



1999 Detailed Forest Management Plan

revised October 2002





ACKNOWLEDGEMENTS

Alberta Newsprint Company Ltd., would like to express appreciation to Geographic Dynamics Corp. and Silvacom Inc. for their assistance in the preparation of this DFMP.

Geographic Dynamics Corp. were instrumental in describing the time zero forest condition, future forest projections, wildlife habitat modeling and the compilation and production of this DFMP and associated CD. Silvacom Inc produced the Timber Supply Analysis, yield curve modeling, and several components of the time zero forest condition. The professional capabilities of these two firms is greatly appreciated by ANC Timber Ltd.



TABLE OF CONTENTS

Chapter 1 Introduction 1.1 Purpose of the DFMP	
1.2 Planning Process	1-2
1.3 Description of the Operating Area	1-4
1.4 1996 Detailed Forest Management Plan	1-5
1.5 Company Philosophy	1-5
1.6 Document Structure	1-5
1.7 Goals and Objectives	1-7
Chapter 2 Landscape Assessment	
2.1 Introduction	2-1
2.2 Abiotic Features	
2.2.2 Soils	2-2
2.2.2.3 Surficial Materials	
2.2.2.4 Common Soil Units	
2.2.2.5 Characteristics of Soils Susceptible to Erosion	
2.2.3 Water Resources	2-12
2.2.4 Natural Disturbance Patterns	2-17
2.3 Biotic Features	2-20
2.3.1 Ecological Land Classification	
2.3.1.1 Ecological Stratification	2-21
2.3.1.2 Common Ecosite Types in the FMA Area	2-22
2.3.2 Rare and Endangered Plants	2-24
2.3.2.1 Characteristics of Rare Plants	
2.3.2.2 Levels of Rarity	
2.3.2.3 Canadian Rarity Status Codes for Plant Species	
2.3.2.4 Rare and Endangered Plants Within the FMA Area	2-25
2.3.3 Age Class Structure	2-27
2.3.3.1 Methods	2-27
2.3.3.2 Entire FMA Area	2-29

2.3.3.3 Natural Subregions	2-30
2.3.3.4 Caribou Zone	2-34
2.3.3.5 Vertical Structure	2-38
2.3.3.6 Non-Commercial Forest	2-39
2.3.4 Fragmentation/Connectedness	2-39
2.3.4.1 Patch Size Analysis	
2.3.4.2 Edge-to-area Area Ratio	
2.3.4.3 Linear Disturbance	
2.3.5 Wildlife Species	2-58
2.3.5.1 Amphibians	
2.3.5.2 Birds	2-61
2.3.5.3 Mammals	2-64
2.3.6 Habitat Types	2-68
2.3.6.1 Habitat Type 1 – Deciduous Forest Community	2-69
2.3.6.2 Habitat Type 2 – Young Burnt Forest/Naturally Disturbed Communities	
2.3.6.3 Habitat Type 3 – Post-rotation Forest Communities	
2.3.6.4 Habitat Type 4 – Riparian Areas	
2.3.6.5 Habitat Type 5 – Thermal Cover	
2.3.6.6 Habitat Type 6 – Residual Structure	
2.3.6.7 Habitat Type 7 – Caribou Habitat	
2.3.6.8 Habitat Type 8 – Grizzly Bear Habitat	2-82
2.3.7 Fish Species	
2.3.7.1 Fish Species of Interest—Selection of Specific Species	
2.3.7.2 Macroinvertebrates	
2.3.7.3 Fish Descriptions	2-86
2.3.8 Significant Biological Features	2-92
2.4 Social, Cultural and Economic Features	2-92
Chapter 3 Timber Supply Analysis	
3.1 Introduction	3-1
3.2 Historical Timber Supply	3-2
3.3 Growth and Yield Curves	3-2
3.3.1 VSP Sample Design	3-2
3.3.2 Yield Strata Definition	3-4
3.3.3 Timber Cruising Procedures	3-4
3.3.4 Cruise Compilation	3-5
3.3.5 Regenerated Yields	3-7

3.4	Landbase Determination	
	3.4.1 Process for Net Landbase Determination	3-10
	3.4.2 Net Landbase Estimates	3-13
3.5	Timber Supply Procedures	3-16
	3.5.1 Introduction.	
	3.5.2 Long Run Sustained Yield Average (LRSYA)	3-16
	3.5.3 Area Volume Check	3-22
	3.5.4 Harvest Simulation	3-28
	3.5.4.1 Simulation Control	
	3.5.4.2 Stand Sequencing	
	3.5.4.3 Annual Allowable Cut Synopsis	
	er 4 Future Forecasting of the Landscape Methods	4-1
4.2	? Age-Class Distribution	12
4.2	4.2.1 FMA Area	
	4.2.2 Natural Subregions	4-6
	4.2.3 Caribou Zone	4-16
	4.2.4 Patch Size Predictions	4-20
4.3	Wildlife Habitat Types	4-33
	4.3.1 Habitat Type 1 – Deciduous Forest Community	
	4.3.2 Habitat Type 2 – Young Burnt/Naturally Disturbed Communities	4-35
	4.3.3 Habitat Type 3 – Post-rotation Forest Communities	4-35
	4.3.4 Habitat Type 4 – Riparian Areas	4-38
	4.3.5 Habitat Type 5 – Thermal Cover	4-40
	4.3.6 Habitat Type 6 – Residual Structure	4-41
	4.3.7 Habitat Type 7 – Caribou Habitat	4-41
	4.3.8 Habitat Type 8 – Grizzly Bear Habitat	4-44



Chapter 5 Forest Management Strategies	
5.1 GOAL 1—Conservation of Biological Diversity	5-12
5.1.1 Forest Structure	
5.1.1.1 Age-class Distribution	5-13
5.1.1.2 Fragmentation and Connectedness	5-13
5.1.2 Terrestrial Wildlife Biodiversity	
5.1.2.1 Habitat Type 1 – Deciduous Forest Community	
5.1.2.2 Habitat Type 2 – Young Burnt Forest/Naturally Disturbed Communit	y5-15
5.1.2.3 Habitat Type 3 – Post-Rotation Forest Community	5-15
5.1.2.4 Habitat Type 4 – Riparian Areas	5-16
5.1.2.5 Habitat Type 5 – Thermal Cover	
5.1.2.6 Habitat Type 6 – Residual Forest Structure	5-16
5.1.2.7 Habitat Type 7 – Caribou Habitat	5-18
5.1.2.8 Habitat Type 8 – Grizzly Bear Habitat	5-20
5.1.3 Aquatic Biodiversity	5-21
5.1.4. Plant Biodiversity	5-21
5.2 GOAL 2—Maintenance of Forest Ecosystem Conditions and Productivity	5-22
5.2.1 Forest Renewal	
5.2.1.1 Basic Reforestation	
5.2.1.2 Enhanced Reforestation	5-26
5.2.2 Protecting the Forest from Natural Disturbances	
5.2.2.1 Wildfire Prevention and Suppression	
5.2.2.2 Wildfire Hazard Reduction	
5.2.2.3 Insects and Disease	5-28
5.2.3 Landbase Withdrawals	5-29
5.3 GOAL 3—Conservation of Soil and Water Resource	5-32
5.3.1 Long Term Access Development Planning	
5.3.1.1. Introduction	
5.3.1.2. Summer Access vs. Winter Access	
5.3.1.3. Access Opportunities Outside ANC FMA Area	5-33
5.3.1.4. Access Needs for Forest Protection	5-34
5.3.1.5. Non-Timber Values	5-34
5.3.1.6. Route Selection	
5.3.1.7. Road Use Management	5-35
5.3.1.8. Road Closures	
5.3.1.9. Implementation of LTADP	5-36
5.3.2 Water Protection Strategies	
5.3.2.1 Water Quality	
5.3.2.2 Water Quantity	5-38
5.3.3 Soil Protection	5-39

5.4 GOAL 4	4—Multiple Benefits of Forests to Society	5-42
5.4.1 E	conomic Viability	5-42
5.4.2 T	mber Production Tracking	5-42
5.4.3 B	alancing of Social, Economic, and Environmental Forest Values	5-43
5.4.4 S	ignificant Features, Including Recreation	5-44
5.4	.4.1 Protected Areas	5-44
5.4	.4.2 Non-Market Goods	5-44
5.4.5 R	esearch and Development	5-45
5.5 GOAL 5—A	accepting Society's Responsibility for Sustainable Development	5-46
	ites of Community Significance	
5.5.2 P	ublic Involvement	5-47
	.2.1 Regional Forest Advisory Committee (RFAC)	
	.2.2 Annual Open Houses	
	.2.3 Ad Hoc Meetings/Tours/Visits	
	.2.4 Personal Contact	
5.5.3 P	ublic Education	5-50
5.5.4 G	overnment Policy	5-50
LIST OF APPE Appendix #1	NDICES Forest Management Agreement	
Appendix #2	Foothills Model Forest Natural Disturbance Program	
Appendix #3	Wildlife Species Status	
Appendix #4	Forestry Wildlife Integrated Technical Committee Terms of Refere	ence
Appendix #5	Little Smoky Corridor Management Strategy	



LIST OF TABLES

Chapter 1 Table 1.1	Provincial and federal acts applicable to ANC's forest operations	1-4
Chapter 2 Table 2.1	Dominance, parent materials, soil series, and texture for common soil units in the FMA area	2-4
Table 2.2	Soil descriptions for common soil units in the FMA area	2-5
Table 2.3	Selected soil physical properties and their relationships to forestry	2-7
Table 2.4	Soil particle size classes	2-8
Table 2.5	Humus forms and their general characteristics	2-11
Table 2.6	Risk of soil erosion in the FMA area	2-12
Table 2.7	Long-term flow rates and average flows for various flood events	2-13
Table 2.8	List of water crossing densities for each type of linear disturbance within the FMA area	2-14
Table 2.9	Water and Soil Protection Lands Area Summary	2-16
Table 2.10	Number of fires and area burned for different size classes, for the greater ANC Area	2-17
Table 2.11	Number of fires and area burned per year in the greater ANC area	2-18
Table 2.12	Natural Regions hierarchical classification scheme	2-21
Table 2.13	Stand-level vs. landscape-level species group variable transition summaries	2-28
Table 2.14	FMA area current age-class distribution, by species groups, in hectares	2-29
Table 2.15	FMA area summaries, by NSR and species groups	2-31
Table 2.16	The summary of the current area, by species groups in the Caribou Zone	2-35
Table 2.17	Area summary of the Caribou Zone, by species groups	2-36
Table 2.18	Entire FMA area summary, by overstorey versus understorey species groups	2-39
Table 2.19	The Caribou Zone area summary, by overstorey versus understorey species groups	2-39



Table 2.20	Area summary of non-commercial forest area in ANC's FMA area	2-40
Table 2.21	Patch size analysis for pure conifer species group for the entire FMA area (ETAR—edge-to-area ratio)	2-41
Table 2.22	Patch size analysis for conifer leading mixedwood for the entire FMA area (ETAR—edge-to-area ratio)	2-42
Table 2.23	Patch size analysis for pure deciduous for the entire FMA area (ETAR—edge-to-area ratio)	2-43
Table 2.24	Patch size analysis for deciduous leading mixedwood for the entire FMA area (ETAR—edge-to-area ratio)	2-44
Table 2.25	Patch size analysis, by natural subregion (entire FMA area)	2-47
Table 2.26	Patch size analysis for Caribou Zone and FMA Area	2-49
Table 2.27	Mean edge/area ratio (m of edge per ha), by species group and age class	2-51
Table 2.28	Linear disturbance in Berland Sustained Yield Unit (by compartment)	2-52
Table 2.29	Linear disturbance in Foothills Sustained Yield Unit (by compartment)	2-52
Table 2.30	Linear disturbance in Little Smoky Sustained Yield Unit (by compartment)	2-53
Table 2.31	Linear disturbance in Pine Sustained Yield Unit (by compartment)	2-54
Table 2.32	General status categories and descriptions	2-58
Table 2.33	Species of concern within the ANC FMA area, listed by status rank	2-59
Table 2.34	Summary of habitat types and associated modelling definitions	2-68
Table 2.35	Deciduous forest community area summary, by species groups	2-69
Table 2.36	The distribution of current young burnt/naturally disturbed forest area, by species groups	2-71
Table 2.37	Area summaries for post-rotation wildlife habitat	2-72
Table 2.38	Age-class area summaries for riparian areas	2-73
Table 2.39	Average overstorey height, in metres, by stand age class for moist and wet moisture regimes	2-75
Table 2.40	Response values for HSI components	2-82
Table 2.41	Natural heritage element rarity ranks	2-85



Table 2.42	Non-game fish species expected to occur in the ANC FMA area	2-86
Table 2.43	Game fish species expected to occur in the ANC FMA area	2-86
Table 2.44	Non-market activities in the FMA area	2-92
Chapter 3 Table 3.1	Quota holders within ANC FMA area	3-2
Table 3.2	Yield strata numbers and assignments	3-4
Table 3.3	Field plot configuration	3-5
Table 3.4	Growing stock summary	3-7
Table 3.5	FMA area landbase summary	3-13
Table 3.6	Landbase summary: Berland SYU	3-14
Table 3.7	Landbase summary: Foothills SYU	3-14
Table 3.8	Landbase summary: Little Smoky SYU	3-15
Table 3.9	Landbase summary: Pine SYU	3-15
Table 3.10	Preliminary LRSYA estimates for ANC FMA - tree improvement regeneration transition	3-17
Table 3.11	Preliminary LRSYA estimates for ANC FMA - 50% empirical regeneration transition	
Table 3.12	Preliminary LRSYA estimates for ANC FMA - 25% PSP regeneration transition	3-19
Table 3.13	Preliminary LRSYA estimates for ANC FMA - fully stocked regeneration transition	3-20
Table 3.14	Preliminary LRSYA estimates for ANC FMA - status quo regeneration transition	3-21
Table 3.15	FMA area volume check results	3-22
Table 3.16	W1 – Little Smoky area volume check results	3-23
Table 3.17	W8 – Pine area volume check results	3-24
Table 3.18	E6 – Berland area volume check results	3-26
Table 3.19	E7 – Foothills area volume check results	3-27

Table 3.20	Run control parameter definitions	3-29
Table 3.21	Simulation parameters and results	3-32
Chapter 4 Table 4.1	ANC's TSA stand predictions, by NSR and canopy types	4-2
Table 4.2	Current area and area projections, by species groups	4-3
Table 4.3	Central Mixedwood NSR – area projections, by species groups	4-6
Table 4.4	Lower Foothills NSR – area projections, by species groups	4-10
Table 4.5	Upper Foothills NSR – area projections, by species groups	4-13
Table 4.6	Subalpine NSR – area projections, by species groups	4-16
Table 4.7	Area projections, by species groups, in the Caribou Zone	4-18
Table 4.8	Pure conifer 10-year predictions for the entire FMA area (ETAR—edge-to-area ratio)	4-21
Table 4.9	Conifer leading mixedwood 10-year predictions for the entire FMA area (ETAR—edge-to-area ratio)	4-22
Table 4.10	Pure deciduous 10-year predictions for the entire FMA area (ETAR—edge-to-area ratio)	4-23
Table 4.11	Deciduous leading mixedwood 10-year predictions	4-24
Table 4.12	Pure conifer 20-year predictions	4-25
Table 4.13	Conifer leading mixedwood 20-year predictions for the entire FMA area (ETAR—edge-to-area ratio)	4-26
Table 4.14	Pure deciduous 20-year predictions for the entire FMA area (ETAR—edge-to-area ratio)	4-27
Table 4.15	Deciduous leading mixedwood 20-year predictions for the entire FMA are (ETAR—edge-to-area ratio)	
Table 4.16	Habitat Type 1 area projections, by NSR	4-34
Table 4.17	Area summary of post-rotation habitat type, by species groups	4-36
Table 4.18	Area summaries in riparian areas habitat type, by species groups	4-38
Table 4.19	Area summaries of thermal cover habitat type	4-41
Table 4.20	Univariate statistics of caribou patch sizes in the FMA area	4-42

Table 4.21	Univariate statistics of patch edge-to-area ratios in the FMA area4-43
Table 4.22	Area summary in hectares, aggregated by grizzly bear HSI4-44
Table 4.23	Percent area summary, aggregated by grizzly bear HSI4-44
Table 4.24	Area summary of grizzly bear HSI in the FMA area, by 9-km² grid cells4-45
Table 4.25	Percent area summary of grizzly bear HSI, by 9-km ² grid cells4-45
Chapter 5 Table 5.1	Cross reference of objectives to strategies and background information5-2
Table 5.2	Reporting Schedule for TSA Validation5-7
Table 5.3	Summary of predicted potential for retention of residual forest structure5-16
Table 5.4	Principles of caribou management and associated strategies5-18
Table 5.5	Reforestation Methods used in the FMA area5-25
Table 5.6	Current (1999) members list on RFAC
	LIST OF FIGURES
Chapter 1	
Figure 1.1	Forest Management Planning Hierarchy1-3
Figure 1.2	Forest Management Units1-4a
Figure 1.3	Natural Daniera and Culturations
	Natural Regions and Subregions1-4b
Chapter 2	
Figure 2.1	Sensitive Soils2-12a
Figure 2.1	Sensitive Soils
Figure 2.1 Figure 2.2	Sensitive Soils
Figure 2.1 Figure 2.2 Figure 2.3	Sensitive Soils



Figure 2.7	Natural Disturbance Stratification	2-18a
Figure 2.8	Regional Fire History	2-18b
Figure 2.9	Forest Fuel Types	2-20a
Figure 2.10	Lightning Intensity	2-20b
Figure 2.11	Insect and Disease Risk, as a Function of Tree Species and Stand Age	2-20c
Figure 2.12	Landscape Management Units	2-24a
Figure 2.13	Rare, Threatened, and Endangered Plants	2-26a
Figure 2.14	Species and Age Class Distribution, species age based on AVI	2-30a
Figure 2.15	Current Age-Class Structure, by Species Groups	2-30
Figure 2.16	Area Summary, by Species Groups, in Central Mixedwood NSR	2-32
Figure 2.17	Area Summary, by Species Groups, in Lower Foothills NSR	2-33
Figure 2.18	Area Summary, by Species Groups, in Upper Foothills NSR	2-33
Figure 2.19	Area Summary, by Species Groups, in Subalpine NSR	2-33
Figure 2.20	Area Summary, by Species Groups, in the entire Caribou Zone	2-35
Figure 2.21	Caribou Zone Area Summary in Lower Foothills NSR	2-37
Figure 2.22	Caribou Zone Area Summary in Upper Foothills NSR	2-37
Figure 2.23	Caribou Zone Area Summary in Subalpine NSR	2-38
Figure 2.24	Vertical Structure, Understorey Used as Proxy for Vertical Structure	2-38a
Figure 2.25	Non-commercial Forest	2-40a
Figure 2.26	Species Group Fragmentation, by Age Class (1999) Time 0, Species Age Based on AVI Overstorey	2-40b
Figure 2.27	Patch Size Analysis for Pure Conifer Species Group (Entire FMA Area)	2-45
Figure 2.28	Patch Size Analysis for Conifer Leading Mixedwood (Entire FMA Area)	2-45
	Patch Size Analysis for Pure Deciduous Group (Entire FMA Area)	2-46
Alborto Nove	naint Company	

Figure 2.30	Patch Size Analysis for Deciduous Leading Species Group (Entire FMA Area)	2-46
Figure 2.31 Figure 2.32	Patch Size Analysis, by Natural Subregion (Entire FMA Area)	
Figure 2.33	Habitat Type 1 - Current Deciduous Community	2-70
Figure 2.34	Area Summary of Young Burnt Forest/ Naturally Disturbed Communites, by Species Groups	2-71
Figure 2.35	Young Naturally Disturbed Habitat Type 2	2-72a
Figure 2.36	Area Summary of Post-Rotation Wildlife Habitat Type	2-72
Figure 2.37	Percent of Post-Rotation Habitat Type Relative to the FMA Area	2-72
Figure 2.38	Post-Rotation (Habitat Type 3): Time 0	2-74a
Figure 2.39	Area Summary in Riparian Areas	2-74
Figure 2.40	Habitat Type 5 - Age-class Distribution of Thermal Cover	2-76
Figure 2.41	Thermal Cover (Habitat 5) Time 0	2-76a
Figure 2.42	ANC's FMA Area that is Scheduled for Harvesting and Not Scheduled for Harvesting, Over the 180-year Planning Horizon	2-77
Figure 2.43	The FMA Area Summary for Category I	2-78
Figure 2.44	Residual Structure (Habitat Type 6), Potential for Softwood Understorey (Category I)	2-78a
Figure 2.45	The FMA Area Summary for Category II	2-79
Figure 2.46	Residual Structure (Habitat Type 6), Potential for Live Balsam Poplar or White Birch (Category II)	2-80a
Figure 2.47	The FMA Area Summary for Category III	2-80
Figure 2.48	The FMA Area Summary for Category IV	2-80
Figure 2.49	Residual Structure (Habitat Type 6), Potential for Standing Dead Coniferous (Category IIII)	2-80b
Figure 2.50	Residual Structure (Habitat Type 6), Potential for Standing Dead Deciduous (Category IV)	2-80c
Figure 2.51	The FMA Area Summary for Category V	2-81

Figure 2.52	Residual Structure (Habitat Type 6), Potential Undersized Trees (Category V)	2-82a
Figure 2.53	Caribou Habitat (habitat type 7) Suitability Model: Time 0	2-82b
Figure 2.54	Current Area Summary of Grizzly Bear Habitat Suitability Index in the FMA Area	2-83
Figure 2.55	Current Area Summary of Grizzly Bear Habitat Suitability Index in the FMA Area, by 9-km ² Grid Cells	2-84
Figure 2.56	Grizzly Bear Fall Feeding HSI model: Time 0, Habitat Type 8	2-84a
Figure 2.57	Grizzly Bear Fall Feeding HSI Grid Cell Model: Time 0, Habitat Type 8	2-84b
Figure 2.58	Significant Features	2-94a
Figure 2.59	Aquatic Fauna	2-94b
Chantan 2		
Chapter 3 Figure 3.1	Decision Rules	3-3
Figure 3.2	Regenerated Yield Curves for Pure Softwood Species Group on Good Sites, Upper Foothills	3-8
Figure 3.3	Regenerated Yield Curves for Pure Softwood Species Group on Medium Sites, Upper Foothills	3-9
Figure 3.4	Regenerated Yield Curves for Pure Softwood Species Group on Good Sites, Lower Foothills	3-9
Figure 3.5	Regenerated Yield Curves for Pure Softwood Species Group on Medium Sites, Lower Foothills	3-10
Figure 3.6	The Net Production Area—Net Down Process Applied to the ANC FMA Area	3-12
Figure 3.7	Landbase Categories	3-12a
Figure 3.8	Compartments	3-30a
Figure 3.9	Simulation of Stand Sequencing	3-31
Figure 3.10	20-Year Harvest Plan, Little Smoky SYU	3-30b
Figure 3.11	20-Year Harvest Plan, Caribou	3-30c
Figure 3.12	20-Year Harvest Sequence, Pine SYU	3-30d



Figure 3.13	20-Year Harvest Sequence, Berland SYU	3-30e
Chapter 4 Figure 4.1	Age-Class Summary for the Pure Deciduous Species Group in the FMA Area	4-4
Figure 4.2	Age-Class Summary for the Deciduous Leading Mixedwood Species Group in the FMA Area	4-5
Figure 4.3	Age-Class Summary for the Pure Deciduous Species Group in the Entire FMA Area	4-5
Figure 4.4	Age-Class Summary for the Conifer Leading Mixedwood Species Group in the FMA Area	4-6
Figure 4.5	Age-Class Summary of the Pure Deciduous Species Group in the Centra Mixedwood NSR	
Figure 4.6	Age-Class Summary of the Deciduous Leading Mixedwood Species Group in the Central Mixedwood NSR	4-8
Figure 4.7	Age-Class Summary of the Pure Conifer Species Group in the Central Mixedwood NSR	4-8
Figure 4.8	Age-Class Summary for Conifer Leading Mixedwood Species Group in the Central Mixedwood NSR	4-9
Figure 4.9	Age-class Summary of the Pure Deciduous Species Group in the Lower Foothills NSR	4-11
Figure 4.10	Age-class Summary for the Deciduous Leading Mixedwood Species Group in the Lower Foothills NSR	4-12
Figure 4.11	Age-class Summary for the Pure Conifer Species Group in the Lower Foothills NSR	4-12
Figure 4.12	Age-class Summary of the Conifer Leading Mixedwood Species Group in the Lower Foothills NSR	4-12
Figure 4.13	Age-class Summary of the Pure Deciduous Species Group in the Upper Foothills NSR	4-14
Figure 4.14	Age-class Summary for the Deciduous Leading Mixedwood Species Group in the Upper Foothills NSR	4-15
Figure 4.15	Age-class Summary for the Pure Conifer Species Group in the Upper Foothills NSR	4-15
Figure 4.16	Age-class Summary for the Conifer Leading Mixedwood Species Group in the Upper Foothills NSR	4-16



Figure 4.17	Age-class Summary for the Pure Conifer Species Group in the Upper Foothills NSR	<i>A</i> _17
Figure 4.18	Age-class Summary for the Pure Deciduous Species Group in the Caribou Zone	
Figure 4.19	Age-class Summary for the Deciduous Leading Mixedwood Species Group in the Caribou Zone	4-19
Figure 4.20	Age-class Summary for the Pure Conifer Species Group in the Caribou Zone	4-19
Figure 4.21	Age-class Summary for the Pure Conifer Leading Mixedwood Species Group in the Caribou Zone	4-20
Figure 4.22	Pure Conifer 10-year Patch Size Predictions for the Entire FMA Area	4-29
Figure 4.23	Conifer Leading Mixedwood 10-year Patch Size Predictions for the Entire FMA Area	4-29
Figure 4.24	Pure Deciduous 10-year Patch Size Predictions for the Entire FMA Area	4-30
Figure 4.25	Deciduous Leading Mixedwood 10-year Patch Size Predictions for the Entire FMA Area	4-30
Figure 4 26	Pure Conifer 20-year Patch Size Predictions for the Entire FMA Area	4-31
Figure 4.27	Conifer Leading Mixedwood 20-year Patch Size Predictions for the Entire FMA Area	4-31
Figure 4.28	Pure Deciduous 20-year Patch Size Predictions for the Entire FMA Area	4-32
Figure 4.29	Deciduous Leading Mixedwood 20-year Patch Size Predictions for the Entire FMA Area	4-32
Figure 4.30	Species Group Fragmentation, by Age Class, Time 10	4-34a
Figure 4.31	Species Group Fragmentation, by Age Class (1999) Time 20	4-34b
Figure 4.32	Species Group Fragmentation, by Age Class (1999) Time 50	4-34c
Figure 4.33	Species Group Fragmentation, by Age Class (1999) Time 100	4-34d
Figure 4.34	Species Group Fragmentation, by Age Class (1999) Time 180	4-34e
Figure 4.35	Habitat Type 1 Area Summary in the Central Mixedwood NSR	4-34
Figure 4.36	Habitat Type 1 Area Summary in the Lower Foothills NSR	4-35

Figure 4.37	Habitat Type 1 Area Summary in the Upper Foothills NSR	4-35
Figure 4.38	Habitat Type 3 Area Summary for the Pure Deciduous Species Group	4-36
Figure 4.39	Habitat Type 3 Area Summary for the Deciduous Leading Mixedwood Species Group	4-37
Figure 4.40	Habitat Type 3 Area Summary for the Pure Conifer Species Group	4-37
Figure 4.41	Habitat Type 3 Area Summary for the Conifer Leading Mixedwood Species Group	4-37
Figure 4.42	Post Rotation (Habitat Type 3): Time 20	4-40a
Figure 4.43	Post Rotation (Habitat Type 3): Time 100	4-40b
Figure 4.44	Post Rotation (Habitat Type 3): Time 180	4-40c
Figure 4.45	Habitat Type 4 Area Summary for the Pure Deciduous Species Group	4-39
Figure 4.46	Habitat Type 4 Area Summary for the Deciduous Leading Mixedwood Species Group	4-39
Figure 4.47	Habitat Type 4 Area Summary for the Pure Conifer Species Group	4-40
Figure 4.48	Habitat Type 4 Area Summary for the Conifer Leading Mixedwood Species Group	4-40
Figure 4.49	Habitat Type 5 Area Summary for the Entire FMA Area	4-41
Figure 4.50	Thermal Cover (Habitat 5): Time 10	4-42a
Figure 4.51	Thermal Cover (Habitat 5): Time 20	4-42b
Figure 4.52	Thermal Cover (Habitat 5): Time 50	4-42c
Figure 4.53	Thermal Cover (Habitat 5): Time 100	4-42d
Figure 4.54	Thermal Cover (Habitat 5): Time 180	4-42e
Figure 4.55a	Change of Predicted Caribou Habitat Over the Planning Horizon	4-43
Figure 4.55b	Caribou Habitat Patch Size Fragmentation Over the Planning Horizon	4-44
Figure 4.56	Caribou Habitat Suitability Model: Time 20	4-44a



Figure 4.57	Caribou Habitat Suitability Model: Time 50	.4-44b
Figure 4.58	Caribou Habitat Suitability Model: Time 100	.4-44c
Figure 4.59	Caribou Habitat Suitability Model: Time 180	.4-44d
Figure 4.60	Area Summary of Grizzly Bear HSI in the FMA Area	4-44
Figure 4.61	Area Summary of Grizzly Bear HSI, by 9-km ² Grid Cells	4-45
Figure 4.62a	Grizzly Bear Fall Feeding HSI Model: Time 20	4-44e
Figure 4.62b	Grizzly Bear Fall Feeding HSI Model: Time 50	. 4-44f
Figure 4.63	Grizzly Bear Fall Feeding HSI Model: Time 100	4-48a
Figure 4.64	Grizzly Bear Fall Feeding HSI Model: Time 180	4-48b
Figure 4.65	Grizzly Bear Fall Feeding HSI Grid Cell Model: Time 20	4-48c
Figure 4.66	Grizzly Bear Fall Feeding HSI Grid Cell Model: Time 50	4-48d
Figure 4.67	Grizzly Bear Fall Feeding HSI Grid Cell Model: Time 100	4-48e
Figure 4.68	Grizzly Bear Fall Feeding HSI Grid Cell Model: Time 180	4-48f
Chapter 5 Figure 5.1	Scheduled Sequence of AVI Photography	5-31
Figure 5.2	Road Development Plan	
Figure 5.3	Road Density	5-26b



Chapter 1 Introduction

ANC Timber Ltd. has been granted a Forest Management Agreement (FMA# 8900026, see Appendix 1) by the Province of Alberta that covers approximately 374,000 ha, of which over 355,000 ha is classified as forested. This detailed forest management plan (DFMP) outlines ANC Timber Ltd.'s management plan for the next ten-year period. The DFMP will not necessarily describe, in detail, how all the commitments are to be delivered. Rather, the DFMP describes the commitments by ANC Timber with respect to how the FMA area is managed over the period of this plan. It provides a framework within which lower level plans and policies are developed. Much greater detail will be provided in documents developed after the approval of the DFMP: Operating Ground Rules, General Development Plans, Annual Operating Plans, Alberta Government policy, and Company policies and procedures.

ANC is committed to the approach that the path to sustainability of forests and their benefits and products must involve an adaptive management process: management activities are modified using experience gained from previous activities; performance monitoring and analysis provide feedback for future management decisions; and the process is repeated during each planning phase, resulting in better strategy development.

1.1 Purpose of the DFMP

Alberta Newsprint Company (ANC), a joint venture of the Stern Group and West Fraser Timber Company Ltd., is a leading manufacturer of premium quality newsprint. Using proven, state-of-the-art equipment and technology throughout its processes, for maximum production efficiency and quality control, the Whitecourt, Alberta mill produces environmentally friendly chemithermomechanical (cTMP) pulp and saleable newsprint.

The mill facility requires about 265,000 Bone Dry Tonnes (approximately 690,000 m³) of virgin coniferous wood fibre and 17,000 Tonnes of recyclable paper annually. The virgin fibre is supplied from the area defined by the Forest Management Agreement (FMA) #8900026 and from a Commercial Timber Quota in FMU W6. Total virgin coniferous fibre available is 391,000 m³ per year. The waste paper is supplied through purchases from community recycling programs.

During recent years, forest management has become increasingly complex as societal values have shifted and scientific knowledge has increased. The government has adopted a multiple-use philosophy with respect to forested areas in the province. This means that forest companies have to consider not only the sustainability of fibre flow, but also the sustainability of other resource values such as recreation, wildlife, and water quality. It is the intent of this plan to provide a description of the management of the FMA area—which will incorporate all resource values, in addition to fibre flow, within the FMA area—and how it will be managed in a long-term, sustainable manner. The Alberta Government, through the Department of Sustainable Resource Development, sets the regulations and guidelines that are intended to protect all values of the forest.

The detailed forest management plan is a requirement of FMA #8900026. The Forest Management Agreement defines the roles and responsibilities of ANC Timber Ltd. and the Alberta Government with respect to the management of the forest management area. It is the



intent of this plan to follow the direction of that agreement in terms of management goals, objectives, and strategies.

The FMA Agreement gives ANC Timber Ltd. the right to establish, grow, and harvest timber within the forest management area. It defines ANC's rights with regards to the land and our management obligations including reforestation and forest protection. It outlines our harvest reporting procedures, dues payment requirements and mill development requirements. The intent is to renew the agreement in perpetuity. The Forest Management Agreement is included as Appendix #1.

This DFMP establishes the sustainable level of harvest for coniferous and deciduous tree species for both ANC Timber and the quota holders who operate within the FMA area. It also fulfills Section 10.(3.) of ANC Timber Ltd.'s Forest Management Agreement which states that the Company shall, "Not later than the tenth anniversary date of this (FMA) agreement...submit a revised detailed management plan...". This version of the DFMP is a result of revisions made on the original draft plan, submitted on June 28, 1999. Figure 1.1 illustrates where this DFMP fits within the Alberta provincial planning hierarchy for Forest Management Planning.

1.2 Planning Process

Figure 1.1 outlines the planning processes of Alberta Newsprint Company. As indicated, there are many layers or levels within the process, all of which are important in meeting the company's and society's Goals. The hierarchical planning structure ensures that higher level initiatives are implemented at the proper level of operations. Regardless of the level within the hierarchy, a similar process takes place. Five steps can be identified:

- 1. Identification of the current conditions
- 2. Development of Goals and Objectives
- 3. Selection and implementation of the most applicable strategy
- 4. Implementation of a monitoring system that will allow evaluation/modification of the selected strategy (key step in adaptive management)
- 5. Revise strategies as appropriate

This DFMP is one of the fundamental documents in setting company Policies, Goals and Objectives. It outlines the broad strategies that we have selected to help us meet those Objectives. Finally, it outlines some of the monitoring systems we have in place to ensure that our strategies are working effectively. The complete set of monitoring systems will be developed, in consultation with Alberta Sustainable Resource Development, during the post-approval negotiations concerning the Operating Ground Rules and the Commitment Matrix.

ANC's latest DFMP has been developed through industry and government cooperation. ANC forest managers have compiled information from several sources, incorporated the applicable legislation (Table 1.1), along with our Goals and Objectives, and devised a sustainable management plan for the FMA area.



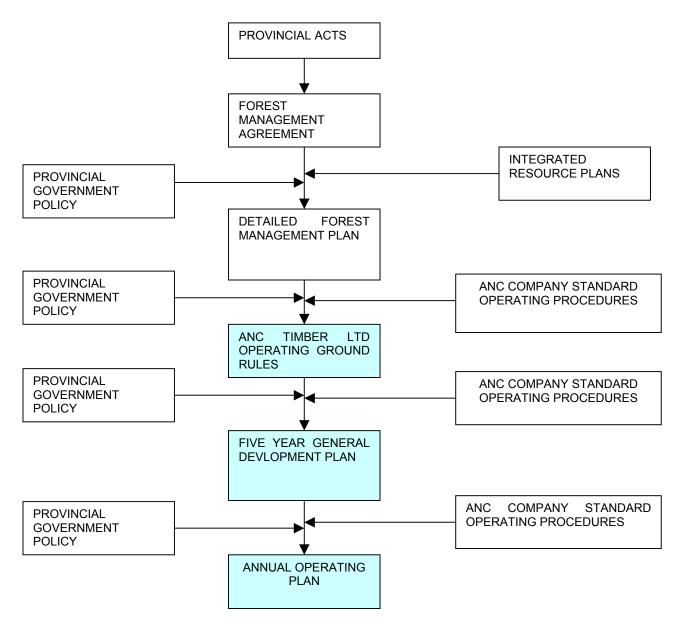


Figure 1.1 Forest Management Planning Hierarchy. Blue boxes are planning levels after the DFMP approval.

Table 1.1 Provincial and federal acts applicable to ANC's forest operations

Provincial	Federal	
Environmental Protection and Enhancement	Canadian Environmental Assessment Act	
Act		
Fisheries (Alberta) Act	Canada Environmental Protection Act	
Forests Act	Federal Fisheries Act	
The Forest Prairie and Protection Act	Fertilizers Act	
Forest Reserves Act	Migratory Birds Convention Act	
Historical Resources Act	Navigable Waters Act	
Natural Resources Conservation Board Act Pest Control Products Act		
Occupational Health and Safety Act Transportation of Dangerous Good		
Provincial Parks Act		
Public Highways Development Act		
Public Lands Act		
Public Transportation Act		
Soil Conservation Act		
Water Act		
Weed Control Act		
Wilderness Areas, Ecological Reserves, and		
Natural Areas Act		
Wildlife Act		

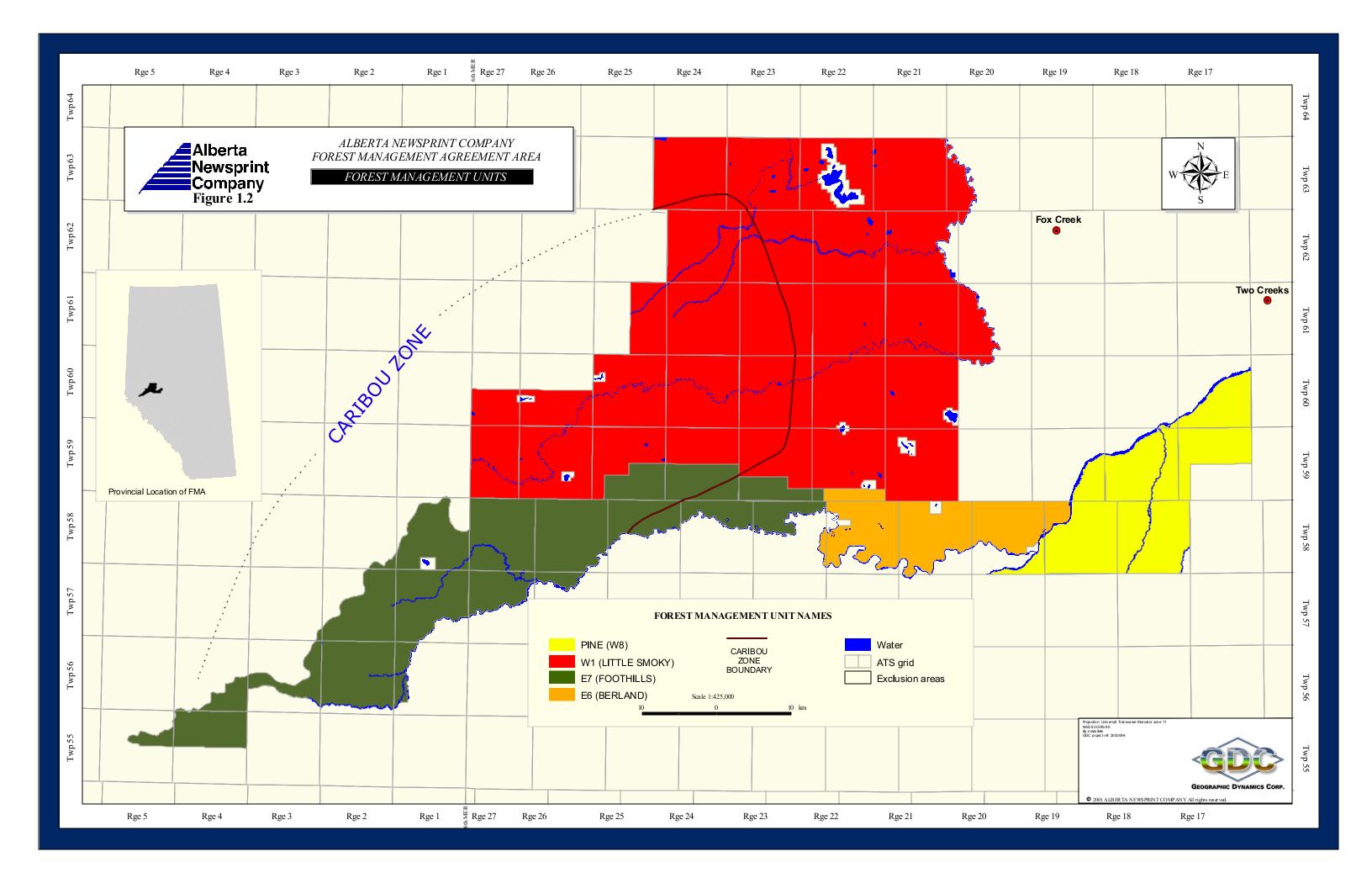
As indicated in Figure 1.1, there are three additional planning levels after the approval of the DFMP whereby further and more detailed implementation strategies are developed. Probably of most significance are the ANC Operating Ground Rules and Standard Operating Procedures, along with the Government policies, which provide the framework for the development of detailed goals, strategies and implementation programs.

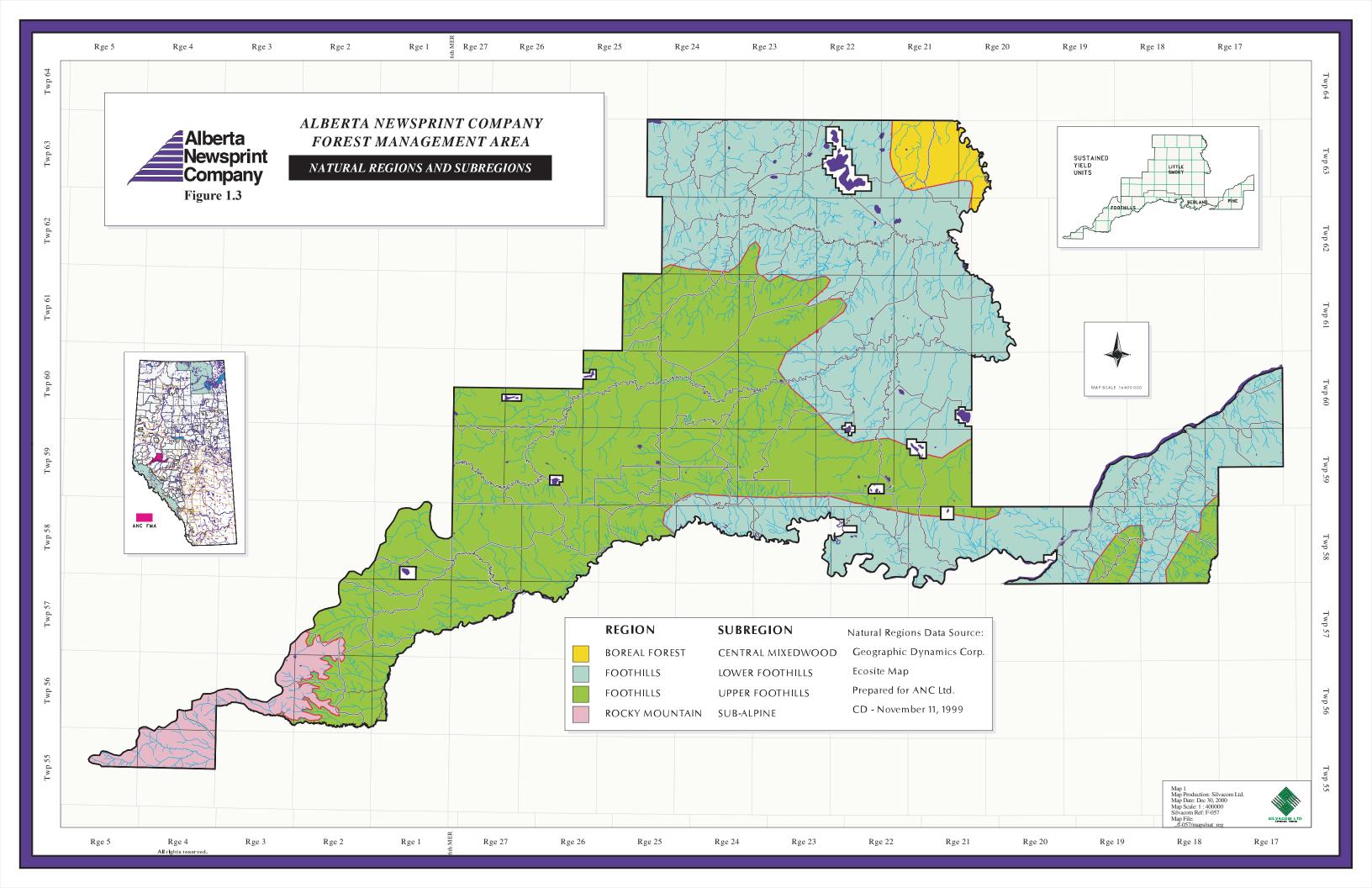
Upon approval of this DFMP, a new set of Operating Ground Rules will be negotiated with Alberta Sustainable Resource Development. These ground rules will be unique to the ANC FMA (per section 11 of the FMA) and will meet the Goals and Objectives contained within this plan.

1.3 Description of the Operating Area

The FMA area's east-west boundary is marked by Ranges 5-17 and its north-south boundary is marked by Townships 55-63 (Figure 1.2). Figure 1.2 also shows the subdivision of the FMA area according to areas (called FMUs) that are used for forest management planning: Pine/W8 (38,700 ha), Little Smoky/W1 (225,600 ha), Foothills/E7 (86,200 ha), and Berland/E6 (23,300 ha), to equal approximately 374,000 ha.

Figure 1.3 is a more detailed depiction of the FMA area, showing its subdivision into the natural subregions: central mixedwood (8,800 ha), lower foothills (171,400 ha), upper foothills (179,300 ha), and subalpine (14,400 ha). Included in these areas is a special management area, the Caribou Zone (172,000 ha). ANC's Forest Management Agreement (FMA) area is approximately 373,900 ha. The FMA area comprises 94% of productive forests, 5% of nonforested and 1% of recreational areas. The close, but not exact, area totals are due to rounding areas.





1.4 1996 Detailed Forest Management Plan

Approved by the Assistant Deputy Minister, Alberta Land and Forest Service on July 5, 1996, the 1996 DFMP describes ANC Timber Ltd.'s original management approach for the FMA area. It was the initial DFMP for the FMA area and it set the stage for future management. The 1996 plan is sound and requires only minor adjustments, rather than a complete change in focus, to ensure that management activities are reflective of new technology, new information and new approaches to resource management. To that end this DFMP enhances the 1996 plan.

Once this Detailed Forest Management Plan is approved by Alberta Sustainable Resource Development, it will replace the 1996 DFMP.

1.5 Company Philosophy

Three statements of intent describe how ANC Timber Ltd. approaches the management of Forest Management Agreement #8900026.

COMPANY MISSION STATEMENT: "We will consistently provide our customers with the best newsprint and service by working together as an efficient, safe and publicly responsible team."

COMPANY CORPORATE CITIZENSHIP OBJECTIVE: "ANC will be trusted by the public to act responsibly with our resources, our environment and within our community."

COMPANY FOREST MANAGEMENT PHILOSOPHY: "ANC Timber Ltd. will adaptively manage the Forest Management Agreement Area based on best available knowledge while being responsive to public desires."

The key word that ties these three statements together is the word "public". In particular, the term "publicly responsible" provides the basis of ANC Timber Ltd.'s approach to forest management. To be publicly responsible, ANC must conduct its operations in a manner that is sustainable in every area of influence. This includes not only ANC's responsibility to its shareholders, but also to the environment, to the local community, and to future generations. ANC takes these obligations very seriously, and we intend to put into place operating procedures that will protect society's interests, while fulfilling the economic benefits that ANC brings to the communities within and adjacent to the FMA area. We will do this by adopting procedures based on current industry and provincial guidelines and by developing new procedures based on current developments in scientific literature. This DFMP is a reflection of our commitment to the public in the form of a responsible forest management plan.

1.6 Document Structure

There is a vast amount of information within a detailed forest management plan and much of it is technical. This DFMP attempts to make the reader's task a little easier through its basic structure and through its use of section introductions that tie the various aspects of the plan together. The DFMP is subdivided into five chapters:

➤ Chapter 1 – Chapter 1 contains background information that lays the foundation for the rest of the DFMP. It includes our company background and philosophy, and the general purpose and cites the supporting documents for the DFMP.



The chapter concludes with a presentation of the Goals and Objectives of this DFMP, which will be used to guide the implementation of the DFMP at the three lower levels of planning (Figure 1-1). These goals and objectives have been adapted from the "Criteria and Indicators for Sustainable Forest Management" developed by the Canadian Council of Forest Ministers (CCFM 1997). ANC believes that the industry-wide approach represented by the CCFM's Criteria and Indicator concept is necessary to deal with goals and objectives that are broader in scope than what can normally be dealt with at an individual company level.

- ➤ Chapter 2 The landscape assessment chapter describes the FMA area according to its abiotic, biotic, and socio-economic features. The information presented in this chapter is a snapshot in time of the existing conditions of the various forest resources.
- ➤ Chapter 3 The detailed forest management strategy of ANC is modelled in the timber supply analysis (TSA). This chapter contains a condensed version of the TSA. The TSA is vital to the DFMP because it analyzes how much timber can be sustainably removed from the FMA area. This in turn, determines the annual allowable cut (AAC) on which many of ANC's strategies depend. The assumptions and models used to determine the AAC are based on sound scientific principles. ANC has spent considerable effort ensuring the TSA reflects realistic levels of timber removal and is sustainable in the long term. The analyses in this chapter are based on the operational units used in forest planning, the FMUs (also called sustainable yield units).
- ➤ Chapter 4 Several of the forest resource components described in Chapter 2 have been predicted in the 180-year planning horizon, as a result of the proposed forest management scenario modelled in the timber supply analysis. By comparing current and predicted forest conditions, ANC assesses the potential impact of forest management activities on the landscape and determines necessary adjustments to the selected forest initiatives. The analyses in this chapter are based on the ecological characteristics of the landbase, as described by the natural subregions and Caribou Zone subdivisions.
- ➤ Chapter 5 This chapter outlines the strategies ANC has developed to meet the Goals and Objectives defined in Chapter 1. It is the most important chapter in the DFMP because it contains the methodologies by which ANC will meet its commitments. The strategies developed in this chapter will form the basis for the operating ground rules and procedures that will be implemented in ANC's day-to-day operations. These are the strategies that will protect such societal values as wildlife, recreation, biodiversity and watersheds. ANC Timber's general approach is to obey all legislated guidelines and standards, while adopting more stringent standard operating procedures (SOP's) wherever we feel that would be beneficial. ANC has developed company-specific SOP's, based on current scientific principles, when we felt that legislation and other guidelines were not enough to meet our stated Goals and Objectives.

1.7 Goals and Objectives

Developing Goals and Objectives applicable to a large FMA area like the one ANC Timber administers, is a difficult task considering the number of factors that must be taken into account during the planning process. The Government of Alberta has embraced a multiple-use concept for public forestland in our province, which adds to the complexity of forest management. Forest planners must consider profitability, environmental sustainability, societal goals, community interests, and the interests of other resource users, to name but a few. Fortunately, the forest industry in Alberta has a long history of cooperation with government agencies and other stakeholders. This has led to the development of strong provincial legislation aimed at creating a sustainable forest industry. It has also led to the development of self-imposed guidelines and operating procedures in addition to government guidelines. These regulations and guidelines assist individual companies in making the right choices during the development of short- and long-term goals, objectives, strategies and operating procedures. Finally, an atmosphere has arisen during the development of the forest industry in Alberta that has attracted many top-level professionals to individual companies' management teams. At ANC Timber, we believe that we have attracted the best people available to fill those positions.

During the process of developing goals and objectives, ANC Timber Ltd. engaged in discussions with Alberta Environmental Protection, Millar Western Industries, Blue Ridge Lumber (1981) Ltd., and Mostowich Lumber Ltd. to determine if it was feasible to develop a series of regional Goals and Objectives for the sustainable management of the forest areas within the Whitecourt region. Consensus was reached that the Canadian Council of Forest Ministers (CCFM) had developed a framework (CCFM 1997) necessary to begin development of regionally based forest management principles. Several discussions and meetings were held among this group with the final consensus that the CCFM wording was an excellent description of sustainable forest management. The Criteria and Indicators (C and I) developed by the CCFM were intended to provide a common understanding and scientific definition of sustainable forest management in Canada. The C and I framework reflects an approach to forest management that is ecosystem based and recognizes that forests provide a wide variety of values to all Canadians.

This DFMP, then, defines a series of Goals and Objectives that address the various topics recognized by the CCFM. In order to provide a sense of scale around the objectives a statement of scope was also defined for each objective. Four scopes or scales recognized: National, Provincial, Landscape/Regional, and Forest/FMA area. If an objective could only be met by implementing strategies across the entire country it was given a National scope. Similarly, if strategies could be developed at a provincial scale then the scope is Provincial. Some objectives could be met by having regional strategies and others could be only approached at the scale of an FMA area. Generally, but not exclusively, if the scope is Forest/FMA area, then ANC Timber will take a significant level of ownership in the development of strategies and measurement criteria associated with determining success or failure in meeting the objective. As the scope broadens towards Provincial and National levels, detailed forest management plans will be less applicable. Every Objective listed within this DFMP has an associated strategy, and the location of this strategy in the DFMP is identified.

The ANC level of involvement statements give the reader some insight into how ANC expects to become involved in the varied aspects of managing the FMA area. A list of definitions is provided for the involvement category given each Indicator:



- O: Owned by ANC Timber. Fundamental to the internal values, mandate or mission of ANC Timber. ANC Timber will normally wish to set indicators and objectives and to take a lead role in forecasting and monitoring performance against these goals.
- A: Adopted by ANC Timber. Originally external to ANC Timber but are accepted by or imposed upon ANC. ANC will normally want to agree on indicators of performance and will be willing to modify conflicting objectives and share in the cost of forecasting and monitoring performance.
- R: Recognized by ANC Timber as valid aims of others. ANC may be unwilling to modify conflicting objectives and to incur uncompensated effort in forecasting and monitoring performance.
- D: Disputed by ANC Timber. These are not accepted as valid aims by ANC. ANC will likely contest any activities in pursuit of such goals and will be unwilling to participate in cooperative monitoring and forecasting.

The Goals and Objectives include traditional concepts, such as timber values, but go beyond timber values to encompass other environmental and social values. ANC used an adaptive management approach to further define the specifics of how an Objective would be met in practice. These are defined as strategies, which are described in Chapter 5 of the DFMP. The following is a complete description of the Goals and Objectives that will be used to achieve aspects of sustainable forest management within ANC Timber's Forest Management Agreement area.

ANC Goals and Objectives

GOAL 1—CONSERVATION OF BIOLOGICAL DIVERSITY

It is the goal of this detailed forest management plan to not cause a reduction in ecosystem diversity, species diversity, or genetic diversity as a result of the activities directed by the plan.

Objective 1.1: Maintain, both spatially and temporally, within the natural range of variability the relative percentage and extent of historical forest types, as measured by the extent, in area, of forest types, relative to the historical condition and total forest area.

Scope: Forest/FMA

ANC Level of Involvement: Owned

The strategies for addressing this objective are in Section 5.1.1.1.

Objective 1.2: Assess the current condition and ensure the current condition is within or moves toward the natural range of variability as measured by percent and extent of area by forest type and age class.

Scope: Forest/FMA

ANC Level Of Involvement: Owned

The strategies for addressing this objective are in Section 5.1.1.1.

Objective 1.3: Maintain the integrity of the ecosystem by not exceeding critical thresholds for levels of fragmentation and connectedness of forest ecosystem components, as measured by the level of fragmentation and connectedness of forest ecosystem components.

Scope: Landscape/Regional

ANC Level Of Involvement: Owned

Strategies for meeting this objective are in Section 5.1.1.2.

Objective 1.4: To maintain or decrease the number of known forest dependent wildlife species classified as extinct, threatened, endangered, rare or vulnerable relative to the total number of known dependent species, as measured by the available habitat.

Scope: Provincial

ANC Level Of Involvement: Adopted

Strategies to meet this objective are in Section 5.1.2.



Objective 1.5: Ensure the populations of select species and species guilds are not put at risk, as measured by the availability of wildlife habitat and the change over time of habitat types.

Scope: Provincial

ANC Level Of Involvement: Adopted

Strategies to meet this objective are in Section 5.1.2.

Objective 1.6: Ensure that the number of known forest dependent species, as measured by the availability of habitat, that occupy only a small percentage of their former range does not increase.

Scope: Provincial

ANC Level Of Involvement: Adopted

Strategies to meet this objective are in Section 5.1.2.

Objective 1.7: Maintain regionally adapted genetic populations for commercial and endangered forest vegetation species, implemented by an insitu/exsitu genetic conservation strategy for commercial and endangered forest vegetation species.

Scope: Landscape/Regional

ANC Level Of Involvement: Adopted

Strategies to meet this objective are in Section 5.1.4.1.

GOAL 2—MAINTAIN AND ENHANCE FOREST ECOSYSTEM CONDITION AND PRODUCTIVITY

Sources of disturbance and stress typically include insects, disease, fire, pollutants and exotic pests. The goal of this DFMP is to not cause disturbance and stress to forest ecosystems that results in a state or condition beyond the range of natural variability. Forest ecosystems have an inherent capacity to recover from disturbances. This DFMP intends to ensure that ecosystem resilience is not diminished.

Objective 2.1: Area and severity of insect attacks are maintained at rates appropriate to ensure other natural processes are not disrupted.

Scope: Forest/FMA

ANC Level Of Involvement: Adopted

Strategies for addressing this objective are in Section 5.2.2.3.



Objective 2.2: Area and severity of disease infestations are maintained at rates appropriate to ensure other natural processes are not disrupted.

Scope: Forest/FMA

ANC Level Of Involvement: Adopted

Strategies for addressing this objective are in Section 5.2.2.3.

Objective 2.3: Area and severity of fires are maintained at rates appropriate to ensure other natural processes are not disrupted.

Scope: Forest/FMA

ANC Level Of Involvement: Adopted

Strategies for addressing this objective are in Section 5.2.2.1.

Objective 2.4: Ensure changes in crown transparency on a forest level do not reflect significant changes to forest health, as measured by the percentage coverage, by class.

Scope: Provincial

ANC Level Of Involvement: Adopted

Strategies for addressing this objective are in Section 5.2.1.1.

Objective 2.5: Ensure the area and occurrence of exotic insect and disease species does not compromise natural ecological processes.

Scope: Landscape/Regional

ANC Level Of Involvement: Adopted

Strategies for addressing this objective are in Section 5.2.2.3.

Objective 2.6: Identical to Objective 1.2.

Objective 2.7: The percentage of area successfully naturally regenerated and artificially regenerated will be 100% of all areas harvested within two years of harvest.

Scope: Forest/FMA

ANC Level Of Involvement: Owned

Strategies for addressing this objective are in Section 5.2.1.2.



Objective 2.8: Not reduce, beyond the natural range of variability, the capacity of the forest to accumulate biomass by means of maintaining or increasing the mean annual increment by forest type and age class.

Scope: Forest/FMA

ANC Level Of Involvement: Owned

Strategies to address this Objective are in Section 5.2.1.2 and Section 5.2.1.3.

Definition Box

Biomass

Represents the mass of living organisms inherent in an ecosystem and is considered a measure of forest ecosystem condition.

Mean annual increment (MAI)

The average increase in volume of individual trees or stands up to a specified point in time. The mean annual increment changes with different growth phases in a tree's life, being highest in the middle years and then slowly decreasing with age. The point at which the mean annual increment peaks is commonly used to identify the biological maturity of the stand and its readiness for harvesting

Objective 2.9: Identical to Objective 1.6.

Objective 2.10: Maintain and, keep current, company forest inventories.

Scope: Forest/FMA

ANC Level of Involvement: Owned

Strategies to address this Objective are in Section 5.1.1.1.



GOAL 3—CONSERVE SOIL AND WATER RESOURCES

This goal is achieved by ensuring that the capacity of soil and water to function within the range of natural variability is not diminished. The soil and water resources of the forest underpin the long-term ecosystem sustainability.

Objective 3.1: Minimize the percentage of harvested area having significant soil compaction, displacement, erosion, puddling, and loss of organic matter, as measured by the percentage of harvested area affected in these ways.

Scope: Forest/FMA

ANC Level Of Involvement: Owned

Strategies to address this Objective are in Section 5.3.3.

Objective 3.2: Minimize the area of forest converted to non-forest land uses (e.g., urbanization and industry).

Scope: Forest/FMA

ANC Level Of Involvement: Adopted

Strategies to address this Objective are in Section 5.2.3.

Objective 3.3: Maintain water quality indices within acceptable levels for the Province of Alberta, as measured by water chemistry, turbidity, and other parameters.

Protection of water resources within the FMA is intended to ensure the quality and quantity of water is not affected beyond the range of variability that would potentially result from natural processes

Scope: Provincial

ANC Level Of Involvement: Adopted

Strategies to address this Objective are in Section 5.3.2.1.

Objective 3.4: Maintain natural trends and timing of events in stream flows from forest catchments.

Scope: Forest/FMA

ANC Level Of Involvement: Adopted

Strategies to address this Objective are in Section 5.3.2.2.



Objective 3.5: Ensure changes in the distribution and abundance of aquatic fauna are within the range of natural variability, as measured by the potential effects of ANC's management activities on aquatic fauna habitat.

Scope: Landscape/Regional

ANC Level Of Involvement: Adopted

Strategies to address this Objective are in Section 5.1.3.

Objective 3.6: Implement policies and guidelines that provide for specific management practices to protect ecosystems from inappropriate practices. In particular, maintain or increase the percentage of area managed for soil and water protection.

Scope: Forest/FMA

ANC Level Of Involvement: Owned

Strategies to address this Objective are in Section 5.3.2.1.

Objective 3.7: Ensure the total FMA area has road construction and stream crossing guidelines in place.

Scope: Forest/FMA

ANC Level Of Involvement: Owned

Strategies to address this Objective are in Section 5.3.1 and Section 5.3.2.1.

Objective 3.8: Ensure the hydrologic cycles are not affected or changed beyond the range of natural variability by forest management activities, measured by the amount of surface area of water within forested areas.

Scope: Forest/FMA

ANC Level Of Involvement: Owned

Strategies to address this Objective are in Section 5.3.2.2.



GOAL 4—MAINTAIN MULTIPLE BENEFITS OF FORESTS TO SOCIETY

This goal is achieved by not reducing the capacity of forests for generating a flow of benefits to society.

Objective 4.1: Ensure quadrant (5 year) removal of forest wood products does not exceed amount determined to be sustainable.

Scope: Forest/FMA

ANC Level Of Involvement: Owned

Strategies to address this Objective are in Section 5.4.2.

Objective 4.2: Minimize the distribution of and changes in landbase not available for timber production.

Scope: Forest/FMA

ANC Level Of Involvement: Adopted

Strategies to address this Objective are in Section 5.2.3.

Objective 4.3: All population trends, as measured by trends in habitat availability, of indicator animal species of economic importance will be maintained or increased.

Scope: Provincial

ANC Level Of Involvement: Adopted

Strategies to address this Objective are in Section 5.1.2.



Objective 4.4: Ensure competitiveness of ANC by maintaining returns on investments to allow increased R and D expenditures in forest products and processing technologies, even in the absence of government incentives.

Definition Box

Relationship between competitiveness and sustainability

Remaining competitive is an important aspect of sustainability for two reasons. First, the provision of jobs and incomes and payment of corporate taxes to governments is dependent on ANC Timber's ability to be profitable. Second, the relative efficiency and competitiveness of ANC Timber will determine its ability to absorb the higher costs that may be associated with environmentally sensitive development and production. ANC Timber intends to remain competitive and profitable in the forest products sector, ensuring a satisfactory return on investment to its owners.

Scope: National

ANC Level Of Involvement: Owned

Strategies to address this Objective are in Section 5.4.4.

Objective 4.5: ANC will contribute to the national economy by maintaining or increasing its employment in forest related sectors.

Scope: Landscape/Regional

ANC Level Of Involvement: Recognized

Strategies to address this Objective are in Section 5.4.1.

Objective 4.6: Maintain or increase the utilization of the forests for non-market goods and services, including forestland use for subsistence purposes.

Scope: Landscape/Regional

ANC Level Of Involvement: Recognized

Strategies to address this Objective are in Section 5.4.3.



Objective 4.7: Maintain opportunities for economic valued non-market goods and services.

Scope: Landscape/Regional

ANC Level Of Involvement: Recognized

Strategies to address this Objective are in Section 5.4.3.3.

Objective 4.8: Maintain availability and use of recreational opportunities.

Scope: Forest/FMA

ANC Level Of Involvement: Adopted

Strategies to address this Objective are in Section 5.4.3.1.

GOAL 5—ACCEPTING SOCIETY'S RESPONSIBILITY FOR SUSTAINABLE DEVELOPMENT Sustainable forest management must recognize individual's and group's rights to protect their current and traditional way of life by allowing these individuals and groups opportunities to provide input into how FMA #890026 is being managed by ANC. ANC intends to ensure that no individual's or group's rights are reduced as a result of ANC Timber's activities.

Objective 5.1: Forest planning and management processes will consider and meet legal obligations with respect to duly established individual and group rights, including Aboriginals.

Scope: Forest/FMA

ANC Level Of Involvement: Owned

Strategies to address this Objective are in Section 5.5.2.

Objective 5.2: Protect unique or significant community (including Aboriginals), social, cultural, or spiritual sites.

Scope: Forest/FMA

ANC Level Of Involvement: Adopted

Strategies to address this Objective are in Section 5.5.1.



Objective 5.3: Continue to provide areas of forestland available for subsistence purposes.

Scope: Provincial

ANC Level Of Involvement: Recognized

Strategies to address this Objective are in Section 5.4.3.3 and Section 5.5.1.

Objective 5.4: Maintain or increase the diversity of forest use at the community level.

Scope: Landscape/Regional

ANC Level Of Involvement: Adopted

Strategies to address this Objective are in Section 5.5.1.

Objective 5.5: Provide opportunities for input to planning processes to communities and groups with stewardship or co management responsibilities.

Scope: Forest/FMA

ANC Level Of Involvement: Owned

Strategies to address this Objective are in Section 5.5.2.

Objective 5.6: Encourage public participation in the forest management process.

Scope: Forest/FMA

ANC Level Of Involvement: Owned

Strategies to address this Objective are in Section 5.5.2.

Objective 5.7: Invest in forest-based research and development.

Scope: National

ANC Level Of Involvement: Adopted

Strategies to address this Objective are in Section 5.4.4.



Objective 5.8: Contribute to public forestry education.

Scope: National

ANC Level Of Involvement: Owned

Strategies to address this Objective are in Section 5.5.2.

Objective 5.9: Participate in mutual learning mechanisms and processes.

Scope: National

ANC Level Of Involvement: Owned

Strategies to address this Objective are in Section 5.5.2.

Objective 5.10: Participate in the development of appropriate forest sector government policy, primarily at the Provincial level but also at the Federal level, where appropriate.

Scope: Forest/FMA

ANC Level Of Involvement: Owned

Strategies to address this Objective are in Section 5.5.3.

Objective 5.11: Ensure the participation of ANC in the defining and amending of all laws and regulations and policies pertaining to or impacting upon forestland management.

Scope: Provincial

ANC Level Of Involvement: Adopted

Strategies to address this Objective are in Section 5.5.3.

LITERATURE CITED

CCFM (Canadian Council of Forest Ministers). 1997. Criteria and Indicators of Sustainable Forest Management in Canada. Technical Report. Natural Resources Canada, Canadian Forest Service, Ottawa, ON.

