GRANDE PRAIRIE REGIONAL COLLEGE
TRAINING FOREST AREA

Forest Management Plan

SUBMITTED TO:

Alberta Sustainable Resource Development
Land and Forest Division
Forest Management Branch

Great West Life Building
8th Floor
9920 108 Street
Edmonton, AB
T5K 2M4

PREPARED BY:

Charles A. Backman, R.P.F.
Grande Prairie Regional College
10726-106 Ave.
Grande Prairie, Alberta
T8V 4C4

Submitted:
July 20, 2006

Revised :
October 9, 2007

Acknowledgements

The training forest documents have been produced through the efforts of a large number of people beginning with Bart Ruptash. Mr Ruptash, a graduate of the Bachelor of Applied Forest Resource Management (BAFRM) program at GPRC, prepared the initial draft of the Terms of Reference and the Preliminary Forest Management Plan. The initial drafts were completed under the general guidance of Jennifer Hacking, a forestry instructor in the BAFRM program with input from Weixing Tan, Albert Sproule, Charles Backman (all instructors within the BAFRM program) and Mort Timanson (a consultant attached to Workforce Development at GPRC).

Mort Timanson and Charles Backman created the Public Involvement Plan while the timber supply analysis was executed by Mark Townsend of the LFD (Peace River) using data and assumptions provided by GPRC. Modifications to the original documents were completed by Charles Backman following input from the government review team. Other people from the public, private and non-governmental sectors, too numerous to mention, have provided insight and time to bring the Forest Management Plan process to this stage. Weixing Tan coordinated editorial changes in 2007.

The Forest Management Plan was completed by Charles Backman while the updated Timber Supply Analysis using the Alberta Vegetative Inventory data was completed by Mr. Mark Townsend. The FMP benefited from numerous comments and insights from members of the GPRC-SRD Planning Group. GPRCs member to this group has been Charles Backman while the membership from the SRD side has varied over the years. The current membership includes Ms. Vicky Bosse, Mr. Mark Townsend, and Mr. Mark Feser.

TABLE OF CONTENTS

APPENDICES

LIST OF FIGURES

LIST OF MAPS

LIST OF TABLES

LIST OF TABLES (cont'd)

EXECUTIVE SUMMARY

While initiating and participating in forestry-related research opportunities based in the Training Forest, GPRC will continue to encourage and enable student involvement in all aspects of management for a broad range of forest values. GPRC will utilize faculty, government, and local agencies to help manage the forest while improving the educational experience for the GPRC student body and other stakeholders. The end result will be to provide an excellent educational training ground while practicing sustainable forest management at all levels.

Achieving the following goals will help GPRC meet its broad based mandate of managing the forest for educational purposes. The goals are:

1. to provide the best possible educational opportunities for GPRC students, staff and other interested agencies;

2. to practice sustainable forest management in the training forest;

3. To facilitate interaction with other stakeholders of the Training Forest in a management planning process that considers the multiple uses of the forest including wildlife, recreation, education and timber management.

Work on the preliminary forest management plan (PFMP) was started in the fall 2000 with a draft prepared by one of the first graduates of the GPRC Bachelor of Applied Forest Resource Management program. Work continued on the draft versions of the PFMP, Public Involvement Plan and the Terms of Reference throughout 2001 and 2002 with final versions of the documents submitted on September 22, 2002.

These documents provided interim management criteria and guidelines while long-term plans were being created and new forest inventory data were being acquired.

Principles used to guide the development of the FMP subsequent to the PFMP are identified below:

1. to initiate and maintain a public involvement process;

2. to consult with Alberta Sustainable Resource Development (ASRD) to define management objectives for resources in the Training Forest Area;

3. to update the phase III resource inventory data to AVI standards; and to use this information in the management of the forest;

4. to operationalize the harvest process;

5. to actively incorporate student involvement into the operations of the training forest.

A forest resources advisory committee (FRAC) was created in 2001 to capture views of external stakeholders. The internal stakeholders advisory committee (ISAC) was created in the following year as a venue through which to collect input from the College community. Annual public meetings were initiated in Debolt and Grande Prairie in 2002 to allow for input from the larger public community.

An ASRD-GPRC Planning committee was created to facilitate the planning process separating the PFMP, ToR, and PIP documents and completion of the FMP. The committee has met regularly, beginning in 2002.

It was through this committee that resources were marshaled for an updated inventory of the training forest to the Alberta Vegetation Inventory (AVI) standard and the preparation of the revised timber supply analysis based on the AVI. Both of these items were completed largely with assistance from SRD.

An integral part of the management of the forest is an understanding of all aspects leading up to the actual harvest including governmental approval process and the disposal of the GPRC wood. The training forest has had three successful harvest seasons, beginning in 2002-3. The fourth will be starting in December 05/January 06 thus continuing to provide an ideal opportunity for students to learn about this part of natural resource management.

An understanding of the management process, including harvesting and the regulatory environment within which it takes place, is an integral part of the educational opportunity for students at GPRC. Students have been gradually phased into all aspects of the training forest operations. Beginning with the initial process to secure the training forest for educational purposes, students have been involved in cut block design and layout, in a five-year general development plan, and in public involvement process. The forest has also been used as the site for outdoor laboratories supporting the classroom learning in such diverse subjects as mensuration, silviculture, insects and disease, and engineering and harvesting.

1.0 INTRODUCTION

Grande Prairie Regional College (hereafter referred to as GPRC) entered into a Memorandum of Understanding (MOU) with the government of Alberta on February 16, 2000 to utilize public forest land for educational purposes (**Appendix A**). The MOU was predated by a Letter of Intent which provided broad guidance as GPRC worked towards securing management responsibilities for the training forest area (**Appendix B**).

The training forest is in the G13 management area as shown in **Map 1.1**.

GPRC requires long-term use of this area of forested public land:

1. to satisfy the intent of forest management training;
2. to provide for practical teaching;
3. to demonstrate current and potential forest management techniques;
4. to provide exposure to integrated, ecological and sustainable resource management practices; and
5. to improve the educational opportunities of students enrolled in the College.

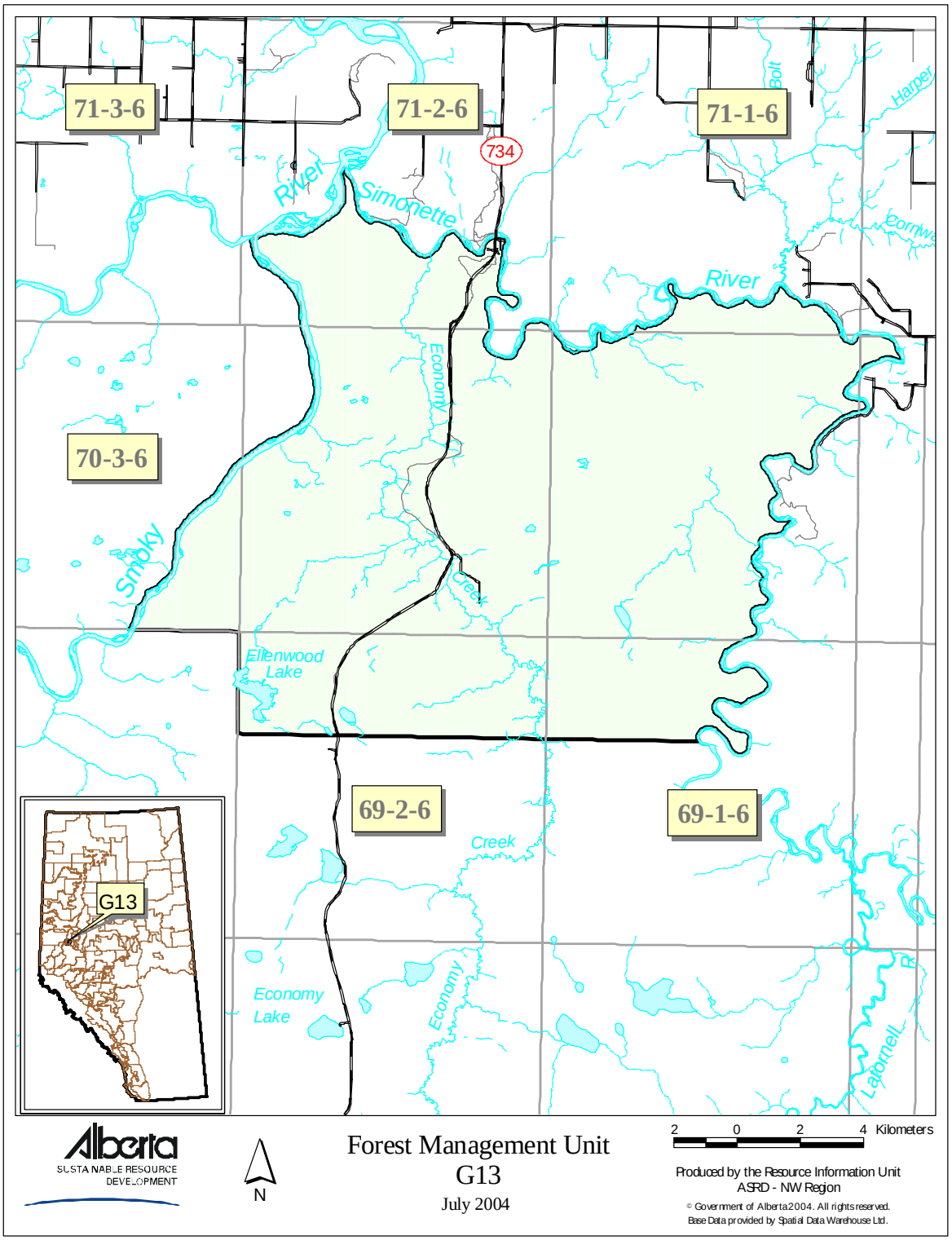
Under the terms of the "Interim Forest Management Planning Manual Guidelines to Plan Development (version April/98) ", GPRC was required to submit a preliminary forest management plan (PFMP), a Terms of reference (TOR) and a public involvement plan (PIP) by February 15, 2001. Version 1 of these documents was submitted by the deadline. Review and subsequent revisions continued during the balance of 2001 and into 2002 with these documents approved in the latter half of 2002.

The primary objectives of the PFMP were:

1. to provide information on the interim harvest level and the associated short-term harvest sequence;
2. to identify interim management objectives and strategies;
3. to describe the current state of the forest; and
4. to outline a plan for collection of new inventory data for the Forest Management Plan (FMP).

While new inventory data was being collected, the PFMP provided the guidance for management activities and harvesting operations in the G13 area. These operations were conducted according to principles identified in the Training Forest Memorandum of Understanding and Letter of Intent. All activities were subject to all relevant Regional, Provincial, and Federal Acts, Rules and Regulations.

Map 1-1: Forest Management Unit G13



With the approval of the TOR, PIP, and PFMP in the fall of 2002, attention turned to three tasks:

1. Operationalization of the harvest;
2. Integration of the training forest into the forest resource management training program at GPRC;
3. Preparation and completion of the FMP.

All of these interrelated tasks were approached simultaneously. Harvesting is an integral part of a student's education in resource management drawing from courses in engineering, harvesting, silviculture, mensuration and integrated forest resource management. The training forest is an ideal place to demonstrate classroom theory in topics such as forest diseases and insects, forest soils, and silviculture. Finally, the FMP provides the overall guidance to conduct operations within the forest to meets GPRC's educational mandate.

2.0 APPROACH TO PLANNING AND MANAGEMENT

The Grande Prairie Regional College's mandate for the Training Forest is to use the area for educational purposes. Demonstrating sustainable forest management practices and incorporating public involvement are key to meeting this mandate.

A tool through which to realize the mandate is the organization structure.

The organizational infrastructure consists of three parts:

1. management – prioritizing of goals/objectives, developing/approving of strategies; overall accountability for execution of strategies and achieving goals/objectives;
2. operational – responsible for execution of strategies to realize goals/objectives; operate training forest within regulatory environment;
3. advisory – collect and provide input from external stakeholders and internal stakeholders to the management team

Management: The Training Forest Steering Committee represents the highest level of organization for the training forest within the college and is headed by the Chair (of the Training Forest Steering Committee). Members of the committee include the Dean of the Arts, Science and Education Division, the Chair of the department within which the forestry program is sequestered (Science Department), the training forest co-ordinator, and other members of the forestry faculty. The Director of Campus operations is also a member.

Initially, the Chair role was filled by the Vice President Academic during the seminal stages of the Training Forest development. Once the forest became operational, the Chair role was filled by the Dean of ASE, the division within which the Training Forest falls. The Vice President continued as a member of the committee to provide continuity. While the committee approves the strategies and the operations, detailed budgetary control is assumed by the department/division within which the training forest lays, in this case the Science Department.

The training forest co-ordinator is nominally under the jurisdiction of the Chair of the department (currently the Chair of the Science Department). In actual fact the co-ordinator reports to the steering committee, and in particular to its Chair.

The Committee meets on a regular basis. During the first three years of operation, meetings numbered 6-8 per year. As systems have been formalized and experience accumulated, frequency of these meetings has decreased and is now in the vicinity of 4 per year.

Operational: The operational structure is divided into two parts. The first part is internal to GPRC and focuses on the forestry group. The second part is external and is the ASRD-GPRC Plan Development Team.

The internal forestry structure consists of the training forest co-ordinator, the forestry program co-ordinator plus other members of the forestry group. These other members could include instructors, consultants or other people deemed beneficial to operations. While the training forest co-ordinator is responsible for operational aspects of the forest, he/she works closely with the instructional team to facilitate the use of the forest as an outdoor laboratory for classroom learning. In addition, he/she makes use of students in conducting the normal activities linked to the ongoing operation of the forest. Co-ordination among members of the internal forestry structure takes place in an informal fashion.

The Plan Development Team was created to facilitate the development of the forest management plan. The primary representative from GPRC in the Team is the training forest co-ordinator. Participants from ASRD include the area forester for the Smoky Area , a resource analyst from the Forest Management Branch, Resource Analysis Section, and a planning forester from the Forest Management Branch, Forest Planning Section. Members from other government agencies participate as required, and to date have included a resource analyst from the Forest Management Branch Resource Analysis Section with expertise in growth and yield, regional Fish and Wildlife Division staff, and other members of the Smoky Area forest district.

It is through this Plan Development Team that the steps necessary to complete the FMP were monitored. Where steps of the process were clearly outside of the ability of GPRC to complete, internal ASRD resources were utilized. In particular, this was essential for the Alberta Vegetation Inventory of the forest and the timber supply analysis. The Plan Development Team met on a regular fashion and as required.

Advisory: There are two advisory groups that have been created to assist the Chair of the Training Forest Steering Committee. The first is an internal stakeholders advisory group (ISAC) created as a forum to collect input from the larger college community. The second, called the Forest Resource Advisory Committee (FRAC), is an external committee consisting of interested stakeholders, industry representatives, and government representatives.

These two committees are purely advisory in nature. More details are provided in the following section on Public Involvement Process.

Figure 2.1 The principle contacts in the College and in the AB Sustainable Resource Development

PLANNING TEAM INTERACTION

The GPRC Training Forest Steering Committee

Vice-President, Academic

Dean, Faculty of Arts and Science; Chair, TF Steering Committee

Chair, Department of Science

Coordinator, Training Forest

Instructors, Natural Resources Management Programs

Director, Campus Operations

Forestry Consultant

Major Stakeholder Participants

Local Trappers
Municipal Districts (MD)
Embedded Private Land Holders
Local forest industry
Smoky River local timber advisory committee
Community of DeBolt
Alberta Sustainable Resource Development

ASRD Contacts

Smoky Area

Area Manager

Senior Forester

Area Forester

Forest Management Branch

Senior Manager, Forest Planning Section

Planning Forester

Senior Forester, Silviculture Practices

Senior Resource Analyst

3.0 PUBLIC INVOLVEMENT PROCESS

Grande Prairie Regional College has created a process for open and consultative communication with local stakeholders and the general public. This process was created to collect and address relevant concerns regarding the training forest and its uses. Although the forest will primarily serve in an educational capacity, the normal operational activities of forest management will require key input from the community and stakeholders. The public involvement plan (see separate public involvement plan) identified important issues and formulated a process for their inclusion into the FMP.

There were three forums for capturing public input into the FMP process and training forest operations. The three forums were:

1. The forest resources advisory committee;
2. The internal stakeholders advisory committee;
3. Public/private meetings.

As GPRC prepared the FMP, arrangements for public presentations and reviews of its proposed forest management plans were made for each of these forums.

The process put in place for collecting input and concerns from the public and stakeholders will be continued on an ongoing basis.

Forest resources advisory committee
A public advisory committee has been struck to ensure public involvement in the planning process. Members of the committee include and in the future may include:

- Alberta Sustainable Resource Development;
- Smoky River District Local Timber Advisory Committee;
- Municipal District of Greenview No. 16;
- CANFOR;
- Tolko;
- Ainsworth;
- representatives from the local trapping industry;
- members of the public recreational and/or management interests in the area;
- band members from Sturgeon Lake Indian Reserve;
- surrounding Municipal District Representatives;
- any local members of the public.

The FRAC has met twice a year, in the spring following cessation of harvest operations, and in the fall, prior to operational plan submission. Since its creation in 2001, the FRAC has met 10 times.

Internal stakeholders advisory committee
An internal stakeholders advisory committee (ISAC) was created to capture the views of the internal College community. The ISAC also served as a vehicle to bring the educational opportunities represented by the forest for other departments within the College.

The ISAC includes representatives from the following departments within the College:

- Fine Arts
- Business/PEAK
- Office Administration
- Upgrading
- Mathematics
- HR
- Advancement
- Campus Operations
- Executive

The intention is for ISAC to meet once a year.

Public/private meeting
The College has convened a number of public meetings and met individually with trappers and owners of private land embedded in the training forest. These meetings have taken place to provide input into operational plans and into the forest management plan. Future meetings will take place on an ongoing basis to provide input into operational plans. In addition, the College will host public information meetings as required to address any concerns the general public may have.

Other organization, groups or individuals in addition to those already mentioned may be involved in future discussions.

After these public presentations and reviews, GPRC shall address concerns and issues raised by the public in these forums. Minutes of these meetings including issues and concerns raised will be kept. Approach and action taken to address the issues and concern will be documented and tracked.

4.0 PERFORMANCE STANDARDS

GPRC was provided the opportunity to manage the training forest on a long-term basis. The forest supports GPRC delivery of integrated resource management training including:

1. practical teaching;
2. demonstrating current and potential forest integrated resource management practices.

Performance standards for the GPRC training forest have been developed based on a framework of goals, objectives, indicators and targets. Strategies were developed to achieve the objectives. Details of the performance standards are presented in tables 4.1, 4.2. and 4.3.

GPRC set for itself three goals based on the MoU (**Appendix A**)

1. To provide the best possible educational opportunities for GPRC students, staff and other interested agencies;
2. To practice sustainable forest management in the training forest;
3. To facilitate interaction with other stakeholders of the Training Forest in a management planning process that considers the multiple uses of the forest including wildlife, recreation, education and timber management.

The GPRC planning team identified objectives for each goal. Strategies at an operational level were developed to meet the objectives. Thus, through the attainment of its objectives, GPRC would correspondingly achieve its goals.

Four objectives supported Goal 1, five objectives supported Goal 2 and four objectives supported Goal 3. Objectives and goals are presented below.

Goal 1: to provide the best possible educational opportunities for GPRC students, staff and other interested agencies

A. **Objective 1.1:** To initiate and participate in forestry-related research opportunities based in the Training Forest and in partnership with other agencies;
B. **Objective 1.2:** To ensure that Training Forest has a sustainable timber supply;
C. **Objective 1.3:** To ensure that the Training Forest has sufficient resources for ongoing operations;
D. **Objective 1.4:** To incorporate the Training Forest into the curricula of students at GPRC.

Goal 2: to practice sustainable forest management in the training forest

A. **Objective 2.1:** To balance the ecological, social, and economic values of the landscape with the educational objectives of the forest;
B. **Objective 2.2:** To maintain biological diversity;
C. **Objective 2.3:** To ensure maintenance of fisheries and aquatic resources;
D. **Objective 2.4:** To maintain resource utilization at a level that ensures the retention of conifer, mixed-wood, and deciduous stands at all stages of development;
E. **Objective 2.5:** Minimize impact of insects, disease and fire on the training forest.

Goal 3: To facilitate interaction with other stakeholders of the Training Forest in a management planning process that considers the multiple uses of the forest

A. **Objective 3.1:** To initiate and maintain a public involvement process;
B. **Objective 3.2:** To create an administrative infrastructure to capture current thinking in forest management;
C. **Objective 3.3:** To initiate and maintain a College infrastructure to inform the college community of Training Forest activities and opportunities;
D. **Objective 3.4:** To integrate other commercial and non-commercial uses with timber management.

A central part of the management of the Training Forest is developing a monitoring system to track the state of the Training Forest; and by inference tracking how successful management strategies have been in guiding the forest to meet GPRC goals. Objectives then are identifiable outcomes, the achievement of which means that GPRC will have met its goals.

Key then is development of observable indicators which are directly linked to each objective. For example, let us take Objective 1.1: To initiate and participate in forestry-related research opportunities based in the Training Forest and in partnership with other agencies.

An indicator, or variable, that is linked to this objective to determine success or failure is research projects. The scale, or how the indicator is measured, is the number of research projects. The target, where the bar is set, is the number of the measurable indicator, in this case, research projects, the achievement of which shows that the objective has been met.

The table below shows by goal and objective the indicators selected to monitor performance.

Goal 1: to provide the best possible educational opportunities for GPRC students, staff and other interested agencies

A. **Objective 1.1:** To initiate and participate in forestry-related research opportunities based in the Training Forest and in partnership with other agencies.
    i. **One indicator:** No. of Research projects

B. **Objective 1.2:** To ensure that Training Forest has a sustainable timber supply.
    i. **Three indicators:** Annual harvest volume; Periodic cut control volume; 20 year harvest sequence

C. **Objective 1.3:** To ensure that the Training Forest has sufficient resources for ongoing operations
    i. **Two indicators:** Training Forest Forester; Sufficient and predictable funding from sales of GPRC wood

D. **Objective 1.4:** To incorporate the training forest into the curricula of students at GPRC
    i. **Two indicators:** Course using training forest; Forest educational program

Goal 2: to be a good steward of the GPRC Training Forest

A. **Objective 2.1:** To balance the ecological, social, and economic values of the landscape with the educational objectives of the forest
    i. **Five indicators:** Protection of hydrologic, soil, environmental sensitive sites; In-block roads; Growth and yield program; Range of patch sizes; Foot print on landscape

B. **Objective 2.2:** To maintain biological diversity
    i. **Seven indicators:** Biodiversity; Amount of over-mature cover group; Ungulate habitat; Soil type; Uncommon plant communities and sensitive sites; Structure retention; Trumpeter Swan habitat

C. **Objective 2.3:** to ensure maintenance of fisheries and aquatic resources
    i. **Two indicators:** Watersheds; Impact of water crossings

D. **Objective 2.4:** to maintain resource utilization at a level that ensures the retention of conifer, mixed-wood, and deciduous stands at all stages of development
    i. **Four indicators:** Minimum harvest age; Range of cut block sizes; % area sufficiently regenerated; Effective riparian habitat

E. **Objective 2.5:** Minimize impact of insects, disease and fire on the training forest
    i. **Seven indicators:** Short-term wildfire threat; Long-term fire threat; Long-term fire susceptibility; Prescribed fire as a management tool; Fire salvage planning; Lands affected by insects, disease, or natural calamities; Invasive plants

Goal 3: To facilitate interaction with other stakeholders of the Training Forest in a management planning process that considers the multiple uses of the forest

A. **Objective 3.1:** To initiate and maintain a public involvement process.
    i. **One indicator:** Effective public involvement

B. **Objective 3.2:** To create an administrative infrastructure to capture current thinking in forest management
    i. **Two indicators:** Industry advisors; Regional workshops

C. **Objective 3.3:** To initiate and maintain a College infrastructure to inform College Community of Training Forest activities and opportunities
    i. **One indicator:** Forum for internal communication

D. **Objective 3.4:** to integrate other commercial and non-commercial uses with timber management
    i. **One indicator:** Members with non timber interest on FRAC

Once indicators, their measures, and the targets revealing success or failure have been identified, management must then determine the state of the forest at the present time in terms of the measures. In effect, this provides a clear indication of what the objective conditions are.

Where the current state deviates from the targets, management must then develop strategies in order to move the forest towards the targets. The tables below provide a clear linkage among goals, objectives, indicators, their measures, targets and the strategies in order to meet the targets.

TABLE 4.1: PERFORMANCE STANDARDS – GOAL 1

GOAL 1: to provide the best possible educational opportunities for GPRC students, staff and other interested agencies

Objective 1.1: To initiate and participate in forestry-related research opportunities based in the Training Forest and in partnership with other agencies.

Indicators	Measures	Targets	Strategies
A. Research projects	Number of research projects	2-3 projects every five years	**i.** Attend workshops/presentations to develop research partnerships.
			ii. Provide seed money for projects in partnership with other agencies.

Objective 1.2: To ensure that the Training Forest has a sustainable timber supply

Indicators	Measures	Targets	Strategies
A. Annual harvest volume	Actual harvest less than or equal to AAC	Zero with a variance of plus or minus 10 %	**i.** Match area and volume per ha to estimated decay in stands to ensure that net volumes line up with the AAC. Utilize students where possible to conduct cruise plots to verify gross volume per ha amounts. Historical harvest volume and area information reported in tabular format in the AOP.

Indicators	Measures	Targets	Strategies
B. Periodic cut control volume	Cumulative harvest less than or equal to cumulative AAC over period	Zero with a plus or minus variance of 5 %	**ii.** Establish first cut control period as May 1, 2001 to April 30, 2006 with cumulative volume harvested less than or equal to five times interim AAC.
			iii. Next cut control period to commence May 1 2006 coinciding with revised TSA.
C. 20 year harvest sequence	Mapped 20 year harvest sequence of approved FMP	Zero with no more than 20% of the total sequenced area in each compartment in each decade deleted while harvesting no more than 100% of the total area within the spatial harvest sequence (SHS) by compartment by decade	**iv.** Follow spatial harvest sequence as approved in the FMP.

Objective 1.3: To ensure that the Training Forest has sufficient resources for ongoing operations

Indicators	**Measures**	**Targets**	**Strategies**
A. Training Forest Forester	GPRC staff member designated as Training Forest Forester/Co-ordinator	One-half release time for one person	**i.** Utilize funding from timber revenues to support one-half release time with endorsement of FRAC and the SRD-GPRC planning committee
B. Sufficient and predictable funding from sale of GPRC wood	Competitive process for sale of GPRC wood	Secure a multi-year educational partnership agreement	**ii.** Initiate a RFP for sale of GPRC AAC on a long-term basis not to exceed 10 years in duration
			iii. Communicate with potential buyers of the GPRC wood on an ongoing basis
			iv. Cultivate short term relationships with purchasers

Objective 1.4: To incorporate the training forest into the curricula of students at GPRC

Indicators	Measures	Targets	Strategies
A. Courses using training forest	Number of courses using the training forest	90 percent of forestry courses incorporating training forest at least once in curriculum	**i.** Policy directive within forestry education group requiring incorporation of training forest at least once in course outline for 90 percent of courses
B. Forest educational program	Existence of forestry program	Existence of MoU/transfer agreement with educational institutions	**ii.** Actively pursue a transfer program in resource management with UNBC
			iii. Explore an exit option for students wishing to enter workforce after 2 year program at GPRC
			iv. Explore options with NAIT on offering a natural resource management program
			v. Where possible explore with UoA transfer options.

TABLE 4.2: PERFORMANCE STANDARDS – GOAL 2

GOAL 2: to practice sustainable forest management in the training forest

Objective 2.1: To balance the ecological, social, and economic values of the landscape with the educational objectives of the forest

Indicators	**Measures**	**Targets**	**Strategies**
A. Protection of hydrologic, soil, environmental sensitive sites	Existence of hydrologic, soil, environmental exclusions to active land base	A revised map of landbase netdown categories for preparation of the next FMP	**i.** Work with local Fish and Wildlife and PLFD to identify sensitive parts of the training forest.
B. In block roads	Roads reclaimed and reforested	Reclaimed roads reforested in summer immediately following reclamation	**ii.** Work with local forest companies to secure seedlings and preferential access to local reforestation contractors.
	Road density	No more than 5% of block area will be roaded.	**iii.** Work with successful buyer of GPRC wood to ensure road density targets achieved.

Indicators	Measures	Targets	Strategies
C. Growth and Yield program	Implementation of a growth and yield program	Establishment of TSP	**iv.** Establish sufficient plots within five years according to guidance provided by SRD Edmonton and where possible using students within the context of a mensuration course.
		Establishment of PSP to monitor long-term change to forest	**v.** Establish sufficient plots within five years according to guidance provided by SRD Edmonton and where possible using students
D. Range of patch sizes within the Training Forest	Distribution of cut block sizes in control period	Ensure that block sizes mimic patch size in nature	**vi.** Find the natural range of variability of patch sizes in the forest; provide a summary by size class distribution of the proposed cut blocks versus the current patch size distribution
			vii. Report actual harvest areas in AOP

Indicators	Measures	Targets	Strategies
E. Foot print on the landscape	Number of operating units active in a 10 year period	No more than 2 operating units shall be active in a 10 year period	**viii.** Set appropriate parameter in the TSA model
		No 2 operating units shall be active for more than 2 consecutive 5 year periods	**ix.** Set appropriate parameter in the TSA model
	Inventory of water crossings	A data base of water crossings	**x.** Maintain an inventory of water crossings by establishment year, location, crossing type, status, year removed
	Inventory of roads	A data base of roads	**xi.** Maintain an inventory of roads by establishment year, location, road class, status, year reclaimed, length
	Percent of road development that utilizes existing access	Minimize construction of roads not using existing access	**xii.** Utilize existing access for road location where possible (i.e. existing roads, cut-lines)
			xiii. Reclaim in block roads in the same operating year as constructed and replant with appropriate species as soon as possible
F. Recreational infrastructure	Length of nature trails	Initiate development of trails summer 2007	**xiv.** Utilize part of the funds from the sale of the wood to construct nature trails with appropriate signage in the forest

Objective 2.2: To maintain biological diversity

Indicators	Measures	Targets	Strategies
A. Biodiversity	Inventory utilizing ABMP criteria as a base	Completion of inventory within 10 years	**i.** Utilization of existing data from Alberta Research Council's Biodiversity Monitoring Project
			ii. Supplement above inventory with student conducted inventory plots
B. Amount of over-mature cover group	Area (ha) within net landbase	At least 10**%** of each cover group area >= target age in active landbase	**iii.** Set appropriate parameter in the TSA to ensure that minimum is achieved
		Over Mature D stands >= 90 years	
		Over Mature C stands >= 120 years	
		Over Mature CD + DC stands >= 110	
C. Ungulate habitat	North-West 1 Smoky Land management referral map and related FW guidelines	Utilization of fish and wildlife guidelines (tied to the NW-1 Smoky Land Management referral map) when operating within ungulate zone and the corresponding AB Timber Harvest Planning and Operating Ground Rules	**iv.** Ensure that guidelines are utilized during planning and operational stages of training forest activities.

Indicators	Measures	Targets	Strategies
			v. A significant portion of the ungulate zone, as identified in the NW-1 Smoky Land Management Referral map, has been set aside in the passive land base as hydrologic buffer along the Smoky and Simonette Rivers and Economy Creek. A portion of the ungulate zone is thus being managed as part of the riparian buffer. These buffers have been accordingly netted out of the active land base.
D. Soil type	Supplement existing soil maps to identify sensitive soil type on operable land base	Completion of soil map covering active land base within 10 years	**vi.** Conduct inventory using students of GPRC soil classes.
			vii. Work with SRD to determine density of plots and the information to be collected from the plots
E. Uncommon plant communities and sensitive sites	Identification of location of uncommon plant communities and sensitive sites	Maintain existence of identified sites	**viii.** During operational activities uncommon plant communities and sensitive sites will be identified through local knowledge, ANHIC, BSOD, and the NW1 Smoky Area Land Management Referral Map.
			ix. Utilize OGR for guidance when dealing these identified sites

Indicators	Measures	Targets	Strategies
F. Structure Retention	% of cumulative block area retained over reporting period (Stewardship Report Period)	8 % of volume converted to area (ha) has replaced traditional adjacency requirements	**x.** Of the in block area to be retained, at least 2/3 will be GPSed/identified in the field prior to execution of the harvest. No more than 1/3 of the retention area will be left to operator's discretion.
G. Trumpeter swan habitat	North-West 1 Smoky Land management referral map and related FW guidelines	Utilization of fish and wildlife guidelines (tied to the NW-1 Smoky Land Management referral map) when operating within Trumpeter Swan zone. and the corresponding AB Timber Harvest Planning and Operating Ground Rules.	**xi.** Ensure that guidelines are utilized during planning and operational stages of training forest activities.

Objective 2.3: to ensure maintenance of fisheries and aquatic resources

Indicators	Measures	Targets	Strategies
A. Watersheds	Boundaries of the three main watersheds (Economy Creek, Smoky, Simonette) identified using the digital elevation model	Completion of watershed boundary determination within 1 years	**i.** Work with AB SRD to delineate watershed boundaries
			ii. Once watersheds have been identified, keep a cumulative tally of area harvested by watershed to ensure that threshold ECA levels are not exceeded
			iii. Work with AB SRD to determine threshold ECA levels
	Delineation of hydrologic exclusions from active landbase	Removal from active landbase forest lying below major topographic breaks to major rivers and creeks	**iv.** Rivers and major creek were buffered based on topographic breaks as interpreted from aerial photography
B. Impacts of water crossings	Season of access	Crossings will be winter/frozen access	**v.** Ensure designs for water crossings meet standards of the code of practice for water course crossings and the OGRs
			vi. Harvesting and crossing placements take place during frozen ground conditions

Objective 2.4: to maintain resource utilization at a level that ensures the retention of conifer, mixed-wood, and deciduous stands at all stages of development

Indicators	**Measures**	**Targets**	**Strategies**
A. Minimum Harvest age	Stand age (years)	D minimum harvest age is 70	**i.** Set appropriate parameter in the TSA to ensure that minimum is achieved
		C minimum harvest age is 90	**ii.** Set appropriate parameter in the TSA to ensure that minimum is achieved
B. Range of cut block sizes	Area (ha)	Deciduous blocks on average 60 ha over cut control period with a variance of plus or minus 15%	**iii.** Set appropriate parameter in the TSA to ensure that the minimum is achieved.
		Maximum deciduous net cut block size of 100 ha	
		Conifer block size to fall within current Provincial Timber Harvest and Planning Ground Rules.	

Indicators	Measures	Targets	Strategies
C. % Area Sufficiently Regenerated	Regeneration Survey Standards and results	D stands SR within 5 years	**iv.** Winter harvest and rely on natural; regeneration. Conduct reforestation survey at the end of the third growing season to confirm success. Utilize fill planting if necessary by year five in the absence of natural regeneration. Conduct official establishment survey no later than 5 years post harvest
		DC stands SR within 8 years	**v.** Winter harvest and utilize fill planting immediately following harvest if necessary to ensure conifer component in the absence of natural regeneration. Conduct unofficial survey in year 3 post harvest. Conduct official establishment survey no later than 8 years post harvest. Conduct performance survey no later than 14 years post harvest. Explore utilization of FRIAA $ paid by purchasers of conifer wood to reforest to SRD standards

Indicators	Measures	Targets	Strategies
D. Effective Riparian Habitat	Maintenance of riparian buffers as identified on landbase net down categories map	Complete compliance with current Provincial Timber Harvest & Planning Ground Rules.	**vi.** Identify during Layout. Where buffers applied to major creeks and rivers in the Training Forest exceed the minimum OGR requirements, any activity within that passive landbase area will not occur unless otherwise approved in advance by SRD.

Objective 2.5: Minimize impact of insects, disease and fire on the training forest

Indicators	Measures	Targets	Strategies
A. Short-term wildfire threat	Number of outstanding debris piles to be disposed.	Complete disposal of debris piles created during forest operations within 24 months of harvesting.	**i.** Review current wildfire threat output from WTR on an annual basis with SRD.
			ii. Dispose of debris piles by burning.
B. Long-term wildfire threat	Fire behaviour potential based on the average head fire intensity (HFI) for forest fuels within FMU G13 under normal (90^{th} percentile) seasonal conditions.	No significant increase in fire behaviour potential within the FMU.	**iii.** Run the spatial harvest sequence through the WTR model to see changes in the wildfire threat rating and select the harvest sequence that does not elevate the fire behaviour potential through the planning horizon.

Indicators	Measures	Targets	Strategies
C. Long-term wildfire susceptibility	Percent of net landbase area in over-mature (>80 years) aspen stage.	Reduce the percentage of high fire risk stands over the planning horizon.	**iv.** Harvest mature and over-mature aspen first.
D. Prescribed fire as a management tool	Use of prescribed fire.	Use prescribed fire where it is identified as the preferred management tool.	**v.** Work with the Forest Protection Division to develop prescribed fire plans where burning is identified as the optimal management strategy.
E. Fire salvage planning	To have a fire salvage plan in place in the event of a fire	To develop a plan within 5 years	**vi.** Adhere to Alberta's fire salvage strategy
F. Lands affected by insects, disease, or natural calamities	Detection of Forest Insect and Disease Infestations within Training Forest	100% of forest area surveyed in a 5 year period	**vii.** Utilize a combination of aerial surveys and ground surveys
			viii. Report any known or suspected Insect or Disease infestations with in the training forest as soon as possible to the Local PLFD Office.
			ix. Spatial harvest sequence may be modified to address insect and disease infestations or natural calamities in consultation with PLFD.

Indicators	Measures	Targets	Strategies
G. Invasive Plants	Noxious weed program	Development of a noxious weed program within 5 years	**x.** Survey forest to determine risk and existence.
			xi. Participate in regional noxious weed programs.
			xii. Notification of existence of weeds to local SRD – PLFD office.
			xiii. Follow requirements of Forest Management Branch Directive 2001-06 'Weed Management in Forest Operations'

TABLE 4.3: PERFORMANCE STANDARDS – GOAL 3

GOAL 3: To facilitate interaction with other stakeholders of the Training Forest in a management planning process that considers the multiple uses of the forest

Objective 3.1: To initiate and maintain a public involvement process.

Indicators	Measures	Targets	Strategies
A. Effective public involvement	Public meetings	At least 1 public meeting per year	**i.** Announce and execute public meeting in the fall in Debolt. Conduct a public meeting in Grande Prairie at least once every three years.
			ii. Extend personal invitations to meeting to affected trappers and to selected members of the FRAC
		Record of public meetings	**iii.** Minutes of these meetings including issues and concerns raised will be kept. Approach and action taken to address the issues and concern will be documented and tracked.
	Forest Resources Advisory Committee	Maintain FRAC beyond FMP preparation process	**iv.** Seek out stakeholders to ensure variability.
		At least five external stakeholders	**v.** Organize and execute a meeting in the fall and in the spring
		At least 2 FRAC meetings per year	

Objective 3.2: To create an administrative infrastructure to capture current thinking in forest management

Indicators	Measures	Targets	Strategies
A. Industry advisors	Membership on FRAC	Representatives from Canfor, Ainsworth, Weyerhaeuser, and SRD on FRAC	**i.** Actively seek out industry representatives for their valuable participation and contribution.
B. Regional workshops	Attendance at forestry (i.e. CIF) technical sessions	Attendance of two technical sessions per year by College faculty	**ii.** Actively search out opportunities to mingle with industry. **iii.** GPRC faculty to participate in company public advisory groups and perform limited contract work.

Objective 3.3: To initiate and maintain a College infrastructure to inform College Community of Training Forest activities and opportunities

Indicators	Measures	Targets	Strategies
A. Forum for internal communication	Internal Stakeholders Advisory Committee	Maintenance after FMP process completed	**i.** Organize a meeting on an annual basis
	Training Forest Steering Committee	Maintenance after FMP process completed	**ii.** Organize at least 4 meetings per year

Objective 3.4: to integrate other commercial and non-commercial uses with timber management

Indicators	**Measures**	**Targets**	**Strategies**
A. Members with non timber interest on FRAC	Membership on FRAC	At least 2 members with non timber interests	**i.** Ensure that representation on FRAC includes people with an interest in other commercial and non commercial uses of the forest

5.0 TRAINING FOREST ACQUISITION PROCESS

In 1995, Grande Prairie Regional College was authorized by Alberta Learning (now Alberta Advanced Education) to offer the Bachelor of Applied Forest Resource Management program. Mr. Mort Timanson, then Area Manager for the Smoky Area PLFD, was also on the GPRC Board of Governors. He understood the importance of an operational training forest as place to demonstrate in a real world setting what is learned in the classroom.

There was an unallocated forest management unit (G13) in the vicinity of Grande Prairie. Mr. Timanson made a proposal that GPRC secure tenure over this land. The proposal was subsequently accepted by GPRC. With the induction of the first cohort of students into the BAFRM program in September 1995, the process to secure use of this land began with student involvement.

Throughout the latter part of 1995, students organized meetings and made presentations at public meetings in Debolt, Valleyview, and Grande Prairie as well as to the GPRC Board of Governors. Formal presentations were also made to local MLAs, the Minister of Environment and to industry.

In 1996 the elected officials accepted the proposal and a formal letter of intent was signed (**Appendix B**). Discussions on the form and structure of the tenure continued with student involvement throughout 1997, 1998 and 1999. The form of the tenure was finalized in mid 1999 as a memorandum of understanding (MoU).

The content of the MoU was finalized between June 1999 and early 2000. A formal signing of the MoU took place on February 16, 2000.

6.0 THE TRAINING FOREST AND RESOURCE MANAGEMENT TRAINING AT GPRC

The training forest is strongly linked to educational programs in integrated resource management offered at GPRC. The Bachelor of Applied Forest Resource Management program was initiated at GPRC with the first intake of students occurring in September 1995, coinciding with the arrival of the training forest

Shown in **Table 6.1**, enrollment levels never achieved the target levels beyond those in the first year of the program. Central to the sharp decline in enrollments was the unclear status which graduates of the BAFRM program would have with the College of AB Professional Foresters. Another contributing factor was a general overall decline in enrolments across Canada in forestry education programs. While GPRC was able to eventually clarify the relationship with CAPF, it was not until a couple years after the first three cohort of students had graduated and demonstrated the quality of their education.

Table 6.1: First year forestry enrollment in various post-secondary institutions in Western Canada

Institute/YEAR	95/96	96/97	97/98	98/99	99/00	00/01	01/02
BCIT	76	102	90	72	46	32	24
UNBC	114	118	110	96	79	65	40
NAIT	89	81	78	70	59	52	46
GPRC	26	16	19	16	8	11	5

Source: Hacking/Sproule: GPRC in house report 2002

AB Learning continued to fund the BAFRM program at GPRC until 2003 in hope that enrollment would recover. Ironically, AB Learning announcement to GPRC that funding for the BAFRM program would cease coincided with not only clarification of the relationship with CAPF but with operationalization of the training forest into the curriculum of the students of the BAFRM program.

With the demise of the BAFRM program, the status of the training forest grew uncertain. The opportunity which GPRC enjoys to manage the forest is linked to offering training in natural resource management. While SRD continued to work with GPRC to make the forest an operational reality, the reason for its existence come the summer of 2006, when the last cohort of BAFRM students would graduate, would no longer exist.

GPRC continued to explore transfer options with neighbouring universities such as University of Alberta and the University of Northern British Columbia. Discussions were also held with NAIT about offering one of their diploma programs.

The most promising opportunities lay with UNBC. The opportunities were subsequently developed into a memorandum of understanding which was signed in early 2005.

The MoU describes the transfer option into UNBC's BSc in natural resource management. The initial framework allows for the first two years of the program to be taken at GPRC with the final two years taken at UNBC. As the MoU matures and student interest is more apparent, opportunities for three years at GPRC can be considered.

As the College moves forward in its initiative with UNBC, it is also exploring a diploma exit option for those students who do not wish to pursue the university degree. This option is expected to be developed further over the next two years.

7.0 STUDENT INVOLVEMENT IN THE TRAINING FOREST

The forest has been a tool used by faculty to enrich the educational experience of students since 1995, demonstrating practical applications in four areas of resource management.

1. Public land tenure and disposition process
2. Preparation of Forest Management Plans and AOP/GDP
3. Training Forest Operations
4. Outdoor laboratory for a variety of forest subjects

Public land tenure and disposition process
From 1995 until 1997 students of the first cohort of the BAFRM program were actively involved lobbying local government officials, the surrounding community, and politicians in support of the concept of the training forest. Involvement continued intermittently focused on development of the terms of the memorandum of understanding. In February 2000 the MoU was signed.

This part of the educational experience was under the overall guidance of Mr. Mort Timanson with contributions from Dr. Rick Erlendson. Dr. Erlendson guided the preparation of the formal proposal by the students.

In the future, the process followed in securing the training forest will be a case study for students of the program.

Preparation of Forest management plans and AOP/GDP
One of the conditions of the MoU was the preparation of the Terms of Reference (TOR), Public Involvement Plan (PIP), and a Preliminary Forest Management Plan (PFMP). One of the graduates of the first cohort of BAFRM students, Mr. Bart Ruptash, was hired on a short term contract to put together the first iteration of these documents. The ToR and the PFMP were submitted February 2001.

Revisions to the ToR and PFMP, including a TSA completed by the SRD, and preparation of a PIP continued into the fall 2002 by faculty of the BAFRM program. All documents were approved by October 2002.

AOPs and GDPs to date have been completed by faculty.

In the future, students will be developing a version of the FMP and AOP/GDP based on the training forest.

Training forest operations
Beginning in the fall 2002, students were incorporated into the activities of the training forest. They identified on the ground preliminary boundaries for the 2002-3 cut blocks as well as putting in inventory plots to determine block volumes. Students continued with these activities in the 2003-4 cut blocks. Students who were involved laying out the

2003-4 cut blocks had the opportunity to see the cut block area subsequent to harvesting through the eyes of one of the local landowners.

In addition to the operations, students have participated in the public involvement side of the forest management. They have been present during some of the forest resource advisory committee meetings and the public meetings held in Debolt.

In the future, students will be incorporated into training forest operations depending on available time and subject matter of courses taken.

Outdoor laboratory

The BAFRM program included courses in mensuration, silviculture, forest management, engineering, harvesting, forest insects and disease, and forest soils. Particular lab components of courses in mensuration and engineering were targeted for the training forest, and formed part of the sequence of steps supporting harvest activity in the training forest. For engineering, the components were cut block layout and design and road reclamation. For mensuration, the component was fixed radius and prism cruising. In addition, selected parts of the forest were used for developing a five year and twenty year harvest design in forest management and in forest engineering.

Components for the harvesting course centered on ground based harvesting systems with this year showing cut to length methods. Silviculture has used the forest to demonstrate pre harvest assessments while forest soils have used the forest as a place to demonstrate soil profiles.

Table 7.1: List of BAFRM courses which used the training forest

	Course No.	Course name	Comments
1	FO1200	Dendrology	Principle AB species in field
2	FO1220	Introductory forest soils	Soil profiles and soil pit in field
3	FO2020	Forest ecology	Eco-system mapping
4	FO2370	Forest mensuration I	Cruising laboratory
5	FO3380	Forest entomology	Examples in field
6	FO3130	Silviculture	Pre-harvest assessment
7	FO3010	Forest engineering	Block and road layout, 20 year harvest design
8	FO3300	Forest management	5 year development plan
9	FO2130	Forest soils and hydrology	Impact of road access on water flows
10	FO3350	Timber harvesting	Ground based harvesting
11	FO4080	Forest pathology	Examples in field
12	FO4240	Forest management planning	Forest management plan

Source: Charles Backman, Albert Sproule**,** Weixing Tan

The following courses form part of the transfer program in natural resource management to the University of Northern British Columbia. It is expected that the training forest will be incorporated into the course content.

Table 7.2: List of UNBC-GPRC Transfer courses which will use the training forest

	Course No.	Course name	Comments
1	FO1200	Diversity of higher plants	Principle AB species in field
2	FO1220	Introduction to soil sciences	Soil profiles and soil pit in field
3	FO2020	Ecosystem of forests	Eco-system mapping
4	FO2100	Integrated natural resources	Forest management plan
5	FO2370	Assessment of natural resources	Cruising laboratory

Source: Weixing Tan

8.0 DESCRIPTION OF THE GPRC TRAINING FOREST AREA

The GPRC training forest is located approximately 50 kms east of Grande Prairie in the G13 Green Management Unit, known as the Economy Creek area. It encompasses about 260 km^2 (26,000 ha). The forest boundary follows the Smoky River on the west, the Simonette River on the north and east, and the northern boundary of section 69 on the south.

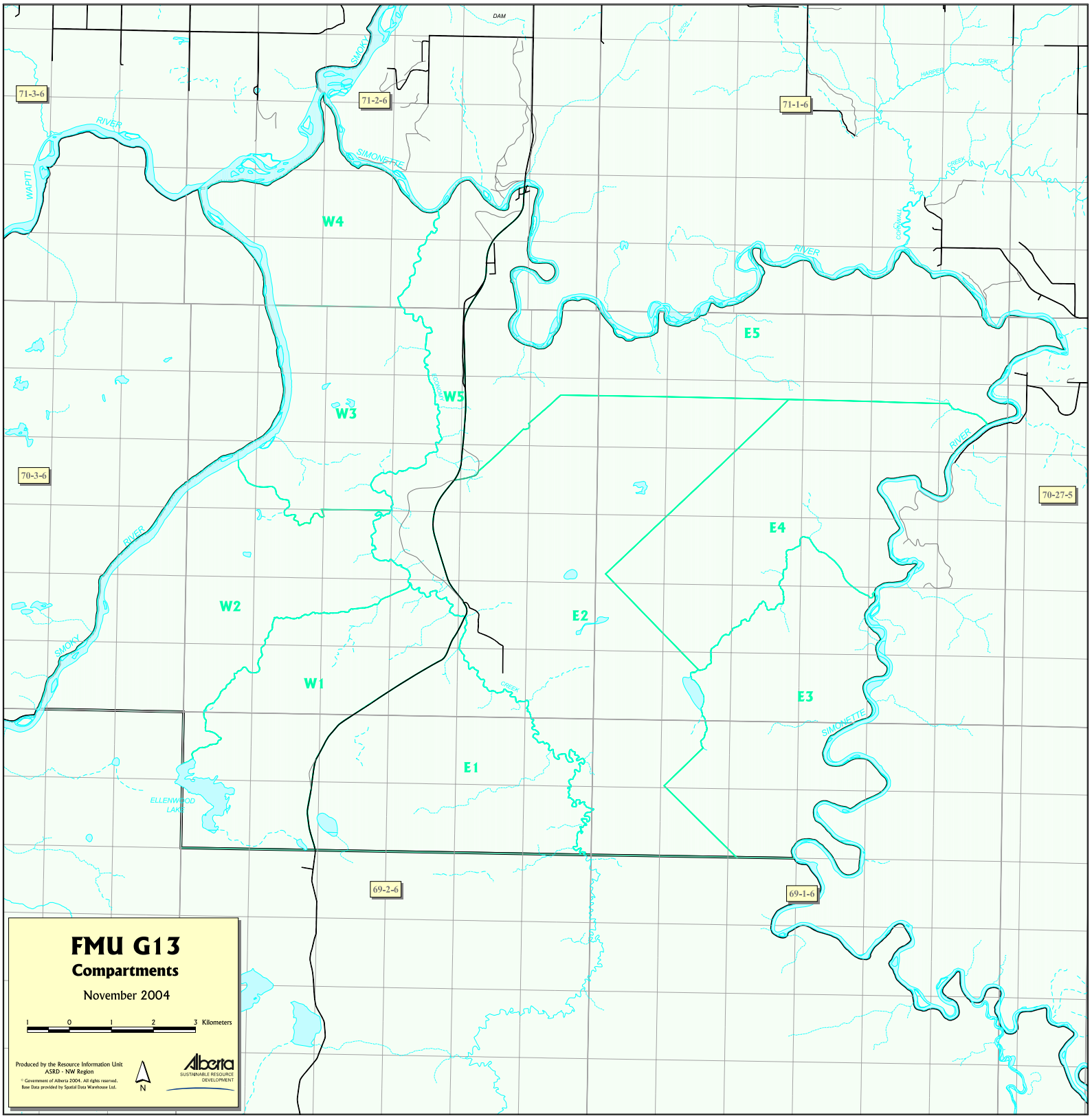
The area was part of a Community Timber Program, and subject to harvesting activity in the past. Timber harvesting in the proposed training forest area has thus been confined to a few small timber permits in which small patches of conifer were logged by local residents.

The training forest falls within the Sturgeon Lake-Puskwaskau Integrated Resource Plan (IRP). The IRP contains two Resource Management Areas (RMA): the River Corridor and Economy Creek. Decisions on management strategies will require consideration of the different site factors in the two RMAs. Furthermore, the goals and objectives of the IRP still apply and are being met by this FMP.

The River Corridor
Two large rivers with wide valleys characterize this area. The Smoky River is the larger, with a predominately V-shaped valley. The river follows a meandering course with terraces and recent floodplains adjacent to the valley bottom. The Smoky River has steep valley walls, up to 130 m high in some places. The second major river system is the Simonette. It is considerably more U-shaped with many terraces and floodplains. Although the Simonette has some steep valley walls, they are not as high as the Smoky River valley walls. Stand types are mainly deciduous with a scattered spruce component.

Economy Creek
This area is primarily covered by muskeg and sand dunes, overlaying glacio-fluvial and lacustrine deposits. The glacial depressions have generally become bogs, and small bodies of water. Stand types are predominantly deciduous.

Planning Boundaries
Due to the small size of the Training Forest and dispersion of different stand types throughout the entire area, the GPRC planning team proposes to manage the training forest as a single unit. However for purposes of the timber supply analysis, the forest was divided into 10 compartments with the Forest Trunk Road dividing the forest into an east side and a west side. Each side consists of five sub-compartments, W1 through W5 and E1 through E5. (**Map 8.1** and **Map C.1** in **Appendix C**)


71-3-6
71-2-6
71-1-6
70-3-6
70-27-5
69-2-6
69-1-6
W1
W2
W3
W4
W5
E1
E2
E3
E4
E5
WAPITI RIVER
SMOKY RIVER
SIMONETTE RIVER
SIMONETTE CREEK
HARPER CREEK
ELLENWOOD LAKE
DAM
FMU G13
Compartments
November 2004
1 0 1 2 3 Kilometers
Produced by the Resource Information Unit
ASRD - NW Region
© Government of Alberta 2004. All rights reserved.
Base Data provided by Spatial Data Warehouse Ltd.
N
Alberta
SUSTAINABLE RESOURCE DEVELOPMENT

9.0 BIOPHYSICAL DESCRIPTION OF THE TRAINING FOREST AREA

All of the Grande Prairie Regional College Training Forest is located within the dry-mixedwood sub-region of the Boreal forest. The table below and the map and key on the following page illustrate the location of the training forest in relation to landscape features and ecodistricts.

Natural Region	Sub-Region	Ecodistrict	Approximate % of Area
Boreal Forest	Dry-Mixedwood	Peace Lowlands	100

The following are descriptions of the Natural Region and Sub-Region. (source: Alberta Environmental Protection, 1994. Natural regions and subregions of Alberta.)

Boreal forest natural region

The Boreal Forest Natural Region is Alberta's largest natural region and covers all of the Training Forest Area. This region is characterized by broad lowland plains and discontinuous hill systems. Extensive wetlands, bogs, fens and marshes are common in this region. The bedrock is buried beneath deep glacial deposits. Climatic conditions reflect a strong boreal influence. Typically summers are short and cool with long, cold winters. Most precipitation occurs in May and August. Although the majority of the regional vegetation is aspen-dominated, forest types at higher elevations and in wetlands are mostly mixedwood or coniferous. The soils are predominately Organic in poorly drained lowlands and Luvisolic in the well-drained uplands. The diversity of the Boreal Forest Natural Region is evidenced by its division into six subregions, separated on the basis of vegetation, geology and landforms. One of the six subregions, the Dry Mixedwood, dominates the Training Forest Area.

Dry Mixedwood Subregion

Undulating terrain characterizes this subregion. The topography of the area is comprised of mostly ground and hummocky moraines and lacustrine materials, with smaller areas of sand dunes and sandy outwash plains present. The soils in this subregion consist mostly of Gray and Dark Gray Luvisols on the well-drained sites while in the coarse-textured sandy uplands, Brunisols are predominant. The low-lying wet areas are made up of Organic and Gleysolic soils.

The vegetation is a transition between the Central Mixedwood and the Central Parkland subregions. Aspen is present in both mixed and pure stands. On the moister sites balsam usually accompanies the aspen. Deciduous forests are frequently fire dependant, but in areas less prone to fire, stands of balsam fir and white spruce may succeed the aspen and balsam poplar. Mixed stands of aspen and white spruce are found throughout this subregion, while the coniferous species are more common further north.

Aspen stands have a very diverse understorey. Conifer stands, on the other hand tend to be much less diversified with moss species being more prevalent. Jack pine forests are

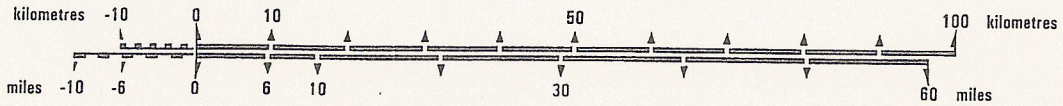
usually present on the dry sandy uplands. Because of the open nature of this forest a ground cover of lichens is usually present. Peatlands are present, but to a much lesser extent than in other boreal forest subregions.

NATURAL REGIONS AND SUBREGIONS OF ALBERTA

MODIFIED UNIVERSAL TRANSVERSE MERCATOR PROJECTION
Produced by Land Information Services Division
PRODUCED FROM DIGITAL DATA

1994

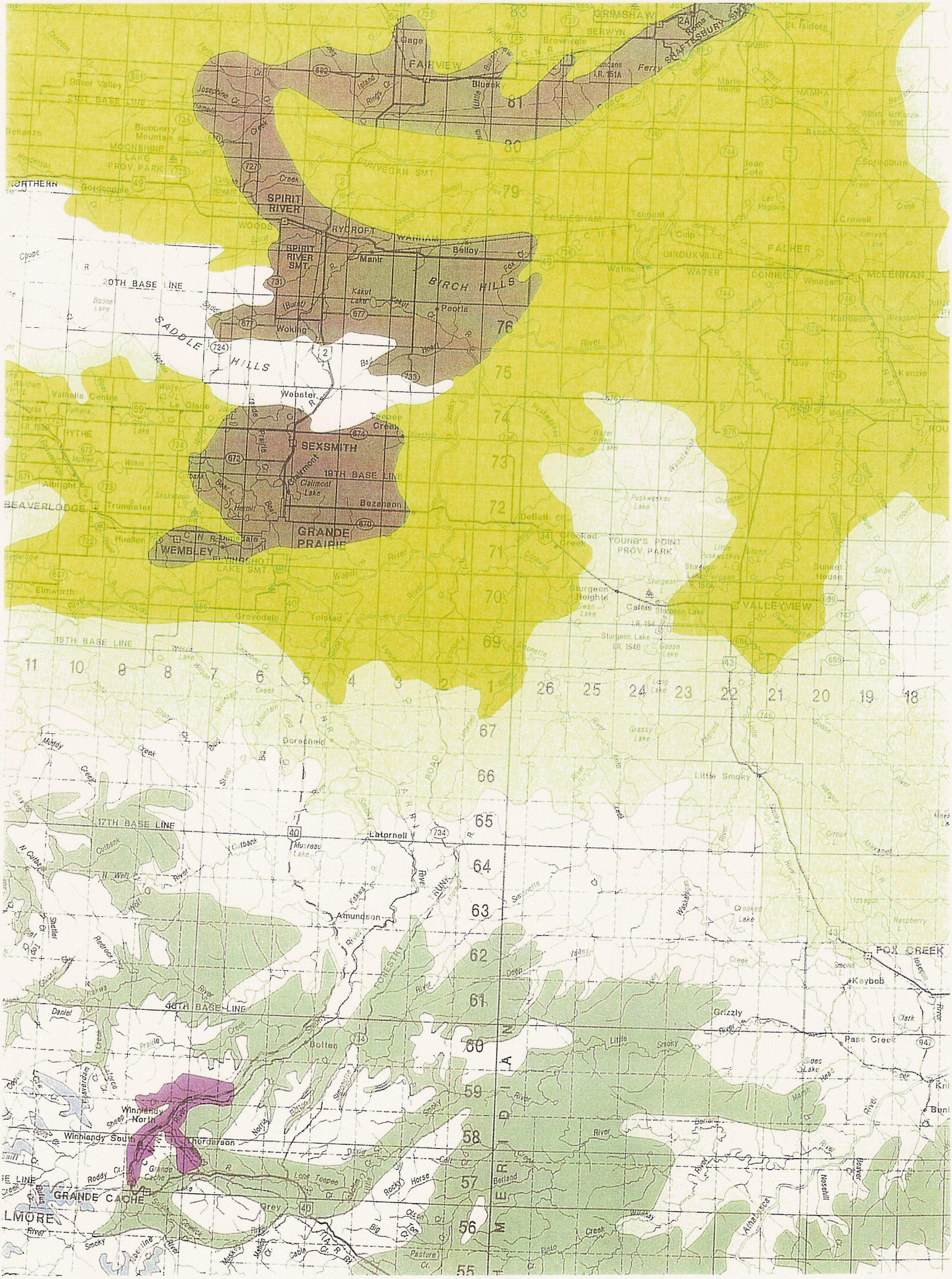
Alberta
ENVIRONMENTAL PROTECTION



SCALE 1:1,000,000

BOREAL FOREST NATURAL REGION			
SUBREGION	**TYPICAL VEGETATION**	**TYPICAL SOILS**	**DOMINANT CLIMATE**
1. Central Mixedwood	Aspen forests	Gray Luvisols	Boreal
2. Dry Mixedwood	Aspen forests	Gray Luvisols	Boreal
3. Wetland Mixedwood	Aspen and black spruce forests, wetlands	Gray Luvisols, Gleysols, Organic soils	Boreal
4. Sub-Arctic	Black spruce forests	Gleysols, Cryosols, Organic soils	Boreal-Subarctic
5. Peace River Lowlands	Aspen-Balsam poplar-White spruce forests and wetlands	Gray Luvisols, Gleysols, Regosols, Organic soils	Boreal
6. Boreal Highlands	Aspen-Balsam poplar-White spruce forests and wetlands	Gray Luvisols, Gleysols, Organic soils	Boreal

ROCKY MOUNTAIN NATURAL REGION			
SUBREGION	**TYPICAL VEGETATION**	**TYPICAL SOILS**	**DOMINANT CLIMATE**
7. Alpine	Alpine heath	Brunisols, Regosols	Cordilleran
8. Sub-Alpine	Lodgepole Pine (Engelmann Spruce-Subalpine fir)	Eutric Brunisols	Cordilleran
9. Montane	Open Douglas-fir and pine forests, grasslands	Eutric Brunisols	Cordilleran-Prairie


FAIRVIEW
SPIRIT RIVER
SPIRIT RIVER SMT.
RYCROFT
BIRCH HILLS
SADDLE HILLS
SEXSMITH
GRANDE PRAIRIE
WEMBLEY
20TH BASE LINE
18TH BASE LINE
17TH BASE LINE
16TH BASE LINE
Webster
Woking
Peoria
Bezanson
Clairmont
Clairmont Lake
Kakwa
Latornell
Amundson
Bolton
Winniandy North
Winniandy South
Thordarson
GRANDE CACHE
Grande Cache
Lone Teepee
Rocky Horse
Grey
Berland
Grizzly
Kaybob
FOX CREEK
Little Smoky
Sturgeon Lake
Sturgeon Heights
YOUNG'S POINT PROV. PARK
VALLEYVIEW
GROUARD MERIDIAN