DETAILED FOREST MANAGEMENT PLAN

FMA 9900037

Canadian Forest Products Ltd.
Alberta Operations
Revised April 2003
Approved November 3, 2003

DETAILED FOREST MANAGEMENT PLAN

Canadian Forest Products Ltd.
Alberta Region
Grande Prairie Operations

Prepared by:

Original Signed

Dwight Weeks, R.P.F.T. — Forest Planner, Grande Prairie Operations

Original Signed

Christine Kreibom Quinn, R.P.F. — Land Management Forester, Alberta Region

Original Signed

Brad Engel, R.P.F. — Forestry Consultant

Approved by:

Original Signed

Lorne Greenhorn, R.P.F. — Woodlands Manager, Alberta Region

Original Signed

Chris Andersen, R.P.F. — General Manager, Peace/Alberta Region

July 2001

ACKNOWLEDGEMENTS

Canfor wishes to express appreciation to all the individual members of the Forest Management Advisory Committee, Forest Ecosystem Management Task Force, Tolko Industries Ltd., Ainsworth Lumber Co. Ltd., Grande Alberta Paper Ltd. and Alberta Sustainable Resource Development, Land and Forest Division for the time, effort and expertise contributed towards the development of this Detailed Forest Management Plan.

Canfor would also like to thank the many individuals who provided information or contributed to specific components of this document.

Copies of this document are available for review at the public libraries in Grande Prairie, Spirit River, DeBolt, Grande Cache and Valleyview. Or attend open houses and townhall meetings, which are held periodically in the South Peace area. Watch for advertisements in local newspapers for times and dates. Additional information can be obtained by contacting:

Canadian Forest Products Ltd.
9401 - 108 Street
Postal Bag 100
Grande Prairie, Alberta
Canada T8V 3A3
Phone; (780) 538-7749
Fax: (780) 538-7800
www.canfor.com

The majority of the literature cited in this document (Section K) is contained on CDs that are available for viewing at Canfor's office. Some electronic copies are abridged.

Letters of Support

Tolko File:
Your File:

July 19, 2001

Canadian Forest Products Ltd.
Alberta Operations
P.O. Bag 100
Grande Prairie, Alberta
T8V 3A3

ATTENTION: Mr. Dwight Weeks

Re: Canfor's Detailed Forest Management Plan

Thank-you for including Tolko Industries Ltd. – High Prairie OSB Division woodlands representatives in the Detailed Forest Management Planning Process.

Representatives of our Woodlands staff have been involved with both the review of the data analysis, and written document. In addition, staff provided input to the development of the Detailed Forest Management Plan via an advisory role in the Forest Management Advisory Committee (FMAC).

Our Woodland staff are looking forward to implementation of the Detailed Forest Management Plan and continued cooperation with CANFOR Management and Operational staff.

Once again, thank-you for including Tolko Industries Ltd. – High Prairie OSB Division staff in the Detailed Forest Management Planning process. Our company is encouraged and looks forward to future interactions with Canadian Forest Products Ltd. – Alberta Operations.

Sincerely,
TOLKO INDUSTRIES LTD.

Original Signed

Hilary J. Wait
Divisional Forester

cc. Director, Timber Management Division: Mr. Doug Sklar

TOLKO INDUSTRIES LTD.
Bag 3000, High Prairie, Alberta, Canada T0G 1E0
Phone: (780) 523-2101 Fax: (780) 523-2204

Ainsworth

Ainsworth Lumber Co. Ltd.
Highway 40, Bag 6700
Grande Prairie, Alberta
Canada T8V 6Y9

780 831 2500 Telephone
780 831 2501 Facsimile

info@ainsworth.ca
www.ainsworth.ca

July 24, 2001

Mr. Doug Sklar
Director, Forest Management Division
Land and Forest Service
9th Floor, Great West Life Building
9920-108 St.
Edmonton, AB
T5K 2M4

Re: Canfor's Detailed Forest Management Plan (DFMP)

Dear Mr. Sklar:

I am writing to indicate Ainsworth Lumber Co. Ltd. (Ainsworth) support for the DFMP that Canfor will be submitting shortly. Although there remain some minor areas where our Companies are not in complete agreement and we are confident that these can be worked out over time.

Ainsworth appreciates the openness, cooperation and flexibility that all parties demonstrated in resolving the difficult issues associated with the development of the DFMP submission. We look forward to participating and cooperating with Canfor in implementation of the DFMP.

If you have any questions or concerns please contact me at 831-2507.

Sincerely,

Original Signed

Dave Cook, RPF
General Manager, Alberta Woodlands

c.c. Ken McCrae, LFS
Chris Andersen, Canfor
Tim Ryan, Ainsworth

Timberline
Forest Inventory Consultants Ltd.

24 July 2001

Mr. Dwight Weeks
Canadian Forest Products Ltd.
Postal Bag 100, 9401 – 108 Street
Grande Prairie, Alberta
T8V 3A3

Dear Dwight:

Re: Detailed Forest Management Plan

Timberline Forest Inventory Consultants represents Grande Alberta Paper on forestry issues, and I am the principal contact for this purpose.

On behalf of Grande Alberta Paper, thank you for providing opportunities for meaningful technical input into your Detailed Forest Management Plan. Canfor is commended for the openness of the consultation process used to solicit input from deciduous timber operators. I was particularly impressed by your willingness to consider questions and concerns regarding landbase definitions, yield curves, regeneration strategies, model constraints, sequencing, and other issues affecting deciduous timber supplies. I am comfortable that your treatment of GAP concerns was fair and reasonable.

Please forward a digital copy of your Detailed Forest Management Plan, as submitted, and I will arrange for a copy to be delivered to the GAP offices. If you only distribute paper copies, two would be appreciated.

Thanks again for facilitating meaningful consultation. Good luck with the approval process.

Sincerely,

Original Signed

Doug Walker
Chief Operating Officer

cc: Doug Sklar
George Don

Suite 315, 10357 - 109th St., Edmonton, Alberta T5J 1N3 • Tel: (780) 425-8826 • Fax: (780) 428-6782 • Website: www.timberline.ca

EXECUTIVE SUMMARY

This Detailed Forest Management Plan (DFMP) has been prepared in accordance with paragraph 10 of Forest Management Agreement 9900037 ("FMA agreement"). This plan will be updated every 10 years, or sooner if significant developments occur that impact current forest management strategies. This document outlines the goals, objectives and strategies that Canfor and other companies operating on the Forest Management Agreement area ("FMA area") will employ in the management of forest resource.

Canfor's Sustainable Forest Management Plan (SFMP), developed and approved in fulfillment of the requirements for certification under the Canadian Standards Association (CSA) Sustainable Forest Management System Standard CAN/CSA-Z809-96, has been incorporated into this Plan. Through a process of public participation, the SFMP attains a local relevance in the form of locally determined values, goals, indicators and objectives.

The DFMP reflects the principles of sustainable ecological management as presented in the *Alberta Forest Conservation Strategy (*Alberta Environmental Protection 1997b) and *Alberta Forest Legacy* document (Alberta Environmental Protection 1997a). *Canfor's Forestry Principles ("the forestry principles"),* which outlines a broad approach to the sustainability of the forests in which Canfor operates, provides the strategic direction for this Plan. The forest management systems, including certification standards, that result from the forestry principles will maintain the long-term health of forest ecosystems, while providing ecological, economic and social opportunities for the benefit of present and future generations. The structure and content of this Plan are compatible with the *Interim Forest Management Planning Manual - Guidelines to Plan Development* (Alberta Environmental Protection1998a).

Canfor has adopted public participation as an essential element in development of the DFMP and SFMP. Without the considerable assistance and contribution of the Forest Management Advisory Committee (FMAC), these plans would not have been possible. Their commitment was crucial to the refinement of both plans and the quality of the final products. The Forest Ecosystem Management Task Force, a panel of scientific experts from government, academia and industry, provided technical input and guidance to ensure this Plan reflected a sound and practical approach to sustainable ecological management. A *Public Involvement Program* has been submitted to, and approved by, Alberta Sustainable Resource Development. The program ensures members of the public have opportunities to contribute their input about forest management.

As recommended by the *Alberta Forest Legacy* document (Alberta Environmental Protection 1997a), this plan generally uses a coarse-filter[1] approach to ecosystem management on the premise that if representative areas of ecosystems are maintained, the species and ecological processes found within those areas will be maintained. A fine-filter[2] approach has been applied to deal with 7 selected indicator species.

---

[1] Coarse-filter approach: maintaining vegetative communities, landscape patterns and processes (the coarse filter) within the limits of natural variability will result in the maintenance of the full complement of native plant and animal species.

[2] Fine-filter approach: a species-by-species approach.

This DFMP reflects the cooperation of the 4 forest companies possessing timber rights within the FMA area - Canadian Forest Products Ltd. (Canfor), Tolko Industries Ltd. (Tolko), Ainsworth Lumber Company Ltd. (Ainsworth) and Grande Alberta Paper Ltd. (GAP). Through the *Resource and Timber Supply Analysis*, this document provides the annual allowable cuts (AAC) for both coniferous and deciduous species, specifically 670,000 m^3 in the long-term (with a 640,000 m^3 20-year harvest level) and 453,712 m^3 per year allocation respectively. The resource and timber supply analysis was modelled for a 200-year period to ensure sustainability of the resource.

The DFMP is a flexible, "living" document that allows for change. This Plan will be implemented through adaptive management, which makes provisions for changes to forest management plans based on a process of scientific evaluation, monitoring, assessment and feedback. Monitoring and forest stewardship reporting are an important component of this Plan. Sustainable forest management rests on Canfor's ability to predict, to some degree, the future forest conditions resulting from various management plans and practices. Monitoring provides the necessary feedback on those predictions, and supports adaptive management. Through the monitoring program, data will be collected to learn more about the forest and, based on this "new" knowledge, management of the forest resources will improve.

The vision for the future is to continue to improve Canfor's understanding of the ecological processes that have produced natural forests and to incorporate this knowledge into future strategic and operational plans. Canfor will continue to be accountable to the public and will verify, by independent audit, that forestry operations are achieving present and future plans.

DFMP Vision

"To provide a forest management plan framework for crown lands under Canfor's tenure in Alberta, that maintains the ecological integrity and biological diversity of forests and is socially acceptable and economically viable." (Canfor 1997: p. 2).

Table of Contents

EXECUTIVE SUMMARY 1

A. INTRODUCTION 1

B. BACKGROUND INFORMATION 3

1. FOREST COMPANIES 3
2. TIMBER SUPPLY AND SOURCES 3
3. TENURE SYSTEM 3
3.1 Forest Management Agreement 3
3.2 TIMBER QUOTA 3
3.3 Timber Permit 4
4. TIMBER SUPPLY WITHIN THE FMA AREA 4
4.1 Canadian Forest Products Ltd. 4
4.1.1 FMA Area Wood 6
4.1.2 Purchase Wood 6
4.1.3 Salvage Wood 6
4.1.4 Pulpwood Agreement 7
4.1.5 Woodchip Agreement 7
4.2 DECIDUOUS COMPANIES 7
4.2.1 Tolko Industries Ltd. (High Prairie OSB Division) 8
4.2.2 Ainsworth Lumber Company Ltd. 8
4.2.3 Grande Alberta Paper Ltd. 8

C. DESCRIPTION OF THE FOREST MANAGEMENT AGREEMENT AREA 9

1. INTRODUCTION 9
2. DESCRIPTION OF LANDSCAPE DYNAMICS 9
2.1 Timber Resources 9
2.2 Species Mix 11
2.3 Watersheds and Lakes 11
2.4 Seral Stages 14
2.5 Natural Landscape Patterns 16
2.5.1 Fire History 16
2.5.2 Insect and Disease 16
2.6 Landscape Planning Units 17
2.6.1 Ecological Classification 17
2.6.2 Landscape Management Units 18
3. OTHER USERS 21
3.1 Trappers 21
3.2 Outfitters 23
3.3 Oil and Gas Sector 25
3.4 Recreation 25
3.4.1 Recreational Assessment 26
3.5 Hunting and Fishing 26
3.6 Grazing Dispositions 26
4. LOCAL COMMUNITIES 28
5. ABORIGINAL PEOPLE 28
5.1 Aboriginal History 30
6. OTHER TIMBER ALLOCATIONS NEAR THE FMA AREA 32

D. DEVELOPMENT OF THE DETAILED FOREST MANAGEMENT PLAN 35

1. INTRODUCTION 35
2. EVOLUTION OF FOREST MANAGEMENT IN ALBERTA 35
3. EVOLUTION OF FOREST MANAGEMENT AT CANFOR 36

3.1 What is an Ecosystem Management Approach? 36
3.1.1 Sample Plot Stratification 38
3.1.2 Ecological Stratification 40
3.1.3 Natural Region 40
3.1.4 Natural Subregion 40
3.1.5 Ecodistrict 44
3.1.6 Ecosection 46
3.1.7 Ecosubsection 46
3.1.8 Ecosite 46
3.1.9 Ecosite Phase 47
3.2 Using Ecological Classification 47
3.3 Evolution of Forestry Operations at Canfor 47
3.4 Participants and their Role in the Development of the Detailed Forest Management Plan 49
3.4.1 Canfor Participation 49
3.4.2 Forest Management Advisory Committee 49
3.4.3 Forest Management Ecosystem Task Force 50
3.4.4 Other Timber Resource Users 50
3.4.5 Forestry Consultants 50
3.4.6 Alberta Sustainable Resource Development 50
3.5 Interim Forest Management Planning Manual – Guidelines to Plan Development (1998) 51
3.6 Detailed Forest Management Plan (DFMP) – Terms of Reference 53
3.6.1 Scope Assessment for Inventory Analysis of the Grande Prairie Management Area 53
3.7 Cut-off Dates for the Detailed Forest Management Plan 54
3.8 Sustainability 54
3.8.1 Cut Control 55

E. ADMINISTRATION OF THE DETAILED FOREST MANAGEMENT PLAN 57

1. INTRODUCTION 57
2. FOREST MANAGEMENT AGREEMENT 57
3. CANFOR GRANDE PRAIRIE WOODLANDS 58
4. DATA AND DATA MANAGEMENT SYSTEMS 58
4.1 Genus RMT 60
4.2 Environmental Management System (EMS) 61
4.3 Geographic Information System (GIS) 62
4.4 Other Data 62
4.5 Linear and Cutover Updates 63
4.6 Aerial Photo Indexing 63
4.7 Forest*VIEWS*® 64
5. PLANS SUBMITTED TO GOVERNMENT 64
5.1 Detailed Forest Management Plan 64
5.2 Annual Operating Plan/5 Year General Development Plan 64
5.3 Public Involvement Program 65
5.3.1 Public Involvement Activities 65
5.3.2 Tracking Public Issues 66
5.3.3 Public Access to Company Documents 66
5.3.4 Forest Management Advisory Committee (FMAC) 66
5.3.4.1 Terms of Reference 67
5.3.4.2 *Issues List* 67
5.3.5 Trappers Notification Program 67
5.3.6 Aboriginal Involvement 68
5.3.6.1 Aboriginal Input 68
5.3.6.2 Responsiveness to Aboriginal Input 69

5.3.6.3 Business Relationships 69
5.3.6.3.1 Stand Tending 70
5.3.6.3.2 Fire Control 70
5.3.6.3.3 Aboriginal Training 70
6. CANFOR'S SUSTAINABLE FOREST MANAGEMENT PLAN (SFMP) 70
6.1 Public Participation in Development of the Sustainable Forest Management Plan 71
6.2 The Role of Forest Management Advisory Committee in Development of the Sustainable Forest Management Plan 71
6.3 Relationship between the Detailed Forest Management Plan and Sustainable Forest Management Plan 72

F. CURRENT FOREST MANAGEMENT CONSIDERATIONS 73

1. CERTIFICATION 73
1.1 ForestCare 73
1.2 Environmental Management System & ISO 14001 74
1.3 Canadian Standards Association (CSA) 75
2. RELATIONSHIP OF DETAILED FOREST MANAGEMENT PLAN, ANNUAL OPERATING PLAN AND 5 YEAR GENERAL DEVELOPMENT PLAN 75
2.1 Annual Operating Plan (AOP) and 5 Year General Development Plan (GDP) 76
2.2 Operational Implementation of the Detailed Forest Management Plan (DFMP) 76
2.3 Implementation of the Detailed Forest Management Plan Harvest Sequence 77
2.4 Harvesting the Profile Established by the Detailed Forest Management Plan (DFMP) 77
2.4.1 DFMP / AOP Validation Process 77
2.5 Timber Harvest Planning and Operating Ground Rules 77
3 ENHANCED FOREST MANAGEMENT 78
4. ENVIRONMENTAL PROTECTION 80
4.1 Watershed Protection 80
4.1.1 Minimize Impact of Water Yield 80
4.1.1.1 Calculation of ECA 81
4.1.1.2 Watercourse Classification 83
4.1.1.3 Watercourse Protective Buffers 83
4.1.2 Conducting Operations to Minimize Erosion 87
4.1.2.1 Prevention of Stream Sedimentation 87
4.1.2.1.1 Quantifying Siltation 87
4.1.2.2 Prevention of Rutting and Compaction 88
4.1.2.3 Steep Slope Protection 88
4.1.2.3.1 Prevention and Mitigation of Slumping Events 88
4.1.2.3.1.1 Slumping and Grade Cut Failures of Roads 89
4.1.2.3.1.2 Slumps on Sensitive Slopes 90
4.1.2.3.2 Minimizing Road Construction 90
4.1.2.4 Design and Location of Watercourse Crossings 90
4.1.2.4.1 Government Requirements for Watercourse Crossings 90
4.1.2.4.2 Design of Watercourse Crossings 92
4.1.2.4.3 Watercourse Crossing Structures 92
4.1.3 Road Maintenance Inspections 93
4.1.4 Road Reclamation and Deactivation 93
5. FISH & WILDLIFE HABITAT 95
5.1 Landscape Structure 95
5.2 Old Seral Stage 96
5.3 Selected Indicator Species 97

5.3.1 The Status of Alberta Wildlife 98
5.3.2 Habitat Suitability Index (HSI) Models 100
5.3.2.1 Moose (*Alces alces*) 100
5.3.2.2 Pileated Woodpecker (*Drycopus pileatus*) 101
5.3.2.3 American Marten (*Martes americana*) 101
5.3.2.4 Barred Owl (*Strix varia*) 101
5.3.3 Habitat Constraint Modelling 102
5.3.3.1 Woodland Caribou (*Rangifer tarandus caribou*) 102
5.3.3.1.1 Little Smoky Herd (boreal ecotype) 103
5.3.3.1.2 A La Peche Herd (woodland ecotype) 103
5.3.3.1.3 Caribou Research 103
5.3.3.1.4 Strategic Planning for Caribou 106
5.3.3.1.5 Operational Initiatives 107
5.3.3.2 Trumpeter Swan (*Cygnus buccinator*) 108
5.3.3.3 Bull Trout (*Salvelinus confluentus*) 109
5.3.3.4 Amphibians as a Selected Indicator Species 111
5.4 Variable Retention 111
5.4.1 Wildlife Trees and Snags 113
5.5 Top Piles 113
5.6 Wildlife Mineral Licks 114
6. RARE PLANTS 114
7. ENDANGERED & THREATENED WILDLIFE 120
8. PHYSICAL ENVIRONMENTS 120
8.1 Rare Physical Environments 121
8.1.1 Alberta Special Places 121
8.1.2 Parabolic Sand Dunes 122
8.2 Areas of Special Interest 122
8.2.1 Historical Resources 123
8.2.2 Wildlife Mineral Licks 124
8.2.3 Grasslands 124
8.2.4 Low Productive Sites 125
9. SOIL PRODUCTIVITY 126
9.1 Strategic Initiatives 126
9.1.1 Coarse Woody Debris (CWD) 126
9.1.2 Predictive Model of Site Quality 126
9.1.3 Minimize Soil Disturbance 127
9.2 Plants as Indicators of Soil Nitrogen 127
10. LOGGING AESTHETICS 127
11 ACCESS 128
11.1 Road Classes 128
11.2 Road Construction Standards 129
11.3 Log Haul 129
11.3.1 Log Haul Distance 129
11.3.2 Log Haul Weight Limits 130
12 PROTECTION OF FOREST LANDS 131
12.1 Minimization of Canfor's Permanent Roads on the Landbase 131
12.2 Landbase Withdrawals 131
12.3 Timber Damage Assessment 132
12.4 Returning Withdrawn Areas to Productive Status 134
12.5 Shared Access 134
12.5.1 Communication Plan 134
13 WOODLOT MANAGEMENT 135
14 UTILIZATION STANDARDS 135
14.1 Timber Dues 137
14.1.1 Scaling 137
14.2 Merchantable Waste 137

15 SILVICULTURE 138
15.1 Government Reporting 138
15.1.1 Reporting Silviculture Activities 138
15.1.2 Silviculture Data Management 138
15.2 Canfor's Approach to Reforestation 139
15.3 Pre-Harvest Ecological Assessment 140
15.4 Ecosite Field Guides 140
15.5 Silviculture Field Guide 141
15.6 Regeneration Strategy 141
15.6.1 Growth and Yield Monitoring 142
15.6.1.1 Maintaining Yield Groups on the Landscape 142
15.7 Regeneration Strategy – Implementation Guidelines 144
15.7.1 Site Preparation 147
15.7.1.1 Drag Scarification 149
15.7.1.2 Disc Trenching 149
15.7.1.3 Mulching 149
15.7.1.4 Mounding 150
15.7.1.5 Piling (Windrow Burning) 150
15.7.1.6 Ripper Plow 150
15.7.1.7 Broadcast Burns (1984 – 1987) 151
15.7.2 Planting 151
15.7.2.1 Planting Windows 152
15.7.2.2 Planting Stock 153
15.7.2.3 Planting Microsite Selection 154
15.7.3 Aerial Seeding 154
15.8 Regeneration Surveys 155
15.9 Vegetation Management 156
15.9.1 Vegetation Management Handbook 156
15.9.2 Selection of Vegetation Management 157
15.9.3 Vegetation Management Treatments 157
15.9.3.1 Manual Treatments 157
15.9.3.1.1 Weeding 157
15.9.3.1.2 Thinning 161
15.9.3.1.3 Girdling 161
15.9.3.2 Herbicide Application 161
15.9.3.2.1 Public Awareness 162
15.9.3.2.2 Types of Application 163
15.9.3.2.2.1 Aerial Application 163
15.9.3.2.2.2 Basal Bark Application 164
15.9.3.2.2.3 Hack and Squirt Application 164
15.9.3.2.2.4 Backpack Foliar Application 164
15.9.3.2.3 Monitoring 164
15.9.3.2.3.1 Monitoring During Operations 164
15.9.3.2.3.2 Follow-up Monitoring 165
15.9.3.2.3.2.1 Excursions 165
15.9.3.2.3.2.2 Monitoring Plots 166
15.10 Reforestation of Wildfires 166
15.11 Genetic Diversity 166
15.11.1 Objectives for Conserving Genetic Diversity of Tree Species 166
15.11.2 Tree Improvement 170
15.11.3 Deployment of Improved Seed 171
15.11.4 Seed Collection 172
16 RESEARCH INITIATIVES 173
16.1 Forest Resources Improvement Program (FRIP) 174
16.1.1 Grizzly Bear 174
16.1.2 Cooperative Fisheries Inventory 176

16.1.3 Soil Compaction 176
16.1.4 Ecological Management Emulating Natural Disturbance (EMEND) 177
16.1.5 Constraints on Crown Development 178
16.1.6 Biological Productivity Project 178
15.1.7 Tree Improvement on Genetic Diversity 179
15.1.8 Northern Interior Vegetation Management 179
16.3 Silviculture Research 180
16.2.1 Operational Planting Trial 181
16.2.2 Non-Native Conifer Plantations 181
16.3 Program to Enhance the Management Activities and the Level of Understanding of the Forest Resources 181
17 MIXEDWOOD MANAGEMENT 182
18 CONIFEROUS UNDERSTORIES 182
18.1 Coniferous Understorey Protection 183
19 FOREST HEALTH 183
19.1 Fire 183
19.2 Insect and Disease 184
19.3 Catastrophic Windfall 184
19.3.1 Windfall Assessments 185
20 FOREST PROTECTION 186
20.1 Canfor's Role in Fire Protection and Control 186
20.2 Fire Prevention and Control Initiatives 186
20.3 Forest Protection Plan 187
20.4 Fire History 187
20.5 Holding and Protection Charges 187
21 CO_2 / NO_x 187

G. RESOURCE MANAGEMENT PHILOSOPHIES, VALUES, GOALS, INDICATORS AND OBJECTIVES 191

1. INTRODUCTION 191
2. CANFOR'S FOREST MANAGEMENT PHILOSOPHY 191
2.1 Canfor's Mission Statement 191
2.2 Canfor's Environment Policy 191
2.3 Canfor's Forestry Principles 193
2.3.1 Linkage with the Alberta Forest Conservation Strategy 193
2.3.1.1 Strategic Directions: 194
2.3.1.2 Principles 196
3. OTHER FOREST MANAGEMENT PLANNING POLICIES, PLANS, GUIDELINES, REQUIREMENTS AND STRATEGIES 197
3.1 Integrated Resource Management 197
3.1.1 Integrated Resource Plans 198
3.2 A Policy for Resource Management of the Eastern Slopes (Revised, 1984) 198
3.3 Northern East Slopes Sustainable Resource and Environmental Management Strategy (NES Strategy) 199
3.3.1 Background Information 199
3.3.2 Purpose of the NES Strategy 200
3.3.3 Desired NES Strategy Outcomes 200
3.4 1996/97 Operating Guidelines for Industrial Activity in Caribou Ranges in West Central Alberta 201
3.5 Forest Management Directives 201
4. VALUES, GOALS, INDICATORS AND OBJECTIVES 203
4.1 Canadian Standards Association (CSA) (1998) 203
4.2 CSA PERFORMANCE FRAMEWORK 205
5. ISSUES AND OPPORTUNITIES 387

5.1 Ecological 387
5.2 Technological 387
5.3 Administrative/Regulatory 387
5.4 Timber Supply 388
5.5 Costs 388
5.6 Markets 388
5.7 People/Communities 389

H. RESOURCE AND TIMBER SUPPLY ANALYSIS 391

1. INTRODUCTION 391

I. IMPLEMENTATION 395

1. FUTURE FOREST STATE 395
2. IMPLEMENTATION OF DETAILED FOREST MANAGEMENT PLAN 397
3. TRAINING 398
4. TRANSITION PERIOD 398

J. PERFORMANCE MONITORING AND REPORTING 399

1. MONITORING 399
1.1 Growth and Yield Monitoring 399
1.2 Permanent Sample Plots (PSP) 400
1.2.1 Timber Inventory Plots 401
1.2.2 Western Boreal Growth and Yield Association (WESBOGY) Plots 401
1.2.3 Foothills Growth and Yield Association 403
1.3 Other Monitoring 404
1.3.1 DFMP / AOP Validation 404
1.4 Stewardship Reporting 404
1.4.1 Five Year Forest Stewardship Report 405
1.4.2 Annual Performance Monitoring Report 405
1.4.3 Annual Public Report 405

K. LITERATURE CITED 407

L. GLOSSARY 421

M. LIST OF APPENDICES 451

The following appendices are included in a separate binder:

Appendix 1 Forest Management Agreement 9900037
Appendix 2 Corporate Profiles
Appendix 3 *Resource and Timber Supply Analysis*
Appendix 4 Forest Management Advisory Committee Issues List
Appendix 5 *Public Involvement Program for Canadian Forest Products Ltd. FMA 9900037*
Appendix 6 Chronological History Forest Management Advisory Committee
Appendix 7 CSA Matrix
Appendix 8 Rare Plant List
Appendix 9 Summary of Reforestation Activities
Appendix 10 *Canfor's Mission Statement*
Appendix 11 Canfor's *Forestry Principles*
Appendix 12 Equivalent Clearcut Area Tables
Appendix 13 Growth and Yield Monitoring Program
Appendix 14 Model II - Objective Driven Performance Standards
Appendix 15 CSA / Research Project Linkages

List of Figures

		Page #
1	Location of the Forest Management Agreement (FMA) Area	2
2	Timber Allocations Within the FMA Area	5
3	FMA Species Mix	11
4	Coniferous Species Mix	11
5	Deciduous Species Mix	11
6	Primary Watersheds within the FMA Area	12
7	Watershed Hierarchy for Primary Drainages Within the FMA Area	13
8	Seral Stage Distribution Within the FMA Area	15
9	Ecosite Classification of the FMA Area	19
10	Landscape Management Units Within the FMA Area	20
11	Trappers	21
12	Registered Traplines within the FMA Area	22
13	Outfitters	23
14	Wildlife Management Units Within the FMA Area	24
15	MacLeod Flats	25
16	Recreational Areas Maintained by Canfor Within the FMA Area	27
17	Grazing Dispositions Within the FMA Area	29
18	Local Communities	31
19	Other Timber Allocations Near the FMA Area	33
20	How Has Forest Resource Management Evolved Over Time?	36
21	Sample Plot Stratification	39
22	The Hierarchical Land Classification System	41
23	Natural Regions Within the FMA Area	42
24	Natural Subregions Within the FMA Area	43
25	Ecodistricts Within the FMA Area	45
26	Ecosite	46
27	Distribution of the Bracted Honeysuckle Ecosite	46
28	Bushmill	47
29	Log Haul - Historic	48
30	Log Haul - Modern	48
31	Feller Buncher Harvesting	48
32	Detailed Forest Management Plan Participants	52
33	Canfor Alberta Operations Woodlands Organization Chart	59
34	GENUS® - CBMS	60
35	GENUS® - FRMS	60
36	GENUS® - Operational Planning	60
37	EMS Website Screen	61
38	Incident Tracking System	61
39	GIS Data Layers	62
40	Softcopy Photogrammetry	63
41	ForestVIEWS®	64
42	Stand Tending	70
43	Hydrological Recovery	81
44	Procedure for Calculating Equivalent Clearcut Area	83
45	Buffers	83
46	Rip-rap	87
47	Gabions	87
48	Multi-span Bridge	94
49	Native Timber Bridge	94

List of Figures (cont.)

		Page #
50	Single-span Bridge	94
51	Concrete Culvert	94
52	Metal Culvert	94
53	Wood Culvert	94
54	Old Seral Stage	96
55	Moose	100
56	Pileated Woodpecker	101
57	American Marten	101
58	Barred Owl	102
59	Woodland Caribou	102
60	Caribou Area	105
61	Trumpeter Swan	109
62	Bull Trout	109
63	Variable Retention	112
64	Wildlife Trees	113
65	Top Piles	113
66	*Aquilegia formosa*	115
67	S Rank	116
68	G Rank	116
69	Frequency Distribution of the Likelihood of Finding a Rare Plant Species Within the FMA Area	118
70	Dunvegan West Wildland	121
71	Parabolic Sand Dunes	122
72	Wildlife Mineral Licks	124
73	Grasslands	124
74	Low Productive Sites	125
75	LOC Roads	128
76	Standard Log Truck Configuration	130
77	Land Withdrawals	131
78	Merchantable Stand	136
79	Merchantable Tree	136
80	Merchantable Piece	136
81	Merchantable Waste Surveys	137
82	Pre-Harvest Ecological Assessments	140
83	Ecosite Field Guides	141
84	Drag Scarification	149
85	Disc Trencher	149
86	Mounding	150
87	Dual Path Mounder	150
88	Ripper Plow	151
89	Broadcast Burns	151
90	Planting	152
91	Planting Microsite	154
92	Weeding	157
93	C Strata Flow Chart	158
94	CD Strata Flow Chart	159
95	DC Strata Flow Chart	160
96	Grass Competition	161
97	Public Awareness	162

List of Figures (cont.)

		Page #
98	Aerial Herbicide Application	163
99	Basal Bark Application	164
100	Seed Collection Zones Within the FMA Area	169
101	Cone Collection	172
102	Cone Storage	173
103	Grizzly Bear	174
104	Cooperative Fisheries Inventory Program	176
105	EMEND	177
106	Operational Planting Trial	181
107	Mixedwood Forest Type	182
108	Coniferous Understories	183
109	Endemic Windfall	184
110	Fire Equipment Trailers	187
111	Fire Management Districts Have Been Established by the Alberta Government	189
112	NSE Strategy	200
113	Defined Landuse Zones Within the FMA Area from A Policy For The Eastern Slopes	202
114	Criteria and Indicators Framework	204
115	Rare Physical Environments Within the FMA Area	209
116	Natural Regions Within the FMA Area	214
117	Seral Stage Distribution for the FMA Area	215
118	Seral Stage Distribution for FMU G8C	216
119	Seral Stage Distribution for FMU G2C	217
120	Seral Stage Distribution for FMU G5C and E8C	218
121	Seral Stage Distribution for Foothills Natural Region	219
122	Seral Stage Distribution for Boreal Forest Natural Region	226
123	Carrying Capacity Moose	228
124	Carrying Capacity American Marten	228
125	Carrying Capacity Pileated Woodpecker	229
126	Carrying Capacity Barred Owl	229
127	Current HSI % for Moose	232
128	Current HSI % for American Marten	232
129	Current HSI % for Pileated Woodpecker	233
130	Current HSI % for Barred Owl	233
131	Caribou Area Within the FMA Area	236
132	Bull Trout Area Within the FMA Area	237
133	Defined H60 Watershed Map	238
134	Trumpeter Swan Buffer Area	240
135	FMA Distribution of Patch Size	260
136	FMU G8C Distribution of Patch Size	261
137	FMU G2C Distribution Of Patch Size	262
138	FMU G5C E8C Distribution Of Patch Size	263
139	Mean Patch Size for FMA and FMUs	264
140	Mean Nearest Neighbour for FMA and FMUs	264
141	Area-Weighted Mean Shape Index for FMA and FMUs	265
142	Waste Survey Results (1994–1997)	335
143	Canfor Maintains 841 Permanent Sample and NIVMA Plots Within the FMA Area	402

List of Tables

		Page #
1	Canfor Timber Supply and Source (m^3)	6
2	Volume of Timber Salvaged from the FMA Area	7
3	Timber Allocations Within the FMA Area (m^3)	8
4	Timber Harvesting Landbase of the FMA Area	10
5	Breast Height Ages for Seral Stages	14
6	Fire Loss in the FMA Area (1986–2000)	17
7	Landscape Management Units	18
8	Professional Outfitters within Canfor's FMA Area	23
9	Areas of Natural Regions	40
10	Areas of Natural Subregions	44
11	Areas of Ecodistricts	44
12	Actual Harvested Volume Vs. AAC	54
13	Watercourse Classification Table	85
14	Operating Ground Rules for Watercourses	86
15	Road Construction Standards and Guidelines	91
16	Percent of Current Forested Landbase in Old Seral Stage	97
17	The Status of the Species of Concern Identified by the Forest Management Advisory Committee	99
18	Percentage of Pioneer/Young and Old Seral Stages in the Woodland Caribou Area	106
19	Watersheds Flagged for Evaluation	111
20	Provincal Rank (S)	115
21	Global Rank (G)	115
22	Number of Rare Plant Species Found in and near the FMA Area by Family	117
23	Summary of Rare Plant Likelihood Classes for the FMA Area	119
24	Rare Physical Environments	121
25	Dunvegan West Wildland Within and Outside the FMA Area	122
26	Integrated Classification of Roads	129
27	Summary of Landbase Activity (1994-2000)	132
28	Regeneration Strategy	143
29	Regeneration Strategy – Implementation Guidelines	145
30	Site Treatments (1996 – 2000)	147
31	Site Preparation Methods	148
32	Broadcast Burns (1984 – 1987)	151
33	Planting Windows	152
34	Seedling Specifications	153
35	Seedling Deployment	154
36	Results of Regeneration Surveys Conducted in 2000	156
37	Vegetation Management within Canfor's FMA Area	157
38	Improved Seed Deployment Strategy	171
39	Deployment of Seed Orchard Seed	172
40	Available Seed	173
41	Research Conducted Under the FRIP Program	175
42	NIVMA Members (2000)	180
43	Compatible Activities by Land Use Zone	199
44	Breast Height Age Ranges for Seral Stages	211
45	Fire Cycle Estimates	212
46	Summary of Fire Cycle Analysis	213
47	Percent of Current Forested Landbase in Old Seral Stage	204

List of Tables (cont.)

		Page #
48	Seral Stage Distribution for the FMA Total	221
49	Seral Stage Distribution for the FMU G8C	221
50	Seral Stage Distribution for the FMU G2C	221
51	Seral Stage Distribution for the FMUs G5C and E8C	222
52	Seral Stage Distribution for the Foothills Natural Region	222
53	Seral Stage Distribution for the Boreal Forest Natural Region	222
54	Percentage of Pioneer/Young and Old Seral Stages in the Woodland Caribou Area	234
55	Watershed Above the ECA of 35% Flagged for Concern	239
56	Patch Size Distribution Targets	259
57	Regeneration Strategy	274
58	Summary of Landbase Withdrawals (1994-2000)	291
59	Site Index Summary by Yield Group	298
60	Pre-Harvest Coarse Woody Debris Volumes by Yield Group	300
61	Hydrological Recovery	314
62	Amount of Wood Salvaged from the FMA Area	336
63	Actual Harvested Volume vs. the AAC	348
64	Key Contributions to Local Communities	350
65	Permanent Sample Plots Within the FMA Area	401
66	WESBOGY Members (2000)	403
67	Foothills Growth and Yield Association Members (2000)	403

A. INTRODUCTION

On May 26, 1964, Canadian Forest Products Ltd. (formerly North Canadian Forest Industries Limited) entered into a 20-year Forest Management Agreement with the Province of Alberta. This Agreement was renewed in 1978. The current Forest Management Agreement 9900037 ("FMA agreement") commenced on May 5, 1999 and expires May 2019, unless renewed under the provisions contained in the FMA Agreement (Appendix 1).

The FMA agreement grants Canfor the rights to manage, grow, harvest and reforest coniferous timber, and to maintain and/or increase the coniferous annual allowable cut (AAC) within a Forest Management Agreement area ("FMA area"), currently comprised of a 649,160 ha (Figure 1). The FMA area is the primary source of coniferous timber for Canfor's Grande Prairie wood processing facilities.

As per subparagraph 10(3) of the FMA agreement, a Detailed Forest Management Plan (DFMP) must be submitted to the Minister not more than 2 years following the commencement date of the FMA agreement (May 1999). The DFMP defines activities in a specific geographic area and time period, and provides detailed justification and environmental planning to support the AAC for both coniferous and deciduous species from the FMA area.

Three deciduous forest companies, Tolko Industries Ltd., Ainsworth Lumber Company Ltd. and Grande Alberta Paper Ltd., have been allocated deciduous timber within the FMA area. All 3 companies played an integral part in development of the DFMP by providing editorial and technical input regarding strategic and operational plans, resource and timber supply analysis, growth and yield projections, and harvest sequencing. Refer to Appendix 2 for additional information regarding companies operating within the FMA area.

All coniferous and deciduous operators within the FMA area will conduct their activities in accordance with this plan.

A discussion of the timber supply within the FMA area is provided in Section B and the physical characteristics of the FMA area are described in Section C.

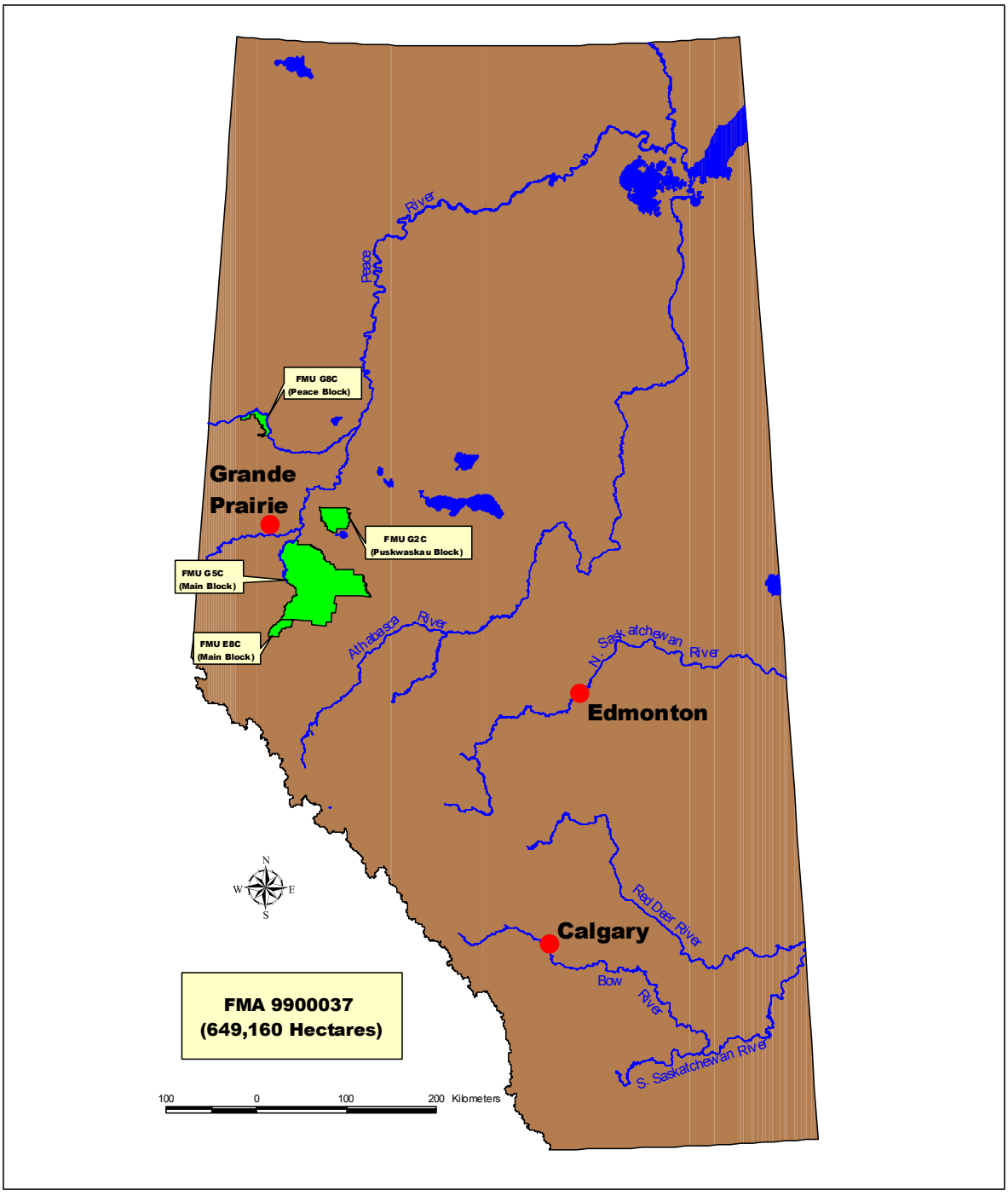


Figure 1. Location of the Forest Management Agreement (FMA) Area

B. BACKGROUND INFORMATION

1. Forest Companies

In addition to Canadian Forest Products Ltd., Grande Prairie Operations (Canfor), 3 forest companies have timber allocations within the FMA area (Figure 2) including:

- Tolko Industries Ltd.;
- Ainsworth Lumber Company Ltd.; and
- Grande Alberta Paper Ltd.

Each company has provided a corporate overview and general description of its manufacturing facilities (Appendix 2). The timber supply for each company is discussed in the following sections.

2. Timber Supply and Sources

Companies operating within the FMA area obtain the timber supply for their various manufacturing facilities from timber obtained within and outside the FMA area. Depending on the company, other sources of timber that may be utilized include salvage, private purchases, crown land timber purchase programs (commercial timber permits) and log purchases from other companies. The primary source of timber for all companies consists of allocations from the Alberta tenure system.

3. Tenure System

Alberta Sustainable Resource Development (ASRD) is responsible for overall land management and to ensure that the forest industry meets all responsibilities and obligations for management of the forest resource. Timber is allocated to the various users through the tenure system. The tenure system includes 3 types of dispositions: the Forest Management Agreement, the Timber Quota, and the Timber Permit. The following description of the tenure system is provided from *The Status of Alberta's Timber Supply* (Alberta Environmental Protection 1996).

3.1 Forest Management Agreement

An FMA agreement is a long-term, negotiated and legislated agreement between the Province of Alberta and a company to establish, grow and harvest timber on a perpetual, sustained-yield basis in a defined land area. The volume of timber that can be harvested is determined through the annual allowable cut (AAC) calculation. The forest company is required to conduct forest management responsibilities, established by the Government, which can change over time based on changing needs and science. The company is also required to construct major facilities to process the timber (e.g. sawmills, pulp mills, oriented strandboard plants, etc.).

3.2 Timber Quota

The quota system was introduced in 1966 and was intended to provide small to medium-sized timber operators with a long-term, secure wood supply. Forest management planning for quota holders is the responsibility of the Provincial Government and results

in a volume-based allocation. A timber quota provides the quota holder with the long-term right to harvest a percentage share of the AAC in a forest management unit (FMU). Most quotas are for the harvesting of coniferous timber. However, deciduous quotas, called a deciduous timber allocation (DTA)[3], have recently been established.

3.3 Timber Permit

Timber permits are administered under the provincial Miscellaneous Timber Use program (MTU). There are 3 types of permits:

- Local timber permits (LTP) - are issued to local residents for private use and are limited to 50 m^3.
- Commercial timber permits (CTP) - are issued to bona fide loggers and mill owners for coniferous volumes up to a maximum of 750 m^3 per permit.
- Deciduous timber permits (DTP) - are issued to anyone who applies for one, with preference given to the bona fide loggers and mill owners. There is no maximum volume set on these permits.

A portion of the annual allowable cut (AAC) in the FMA area is reserved for local community use and bona fide loggers or mill owners with minimal volume requirements through the above permitting system (refer to Appendix 1 regarding the volumes reserved within the FMA area).

4. Timber Supply Within the FMA Area

This section describes the timber allocations for each company within the FMA area. Canfor has the rights to manage, grow, harvest and reforest coniferous timber on FMA 9900037 under its current agreement with the Crown. Tolko Industries Ltd. (Tolko), Ainsworth Lumber Company Ltd. (ALC) and Grande Alberta Paper Ltd. (GAP) have been allocated deciduous timber rights within the FMA area (Figure 2). Information regarding the timber sources for each company outside the FMA area is contained in Appendix 2.

4.1 Canadian Forest Products Ltd.

Canadian Forest Products Ltd. (Canfor) obtains its log supply for its Grande Prairie dimension sawmill and fingerjoint plant primarily from the FMA area. This supply is augmented by purchased wood, salvage wood from the FMA area, commercial timber permits (CTP), log transfers from Canfor's Hines Creek Operations, and other FMA holders, including Weyerhaeuser and Alberta Newsprint Company. The amount of timber required from the FMA area fluctuates from year to year depending on the availability of outside sources. Based on the mill requirements of 730,000 m^3, the typical timber supply is indicated in Table 1. Approximately 586,000 m^3 of the established 20-year harvest level (640,000 m^3) harvested from the FMA area will be delivered for use in Canfor's sawmill and 54,000 m^3 will be pulpwood delivered to Weyerhaeuser. More information regarding each component of Canfor's timber supply is provided in the following sections.

[3] DTA means deciduous timber allocation, a long-term right to harvest deciduous timber on a percentage share of the allowable harvest in a forest management unit (FMU).

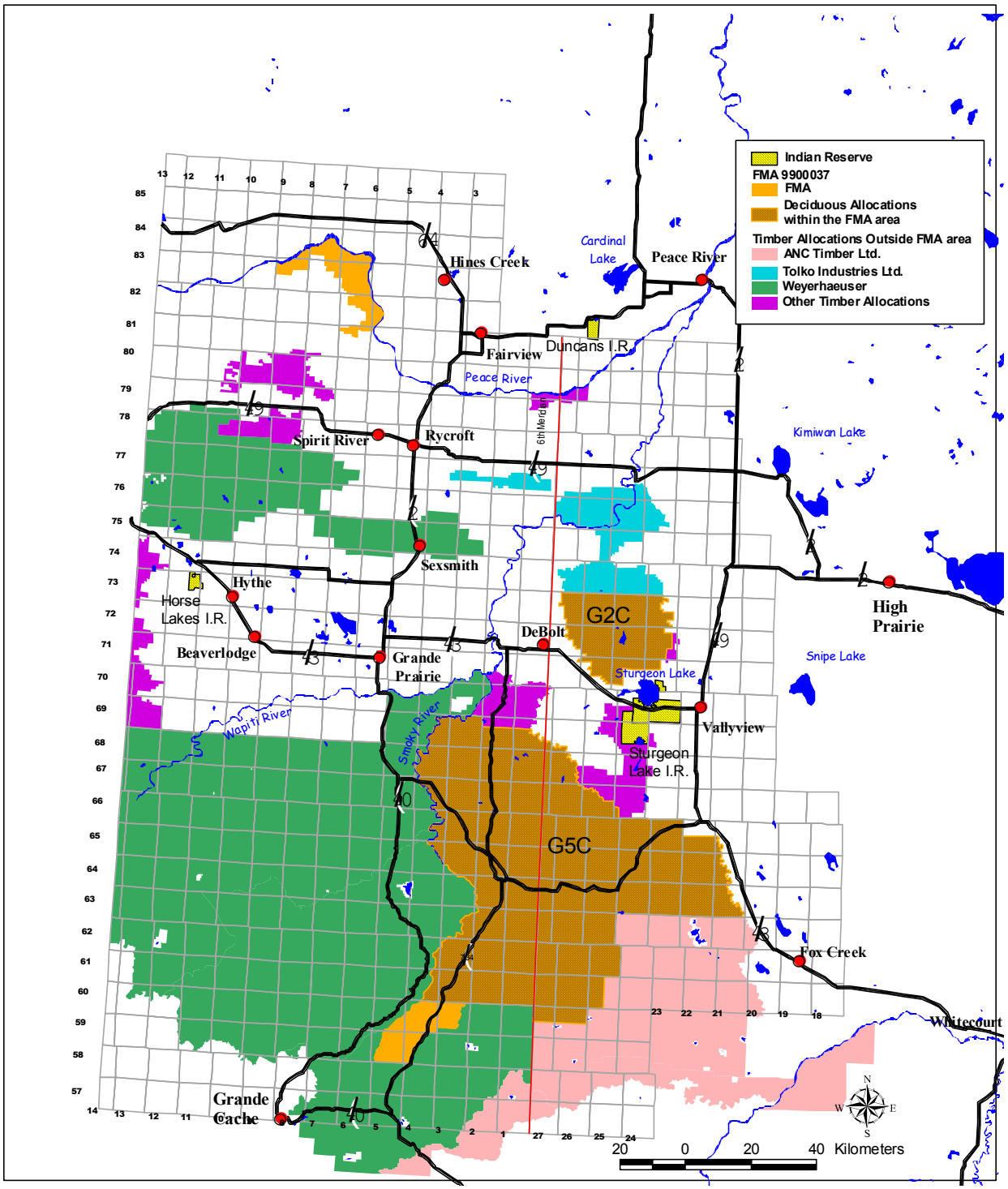


Figure 2. Timber Allocations Within the FMA Area

Table 1. Canfor Timber Supply and Source (m^3)

DFMP_Tables.xls
Table 68

Deliveries to Grande Prairie Mill From FMA area		Purchase Wood		Hines Creek Transfers	Sawmill Requirements
FMA area	Salvage	Crown	Private		
586,000	15,000	100,000	9,000	20,000	730,000
Notes: Volumes for 2001/2002 reflect current thinking. Volumes of purchase wood will be evaluated as it comes available Private wood will be purchased if it is economically attractive and environmentally sound to log					

Source: Canfor compiled data

4.1.1 FMA Area Wood

Under Forest Management Agreement 9900037, Canfor has the right to harvest coniferous species within the FMA area. The current coniferous annual allowable cut (AAC) is 670,000 m^3 (with a 640,000 m^3 20-year harvest level), as determined from the *Resource And Timber Supply Analysis* (RTSA). Refer to Appendix 3 for additional information regarding determination of AACs for both coniferous and deciduous species.

4.1.2 Purchase Wood

Canfor purchases wood from 2 general sources: private and crown purchase wood programs. Timber is purchased from private lands if it is logged in an environmentally sound manner. The Crown offers small volumes for sale. These sales, called commercial timber permits (CTP), are generally for volumes up to a maximum of 750 m^3 per permit. Canfor purchases wood from CTP holders if a favorable contract can be negotiated.

4.1.3 Salvage Wood

Roads, wellsites, processing plants, powerlines, pipelines, recreational sites, campsites, and gravel pits are all examples of dispositions (permanent landwithdrawls) where salvage timber may be generated. In accordance with Alberta Sustainable Resource Development (ASRD) requirements, all merchantable species from these lands must be salvaged. The appropriate forest company must be advised that salvage is available and once notified, forest companies have the option to accept the timber or allocate it to some other user.

It is desirable to utilize as much salvage as possible, however, salvaging timber can sometimes be problematic. At times, the salvage is inaccessible or unmerchantable. Other times, forest companies do not receive notice that the salvage is available. An objective has been established to utilize 100% of the accessible, merchantable industrially salvaged wood from permanent land withdrawals (Section G “Critical Element 4b, Objective 1.3b.1”).

Canfor has established procedures to track the volume of salvage wood originating from the FMA area. Other companies desiring dispositions within the FMA area must obtain approval from Canfor and, prior to conducting their operations, must sign a salvage commitment form indicating whether the salvage has been accepted or declined by Canfor. These transactions are recorded in the landuse database, which has the

capability to track a number of salvage components. Based on a recent query of the database for 2000-2001, salvage wood has been hauled from 97% of the reported dispositions.

Table 2 shows the amount of wood salvaged from the FMA area during the period 1995/1996 to 2000/2001. Salvage timber volumes fluctuate from year to year depending on the activities conducted within the FMA area.

Table 2. Volume of Timber Salvaged from the FMA Area

DFMP_Tables.xls
Table 15

Year	2000/2001	1999/2000*	1998/1999	1997/1998	1996/1997	1995/1996
Amount of wood (m^3)	14,480	25,166	10,277	11,494	8,044	14,397
* Volume indicated is higher than average due to the removal of forest cover for the Alliance pipeline project in the FMA area.						

Source: Canfor compiled data

4.1.4 Pulpwood Agreement

Canfor has a commitment to provide up to 54,000 m^3 of pulpwood annually to the Weyerhaeuser pulp mill in Grande Prairie. The volume provided each year might fluctuate depending on the amount requested by Weyerhaeuser. For example, Weyerhaeuser required approximately 40% (21,141 m^3) of this volume for the 2000 harvest season.

4.1.5 Woodchip Agreement

Woodchips produced by Canfor are sold to Weyerhaeuser's pulp mill in Grande Prairie. Canfor also has an agreement to supply chips from its Hines Creek operation to Alberta Newsprint Company Ltd. (ANC) in exchange for purchasing logs to supplement Canfor's timber supply. When there has been an oversupply of woodchips, the surplus has been shipped to Canfor's pulp mills in Prince George, B.C.

4.2 Deciduous Companies

Three forest companies have been granted the right to harvest deciduous species in FMUs G2C and G5C. Table 3 provides a breakdown of the deciduous allocations by quadrants. A brief description of the timber supply for each company follows.

Table 3. Timber Allocations Within the FMA Area (m^3)

DFMP_Tables.xls
Table 70

DFMP Quadrant	Year	FMU G2C	FMU G5C			Total (m^3)			Quadrant Totals (m^3)		
		Tolko	Tolko	Ainsworth	GAP	G2C	G5C	FMA Area	G2C	G5C	FMA Area
1	1999										
	2000		134,563				134,563	134,563			
	2001	436,686	54,212	170,000		436,686	224,212	660,898			
	2002	60,500	54,212	170,000		60,500	224,212	284,712			
	2003	60,500	54,212	170,000		60,500	224,212	284,712	557,686	807,199	1,364,885
2 - 4	2004	60,500	54,212	170,000	169,000	60,500	393,212	453,712			
	2005	60,500	54,212	170,000	169,000	60,500	393,212	453,712			
	2006	60,500	54,212	170,000	169,000	60,500	393,212	453,712			
	2007	60,500	54,212	170,000	169,000	60,500	393,212	453,712			
	2008	60,500	54,212	170,000	169,000	60,500	393,212	453,712	302,500	1,966,060	2,268,560

NOTE: Blue numbers were derived from actual production number harvested minus the total quadrant allocation

Source: Canfor compiled data

4.2.1 Tolko Industries Ltd. (High Prairie OSB Division)

The operating area of Tolko Industries Ltd. extends in a radius of approximately 250 km from the mill and provides an annual harvest of up to 850,000 m^3 of trembling aspen (*Populus tremuloides* Michx.), balsam poplar (*Populus balsamifera* L.*)* and a small component of white birch (*Betula papyrifera*). A portion of the timber supply for its High Prairie OSB Division is obtained from deciduous timber allocation (DTA) certificates within Canfor's FMA area in forest management unit (FMU) G2C and FMU G5C. Tolko has exclusive rights to the deciduous timber in FMU G2C, with an annual allowable cut (AAC) of 60,500 m^3 per year (DTA G02C0001) and an AAC of 54,212 m^3 per year in FMU G5C (currently obtained from DTA G050001). Additional information regarding Tolko Industries Ltd. and its operations and timber supply outside the FMA area is contained in Appendix 2.

4.2.2 Ainsworth Lumber Company Ltd.

Ainsworth Lumber Company Ltd.'s Grande Prairie mill and value-added facilities currently consist of an OSB mill, a rim board facility and a tongue and groove/sanding line. Ainsworth has rights to 170,000 m^3 per year of deciduous timber (trembling aspen and balsam poplar) within FMU G5C. Additional information regarding Ainsworth and its operations and timber supply outside the FMA area is contained in Appendix 2.

4.2.3 Grande Alberta Paper Ltd.

In 1996, Grande Alberta Paper Ltd. (GAP) reached an agreement in principle with the Province of Alberta to construct a single-line, lightweight paper mill near Grande Prairie. The Crown made provision for GAP's timber requirements by planning for a deciduous allocation of 169,000 m^3 per year within FMU G5C. Additional information regarding GAP and its operations and timber supply outside the FMA area is contained in Appendix 2.

C. DESCRIPTION OF THE FOREST MANAGEMENT AGREEMENT AREA

1. Introduction

The FMA area (Figure 1) consists of 3 separate blocks of forested land (649,160 ha) within 4 forest management units (FMU): FMU G8C (Peace Block), FMU G2C (Puskwaskau Block), FMU G5C (contained in the Main Block) and FMU E8C (contained in the Main Block). The FMA area encompasses portions of 4 Natural regions including the Boreal Forest, Parkland, Foothills and Rocky Mountain. Refer to Section D 3.1.3 for additional information regarding the Natural regions.

2. Description of Landscape Dynamics

This section provides a brief description of several landscape level attributes that characterize the natural world found within the FMA area.

2.1 Timber Resources

Fire has played a prominent role in the age structure and composition of the forest. Over time, repeated fires have created a patchwork of timber stands. As a result, the forest cover within the FMA area contains various proportions of coniferous and deciduous species depending on the location. Well-drained and upland sites generally contain white spruce (*Picea glauca* [Moench] Voss*)*, lodgepole pine (*Pinus contorta var. latifolia*), balsam fir (*Abies balsamea* [L.] Mill.*)*, subalpine fir (*Abies lasiocarpa* [Hook] Nutt.), and trembling aspen (*Populus tremuloides* Michx.).

Imperfectly drained local areas are commonly covered by combinations of black spruce (*Pices mariana* [Mill.] B.S.P.), balsam poplar (*Populus balsamifera* L.), white spruce and sometimes white birch (*Betula papyifera* Marsh.). Poorly drained depressional areas often contain tamarack (*Larix laricina* [Du Roi] K. Koch), and black spruce.

The primary commercial coniferous species managed and harvested by Canfor are white spruce, lodgepole pine, balsam fir and black spruce. Other coniferous tree species, including jack pine (*Pinus banksiana* Lamb) and engelman spruce (*Picea engelemannii),* are also found within the FMA area but at this time they are of minor commercial importance.

Tolko Industries Ltd. and Ainsworth Lumber Company Ltd. both have the rights to utilize trembling aspen and balsam poplar from their deciduous timber allocations. Tolko also has rights to utilize white birch.

Table 4 provides a summary of the components of the timber harvesting landbase (Canfor 2001n).

Table 4. Timber Harvesting Landbase of the FMA Area

DMP_Tables.xls
Table 24

Classification	Area (ha)	Area (ha)	% of Total Area	% of Forested Area
Total landbase		**649,159.89**	**100.00**	
Reductions for non-forest				
Natural non-vegetated	12,959.91		2.00	
Anthropogenic non-vegetated	4,939.35		0.76	
Anthropogenic vegetated	4,946.51		0.76	
Non-forest vegetated	32,884.48		5.06	
AVI Attribute MODCON1 = “sc”	0.18		0.00	
AVI Attribute MODCON1 = “cl”	0.68		0.00	
Roads not included in AVI	1,132.95		0.17	
Total non-forest reductions	56,864.06	56,864.06	8.76	
Total forested landbase		**592,295.83**	**91.24**	**100.00**
Reductions to forested landbase				
Steep slopes (from AVI)	10,522.07		1.62	1.78
Slumps (from AVI)	42.51		0.01	0.01
Gravesites	5.15		0.00	0.00
DRS	320.48		0.05	0.05
Peace Parkland Rare Physical Environment	303.82		0.05	0.05
Cactus Hills Rare Physical Environment	8.00		0.00	0.00
Peace River Dunvegan Rare Physical Environment	374.33		0.06	0.06
Parabolic Sand Dunes Rare Physical Environment	5,480.31		0.84	0.92
Swan buffers	2,247.56		0.35	0.38
Watercourse buffers	37,715.86		5.81	6.37
Low productive (Yield Group 13)	25,821.55 [1]		3.98	4.36
River buffers (Beaver)	3.79		0.00	0.00
Non-allocated deciduous areas	9837.93 [2]		1.51	1.66
Height/Age Reduction areas	18,383.65 [3]		2.83	3.10
Non-allocated birch areas	6,903.09 [4]		1.06	1.16
AOP Reserve Areas	132.69 [5]		0.02	0.02
Total reductions to forested landbase	118,102.79	118,102.79	18.19	19.94
Timber harvesting landbase		**474,193.04**	**73.05**	**80.06**

The changes that have occurred to this present landbase summary as result of the integration of the 2001 Annual Operating Plan (AOP) include:

1. Low productive - Yield Group 13 (SBLT/LTSB-U)
Approximately 11 ha of yield group 13 in proposed cutblocks are not included in low productive. In addition, one of the GIS inputs into the timber supply is an AOP coverage containing stands to be harvested in the near term. One of the assumptions built into the process is that all timber within an AOP block is economically operable. The AOP coverage that was present at the time of the Benchmark Report contained a block that overlaid approximately 5 ha of a yield group 13 (SBLT/LTSB-U) type. Despite this, the 5 ha was assumed to be operable. Under the updated AOP coverage, this particular stand was either modified or removed. The 5 ha of yield group 13 reverted back to inoperable.

2. Non-Allocated Deciduous Areas
The addition of stands classified as non-allocated deciduous areas which were removed from the Timber Harvesting Landbase (THLB). These are hardwood stands within G8C and E8 that are not part of the hardwood quota allocation.

3. Height/Age Reductions Areas
The addition of stands classified as height/age reduction areas which were removed from the THLB. These are stands which met the following height requirements:
- Yield group 12 (SBLT/LTSB – G,M,F) stands with heights < 16 and ages > 80.
- All other coniferous stands with height < 13 and ages > 80.

4. Non-Allocated Birch Areas
The addition of stands classified as non-allocated birch areas which were removed from the THLB. These are birch stands which have not been allocated.

5. AOP Reserve Areas
The addition of stands classified as AOP reserve areas were removed from the THLB. These are polygons classified within the new AOP coverage as AOP blocks with a reserve status.

Source: *Detailed Forest Management Plan Resource and Timber Supply Analysis* (Canfor 2001n)

2.2 Species Mix

There are 8 primary commercial species within the FMA area – 5 coniferous and 3 deciduous (Figure 3). Approximately 60% of the trees are coniferous and 40% are deciduous.

White spruce is the most common of the coniferous species closely followed by lodegepole pine (Figure 4). Trembling aspen is the most common deciduous species (Figure 5).

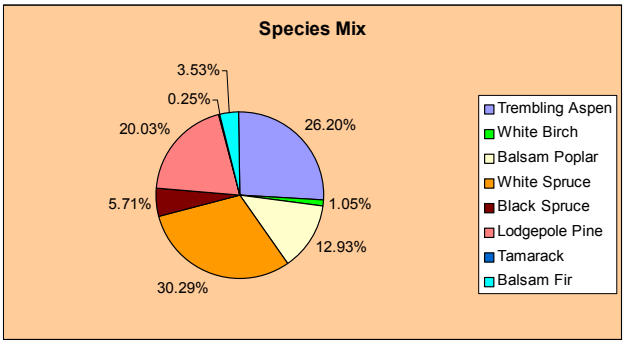


Figure 3. FMA Species Mix
Percentage distribution of the 8 primary tree species within the FMA area.

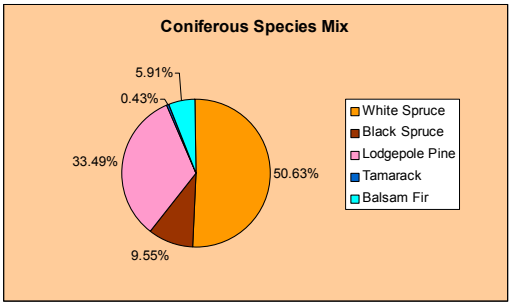


Figure 4. Coniferous Species Mix
Percentage distribution of coniferous species.

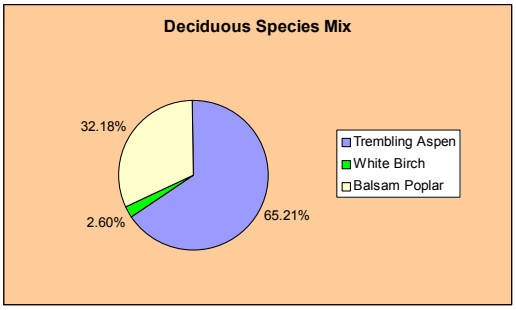


Figure 5. Deciduous Species Mix
Percentage distribution of deciduous species.

2.3 Watersheds and Lakes

Canfor maintains a database of all the watersheds within the FMA area classified according to Strahler (Canfor 1998g). An index map indicating the 13 primary drainages is provided (Figure 6). A large-scale map is available for viewing at Canfor's Grande Prairie administration office.

The Peace River provides the main drainage for all 4 FMUs within Canfor's FMA area. Originating in British Columbia, it passes through the Rocky Mountains and on its way to the Arctic Ocean, it cuts a deep gash up to 11 km wide across northern Alberta. Just inside the Alberta/British Columbia border, one of its large loops engulfs forest management unit (FMU) G8C, the northern parcel of Canfor's FMA area. Fourth Creek and Cactus Creek drain that area directly into the Peace River.

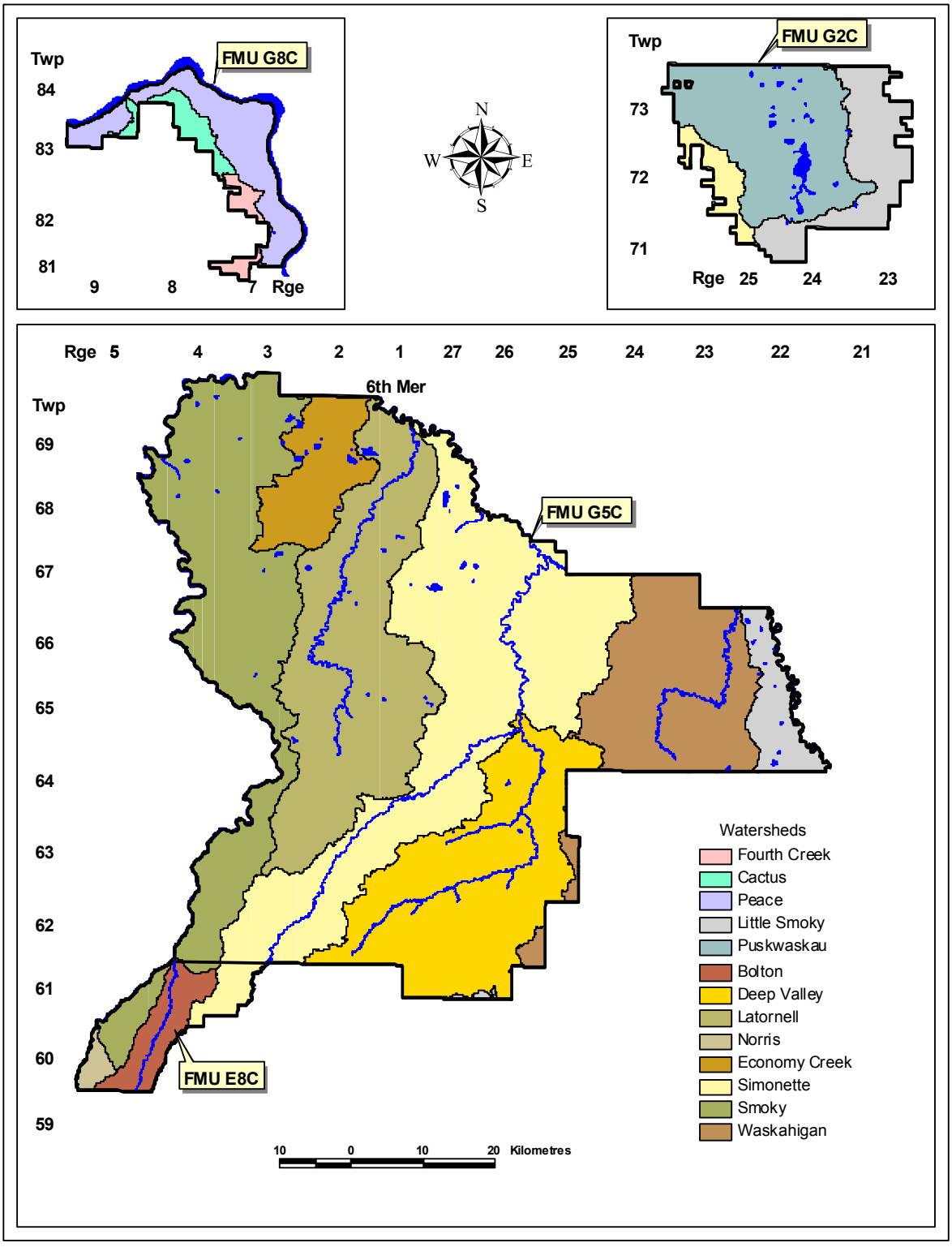


Figure 6. Primary Watersheds Within the FMA Area

The Smoky River provides the primary drainage for FMU G5C, FMU E8C and FMU G2C of the FMA area, with all watersheds within those FMUs eventually draining into that system (Figure 7). The Smoky River serves as the western FMA area boundary for FMUs G5C and E8C, and along with the Bolton and Norris creeks, provides drainage of the western FMA area. Many other small secondaries and tertiary streams enter the Smoky, dissecting the landscape and creating very rugged terrain.

The Simonette River is a tributary of the Smoky River and with its main tributaries, the Latornell River and Economy and Deep Valley creeks, provides drainage of the central regions of FMU G5C.

The Little Smoky River and its tributary, the Waskahigan River, drain the eastern portions of FMU G5C. The Little Smoky, Simonette and Puskwaskau rivers drain FMU G2C. The Puskwaskau River drainage system contains a series of small bogs and lakes, the largest being Puskwaskau Lake. Other numerous small, shallow lakes are also found in the FMA area.

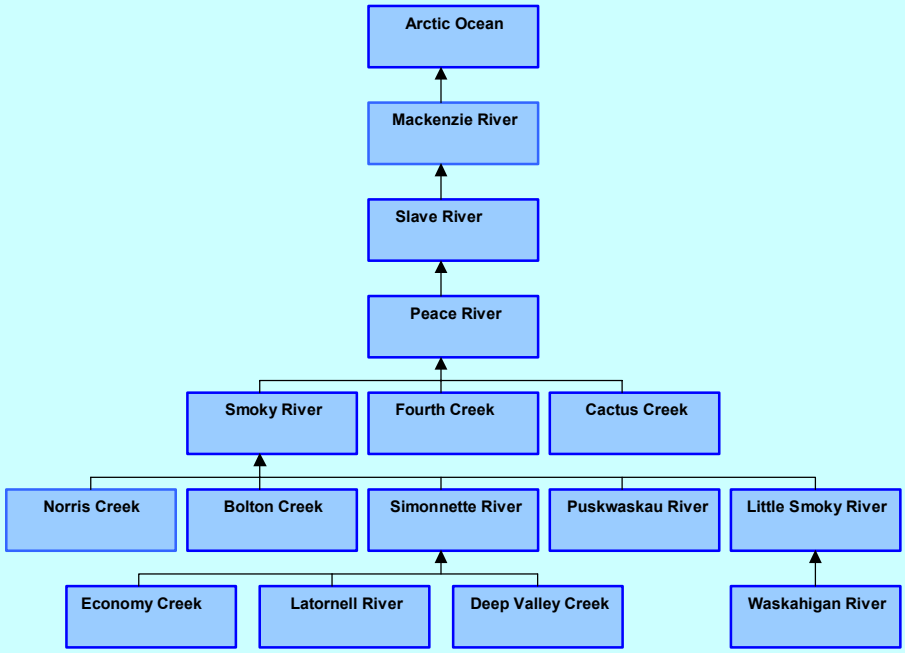


Figure 7. Watershed Hierarchy for Primary Drainages Within the FMA Area

2.4 Seral Stages

Seral stages are the series of plant community conditions that develop during ecological succession from bare ground (or major disturbances) to the potential plant community capable of existing on a site where stand replacement begins and the secondary successional process starts again (Dunster and Dunster 1996). Seral stages play an important role in:

- Maintaining wildlife habitat for all species;
- Conservation of ecosystem resilience (a full range of ecosystem types and successional habitats allows ecosystems to persist, absorb change, and recover from disturbances); and
- Conservation of global ecological cycles (a full range of ecosystem types contribute to the health of the global ecological cycles).

Seral stages have been established for each of the 17 yield groups within the FMA area based on a specified age to reach breast height (Canfor 2000). 5 seral stages are present – "pioneer", "young", "mature", "over mature" and "old" (Table 5).

Table 5. Breast Height Ages for Seral Stages

DFMP_Table.xls
Table 1

Yield Group	Description	Pioneer (1)	Young (2)	Mature (3)	Over mature (4)	Old (5)	Species	Years to Breast Height (BH)
1	AW +(S) - AB	0	1–20	21–70	71–110	110+	AW	6
2	AW +(S)-CD	0	1–20	21–70	71–110	110+	AW	6
3	AWSW/PBSW/BWSW	0	1–40	41–80	81–120	120+	SW	15
4	BW/BWAW+(S)	0	1–20	21–70	71–110	110+	BW	6
5	FB+OTHERS	0	1–40	41–100	101–120	120+	FB	15
6	H+(S)/S	0	1–40	41–80	81–120	120+	SW	15
7	PB+(S)	0	1–20	21–80	81–110	110+	PB	6
8	PL/PLFB+(H)	0	1–40	41–80	81–120	120+	PL	10
9	PLAW/AWPL	0	1–30	31–70	71–120	120+	PL	10
10	PLSB+OTHERS	0	1–40	41–90	91–120	120+	PL	10
11	PLSW/SWPL + (H)	0	1–40	41–90	91–120	120+	PL	10
12	SBLT/LTSB (G,M,F)	0	1–50	51–130	131–150	150+	SB	20
13	SBLT/LTSB(U)	0	1–50	51–140	141–160	160+	SB	20
14	SBPL/SBSW/SBFB	0	1–40	41–100	101–130	130+	SB	20
15	SW/SWFB + (H)-AB	0	1–40	41–90	91–120	120+	SW	15
16	SW/SWFB +(H)-CD	0	1–40	41–90	91–120	120+	SW	15
17	SWAW/SWAWPL	0	1–40	41–90	91–120	120+	SW	15

Note: Ages are breast height age
AW = aspen FB = balsam fir SW = white spruce PB = balsam poplar BW = white birch PL = lodgepole pine
SB = black spruce LT = tamarack

Source: ORM compiled data (Canfor 2000)

An index map is provided to indicate the current (1999) distribution of seral stages within the FMA area (Figure 8). A large-scale map is available for viewing at Canfor's Grande Prairie administration office.

Canfor is committed to submitting seral stages linked to yield groups to assist the Company and ASRD to evaluate the ecological implications of the DFMP. Canfor will provide rational on how age categories were selected for each yield group seral stage. The Company and ASRD will work co-operatively to review information, identify issues and determine the appropriate courses of action. For additional information regarding seral stages refer to Section G "Critical Element 1a, Objective 1.2b.1"

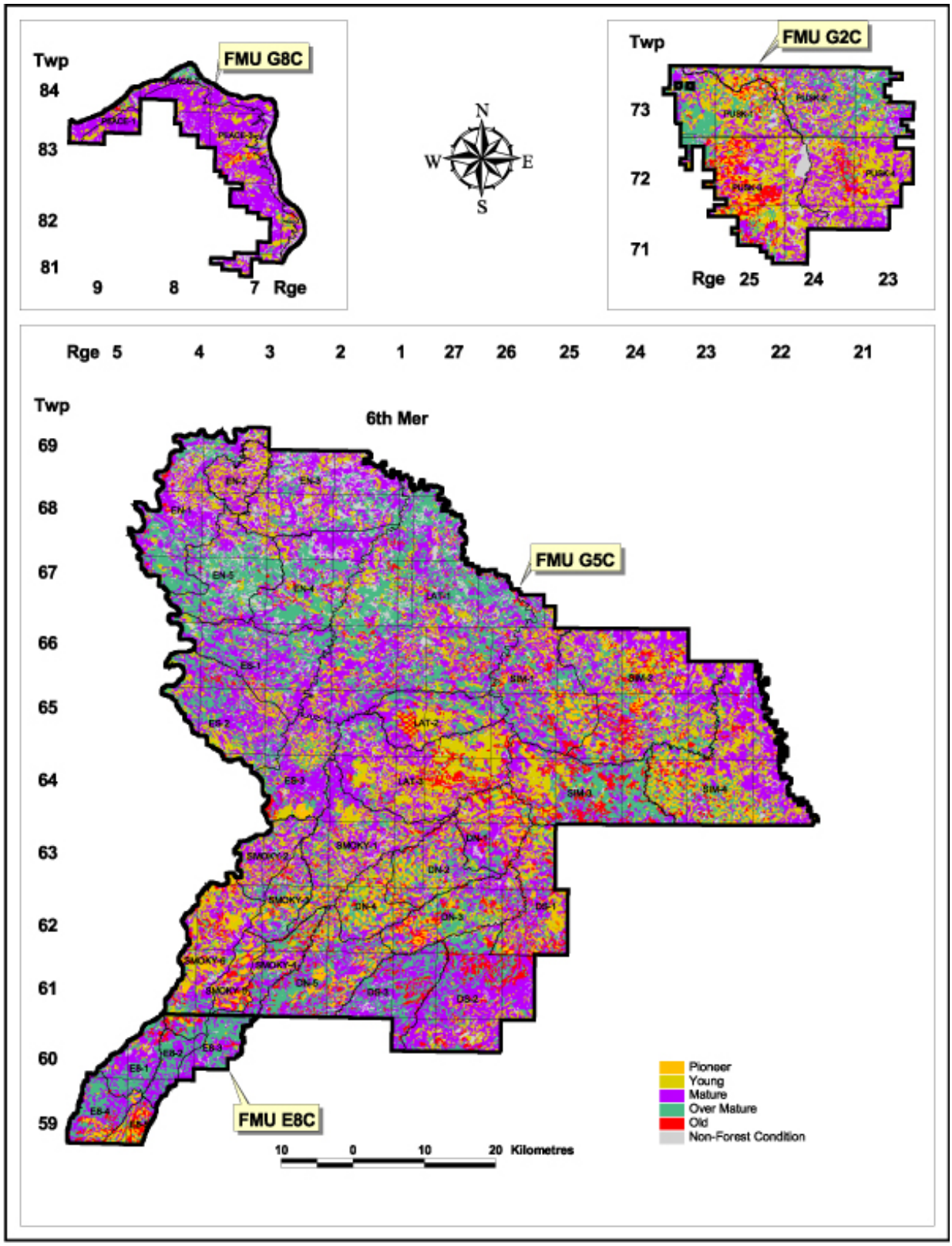


Figure 8. Seral Stage Distribution Within the FMA Area

2.5 Natural Landscape Patterns

Fire is the most significant landscape disturbance in the FMA area. Timber harvesting and other industrial activities, such as geophysical exploration and energy sector processing plants, have also played a role in the makeup of the forest.

2.5.1 Fire History

Fire has played a dominant role in the development and rejuvenation of stands within the boreal forest and foothill regions. Large fires tend to produce a more homogeneous pattern in structure, species composition and age (i.e. less biodiversity at the landscape level). However, large fires have rejuvenating qualities that play a role in ecosystem condition and productivity. Fire control and prevention programs have limited the number and area of fires within the FMA area. As indicated in Table 6, there have been 178 fires in the FMA area during the last 15 years (1986–2000 inclusive), impacting a total of 187.4 ha. The average number of fire occurrences per year in the past 15 years has been 12, impacting an average of 12.5 ha a year. Forty-two percent (78.8 ha) of the burned area has been reforested. In the past, the causes of fires have been contractors, pipeline rupture, powerlines, flare pits or lightning.

Canfor's goal is to maintain forest sustainability by protecting the forest resources within the FMA area from fire. Achieving this goal is problematic because the Company has no control over many of the natural and anthropogenic processes that cause fire i.e. human-caused (non-Company), other industrial fires or lightning-caused fires. As a result, Canfor has established an objective to have zero Company-caused fires within the FMA area (Section G "Critical Element 2a, Objective 1.1a.1"). Performance in attaining that objective will be monitored by tracking and reporting the number and occurrences of fires in the annual *Forest Protection Plan* (Canfor 2000e).

2.5.2 Insect and Disease

A certain amount of insect and disease is endemic in all forested areas. This usually involves relatively small, localized areas and has minor impact on timber volumes. The only insect epidemics that have occurred in the FMA area have been associated with the forest tent caterpillar and large aspen tortrix, both species that impact deciduous trees. Insect infestations of coniferous tree species remain at endemic levels, as they have for many years. Diseases of both conifer and deciduous tree species have only occurred at endemic levels within the FMA area.

Canfor's *Forest Protection Plan* (refer to Section F 19.3) makes provisions for reporting any insect and disease found during routine work. Every reported incident is investigated to determine the extent of the problem and what further action is required. Refer to Section F 18.2 for additional information regarding insect and disease.

As per subparagraph 28(4) of FMA Agreement 9900037, the Company will, in co-operation with ASRD, develop a strategy to suppress any insect and disease outbreak of epidemic proportion within the FMA area.

Table 6. Fire Loss in the FMA Area (1986–2000)

DMP_Tables.xls
Table 25

Year	Number of Fires	Area Burned	Productive Area (ha)	Potentially Productive (ha)	Non-productive Area (ha)
1986	3	0.7	0.0	7.0	0.0
1987	18	9.8	0.0	9.8	0.0
1988	11	1.1	0.0	1.1	0.0
1989	3	2.3	0.0	2.3	0.0
1990	9	1.0	1.0	0.0	0.0
1991	17	19.1	0.7	18.4	0.0
1992	28	14.1	12.5	1.6	0.0
1993	30	57.3 [1]	9.0	48.3	0.0
1994	6	27.6 [2]	15.6	7.9	4.1
1995	8	5.4 [3]	1.6	3.3	0.5
1996	0	0.0	0.0	0.0	0.0
1997	6	1.5	1.5	0.0	0.0
1998	27	37.6 [4]	32.3	5.3	0.0
1999	9	5.9 [5]	5.9	0.0	0.0
2000	3	4.0	4.0	0.0	0.0
Total	**178**	**187.4**	**84.1**	**105.0**	**4.6**

Notes:
1. 36.4 ha cutblock reforested
2. 15.0 ha cutblock reforested
3. 3.0 ha cutblock reforested
4. 20.0 ha pipeline planted spring 2000
5. 4.4 ha were in a cutblock that was harvested in 1999 and reforested in July 1999

Total area reforested = 78.8 ha (42%)
Actual loss 1986 - 2000 = 108.6 ha

Source: Canfor 2000e

2.6 Landscape Planning Units

The FMA area is comprised of a variety of ecosystems that, depending on their characteristics may require different management strategies. Canfor has therefore developed ecological classification and landscape management units as a basis for management of the forest resources.

2.6.1 Ecological Classification

In 1997, Canfor retained Geographic Dynamics Corp. (GDC) to collect ecological data (1,395 plots) in conjunction with the timber inventory temporary sample plot (TSP) program. The resultant data was used by GDC to prepare ecological classification maps and to enhance the *Field Guide to Ecosites of West-central Alberta* (Beckingham *et al* 1996a) and the *Field Guide to Ecosites of Northern Alberta* (Beckingham and Archibald 1996).

The ecologicial classification and inventory system provides data and maps of ecological units at multiple scales and ancillary interpretative information, useful in estimating ecosystem potentials and capabillities (Canfor 2001a). A description of each component of the classification system is provided in Section D 3.1. Figure 9 provides an index map of the ecosite classification of the FMA area. A large-scale map is available for viewing at Canfor's Grande Prairie administration office.

2.6.2 Landscape Management Units

The published reports of Ojamaa (1978), Van Waas (1978), Nelson (1983), Archibald *et al* (1984), and Strong (1996) were utilized to delineate the FMA area into logical planning units, with the approval of the Forest Management Advisory Committee, Forest Ecosystem Management Task Force and Alberta Sustainable Resource Development. Canfor refers to these delineations as landscape management units (LMU) (Figure 10). Fourteen LMUs have been identified within Canfor's FMA area (Table 7).

Landscape management units (LMU) are at a finer scale than the Natural subregion level but are not nested within the hierarchical classification system (Figure 22). They are defined by definite patterns of relief, elevation, geology, geomorphology, landform, surficial deposits, drainage, ecoregion and plant physiognomy (Archibald *et al* 1984).

Table 7. Landscape Management Units

DFMP_Tables ver 1.xls
Table 59

Landscape Management Unit (LMU)	LMU Area (ha)	% of FMA Area Occupied by each LMU
Deep Valley Plateau	47,182	7.3
Iosegun Plain	124,847	19.2
Kakwa Benchlands	12,363	1.9
Latornell Delta	66,643	10.3
Little Smoky Valley	760	0.1
Major Watercourse/Valley Complex	46,794	7.2
Peace Parkland	2,373	0.4
Puskwaskau	69,686	10.7
Peace Slopes	8,124	1.3
Peace Upland	17,579	2.7
Simonette Benchlands	156,460	24.1
Smoky Plain	28,689	4.4
Simonette Uplands	56,302	8.7
Simonette Uplands Slopes	11,358	1.7
Total	**649,160**	**100.0**

Source: Canfor 2001a

During the initial stages of development of the Detailed Forest Management Plan (DFMP), Canfor intended to use LMUs as the basis for strategic planning. Subsequent evaluation determined that most companies, and national and provincial governments were utilizing Natural regions and subregions as the basis for strategic and operational planning. To be consistent, Canfor followed suit.

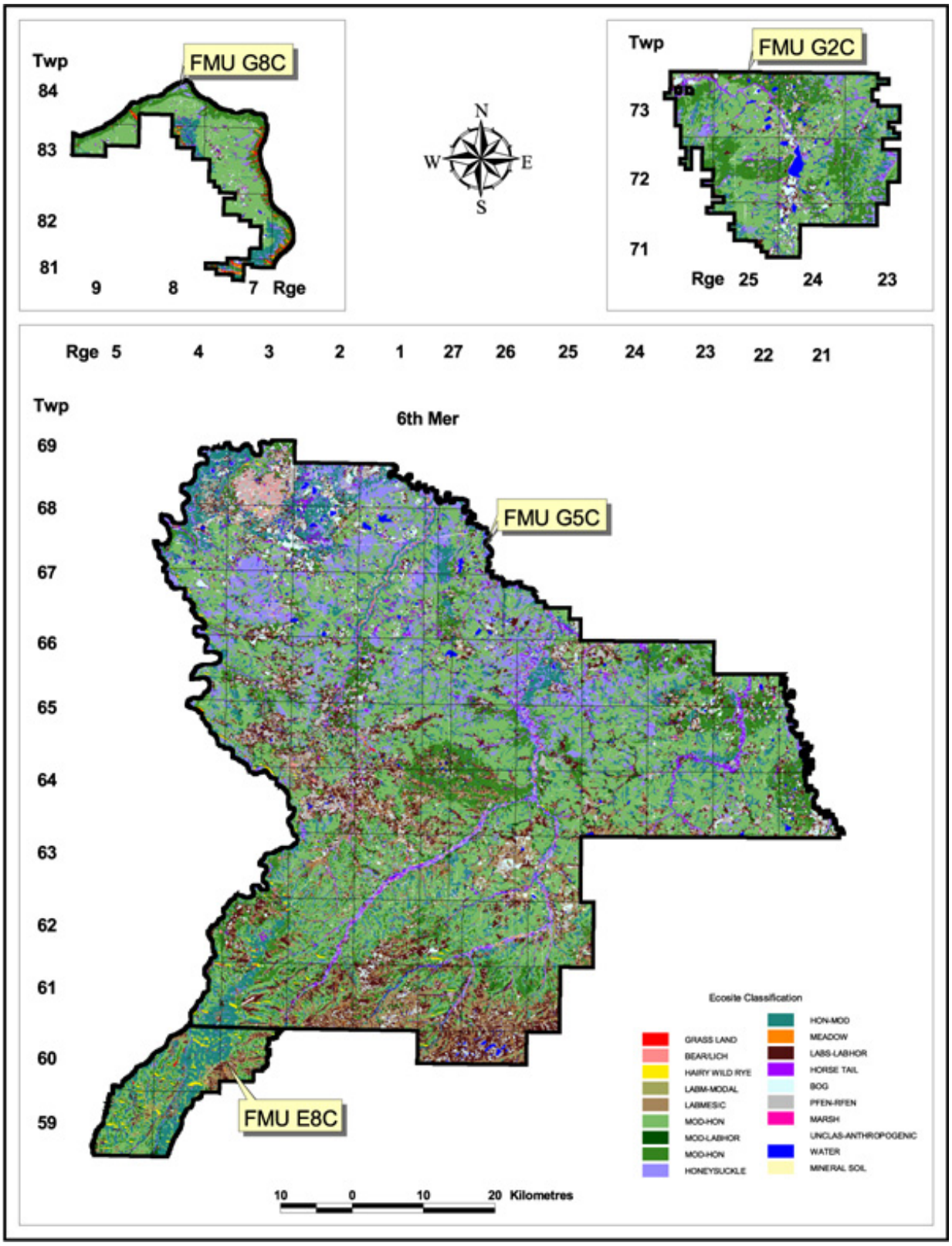


Figure 9. Ecosite Classification of the FMA Area

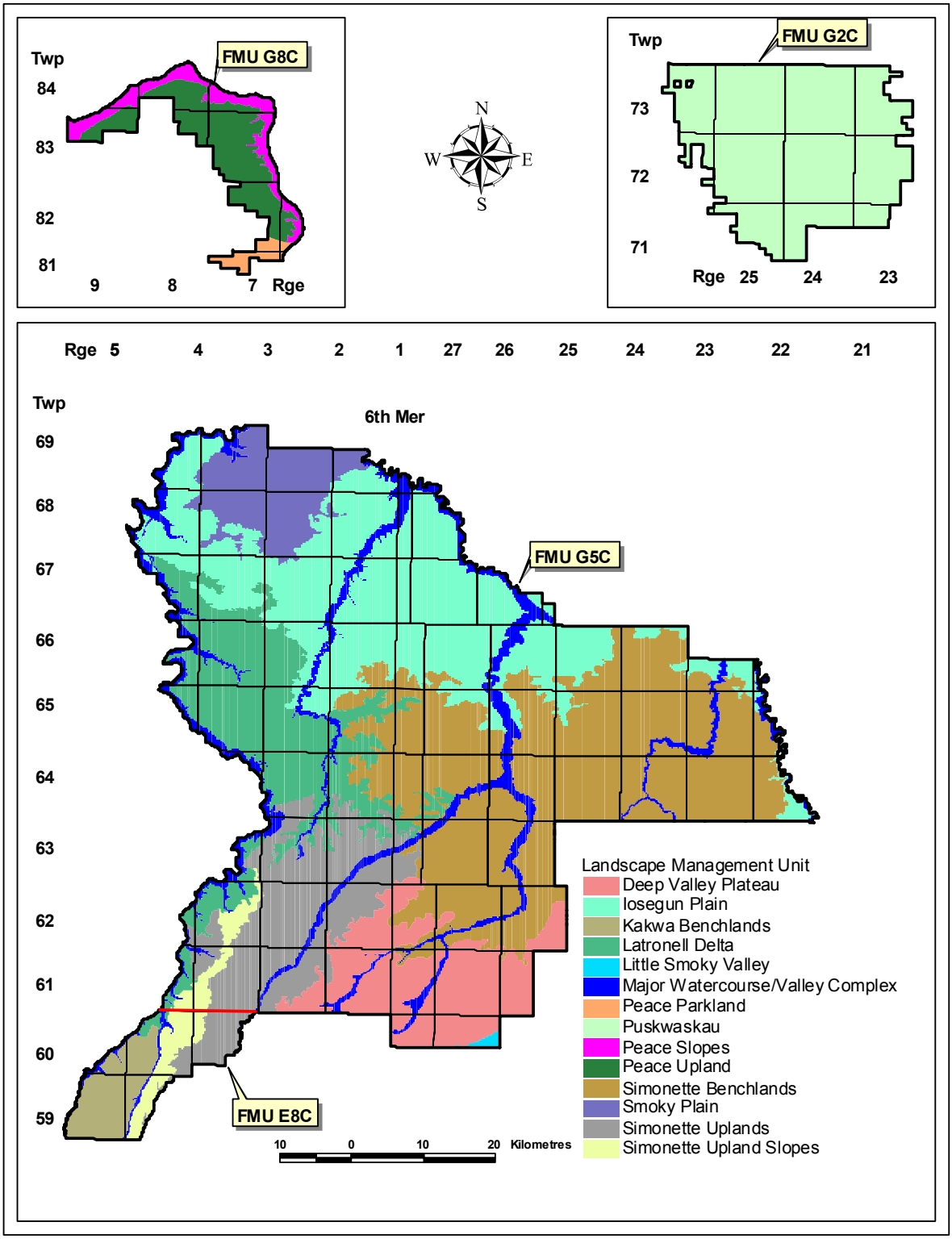


Figure 10. Landscape Management Units Within the FMA Area

3. Other Users

In addition to timber resource users, the resources of the FMA area are utilized by a number of other individuals and user groups. Canfor recognizes that timber harvesting may have an impact on some of them. The impact may be positive or negative depending on the specific circumstances. For example, roads increase hunting and fishing access; however, they may increase the impact on other values. The following sections briefly describe some of the stakeholders and user groups operating within the FMA area. The DFMP advances a coarse-filter approach[4] to forest management that maintains forests and wildlife habitat across the landscape. The objective of this approach is to have a neutral effect on other users within the FMA area.

3.1 Trappers

Trapping of furbearing animals has been a traditional pursuit in western Canada since the mid-1600s. It has helped open the country to exploration and started the commerce that eventually built a nation. Trapping continues in Alberta today.

Figure 11. Trappers
Trapping is a viable use of a natural renewable resource. There are 59 traplines within the FMA area. Trappers are notified of all forest activities planned within their registered traplines.

Trapping is a viable use of a natural renewable resource (Figure 11). Each trapper is responsible for managing the furbearers on his or her trapping area. Trappers are concerned with the well-being of the resource and ensure the animals they harvest can easily be replaced by the naturally reproducing wild populations. Indeed, without concerned trappers in the field constantly assessing furbearer populations, the status of many of these species of Alberta wildlife may not be known. There are approximately 2,300 trappers in the province. Of those, about 1,600 trap on 1,700 Registered Fur Management Areas (RFMA). An RFMA, commonly known as a trapline, is a parcel of public land allocated to the holder of a Registered Fur Management License by Alberta Sustainable Resource Development (ASRD). These registered trappers may form partnerships with other trappers to trap their RFMAs. About 640 holders of Resident Fur Trapping Licenses trap on privately owned land and public lands not included in RFMAs. The remaining trappers in the province hold Metis and Indian Licenses to trap on Metis settlements and Indian reserves. http://www.gov.ab.ca/env/fw/trapping/index.html.

There are 59 traplines in Canfor's FMA area (Figure 12). Canfor developed the *Trappers Notification Program* (Canfor 2001l) to ensure all trappers affected by Canfor's Annual Operating Plan (AOP) are notified and made aware of all activities planned within their registered trapline (refer to Section E 5.3.5). The Company has retained 2 contractors to hand deliver annual trapper notifications regarding its harvesting and silviculture activities. Each senior trapper receives a map indicating the planned activities and the contractor answers any questions during his visit. Any concerns are noted on the notification form, dated, signed (if possible) and completed forms returned

[4] Coarse-filter approach: maintaining vegetative communities, landscape patterns and processes (the coarse filter) within the limits of natural variability will result in the maintenance of the full complement of native plant and animal species.

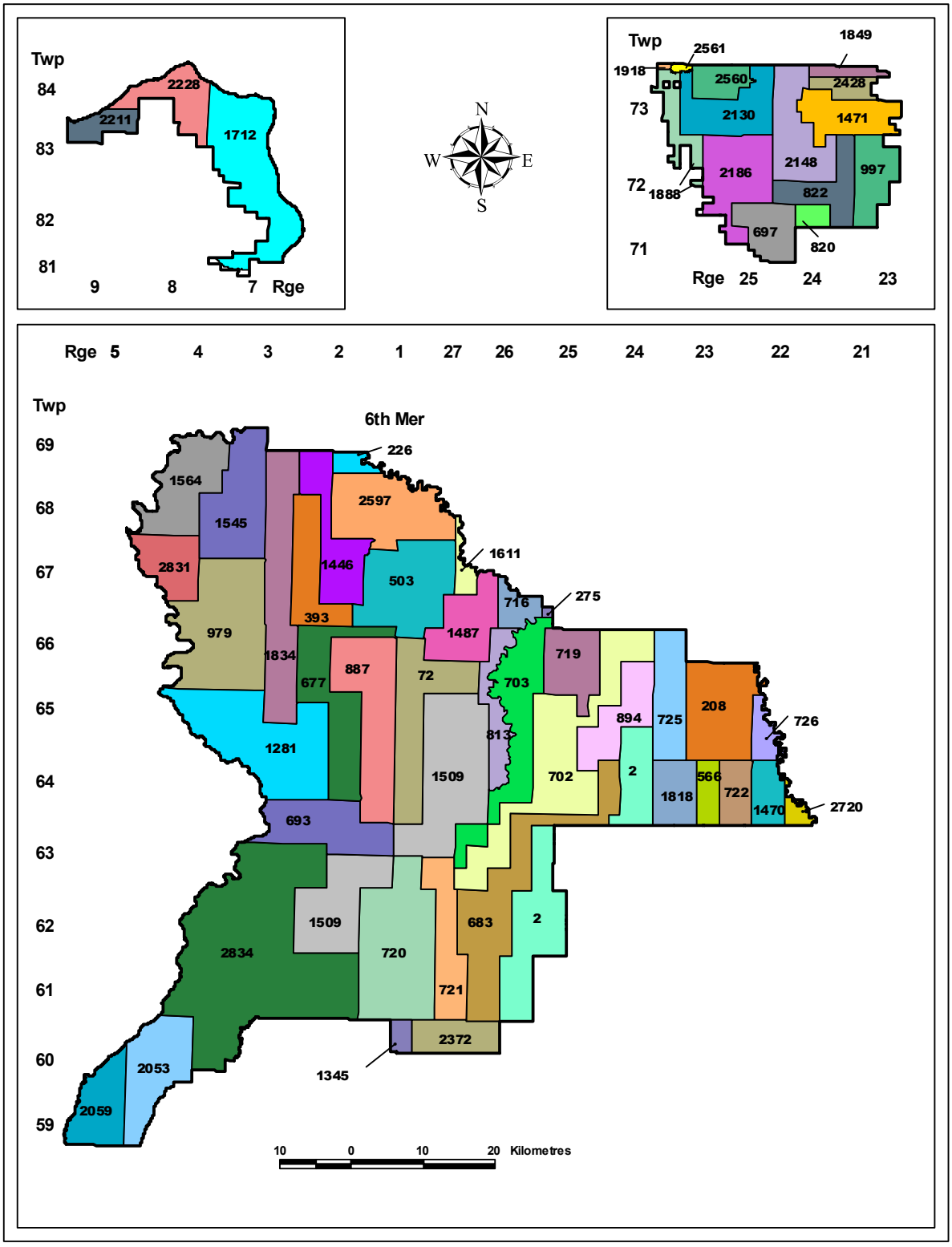


Figure 12. Registered Traplines within the FMA Area

to Canfor supervisors. Trapper comments are recorded in *Canfor's Incident Tracking System* and to ensure follow up. They remain on file for information purposes (Canfor 2001b).

The Alberta Trappers Association represents trappers in the province (http://www.telusplanet.net/public/atatrap/index.html). Their representative participates in the development process for the Detailed Forest Management Plan (DFMP) and Sustainable Forest Management Plan (SFMP) by providing input as an active member of the Forest Management Advisory Committee (refer to Section E 6.2).

3.2 Outfitters

Outfitters operate in all portions of the FMA area. According to information provided by the Alberta Professional Outfitters Society (APOS), there are 26 professional outfitters in the FMA area (Figure 13 and Table 8). Outfitters operate within Wildlife Management Units (WMUs) established by Alberta Sustainable Resource Development (Figure 14). APOS maintains an official directory of outfitters that are permitted to operate in Alberta (http://www.apos.ab.ca).

Their representative participates in the development process for the DFMP and SFMP by providing input as an active member of the Forest Management Advisory Committee (refer to Section E 6.2).

Figure 13. Outfitters
There are 26 professional outfitters operating in the FMA area. All are registered with the Alberta Government.

Table 8. Professional Outfitters within Canfor's FMA Area

DMP_Tables.xls
Table 31

	Company	Wildlife Management Unit (WMU)
1	654396 0/A Petra Contracting	356
2	721817 Alberta Ltd..	353, 354
3	Bear Creek Outfitting	359
4	Bear Paw Outfitting	521, 356
5	Bredeson Guiding & Outfitting	356
6	Classic Bowhunts	353, 359
7	Classic Outfitters Ltd.	354
8	Coleman Ranching & Outfitting Ltd.	356
9	David Kramps	521
10	Diamond T Outfitters	356
11	Hebert Guiding	353, 354, 521
12	Helmut Penno	354
13	Larry Smith	359
14	Lawrence F. Clegg	354
15	Moose Valley Outfitters	359, 356
16	Northern Lights Outfitters	354
17	Outdoor Pastimes Unlimited	353
18	Red Willow Outfitters	353, 359, 354
19	Scott Carter	411
20	Shilka Enterprises	359
21	Silver Fox Outfitting Ltd.	411
22	Smoky River Outfitting Ltd.	521, 411, 354, 356
23	South Peace Outfitters	521
24	Stricker Outfitting Ltd.	359
25	Ukrainetz Guided Hunts	359
26	Wild Kakwa Outfitters	356

Source: Compiled from Alberta Professional Outfitters Society data

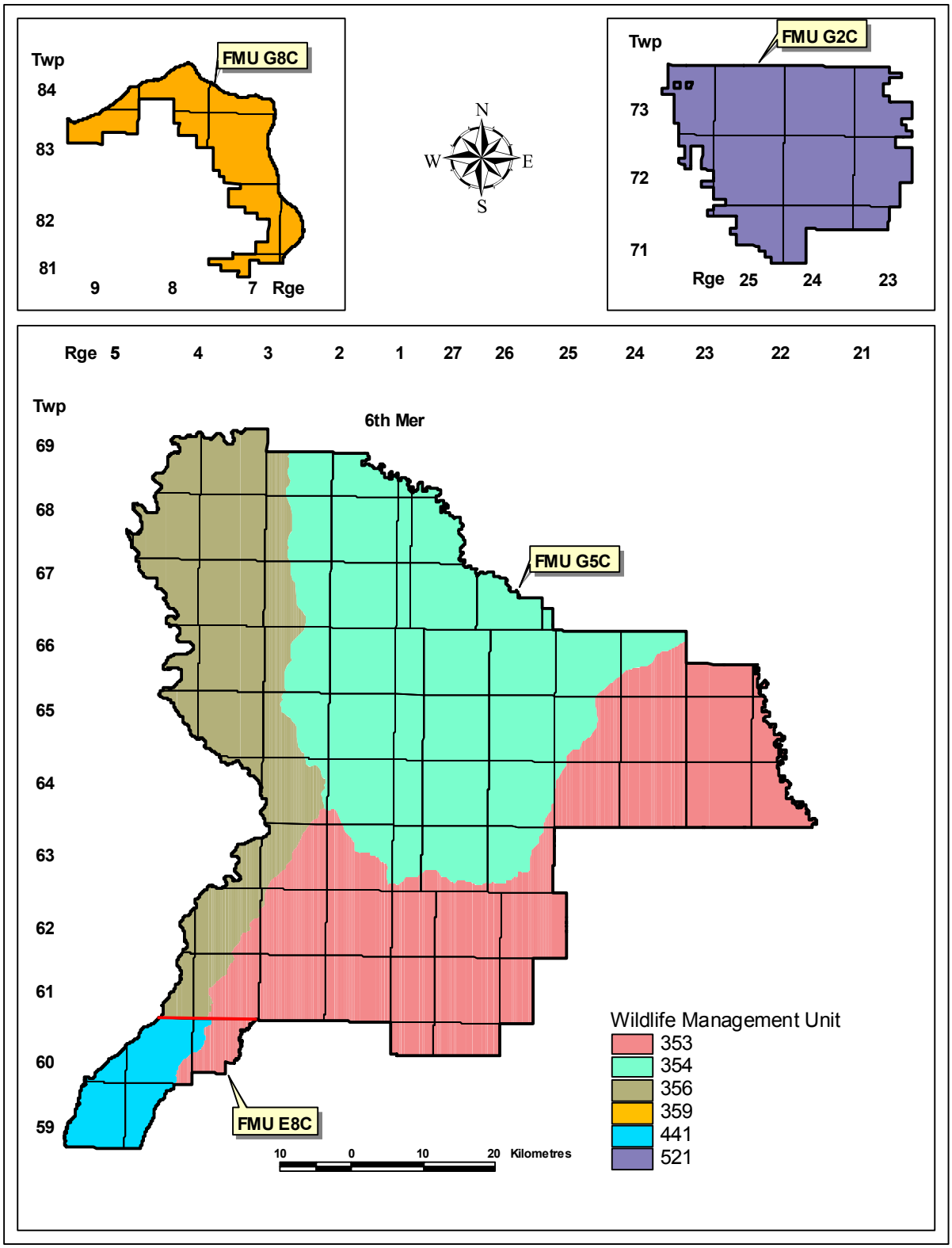


Figure 14. Wildlife Management Units Within the FMA Area

Canfor is committed to ensuring all outfitters directly impacted by harvest operations are contacted (Section G "Critical Element 5c, Objective 1.1d.1"). In September 2000, a letter was forwarded to outfitters requesting information regarding their operating area and the type of information they desire to receive from Canfor. Outfitters are invited to Canfor's forestry open house to provide input into operational plans. They will receive the 5 Year General Development Plan map annually. The intent is to work with the outfitters and incorporate their issues as they arise.

3.3 Oil and Gas Sector

Much of northern Alberta, including the FMA area, is underlain with rich oil and gas deposits. Exploration and production of the petrochemicals found in these reserves have a significant impact on the local, provincial, national and international economies. The oil and gas sector has been, and will continue to be, a major factor influencing the boreal forest landscape (Stelfox *et al* 1999).

Mineral development and geophysical deletions within the FMA area take the form of license of occupation (LOC), pipeline rights-of-way, mineral surface leases and rights-of entry. Refer to Section F 11.2 for additional information regarding landbase withdrawals, Section F 11.5 for information regarding shared access and Section F 11.5.1 regarding development of communication plans between industry sectors.

3.4 Recreation

Canfor maintains 4 recreational areas within the FMA area and 1 outside the FMA area, located approximately 25 km west of Valleyview (Figure 16):

- MacLeod Flats (formerly Smoky Flats) (Figure 15);
- Economy Lake;
- Frying Pan Creek;
- Westview; and
- Swan Lake (outside the FMA area).

Figure 15. MacLeod Flats
Canfor's MacLeod Flats Recreational Area is named in memory of one of Canfor's long-time woodlands employees.

Canfor publishes a brochure titled *Canfor Public Recreation Areas* (Canfor 1998c) that is available through the Grande Prairie Tourism Association, Muskoseepi Park and Canfor's administration office. A description of each recreation area is contained within the brochure. Canfor is committed to maintaining these recreational areas (Section G "Critical Element 5c Objective 1.1b.2").

A typical site includes camping stalls, picnic tables, firewood, garbage receptacles and pit toilets. MacLeod Flats and Economy Lake also have well water, which must be boiled before using. All camping and firewood are currently provided free of charge.

Campsite users are asked to be community minded:

- Keep the sites clean – dispose of garbage in the receptacles provided; and
- Keep campfires small to help conserve firewood.

Canfor retains a campground attendant for sites within the FMA area to provide maintenance and an adequate supply of wood. A local resident has been hired to maintain the Swan Lake Recreation Area.

Alberta Conservation Association, Natural Resource Services and Canfor developed Swan Lake Recreation Area as a year-round sports fishery. Swan Lake, located approximately 25 km southwest of Valleyview, is aerated each winter to ensure oxygen levels are adequate to maintain the stocked rainbow trout. The site contains a small boat launch and day-use facility such as a cookhouse and picnic area. The Valleyview Fish and Game Association and Alberta Conservation Association (formerly the Buck for Wildlife Program) have also secured lands around the lake for several habitat diversification projects that enhance forage and browse for ungulates.

3.4.1 Recreational Assessment

There are a variety of recreational uses within the FMA area, such as the recreational areas maintained by Canfor. Other uses, such as hunting, fishing, canoeing, river boating, trail riding, snowmobiling, berry picking, etc., also occur. However, the exact levels of these uses are not fully known at this time. As a result, Canfor will conduct a recreational assessment within 5 years after the Detailed Forest Management Plan (DFMP) is approved (refer to Section G "Critical Element 5c, Objective 1.1b.1"). This assessment will be broad-based and will include a report on who uses the forest, what general lands are used and for what purpose. Canfor will also evaluate future opportunities identified within the boundaries of the FMA area.

3.5 Hunting and Fishing

The FMA area is home to a wide variety of wildlife that are managed and regulated by the Crown. Hunters and other groups use roads constructed within the FMA area for access. Increased access provides more recreational and hunting opportunities into previously inaccessible areas, which some members of the public view as positive. However, other users may view it as a negative. Many members of the general public use the campsites maintained by Canfor.

3.6 Grazing Dispositions

According to the *Public Lands Act, Dispositions and Fees Regulation* (Alberta Regulation 54/2000), a grazing disposition means a grazing lease, forest grazing lease, a grazing license, a grazing permit or a head tax grazing permit. There are 3 forest grazing licenses (FGL), comprising 1,424.7 ha, within the FMA area (Figure 17).

In accordance with subparagraph 8(2)(d) of FMA Agreement 9900037;

…"*after consultation with the Company, the Crown retains the right to authorize grazing dispositions within the FMA area provided, however, that the growth performance of the managed species is not impaired and the regeneration will not be damaged by domestic stock grazing to the point where the overall stocking is reduced below the reforestation standard as set out in the Timber Management Regulation, and provided the Company's rights to manage the area for timber production is not significantly impaired.*"

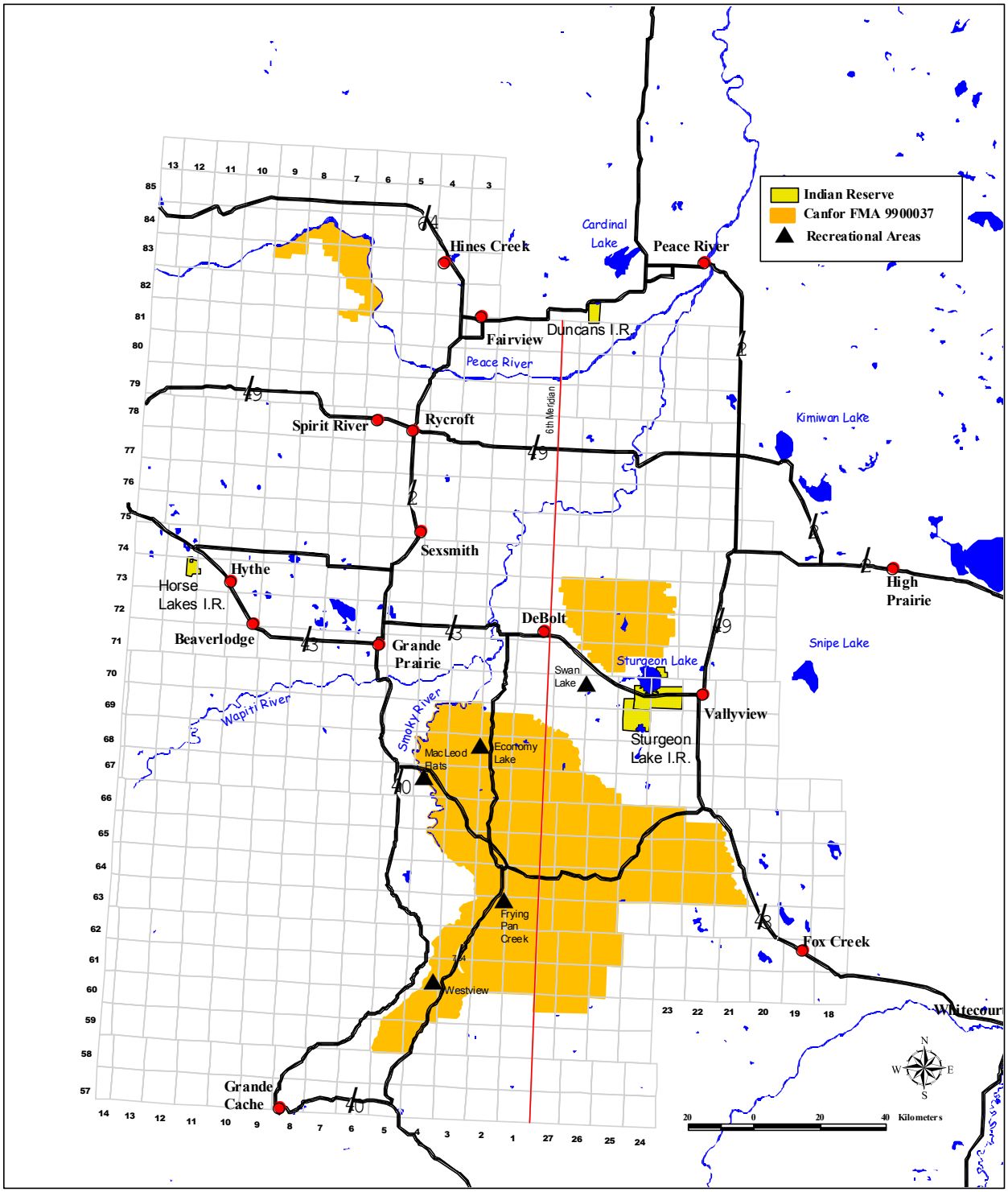


Figure 16. Recreational Areas Maintained by Canfor Within the FMA Area

Meetings are held with grazing disposition holders to discuss the harvesting plan. The Company will repair or replace any fences or chattels where it is confirmed that damage or destruction has occurred as a result of logging operations.

4. Local Communities

As stewards of the forest resource on publicly owned forestland, Canfor recognizes that the forest sector is crucially important to local people and local communities[5] (Figure 18).

Canfor strives to keep local communities apprised of its operations through its *Public Involvement Program* (refer to Section E 5.3) which includes committee meetings, open houses and providing planning documents in libraries.

Canfor believes it has an open and transparent relationship with local communities that provides opportunities for stakeholders to identify issues and obtain input regarding Company activities. Meetings are held annually with the local Municipal Districts (MD) wherein Canfor makes presentations regarding its operations and answers any questions or provides information.

Roads and log hauling continue to be of interest to both Canfor and local communities. The Company strives to reduce the impact of the log haul by addressing local issues such as over-weight monitoring, safety and road bans. (refer to Section F 11.3 for more information on the log haul).

The Forest Management Advisory Committee (FMAC) emphasized very strongly that local communities need to benefit from the presence of the FMA area and the activities of the industries that operate there. Canfor supports local communities and provides a range of benefits:

- Employment of local contractors;
- Purchase of goods and supplies;
- Salaries, benefits and wages;
- Community contributions;
- Recreational opportunities; and
- Local timber supplies.

For more information on Canfor's contribution to local communities refer to Appendix 2.

5. Aboriginal People

Section 35 of the *Constitution Act, 1982* identifies Aboriginal people as the "Indian, Inuit and Metis of Canada". Canfor has a long history of working with Aboriginal people to provide employment and contract opportunities, and to garner their input regarding management of the forest resources within the FMA area. The Company continues its association with Aboriginal people by directly hiring or providing funding for initiatives such as stand tending contracts, ground application of herbicide, specific stand-by fire crews, Adult Vocational Center (AVC) training and *Trappers Notification Program.*

[5] Local communities have been defined by the FMAC as those adjacent to the FMA area i.e., Valleyview, DeBolt, Fox Creek, Spirit River, Fairview, Grande Cache, and Grande Prairie. Municipal District (MD) of Greenview No. 16, MD of Spirit River No. 20 and County of Grande Prairie No. 1 are also deemed to be local communities.

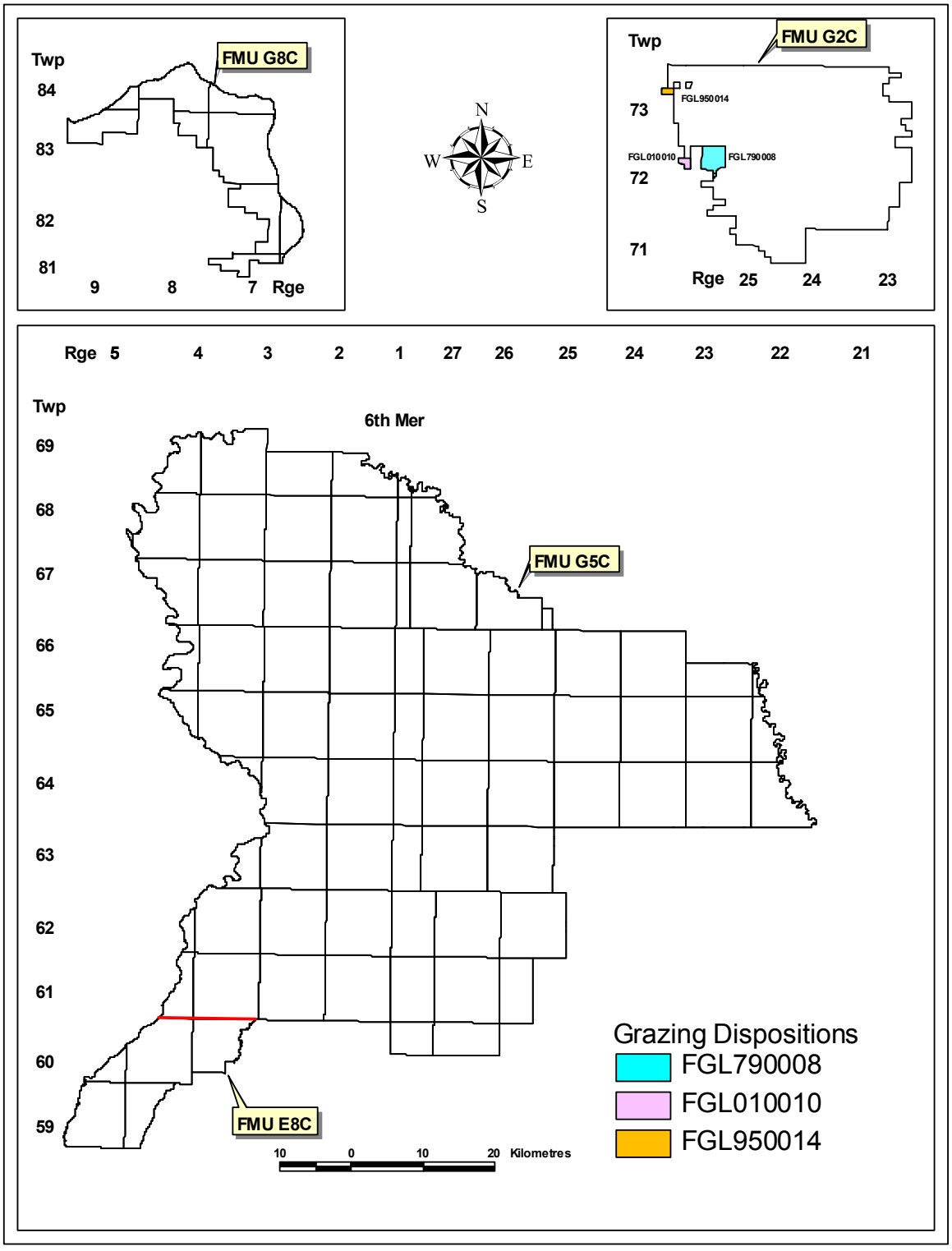


Figure 17. Grazing Dispositions Within the FMA Area

The Alberta government has issued three forest grazing licenses (FGL) within the FMA area.

Canfor's Forestry Principles (Canfor 1999a) provide guidance on pursuing business partnerships and co-operative working arrangements with Aboriginal people. In recognition of the special and unique needs of Aboriginal people, this Plan contains 6 objectives directly pertaining to Aboriginal people (refer to Section G).

5.1 Aboriginal History

The ethnography section of the *Historical Resources Overview Assessment* (Altamira 1998) provides a discussion of the Aboriginal people who inhabited the area surrounding Canfor's FMA area from proto-historic[6] to modern times. Five specific bands were discussed: Beaver, Sekani, Sarcee, Iroquois and Cree. Another group, and one that is associated with the arrival of the fur trade to the region, is the Metis. Some of these people continue to live in or near the FMA area (Altamira 1998).

The Beaver, Sekani and Sarcee appear to have inhabited various portions of the northwest region of the province during late pre-historic and proto-historic times (Nicks 1974, 1980; Jenness 1937). This changed during early historic times when the fur trade resulted in the first immigration of Cree to the region in the mid-18th century. The establishment of fur trading posts also saw the arrival of several "new" groups into the area. At the turn of the 19th century, the Metis and the Iroquois arrived as employees of the Northwest Company and of the Hudson's Bay Company. They made their living as translators, traders, trappers and hunters.

The Sturgeon Lake Cree Nation is one Aboriginal group living in the immediate vicinity of the FMA area. Other reserves have been established in the general area including the Horse Lake Reserve near Hythe, and the Duncan Reserve located near Hines Creek (Figure 18). Their representative participates in the development process for the DFMP and SFMP by providing input as an active member of the Forest Management Advisory Committee (refer to Section E 6.2).

Members of the Sturgeon Lake Cree Nation live at the Sturgeon Lake Reserve No. 154 located near Valleyview, Alberta. Reserve 154B, located at Goose Lake (64-24-W5M), provides members with an area for hay production. Today, members are involved in forestry, agricultural and other jobs. Trapping remains an important economic activity for some members.

The Aseniwuche Winewak Nation of Canada (AWN) was formalized in September 1994 by joining the 6 Aboriginal settlements surrounding the town of Grande Cache, Alberta. Aseniwuche Winewak is Cree for Rocky Mountain People. The members of AWN are non-status Indians descended from Cree, Beaver, Stony and Iroquois fur trappers and traders who lived in the area (AWN 1997). Canfor and AWN representatives have met several times and dialog has occurred on topics of interest. Canfor contributed funds to assist AWN to conduct a traditional land use and occupancy study. Canfor has requested AWN to provide the location of cultural sites in order to protect the sites from timber harvest.

[6] The Proto-historic Period refers to that period of time within a region that occurs immediately preceding the first written record. This is the period of time that immediately precedes the arrival of the first white explorers. It is a period of time when the first European goods and items are traded into Aboriginal culture before the actual arrival of the first white European.

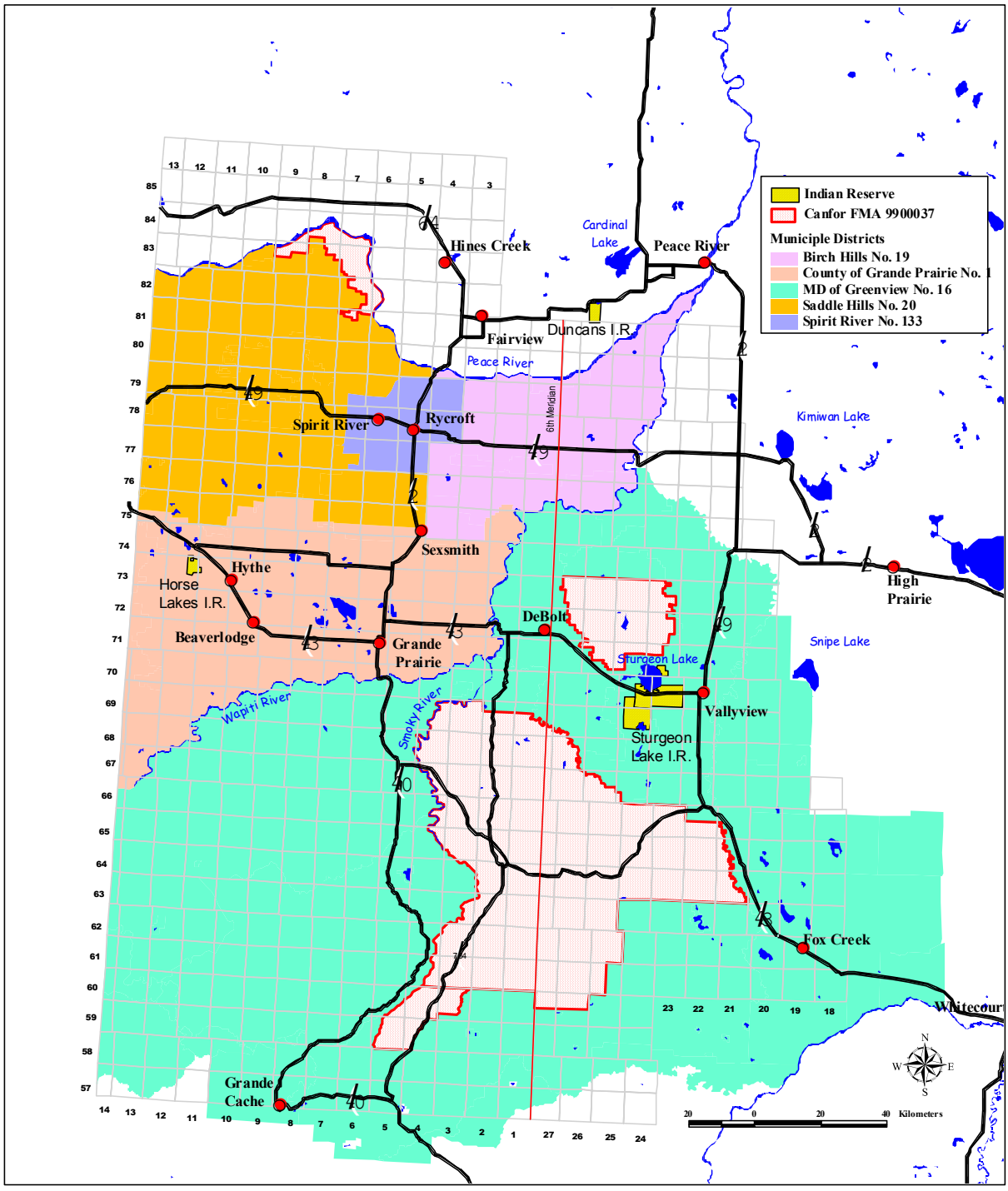


Figure 18. Local Communities

Local communities have been defined by the Forest Management Advisory Committee as those adjacent to the FMA area i.e., Valleyview, DeBolt, Fox Creek, Spirit River, Fairview, Grande Cache, and Grande Prairie. Municipal District (MD) of Greenview No. 16, MD of Spirit River No. 20 and County of Grande Prairie No. 1 are also deemed to be local communities.

The Metis are Aboriginal people who have played a major role in opening up the North American continent. As Canada grew, the Metis contributed as nation builders, educators, farmers, professionals, entrepreneurs and industrialists. They continue to play a significant role in the evolving partnerships between Aboriginal and non-Aboriginal people in Canada. The Metis Nation of Alberta Association (MNAA) consists of a provincially elected executive and an elected executive for each of 6 Zones within the province. There are approximately 65 MNAA Locals across Alberta (Alberta Aboriginal Affairs 2000). In the Grande Prairie area, Zone 6 Metis Nation represents 3 locals:

1. Grande Prairie Local 1990;
2. Red Willow Local 1929; and
3. Aspen Grove Local.

Zone 6 Metis Nation is an active member of the Forest Management Advisory Committee (refer to Section E 6.2).

6. Other Timber Allocations Near the FMA Area

Three FMA areas are located directly adjacent to Canfor's FMA area including:

- Alberta Newsprint Company Ltd.;
- Weyerhaeuser; and
- Tolko Industries Ltd.

There are several other timber allocations near the FMA area from which Alberta Sustainable Resource Development (ASRD) allocates timber for public use (Figure 19). Two of these allocations, in the vicinity of Valleyview, share a boundary with the FMA area. Other areas are located adjacent to the Alberta/B.C. border, west of Beaverlodge and north of the Saddle Hills near Spirit River.

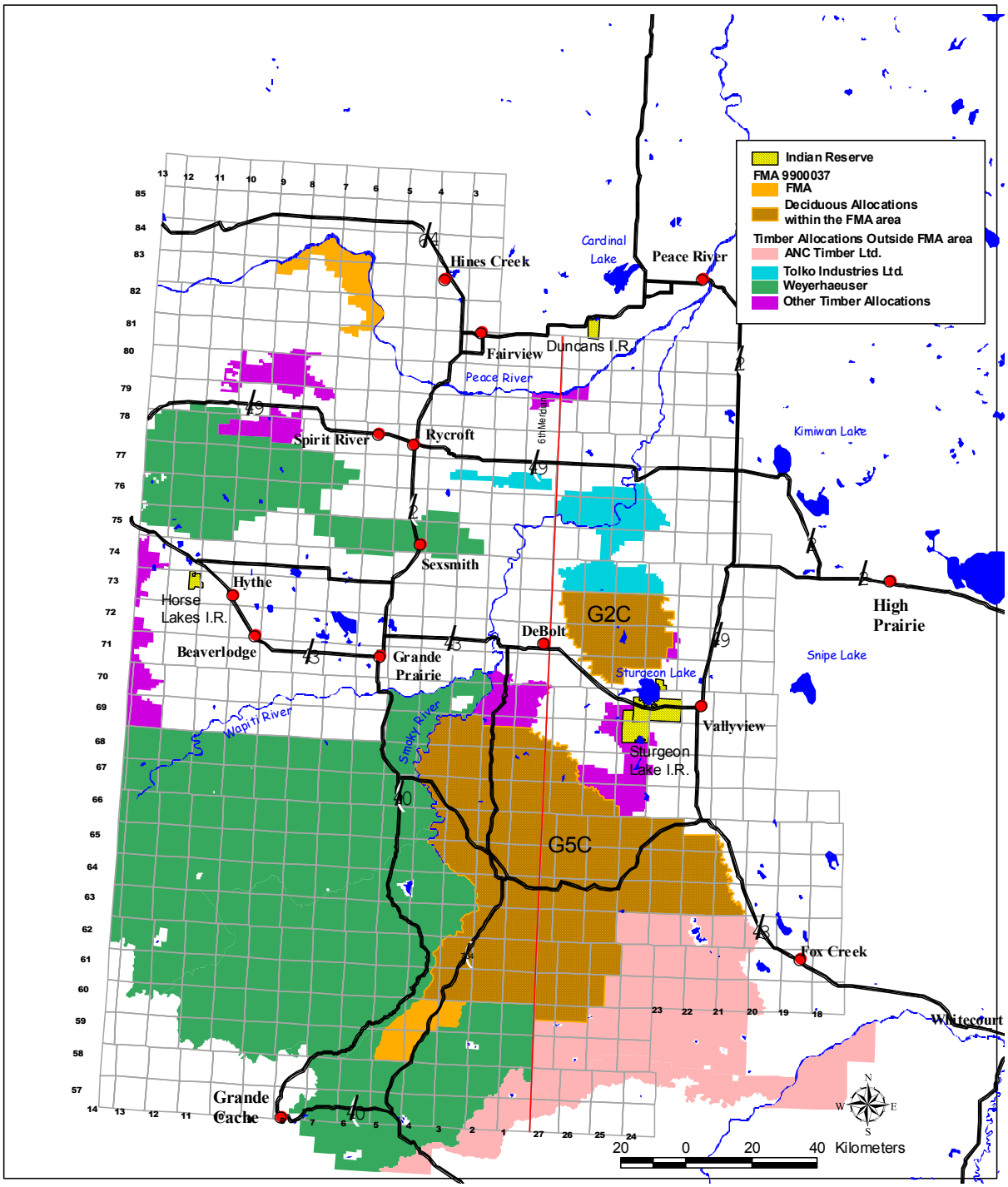


Figure 19. Other Timber Allocations Near the FMA Area

D. DEVELOPMENT OF THE DETAILED FOREST MANAGEMENT PLAN

1. Introduction

Detailed Forest Management Plans are required for every Forest Management Area (FMA) established by the Minister under Section 14(1) and (2) of the *Forests Act*. This planning authority extends to provincial crown land and does not pertain to federal or private land. FMA holders assume this responsibility from the Government and prepare a Detailed Forest Management Plan (DFMP). The transfer of responsibility occurs through the negotiation of an agreement, which is approved by an Order in Council. Section 10(3) of Forest Management Agreement 990037 ("FMA agreement") outlines the specific planning requirements for Canfor's FMA area.

The following sections provide information on the development of Canfor's Detailed Forest Management Plan (DFMP).

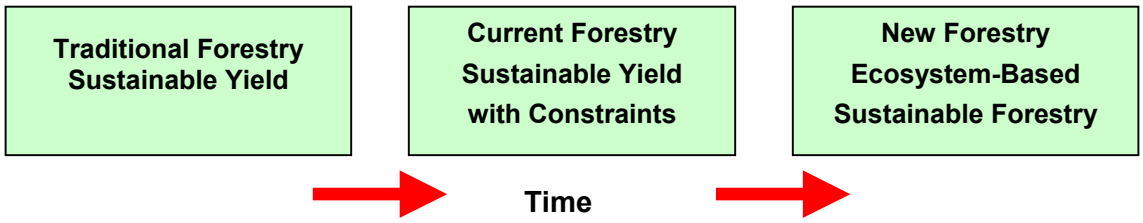
2. Evolution of Forest Management in Alberta

Over the years, forest management in Alberta has been guided by a number of planning processes and principles. Forest management evolved as new information became available and as more was learned about the forest and its resources. Traditional forest management emphasized sustained-yield timber management as required under the *Forests Act*. It was government policy to recognize other resource values and uses. The sub-regional integrated resource management plans prepared by the Government in the 1970s and 1980s provided much of this information and incorporated a public involvement process. The Government then introduced a policy that required FMA holders to carry out a public involvement process in conjunction with the preparation of their detailed forest management plans. This public involvement process was not in place for the last series of government forest management plans prepared between 1985 and 1990 (Alberta Environment 1998a).

Over time, society's attitude towards the value of forests and the approach to forest management has evolved (Figure 20). Members of the public let it be known that the forest should be managed to provide a wide range of benefits and values including market resources such as timber, agriculture, recreation, tourism and mineral resources, and non-market values including fish and wildlife habitat, forest soils, clear air and clean water. In response, forests are managed for sustained yield of timber with emphasis on an increasing number of constraints. These constraints were introduced to conserve or protect a range of non-timber values. As a result, current forest management is conducted within a context of an integrated and sustainable approach to resource planning.

The forest industry is moving towards "new" forest management that is sustainable and ecologically-based. Community resource values and ecological integrity are maintained while ensuring a sustainable flow of timber to market. Ecosystem management[7] differs fundamentally from traditional management systems in that all components of the ecosystem, including people, must be considered as an integral part of the management planning process (Gilmore 1997).

Figure 20. How Has Forest Resource Management Evolved Over Time?



Source: Based on *Canfor's Forestry Principles*

3. Evolution of Forest Management at Canfor

Canfor has adopted a sustainable ecosystem management approach for current and future plans. The Company will continue to improve its understanding of the ecological processes that have produced natural forests and will incorporate this knowledge into its daily operations. Social, environmental and economic values will be addressed within a framework of ecological processes and science to deliver desirable future forest conditions. Measurable ecological targets will be included to help gauge performance and independent audits will be used to verify progress (*Canfor Forestry Principles* 1999a).

3.1 What is an Ecosystem Management Approach?

Ecosystem management is a relatively new approach to forest management. It has developed in response to a need to find solutions in resource management that are socially acceptable and ecologically and economically sound. It differs from traditional techniques in that it first identifies what the end result will be and then developes a plan to achieve that goal.

Ecosystem management uses an ecosystem-based approach to resource management in order to address the myriad challenges that arise from fragmented landscapes and diverse management strategies. An ecosystem management approach has 5 key elements:

1. Requires consideration of geographic areas defined by ecological boundaries and the perspectives provided by different spatial scales and longer time frames;

[7] Ecological Management: derivation of goods or services from or beneath ecosystems in ways that respect ecological integrity. It is a bio-centred approach to resource use, in which human needs are met if the ecosystem's ability to manage itself is not compromised, focusing on the management of human activities more strongly than other ecosystem components (Dunster and Dunster 1996).

2. Requires managers to take into account the complexity of natural processes and social systems and to use that understanding to craft management approaches that take advantage of these processes rather than work against them;
3. Incorporates explicit definition of biological and social goals at both the national and local scales and elevates maintenance and restoration of ecological sustainability and ecosystem integrity as important goals;
4. Emphasizes collaborative decision making to deal with a landscape owned by many individuals and organizations with different values, interests and capabilities; and
5. Uses a process of adaptive management to account for the uncertainty inherent in the Company's understanding and the future, and employs a wide range of strategies and policy tools http://wwwsnre.umich.edu/ecomgt/emapproach.htm.

Canfor is developing the Detailed Forest Management Plan (DFMP) using an approach of forest management based on ecological principles. This Plan is based on *Canfor's Forestry Principles* (Canfor 1999a) which provide the foundation for forest management strategies, policies and operating procedures for all its operations into the next century. *Canfor's Forestry Principles* outline a broad approach to the sustainability of the forests in which Canfor operates. The forest management systems, including certification standards, that result from the *Forestry Principles* will maintain the long-term health of forest ecosystems, while providing ecological, economic and social opportunities for the benefit of present and future generations.

One of the primary tools for ecosystem management is ecological classification. It forms the framework upon which many forest management strategies and decisions are based. The ecologicial classification and inventory system provides data and maps of ecological units at multiple scales and ancillary interpretative information useful in estimating ecosystem potentials and capabillities.

Ecosystem classification and mapping provide a concise overview of the spatial and volumetric structure of landscapes that can be used to support analysis and modelling of ecosystem processes and decisions about where various management approaches should be implemented. Research in this field covers a wide array of topics, ranging from analyzing the accuracy of remote sensing, classifying landscapes according to ecosystem classifications, and conducting inventories of natural resources and ecosystems http://www.snre.umich.edu/ecomgt/classification/classifyresearch.htm.

Ecological classification has many benefits:

- Defines many scales important to ecologically-based strategic and operational management planning;
- Establishes a lasting framework for the submission of the next DFMP;
- Reveals ecological relationships and patterns at a variety of scales;
- Provides ecological information at many different levels of resolution;
- Allows for the evaluation and scheduling of operational activities; and
- Illustrates biophysical variables at multiple levels, revealing geographical differences useful in spatial and temporal management options.

To manage timber production without harming the health or the integrity of the forest ecosystem requires that ecosystems be delineated and described across the landscape. As a result, in 1991 Canfor initiated a pilot program with Canadian Forest Service (CFS) and Alberta Research Council (ARC) to ecologically classify proposed harvested areas. Later, during the development of yield curves for the *Resource and Timber Supply*

Analysis (RTSA), a need was identified to collect detailed ecological data to enhance the Company's timber inventory and to have a direct link to ecological attributes. Ecological data was collected from 1,395 plots in conjunction with the timber inventory temporary sample plot (TSP) program. Refer to Section D 3.1.1 for additional information regarding ecological plot stratification. A report for the project, *Ecosection and Ecosite Evaluation and Mappin*g, was completed February 2001 (Canfor 2001a).

The purpose of the project was to:

- Create a land classification system for Canfor's Grande Prairie FMA area in west central Alberta, with various levels of resolution;
- Evaluate, describe, and map each of these levels within a structured ecological hierarchy, based on the analysis of detailed ecological data and existing resource information;
- Refine those levels that require adjusting based on new information and ecological concepts;
- Develop new hierarchical levels that have not been previously mapped, such as ecosite, or to fill in gaps; and
- Provide a geographically based hierarchical ecological framework that can be used in other research projects, such as forest productivity, plant biodiversity, forest succession and wildlife habitat evaluations.

Canfor also retained Geographic Dynamics Corp. (GDC) to enhance the *Field Guide to Ecosites of West-central Alberta* (Beckingham et al 1996a) and the *Field Guide to Ecosites of Northern Alberta* (Beckingham and Archibald 1996). The enhanced field guides are being used operationally in the ecological classification program (refer to Section F 15.4 for more information). Although the FMA area ecosite maps and data are not currently being used for this Detailed Forest Management Plan (DFMP), they will provide the framework for future plans as Canfor continues the progression from "Current Forestry" to "New Forestry" (Section D 2).

3.1.1 Sample Plot Stratification

Canfor's FMA area landbase was initially stratified using Alberta Vegetation Inventory (AVI) stand attributes of species composition, density, height and timber productivity into 40 strata that reflect practical considerations, operational concerns and ecological management constraints (Gulyas and Stewart 1999). The primary objective of this work was to stratify the FMA area for development of a volume sampling program which would "drive" the growth and yield models. Initially, it was determined that 926 plots would satisfy the requirements of the growth and yield objectives. However, in order to account for the ecological variability in the FMA area, 469 additional plots were added. Thus, a total of 1,395 stands were selected for detailed site, soil and vegetation description and tree mensuration according to a growth and yield mandate. The additional 469 plots were selected randomly from a stand list for each strata for the entire FMA area. Plot locations within the stands were also selected randomly and recorded in the field using a global positioning system (GPS) (Figure 21). Detailed ecological data was collected in accordance with Canfor's *Ecological Assessment and Cruising Manual* (Canfor 1997b).

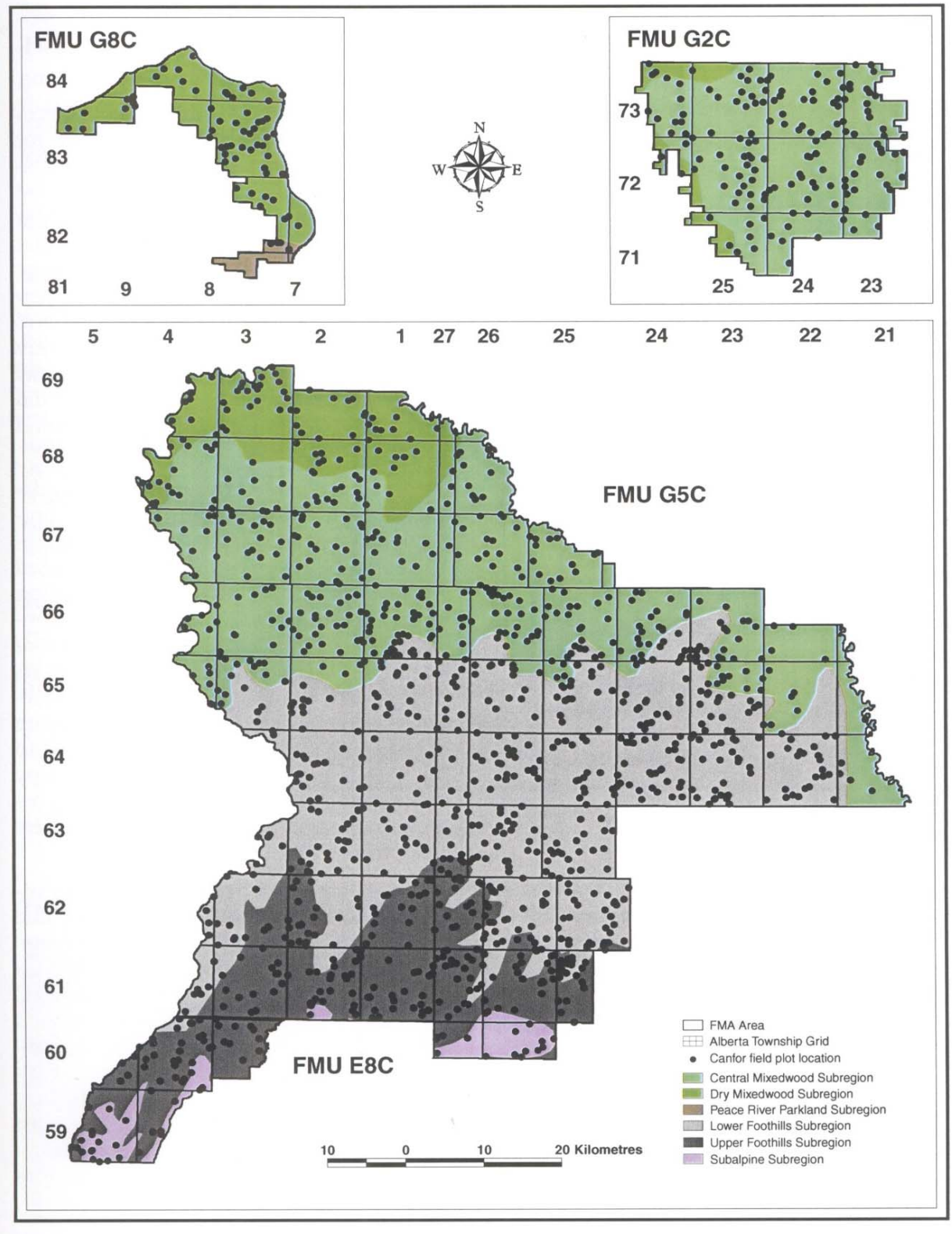


Figure 21. Sample Plot Stratification

3.1.2 Ecological Stratification

The ecological classification of the FMA area is a nested hierarchical ecological design with the FMA area as the highest level of resolution. All other levels stratified within the FMA area range from broad scale to site specific (Figure 22).

3.1.3 Natural Region

A Natural region is an area characterized by a distinctive regional climate as expressed by vegetation. It is defined by broad interpretations of regional landscapes, elevation, relief, bedrock geology and major surficial deposits. Thus, Natural regions provide the "big-picture" of landscapes in the province. In total, there are 6 Natural regions in the province of which 4 are found within the FMA area, including the Boreal Forest, Parkland, Foothills, and Rocky Mountain (Figure 23). Because Natural regions were defined from a provincial perspective covering a large geographical area, this level is best suited for broad-level applications (Canfor 2001a).

Table 9 indicates the area for each Natural region found within the province and the percentage of FMA area occupied by each Natural region.

Table 9. Areas of Natural Regions

DFMP_Tables ver 1.xls
Table 56

Natural Region (NR)	NR Provincial Area	FMA Area (ha)	FMA Area as % Compared to NR Province	% of FMA Area Occupied by each NR
Boreal Forest	34,694,658	316,138	0.9	48.7
Foothills	9,487,425	316,300	3.3	48.7
Parkland	6,249,820	2,455	0.0	0.4
Rocky Mountain	4,626,374	14,266	0.3	2.2
Total	**55,058,278**	**649,160**	**1.2**	**100.0**
Note: Total Provincal Area is 66,295,258				

Source Canfor 2001a

3.1.4 Natural Subregion

A Natural subregion is a division of the Natural region based on differences in regional climate, landform, bedrock geology and soils (Figure 24). Even though the Natural subregion is generally mapped at the same scale as the Natural region, the Natural subregion level is more refined through variations in elevation in addition to distinctive vegetation associations. Natural subregions contain "reference" vegetation types that are characterized by climate and environment (moisture and nutrients).

Table 10 indicates the area for each Natural subregion found within the province and the percentage of FMA area occupied by each Natural subregion.

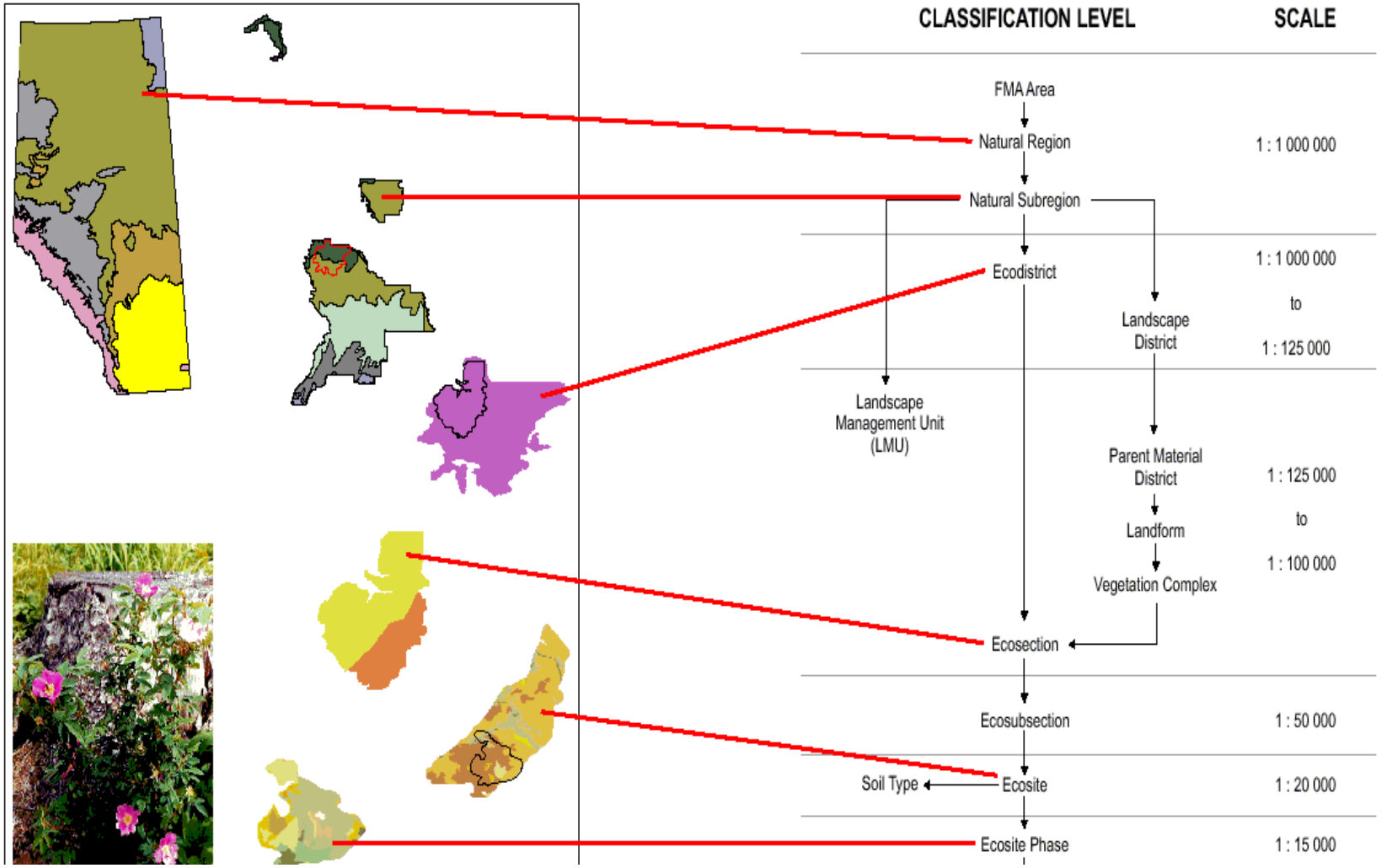


Figure 22. The Hierarchical Land Classification System

Source: *Ecosection and Ecosite Evaluation and Mapping* (Canfor 2001a)

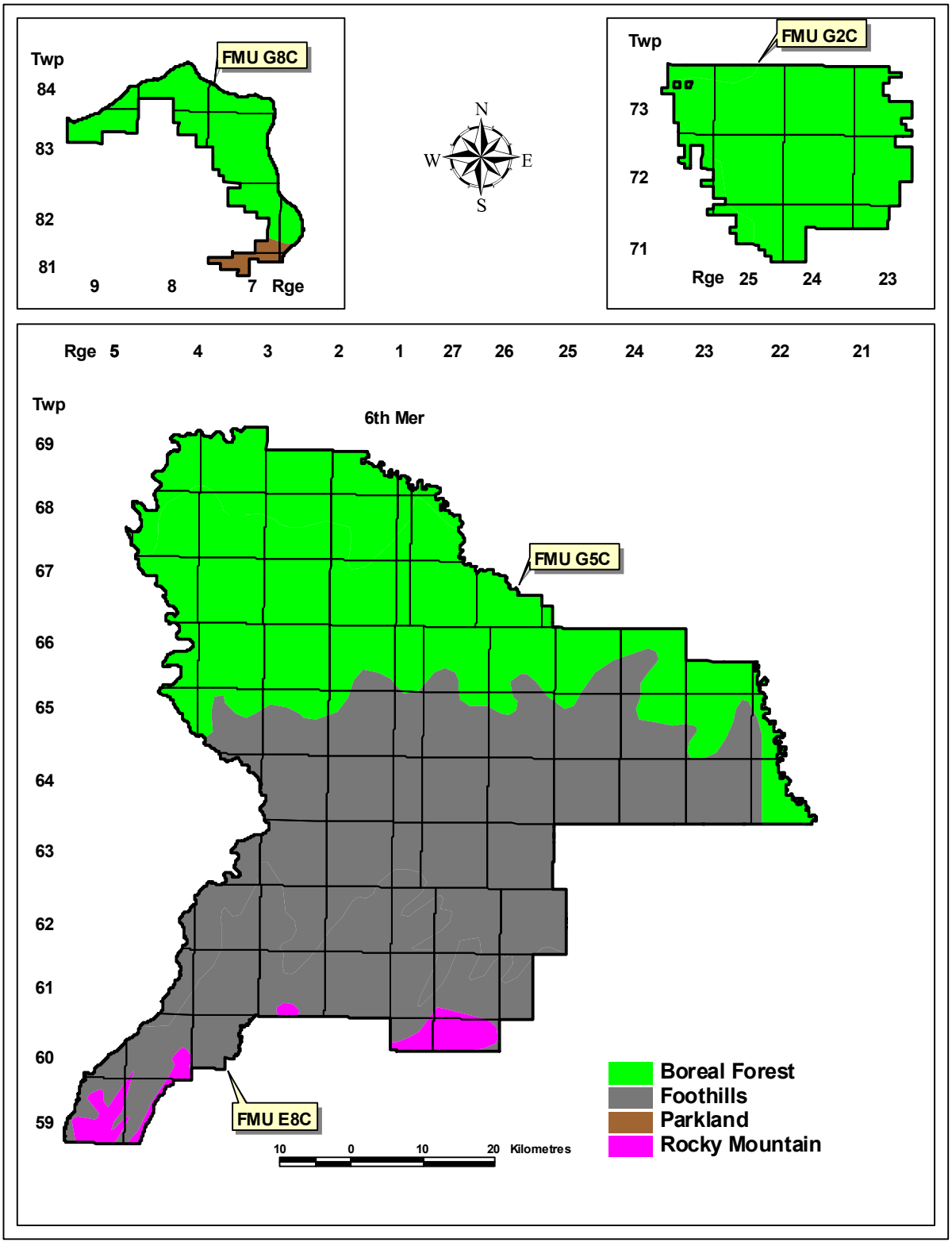


Figure 23. Natural Regions Within the FMA Area

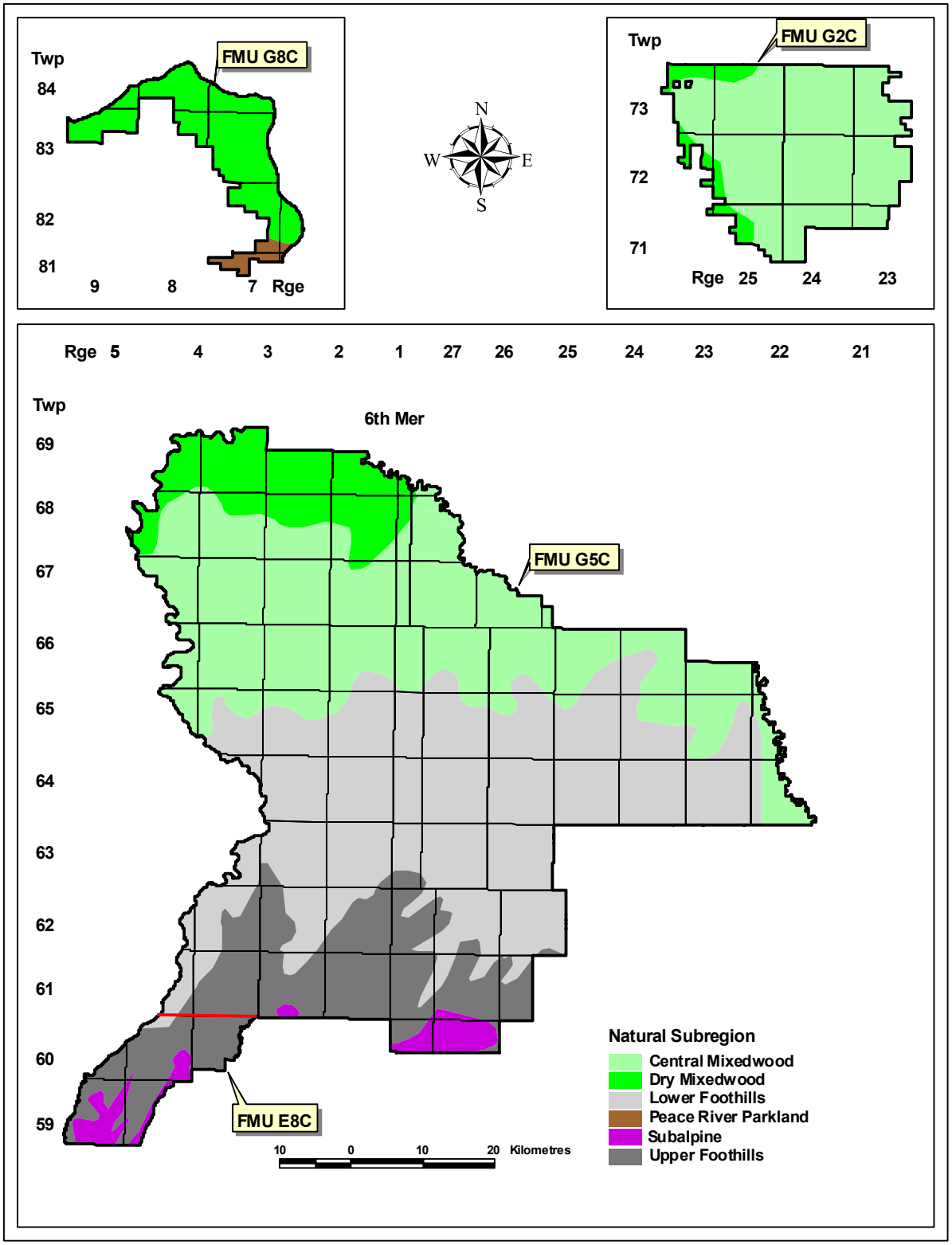


Figure 24. Natural Subregions Within the FMA Area

Table 10. Areas of Natural Subregions

DFMP_Tables ver 1.xls
Table 57

Natural Subregion (NSR)	NSR Provincial Area	FMA Area (ha)	FMA Area as % Compared to NSR Province	FMA Area % Occupied by each NSR
Central Mixedwood	15,467,084	243,044	1.6	37.4
Dry Mixedwood	10,057,771	74,961	0.7	11.5
Peace River Parkland	465,725	2,373	0.5	0.4
Lower Foothills	6,732,443	226,264	3.4	34.9
Upper Foothills	2,754,982	88,805	3.2	13.7
Subalpine	2,576,345	13,713	0.5	2.1
Total	**38,054,349**	**649,160**	**1.7**	**100.0**
Note: Total Provincal Area 66,295,258				

Source Canfor 2001a

3.1.5 Ecodistrict

Ecodistricts are divisions of the Natural subregion based on distinctive physiographic and/or geologic patterns (see Figure 22). They identify similar patterns of local relief, geology, geomorphology and parent materials. There are 10 ecodistricts within the FMA area (Figure 25). Within this land classification system, the ecodistrict and Natural subregion levels contain similar information and are defined by similar boundaries (Figures 24 and 25). They may be considered to be ecologically equivalent within the FMA area (Table 11).

Table 11. Areas of Ecodistricts

DFMP_Tables.xls
Table 58

Ecodistrict	FMA Area (ha)	% of FMA Area Occupied by each Ecodistrict
Worsley Plain	9,997	1.5
Blueberry Plain	15,705	2.4
Rycroft Plain	2,373	0.4
DeBolt Plain	4,520	0.7
Puskwaskau Upland	65,224	10.0
Smoky Plain	44,728	6.9
Iosegun Plain	177,825	27.4
Cutbank Plain	226,256	34.9
Berland Plain	96,030	14.8
Willmore Foothills	6,503	1.0
Total	**649,160**	**100.0**

Source: Canfor 2001a

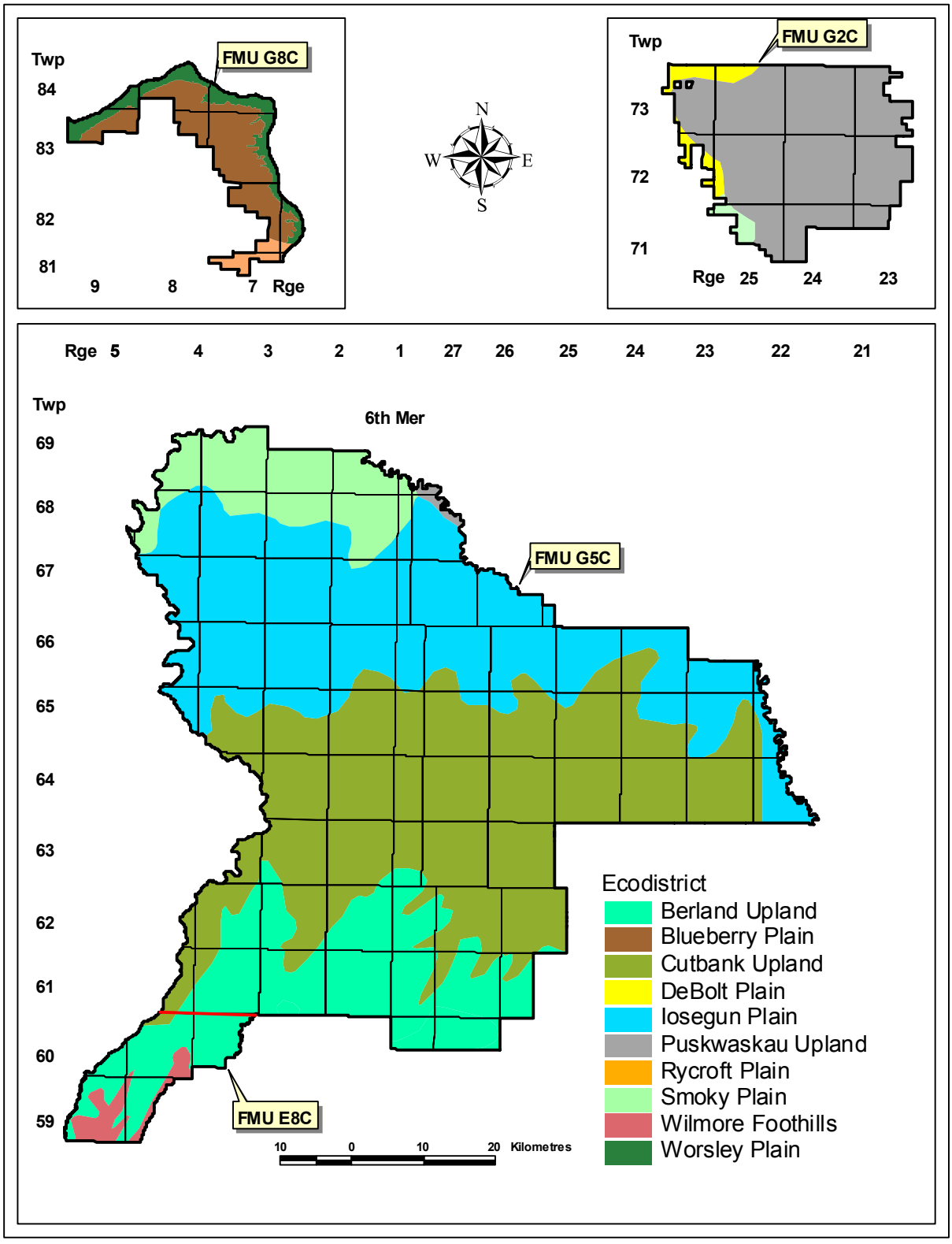


Figure 25. Ecodistricts Within the FMA Area

3.1.6 Ecosection

Ecosections are defined by recurring patterns of landform, topography, soils, soil drainage, parent materials, slopes, stream order, valley and channel morphology, and stream gradient within each ecodistrict. Ecosections differ from ecodistricts in that they are characterized by recurring vegetation patterns. Thus, the ecosection is a complex mapping unit of identifiable landforms (topography) and vegetation that traditionally falls between the ecodistrict and ecosite classification levels (Figures 22).

Figure 26. Ecosite

This bracted honeysuckle ecosite is commonly abundant in richer indicator species, including cow parsnip, devil's-club, dogwood, and wild red raspberry.

Source: *Plant Resource Evaluation* (Canfor 2001f)

3.1.7 Ecosubsection

The ecosubsection level was not previously defined for the FMA area. It is usually a unit between ecosection and ecosite levels within the ecological framework (Figure 22). However, after closer examination, it was found to be identical to the ecosection in definition and description (except for a slight difference in mapping scale).

3.1.8 Ecosite

Ecosites are ecological units that develop under similar environmental influences (climate, moisture regime and nutrient regime). They are based on the combined interaction of many biophysical factors and contain stand and plant species variations known as ecosite phases and plant community types (Figure 22). For more information about the functionality of the ecosite level, refer to Beckingham *et al* (1996a) and Beckingham and Archibald (1996). For a description and classification of ecosites found specifically within the FMA area, refer to *Refinement of the Northern and West-central Alberta Ecosite Classification Field Guides* (Canfor 1999i).

Ecosites were classified, reported and mapped specifically for this project to provide another level of resolution in the overall hierarchical structure. This level was previously lacking and was therefore created specifically for this project.

Figure 26 provides an example of ecosite classification for the bracted honeysuckle type. Figure 27 shows a sample of the distribution of the bracted honeysuckle ecosite within the FMA. A large-scale map showing the distribution of all ecosites within the FMA area can be viewed at Canfor's Grande Prairie administration office.

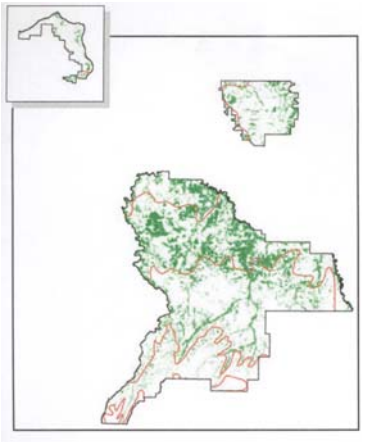


Figure 27. Distribution of the Bracted Honeysuckle Ecosite

Distribution of the bracted honeysuckle ecosite within the FMA area. This site is common on the fine-textured materials of moraine and lacustrine landforms in the Dry and Central Mixedwood Natural subregions.

Source: *Plant Resource Evaluation* (Canfor 2001f)

3.1.9 Ecosite Phase

The ecosite phase is a subdivision of an ecosite based on the dominant canopy structure and composition of the stand (Figure 22). Thus, the ecosite phase provides a functional unit that can also be mapped which represents the "stand-level" of resolution. For a complete list and description of ecosite phases found in the FMA area, refer to the *Refinement of the Northern and West-central Alberta Ecosite Classification Field Guides* (Canfor 1999i).

3.2 Using Ecological Classification

The results from ecological classification of the FMA area have increased the Company's understanding about the spatial and temporal dynamics of ecosystem function and structure. This knowledge can be applied to sustain environmental quality, social systems and economics based on ecosystem management principles not only at a local scale but at the provincial and national scale as described by the *Alberta Forest Conservation Strategy* (Alberta Environmental Protection 1997b).

It is Canfor's objective to identify ecosite phase distribution objectives for application in the next Detailed Forest Management Plan (DFMP) (Section G "Critical Element 2c, Objective 1.1b.1"). Over the next 5 years (ending 2005), strategic directions involving ecosite and ecosite phases will be defined. The goal is to use forest ecosystem management that encompasses entire forest landscapes and that forecasts the future condition of forests for 100 years or more. The Company will use the best available science to develop an understanding of ecological responses to natural and human-caused disturbances. This knowledge will be incorporated into higher level and operational plans by applying ecosystem management principles to achieve desired future forest conditions. This also means that ecosystem management may include a range of management systems at varying intensities, that is, some type of zoning.

Ecosystem management will enable the Company to emulate natural disturbances to manage forests for a range of values. Data and modelling tools will be needed to assist in forecasting a range of management options and their ecological consequences. The feedback from these predictive tools will facilitate adjusting actions through the process of adaptive management (*Canfor Forestry Principles* 1999a).

3.3 Evolution of Forestry Operations at Canfor

Forestry operations have been evolving since 1953 when Canfor, then known as Northern Plywoods Ltd., harvested balsam poplar to manufacture plywood. By 1961, as North Canadian Forest Industries Limited, the Company was harvesting white spruce and lodgepole pine to make lumber and plywood. In those days, the Company directly employed people at its bush mills and to conduct forestry operations (Figure 28).

Figure 28. Bushmill
In the past, sawmills were often located in the forest.

Trees for the mills were felled by handsaws and the logs were often hauled by horses (Figure 29).

Figure 29. Log Haul - Historic
In days past, some logs were transported by sled or wagon

Figure 30. Log Haul - Modern
In modern times, powerful trucks safely transport logs to the mill. Depending on the season and configuration, each truck can haul from 56,500 to 65,000 kg.

After signing an FMA agreement in 1964, the bush mills were centralized in Grande Prairie and phase contracting (where separate independent contractors provided specialized services in the various stages of logging, trucking and reforestation) became more prevalent. Clearcutting was the preferred forest harvesting system and hand felling with chainsaws was standard practice. Based on the knowledge of the time, leaving a cutblock to regenerate naturally was a common practice.

Prime contracting (where one main contractor organized and hired subcontractors to provide stump-to-dump services) became the norm over time. Mechanical felling gradually replaced hand felling and horses as equipment and technology evolved. Today, harvesting is completed almost entirely by feller bunchers (Figure 31). Canfor reforests all harvested areas, using a variety of methods, to ensure a new, healthier, faster-growing forest replaces the harvested timber. By using the latest technology and management systems, the Company's woodlands are safer and more productive than ever before (Figure 30).

Figure 31. Feller Buncher Harvesting
In the past, trees were felled using handsaws and later using chainsaws. Harvesting is now primarily conducted using feller bunchers.

3.4 Participants and their Role in the Development of the Detailed Forest Management Plan

Development of Canfor's DFMP is a cooperative effort between the public, other timber resource users, other stakeholders, Government, Canfor and consultants. Ainsworth Lumber Company Ltd., Tolko Industries Ltd. and Grande Alberta Paper Ltd. have provided technical input. Figure 32 is provided to indicate the participants.

3.4.1 Canfor Participation

Canfor has adopted a team approach for the development of the Detailed Forest Management Plan (DFMP). Dwight Weeks, Forest Planner, manages the DFMP program. He is also a member of the Forest Management Planning Committee (FMPC) which has a mandate to provide the direction and guidance for development of this Plan. The FMPC is comprised of 3 additional Canfor personnel including Peter Blake, Silviculture Forester, Christine Kreibom Quinn, Land Management Forester, and Brian Martell, Woodlands Superintendent. To fulfill their mandate, Committee members draw on expertise from personnel within Canfor and from forestry consultants as required.

The DFMP receives the approval of Chris Andersen, General Manager, Peace/Alberta Region, and Lorne Greenhorn, Woodlands Manager, Alberta Operations, prior to its submission to the Government.

3.4.2 Forest Management Advisory Committee

Public participation is key to the development of a successful ecologically-based Detailed Forest Management Plan (DFMP). Recognizing this, Canfor actively sought public participation in August 1995 through the formation of a Forest Management Advisory Committee (FMAC). The Committee is comprised of local stakeholder groups who are directly affected by or have an interest in the management of the forest resource. The Committee, who first met in September 1995, has been providing valuable input into the development of the DFMP by reviewing various documents and identifying issues of concern. These issues have been documented in an "*Issues List*" for incorporation into the DFMP (Appendix 4).

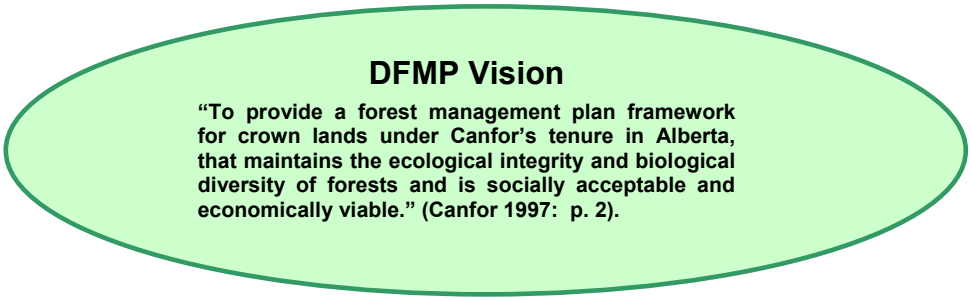
In July 1999, Canfor decided to actively pursue CSA certification. On October 13, 1999, the FMAC was approached to consider also acting as the public consultation committee for the development of values, goals, indicators and objectives of the CSA criteria and critical elements for the Sustainable Forest Management Plan (SFMP). At the December 1, 1999 meeting, the Committee agreed (via consensus) to become involved in the CSA process. At the January 19, 2000 meeting, work began on the *Terms of Reference* for the Committee. On February 23, 2000, the Committee gave final approval to the FMAC *Terms of Reference* (Appendix 5). The *Terms of Reference* clearly state the goals, operating rules, methodology of making decisions and dispute resolution mechanisms by which the Committee provides input to Canfor. When the mandate of the FMAC was expanded to include CSA certification, additional organizations were invited to participate (Appendix 6).

3.4.3 Forest Management Ecosystem Task Force

Canfor also sought the advice of government and academic experts in the fields of ecology, forest management and wildlife biology (Figure 32).

The Forest Ecosystem Management Task Force (FEMTF) served as a scientific technical group in development of the DFMP. The FEMTF provided guidance to ensure that the Plan reflected a sound and practical approach to ecological management.

This FEMT developed a vision statement to guide development of the DFMP, which has been adopted by Canfor Grande Prairie Operations.



3.4.4 Other Timber Resource Users

Canfor has the rights to manage, grow, harvest and reforest coniferous timber within the FMA area under its current agreement with the Crown. Tolko Industries Ltd. (Tolko), Ainsworth Lumber Company Ltd. (ALC), and Grande Alberta Paper Ltd. (GAP) have been allocated deciduous timber rights within the FMA area (refer to Section B 4.2 for additional information on deciduous allocations).

ALC and Tolko representatives act in an advisory capacity to the Forest Management Advisory Committee (FMAC). Along with GAP, they also provide technical input regarding strategic and operational plans, resource and timber supply analysis, growth and yield projections, and operational and harvest sequence plans for the DFMP.

3.4.5 Forestry Consultants

Forestry consultants play an important role in the development of the DFMP. Canfor ensures that consultant services are provided in a manner consistent with their goals and objectives.

Olympic Resource Management (ORM) provides services directly related to the *Resource and Timber Supply Analysis* (Appendix 3)

Geographic Dynamics Corp. (GDC) provides ecologically technical expertise.

Brad Engel, R.P.F. is an independent forestry consultant who has been retained by Canfor to provide technical input and prepare documents related to the current plan.

3.4.6 Alberta Sustainable Resource Development

Alberta Sustainable Resource Development (ASRD) is the review and approval agency of the Detailed Forest Management Plan (Figure 32).

ASRD personnel at the district, regional and provincial head office levels will conduct reviews of this Plan. Craig Brown, Area Forester, is the primary ASRD contact for submission of all plan products developed by Canfor.

3.5 Interim Forest Management Planning Manual – Guidelines to Plan Development (1998)

Alberta Sustainable Resource Development (ASRD) developed the planning manual to guide sustainable forest management planning in Alberta. The document outlines several key guiding principles for consideration when preparing forest management plans. Wherever possible, development of the DFMP was based on the principles outlined in the *Interim Forest Management Planning Manual – Guidelines to Plan Development* (1998). These principles, as outlined in the planning manual, are:

- Current sustained-yield timber management planning is required under existing legislation but planning should move toward sustainable forest management (SFM). The Government recognizes the variability in production capacity and forest management staffing levels within the forest industry and that this may have an impact on the ability of any given company to satisfy the requirement for SFM;
- One forest management plan should be prepared for an area. This will require the cooperation of all forest companies involved. There is an expectation that forest companies and the Government will cost share in areas of mutual interest;
- The current forest management administrative units (FMU and FMA boundaries) are respected but allow future forest management plans to recognize larger, ecologically relevant landscape units as the basis for sustainable forest management;
- The approach to forest management planning is open and consultative. It utilizes an extensive and ongoing public involvement process in which the Government has an active role in presenting government policy, legislation and regional resource planning information. The Government also assumes a role in the mediation of disputes arising from the planning process. The Government will take into account the financial stake for input received during forest management plan review or in resolving consultation conflicts. Those parties with greater stakes should have greater influence over decisions. This approach will facilitate prompt approval of forest management plans;
- The forest management plan is prepared and implemented with the collaboration of government agencies, other resource industries and the public;
- Forest management planning (FMP) is a dynamic process in that:
  - Knowledge obtained through research and operational trials is incorporated;
  - Forest management enhancements resulting from new national or provincial policy, or as a result of legislation changes, is captured;
  - Performance monitoring mechanisms provide corrective feedback to the FMP, thereby improving performance; and
  - Operational plans are linked to the FMP, ensuring day-to-day operations are in compliance with the objectives set out in this Plan.

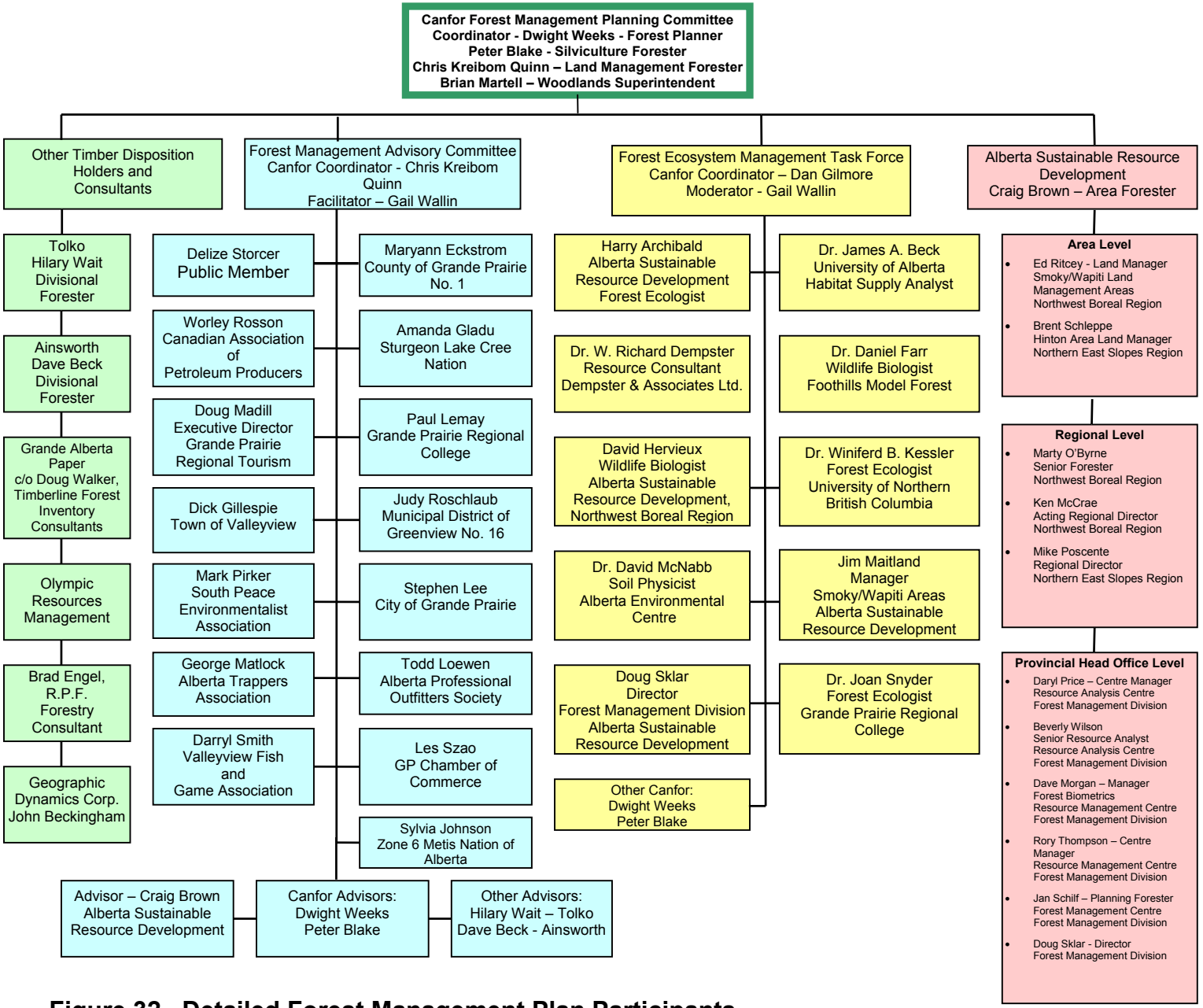


Figure 32. Detailed Forest Management Plan Participants

- The Government respects approved FMA plans and tenure rights and ensures that their staff monitor and regulate the forest company's operations consistent with the approved plan;
- Forest management recognizes timber and other forest resource values and considers the management of these values within the defined forest management area;
- The FMA holder has tenure rights to harvest and reforest trees on their FMA area. They are also responsible to mitigate impacts of their activities on other forest resource values but not for the management of these resource values. Management of other forest resources is currently the responsibility of the Crown. The forest industry and the public however, must consider these resource values. The assessment and inventory of these other resource values are a shared responsibility between government and the resource industries. The Government will not be unreasonable in its expectations where other resource information is lacking or limited; and
- Forest management planning will recognize all current resource commitments as the basis for future planning and decision making.

3.6 Detailed Forest Management Plan (DFMP) – Terms of Reference

The *Terms of Reference for the Detailed Forest Management Plan* (Canfor 1997) contains the information required by Alberta Sustainable Resource Development (ASRD) and as outlined in the Canfor document, *Detailed Management Plan Framework Outline* (October 1996). It was approved by ASRD on September 30, 1997.

The *Terms of Reference for the Detailed Forest Management Plan* outlined how Canfor would use ecological management as the basis of this Plan and indicated the Company would be evolving from a fiber-based, sustained-yield management philosophy to an ecologically-based approach to resource management. It noted that the DFMP would be implemented using an adaptive management approach, whereby changes to forest management plans are based on a continuous loop process of scientific evaluation, monitoring, assessment and feedback.

3.6.1 Scope Assessment for Inventory Analysis of the Grande Prairie Management Area

The scope assessment (Simons Reid Collins 1996) was part of a participatory management-planning framework proposed by Canfor for scheduling the inventory and analysis, development of goals and objectives, and strategic planning tasks, leading to approval of the DFMP. The document described the main inventory and analytical tasks to be undertaken as a basis for the resource and timber supply analysis component of the DFMP scheduled for submission to the Alberta Sustainable Resource Development, Land and Forest Division (LFD). The purpose, scope and required outputs for each task, and the interrelationships between tasks, were described for review by the LFD, Forest Management Advisory Committee and Forest Management Ecosystem Task Force and for budgeting, assigning and controlling the inventory and analytical work to be undertaken for the DFMP.

3.7 Cut-off Dates for the Detailed Forest Management Plan

Cut-off dates for information used in the DFMP are as follows:

- Alberta Vegetation Inventory (AVI) ver 2.1 maps were developed based on color infrared (IR) photography conducted during 1993 to 1995. A combination of leaf-on and leaf-off was utilized;
- AVI polygons will be updated to include harvested areas up to April 1996;
- Hydrology and transportation (linear disturbances) updates were developed based on color IR aerial photos and from 1993 orthos;
- Planned harvested areas will be included for the resource and timber supply analysis, as per the 2001 Annual Operating Plan/5 Year General Development Plan submission;
- Proposed harvest areas for the 1995 to 1996 harvest season were excluded to prevent inventory plots from being located in areas that will be harvested prior to the inventory program;
- Permanent sample plots (PSP) were completed by September 1997;
- 1,395 temporary sample plots (TSP) were completed by September 1997; and
- General statistics and data were supplied to December 31, 2000, unless otherwise indicated.

3.8 Sustainability

Canfor is committed to sustainable ecosystem management. *Canfor's Forestry Principles* (Canfor 1999a) outlines a broad approach to the sustainability of the forests in which Canfor operates. The forest management systems, including certification standards, that result from the *Forestry Principles* will maintain the long-term health of forest ecosystems while providing social, ecological and economic opportunities for the benefit of present and future generations.

The Company is committed to maintaining sustainable harvest levels in the FMA area (Section G "Critical Element 5a, Goal 1.1") by ensuring the amount of harvest never exceeds, on a long-term basis, the amount that the forest can grow (Section G "Critical Element 5a, Objective 1.1a.1").

The annual allowable cut (AAC) is calculated to ensure that the local productive capacity of the forest is not exceeded on a long-term basis (sustained yield). The current coniferous AAC, as per Canfor's 1991 approved Detailed Forest Management Plan, is 730,000 m^3. The Company is currently harvesting below this level, as indicated in Table 12.

Table 12. Actual Harvested Volume vs. AAC

DFMP_Tables.xls
Table 28

Cut Control Period	Harvested (m3)	AAC (m3)	Variance (m3)	Variance (%)
1988-1992	3,080,603	3,354,500	273,897	- 8
1993-1997	3,142,717	3,650,000	507,283	-14
Total	**6,223,320**	**7,004,500**	**781,180**	**-11**

Source: Based on 5 Year General Development Plan Cut Control Table

It should be noted that harvest levels in any one year can vary as long as the total amount harvested in the established 5 year cut control period does not exceed 5% of the total approved AAC for that period. Adjustments will be made within a 5 year cut control period, as required, to ensure the acceptable variance, as noted above, is not exceeded.

The *Resource and Timber Supply Analysis* indicates a "new" coniferous AAC of approximately 670,000 m^3 (with a 640,000 m^3 20-year harvest level), as compiled by Olympic Resources Management (refer to Appendix 3).

3.8.1 Cut Control

The process for monitoring the harvest levels to ensure that the annual allowable cut (AAC) is not exceeded by 5% in a given 5 year period is called "periodic cut control". The FMA agreement, Section 17, establishes cut control periods as follows:

"Section 17.

(1) The term of this Agreement shall be divided into four cut control periods each with a duration of five years. The annual allowable cut shall be recalculated when requested by either the Minister or the Company and not later than by the end of the second control period.

(2) If the Company overcuts the periodic allowable cut the Minister shall reduce the allowable cut during the subsequent period by an amount equivalent to the entire overcut volume, except to the extent such overcut results from the salvage of dead, damaged, endangered, diseased, or fire killed timber.

(3) Where production is lower than the periodic allowable cut, the Company may submit a program satisfactory to the Minister making up the under cut volume in the subsequent cut control period."

Actual and proposed harvest levels are monitored on an annual basis to ensure that cut control volumes as established in the Detailed Forest Management Plan are maintained. Refer to Appendix 3 for additional information regarding periodic cut control.

E. ADMINISTRATION OF THE DETAILED FOREST MANAGEMENT PLAN

1. Introduction

Administration of the Detailed Forest Management Plan (DFMP) is conducted from Canfor's Alberta Operations office in Grande Prairie, Alberta. Canfor draws its primary rights to harvest timber from an FMA agreement 9900037 with the Province of Alberta (O.C. 198/99). The Company maintains all records required by the FMA agreement plus files, maps and databases necessary for effective management of the resources within the FMA area.

2. Forest Management Agreement

On May 26, 1964, Canadian Forest Products Ltd. (formerly North Canadian Forest Industries Limited) entered into a 20-year Forest Management Agreement with the Province of Alberta that was renewed in 1978. The current Forest Management Agreement 9900037 (O.C. 198/99) commenced on May 5, 1999 and expires in May 2019, unless renewed under the provisions contained in the FMA agreement (Appendix 1).

This FMA agreement grants Canfor the rights to enter upon the FMA area to manage, grow, harvest and reforest coniferous timber, and to maintain and/or increase the coniferous annual allowable cut (AAC) within an FMA area. The FMA area is the primary source of coniferous timber for Canfor's Grande Prairie wood processing facilities.

FMA area Facts (2000)

FMA area Description:

- Total landbase (ha.): 649,160
- Harvesting landbase (ha): 474,193

Canfor Activities:

- Area harvested yearly (ha): 3,100
- Average haul distance (km): 145
- Annual volume harvested (m^3): 627,702
- Trees planted per year: 3,900,000
- Area planted per year (ha): 3,000
- Roads maintained (km): 300

The DFMP uses a sustainable forest management approach based on ecological principles. This Plan is consistent with national and provincial legislated policies for sustainable development and landscape management (refer to Section D).

Canfor's Grande Prairie forestry operations are located almost exclusively on public lands. Most of the timber for the lumber manufacturing facilities in Grande Prairie, Alberta is obtained from Forest Management Agreement 9900037 located in 3 major areas (Figure 1).

The history of the FMA area began 37 years ago. On May 26, 1964, North Canadian Forest Industries Limited signed a Forest Management Agreement (O.C.836/64) consisting of 287,863 ha located east and south east of Grande Prairie. The original boundaries of the FMA area were amended in 1971 (O.C. 1410/71) with the addition of forest management unit (FMU) G8C and townships 66-22-W5M, 66-21-W5M and 65-21-W5M. In 1977, FMU E8C was added to the FMA area (O.C. 1292/77) to compensate for quota relinquished by the Company in FMUs G3, G4 and G5C. At the

same time, FMU W1C was established as a provisional reserve. The reserve was activated in 1986 and added 78,368 ha to the FMA area.

In 1989, Canfor relinquished quota in FMU G7 to obtain FMU G5P to meet the increasing timber requirements of the upgraded sawmill. FMU G5P added 220,225 ha to the FMA area. As of 2001, the FMA area currently contains 649,160 ha. More information regarding the forest resources within the FMA area is contained in Section C.

3. Canfor Grande Prairie Woodlands

Canfor's trained and experienced professional foresters and technicians administer, supervise and conduct work required to manage the forest resources within the FMA area. Their primary function is to develop, monitor and supervise strategic and operational plans. More information on the role of Canfor personnel in development of the Detailed Forest Management Plan and the AOP/ 5 Year General Development Plan is contained in Section D 3.4 and Section E 5.2 respectively. The organization chart for Grande Prairie Woodlands is provided as Figure 33.

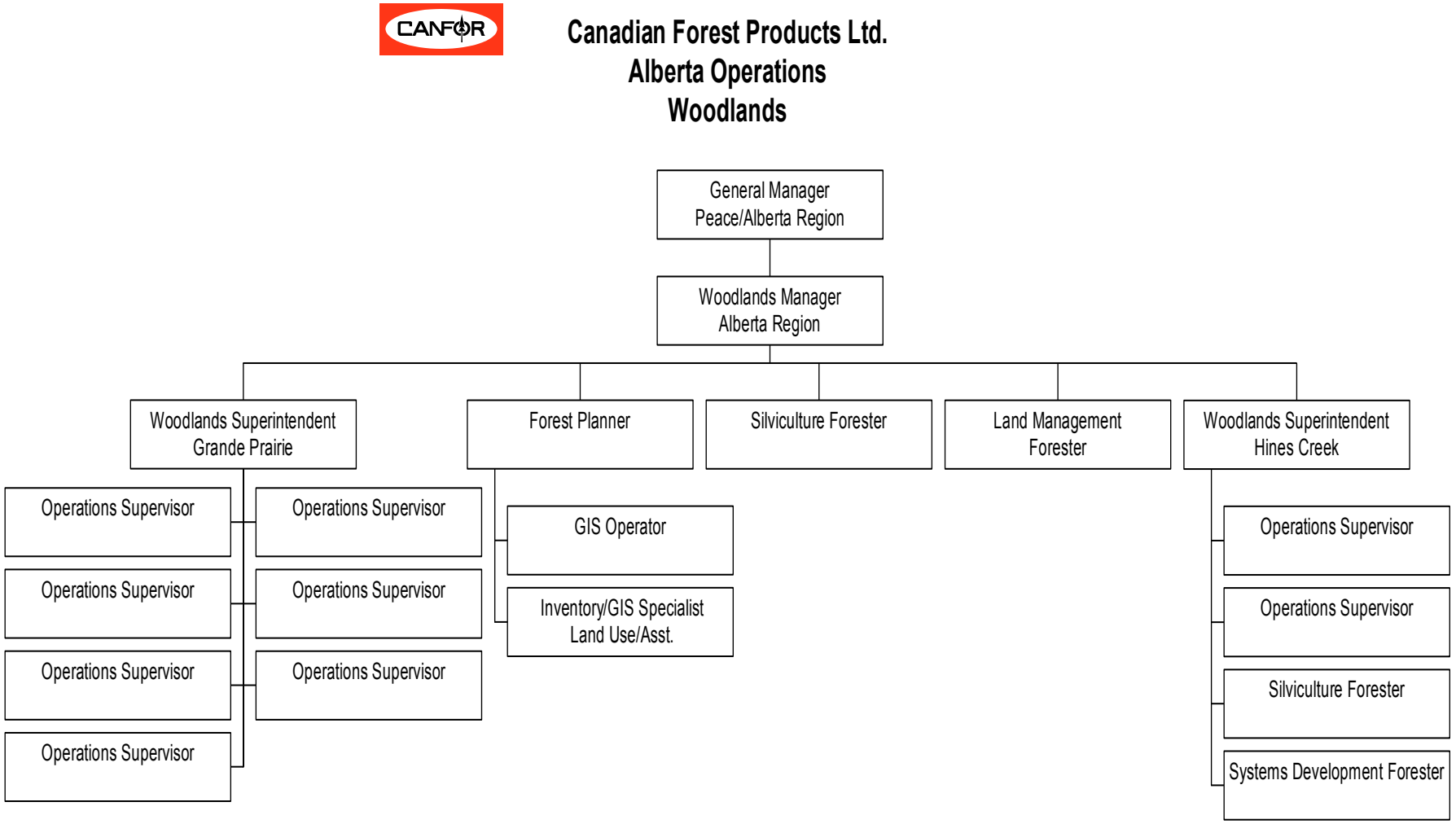
Qualified contractors are retained to conduct woodlands activities including harvesting, log delivery, road construction, silviculture and other forestry activities. Contractors are hired in accordance with Environmental Management System (EMS) policy MSP I-04. This policy requires contractors to have the appropriate level of skill and knowledge and to meet all Company environmental requirements and other performance requirements.

4. Data and Data Management Systems

Up until recently, Canfor's Grande Prairie operations utilized several different systems to manage critical operational data. These systems were not tightly integrated and were comprised of several independent databases. This infrastructure lead to data duplication. Furthermore, tracking of and reporting on the data were extremely difficult. Some of the systems did not have a spatial component, greatly reducing the information content of the data.

To effectively manage the resources within the FMA area requires a wide range of spatial and aspatial data and the systems to allow resource managers to access and use information. Some of the main components of the systems are described in the following text.

Figure 33. Canfor Alberta Operations Woodlands Organization Chart



Source: DFMP_Woodlands Organizational Chart-01.doc

4.1 Genus RMT

In the past 2 years, Canfor has implemented GENUS®, a system that uses cutting edge technology to store, maintain and report on data. GENUS RMT (a wholly owned subsidiary of Canfor) has developed a suite of applications which allows Canfor to manage all forest resources entrusted to its care. The system is a fully integrated business management tool that offers one-window access to the full spectrum of spatial and attributes data in a single database. It provides individuals with powerful GIS functionality and spatial interaction with the landbase. GENUS® is a seamless modular design. The modules currently in use by Canfor Grande Prairie are:

- Cut Block Management System (CBMS):
  CBMS offers complete tracking and reporting of specific cutblock or FMA area level details. It features full project management functionality for all cutblock activities, with an interactive display of stream, forest cover, road, contour and ortho layers (Figure 34);
- Forest Road Management System (FRMS):
  FRMS includes tracking and reporting of road construction, inspections, maintenance, deactivation, and access control. It provides a dynamic map display on road activities, attributes and structures (Figure 35);
- Operational Planning:
  Operational planning includes strategic analysis tools for developing planning. It also provides short-term planning such as the creation of logging and hauling plans, cut control management, cut volume reporting and inventory control. Scenario graphing and reporting is also available; (Figure 36);
- Logging Production System:
  This system provides complete fiber management from tracking of logs, inventories, harvest reconciliation and scaling to contractor management, consumption rates and quality control; and

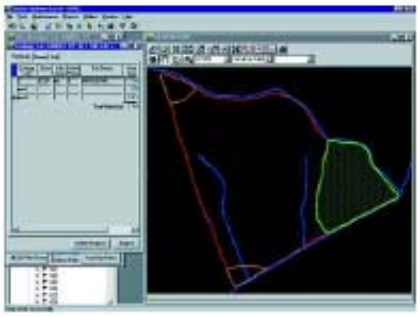


Figure 34. GENUS® - CBMS
CBMS provides land managers with state-of-the art tools for tracking and reporting cutblock and FMA area level data.

Figure 35. GENUS® - FRMS
Tracking and reporting of road construction, inspections, maintenance, deactivation, and access control is provided by FRMS.

Figure 36. GENUS® - Operational Planning
The silviculture module provides the capabilities for managing growth, reproduction and environmental data for the growing of trees.

- Silviculture:
  This module is a comprehensive resource planning tool for managing growth, reproduction and environmental requirements critical to the growing of trees. It is currently in its final stage of development, and is being developed in parallel with the Government's Alberta Regeneration Information System (ARIS) to ensure that Canfor will be able to fulfill its reporting requirements to the Government in full support of this Detailed Forest Management Plan (DFMP).

In addition to the role in strategic and operational planning, Canfor will use GENUS® to monitor specific objectives established in the DFMP.

4.2 Environmental Management System (EMS)

As a preparatory step to certification, Canfor developed an EMS for the Company's woodlands operations. In November 1999, this system was certified to the ISO 14001 standard developed by the International Organization for Standardization. The system provides a platform on which to build the sustainable forest management system required to meet the CSA standard. It provides the framework to describe the Company's activities (policies, plans and objectives), to conduct its activities as planned, and to monitor those activities to ensure compliance with stated plans and objectives (Figure 37). Monitoring involves validation of observed results against model forecasts (leading to corrective measures and continual improvement), ensuring that performance standards are met, and determining conformance of activities and prescriptions with stated objectives. One of the tools used under the EMS to manage the Company's performance is the Incident Tracking System (also a module of GENUS®) described below:

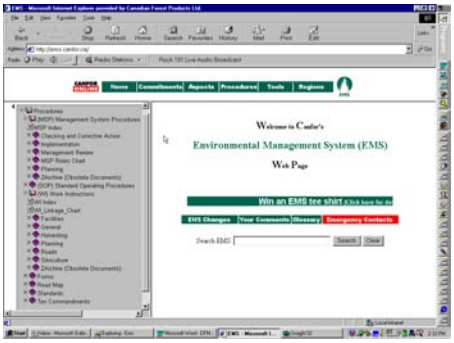


Figure 37. EMS Website Screen
Canfor's Environmental Management System (EMS) includes a web page application that can manage all procedures and documents related to EMS.

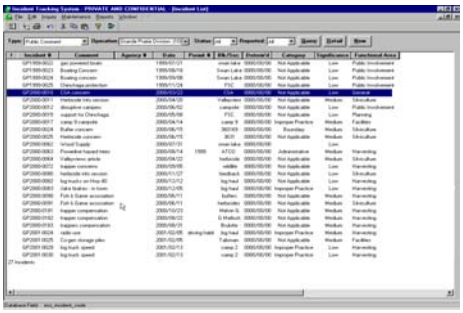


Figure 38. Incident Tracking System
Canfor's Incident Tracking System (ITS) assists the Company to monitor issues and ensures action plans are developed and implemented.

- Incident Tracking System:
  Canfor implemented an Incident Tracking System (ITS) in November 1999 (Figure 38). Issues are documented as per the EMS guidelines and submitted to the EMS representative for entry into the ITS. The system can track non-conformance to corporate policies and procedures, non-compliance to legislation or regulations, public comments, spills and general action items. All records are evaluated annually to

determine if trends have developed. If trends are identified, an action plan is implemented to address the concern.

4.3 Geographic Information System (GIS)

GIS is an organized collection of computer hardware, software and geographic data that allows personnel to efficiently capture, store, update, manipulate, analyze and display all forms of geographically referenced information (Environmental Systems Research Institute Inc. 1997). Simply, it is a computer system capable of storing geographical data and associated attributes that accurately describe the real world (Figure 39).

GIS is essential to forest management within the FMA area. It provides woodlands personnel with a powerful tool for spatial interaction with the landbase.

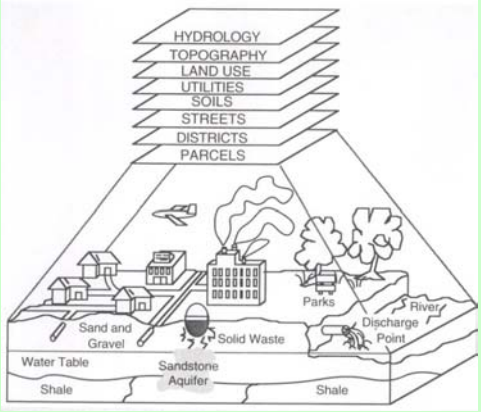


Figure 39. GIS Data Layers
In GIS, a number of related data layers can represent the many geographies of the real world.
Source: Environmental Systems Research Inst. Inc. 1997

4.4 Other Data

Not all the data and information required by managers is stored in GENUS®. Some of the most significant examples are listed below:

- Annual Operating Plan/5 Year General Development Plan;
- Alberta Vegetation Inventory ver. 2.1;
- Landuse data;
- Streams;
- Contours;
- Fish inventory; and
- Scientific reports:
  - Ecological classification;
  - Forest productivity;
  - Plant resources;
  - Wildlife habitat suitability;
  - Soil productivity; and
  - Site productivity.

4.5 Linear and Cutover Updates

Canfor updates forest disturbances on an annual basis for cutover updates and once every 5 to 10 years for linear updates. These programs currently use conventional aerial photograph scales (1:15,000–1:20,000) in conjunction with small-scale photography (1:60,000) and updated orthophoto bases. Linear updates are current to September 2000.

A new technology, called *Softcopy Photogrammetry* (Figure 40), has recently become available which minimizes the use of hardcopy products to complete these programs. Softcopy Photogrammetry takes conventional aerial photography (uncontrolled/unrectified) through a series of advanced computer manipulations and converts the aerial photographs into digital models that are geometrically correct. Using the DiAP Viewer system, a specialized software package, these digital photographs can be viewed in 3-D.

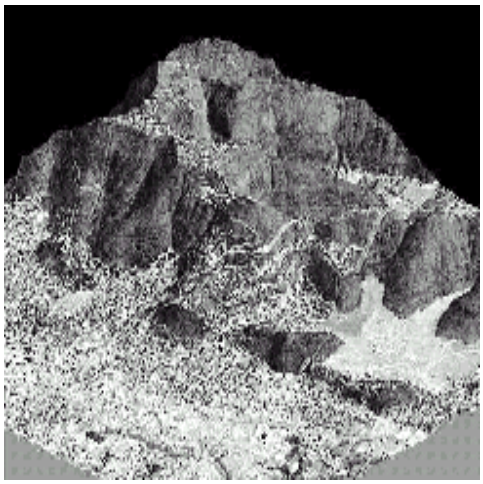


Figure 40. *Softcopy Photogrammetry*
This technology uses the DiAP Viewer system which is a specialized software package, to create 3-D views on-screen. Such technology will enhance the Company's ability to manage the forest resources.
Source: (http://www.rwel.com/dms.htm)

This application allows all classification and digitizing to be completed on-screen. All new cutovers will be snapped to AVI coverages so specific features such as roads, wellsites, pipelines, etc. are tied in to the block boundaries. All digital data will be projected in an NAD 83 media.

Canfor is in the process of testing and evaluating this technology and expects it to be fully operational by 2003.

4.6 Aerial Photo Indexing

Canfor utilizes *Air Photo Master* software (ver. 2.2.063) to track and catalog aerial photography locations, thereby increasing the accessibility and knowledge of existing aerial photography held by the forest companies and the Government. The software eliminates the need to store hard copy index maps.

4.7 Forest*VIEWS*®

Forest*VIEWS*® is a proprietary forestry-related information database and viewing product produced by Specialized Communications Inc. It provides Canfor with the most current version of National and Alberta statutes, regulations, policies, guidelines, management directives, forest management agreements, codes of practice, information and initiatives. Canfor uses the product under a license agreement, which makes provisions to update the information every six weeks (Figure 41).

Figure 41. Forest*VIEWS*®
Forest*Views*® is a proprietary product that provides Canfor with the most current version of statutes, regulations, policies, guidelines, and other forestry related information and initiatives.

Source: Specialized Communications Inc.

5. Plans Submitted to Government

This section describes the primary plans that are submitted to Alberta Sustainable Resource Development in accordance with Alberta statutes and regulations.

5.1 Detailed Forest Management Plan

The primary regulatory environment under which Canfor Grande Prairie Operations conducts its forest operations is Forest Management Agreement 9900037 ("FMA agreement"), signed with the Minister on May 5, 1999 and expiring on May 4, 2019.

As per subparagraph 10(3) of the FMA agreement, a Detailed Forest Management Plan (DFMP) must be submitted to the Minister not more than 2 years following the commencement date of the FMA agreement. The DFMP defines activities in a specific geographic area and time period, and provides detailed justification and environmental planning to support the annual allowable cut (AAC) for both coniferous and deciduous species from the FMA area. Refer to Section D for additional information on development of the DFMP.

5.2 Annual Operating Plan/5 Year General Development Plan

It is important that the strategies and objectives developed within DFMP are implemented in operational plans. The Annual Operating Plan (AOP) and 5 Year General Development Plan (GDP) are the primary plans in this regard. They are submitted to Alberta Sustainable Resource Development (ASRD) annually as per subparagraph 18(2) of the FMA agreement. Actual harvesting operations are conducted in accordance with established *Timber Harvest Planning and Operating Ground Rules*.

As per the FMA agreement, subparagraph 16(2), the current ground rules must be revised within 6 months following the approval of this DFMP.

Refer to Section F 2 for additional information regarding the relationship between the DFMP and AOP.

5.3 Public Involvement Program

Canfor is committed to providing opportunities for the public to garner information and provide input about resource management within the FMA area. Public participation is a major component of the development of the DFMP and is an integral part of the Company's formal planning process. Canfor's corporate policies (*Environment Policy, Mission Statement* and *Canfor's Forestry Principles*) and certification strategy clearly demonstrate the importance of public involvement to its business.

Canfor developed *A Public Involvement Program for Canadian Forest Products Ltd.'s Forest Management Agreement (FMA) 9900037* (Canfor 2001b) as a result of its commitment. The document describes the main principles and initiatives that Canfor is implementing to inform the public and solicit public feedback, including the maintenance of a stakeholder list for communication purposes.

Canfor's goal is to ensure that members of the public have opportunities to contribute their input about forest management. To achieve this goal, the Company utilized the objectives from the Land and Forest Service *Public Involvement for FMA Planning: Policy and Process* (Alberta Environmental Protection 1990), as a guide.

The *Public Involvement Program* contains a conflict-resolution mechanism to assist in addressing competing landuse conflicts and to provide a mechanism for individuals, groups and the general public to obtain information on how their concerns are addressed in the DFMP. It must be recognized that not all conflicts can be resolved. Canfor is sensitive to the needs of its stakeholders and incorporates concerns where feasible. However, the economic needs of its business must be met while operating within the bounds of the FMA agreement, ground rules and Alberta legislation, policies and strategies.

Canfor recognizes the rights of stakeholders to be involved in the planning process, and wants to ensure that public issues are addressed. Canfor has accomplished this by:

- Seeking input from the Forest Management Advisory Committee (refer to Section E 5.3.4 for more information); and
- Pursuing the CSA certification standard (refer to Section F 1).

5.3.1 Public Involvement Activities

The following is the current status and brief history of the Company's public involvement activities (Canfor 2000c):

- Forest Management Advisory Committee (FMAC) meetings are currently conducted every 6 - 8 weeks;
- Annual forestry open houses are held in the spring in Grande Prairie, Grande Cache and Valleyview to review the Company's operational plans with the public;

- Townhall meetings for the Detailed Forest Management Plan (DFMP) were held in November 1998 in Valleyview, Crooked Creek, and Grande Prairie. Minutes of those meetings are on file;
- Written submissions are received periodically. Response letters are on file and they are tracked in the Incident Tracking System (ITS);
- The *Trapper Notification Program* is operational; and
- The stakeholder database is maintained.

5.3.2 Tracking Public Issues

It is Company policy that 100% of public issues received after November 1999 are responded to by Canfor (Section G "Critical Element 6a, Objective 1.1b.1"). The Company committed to a tracking process for public input external to the FMAC process upon registration of the Company's Environmental Management System in November 1999. It should be noted that letters received prior to November 1999 were responded to; however, Canfor's tracking system was not in place at that time so letters and responses were kept on file.

Canfor records, monitors and addresses all input received from the activities conducted under its Public Involvement Program. The Company's Incident Tracking System allows all public comments to be recorded and action plans developed and monitored to ensure appropriate follow up (refer to Section E 4.2).

5.3.3 Public Access to Company Documents

Documents such as the Annual Operating Plan/5 Year General Development Plan, Sustainable Forest Management Plan for CSA certification and once approved, the Detailed Forest Management Plan, are made available to the public through the following local libraries:

- Grande Prairie;
- DeBolt;
- Valleyview;
- Spirit River; and
- Grande Cache.

Additional documents, such as the Company's Public Reports, will also be forwarded to the public libraries.

5.3.4 Forest Management Advisory Committee (FMAC)

This public advisory group has and will continue to play a role in development of Canfor's:

- Public Involvement Program;
- Detailed Forest Management Plan (DFMP); and
- Sustainable Forest Management Plan (SFMP).

Their role in development of the DFMP and SFMP is discussed in Section D 3.4.2 and Section E 6.2 respectively.

5.3.4.1 Terms of Reference

All activities of the FMAC are conducted in accordance with their *Terms of Refere*nce, developed in February 1998 and revised in February 2000 as a result of the Committee's expanded role in development of the SFMP. A copy of the *Terms of Reference* can be found in *A Public Involvement Program for Canadian Forest Products Ltd.'s Forest Management Agreement (FMA) 9900037* (Canfor 2001b) (Appendix 5).

5.3.4.2 *Issues Lis*t

Since 1995, the FMAC has been providing valuable input into the development of the DFMP by reviewing various documents and identifying issues of concern. These issues and concerns have been documented in an *Issues List* (Appendix 4) and, wherever possible, they have been incorporated into the DFMP. The list is a "living document", which means all new issues are incorporated as they are raised. The *Issues List* will be maintained for the life of the Committee.

It is Canfor's objective to address 100% of the topics from the *Issues List* to the satisfaction of the Committee by the submission date of the DFMP (Section G "Critical Element 6a, Objective 1.1a.1"). It is recognized that this may not be possible and has an acceptable variance of 10% has been established, i.e. 90% of the topics must be addressed to the Committee's satisfaction. To achieve the objective, the existing *Issues List* was reviewed with the Committee in December 2000 to explain how the issues will be incorporated into the DFMP. The *Issues List* will be modified slightly to demonstrate the DFMP linkages and will be reviewed with the Committee in winter 2001.

5.3.5 Trappers Notification Program

Canfor, in consultation with the Alberta Trappers Association and the Sturgeon Lake Cree Nation, developed a *Trappers Notification Program* (Canfor 2001l). The program was reviewed with the Forest Management Advisory Committee (FMAC) and implemented in 1998 and subsequently revised in 2001. The objective of the program is to ensure all trappers affected by Canfor's Annual Operating Plan (AOP) are notified and made aware of all activities planned within their registered trapline (Section G "Critical Element 5c, Objective 1.1c.1"). Canfor maintains a current list of all senior trappers operating within the FMA area and a map of their registered traplines (Figure 12).

The *Trappers Notification Program* specifies that personal contacts must be made with the trappers concerning:

- Cabin, trapline, and important wildlife areas;
- When and where harvesting, road building, log hauling and silviculture activities will occur; and
- Exact locations of cutblocks and logging roads.

To meet the program objectives, Canfor has retained 2 contractors to hand deliver annual trapper notifications regarding its harvesting and silviculture activities. Each

senior trapper receives a map indicating the planned activities and the contractor answers any questions during his visit. Any concerns are noted on the *Trappers Notification Form.* These forms are dated and signed (if possible). Completed forms are returned to Canfor. Trapper comments are recorded in Canfor's Incident Tracking System (refer to Section E 4.2) and appropriate actions are planned to ensure follow-up. Completed forms remain on file.

A spreadsheet has been developed to track all contacts and monitor conformance to the program. Comments made by the trappers will be tracked in the Incident Tracking System, as per EMS MSP I-03 - Public Communication.

5.3.6 Aboriginal Involvement

Canfor's *Public Involvement Program* provides many opportunities for Aboriginal people to provide input regarding the management of the resources within the FMA area. The following is a brief discussion.

5.3.6.1 Aboriginal Input

Canfor believes it is very important to understand and respect the special and unique needs of Aboriginal people. The Company maintains ongoing contact with Aboriginal people to ensure their interests and concerns are identified and, wherever possible, incorporated in strategic and operational planning and woodlands operations. Input from Aboriginal people has been actively sought to help identify special cultural and historic sites.

Canfor's goal is to avoid infringement of treaty and Aboriginal rights (Section G "Critical Element 6b, Goal 1.1"). As a result, 2 objectives were developed to achieve the goal:

1. To provide increased opportunities for input by Aboriginal people (Section G "Critical Element 6b, Objective 1.1a.1"); and
2. To develop and implement an early consultation process (Section G "Critical Element 6c, Objective 1.1a.1").

The most effective way to achieve these objectives is to provide a mechanism whereby Aboriginal people can readily provide input to Canfor. The current mechanism is the Forest Management Advisory Committee (FMAC) (refer to Section D 3.4.2 and Section E 6.2). The Sturgeon Lake Cree Nation and the Metis Nation of Alberta, Local 1990 have been members of the FMAC since inception (1995). As of April 2001, the Metis Nation of Alberta, Local 1990 has been represented by the Zone 6 Metis Nation of Alberta. Both groups have provided input regarding forest management activities that may impact treaty and Aboriginal rights.

It is also the Company's policy to meet with Aboriginal groups independently of other public groups. Canfor initiated meetings with the Sturgeon Lake Cree Nation to discuss communication between both parties including a process or mechanism to increase input opportunities and to ensure early consultation with Aboriginal people. Canfor has also contacted the Zone 6 Metis Nation of Alberta and the Aseniwuche Winewak Nation (AWN).

5.3.6.2 Responsiveness to Aboriginal Input

Changes to forest management and woodlands activities, resulting from Aboriginal input, will be documented, and action plans for implementation developed. If the input leads to changes, the details will be specified in the operating plans. Action items will be tracked in Canfor's Incident Tracking system. Correspondence, feedback, responses and other pertinent documents will also be kept on file.

5.3.6.3 Business Relationships

Canfor's Forestry Principles outline the Company's vision regarding business relationships with Aboriginal people, *"We will pursue business partnerships and cooperative working arrangements with Aboriginal people to provide mutual social, cultural and economic benefits and to address mutual interests."* (Canfor 1999a: p. 17).

Canfor wants to be a leader in establishing business relations with Aboriginal people. The Company's approach will be based on sound business practices and decisions while working together to address the issues and needs of both parties. Canfor will be open to the development of partnerships and working arrangements with Aboriginal people that are mutually beneficial and increase value to its shareholders (*Canfor's Forestry Principles*).

Canfor has established the following objective to achieve its vision of being a leader in establishing business relations with Aboriginal people.

- To identify present and future employment and business opportunities (Section G "Critical Element 6c, Objective 1.2a.1")

On April 20, 2000 Canfor met with Sturgeon Lake Cree Nation representatives to discuss issues of mutual interest and to develop a long-term working relationship. Based on the consensus at the meeting, Canfor agreed to prepare a draft 5 Year Strategic Plan and make it available for discussion at a future meeting. The draft plan was presented to the Sturgeon Lake Cree Nation on May 12, 2000. Both parties have continued to meet and develop the plan. Once completed, approval is required at the Canfor corporate level as well as the Band Council level.

Canfor is working with the Zone 6 Metis Nation of Alberta and Aseniwuche Winewak Nation to develop a framework for working together. Key interests and issues or areas of concern need to be identified by all parties. Those issues that provide mutual benefits, are appropriate, and are desirable to address or resolve will be explored.

Canfor believes that the development of cooperative working relationships with Aboriginal people will help provide certainty of timber supply for its manufacturing facilities. This in turn will help provide the stable business climate needed to attract investment, which ultimately is needed to sustain the Company's business and the communities where it operates. Again, all of these arrangements must be based on good, sound business practices and must be mutually beneficial to both Aboriginal people and Canfor (*Canfor's Forestry Principles* 1999a). The current business relationships with the Sturgeon Lake Cree Nation are described in the following sections.

5.3.6.3.1 Stand Tending

Sturgeon Lake Resources Ltd. has been awarded major stand tending contracts annually since 1994 (Figure 42). To date they have tended approximately 2,378 ha. Refer to Section F 15.9.3 for more information on stand tending programs.

Figure 42. Stand Tending
Since 1994, Sturgeon Lake Resources Ltd. has stand tended approximately 2,378 ha for Canfor.

5.3.6.3.2 Fire Control

Since 1994 Canfor has participated in a 3 way forest protection initiative with Lands and Forest Division (LFD) and Sturgeon Lake Cree Nation (Canfor 1999m). Under this program, Canfor hires Sturgeon Lake personnel for stand tending, the LFD provides suppression equipment and, when the fire hazard warrants it, Sturgeon Lake personnel become a stand-by crew for fire suppression. Canfor then "tops up" the fire wages so that the Sturgeon Lake crew earns the same salary as if they were stand tending.

5.3.6.3.3 Aboriginal Training

Since 1999, Canfor has provided annual assistance to 6 Sturgeon Lake Cree Nation members for training at the Grouard Adult Vocational Center. Trainees are gaining job-related skills.

6. Canfor's Sustainable Forest Management Plan (SFMP)

In July 1999, Canfor formally announced its commitment to seek sustainable forest management certification of the Company's forestry operations under the Canadian Standards Association (CSA) *Sustainable Forest Management System standard* CAN/CSA-Z809-96 (CSAI 1996a).

The purpose of the CSA standard is to describe the components and performance objectives of a sustainable forest management system. Under the system, the certification applicant must specify a Defined Forest Area (DFA)[8]). Canfor designated the FMA area as the DFA.

The CSA system ensures that management objectives are developed for the 22 critical elements of the 6 criteria for sustainable forest management established by the Canadian Council of First Ministers (CCFM 1997). Through a process of public participation, the CSA performance framework attains a local relevance in the form of locally determined values, goals, indicators and objectives (Refer below for more

[8] Defined Forest Area (DFA) is "a specified area of forest, land, and water delineated for the purposes of registration of the Sustainable Forest Management System " (CSAI 1996a: p. 2). The designated forest area for the SFMP is Canfor's FMA area.

information regarding public participation and Section G 4 for information regarding the CCFM framework).

Such participation by the Forest Management Advisory Committee (FMAC) resulted in the development of *The Sustainable Forest Management Plan for Canfor, Alberta Operations, Grande Prairie Operations* (July 2000).

Canfor Grande Prairie's Sustainable Forest Management Plan (SFMP) was certified to the CSA Z809-96 standards in June 2000, after an extensive review by KPMG, an independent third party audit firm. The primary components of the SFMP including values, goals, indicators and objectives, are contained in the Detailed Forest Management Plan (DFMP) as Section G 4.

6.1 Public Participation in Development of the Sustainable Forest Management Plan

An essential element to the success of sustainable forest management is the inclusion of systematic and formal public input into the management of the forested landbase in the defined forest area (DFA). According to the CSAI (1996b: p. xiii):

"*the registration of an SFM System applied to the DFA will follow a successful independent third-party registration audit, which will assess that an SFM System including quantified objectives for meeting sustainable forest management criteria has been established through a process of public participation."*

Public participation processes are characterized by accommodating, "*the public's varied knowledge of sustainable forest management, its different interests, levels of involvement, and differing cultural and economic ties with the forest."* (CSA 1996b: p. 15).

Involvement of FMAC in Canfor's Sustainable Forest Management Plan

- December 1, 1999 - the Committee agrees (via consensus) to undertake the CSA process.
- January 19, 2000 - work commences on a Terms of Reference for FMAC.
- February 23, 2000 - FMAC approves the final Terms of Reference.
- March 2000 – FMAC commences development of a CSA matrix.
- April 12, 2000 – FMAC finalizes and approves the matrix.
- Oct 2000 – FMAC reviews the final Sustainable Forest Management Plan (SFMP).

6.2 The Role of Forest Management Advisory Committee in Development of the Sustainable Forest Management Plan

Canfor has adopted public participation as an essential element in its forest management strategy. The FMAC, comprised of local stakeholder groups who are directly affected by or have an interest in the management of the forest resources, was organized to provide valuable input into the development of the DFMP by reviewing various documents and identifying issues of concern. On October 13, 1999 Canfor approached the FMAC and requested they consider also acting as the public consultation committee for the development of values, goals, indicators and objectives of the CSA criteria and

critical elements for the Sustainable Forest Management Plan (SFMP). The side bar provides a chronology of their participation in the development of the SFMP.

The Committee developed a *Terms of Reference*, thereby acknowledging their expanded role in assisting Canfor in their forest management planning activities. The *Terms of Reference* clearly states the goals, operating rules, methodology of making decisions, and dispute resolution mechanisms by which the Committee is able to provide input to Canfor on an objective and fair basis. When the mandate of the FMAC was expanded to include CSA certification, additional organizations were invited to participate. The members of the FMAC, as of March 4, 2000, are listed in Appendix 6 (together with a more detailed history of the FMAC meetings).

The primary task of the FMAC was to provide local values, goals, indicators and objectives (as per the definitions below) to Canfor for the criteria and critical elements as defined in CSA (1996b: p. 9):

- *"Values: principles, standards, or qualities considered worthwhile or desirable;*
- *Goals: broad, general statements that describe a desired state or condition related to one or more forest values;*
- *Indicators: measurable variables used to report progress toward the achievement of a goal; and*
- *Objectives: clear, specific statements of expected quantifiable results to be achieved within a defined period of time related to one or more goals; an objective is commonly stated as a desired level of an indicator."*

A matrix (Appendix 7) containing the Committee's values, goals, indicators and objectives was developed as the basis for the SFMP. A draft matrix was developed by FMAC members working together to arrive at a consensus during 5 meetings between January 2000 and March 2000. Canfor provided the rewording and rephrasing of the technical content with the approval of the FMAC. Final approval of the *CSA Matrix* was received on April 12, 2000.

6.3 Relationship between the Detailed Forest Management Plan and Sustainable Forest Management Plan

The relationship between the two strategic plans is strong. All of the quantitative objectives contained in the SFMP are incorporated into this DFMP. Other incorporated information includes:

- Detailed discussions about the interplay of technical and social parameters;
- Technical calculations and justification for the proposed annual allowable cut; and
- Community input about larger social issues of forest management.

It should be noted that some specific objectives from the SFMP relate only to Canfor and do not transfer liabilities to deciduous companies.