amoco gas plant south of the Town of Fox Creek is 106.0 hectares, and the gas plant north of the Town of Fox Creek is 15.6 hectares.

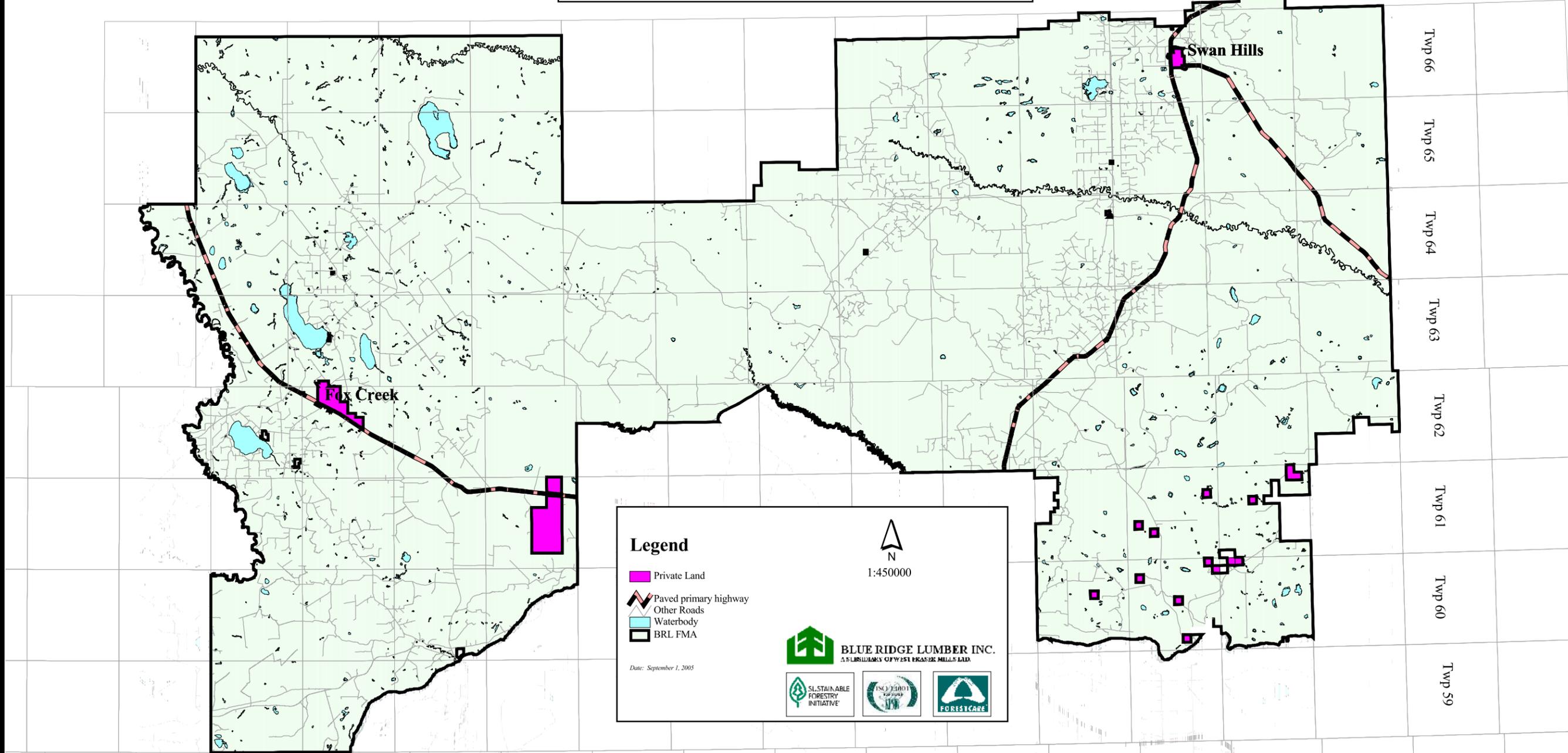
Please refer to the following table and map for a summary of private land exclusions for the BRL FMA area.

Table 32: Private Land within the BRL FMA Area

Location		Description	Area (ha)
60-9	NE 31 NW 32	Freehold	130
60-10	NE 3 SW 22 NE 30 NW & SE 36	Freehold	327
60-11	NE 22	Freehold	65
61-9	NW 21 NE & SE 35 SW 36	Freehold	261
61-10	NE 8 SE 18 SW 25	Freehold	199
66-10	Portions of: 14, 15, 22, 23 & 26	Town of Swan Hills	299
62-19	32 and portions of: 21, 22, 27, 28, 29, 30 & 33	Town of Fox Creek	910
63-19	Portions of: 4 & 5		
61-17	Portions of: 10, 11, 14, 15, 22, 23, 26 & 35	Alexander First Nations Land Claim	2,033
64-11	NE 25	Freehold	25
64-13	NE & SE 17	Freehold	12
65-11	SE 13	Freehold	6
Total			4,267

Table updated September 20, 2005

BLUE RIDGE LUMBER INC.
FOREST MANAGEMENT AGREEMENT AREA
PRIVATE LAND



Legend

- Private Land
- Paved primary highway
- Other Roads
- Waterbody
- BRL FMA

Date: September 1, 2005



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BLUE RIDGE LUMBER INC.
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5.12 Purchase Wood from Private Landowners

Blue Ridge Lumber purchases wood from private landowners, (farmers, and woodlot owners) when markets and timber supply permit.

The Company promotes responsible environmental practices on wood that is purchased from private lands. Information on responsible environmental practices is provided to landowners upon request. Information that is provided includes:

- Woodlot pamphlets
- Insect and Disease information
- Safe Logging Practices
- Promoting Leadership in Sustainable Forest Management
- Logging Private Lands in Alberta
- Weed Awareness
- Herbicide Treatment
- Tree Identification

The Company provides additional assistance to the private landowner if requested such as developing logging plans, maps, cruising timber, ribboning of watercourses, boundaries, landing or road centerlines and developing reforestation plans.

If the logger or landowner contacts the Company before the commencement of operations, a pre and post operation inspection is completed. Post logging inspections are done to check for rutting or damage to any watercourses. If problems are encountered during these inspections, the Company supervisor will notify the harvesting contractor, who will rectify the concerns and another follow-up inspection is completed. Blue Ridge Lumber has sold seedlings to landowners when requested, even if the Company did not receive any logs from that specific landowner.

The purchased wood program was reduced from 1998 to 2001 due to the Virginia Hills fire salvage.

The following table is a summary of wood purchased from private landowners from 1995 to 2005.

From 1995 to 2005, Blue Ridge Lumber has increased its yearly timber purchases by approximately 250%, with the largest increase from other permit holders. The purchased wood program was reduced during 1998 to 2001 due to the Virginia Hills fire salvage program.

It is the intent of Blue Ridge Lumber to aggressively pursue the salvage of all timber from pipelines, road right of ways, and wellsites on the BRL FMA and Quota areas. BRL is also interested in the purchase of timber from farmers, land developers, woodlot owners and other permit holders.

Table 33: Total Wood Purchase Deliveries (m³) (May 1, 1995 to April 30, 2005)

Year	Private	Crown	Crown - other	Industrial Salvage	Total Wood Purchased
1995 – 1996	978.90	4,942.99	24,025.30	20,114.33	50,061.52
1996 – 1997	3,238.96	15,454.36	38,821.73	19,756.76	77,271.18
1997 – 1998	15,612.07	4,677.28	39,378.03	32,522.63	93,652.15
1998 – 1999	576.71	2,091.12	6,334.95	24,429.10	33,431.88
1999 – 2000	12,076.09	32,130.39	3,259.89	858.54	78,671.48
2000 – 2001	23.93	0	16,467.09	29,920.04	46,411.06
2001 – 2002	386.41	496.06	5,747.10	30,028.79	36,658.36
2002 – 2003	15,828.36	14,734.58	14,139.21	14,072.26	58,774.41
2003 – 2004	7,904.94	4,370.33	151,012.04	26,342.78	189,632.00
2004 – 2005	5,754.47	940.28	154,155.77	19,600.97	179,466.37
Total	62,380.84	79,837.39	453,341.11	217,646.20	844,030.41

Private = purchased from deeded land and First Nation reservations.

Crown = CTP, LTP

Crown other = crown timber from other disposition holders and other FMA areas and Quotas

Salvage = industrial salvage, right-of-way clearing, etc.

Blue Ridge Lumber is an industrial member and an active supporter of the Alberta Woodlot Association of Alberta. The Alberta Woodlot Association is a society whose aim is to promote leadership in sustainable forest management by encouraging the development of private and public forests.

Additional information on the Alberta Woodlot Association can be found on the web at www.woodlot.org.

Blue Ridge Lumber supports the Alberta Woodlot Association and has assigned a staff member to work with private landowners, and to hand out information on woodlot management. The same Company supervisor who assists the landowners and inspects their harvesting operations to ensure the use of sound forestry practices and environmental protection also attends the annual Alberta Woodlot meetings to assist in the development of the Alberta Woodlot program.

5.13 Land Withdrawals

Blue Ridge Lumber’s FMA area covers one of the most active oil and gas fields in the Province.

Consequently, there is a significant amount of land withdrawals and landscape disturbance occurring such as new well sites, pipelines, power transmission lines, facilities and access roads. BRL reforests abandoned wellsites with reclamation certificates.

The exception to this is the seismic lines, which are considered as a temporary withdrawal and thus are not permanently removed from the forest land base. Seismic lines are included in the reforestation of cutblocks unless the seismic lines are identified as required access by trappers and others.

The clearing of forested lands for industrial use removes the land available for growing timber thus causing a loss in the annual allowable cut. This impact of timber loss due to the activity of the industrial users is minimized by salvaging all available timber. Blue Ridge Lumber makes every effort to salvage timber from these withdrawals, however if this is not possible, the Company will purchase the salvaged timber from the industrial user.

All surface dispositions applied for within the Blue Ridge Lumber FMA area by outside parties require consent from Blue Ridge Lumber for withdrawal of lands from the FMA area. The purpose of the consent process is to govern the conditions of the land withdrawal and to ensure the proposed development occurs in an integrated fashion and does not conflict with the operation of the FMA area. While the FMA does not have management responsibility for the industrial activities of other users, the withdrawal process can be used to facilitate integration of their activities in a way that reduces the overall industrial footprint on the FMA area.

The Blue Ridge Lumber management objective in reviewing land withdrawals for industrial use is to minimize the impact upon harvesting and reforestation operations. This is accomplished by requesting that industrial land withdrawals be located along the edges of existing and proposed cut blocks, using existing or adjacent corridors and minimizing the creation of small isolated areas of forested land.

Blue Ridge Lumber has an ongoing dialogue with other industrial users with respect to land withdrawals and the Company’s harvesting and reforestation operations. Meetings are held with other users to discuss road use concerns, the location and construction of pipeline crossings, safety procedures, toxic waste and combustible materials, and contact persons for all users.

Blue Ridge Lumber is aware that long-range planning by other industrial users is made very difficult by the uncertainties in finding oil and gas. The Company encourages other industrial users to extend their planning horizons as far as possible so that proposed developments can be incorporated into our plans and any concerns resolved prior to construction.

In 1979 approximately 155 hectares was withdrawn from the Blue Ridge Lumber FMA area for the Swan Hills Airport. In 1980 approximately 921 hectares was withdrawn for the Carson-Pegasus Provincial Park. In March 1987 the FMA boundary was amended as per Order in Council 178/87 to accommodate the removal of the Millar Western Industries Ltd. Coniferous Timber Quota.

A total of 7,608.41 hectares of permanent land withdrawals have been withdrawn from the Blue Ridge Lumber FMA area during the period from January 1, 1995 to December 31, 2004. This represents a withdrawal of approximately 845.34 hectares per year or 3.3 sections per year from the BRL FMA area. The FMA area land withdrawals by disposition type for the 10 year period of 1995 to 2004 include pipelines (34%), license of occupation (35%), well sites (29%) and power lines (1%).

Graph 17: Land Withdrawals within Blue Ridge Lumber Inc. FMA Area

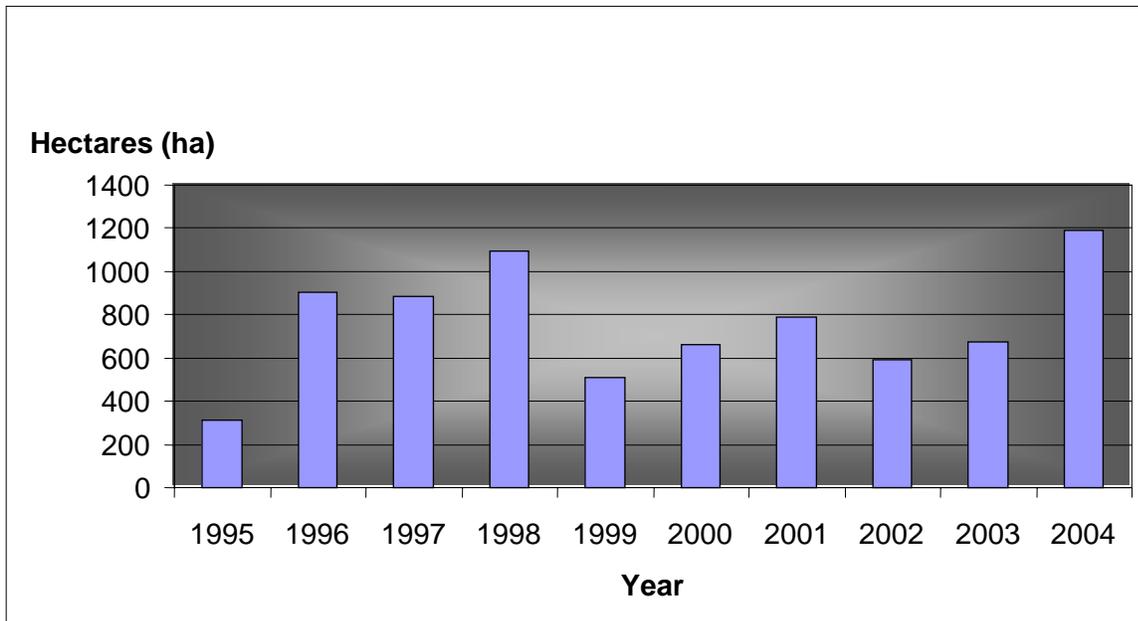


Table 34: Land Withdrawals BRL FMA Area 1995 to 2004

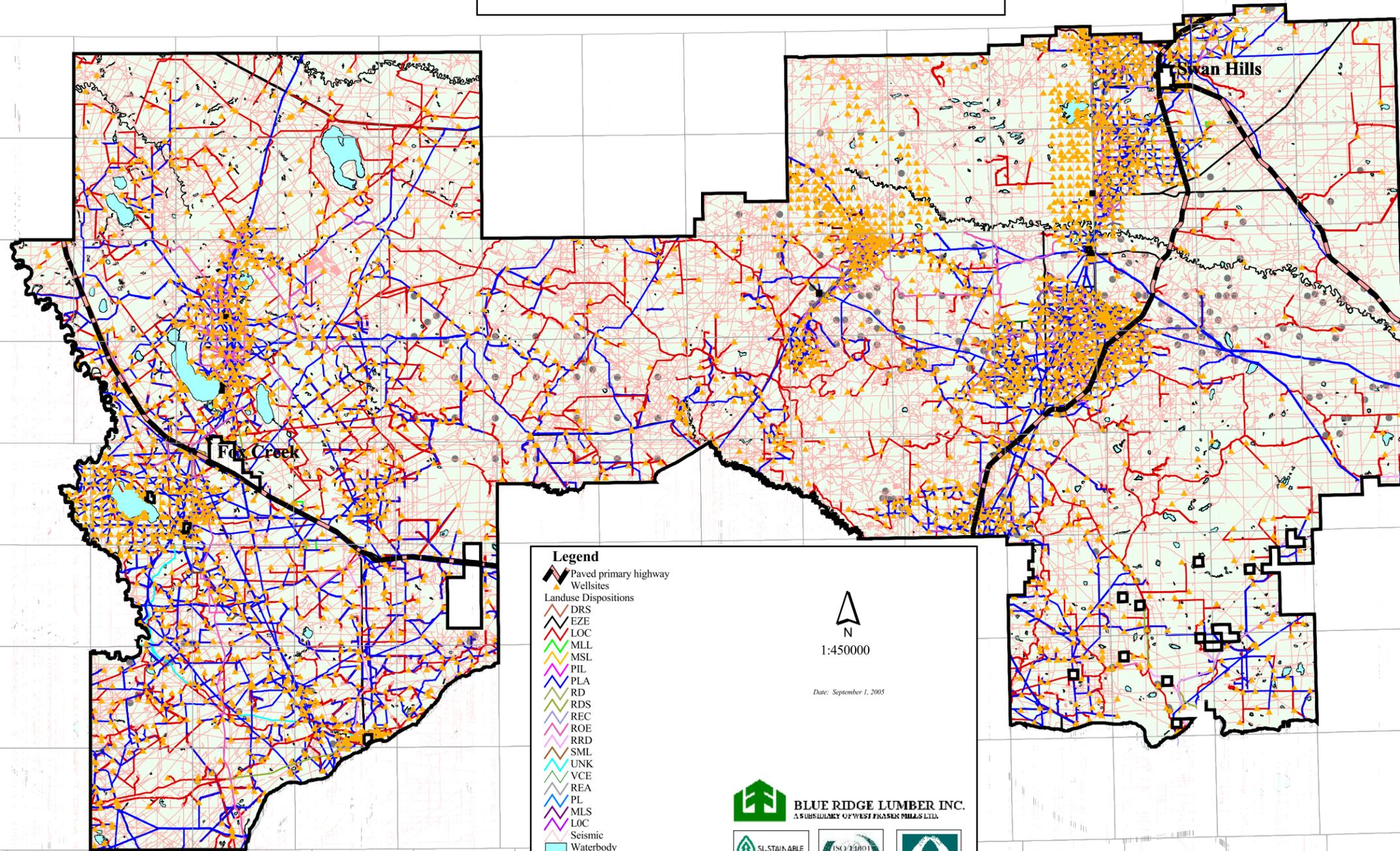
Year	Land Withdrawn (ha)	Geophysical (ha)	Total (ha)
1995	277.24	35.65	312.89
1996	768.41	136.33	904.74
1997	544.92	336.65	881.57
1998	916.44	179.74	1096.18
1999	297.81	208.32	506.13
2000	607.38	55.33	662.71
2001	766.61	19.85	786.46
2002	547.40	43.59	590.99
2003	601.98	73.84	675.82
2004	1163.21	27.70	1190.91

The tremendous oil and gas exploration and development trends that have been experienced in the past are expected to continue in the future on the FMA area. In addition, an area of potential coal development has been identified by Esso Resources Canada Limited and is located in Township 64 Range 1 West of the 5th Meridian. Coal bed methane development is also expected to increase in the future.

It is extremely important to continue to minimize the impact of land withdrawals on the FMA area and to increase growth on the existing land base to make up for these losses. Blue Ridge Lumber uses funds received from Timber Damage Appraisal for reforesting abandoned well sites, spacing, cleaning, commercial thinning and other silviculture projects, and the purchase of roundwood to replace the lost annual allowable cut.

The map on the following page shows the tremendous land use activity and the highly industrialized areas on the BRL FMA area.

BLUE RIDGE LUMBER INC.
FOREST MANAGEMENT AGREEMENT AREA
LANDUSE



- Legend**
- Paved primary highway
 - Wellsites
 - Landuse Dispositions**
 - DRS
 - EZE
 - LOC
 - MLL
 - MSL
 - PIL
 - PLA
 - RD
 - RDS
 - REC
 - ROE
 - RRD
 - SML
 - UNK
 - VCE
 - REA
 - PL
 - MLS
 - LOC
 - Seismic
 - Waterbody
 - Plots
 - BRL FMA

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Date: September 1, 2005

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5.14 Alexander First Nations Land Claim

In 1876 the Alexander First Nation Reserve was included in the signing of Treaty 6, and in 1881 10,625 hectares was set aside as a reserve. In 1987 Alexander First Nations filed a claim with the Government of Canada indicating that it had not received the correct amount of land. In 1990 the Government of Canada validated the claim and made a request to the Government of Alberta to provide 1,451 hectares of Crown land to settle the claim.

In 1996, The Government of Canada agreed to set aside 6,130 hectares of land in the Fox Creek area, at the Fort Assiniboine Ranger Station, and adjacent to the Alexander First Nations Reserve, as well as up to 3,825 hectares to be acquired by Alexander First Nations on a willing seller, willing buyer basis adjacent to the Reserve. The Government of Canada also agreed to provide \$7 million as part of the settlement, while the Government of Alberta will provide \$3 million.

The Alexander First Nation reserve of approximately 2,033 hectares has been set aside in the Fox Creek area within the Blue Ridge Lumber FMA area. The location of the Alexander First Nations land claim is Twp 61 Rge 17 W5thM sections 10, 11, 14, 15, 22, 23, 26, and 35.

Blue Ridge Lumber is cooperatively working with the Alexander First Nation to assist them in the management of the timber resource on their newly acquired reserve area. Several discussion meetings with Alexander First Nation have taken place over the past year to develop a “Cooperative Forest Management Opportunities Agreement”. To assist this Agreement a cooperative timber supply analysis was conducted utilizing the net land base and yield curves developed for the Blue Ridge Lumber June 2004 DFMP. The timber supply analysis was presented to the Alexander First Nation Chief and Council on April 12, 2005 to facilitate further discussions.

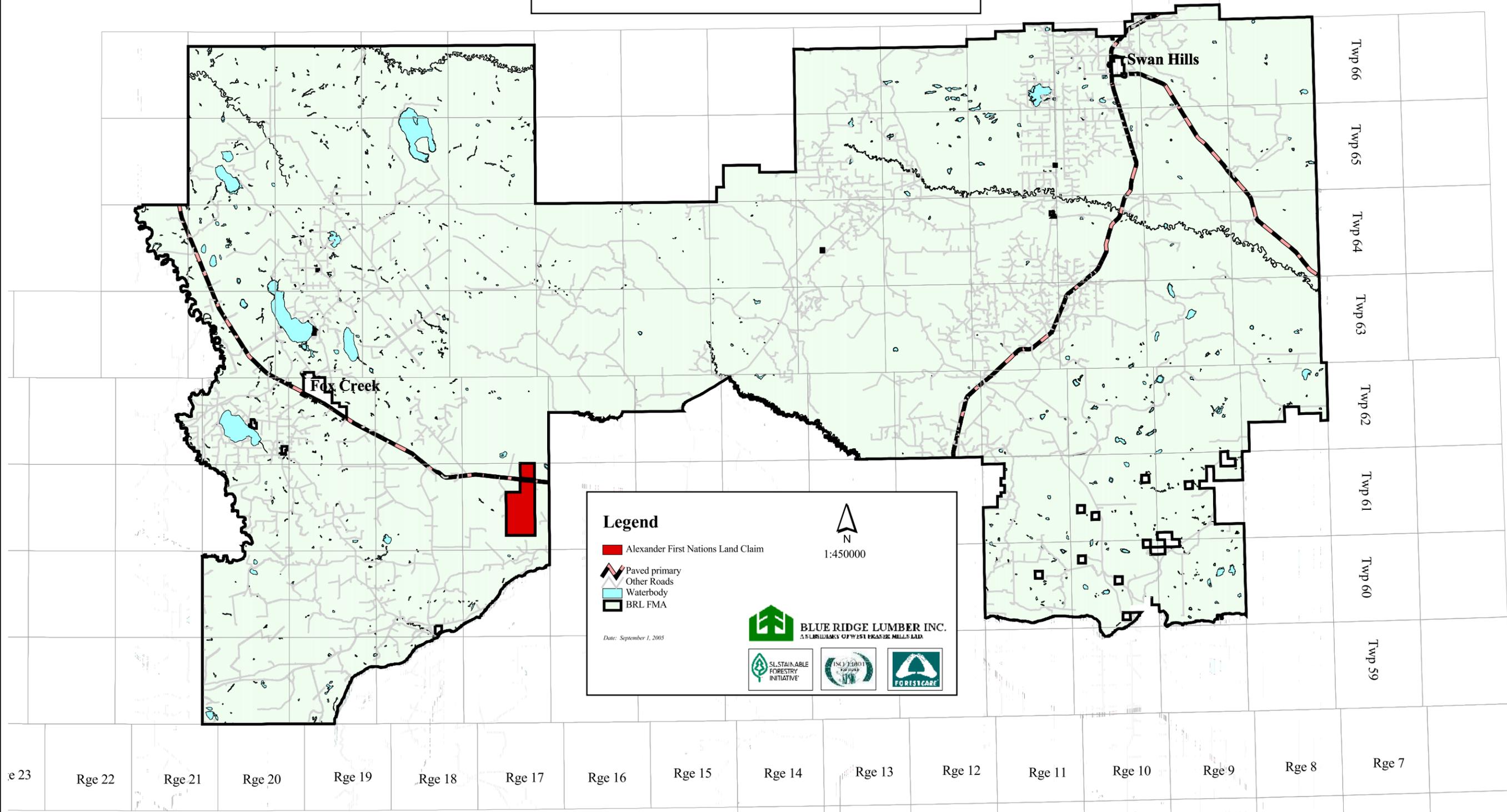
A total of 1,767 m³ of logs were purchased by Blue Ridge Lumber from local First Nations in the 2002-2003 Timber Year. The Company purchased 449 m³ from the Alexander First Nation and 1,318 m³ from Alexis First Nation Reserve which is located at the junction of highways 43 & 32.

Please refer to the map on the following page showing the location of the Alexander First Nations Land Claim. Additional information is available on the web at:

<http://www.lsd.nrcan.gc.ca/english/productsearche.asp?type=map> or
<http://www.wroc.nrcan.gc.ca/english/mape.asp?Prov=AB>

“The Government of Alberta is currently developing policy outlining Alberta’s role in consultation with First Nations. Future government policy regarding Alberta’s role may require amendments to the strategy articulated in the plan. Blue Ridge Lumber will keep complete and accurate written records of their consultations with First Nations; i.e., comments received, and how concerns identified have been addressed and incorporated into forest management planning. This information will be reported in BRL’s stewardship report and shall also be incorporated into the next DFMP in 2015.” (June 1, 2004 DFMP Approval Decision 6).

BLUE RIDGE LUMBER INC.
 FOREST MANAGEMENT AGREEMENT AREA
ALEXANDER FIRST NATIONS LAND CLAIM



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5.15 Protected Areas

Natural areas provide a protected landbase for low intensity, non-facility oriented use and are set aside with the objective of maintaining their natural features. Natural areas emphasize public appreciation, education, research and/or recreation. Ecological reserves are essential to conserve the genetic resources of unaltered species that will provide a broad base for research and development. These reserves will provide undisturbed areas for scientific studies of structure, function and changes in the natural environment. Special Places 2000 is a strategic plan for coordinating the designation and protection of the environmental diversity of Alberta's six Natural Regions and 20 sub-regions by the end of 1999. Special Places 2000 is intended to balance the preservation of Alberta's natural heritage with the policy's other three goals, which are outdoor recreation, heritage appreciation and tourism/economic development.

There are presently no wilderness, natural, ecological or Special Places 2000 areas designated within the Blue Ridge Lumber FMA area.

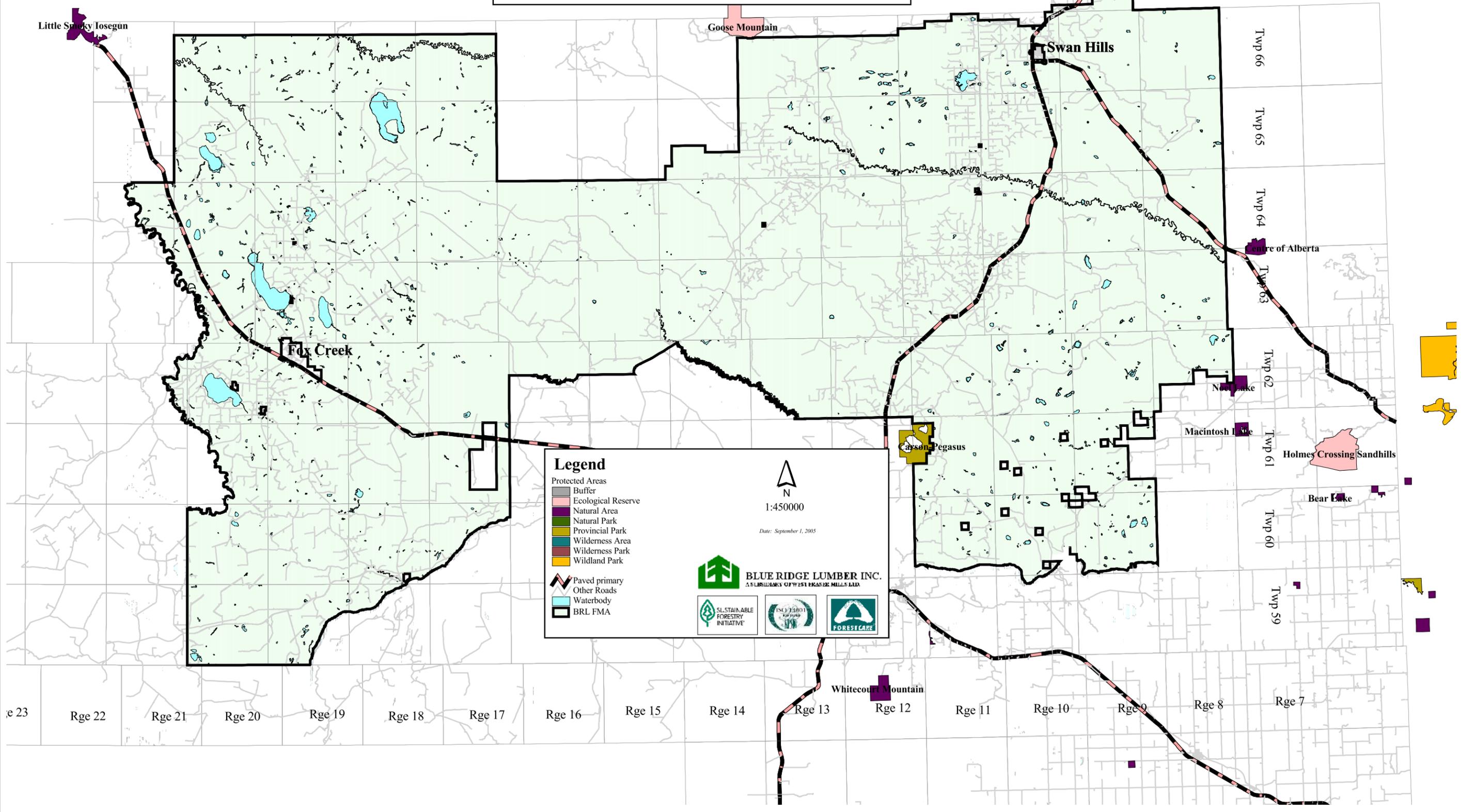
Immediately adjacent to the FMA area are two Ecological Areas: the Goose Mountain Ecological Reserve and a smaller ecological reserve called the Holmes Crossing Sandhills Ecological Reserve. The Fort Assiniboine Sandhills Wildland Provincial Park is located just north and east of the Village of Fort Assiniboine. The Noel Lake Natural area is also adjacent to the FMA area.

The Goose Mountain Ecological Reserve is a major reserve which is large enough to contain examples of all or most of the ecosystem types in the upper foothills natural sub-region (Alberta Energy and Natural Resources, 1981). This Ecological Reserve is immediately adjacent to the northern boundary of the FMA area in parts of Township 66, Range 13 & 14 and Township 67, Range 13, West of the 5th Meridian. The Goose Mountain Ecological Reserve has been set aside to maintain the area in an undisturbed condition and to allow natural processes to predominate. There are unique examples of biological or natural phenomenon, endangered or rare species and specific scientific research opportunities exist in this reserve.

The Fort Assiniboine Sandhills Wildland Provincial Park and the Holmes Crossing Sandhills Ecological Reserve Sand Hills Natural Area at Ft. Assiniboine are immediately adjacent to the eastern boundary of the Blue Ridge Lumber FMA area. The Fort Assiniboine Sandhills Wildland Provincial Park is on the northern banks of the Athabasca River in Township 63 and 62, Range 4 and 5, West of the 5th Meridian. The Holmes Crossing Sandhills Ecological Reserve Sand Hills Natural Area is immediately south of the Athabasca River and is located in Townships 61, Ranges 6 and 7, West of the 5th Meridian.

Two areas within the FMA area were nominated as potential reserves for Special Places 2000 but were withdrawn. Suitable areas for additional wilderness areas, natural areas, ecological reserves or for Special Places 2000 areas within the FMA area are not apparent. The map on the following page shows the protected areas immediately adjacent to the BRL FMA area.

BLUE RIDGE LUMBER INC.
FOREST MANAGEMENT AGREEMENT AREA
PROTECTED AREAS



Legend

- Protected Areas
- Buffer
 - Ecological Reserve
 - Natural Area
 - Natural Park
 - Provincial Park
 - Wilderness Area
 - Wilderness Park
 - Wildland Park
- Roads
- Paved primary
 - Other Roads
- Waterbody
- Waterbody
- BRL FMA
- BRL FMA

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Date: September 1, 2005

BLUE RIDGE LUMBER INC.
A SUBSIDIARY OF WEST PRAIRIE MILLS LTD.





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5.16 Aesthetics

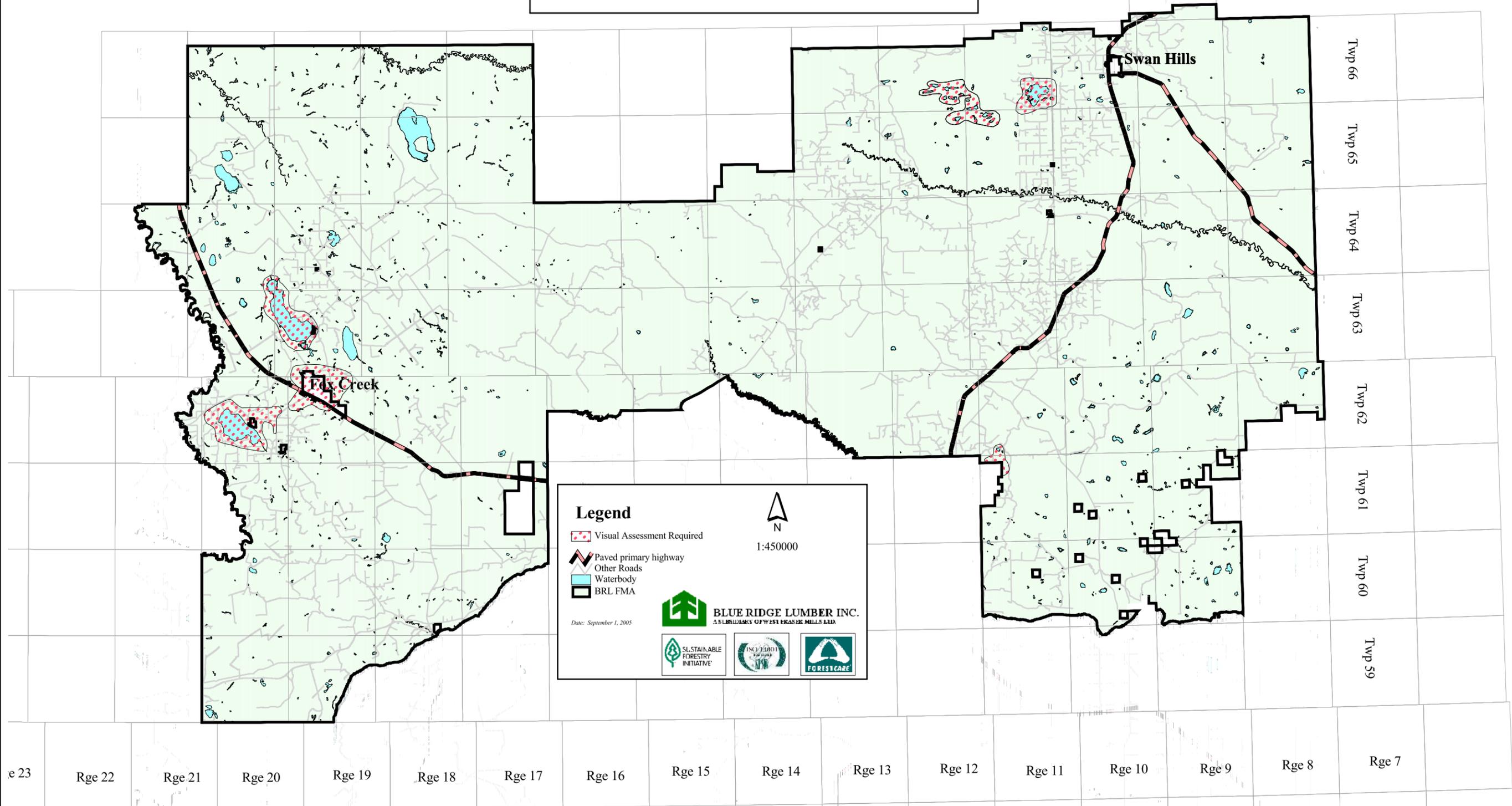
Blue Ridge Lumber provides opportunities for public input in respect to aesthetics in the Preliminary Harvest Designs, which are presented at the annual Woodlands Open House Meetings. Any aesthetic concerns by the public will be addressed and resolved by Blue Ridge Lumber. There has been very little aesthetic concern by the public to date, probably due to our relatively flat undulating terrain, small cutblock shapes and sizes, alternate cut and leave pattern, mixed-wood species, timing of operations, and the influence of the oil and gas industry.

BRL has however incorporated aesthetic concerns into our AOP and GDP planning. Examples include north of Carson-Pegasus Provincial Park (operating unit JC 15), along Highway 32 (operating unit JC15), along the BRL Haul Road, Swartz Lakes and Freeman Lake (operating unit SH32), Trapper Lea's and along Highway 33 (operating unit SH37).

Blue Ridge Lumber has the GIS computer software and expertise to do terrain landscape modeling, when required or warranted. Terrain landscape modeling can help to determine the visual impact potential of proposed cutblocks in highly visual sensitive areas. An example of this could be immediately adjacent to the Carson-Pegasus Provincial Park. Blue Ridge Lumber is not scheduling cutblocks that are visible from the Park within the next 5 years.

The following map shows where visual assessment is required to protect high aesthetic values on the BRL FMA area. Most areas within the FMA area do not need an actual visual assessment as the planners and logging supervisors are sensitive to visual concerns and they can design and harvest the cutblocks in a way that minimizes the visibility of harvested areas (i.e. smaller cutblocks, feathered boundaries, irregular shapes, protect roadside vegetation, buffers, understorey protection, and tree retention etc.).

BLUE RIDGE LUMBER INC.
 FOREST MANAGEMENT AGREEMENT AREA
VISUAL ASSESSMENT



Legend

- Visual Assessment Required
- Paved primary highway
- Other Roads
- Waterbody
- BRL FMA

Date: September 1, 2005

BLUE RIDGE LUMBER INC.
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SUSTAINABLE FORESTRY INITIATIVE

ISO 14001

FOREST CARE

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5.17 Recreation

5.17.1 General Overview

The Blue Ridge Lumber FMA area is in close proximity to Edmonton. Due to extensive natural resource development in the area, access to most areas is good to excellent. Recreation opportunities are very diverse with fishing, hunting, camping, ATV riding, cross-country skiing, and snowmobiling being the big attractions.

Other activities include picnicking, boating, canoeing & kayaking, jet boating, swimming, berry &/ or mushroom picking, photography, nature viewing or just plain relaxation. Whitecourt hosts the Annual Jet Boat Races, which take place on the Athabasca River.

Fishing and hunting are the primary recreational activities within the FMA area. Fish and Wildlife Division has stocked a large variety of lakes within the FMA area. The largest annual fish stocking program within Alberta is undertaken at Carson-Pegasus Provincial Park.

In the VSA 1 Pine Point borrow pit is stocked annually with rainbow trout. There are also a number of small lakes in the VSA 1 area that contain no fish populations as well as some lakes that contain only pike or forage fish species. The only lakes that contain northern pike, walleye and perch are Smoke Lake and Iosegun Lake that contain naturally reproducing populations of lake whitefish and burbot. Meekwap, Raspberry and Jerry Lakes contain populations of northern pike, and yellow perch but no walleye.

Please refer to the Fish & Wildlife Section to see the number of fish that have been annually restocked in the FMA area.

Potential recreational value within the FMA area is recognized by Blue Ridge Lumber and special harvesting and reforestation guidelines are implemented where appropriate. Some examples are:

- Carrying out harvesting operations during low demand periods. (i.e. conduct winter operations beside summer camping areas, and conduct summer operations in areas used by winter snowmobile and cross-country skiing).
- Limiting sight line distances by leaving small patches of wind firm timber, retention of deciduous timber or shrubs along ridges or roadsides.
- Implementation of a third pass cut system or smaller cut blocks near prime recreation areas.
- Removal of debris from skid trails used by snowmobiles and trappers.

Table 35: Developed Recreation Areas within the FMA Area

Name	Location	Use
Freeman River	NW 26-64-10-W5	Campsite
Trapper Lee’s Cabin	SE 11-64-8-W5	Campsite
Kidney Lake	NW 28-63-9-W5	N.A.I.T. Forestry Camp
Morse River	SW 32-64-8-W5	Boy Scouts of Canada Camp
Emerald & Laura Lakes	SW 5-62-11-W5 NW 29-61-11-W5	Random camping. No development.
Krause Lake	NE 3-66-10-W5	Campsite staging area for Swan Hills Snowmobile Club
Krause Lake	11 N, 12, 13S and 14S 66-10-W5	Swan Hills X-country Ski Club Trails
Freeman Lake	NW 1-66-11-W5	Campsite
Smoke Lake	NW 15-62-20-W5	Campsite & boat launch
Iosegun Lake	SE 21-63-19-W5	Campsite & boat launch
Swan Hills Horse Riding Trails	Portions of sections 12, 13, 14, 15, 22, 23, 24, 26S –66-10-W5	Horse riding

5.17.2 Campgrounds

There is a wide assortment of government and commercial campground facilities within and adjacent to the Blue Ridge Lumber FMA area.

The developed campgrounds in the Blue Ridge Lumber FMA area are located at Freeman River, Freeman Lake and Trapper Lea’s. The Freeman River campground consists of 15 campsites that do not have any power but are equipped with a water hand pump and outhouses. Freeman Lake is a group area campsite that contains 10 sites with a grassy area, no power, but does have a water hand pump and outhouses. The main feature of the Freeman Lake campground is a gazebo with a central firepit. Trapper Lea’s has 20 campsites that also does not have power but is equipped with a cook shack, hand water pump, outhouses and is also a snowmobile staging area. Both Freeman River and Trapper Lee’s campsites are open all year round where as the Freeman Lake campsite is only open from May-September. The cost of maintenance of the Freeman River, Freeman Lake, and Trapper Lee’s campgrounds is shared between the Municipal District of Big Lakes, Blue Ridge Lumber, and the Town of Swan Hills.

Additional recreation areas in the FMA area include Krause Lake, which is a popular snowmobile staging area. Emerald & Laurel Lakes are proposed as a wilderness campground. Goose Lake is a popular recreation area immediately adjacent to the FMA area.

Developed campgrounds are also located at Smoke Lake, and Iosegun Lake. Smoke Lake is located 8 kilometers south of Fox Creek. This campground contains a boat launch and a public beach. There are 47 campsites with a water hand pump and outhouses. The Iosegun Lake campsite is situated 11 kilometers north of Fox Creek and contains a boat launch, beach, picnic shelter and 52 campsites with a water hand pump and outhouses. The Town of Fox Creek

operates the Fox Creek Regional Parks Service to manage the Iosegun Lake Campground, Smoke Lake Campground and the Fox Creek RV Campground.

There are a few additional camping facilities located adjacent to the FMA area, which are either privately owned or operated by Alberta Sustainable Resource Development.

In Whitecourt, the Alberta Sustainable Resource Development operates a 27-site group campground facility at the Eagle River site. Commercial operated campgrounds in the Whitecourt area include the 90 campsites at the Sagitawah Tourist Park, 70 sites at the Whitecourt Lions Club Campground, 27 sites at the Eagle River Wilderness Adventure, 22 sites at the Alaska Highway Motel and RV Park, and 12 sites at the White-Cap Motel and RV Park.

Swan Hills has 13 campsites at the Four Season Wilderness Camp Grounds that has power for five of the 13 sites. This campground is equipped with washrooms, showers and outhouses.

The Fox Creek RV Campground is situated near the Oil Rig tourist attraction at Fox Creek. This campground includes 17 fully serviced stalls and 7 non-serviced stalls.

5.17.3 Carson-Pegasus Provincial Park

The largest park in the Whitecourt area is the Carson-Pegasus Provincial Park. This park is a multi-purpose recreation area that is adjacent to the Blue Ridge Lumber FMA area.

Creation of Carson Lake Provincial Park withdrew 921 hectares from the Blue Ridge Lumber FMA area in 1980. Carson-Pegasus Provincial Park was established in 1982 and is of medium-size, encompassing 1209.64 hectares and surrounds McLeod Lake, Little McLeod Lake and part of Laura Lake. The lakes together cover approximately a quarter of the park's area. The park offers 182 sites for tents, campers and motor homes with semi-serviced lots and heated and shower facilities. During the off-season, the park has 27 powered campsites and a heated washroom.

McLeod Lake is stocked each year with approximately 450,000 rainbow trout (*Oncorhynchus mykiss*) fingerlings because of the high fishing demand placed upon the lake by park visitors. McLeod Lake has no suitable spawning habitat for rainbow trout but it does have spawning habitat for naturally reproducing populations of white sucker, longnose sucker and burbot. Little McLeod Lake has native populations of northern pike (*Esox lucius*), yellow perch (*Perca flavescens*) and lake whitefish (*Coregonus clupeaformis*). There is little fishing in Laura Lake because past stocking attempts have been unsuccessful. Laura Lake was successfully stocked from 1967 to 1994 with brook trout and rainbow trout but stocking ceased due to intermittent winter kill and the lakes close proximity to McLeod Lake which was first stocked with rainbow trout in 1976.

Park visitation have increased steadily each year to the present summer weekend campground occupancy rate of 100% capacity, and the summer week days are booked to 70%. This park’s primary attraction is fishing and camping. Carson-Pegasus is used as one of the winter staging area for snowmobile’s that access the various trails within the area.

McLeod Lake is the only lake within the area that has good primary water recreation opportunities for swimming, scuba, skin diving and wind surfing and a fair opportunity for kayaking and sailing. McLeod Lake has a boat speed limit of 12 km per hour. Smoke Lake and Iosegun Lake have no boat speed restrictions except for designated swimming areas. These two lakes have potential for other recreation opportunities similar to McLeod Lake.

5.17.4 Eric Huestis Demonstration Forest

The Eric S. Huestis Forest is the closest demonstration forest to Edmonton and is located just north of Whitecourt on Highway #32. The Forest covers 10 square kilometers and has a self-guided tour that encompasses 16 interpretive sites on a seven-kilometer trail. Each site demonstrates a different management technique or stage in the life cycle of a forest.

Blue Ridge Lumber supported the establishment of the Huestis Demonstration Forest by harvesting, building a bridge, road development, and continuing contribution to the ongoing maintenance of the Forest.

The Eric S. Huestis Forest is an excellent center for forest training and tours. The area is used annually by the University of Alberta and Northern Alberta Institute of Technology forestry students.

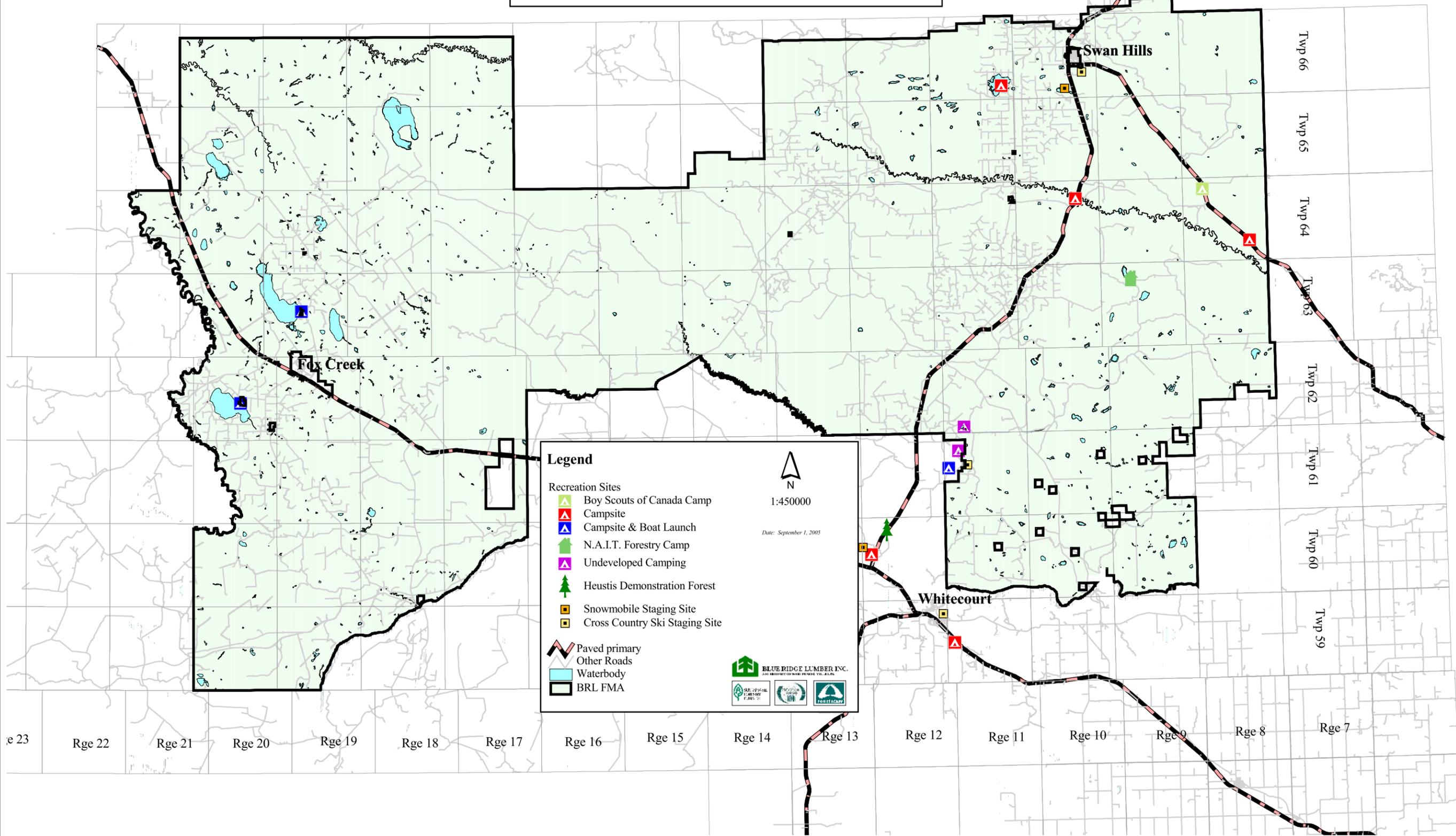
The map on the following page shows the location of the developed recreation areas, campgrounds, NAIT, Carson-Pegasus Provincial Park, and the Eric Huestis Demonstration Forest.

5.17.5 Whitecourt Forestry Interpretive Centre

The Whitecourt & District Heritage Society was founded in June of 1979 to safeguard and promote the town's heritage. In 1993 the Heritage Society announced plans to construct a \$1.4 million Forestry Interpretive Center and Heritage Park. Blue Ridge Lumber Inc., ANC Timber Ltd. and Millar Western Industries Ltd. have each committed \$100,000 towards the construction of the Whitecourt Forest Interpretive Center.

The Interpretative Center was opened to the public on September 9, 2000 with the grand opening ceremonies. The Whitecourt Forestry Interpretive Centre is located 3 km east of Whitecourt on Highway 43 next to the Lions Campground.

BLUE RIDGE LUMBER INC.
 FOREST MANAGEMENT AGREEMENT AREA
 RECREATION AREAS



- Legend**
- Boy Scouts of Canada Camp
 - Campsite
 - Campsite & Boat Launch
 - N.A.I.T. Forestry Camp
 - Undeveloped Camping
 - Heustis Demonstration Forest
 - Snowmobile Staging Site
 - Cross Country Ski Staging Site
 - Paved primary
 - Other Roads
 - Waterbody
 - BRL FMA

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Date: September 1, 2005



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5.17.6 Snowmobiling

Whitecourt is the “Snowmobile Capital of Alberta”. The Whitecourt, Swan Hills and Fox Creek area has an extensive array of seismic cut lines, and the access development from the various forestry operations, and oil & gas activity makes the area a superb backcountry snowmobile destination. These excellent trails and excellent snow conditions make for a very diverse family experience.

In the late 1970’s and early 1980’s the Alberta Sustainable Resource Development assisted various clubs in the development of 12 snowmobile trail systems within the province. One of these areas was at Krause Lake in the Swan Hills area where 63 miles of trails were constructed. Three trail loops of different sizes were constructed.

Whitecourt snowmobilers use the staging areas at Carson-Pegasus Provincial Park and the Eagle River Snowmobile Staging Area, which is 14 kilometers northwest of the town. The Whitecourt Trailblazers have established a warm-up and emergency shelter located at SW Section 16, Township 61, Range 11, W5th meridian.

The Eagle River Trail Area has over 48 kilometers of groomed trails, a staging and warm-up area, and for the more adventurous snowmobilers the Eagle River and Carson Pegasus Park is connected to the 220 mile (354 kilometer) Golden Triangle Snowmobile Trail System which is a system of trails between Whitecourt, Swan Hills and Fox Creek. The Golden Triangle Trail system was developed by the three snowmobiling clubs; Whitecourt Trailblazers, Swan Hills Sno-Goers and the Northland Sno-Goers of Fox Creek. This trail system has staging areas in all three communities.

Blue Ridge Lumber meets annually with the Whitecourt, Swan Hills and Fox Creek Snowmobile Clubs to bring them up to date on our proposed winter harvesting. Any potential conflicts with the snowmobile trail system are immediately resolved to the satisfaction of all parties.

The local snowmobile clubs are all members of the Alberta Snowmobile Association, which is promoting a large network of designated trails within the province. This development of an integrated system of trails and the corresponding support services will promote tourism and will improve the economic activity in the local area.

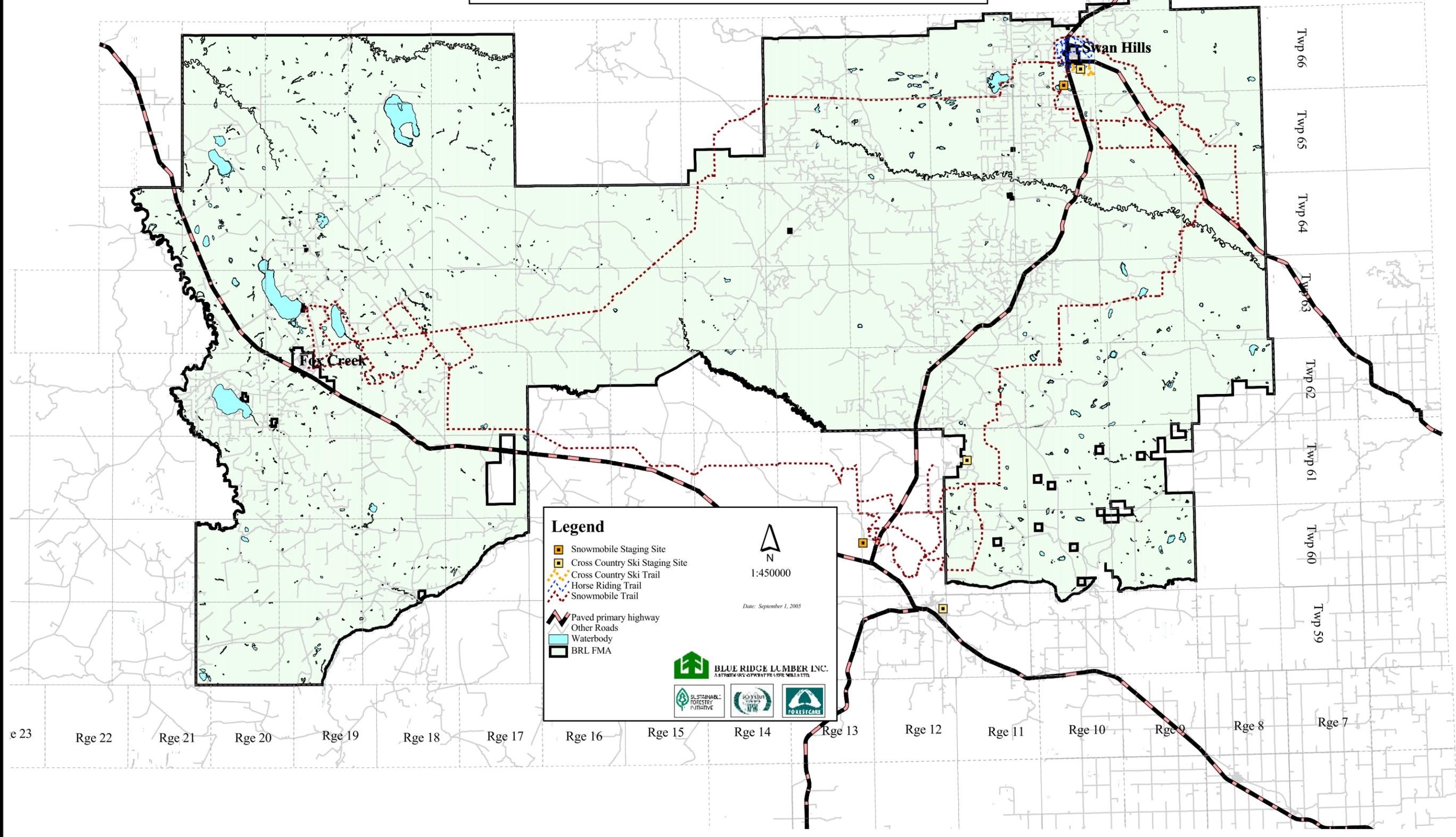
5.17.7 Cross Country Skiing

The Swan Hills Cross-country Ski Club has 8.1 kilometers of trails in the Krause Lake area.

The Whitecourt Cross-country Ski Club has 28 kilometers of ski trails at the Sandhills Cross-country Ski Area, which is located south of the gravel road between Whitecourt and Blue Ridge. The ski trails are used as hiking trails during the summer months.

Please refer to the map on the following page showing the snowmobile, cross country ski, and horse riding trails in the Whitecourt, Swan Hills and Fox Creek areas.

BLUE RIDGE LUMBER INC.
 FOREST MANAGEMENT AGREEMENT AREA
 SNOWMOBILE, CROSS COUNTRY SKI
 AND HORSE RIDING TRAILS



Legend

- Snowmobile Staging Site
- Cross Country Ski Staging Site
- Cross Country Ski Trail
- Horse Riding Trail
- Snowmobile Trail

- Paved primary highway
- Other Roads
- Waterbody
- BRL FMA



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Date: September 1, 2005

BLUE RIDGE LUMBER INC.
 A DIVISION OF Weyerhaeuser Mills Ltd.

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5.17.8 Klondike Trail

The Klondike Trail was used during the 1897/1898 Klondike Gold Rush and was promoted by the Edmonton Bulletin, Edmonton merchants and the Government of Canada, as an all-Canadian route to the Yukon. The Trail was cut to provide Klondike Gold seekers with an overland route to reach the Peace River Crossing, the first leg of the 1,500-mile trip to the Klondike. The Chalmers Trail was a 120-mile segment of the Klondike Trail from the Athabasca River crossing at Fort Assiniboine to the Slave Lake settlement (modern day Grouard).

On September 9, 1897 the Government of the North West Territories (Alberta was not a Province until 1905) sent T.W. Chalmers, a road engineer on a reconnaissance trip to mark a trail from Edmonton to the settlement of Lesser Slave Lake. He returned to Edmonton on November 7, and left the next day with a crew of axemen to improve the old Hudson Bay packtrail to Fort Assiniboine. By the end of 1897 Chalmers was cutting his way to the south slope of the Swan Hills.

Part of the Trail is located in the “Sandhills Wilderness Park” near Fort Assiniboine. An 1898 grave is located beside the Trail about 3 km from the Park staging area. North of the Park area, the Trail passes through Dead Horse Meadows.

The Dead Horse Meadows are a series of large natural meadows located where the Chalmers Trail crossed the Coutts River. This is 14 miles east of the present day town of Swan Hills and 33 miles north-northwest of Fort Assiniboine. The Dead Horse Meadows are located just inside of the Blue Ridge Lumber FMA area in the northeast corner of Township 66 Range 8 W5thM. These meadows hold evidence of being used as a camping site long before the gold rush and sections of the very old migration can be clearly seen in some areas. According to local history, a family arrived at Dead Horse Meadows during the gold rush with a team of horses pulling a wagon. One of the horses became stuck in the muskeg and this is believed to be the reason for the name Dead Horse Meadows.

The Klondike Trail Society is a group of local residents from Fort Assiniboine who are interested in locating and marking the first 250 miles of the Trail from Edmonton to Dawson City, Yukon. Additional information on the Klondike Trail Society can be obtained from the web at: www.klondiketrail.ca.

Blue Ridge Lumber has met with the Klondike trail Society on several occasions. The Klondike Society (Mr. Doug Borg and Mr. Jim Kirstein) was contacted on July 19, 2001 to obtain a GPS digital file that identifies the Klondike Trail within the BRL FMA area. A digital copy of the Klondike Trail was provided to BRL on August 22, 2001 and put onto the GIS system. Please refer to the map on the following page, which shows the location of the Klondike trail within the BRL FMA area.

Klondike Trail Society wants to continue to identify and record the trail but not to develop it. The Klondike Trail Society is not requesting a buffer along the trail but would like to preserve as

much of the original trail as possible. The Klondike Trail Society has requested industry to modify layout to use the trail as a back or sideline rather than skidding across the trail and to avoid using the trail as a road.

The Klondike Trail Society would like to identify any additional historical sites along the trail (Dead Horse Meadow). There is a PNT along the Dead Horse Meadow.

The Klondike Trail may have several diversions. There is a need to identify and map the main trail. BRL has the 1915 Forestry Canada map that can be used for preliminary identification of the trail but this map is not very accurate. The forest industry has agreed to assist the Klondike Trail Society by accurately locating the trail with GPS when working in the area and to provide a digital copy of the file to the Society.

Blue Ridge Lumber is committed to continue working with the Klondike Trail Society to protect the cultural values of the trail.

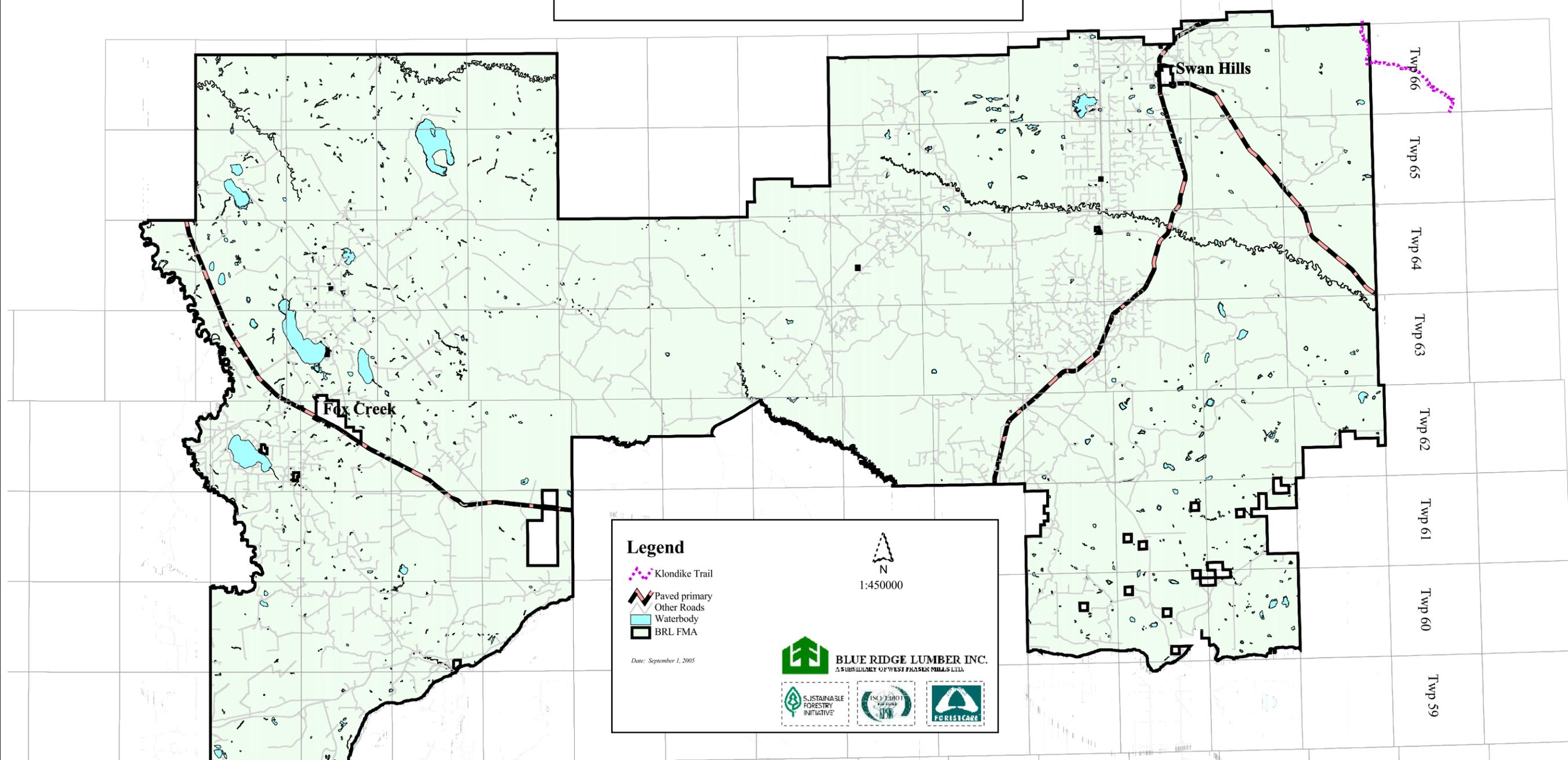


Dead Horse Meadows



Cabin at Dead Horse Meadows

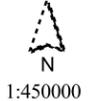
BLUE RIDGE LUMBER INC.
FOREST MANAGEMENT AGREEMENT AREA
KLONDIKE TRAIL



Legend

- Klondike Trail
- Paved primary
- Other Roads
- Waterbody
- BRL FMA

Date: September 1, 2005



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BLUE RIDGE LUMBER INC.
A SUBSIDIARY OF WEST FRASER PULP LTD.



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5.18 Trapping

Trapping is common throughout the FMA area, and is allocated to licensed trappers under “Registered Trapping Area Certificates”. Some trappers are very active and others are not.

Beaver (*Castor canadensis*) is the furbearer of greatest significance and economic importance, followed by lynx (*Lynx canadensis*) and coyote (*Canis latrans*). Fisher (*Martes pennanti*), marten (*Martes americana*) and red squirrel (*Tamiasciurus hudsonicus*) have been economically important to the trapping industry over the past couple of years.

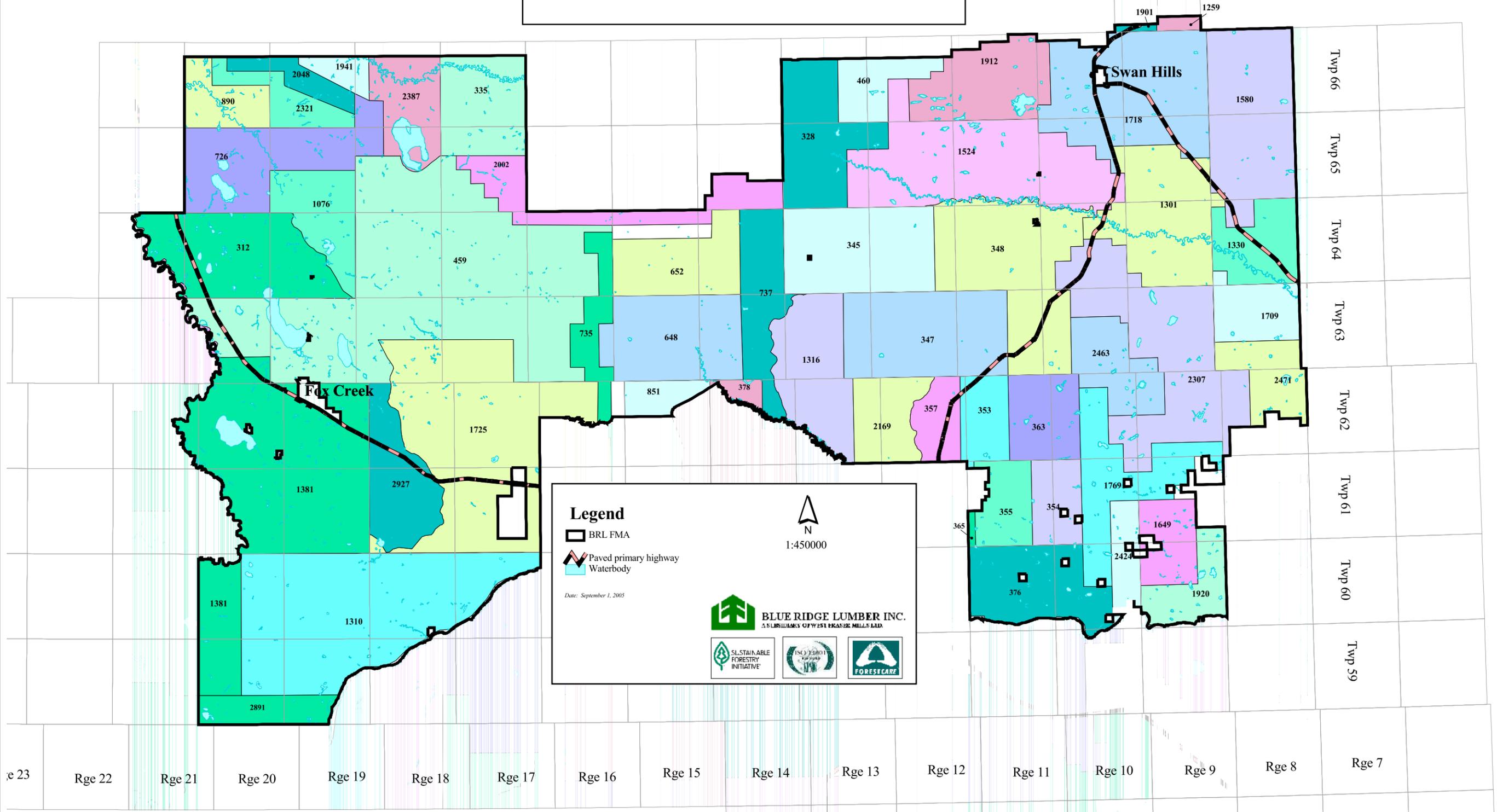
Other animals that are occasionally trapped are: mink, otter, muskrat, ermine or weasel, red fox, wolf, skunks, badger, and wolverine. Rabbits are occasionally trapped for food, but not for fur. Grizzly bears, black bears, and cougars are not trapped but are occasionally shot.

The Company contacts local trappers when the need arises to remove nuisance beaver that plug culverts and damage roads.

The Company maintains a map and an up to date list of registered trappers that is provided by SRD Fish and Wildlife. The Company has maintained good communications with registered trappers within the FMA area well in advance of harvesting operations. Blue Ridge Lumber contacts affected trappers to obtain their input prior to designing the harvest plan for each operating unit. Blue Ridge Lumber also sends each trapper a copy of the approved preliminary plan and explains to the trapper how we plan to proceed with operations through the unit. Finally, the Company contacts the trappers annually by registered letter to explain current year operations with a map showing trapline boundaries, blocks cut to date, and existing and proposed access routes. Any traditional trapline access routes that are identified during planning process are left accessible.

Please refer to the map on the following page showing the location of registered trap lines within the Blue Ridge Lumber FMA area.

BLUE RIDGE LUMBER INC.
FOREST MANAGEMENT AGREEMENT AREA
REGISTERED TRAPLINES



Legend

- BRL FMA
- Paved primary highway
- Waterbody

Date: September 1, 2005

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BLUE RIDGE LUMBER INC.
A SUBSIDIARY OF WEST FRASER MILLS LTD.

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5.19 Outfitters and Guides

Outfitting and guiding is a popular recreation industry within the FMA area. Alberta hunting regulations require that non-residents (out of province Canadian) and non-resident aliens (non-Canadian resident) must be accompanied by a licensed guide.

Blue Ridge Lumber maintains a list of outfitters and guides that operate within the FMA area, and contacts any that are affected by harvesting operations. Listings of the Alberta Professional Outfitters Society can be found on the web at: www.apos.ab.ca.

There is an outfitting and guiding lodge located within the BRL FMA area on private land in SW section 25 Township 61 Range 10 W5M. The lodge is owned and operated by Mr. Bryan Radke of Athabasca River Outfitters R.R. #1 Barrhead, Alberta T7N 1N2 telephone (780) 674 -5715. Additional information on Athabasca River Outfitters can be obtained by email at: aroutfitters@telusplanet.net or the website at: www.telusplanet.net/public/aroutfit/contactus.htm.

5.20 Protection of Conifer Understorey

Blue Ridge Lumber Inc. has the rights to all of the conifer timber within the W3 and W4 FMA area except that which is sold through timber permits. The timber supply benefit of retaining advanced conifer regeneration is recognized in the timber supply analysis. The protection of advanced understorey growth is most important because these trees are young and they are able to put on growth to fill the age class gap as a result of the Virginia Hills Fire. It is also recognized that this advanced regeneration helps to provide cover for animals, break up line of sight and provide variable retention opportunities in mixed-wood stands.

The embedded deciduous timber allocations require that conifer growth occurring in mixture with deciduous timber be protected using methods approved by the Minister.

Understorey issues and guidelines are identified in the FMA, the Deciduous Timber Allocation Certificates, the Timber Management Regulations, the Operating Ground Rules, and the timber supply analysis of this Detailed Forest Management Plan. The following is a summary of the requirements:

Forest Management Agreement

The BRL FMA Section 7 (1) (b) and (c) describes the Company's rights to harvest and remove conifer timber on and from the FMA area, and the right to remove deciduous timber on and from the FMA area when such timber is mixed in a merchantable conifer stand located in FMU W3 and W4.

The BRL FMA Section 16 states that the Company shall at its own expense, conduct such forest inventories of the FMA area as are necessary to prepare the plans required.

The BRL FMA Section 25 (2) describes the Company's rights and responsibilities for the management of this incidental conifer growing stock on the FMA area. It states *that "The Company shall **account** for incidental conifer growing stock in the forest management plans, and shall ensure, through the approved forest management plans and annual operating plans, that the incidental conifer timber component is being **sustained** through strategies acceptable to the Minister."*

The Deciduous Timber Allocation Certificates

1. Summary of the MWFP DTA W910001 Certificate

- Section 11 states: *"Operations must be conducted so as to avoid damage to any young conifer growth that occurs in mixture with deciduous timber except where otherwise designated in an approved Timber Management Plan for the Unit.*
- Section 15 states: *"No conifer timber may be harvested under the Deciduous Timber Allocation (DTA) except where the DTA Holder provides the Department with proof in the form of a written contract showing that the*

conifer trees and logs harvested will be sold within twelve (12) months of the date of harvest to a purchaser acceptable to the Minister.”

2. Summary of the MWFP DTA W910002 Certificate

- Section 8 states: *“The Certificate AAC will be comprised of the deciduous volume within the pure deciduous stands used in the approved AAC calculation for FMU W3 and W4. The deciduous timber allocation will be sequenced in 15/10 stands.”*
- Section 12 states: *“In accordance to strategies acceptable to the Minister for maintaining conifer growth in deciduous stands with identified conifer understories and approved management plans and AOP’s, the Certificate Holder will have the right to harvest deciduous from deciduous stands with identified understories.*
- Section 13 states: *“To the extent possible in the circumstances, operations of the Certificate Holder must be conducted so as to avoid damage, to any young conifer growth that occurs in mixedwood stands except where otherwise designated in an approved AOP. The actual method(s) for minimizing this damage may vary and will be defined by the AOP of the Certificate Holder.”*
- Section 14 (2) states: *“The Certificate Holder acknowledges that the FMA Holder, currently Blue Ridge Lumber Inc., has the rights to all the conifer timber within W3 and W4 except that which is sold through permits.”*
- Section 15 (2) states: *“The Certificate Holder shall integrate its planning and harvesting operations by agreement with other disposition holder(s), through joint planning of the annual operating plan(s). AOP’s submitted by the Certificate Holder will not be approved by the Minister until conflicts between the Certificate Holder and other disposition holder(s) have been resolved to the satisfaction of the Minister.”*

3. Summary of the ANC DTA W020001 and DTA W020002

- Section 10 states: *“To the extent reasonably possible under the circumstances, operations of the Certificate Holder must be conducted so as to avoid damage to any young conifer growth that occurs in mixture with deciduous timber. The actual method(s) for minimizing this damage may vary and will be defined by the annual operating plan of the Certificate Holder.”*
- Section 11 (1) and (2) states: *“The Certificate Holder has no rights to any of the conifer trees in timber stands within FMU W02 to be harvested under authority of this certificate, and the Certificate Holder has no rights to the Balsam (Black) Poplar or Birch trees in timber stands within FMU W02 to be harvested under authority of this certificate.*
- Section 12 (2) states: *“The Certificate Holder shall integrate its planning and harvesting operations by agreement with all timber disposition holders, through joint planning of all parties annual operating plan(s).*

The Timber Management Regulations

Paragraph 100 (j) states that: *“Every person who harvest timber on public land shall avoid damage to regeneration, advanced growth and residual trees. This means a live and healthy tree that prior to logging an area, has grown on that area and was not authorized to be cut.”*

5.21 Strategy for Protection of Conifer Understorey

5.21.1 Introduction

The identification and protection of conifer understorey is an important component of the Blue Ridge Lumber timber supply strategy. We are committed to improving all aspects of our understorey protection program. The main components of the program include inventory and classification, operational protection, and monitoring.

Blue Ridge Lumber has been concerned that some stands that were typed as deciduous (D) by the AVI may actually have a significant conifer understorey. This is due to the fact that the AVI was an interpretation of leaf-on photography, which made identification of conifer understorey very difficult. The picture to the right shows the results of planned understorey protection in a stand that had been typed by AVI as pure deciduous (D).



A DTA holder does not have the right to conifer trees, and all operators must protect conifer understorey. It is not the intention of Blue Ridge Lumber to make understorey protection onerous. There must, however, be some flexibility on the part of deciduous operators, in recognition of inventory limitations. Understorey will only require planned protection if it has enough stocking, vigor, and size to make a significant contribution to the conifer timber supply.

The timber supply analysis assumes that over the next 20 years there will be an average of 150 hectares of planned understorey protection annually. This protection will primarily be required in D(C) stands. However, there will be cases where planned protection is required in deciduous (D) landbase, particularly where the leaf-off inventory has not yet been completed. However, in these areas there will also be offsetting situations where stands typed as D(C) actually do not require planned protection because the understorey is not significant. Blue Ridge Lumber will make our inventory (where completed) or leaf-off photography available to deciduous operators in order to increase the accuracy and ease of planning for understorey protection.

5.21.2 Inventory and Classification

In 1987 an aerial assessment of conifer understorey with ground sampling was carried out on 40,500 hectares of deciduous dominated stands. This inventory was used in the timber supply analysis that was approved in 1991. In 1994 large scale panchromatic leaf-off photography was interpreted for 160,000 hectares. This inventory was used in the post fire timber supply analysis that was approved in 2001.

In this DFMP and timber supply analysis, a new detailed conifer inventory using leaf-off false color infrared photography flown in 2003 was interpreted for 78,000 hectares (9 townships). For areas where a detailed conifer inventory was not completed, stands were classified as deciduous with a significant conifer understorey (D(C)) based on AVI calls.

The Timber Supply Document gives a more detailed description of the 2004 conifer understorey inventories that was used in this timber supply analysis and describes the inventory classification rules and timber supply assumptions that have been applied.

“All future conifer understorey inventory updates will adhere to the standards approved by SRD. Prior to commencing any further understorey inventories, BRL will develop a strategy acceptable to the department to enable the transition of current understorey inventory data to the new standard. Prior to initiating any understorey protection harvests outlined in Figure 3-1 of the (June 1, 2004) TSA, BRL shall develop a monitoring program acceptable to SRD to verify the assumptions used in this strategy.” (June 1, 2004 DFMP Approval Condition 1).

5.21.3 Operational Protection

Planned protection is carried out in stands that have understorey with enough stocking, vigor, and size of conifer understorey to make a significant contribution to the conifer timber supply. Avoidance protection is carried out in stands that have less important understorey.

In planned protection the goal is to achieve $\geq 50\%$ protection of conifer understorey from harvest and subsequent windthrow. In order to achieve this goal, an average of 10% of the deciduous volume is left unharvested to protect the understorey from blowdown. An average of 10 m³/ha of merchantable conifer understorey is also left unharvested. These unharvested deciduous and conifer volumes have been accounted for in the timber supply analysis and are therefore not chargeable against the AAC's (Timber Supply Document).

Planned protection involves inventory/photo analysis, ground truthing and usually requires modified harvesting with strip understorey protection. The best available photography and inventory should be used in order to identify understorey requiring planned protection. Blue Ridge Lumber will make our leaf-off photography and inventory available to DTA holders to ensure stands with significant understorey are identified and protected.

In avoidance protection the goal is to achieve significant protection of conifer understorey. Avoidance is particularly successful in situations where there are understorey clumps that are likely to withstand blowdown. None of the conifer or deciduous merchantable volume is left unharvested for protection of the understorey.

Harvest operations will be careful to follow plans for understorey protection. Any additional D(C) stands that are identified during operations will also be protected.

5.21.4 Monitoring

In order to improve operational understorey protection and improve upon future timber supply assumptions Blue Ridge Lumber recognizes the need for an understorey monitoring program.

In planned understorey protection areas appropriate tools such as leaf-off photography, ground truthing and/or strip cruising will be used to identify and plan for understorey protection.

Blue Ridge Lumber will adopt the concepts that are being developed by SRD in the draft “Understorey Protection Harvest Assessment” document. These concepts will be used to adjust the mixedwood regeneration survey to ensure that protected understorey is measured appropriately. The survey will take place 4-8 years after harvest to coincide with the mixedwood regeneration survey timing requirements.

As a part of the monitoring program Blue Ridge Lumber will target planned understorey protection stands with our Growth and Yield or Temporary Sample Plots in order to improve upon the long term monitoring and yield curve assignments of protected stands.

5.22 Incidental Volume Replacement Strategy

Accounting for incidental volume replacement is required by the Province (June 1, 2004 DFMP Approval Condition 2). The BRL FMA Section 25 (2) describes the Company’s rights and responsibilities for the management of this incidental conifer growing stock on the FMA area. It states that *“The Company shall account for incidental conifer growing stock in the forest management plans, and shall ensure, through the approved forest management plans and annual operating plans, that the incidental conifer timber component is being sustained through strategies acceptable to the Minister.”* The following strategy for incidental volume replacement was approved August 3, 2005, and later updated with the 2005 Spatial Harvest Sequence

The purpose of this section is to establish a strategy for ensuring the adequate replacement of incidental timber volumes in conifer and deciduous stands. Overall, the strategy developed will:

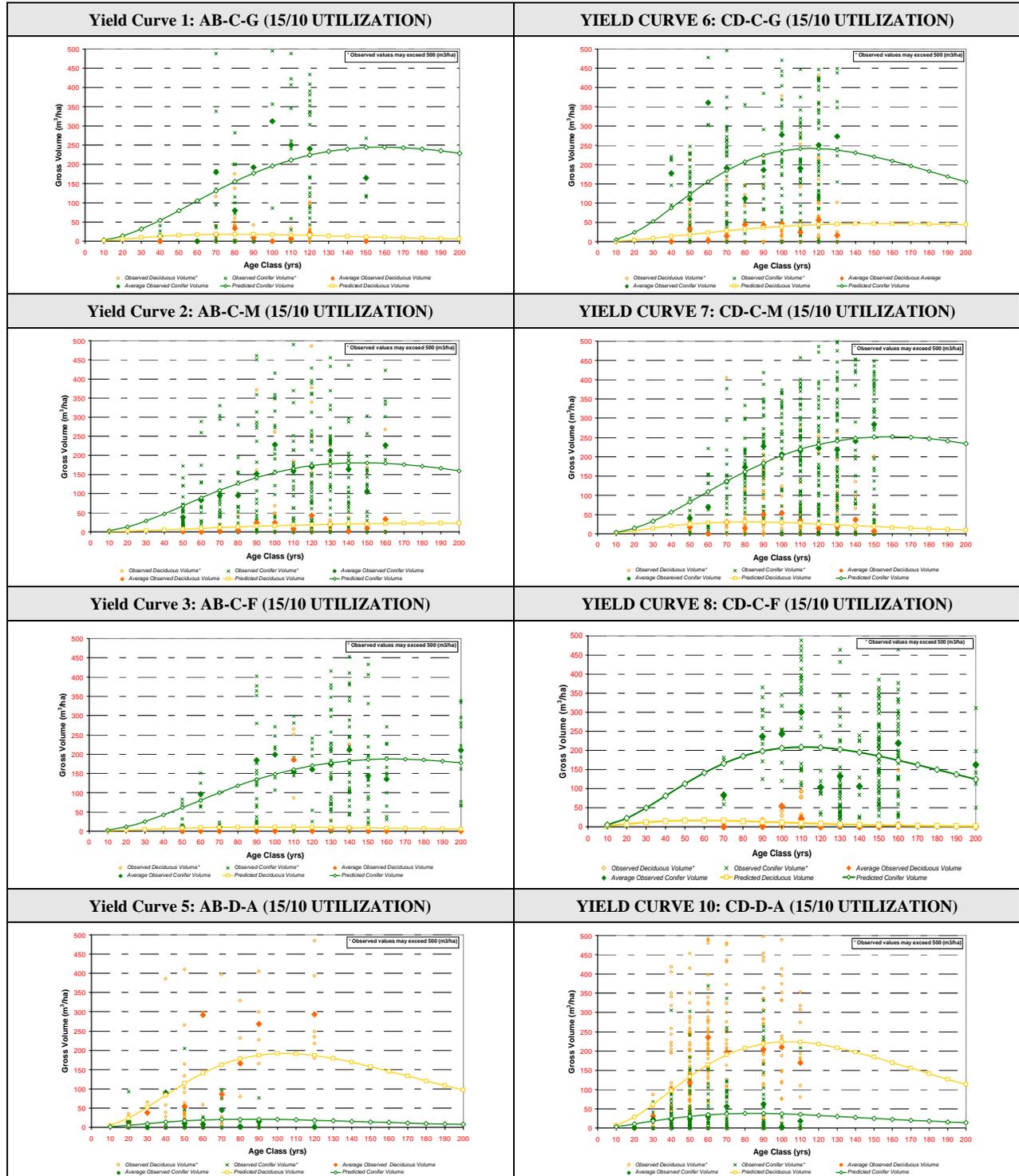
- Consider the replacement of both conifer and deciduous incidental growing stock;
- Only address incidental volumes from conifer (C) and deciduous (D) stands – not D(C) stands (please refer to the DFMP TSA regarding further detail on how the D(C) strata is being managed);
- Be simple, straight forward and easy to implement;
- Be landscape in scope. The strategy will focus on the maintenance of incidental volume components across the entire FMA area (i.e. some cutblocks may have a significant incidental components while others may have none);
- Utilize existing operating procedures and define a monitoring strategy aimed at ensuring objectives are being met.

To assist in the development of this strategy, a review of the Growth & Yield information as well as a sensitivity analysis assessing the PFMS’s dependence on incidental volumes was completed.

5.22.1 Growth & Yield Information Review

BRL’s PFMS assumes the replacement of an incidental volume component in conifer and deciduous stands. The six conifer and two deciduous yield curves used in the TSA are summarized in the following figure.

Graph 18: Pure Conifer and Pure Deciduous Yield Curves used in the Blue Ridge Lumber Preferred Forest Management Strategy (PFMS)



As indicated in the graphs, the incidental volume component on all yield curves is much smaller than the primary volume; the incidental volume of both conifer and deciduous does not exceed 50m³/ha at any time period for the eight yield curves.

5.22.2 Incidental Volume Replacement Sensitivity Analysis

In order to gain a better understanding of the PFMS’s dependence on incidental volumes from conifer and deciduous stands an AAC sensitivity analysis was completed. The sensitivity analysis evaluated the impact of adjusting the predicted incidental volumes in the eight conifer and deciduous yield curves for the second and third entries, while maintaining the D(C) incidental volume replacement strategy. The results from the analysis are indicated in the following table.

Table 36: Incidental Volume Replacement Sensitivity Analysis Results

STRATEGY	% AAC Impact	
	Conifer AAC Impact (m ³ /yr)	Deciduous AAC Impact (m ³ /yr)
2004 PFMS with incidental conifer and deciduous volumes set to 0 in the second and third entries (unrealistic)	Less than 2%	No Impact
2004 PFMS with incidental conifer and deciduous volumes reduced by 50% of the total in the second and third entries	Less than 1%	No Impact
2004 PFMS with incidental conifer and deciduous volumes set to 0 in the second and third entries and with the conifer evenflow volume allowed to fluctuate up to +/- 10% at any time throughout the 160 year planning horizon	No Impact	No Impact

5.22.3 Incidental Volume Replacement Strategy Development

The objective of this strategy is to ensure the maintenance of incidental conifer in deciduous stands and incidental deciduous in conifer stands across the entire BRL FMA area.

The main components of the strategy include:

1. Identifying the conifer incidental volume generated in the first 20 years of the SHS;
2. Defining the actions taken to achieve the objective;
3. The mechanisms used to measure and determine if the objective is being met;
4. The remedial actions that will occur if it is determined the objective is not being met.

1. Identifying the conifer incidental volume generated in the first 20 years of the SHS

Table 37: Summary of the Conifer Incidental Volume Harvested from the Pure Deciduous Strata in the First 20 Years of the 2005 SHS

Incidental Conifer Volume Harvested (m ³)	Area of Pure Deciduous Stands (ha)	Volume per hectare requiring replacement (m ³ /ha)
671,935 m ³	22,242 ha	30.2 m ³ /ha

2. The actions taken to achieve the objective

Immediate steps will be taken to ensure that the incidental volume replacement objective is being met. These steps include:

a) Pure D Yield Strata

- All deciduous stands will be reforested to the pure D yield strata as per the provincial reforestation standards.
- Continue practicing conifer avoidance and protection strategies, where 50% of the acceptable conifer trees in the understory will be retained without harvest damage. This advanced growing stock will contribute significantly to the conifer incidental replacement requirement.
- The estimated amount of incidental conifer requiring replacement in addition to advanced growing stock is identified in the following table. Immediate action will be taken to re-forest 50 ha/yr of pure D yield strata with conifer, primarily on roads and burn piles.

b) Pure C Yield Strata

- All conifer stands will be reforested to the pure C yield strata as per the provincial reforestation standards.
- A commitment to ensure the replacement of the incidental deciduous volume still exists. It is anticipated that the current harvesting and

silvicultural practices will ensure the replacement of the incidental deciduous volume, however this will be monitored.

Table 38: Estimated Incidental Conifer Volume Replacement for 20 YR 2005 SHS (pure D Yield Strata = 22,242 ha)

Scenario	Total Volume in first 20 yrs of SHS (m ³)	Average Volume per hectare in first 20 yrs of SHS (m ³ /ha)	Target
20YR SHS Total Conifer Incidental Volume from pure D stands	671,935 m ³	30.2 m ³ /ha	
Estimated Replacement from Existing Understorey Protection & Avoidance in pure D stands*	516,014 m ³	23.2 m ³ /ha	75 stems/ha (on average across all pure D stands)
Incidental Conifer Volume Requiring a Replacement Strategy	155,921 m ³	7.0 m ³ /ha	50 ha/yr planted primarily on roads and burn piles**

* The estimated replacement from conifer understorey protection and avoidance was derived from available data (2004 Conifer Inventory and TSP data); however several assumptions were necessary in order to identify targets. Monitoring will play an important role in verifying these assumptions.

** A conversion rate of 156 m³/ha was used from the fully stocked conifer yield strata at 60 years of age (which is when the pure deciduous stands are harvested on average in the TSA).

3. Monitoring activities related to achieving the strategy objectives

Both the conifer incidental in deciduous stands and the deciduous incidental in conifer stands will be monitored. If it is determined that the incidental replacement is inadequate (through the stewardship report), remedial action will be taken as outlined in section 4.

The monitoring activities associated with this strategy are outlined in the following table and are the responsibility of Blue Ridge Lumber. All operators will be expected to supply the required information to Blue Ridge Lumber.

Table 39: Incidental Volume Replacement Monitoring Activities

Monitoring Component	Monitoring Details
Regeneration Survey Data	<ul style="list-style-type: none"> Operators will need to supply digital regeneration survey information to Blue Ridge Lumber.
Stewardship Report	<ul style="list-style-type: none"> A stewardship report is required ever 5 years. The stewardship report will summarize available regeneration survey information related to the stocking of incidental species. This information will be compared to the target in Table 38
Growth and Yield Program	<ul style="list-style-type: none"> The program tracks early stand establishment and over time will help identify the presence of incidental volume in conifer and deciduous stand types.

4. The remedial actions that will occur if it is determined the objective is not being met.

A review of the available regeneration survey information will occur at the time of the 5-year Stewardship Report by Blue Ridge Lumber. If it is determined that there is inadequate incidental replacement of either conifer or deciduous species, the following will occur:

- a) Should the pure deciduous stands have an incidental conifer deficiency, the companies will work together to determine an effective method for addressing the deficiency (e.g. landbase conversion).
- b) Should the pure conifer stands have an incidental deciduous deficiency, the companies will work together to determine an effective method for addressing the deficiency (e.g. landbase conversion).

5.23 Structure Retention Strategy

Accounting for structure retention is required by the Province (June 1, 2004 DFMP Approval Condition 3). The FMA holder and embedded operators must report structure retention as drain to the annual allowable cut. The following strategy for structure retention strategy was approved August 3, 2005.

Discussion

Wildfire is the most common natural disturbance on the FMA area and current information suggests that there is ecological benefit to making harvested areas more similar to areas disturbed by wildfire. One of the ways to emulate wildfire is to retain vertical structural diversity on harvest areas. Stands resulting from fire tend to have green unburned patches, prolific regeneration and dead standing trees, all of which contribute to structural diversity over time.

Larger patches of residual structure generally have more benefit than smaller patches and small patches generally have more benefit than individual stems. Larger patches have more benefit because of their lower blowdown probability, their interior forest characteristics and their increased value as hiding and thermal cover.

In order to identify structure retention opportunities, evaluations will take place at the FMA, compartment, and harvest area levels. It is important to maintain flexibility throughout the process to allow for site-specific deviations. Every cutblock is expected to look different and structure retention strategies will be applied with careful consideration so as to ensure that the structure retained has a high utility for timber and wildlife values.

FMA Area Vertical Structure Status and Opportunity

There are 483,655 hectares within the net landbase. There is a wealth of vertical structure that has been retained on the net landbase due to wildfires, harvest designs, harvesting techniques, and historically variable deciduous market conditions.

There are 258,572 hectares of conifer stands in the net landbase. The majority of pure conifer stands are found at medium and high elevations ranging from the SW to the NE of the FMA area. There are a number of opportunities for retaining structure in conifer stands some of which include, a) partial cutting and retention of patches in harvest areas and b) retention of young unsalvaged wildfire stands.

There are 61,207 hectares of young unsalvaged fire stands less than 35 years old in the net landbase. These stands are highly variable in distribution and size, and they are interspersed with salvaged stands, older burned harvest areas, and variably-aged unburned green stands which add to the landscape level structural diversity. A significant portion of these stands will likely be retained as long term structure retention until they are available for harvest.



There are 225,083 hectares of mixedwood and deciduous stands in the net landbase. The majority of these stands are found in the SE and NW portions of the FMA area at lower elevations. At the landscape level there are opportunities to retain structure, particularly through the protection of conifer understorey.

There are 102,004 hectares of stands within the net landbase that contain a minimum of 10% balsam poplar or birch not allocated for harvest. Small patches and individual trees are left unharvested where feasible, particularly along riparian zones to enhance buffers.

FMA Area and Compartment Strategies

The FMA gross forested landbase is 599,571 hectares. Of this total, the inoperable forested area is 136,087 hectares or 23 % that is not eligible for harvest over the entire 160 year PFMS planning horizon.

The watershed constraints found in Section 4.2.9 of the Timber Supply Document ensure that at least 50% of the gross forested area will be above threshold age limits for the first 20 years of the PFMS. This equates to a minimum of 409,034 hectares or 68 % of the gross forested area.

The conifer understorey inventories have identified an area of 44,742 hectares or 7.5% of the gross forested landbase which has significant conifer understorey. This understorey contributes to vertical structure before harvest and also after harvest due to understorey protection.

In order to emulate wildfire at the landscape and compartment design level, harvest planning designs harvested areas as analogous to burned areas, and unharvested areas as analogous to green patches that escape wildfire.

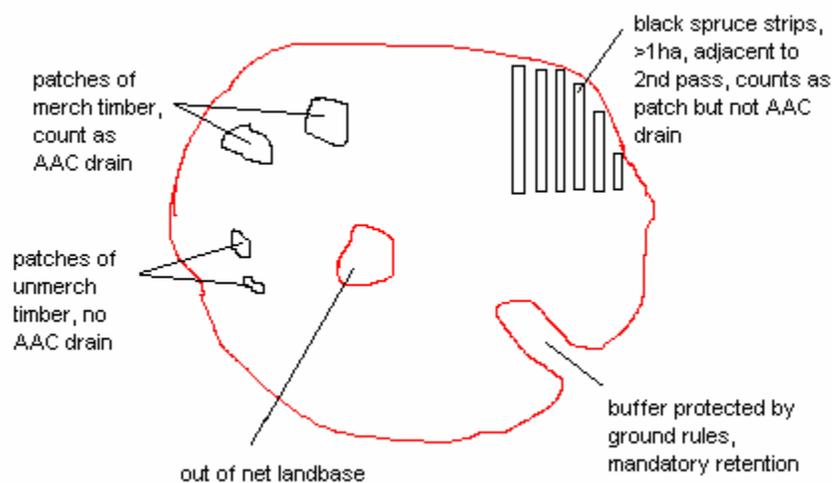
Company planners will give consideration to such things as wildlife zones, understorey protection or strip cutting potential, proximity to large permanent streams/lakes, harvest area size, edge effect, line of sight issues, and distance to hiding cover when establishing priority areas for patch retention within a compartment. For example, an area to be designed within an elk zone in a river valley would have a relatively high priority for patch retention.

The "average number of patches per hectare" target is the sum of all patches that have been intentionally retained within a harvest area. This target does not include landbase deletions and operating ground rule exclusions which often contribute additional structure to harvest areas. Examples of a landbase deletion and an operating ground rule exclusion buffer are shown in the following figure.

A large patch is larger than 0.2 hectares in size and a small patch ranges from 4 canopy trees to 0.2 hectares in size.

As described in the timber supply analysis, patches resulting from understorey protection will not be harvested for a minimum of 50 years. In some cases, the leave patches that result from black spruce strip cuts may be harvested in as few as 20 years. However, in all stand types, compartment structure retention targets will be maintained over time.

Examples of Patches



The target for average large patches/ha in a compartment is 0.02 patches per hectare. There will also be additional retention due to in-block net landbase deletions and operating ground rule requirements (i.e. in-block buffers).

The target for average small patches/ha in a compartment is 0.2 patches per hectare.

The average number of patches/ha will be reconciled by pre-harvest stratum areas in order to ensure that the conifer, mixedwood, and deciduous stands are appropriately represented in the structure that is retained. The target for reconciliation is 20% by stratum.

Harvest Area Strategies

There may be zero patches in any particular harvest area as long as there is compensation in other harvest areas to meet the compartment targets.

Attempts will be made to incorporate non-merchantable patches within the cutblock boundary where such opportunities exist. Residual patches shall be located with consideration for ecological benefit.

In pure deciduous stands, patches are left as needed in order to satisfy the compartment targets. These patches along with understorey-protected patches ensure that deciduous is retained.



In mixedwood and deciduous stands, patches are commonly left as protection for conifer understorey. The amount of deciduous retained is variable depending on the need for protection from windthrow. The deciduous and conifer understorey both contribute significantly to structure retention, and are left as long term structure. A detailed description of the understorey protection strategy is found in Section 5.20 and 5.21. Patches will be left in mixedwood stands as needed in order to meet compartment targets.



Patches of younger conifer are sometimes found within older stands. These patches are not harvested if they are large enough, vigorous enough and accessible enough to harvest at a more appropriate rotation age. These patches emulate the unburned green islands associated with wildfires. They are also valuable from a timber supply perspective as they are often white spruce, which are just beginning to accumulate significant volume. Patches will be left in conifer stands as needed in order to meet compartment targets.



In order to achieve consistent reforestation success after harvesting, black spruce stands are often harvested utilizing strip cuts. Strip cutting is only carried out in stands that are large enough, vigorous enough and accessible enough for future harvest. The patches left after strip cutting serve as structure retention, and to some degree they emulate the green unburned corridors often found after wildfire.



In order to achieve the prolific regeneration associated with wildfires, harvest areas typically undergo site preparation, scarification, prescribed burning and/or tending. The retention of

individual trees may be in conflict with silviculture and/or safety. These requirements often make it inappropriate to leave individual standing trees.

Individual trees will not be left unharvested where they potentially compromise the safety of personnel or silvicultural success. However, where there is no conflict, as a guiding principle, unmerchantable trees will be left unharvested, or left as debris if cut down.

Trees that are of poor form for merchantable use will also be left particularly along riparian zones where their benefit to the biotic community is maximized. Research has shown that even an individual white spruce can help meet the habitat requirements of various bird species. Through the use of understory protection (planned and avoidance) the timber supply analysis has accounted for many individual and clumped merchantable white spruce that will be left unharvested.

Patches of advanced regeneration will be retained as determined appropriate to meet planned objectives.

Monitoring and Reporting

As described in the Timber Supply Document, the Timber Supply Analysis has accounted for merchantable conifer and deciduous that is retained in 150 hectares/year harvested in understory-protected stands. Due to inventory limitations, this protection is simulated spatially as strictly D(C) stands in the TSA. In reality, mixedwood or deciduous stands may require planned understory protection, but this is consistent with the TSA because they will be included in the landbase balancing and be reforested as mixedwood stands, as assumed in the TSA.

On all timber dispositions a subjective visual inspection will be carried out by the area supervisor post harvest to ensure adherence to the forest management plan strategy and the Operating Ground Rule. The supervisor will determine the AVI call for all merchantable large patches.

During the annual harvest area update, areas will be calculated for large patches and a count will be made of small patches. A random selection of 5% of the small patches will be digitized in order to determine the average size of the small patches. The AVI call will be assigned to the appropriate forest management plan yield stratum and the patch areas and counts will be used to generate volumes.

Patches will be classified as “to be harvested later” if they have already been accounted for in the TSA or if they are a) readily accessible to a road or to a second pass harvest and b) their cumulative area is greater than 1 hectare.

The patches will be assigned status as “not AAC drain” or “AAC drain”. “Not AAC drain” includes all patches to be harvested later and unmerchantable patches.

All operators will collaborate to annually update a structure retention reporting table for their dispositions. This table will show the AAC drain volumes and the number of large and small patches of structure retained in conifer, mixedwood and deciduous stratum.

All operators will report AAC drain volume of merchantable deciduous and conifer in the GDP. In the 5 year Stewardship Report the FMA holder will also report on the number of patches of structure retained in conifer, mixedwood and deciduous stratum.

Temporary Sample Plots will be established in some of the patches to monitor mortality over time. The results will be used to reconcile and refine the relevant TSA assumptions.

5.24 Integration of Operations

DTA Holders are required to integrate their planning and harvesting operations by agreement with other disposition holders through joint planning of all party's annual operating plans. AOP's submitted by the Certificate Holder will not be approved by the Minister until conflicts between the Certificate Holder and other disposition holder(s) have been resolved to the satisfaction of the Minister."

Agreement should be reached between disposition holders regarding but not limited to:

- Deciduous and conifer volumes to be harvested each year.
- Volume supply and wood swap agreements and delivered price.
- Utilization specifications.
- Harvesting methods.
- Understorey Protection Guidelines. These will be modified from time to time as new information and methods are developed.
- Reforestation standards.
- Road use agreements.
- Data supply agreements.
- Cut over Photography and record keeping.
- Reforestation record keeping.

The following is a summary of different methods to integrate harvesting operations:

- Volume Supply Agreement
- Wood Swap
- Independent Operations

5.25 Industrial Salvage Strategy and Tracking Procedure

Industrial Salvage Timber is in the final stages of approval and will be added to the DFMP upon approval.

BRL and embedded operators will follow the industrial salvage strategy and tracking procedure when it is finalized.