



## Detailed Forest Management Plan

2004 – 2014

Volume III

Chapter 7: Resource Management Objectives, Strategies  
and Tactics

Chapter 8: Implementation Plan

Chapter 9: Performance Monitoring

Chapter 10: Future Considerations

Weyerhaeuser Company Ltd.

Edson, Alberta



## Foreword

This is Volume III of the Edson Detailed Forest Management Plan (DFMP) for the area managed under Forest Management Agreement # 9700035. This area includes Forest Management Units (FMU) E1, E2, W5, and W6. Each volume of the DFMP can be read as a freestanding report. However, the entire set of three volumes together is the full DFMP. Each volume has a separate Table of Contents, but for consistency they all share a common List of Acronyms and Glossary.



## Table of Contents

FOREWORD.....	i
ACRONYM LIST .....	vi
GLOSSARY .....	viii
7 RESOURCE MANAGEMENT OBJECTIVES, STRATEGIES AND TACTICS .....	7-1
7.1 Fibre Supply.....	7-3
7.2 Forest Diversity.....	7-9
7.3 Ecosystem Capacity .....	7-14
7.4 Watersheds.....	7-15
7.5 Public Accountability.....	7-17
7.6 Resource Integration .....	7-19
7.7 Unique Sites .....	7-20
7.8 Increasing the Timber Supply .....	7-21
7.9 Conflicting Objectives .....	7-22
8 IMPLEMENTATION OF PLAN.....	8-1
8.1 Timber Operations .....	8-1
8.1.1 Sequencing.....	8-1
8.1.2 Harvesting and Hauling Methods .....	8-3
8.1.3 Temporary In-Block Roads .....	8-4
8.1.4 Salvage.....	8-4
8.1.5 Green-up Constraints .....	8-5
8.1.6 Understorey Protection .....	8-5
8.1.6.1 Planned Protection .....	8-5
8.1.6.2 Avoidance Protection .....	8-6
8.1.7 Transition Assumptions for Regenerating Stands .....	8-6
8.1.8 Silviculture .....	8-6
8.1.9 Incidental Coniferous and Deciduous Timber Replacement Strategies on the FMA .....	8-8
8.1.10 Marginal Stands.....	8-8
8.1.11 Potentially Productive Area .....	8-9
8.1.12 The Sundance Provincial Park Special Management Zone .....	8-9
8.1.13 Chip Lake Fire Regeneration Protocols .....	8-10
8.1.14 Petroleum .....	8-11
8.1.15 Periodic and Quadrant Reconciliation Volumes .....	8-13
8.1.16 Cut Control Periods and Periodic Cut Calculations.....	8-13
8.1.16.1 Weyerhaeuser .....	8-13
8.1.16.2 Quota Holders .....	8-14
8.1.16.3 Community Timber Program.....	8-15
8.1.17 Weyerhaeuser Non-FMA Volume Chargeability .....	8-17
8.2 Landscape Strategies.....	8-18
8.2.1 Biodiversity, Wildlife and Fisheries Resources.....	8-18
8.2.2 Biodiversity .....	8-18
8.2.2.1 Fish and Wildlife.....	8-19
8.2.3 Operational Planning Considerations .....	8-20
8.2.4 Grizzly Bear .....	8-29
8.3 Access Management .....	8-30
8.3.1 Values, Issues and Recreational Activities in the Forested Areas.....	8-30
8.3.2 Access Management upon the FMA .....	8-30
8.3.3 Shining Bank Buck for Wildlife Area Access Management Plan.....	8-31
8.3.4 Tactics for Access Management .....	8-31
8.4 Watersheds.....	8-32
8.4.1 Watershed Analysis .....	8-32



8.4.1.1	Process .....	8-32
8.4.1.2	Process Improvement .....	8-33
8.5	Integrating Timber Operators .....	8-35
8.5.1	Quota Holders.....	8-35
8.5.2	Community Timber Program (CTP).....	8-36
8.5.3	Data Sharing.....	8-36
8.5.4	Reporting .....	8-36
8.6	Stakeholder Involvement.....	8-37
8.6.1	WeyFAC .....	8-37
8.6.2	Quota Holder/CTP Group .....	8-37
8.6.3	Trapping.....	8-37
8.6.4	Grazing .....	8-38
8.6.5	General Public .....	8-38
8.7	Unique Findings.....	8-39
8.7.1	Archeological and Historical Information.....	8-39
8.7.2	Unique Sites .....	8-39
8.7.3	Rare, Endangered or Threatened Animal Species.....	8-40
8.8	Forest Protection and Health.....	8-40
8.8.1	Insects and Disease .....	8-40
8.8.2	Noxious Weeds.....	8-40
8.8.3	Fire Protection .....	8-41
8.9	Tree Improvement Program .....	8-41
8.10	Ground Rule Development .....	8-43
8.11	Education and Training.....	8-44
8.12	Landuse Update Process .....	8-44
8.13	Re-Inventory of AVI .....	8-45
9	PERFORMANCE MONITORING.....	9-1
9.1	Timber Supply Sensitivity Analysis (validation of assumptions).....	9-1
9.2	Regeneration Standards.....	9-2
9.3	Annual Performance Monitoring Reports .....	9-2
9.4	Stewardship Report Contents.....	9-3
9.5	DFMP Objectives and Associated Indicators .....	9-3
10	FUTURE CONSIDERATIONS .....	10-1
10.1	Insects and Disease .....	10-1
10.2	Long-term Harvesting and Grazing Implications .....	10-1
10.3	Enhanced Forest Management .....	10-2
10.4	Forest Inventory and Timber Supply Analysis .....	10-3
10.5	Ecological Sustainability .....	10-3
10.6	Alternative Regeneration Standards.....	10-3
10.7	Research and Long-term Monitoring .....	10-4
10.8	Adjustment of Salvage Chargeability and Tracking.....	10-4

## LIST OF TABLES

Table 8-1	Variance from DFMP SHS.....	8-2
Table 8-2	Harvesting Methods Currently Used by Weyerhaeuser .....	8-3
Table 8-3	BCG by Age Definitions for Late Seral Stages.....	8-24
Table 8-4	Seral Stage Definitions .....	8-25
Table 8-5	BCG by Landbase constraints applied in the TSA .....	8-26
Table 8-6	Areas used to determine impacts on water yields within a fourth-order watershed upon the FMA (Step #1).....	8-34



---

## LIST OF FIGURES

Figure 7-1 Framework of the Edson DFMP Goals, Objectives, Strategies and Tactics ..... 7-2

## LIST OF APPENDICES

Appendix 8-1 Monitoring Protocol for the Establishment and Growth of Trees on Temporary Roads  
Appendix 8-2 Edson FMA Stand Level Retention Monitoring Report: 2000 – 2004  
Appendix 8-3 Strata Level Silviculture Strategies for the Edson FMA  
Appendix 8-4 Stand Level Ecological Guidelines  
Appendix 8-5 Ecologically Based Forest Management: The conservation of Biodiversity in Weyerhaeuser Canada Forest Management Areas in Alberta, December 1997  
Appendix 8-6 Fourth Order Watershed Calculations  
Appendix 8-7 Guidelines for Integrating Timber Harvesting and Domestic Grazing in the Green Area, Feb. 2002  
Appendix 8-8 Hardwood Tree Improvement Five-Year Plan





---

## ACRONYM LIST

<b>AAC:</b>	Annual Allowable Cut
<b>AAFMI:</b>	Alberta Advanced Forest Management Institute
<b>ACE:</b>	Allowable Cut Effect
<b>AFPA:</b>	Alberta Forest Products Association
<b>AOP:</b>	Annual Operating Plan
<b>ASL:</b>	Above Sea Level
<b>ASRD:</b>	Alberta Sustainable Resource Development
<b>AUM:</b>	Animal Unit Measure
<b>AVI:</b>	Alberta Vegetation Inventory
<b>CDWD:</b>	Coarse Down Woody Debris
<b>CNT:</b>	Consultative Notation
<b>CTP:</b>	Community Timber Program
<b>CTQ:</b>	Coniferous Timber Quota
<b>DFA:</b>	Defined Forest Area
<b>DFMP:</b>	Detailed Forest Management Plan
<b>DTM:</b>	Digital Terrain Model
<b>EFM:</b>	Enhanced Forest Management
<b>EMS:</b>	Environmental Management System
<b>ESIP:</b>	Eastern Slopes Interdepartmental Planning
<b>FAC:</b>	Forest Advisory Committee
<b>FMA:</b>	Forest Management Agreement
<b>FMU:</b>	Forest Management Unit
<b>FRIAA:</b>	Forest Resource Improvement Association of Alberta
<b>FRIP:</b>	Forest Resource Improvement Program
<b>FYHS:</b>	Five-Year Harvest Schedule
<b>GDP:</b>	General Development Plan
<b>GIS:</b>	Geographic Information System
<b>GPS:</b>	Global Positioning System
<b>HDA:</b>	Harvest Design Area
<b>IRM:</b>	Integrated Resource Management
<b>IRP:</b>	Integrated Resource Plan



---

<b>LRSYA:</b>	Long Run Sustained Yield Average
<b>MAI:</b>	Mean Annual Increment
<b>NIVMA:</b>	Northern Interior Vegetation Management Association
<b>PHA:</b>	Pre-Harvest Assessment
<b>PLFD:</b>	Public Lands and Forests Division
<b>PSP:</b>	Permanent Sample Plot
<b>PNT:</b>	Protective Notation
<b>PTA:</b>	Post-Treatment Assessment
<b>RET:</b>	Rare, Endangered or Threatened
<b>RLTAP:</b>	Rolling Long Term Access Plan
<b>SFM:</b>	Sustainable Forest Management
<b>SHS:</b>	Spatial Harvest Sequence
<b>SRD:</b>	Sustainable Resource Development
<b>SYU:</b>	Sustained Yield Unit
<b>TDA:</b>	Timber Damage Assessment
<b>WESBOGY:</b>	Western Boreal Growth & Yield Co-Op
<b>WeyFAC:</b>	Weyerhaeuser Forest Advisory Committee





---

## GLOSSARY

### A

**Adaptive management approach:** A learning approach that states intent, provides monitoring and verification of intent, and makes changes to planned or intended activities as required.

**Age Class:** The classification of stands in a forest, or trees in a stand, into a series of ages (e.g. 0 to 4.99 = age class 1). For the DFMP, the age class of the AVI stands on the FMA area is defined by the stand age. The stand age is determined by using the DFMP base year minus the AVI origin plus five years.

**Age Class Distribution:** Distribution of the amount of area by age class and species group.

**Aeolian:** Well-sorted, poorly compacted, medium to fine sand and coarse silt sediment that has been transported and deposited by wind.

**Aesthetics:** The philosophy concerning judgments made about beauty.

**Afforestation:** The conversion of non-forested land to forested land through the practice of introducing commercial trees species to the site, through appropriate silviculture techniques.

**Alberta Vegetation Inventory (AVI):** A system for describing the quantity and quality of vegetation present. It involves the stratification and mapping of the vegetation to create digital data according to the AVI Standards Manual and associated volume tables.

**Allowable Cut Effect (ACE):** The allocation of anticipated future forest timber yields to the present allowable cut. The effect is typically based on several assumptions about the yields that may develop as a result of activities and decisions taken in the present. Shortening the rotation period, raising the increment, or both, increases the allowable cut.

**Annual Allowable Cut (AAC):** The volume of timber that can be harvested under sustainable forest management in any one year.

**Annual Operating Plan (AOP):** Plans prepared and submitted annually by timber operators describing how, where and when to develop roads and harvest timber. They describe the integration of operations with other resource users, the mitigation of the impacts of logging, the reclamation of disturbed sites and the reforestation of harvested areas.

**Artificial regeneration:** The creation of a new stand by direct seeding or by planting seedlings or cuttings.

**Autecology:** Growth characteristics of specific tree species.



## **B**

**Berm:** A raised mound of soil.

**Biodiversity:** The variety, distribution and abundance of different plants, animals and other living organisms, the ecological functions and processes they perform, and the genetic diversity they contain at local, regional and landscape levels of analysis.

**Bisequa:** A dark beige colour.

**Broadcast slash buildup:** Slash scattered across a cutblock due to logging practices.

**Broad Cover Group:** Defined by the occurrence of coniferous as determined by AVI:

Coniferous - stands with at least 80% conifer.

Coniferous/Deciduous - stands with at least 50% and less than 80% conifer, and leading species conifer.

Deciduous/Coniferous - stands with at least 30%, and no more than 50% conifer, and leading species deciduous.

Deciduous - stands with less than 30% conifer.

**Buffer:** A protected strip of vegetated land beside roads, watercourses, mineral licks or other important features.

**Buck-For-Wildlife Area:** Area identified for wildlife habitat improvement.

## **C**

**Carrying Capacity:** The number of individuals of any one species that can live in a habitat without degrading it.

**Chert:** A rock resembling flint.

**Chinook:** A warm dry wind that blows east from the Rockies.

**Clear cut System:** A silviculture system that removes an entire stand of trees from an area of one hectare or more, and greater than two heights in width, in a single harvest operation. With the clearcut system, the opening size and dimensions created are generally large enough to limit significant microclimatic influence from the surrounding stand.

**Coarse filter management:** Forest management at a landscape level or over broad regions aimed at maintaining a range of stands of different size, age and composition to provide habitat for all species.

**Coarse Down Woody Debris:** Sound and rotting logs and stumps that provide habitat for plants and animals, and a source of nutrients for soil structure and development. Generally classified as material greater than 10 centimeters in diameter.

**Colluvial:** Rock or soil material deposited as a result of gravity.

**Common corridors:** Linear land areas established to concentrate utilities and roads and to provide access for resource use and development.

**Commercial Timber Permit:** A timber disposition issued under section 22 of the Forests Act authorizing the permittee to harvest public timber.



**Community Timber Program:** A term used to describe a category of timber use that provides for those operators who harvest volumes through permits.

**Coniferous species:** Are cone bearing plants; pertaining to the class Gymnospermae. In this DFMP, it refers to the following tree species used in the processing facilities: white spruce, black spruce, Engelmann spruce, lodgepole pine, balsam fir, alpine fir, and tamarack.

**Coniferous stands:** Forest stands that consist predominately (> 70%) of coniferous tree species.

**Coniferous Timber Quota (CTQ):** A share of the allowable cut of coniferous timber within a forest management unit.

**Constituency:** A group or body that patronizes, supports, or offers representation.

**Constraint:** The restrictions, limitations, or regulation of an activity, quality, or state of being to a predetermined or prescribed course of action or inaction. Constraints can arise from the influence of policies, political will, management direction, attitudes, perceptions, budgets, time, personnel, data availability limitations, or complex interaction of all these factors.

**Cordillera:** A system of usually parallel mountain ranges together with intervening plateaus.

**Criterion:** A distinguishable characteristic of sustainable forest management; a value that must be considered in setting objectives and in assisting performance.

**Cross-ditching:** The practice of constructing ditches across roads to allow for the movement of water from one side of the road to the other.

**Crown charges:** Amounts paid to the Province as a royalty or in consideration of services rendered.

**Crown land:** Land owned by the Province of Alberta.

**Cubic metre:** Unit of measure of the volume of total wood contained in a tree or log, measured as one metre by one metre by one metre of solid wood.

**Cumulative impact:** Additive nature of individual effects.

**Cut control period:** A period of five consecutive forest management operating years or as otherwise agreed to by the Minister and a Company.

**Cut sequence:** The order of harvest operations in time and space.

## D

**Deciduous species:** Belongs to the class Angiospermae. In this DFMP, it refers to the following tree species used in the processing facilities: trembling aspen, balsam poplar, and white birch.

**Deciduous stands:** Forest stands that consist predominately (> 70%) of deciduous tree species.

**Deciduous Timber Allocation (DTA):** Percentage of the deciduous annual allowable cut for a management unit, based on either volume or area.

**Decommissioning:** To take out of active service.



**Deleterious:** Harmful.

**Denning sites:** Areas where animals hibernate or raise their young.

**Detailed Forest Management Plan (DFMP):** A strategic long-term plan. It is the foundation for all forest management activities upon the FMA.

**Digital Terrain Model (DTM):** The computerized portrayal of a landform in three dimensions. It involves translating contour lines into digital format for use in the computer. It is also called digital elevation model.

**Disposition:** A lease, license, permit or letter of authority issued under provincial legislation for activities either surface or sub-surface.

**Disturbance:** A force that causes significant change in structure and or composition of a habitat.

**Disturbance modeling:** Computer program that models the degree of some type of disturbance.

**Diversity:** An assessment of the number of species present, their relative abundance in an area, and the distribution of individuals among the species.

## E

**Eastern Slopes Policy:** A Policy for Resource Management of the Eastern Slopes. A policy covering about 90,000 km<sup>2</sup> of the eastern slopes of the Rocky Mountains in Alberta. It was first released in 1977 and revised in 1984. The policy presents the Government of Alberta's resource management policy for public lands and resources within the region.

**Ecology:** The science that studies the interrelationships, distribution, abundance, and contexts of all organisms and their interconnections with their living and non-living environment.

**Ecological integrity:** Unimpaired, functional processes.

**Ecoregion:** A geographic area that has a distinctive, mature ecosystem on reference sites plus specified edaphic variations as a result of a given regional climate.

**Ecosite:** Ecological units that develop under similar environmental influences (climate, moisture, and nutrient regime). It is a functional unit defined by moisture and nutrient regime.

**Ecosystem:** A dynamic complex of plants, animals, and micro-organisms and their non-living environment interacting as a functioning unit.

**Ecotone:** A transition area between two communities, which has characteristics of both as well as characteristics of its own.

**Edaphic:** Pertains to the soil, particularly with respect to its influence on plant growth and other organisms together with climate.

**Edge:** Where plant communities meet.



**Endangered:** In jeopardy of continuing existence.

**Endangered, threatened and rare species:** Classifications of the status of species populations as determined by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Endangered indicates any indigenous species of fauna or flora that is threatened with imminent extirpation or extinction throughout all or a significant portion of its Canadian range. Threatened indicates any indigenous species of fauna or flora that is likely to become endangered in Canada if the factors affecting its vulnerability do not become reversed. Rare indicates an indigenous species of fauna or flora that, because of its biological characteristics or because it occurs at the fringe of its range, or for some other reasons, exists in low numbers or in very restricted areas in Canada but is not a threatened species.

**Endangered wood:** Timber that has or will be impacted by some natural or man-made process.

**Enhanced forest management (EFM):** Undertaking silviculture efforts that exceed Provincial requirements or liabilities.

**Establishment period:** The time elapsing between initiation of regeneration and its acceptance according to defined reforestation standards in the Timber Management Regulation.

**Establishment stage:** The early stage of reforestation where a crop of trees is initiated.

**Even-aged Stand:** A forest stand comprising trees with less than a 20-year difference in age.

**Even flow:** In harvest scheduling, the requirement that the harvest level in each period be equal to the harvest level in the preceding period.

**Extensive silviculture:** Silviculture practices, which, at the minimum, meet current provincial reforestation standards and support the current annual allowable cut.

## **E**

**Fauna:** Animal life.

**Feature species:** Those species that are rare, threatened, endangered or of social value. Fine filter management: Specific habitat management for a single or a few species rather than broad management at a landscape level to maintain a range of habitat opportunities for all wildlife species (coarse filter).

**Fire cycle:** The number of years required to burn over an area equal to the entire area of interest.

**Flora:** Plant life.

**Forecast:** A prediction of future conditions and occurrences based on the perceived functioning of a forest system. A forecast differs from a "projection" which is a prediction of anticipated future conditions based on an extrapolation of past trends.

**Forest:** A collection of stands that occur in similar space and time.

**Forest Access Zone:** An area designated by the Provincial government that has specific access constraints in place.



**Forest Advisory Committee (FAC):** A collection of stakeholder representatives for Weyerhaeuser's FMA area that give advice and direction to the company and Alberta Sustainable Resource Development to ensure that integrated forest resource management is practiced, to sustain the health and integrity of the land and forests for future generations.

**Forest connectivity:** A measure of how well different areas (patches) of a landscape are connected by linkages such as habitat patches or corridors of like vegetation.

**Forest health:** As a specific condition, the term refers to a growing forest having many or all of its native species of plants and animals. As a management objective, it refers to maintaining or restoring the capacity of a forest to achieve health.

**Forest Management Agreement (FMA):** Agreement between the Province and a company to grow, harvest and reforest on a landbase tenure.

**Forest Management Area (FMA):** Refers to the tract of forest land over which a company has been given management rights for establishing, growing and harvesting trees on a perpetual sustained yield basis for a defined period of time.

**Forest Management Plan:** A generic term referring to both Forest Management Unit plans prepared by the government, and Detailed Forest Management Plans prepared by industry.

**Forest Management Unit (FMU):** A defined area of forest land located in the Green Area of the province designated by the Department to be managed for sustainable forest management.

**Forested land:** Land is considered to be forested if it supports tree growth, including seedlings and saplings.

**Forests Act:** Revised Statutes of Alberta 1980, Chapter F-16 as amended from time to time. It establishes the authority and means by which the Minister of Environment administers and manages timber on public land for sustained yield. It describes how timber allocations can be made on crown land and empowers the Minister to enforce the Act and associated regulations.

**Fragmentation:** The process of transforming large continuous forest patches into one or more smaller patches surrounded by disturbed areas. This includes loss of stand area, loss of stand interior area, changes in relative and absolute amounts of stand edge, and changes in insularity. This occurs naturally through such agents as fire, landslides, windthrow and insect attack. It also occurs due to anthropogenic activities such as timber harvesting, road building and wellsite development.

**Free-to-grow:** Stands that meeting stocking, height, and/or height growth rate as indicated by specifications or reforestation standards, and judged to be essentially free from competing vegetation.

**Furbearer:** Animals whose pelts and carcasses have a legal trade value.

## G

**General Development Plan (GDP):** A five-year operating plan prepared, updated and submitted annually by the timber harvest operator.

**Glaciofluvial deposits:** Stratified outwash transported and deposited by glacial meltwaters that flowed upon, within, under, or beyond the glacier.



**Goal:** Broad statements of intent or direction relative to an aim, end or state of being to be achieved at some point in the future or maintained over a period of time.

**Grazing disposition:** An authorization issued under authority of the Public Lands Act for the purpose of domestic livestock grazing on Crown land.

**Green Area:** Area designated by the Province whose primary function is timber production.

**Green-up:** The process of re-establishment of vegetation following logging.

**Green-up period:** The time needed to re-establish vegetation after disturbance. Specific green-up periods may be established to satisfy visual objectives, hydrological requirements, or as a means of ensuring re-establishment of vegetation (for silviculture, wildlife habitat, or hydrological reasons) before adjacent stands can be harvested.

**Ground rules:** Provide direction to timber operators and employees of Alberta Sustainable Resource Development for planning, implementing and monitoring timber operations on the FMA. They highlight important management principles, define operating and planning objectives, and present standards and guidelines for timber harvest, road development, reclamation, reforestation and integration of timber harvesting with other forest users.

**Growing stock:** The sum (by number, basal area, or volume) of trees in the forest or a specified part of it.

**Growth and yield:** In timber management, the "yield" is the volume of wood available for harvest at the end of a rotation, usually measured as unit volume per unit area (e.g. Cubic meters per hectare). The "growth" is the rate and yield of biomass produced by plants regardless of function or use.

**Guidelines:** A set of recommended or suggested methods or actions that should be followed in most circumstances to assist administrative and planning decisions, and their implementation in the field. Note that guidelines cannot, by definition, be mandatory.

## H

**Habitat:** The place where a plant or animal naturally or normally lives and grows.

**Harvest area:** A cutblock or cutover.

**Harvest area orientation:** Alignment of harvest area for some purpose, normally perpendicular to the prevailing wind.

**Harvest design:** A forest harvesting plan for a given area which may include in addition to the initially sequenced cutblocks, reserves for fish and wildlife or protection of unique sites, a reforestation program, watershed and riparian area protection, and roading and reclamation requirements.

**Harvest design area (HDA):** Geographically defined area for planning purposes.

**Hectare:** Area of land measuring 10,000 square meters.

**Hibernacula:** A sheltered place where snakes spend the winter.

**Historical resources:** Man-made objects of historical significance.

**Hog fuel:** A by-product of the processing facilities, which is used to generate heat and/or electricity. Hog fuel can be made up of bark, saw dust, and trim blocks.





**Improved stock:** The result of long-term tree breeding programs geared towards selecting for heritable characteristics that are desired.

### I

**Incidental:** Having a minor role in relation to a more important thing or event.

**Increment:** Increase in volume of a particular tree or stand overtime.

**Indicator:** A measurable variable used to report progress toward the achievement of a goal.

**Integrated Resource Management (IRM):** A cooperative and comprehensive approach to the establishment of plans and to the delivery of benefits from the resource base in an efficient and effective manner.

**Integrated Resource Plan (IRP):** A regional plan developed by provincial government agencies in consultation with the public and local government bodies. It provides strategic policy direction for the use of public land and its resources within the prescribed planning area. It is used as a guide for resource planners, industry and publics with responsibilities or interests in the area.

**Issue:** A matter of wide public concern.

### J, K & L

**Lacustrine:** Fine sand, silt, and clay sediments deposited on the lake bed or coarser sands that are deposited along a beach by wave action.

**Landscape:** A heterogeneous land area with interacting ecosystems.

**Landscape diversity:** The size, shape, and connectivity of different ecosystems across a large area.

**Linear disturbance:** The removal of vegetation in a narrow and generally long pattern, such as a road, pipeline, or seismic line.

**Long run sustained yield average (LRSYA):** The hypothetical timber harvest that can be maintained indefinitely from a management area once all stands have been converted to a managed state under a specific set of management activities.

### M

**Mean annual increment (MAI):** The total increment to a given age in years, divided by that age.

**Merchantable:** A standard applicable to stands of timber or to individual trees indicating net usable volume.

**Miscellaneous Timber Unit (MTU):** Portion of a Forest Management Unit set aside for programs to make timber available to small operators.

**Miscellaneous Timber Use Area (MTU):** An area managed by Land and Forest Division to provide timber to operators who harvest small volumes of timber each year.

**Mission:** The reason an organization exists, the societal need it fulfils, and its functional focus.





**Mixedwood stands:** Stands containing both deciduous and coniferous species. Species content of either/or would be greater than or equal to 20% or less than or equal to 80% of the total cover in the canopy.

**Monitor:** The process of checking a situation or operation to validate.

## N

**Natural regeneration:** The renewal of a forest stand by natural rather than human means, such as seeding-in from adjacent stands, with the seed being deposited by wind, birds, or animals. Regeneration may also originate from sprouting, suckering, or layering.

**Natural process:** Naturally occurring function, such as decomposition, fire, etc. Non-forested land: Land is considered to be non-forested if it does not support tree growth, including seedlings and saplings.

**Non-productive land:** Forest land currently incapable of producing a merchantable stand within a reasonable length of time.

**Nutrient Cycling:** The circulation or exchange of elements and compounds, such as nitrogen and carbon dioxide, between nonliving and living portions of the environment.

## O

**Objective:** A clear, specific statement of result or conditions to be achieved through implementation of the management plan.

**Old growth forest:** Forest older than rotation age that contains live and dead trees of various sized, species, composition, and age class structure.

**Operability:** Classification of a forest site based on the potential to harvest the timber on this site. The physiographic characteristics and moisture conditions of the site are critical to this classification, as is the harvesting equipment available and the technology associated with the harvesting operation.

**Operating guidelines:** Rules that define forest management practices.

**Order in Council:** An order made by the Lieutenant Governor or Governor General by and with the advice of the Executive or Privy Council, sometimes under statutory authority or sometimes by virtue of royal prerogative  
**Oriented Strand Board (OSB):** wood composite product  
**Own use permits:** Small volume permit issued to individuals for their own use, e.g., post and rails.

## P

**Patch:** A relatively heterogeneous non-linear area that differs from its surroundings.

**Patch retention:** Islands of timber retained within a generally clearcut area.

**Periodic Allowable Cut:** The total of the annual allowable cuts approved for a five-year cut control period.

**Permanent roads:** Roads that will be in use for more than two years.

**Permanent sample plot (PSP):** Plots established for long-term timber growth and yield studies.



**Philosophy:** General understanding of values.

**Physiography:** Pertains to the physical landform characteristics, also known as geomorphology.

**Policy:** A course of action adopted or proposed; prudent conduct.

**Potentially productive:** A site that is capable of growing trees but is currently void of commercial tree species.

**Predictive modeling:** Computer models that forecast outcomes of actions.

**Pre-harvest assessment:** Survey of area prior to harvest to determine pre- and post-logging requirements, such as season of harvest, reforestation tactics, etc.

**Prescribed burning:** Burning planned to provide some type of desired results.

**Principle:** A formal statement that provides a basis for sustainable forest management policy and that serves as a fundamental guide to action.

**Productive landbase:** Area deemed to support forest growth.

**Public Lands and Forests Division (PLFD):** A part of the Department of Alberta Sustainable Resource Development.

## Q

**Quadrant Volumes:** Five year's accumulation of AAC.

**Quota:** A form of timber disposition defined by the Forests Act that allows for the allocation of a portion of the sustainable harvest level determined for a given forest management unit.

**Quota Certificate:** A certificate that entitles the owner to a percentage share of the AAC of a forest Management Unit. This percentage is translated into a fixed roundwood volume.

## R

**Range of natural variability:** The range of results that have occurred naturally.

**Range of variability:** Characterizes fluctuations in ecosystem conditions or process over time. It can describe variations in diverse characteristics such as tree density, vertebrate population size, water temperature, frequency of disturbance, rate of change, etc.

**Rare:** Few.

**Reference ecosite:** Site having average characteristics.

**Reforestation:** Process of reestablishing a crop of trees.

**Reforestation deletion:** Stands which are deleted from the timber harvesting landbase due to their relatively low productivity combined with the difficulty of reforesting the sites.

**Reforestation lag period:** The time between completion of timber harvest operations and the establishment of a regenerated stand, based on current procedures for evaluating successful stand establishment.

**Refugium:** Large areas free from trapping and land-use activity.



**Regeneration:** The renewal of a forest or stand of trees by natural or artificial means.

**Retention period:** The length of time between harvesting passes.

**Right-of-way:** A strip of land over which a power line, railway line, road, or other linear disturbance extends.

**Riparian areas:** Those terrestrial areas where the vegetation complex and microclimate conditions are products of the combined presence and influence of perennial and /or intermittent water, associated high water tables, and soils that exhibit some wetness characteristics.

**Roll-back:** Strippings and debris returned to disturbed areas for reclamation purposes.

**Rotation:** The period of years required to establish and grow timber crops to a specified condition of maturity.

**Rotation Age:** The planned number of years between regeneration of a forest stand and its final harvest.

## **S**

**Salvage Cut:** A cutting method to remove dead or damaged trees with merchantable wood.

**Scarification:** Silvicultural practice involving the mechanical disruption of the ground surface to expose mineral soil.

**Sedimentation:** Deposit of waterborne material.

**Selection harvest:** An uneven-aged silvicultural system in which selected trees are harvested individually or in small groups at periodic intervals.

**Selective cutting:** A harvest practice in which only trees of a certain species with a specified diameter and/or value are harvested.

**Sensitivity analysis:** An analytical procedure in which the value of one or more parameters is varied and the changes that this produces are analyzed in a series of iterative evaluations. If a small change in a parameter results in a proportionately larger change in the results, the results are said to be sensitive to the parameter.

**Seral stages:** The stages of ecological succession of a plant community from young to old. This is the characteristic sequence of biotic communities that successively occupy and replace each other.

**Silviculture:** The theory and practice of controlling the establishment, composition, structure and growth of forests.

**Silviculture regimes:** Tactics to establish a crop of trees.

**Single-tree retention:** Process of leaving single trees standing in generally clearcut area.

**Site index:** A measure of forest site productivity expressed as the average height of the tallest trees in the stand at a defined index age, typically less than the planned rotation ages. For this DFMP, a site index age of 50 years was used.

**Site preparation:** Mechanical preparation of forest soils for reforestation purposes.



**Site productivity:** The mean annual increment in merchantable volume which can be expected for a forest area, assuming it is fully stocked by one or more species best adapted to the site, at or near rotation age.

**Slash hazard reduction:** Process to remove or reduce the buildup of logging slash.

**Snag:** A standing dead tree from which the leaves and most of the branches have fallen.

**Spatial database:** Data referenced to a set of geographical coordinates and encoded in digital format so that they can be sorted, selectively retrieved, statistically and spatially analyzed. The different data planes can be overlaid in virtually any order.

**Special Places:** A Government of Alberta initiative committed to the establishment of a network of Special Places that represent the environmental diversity of the province's six natural regions (20 subregions). The program encompasses a balanced approach to preservation, outdoor recreation, heritage appreciation, tourism and economic development.

**Stand:** A continuous group of trees or other growth occupying a specific area and sufficiently uniform in composition, age, arrangement, and conditions as to be distinguishable from the forest or other growth on adjoining areas.

**Stand structure:** The various horizontal and vertical physical elements of the forest. The physical appearance of canopy and subcanopy trees and snags, shrub and herbaceous strata, and down woody material.

**Stand Tending:** Activities such as thinning, spacing, removal of diseased trees, and weed or brush control, carried out in already established stands.

**Stewardship:** Obligation to manage.

**Stewardship Report:** A report that accounts for all activities, undertaken as a steward of a given article, resource, area or process, related to strategies to achieve stated stewardship goals. Measures of performance are included and linked to plans that express the desired goals.

**Stocking:** A measure of the proportion of an area occupied by trees/seedlings, expressed in terms of percentage of occupied fixed area sample plots.

**Strata:** A multitude of layers or groups.

**Strategy:** Statement of broad activity designed to achieve the goals or objectives.

**Stratum:** A single layer or group.

**Sub-regional Integrated Resource Plans:** A system of Cabinet approved plans incorporating a cooperative and comprehensive approach to decision making relative to the allocation and use of Crown land and resources.

**Succession:** The replacement of one plant community by another in a progressive development towards climax vegetation.

**Successional patterns:** Evolutionary process of vegetation stages.

**Sustainable development:** Development of a resource while maintaining other values.



**Sustainable forest management (SFM):** The maintenance of the ecological integrity of the forest ecosystem while providing for social and economic values such as ecosystem services, economic, social and cultural opportunities for the benefit of present and future generations.

**Sustainable timber management:** Managing the forest to provide a perpetual supply of timber now and into the future.

**Sustained-yield timber management:** The yield a forest can produce continuously at a given intensity of management.

## T

**Tactic:** A method to achieve something.

**Temporary road:** Temporary roads are those that are part of a cutblock, or connect cutblocks and are built, used and reclaimed before expiry of the AOP, or reclaimed within two years of construction.

**Temporary sample plot (TSP):** an area of established size used in the measurement of trees and other physical characteristics.

**Threatened:** Class of plant or animal life under pressure to maintain existence.

**Timber harvesting landbase:** The timber harvesting landbase is the portion of the total land area of the FMA that can be considered to contribute to and be available for long-term timber supply. It is the landbase remaining after deductions for areas that cannot, should not, or will not be managed for timber production.

**Timber management:** The activity involving the allocation of forested lands for harvesting of the timber on that land. Timber management may involve planning, road building, logging extraction of merchantable timber for processing off-site, and varying intensities of silvicultural activity to encourage another stand of trees to grow back. Timber management is an important subset of forest management, but it is not an equivalent activity.

**Timber Management Regulation:** The legislative stature that describes the mechanism and regulations by which the forested lands of Alberta are managed.

**Timber Operations:** Includes all activities related to timber harvesting including site assessment, planning, road construction, harvesting, reclamation and reforestation.

**Tufa:** A porous rock composed of calcium carbonate and found around mineral springs.

## U

**Understorey:** Those trees or vegetation in a forest stand below the main canopy level.

**Understorey protection:** Avoidance of damaging immature tree species during harvesting operations.

**Uneven aged stands:** Stands in which the trees differ markedly in age, usually with a span greater than 20 years.

**Ungulate:** Hoofed animal.

**Unique areas:** Sites that contain natural features or special values for wildlife and plant species. Also includes historical and archeological significant areas.



**Unique ecological sites:** Areas supporting rare species or processes.

**Utilization standards:** Standards establishing stand and tree merchantability.

## V

**Value:** A principle, standard, or quality considered worthwhile or desirable.

**Viewshed:** The visible area, as it appears from one or more viewpoints.

**Vision:** Foresight.

**Volume table:** A table, graph or equation showing the estimated average tree or stand volume corresponding to selected values of more easily measured tree or stand variables.

## W, X, Y & Z

**Water source areas:** That portion of a watershed where soils are water saturated and/or surface flow occurs and contributes directly to stream flow.

**Water yield:** The quantity of water derived from a unit area of watershed.

**Watershed:** An area of land that collects and discharges water into a single creek or river through a series of smaller tributaries.

**White Area:** Forested area in the Province managed primarily for grazing, while also managing for some sustainable timber production. It also includes a mixture of private and Crown land.

**Wood chip direction:** Provincial direction of byproduct of timber manufacturing to specific pulping facilities.

**Woody debris:** Live or dead, standing or downed, woody material left on a site after logging.

**Yield Curve:** Graphical representation of a yield table.

**Yield Table:** A summary table showing, for stands (usually even aged) of one or more species on different sites, characteristics at different ages of the stand.



## 7 RESOURCE MANAGEMENT OBJECTIVES, STRATEGIES AND TACTICS

Ecological, societal and economic values are represented in the DFMP by a series of goals. Along with these goals are associated objectives, strategies and tactics.

Goals, as defined in Volume I, Chapter 5, are:

*“Broad statements of intent or direction relative to an aim, end or state of being to be achieved at some point in the future or maintained over a period of time.”<sup>1</sup>*

Objectives are defined as:

*“A clear, specific statement of results or conditions to be achieved through implementation of the management plan.”<sup>2</sup>*

Strategies are defined as:

*“Activities designed to achieve the goals or objectives.”*

Tactics are defined as:

*“A method to achieve something.”<sup>3</sup>*

The intent of the objectives, strategies and tactics in the DFMP is to conform to the Acts and Regulations of Alberta and Canada. It is not the intent to contradict any act or regulation, or to practice or promote unsafe or unhealthy practices.

The flowchart identified in Figure 7-1 illustrates the progression from goals, objectives, strategies and finally to potential tactics.

The following goals and associated objectives, strategies and tactics will be in place for the duration of the plan.

All of the objectives will be pursued by timber operators on the FMA. Some of the strategies and tactics that support objectives will be pursued only by Weyerhaeuser. Where commonality occurred, the word “common” precedes the objective, strategy or tactic. If specific to Weyerhaeuser, the symbol “WY” preceded the strategy or tactic.

Strategies and tactics to support the goals and objectives are not all inclusive. Over the life of the plan, these will continue to evolve. New strategies and tactics will appear, while obsolete ones will be discontinued in their use.

<sup>1</sup> A Sustainable Forest Management System: Specifications Document. 1996. CSA Standard CAN/CSA-Z809-96.Pg. 3.

<sup>2</sup> A Sustainable Forest Management System: Specifications Document. 1996. CSA Standard CAN/CSA – Z809-96.Pg. 3.

<sup>3</sup> The Canadian Oxford Dictionary. 1998. Oxford University Press.

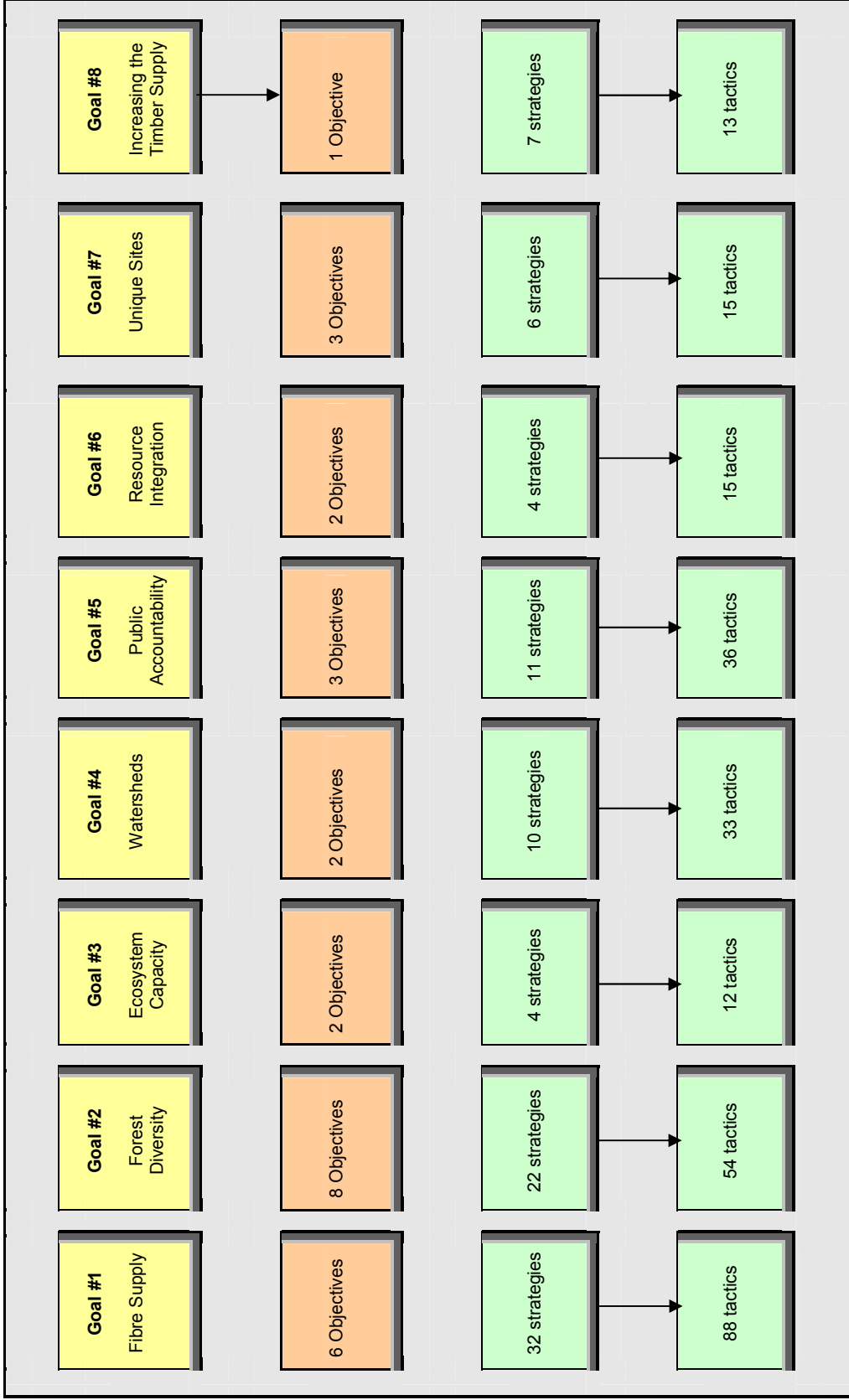


Figure 7-1 Framework of the Edson DFMP Goals, Objectives, Strategies and Tactics





## 7.1 Fibre Supply

**(WY) Goal 1:** Ensure that Weyerhaeuser's Edson and Drayton Valley facilities remain globally competitive with respect to fiber supply from the FMA area while recognizing that other facilities share similar desires.



Goal 1 has 6 objectives, 32 strategies and 88 potential tactics associated with it, as follows:

### **(Common) Objective 1.1 Maintain the AAC from the Edson FMA.**

#### Strategies to achieve this objective are:

- ◆ **(Common) To meet or exceed approved reforestation standards by**
  - Undertaking prompt reforestation on all cutovers upon the FMA within 24 months,
  - Undertaking appropriate surveys or assessments on all blocks prior to harvest and/or immediately after harvest,
  - Planning and conducting reforestation activities to the establishment, and performance stage,
  - Promptly addressing establishment failures, and
  - Updating ARIS records promptly and accurately.
  
- ◆ **(Common) To pursue the opportunity to utilize enhanced forest management (EFM) to increase conifer and deciduous growth by:**
  - Analyzing opportunities for stand tending (i.e. spacing and thinning, vegetation management),
  - Analyzing the opportunities for mixedwood management,
  - Reviewing opportunities to convert non-productive landbase to productive landbase,
  - Planting white spruce under mid-rotation deciduous stands,
  - Harvesting mature deciduous and protecting immature white spruce,
  - Utilizing mixedwood shelterwood harvest techniques,
  - Planting high density pine followed by commercial thinning,
  - Planting of voids to produce full stocking, and
  - Investigating opportunities through a tree improvement program.

**(Common) Objective 1.1 Maintain the AAC from the Edson FMA. (Continued)****Strategies to achieve this objective are:**

- ◆ **(Common) To balance the harvest by allocation within +/- 10% of the approved periodic 5-year allowable cut by:**
  - Planning and tracking production, and
  - Transferring over or under cuts as directed by the FMA Agreement or Government Policy.
  
- ◆ **(Common) To follow the spatial harvest sequence as outlined in the timber supply analysis by:**
  - Planning Harvest Design Areas (HDAs) by decade, and
  - Harvesting according to the timber supply assumptions (i.e. Timber protocols as identified in the Woodstock and Stanley inputs).
  
- ◆ **(Common) To maintain the incidental timber by:**
  - Following silviculture strategies for all strata,
  - Regenerating stands to preharvest broad cover group following approved guidelines or policies,
  - Protecting understorey,
  - Planting roads and landings with conifer in deciduous blocks,
  - Retaining incidental deciduous on the conifer landbase, and
  - Planting of conifer on harvested deciduous landbase.
  
- ◆ **(Common) To maintain pure conifer and pure deciduous stands across the landscape by:**
  - Following silviculture strategies for pure strata.
  
- ◆ **(WY) To increase the knowledge of the timber resource through permanent sample plots (PSPs) by:**
  - Maintaining Permanent Sample Plots (PSP's) and establishing new PSP's when required, and acquiring existing PSP data from other sources.
  
- ◆ **(WY) To maintain a vegetation inventory by:**
  - Updating timber, land use and other depletions.



**(Common) Objective 1.2 Maximize use of the timber resource.**

**Strategies to achieve this objective are:**

- ◆ **(WY) To enter into new and maintain existing wood trades with other resource users by:**
  - Continuing to purchase timber allocated to the Edson and Cold Creek Community Timber Programs (CTPs), and
  - Maintaining a wood trade agreement with Sundance Forest Products.
  
- ◆ **(Common) To pursue increased utilization of new technologies by:**
  - Maintaining active membership in Forest Engineering Research Institute of Canada (FERIC),
  - Encouraging innovation with company contractors, and
  - Incorporating new technology.
  
- ◆ **(Common) To utilize all merchantable timber within cutovers, excluding those trees left for retention purposes by:**
  - Educating operators on merchantability standards, and
  - Inspecting blocks during harvesting to insure all merchantability standards are met.
  
- ◆ **(Common) To integrate logging operations with other timber operators by:**
  - Sharing and formulating plans with other operators, and
  - Promoting single entry logging.
  
- ◆ **(Common) To promote full utilization of the species mix, excluding those trees left for retention purposes, by:**
  - Pursuing further research in species utilization by the mills, and
  - Making unutilized species available to other users of the timber resource without unduly impacting future opportunities of Weyerhaeuser.
  
- ◆ **(Common) To pursue common corridors among all resource users by:**
  - Planning closely with Land Use coordinator and other resource users,
  - Lobbying government on policy direction to use common corridors, and
  - Encouraging road use agreements.

**(Common) Objective 1.2 Maximize use of the timber resource. (Continued)****Strategies to achieve this objective are:**

- ◆ **(Common) To pursue utilization of salvageable timber by:**
  - Pursuing operational efficiencies with a close working relationship between landuse and planning,
  - Inventorying endangered wood as identified, and
  - Pursuing and encouraging the harvest of salvageable wood.
  
- ◆ **(WY) To pursue private land wood purchases by:**
  - Scheduling the purchase of private wood to complement the flow of production from Crown lands,
  - Considering long-term fibre arrangements with private land owners,
  - Working cooperatively with the Alberta Woodlot Association's education program, and
  - Maintaining a private land inventory.
  
- ◆ **(Common) To promptly utilize harvested wood by:**
  - Striving to haul wood in the season of harvest.

**(Common) Objective 1.3 Minimize the cost of the raw material.****Strategies to achieve this objective are:**

- ◆ **(Common) To optimize use of contractors by:**
  - Maintaining efficient long-term contractors,
  - (WY) Matching contractors to operating conditions, and
  - (WY) Working with the Local Loggers Opportunity Program (LLOP).
  
- ◆ **(Common) To minimize wood hauling costs by:**
  - Lobbying the Provincial government to maintain the winter weight program,
  - Building haul routes for efficient and safe movement of raw material,
  - (WY) Pursuing private wood sources within close proximity to Edson, and
  - (WY) Maintaining an average haul distance across the FMA.
  
- ◆ **(WY) To provide infrastructure for year round access to the wood supply by:**
  - Building strategic all-weather roads,
  - Planning and developing common corridors with other resource users, and
  - Lobbying the Provincial government to develop regional road systems.



**(Common) Objective 1.3 Minimize the cost of the raw material. (Continued)**

**Strategies to achieve this objective are:**

- ◆ **(WY) To minimize storage of fibre inventories in the mill yard by:**
  - Working closely with the mill to keep inventory levels at planned levels,
  - Hauling year round,
  - Working closely with private landowners to regulate flow of timber, and
  - Maximizing opportunities for summer wood from private land.
  
- ◆ **(WY) To utilize small local contractor's workforces for Forestlands operations by:**
  - Utilizing the Local Loggers Opportunity Program (LLOP) for Cold Creek and Edson, and
  - Utilizing local timber management specialists.

**(Common) Objective 1.4 Minimize losses of timber from insects and disease.**

**Strategies to achieve this objective are:**

- ◆ **(Common) To work cooperatively with Alberta Sustainable Resource Development in protection programs by:**
  - Participating with the integrated insect and disease Management Working Groups.
  
- ◆ **(Common) To develop plans that identify and manage outbreaks of insects and disease by:**
  - Working with Alberta Sustainable Resource Development and other timber operators to develop strategies for insect and disease outbreaks.
  
- ◆ **(Common) To educate staff and contractors on the identification of insects and diseases by:**
  - Undertaking workshops on insect and disease identification, and
  - Making resource material available.
  
- ◆ **(WY) To monitor for rates of insect and disease incidence by:**
  - Utilizing surveys to acquire insect and disease data, and
  - Cooperate with SRD in the reporting and monitoring of mountain pine beetle.



**(Common) Objective 1.5 Decrease losses due to fire.**

**Strategies to achieve this objective are:**

- ◆ **(Common) To work cooperatively with Alberta Sustainable Resource Development in protection programs by:**
    - Participating actively on fire suppression readiness planning committees, and
    - Updating Fire Control Plans annually prior to commencement of the fire season.
- 
- ◆ **(Common) To maintain levels of fire suppression readiness during the fire season by:**
    - Ensuring designated planning and operations staff and contractors undergo annual fire training and are available for fire suppression duty,
    - Following the approved annual fire control plan,
    - Ensuring equipment on hand is in proper working order, and
    - Updating Forest Protection as required in the Fire Control Plan to status of bush operations.
  - ◆ **(WY) To develop plans to address the role of fire across the FMA by:**
    - Pursuing the co-operative use of fire risk models in assessing fire potential,
    - Promoting activities that address fire management objectives across the landscape, and
    - Developing Fire Smart plans where identified in cooperation with SRD.

**(Common) Objective 1.6 Minimize the loss of productive forest landbase.**

**Strategies to achieve this objective are:**

- ◆ **(Common) To minimize practices that decrease the productive landbase (i.e. excessive road building, excessive environmental damage, and special uses) by:**
  - Maintaining a proactive program to reduce the area of roads across the landscape,
  - Utilizing access management plans to reduce duplication of development,
  - Recommending low impact seismic, and
  - Promoting use of existing access.
- ◆ **(Common) To encourage the use of common corridors by:**
  - Working closely with oil and gas operators to use common roads, and
  - Utilizing access management plans, where available.



**(Common) Objective 1.6 Minimize the loss of productive forest landbase.  
(Continued)**

**Strategies to achieve this objective are:**

- ◆ **(WY) To return withdrawn productive landbase to the productive forest landbase by:**
  - Maintaining an inventory of potential sites to be returned to productive forest landbase, such as roads, wellsites, pipelines, etc., and
  - Using alternate funding when available to reforest previously productive forest landbase.

**7.2 Forest Diversity**

**Goal 2:** Maintain forest diversity at the stand and landscape level in terms of structure, composition and function.

Goal 2 has 8 objectives, 22 strategies, and 54 potential tactics associated with it, as follows:



**(Common) Objective 2.1 Maintain diversity of age classes across the landscape.**

**Strategies to achieve this objective are:**

- ◆ **(Common) To maintain a percentage of the FMA landbase in late, very late and extremely late seral stage stands by:**
  - Managing for late, very late and extremely late seral stages,
  - Maintaining percentages of late, very late and extremely late seral stage stands (as defined in the timber supply analysis),
  - Managing for maintenance of operational deletions (e.g., steep slopes, riparian management zones),
  - Promoting research into the maintenance of late, very late and extremely late seral stage characteristics through harvesting and silviculture practices, and
  - Promoting research into the ecological significance of late, very late and extremely late seral stage features.
  
- ◆ **(WY) To use disturbance modeling tools to evaluate:**
  - Man-made disturbance patterns, and
  - The historic pattern of disturbance.





**(Common) Objective 2.2 Maintain a variation of patch size throughout the landscape.**

**Strategies to achieve this objective are:**

- ◆ **(Common) To vary the harvest size by:**
  - Using a range of harvest sizes from 2 to 700 hectares that will consider watershed integrity,
  - Utilizing the autecology of species to reflect the size of harvest events, and
  - Utilizing harvest event sizes to promote fine filter approach to management.
  
- ◆ **(WY) To use ecosite and AVI inventories and landscape analysis to determine the range of variation by:**
  - Projecting age class and cover type information over time.

**(Common) Objective 2.3 Maintain a diversity of structure within harvested openings across the landscape while maintaining safe working conditions for forest operations.**

**Strategies to achieve this objective are:**

- ◆ **(Common) To retain snags by:**
  - Using stand level ecological guidelines to develop FMA operating ground rules for snag identification and retention,
  - Creating snags in areas without snags, and
  - Foregoing opportunities to salvage selected fire-killed and blowdown timber with consultation of PLFD.
  
- ◆ **(Common) To practice single tree and small clump retention of merchantable trees by:**
  - Utilizing ecological guidelines for identification of optimum retention characteristics, and
  - Maintaining merchantable trees within clumps of unmerchantable or understorey trees.







**(Common) Objective 2.3 Maintain a diversity of structure within harvested openings across the landscape while maintaining safe working conditions for forest operations. (Continued)**

**Strategies to achieve this objective are:**

- ◆ **(Common) To retain tree patches of merchantable trees by:**
  - Providing guidelines for identification and retention of tree patches, and
  - Undertaking stub creation to stabilize patches.
  
- ◆ **(Common) To retain coarse down woody debris by:**
  - Providing operating guidelines for harvesting and silviculture operators,
  - Returning landing slash back to the harvested areas, and
  - Leaving brush piles in harvested areas.
  
- ◆ **(Common) To maximize understorey protection by:**
  - Identifying understoreys during the harvest design stage,
  - Pursuing the use of leaf off photography or enhanced AVI,
  - Providing guidelines for the identification of suitable understorey (e.g. slenderness code),
  - Undertaking stub creation to stabilize patches,
  - Planning of proper harvest design to provide protection from damaging winds, and
  - Using the appropriate harvesting systems to protect understorey.
  
- ◆ **(Common) To use a variety of silviculture systems by:**
  - Undertaking surveys or assessments to identify the appropriate silviculture system (i.e. clear cutting, selection cutting, selective cutting, shelterwood cutting, and seed tree cutting).

**(Common) Objective 2.4 Sustain the long term benefits of riparian zones.**

**Strategies to achieve this objective are:**

- ◆ **(WY) To assess the ecological value of riparian zones by:**
  - Pursuing research through the University of Alberta and other organizations, and
  - Transferring knowledge gained from research.
  
- ◆ **(WY) To assess and utilize alternative harvesting and silvicultural practices (e.g. thinning) to sustain the long term benefit of riparian zones by:**
  - Implementing research trials, and
  - Transferring knowledge from research.



**(Common) Objective 2.5 Maintain tree species diversity across the stand and the landscape.**

**Strategies to achieve this objective are:**

- ◆ **(Common) To manage stands of mixed and pure species composition by:**
  - Establishing silvicultural regimes for each cutblock, and
  - Regenerating harvest areas to pre-harvest composition (Policy 2004-01 or equivalent).



**(Common) Objective 2.6 Maintain habitats for rare, endangered and threatened (RET) species (flora and fauna).**

**Strategies to achieve this objective are:**

- ◆ **(Common) To inventory rare and endangered species upon the FMA by:**
  - Mapping known sites of RET species,
  - Mapping new sites, and
  - Recording RET species occurrences when encountered or reported.
- ◆ **(Common) To protect rare and endangered plant habitats upon the FMA by:**
  - Providing protective zones around sites, and
  - Providing operating guidelines for forest management planners and operators.
- ◆ **(Common) To collaborate on research and monitoring by:**
  - Pursuing joint monitoring programs with different organizations,
  - Using knowledge to adjust operating guidelines, and
  - Alignment with Provincial 'Species at Risk' recovery plans.



**(Common) Objective 2.7 Improve and apply the knowledge base of ecological processes and classification.**

**Strategies to achieve this objective are:**

- ◆ **(Common) To increase the knowledge base concerning ecological processes by:**
  - Making resource material available to staff and contractors, and
  - Undertaking training sessions for staff and contractors as required.
  
- ◆ **(Common) To increase ecological knowledge of the forest by:**
  - Making resource material available, and
  - Continuing research-linking ecology with other forest management activities.
  
- ◆ **(WY) To research link between ecosite and tree growth by:**
  - Evaluating PSP data and ecosite relationships.

**(Common) Objective 2.8 Improve and apply knowledge of fish and wildlife responses to forest management practices.**

**Strategies to achieve this objective are:**

- ◆ **(Common) To modify practices based on better understanding by:**
  - Pursuing ground rule modifications, and
  - Studying impacts of modifications.
  
- ◆ **(WY) To investigate the responses of fish and wildlife to forest management practices by:**
  - Funding long-term research and monitoring programs.
  
- ◆ **(WY) To transfer knowledge by:**
  - Developing and promoting guidelines and strategies,
  - Making research notes available,
  - Developing and maintaining a database for wildlife and fisheries inventories, and
  - Applying findings from other research studies where applicable.



### 7.3 *Ecosystem Capacity*

**Goal 3:** Maintain the productive capacity of the forest ecosystem.

Goal 3 has 2 objectives, 4 strategies, and 12 potential tactics associated with it, as follows:

#### **(Common) Objective 3.1 Retain woody debris on site for nutrient recycling.**

##### Strategies to achieve this objective are:

- ◆ **(Common) To implement forest management practices that leave structure and debris on site by:**
  - Utilizing stand level ecological guidelines to develop FMA operating ground rules,
  - Reduce large slash coming to landings, and
  - Spreading of harvest generated debris.



#### **(Common) Objective 3.2 Minimize the detrimental effects of forest practices on soil productivity.**

##### Strategies to achieve this objective are:

- ◆ **(Common) To minimize harvest during adverse soil conditions by:**
  - Education of the logging and site preparation contractors, and
  - Conducting assessment's on all blocks (scheduled for harvesting during non-frozen periods).
- ◆ **(Common) To use appropriate harvest and silviculture systems by:**
  - Following silviculture prescriptions based on assessments, and
  - Following approved monitoring protocols for temporary roads.
- ◆ **(Common) To schedule road construction, maintenance and reclamation activities for the appropriate season by:**
  - Assessing soil sensitivities,
  - Building roads only when appropriate weather conditions occur,
  - Utilizing proper road building techniques,
  - Installing proper drainage structures, and
  - Providing appropriate erosion control measures.




## 7.4 Watersheds

**Goal 4:** Maintain the process and function of watersheds.

Goal 4 has 2 objectives, 10 strategies, and 33 potential tactics associated with it, as follows:

### **(Common) Objective 4.1 Minimize adverse impacts on fish habitat resulting from forest operations.**

#### Strategies to achieve this objective are:

- ◆ **(Common) To maintain appropriate watercourse and riparian protection by:**
    - Following approved operating ground rules,
    - Educating contractors about maintaining appropriate crossing protection,
    - Utilizing watercourse crossing guidelines,
    - Addressing noted deficiencies,
    - Constructing and maintaining proper watercourse crossings, and
    - Minimizing the number of watercourse crossings required.
- 
- ◆ **(Common) To minimize disturbance on soils by:**
    - Undertaking assessments on all blocks (scheduled for harvesting during non-frozen periods),
    - Identifying sensitive zones,
    - Operating in the appropriate season and conditions, and
    - Operating using the appropriate equipment.
- 
- ◆ **(Common) To co-operate with other resource users to minimize impacts upon watersheds by:**
    - Making use of common corridors,
    - Notifying appropriate agencies of crossing structure failures or deficiencies,
    - Following access management plans, and
    - Sharing knowledge of sensitive areas with others.
  - ◆ **(WY) To collaborate on research and monitoring of fish habitat by:**
    - Undertaking research on aquatic habitat indicators,
    - Pursuing joint monitoring programs, and
    - Using knowledge to adjust operating guidelines.



**(Common) Objective 4.2 Minimize adverse impacts on watersheds (quality, quantity and timing) resulting from forest operations.**

**Strategies to achieve this objective are:**

- ◆ **(Common) To collaborate on research and monitoring where appropriate by:**
  - Joining in co-operative research and monitoring initiatives (i.e. Suspended sediments, baseline water flows), and
  - Altering practices where effects are outside of accepted limits.
- ◆ **(Common) To conduct appropriate forest management activities by:**
  - Assessing cutblocks (scheduled for harvesting during non-frozen periods) prior to harvest to assess soil sensitivity,
  - Scheduling activities for appropriate times, and
  - Applying modeling scenarios if needed to assess impacts.
- ◆ **(Common) To co-operate with other resource users to minimize impacts upon watersheds by:**
  - Contacting the owners or notifying Alberta Sustainable Resource Development of infrastructures showing deficiencies, and
  - Pursuing common corridors.
- ◆ **(Common) To conduct road construction, maintenance and reclamation activities in an appropriate manner by:**
  - Assessing soil sensitivity,
  - Scheduling for appropriate times, and
  - Applying guidelines for road building.
- ◆ **(Common) To identify and monitor sites for potential sources of soil erosion which may result from forest management activities and apply remedial techniques as required by:**
  - Identifying and monitoring all watercourse crossing structures, and
  - Undertaking appropriate remedial action as required.
- ◆ **(Common) To complete a watershed assessment:**
  - Review fourth-order watershed output report in the TSA during the harvest design stage,
  - Analyze the watershed using the Effective Clear Cut Area (ECA) model where required,
  - Analyze watershed using WRENSS (Water Resource Evaluation of Non-Point Silvicultural Sources) model where required, and
  - Modify operational harvest plans to reduce impacts to water flow when analyzed results are at threshold levels.





## 7.5 Public Accountability

**Goal 5:** Improve public acceptability and comprehension of forest management activities.

Goal 5 has 3 objectives, 11 strategies, and 36 potential tactics associated with it, as follows:



**(Common) Objective 5.1 Increase meaningful input into the management planning process.**

Strategies to achieve this objective are:

- ◆ **(WY) To maintain the Sustainable Forest Management Plan (SFMP) on the Defined Forest Area (DFA)**
  - CSA Certification to the CSA Standard,
  - Involving the WeyFAC in the review and acceptance of the SFMP annually, and
  - Reviewing the SFMP Annual Report with WeyFAC.
- ◆ **(Common) To undertake solicit public input into all new planning areas and Annual Operating Plans by:**
  - Advertising open houses,
  - Direct mail out to individual stakeholders, and
  - Responding to all public inquiries.
- ◆ **(WY) To continue with the Weyerhaeuser Forest Advisory Committee (WeyFAC) by:**
  - Conducting meetings as described in the WeyFAC Terms of Reference,
  - Responding formally to WeyFAC recommendations,
  - Reporting annually to WeyFAC, and
  - Participating actively in the group.

**(Common) Objective 5.1 Increase meaningful input into the management planning process. (Continued)****Strategies to achieve this objective are:**

- ◆ **(WY) To undertake random sampling of community to assess public opinion by:**
  - Incorporating Edson into the Weyerhaeuser Corporate Survey,
  - Surveying recreational users on the FMA, and
  - Completing surveys at trade fairs, open houses, etc.
  
- ◆ **(WY) To maintain a public involvement plan by:**
  - Review of the public involvement plan by WeyFAC as required, and
  - Receiving approval of plan amendments by SRD.
  
- ◆ **(WY) To maintain ongoing liaison with the Community Timber Program groups by:**
  - Participating in discussions with the Cold Creek and Edson Local Advisory Committees, and
  - Participating in discussions with the Lobstick Millers and Loggers Association and the Edson and District Independent Loggers Association.
  
- ◆ **(WY) To implement the approved Public Involvement Plan (PIP) by:**
  - Following the protocols set out in the PIP.

**(Common) Objective 5.2 Consider public values in planning and conducting forest operations.****Strategies to achieve this objective are:**

- ◆ **(Common) To work with Forest Advisory and other stakeholder groups to monitor shifts in public values regarding all forest resources by:**
  - Ensuring members have the opportunity to express ideas and opinions, and
  - (WY) Undertaking random surveys to gauge public opinions.
  
- ◆ **(Common) To provide opportunities for Aboriginal involvement in Forest Management Planning by:**
  - Following Alberta Aboriginal Consultation Guidelines,
  - (WY) Following corporate direction regarding Aboriginal relationships,
  - (WY) Developing an Aboriginal Consultation Guideline for Alberta,
  - (WY) Implementing the Aboriginal Consultation Guideline,
  - Respecting First Nations Treaty Rights, and
  - (WY) Offering local participation as a member of WeyFAC.





**(Common) Objective 5.3 Increase public awareness and understanding of forest management activities.**

**Strategies to achieve this objective are:**

- ◆ **(Common) To work with private woodlot owners and other stakeholders to practice sustainable forest management by:**
  - Promoting proper forest management on private land,
  - (WY) Coordinating seedling requests from private landowners, and
  - (WY) Pursuing an alliance with and support the Alberta Woodlot Association.
  
- ◆ **(Common) To utilize different forums to communicate with and educate the public by:**
  - Participating in trade fairs,
  - Sponsoring seminars that include people of differing opinions,
  - Holding open houses,
  - Participating in school talks,
  - Providing tours of Forestlands operations,
  - Installation of information signage on the FMA, and
  - Pursuing new avenues of communication.

**7.6 Resource Integration**

**Goal 6:** Integrate forest management activities with the needs of other resource users.

Goal 6 has 2 objectives, 4 strategies and 15 potential tactics associated with it, as follows:



**(Common) Objective 6.1 Minimize visual impacts of harvesting on the landscape.**

**Strategies to achieve this objective are:**

- ◆ **(Common) To conduct detailed planning and use a variety of harvest and silviculture systems when aesthetics are of concern by:**
  - Using visual landscape models,
  - Soliciting input through public involvement processes,
  - Utilizing harvesting and silviculture systems that diminish the negative impacts of logging on aesthetics, and
  - Educating the public about sound ecological principles.



**(Common) Objective 6.2 Improve integration of forest operations with commercial users.**

**Strategies to achieve this objective are:**

- ◆ **(Common) To promote integration of operations with all resource users by:**
  - Soliciting input during the development of General Development Plans and Annual Operating Plans with affected operators and addressing concerns where appropriate,
  - Making access management plans available,
  - Implementing access management plans, and
  - Participating actively in the Integrated Resource Management process.
- ◆ **(Common) To integrate planning and operations with all timber operators during all planning stages by:**
  - Collaborating on plans in areas that overlap,
  - Working closely with CTP groups during planning and operations,
  - Integrating CTP groups with company operations where feasible,
  - Pursuing data sharing agreements, and
  - Utilizing one set of ground rules.
- ◆ **(WY) To respond to concerns by:**
  - Taking leadership in addressing issues upon the FMA, and
  - Lobbying the provincial government.

**7.7 Unique Sites**

**Goal 7:** Protect unique archeological and ecological sites.

Goal 7 has 3 objectives, 6 strategies, and 15 potential tactics associated with it, as follows:

**(Common) Objective 7.1 Minimize impacts on archeological sites.**

**Strategies to achieve this objective are:**

- ◆ **(Common) To implement a historical resources management system that provides for identification and reporting of findings, verification of finds, and recognition of potential for resources to occur by:**
  - Reviewing AOP's annually with a certified archeologist, and
  - Amending harvest plans accordingly.
- ◆ **(Common) To educate operators in identifying potential archeological sites by:**
  - Making resource information available,
  - Providing operating guidelines, and
  - (WY) Undertaking training for Forestlands staff to act as resource people.
- ◆ **(WY) To maintain an inventory of known sites by:**
  - Maintaining a GIS database, and
  - Mapping sites as identified.



**(Common) Objective 7.2 Minimize impacts on identified unique ecological sites.**

**Strategies to achieve this objective are:**

- ◆ **(Common) To educate staff in identifying unique ecological sites by:**
  - Providing workshops to staff and contractors,
  - Providing resource material for staff and contractors, and
  - Providing operating guidelines.
  
- ◆ **(WY) To maintain an inventory of known sites by:**
  - Ensuring sites are documented, and
  - Continuing research in the identification and classification of unique ecological sites.

**(Common) Objective 7.3 Minimize impacts on identified First Nations and Métis sites of cultural, historical, medicinal or spiritual significance.**

**Strategies to achieve this objective are:**

- ◆ **(Common) To work with First Nations and Métis groups in identifying important sites by:**
  - Following consultation procedures as they are developed,
  - Inventorying known sites identified in the consultation process, and
  - Protecting known sites from operational activities.

**7.8 Increasing the Timber Supply**

**Goal 8:** Increase the sustainable harvest level of deciduous and coniferous timber.

Goal 8 has 1 objective, 7 strategies and 13 potential tactics associated with it, as follows:



**(Common) Objective 8.1 Identify opportunities to increase the level of forest production from the productive landbase.**

**Strategies to achieve this objective are:**

- ◆ **(Common) To pursue development of Enhanced Forest Management by:**
  - Working co-operatively with other timber operators, and
  - (WY) Continuing with the existing EFM strategies, such as understorey planting, stand tending, stand rehabilitation, full stocking, and maintaining accurate and representative inventory, growth yield data, and productivity data.



**(Common) Objective 8.1 Identify opportunities to increase the level of forest production from the productive landbase.**

**Strategies to achieve this objective are:**

- ◆ **(Common) To investigate increased utilization by:**
  - Pursuing opportunities within Weyerhaeuser and other area mills, and
  - Pursuing opportunities during the harvesting phase.
  
- ◆ **(Common) To investigate increased site productivity and treatment response by:**
  - Continuing with research programs aimed at estimating site productivity, and
  - Pursuing co-operative programs.
  
- ◆ **(Common) To combine resources for research where possible with other agencies by:**
  - Pursuing co-operative programs to optimize research dollars.
  
- ◆ **(Common) To promote common management tactics for EFM by:**
  - Reviewing EFM practices with other operators in common FMUs.
  
- ◆ **(WY) To utilize alternate funding for projects by:**
  - Continuing with TDA and FRIAA projects.
  
- ◆ **(WY) To allocate resources to pursue tree improvement by:**
  - Continuing research at the Weyerhaeuser Tree Improvement Center,
  - Continuing in a spruce tree improvement program,
  - Continuing in an aspen tree improvement program, and
  - Continuing in co-operatives studying tree improvement.

## **7.9 Conflicting Objectives**

Over the course of developing the objectives to achieve the goals for the DFMP, it became immediately apparent that there were going to be conflicting objectives throughout the plan. Through the iterative process of balancing potential objectives and strategies (as defined in Volume I, section 4.3), the impacts of these conflicts have been minimized.



## 8 IMPLEMENTATION OF PLAN

The implementation plan will identify potential changes in policy and provide direction for conducting forest management practices. As identified in Chapter 4 of the DFMP, 'Weyerhaeuser Forest Management Philosophy and the Planning Process', Weyerhaeuser will practice adaptive management upon the FMA, the benefits of which include:

- ◆ Confidence in forest management practices by identifying variances between forecasted conditions and actual conditions
- ◆ Flexibility in adjustments to management for identified variances, and
- ◆ Accumulation of an information base for continued improvement for future planning requirements

The avenue for implementation of goals, objectives and strategies of the DFMP will be the production of a General Development Plan (GDP) and an Annual Operation Plan (AOP). The guiding document for the development of the GDP and the AOP will be the Ground Rules.

### 8.1 *Timber Operations*

The timber operating year is defined as May 1<sup>st</sup> to April 30<sup>th</sup>.

#### 8.1.1 Sequencing

The timber supply models being used (Woodstock and Stanley) will provide information on the shape, size, and distribution of harvest areas for the first twelve periods (60 years). Harvest areas identified through previous planning exercises (pre-planned) have been scheduled for harvest in period one (2004-2009). Where these planned areas exceed volumes proposed in the first period of the plan, then the remainder are scheduled in period two (2010-2014).

The first planning period will commence on May 1<sup>st</sup>, 2004, which coincides with the start of the timber year for the FMA.

For operational planning purposes, the spatial harvest sequence (SHS) for the first four periods (May 1<sup>st</sup>, 2004 – April 30<sup>th</sup>, 2024) will be utilized. It is expected that the SHS as submitted and approved, will be followed by all timber operators. Harvest areas are identified by operator for the first two periods of the DFMP (2004-2014).

Variances to the SHS will most likely occur. Stand conditions (i.e. age, health) unaccounted for in the inventory may arise that would result in endangered timber conditions or a requirement to harvest damaged, dying or dead timber. Similarly there may be site-specific management objectives that could not be accounted for in the DFMP analysis, or that arose after the DFMP submission. Table 8-1 describes potential reasons for variances to the plan. The table is not an exhaustive list, but identifies the most common issues when operationalizing a strategic plan.

**Table 8-1 Variance from DFMP SHS**

<p>1. <i>Additions</i></p> <ul style="list-style-type: none"><li>◆ fire damaged (including risk),</li><li>◆ affected by insects and disease,</li><li>◆ rapidly declining stand volume,</li><li>◆ blowdown,</li><li>◆ pending alternate land uses,</li><li>◆ marginal stands (see 8.1.10),</li><li>◆ Inventory polygon size constraint (i.e. portions of an adjacent unsequenced polygon may be added to a block to meet environmental or operational objectives), and</li><li>◆ Switch stands.</li></ul>
<p>2. <i>Subtractions</i></p> <p>a) <i>Deferrals</i></p> <ul style="list-style-type: none"><li>◆ Watershed analysis restrictions,</li><li>◆ Specific habitat requirements,</li><li>◆ Stakeholder concerns,</li><li>◆ Ground Rules requirements,</li><li>◆ New management initiatives,</li><li>◆ Research Requirements, i.e. PSPs, ISPs, etc.,</li><li>◆ Block size combined with location (i.e. isolated small block),</li><li>◆ Greenup not accounted for in the TSA,</li><li>◆ Harvesting season restrictions,</li><li>◆ Low volume,</li><li>◆ Immature stands, and</li><li>◆ Understorey is more valuable in overstorey.</li></ul> <p>b) <i>Deletions</i></p> <ul style="list-style-type: none"><li>◆ Inclusion of wrong strata into spatial sequence,</li><li>◆ Unique finds,</li><li>◆ Small scale landuse developments, and</li><li>◆ Ground rule requirements.</li></ul>

Variance from the spatial harvest sequence (SHS) will be tracked during the operational final harvest planning stage for each Land Management Unit (LMU). Additions will be cumulative and should not exceed the SHS area without approval from SRD.

Subtractions (deferrals and deletions) will be tracked separately from additions. Cumulative subtractions to final harvest plans for each LMU should not exceed 20% of the SHS without approval from SRD.

All timber operators will apply these variances against their respective sequencing for the decade as identified in the approved DFMP.



### 8.1.2 Harvesting and Hauling Methods

The harvesting and hauling methods adopted by the Company were selected to meet the following criteria:

- ◆ minimize environmental impacts;
- ◆ increase the efficiency in implementing dominant silviculture regimes;
- ◆ decrease the cost of delivered wood;
- ◆ maximize safety;
- ◆ meet requirements for piece size, wood quality, and delivery schedules;
- ◆ align with public values.



Table 8-2 below represents the predominate harvesting methods currently used by Weyerhaeuser.

**Table 8-2 Harvesting Methods Currently Used by Weyerhaeuser**

Phase	Deciduous	Coniferous
<b>felling</b>	mechanical	mechanical
<b>skidding</b>	rubber tired grapple, or forwarder ("wide" tired during unfrozen conditions )	rubber tired grapple, or forwarder ("wide" tired during unfrozen conditions)
<b>limbing / topping</b>	stump side or roadside; mechanical	stump side or roadside; mechanical
<b>bucking</b>	roadside mechanical	roadside mechanical
<b>hauling</b>	shortwood (2.6m) or treelength	treelength or cut to length

All harvesting operations are currently contracted on a "stump to dump" or "stump to roadside" basis.

The Company has initiated a skills development program to improve its technical knowledge of logging on steep slopes (between 45% and 60%). In the development of harvest designs a terrain stability assessment will be provided to identify sensitive sites due to the presence of, but not limited to, seepage, proximity to watercourses, and steep slopes (greater than 45%). In cooperation with our logging contractors, the Company will develop methods for timber harvesting on steep slopes in an environmentally sound, safe and cost effective manner. Harvesting on all steep slopes (in excess of 45%) will be conducted in a manner that will minimize soil erosion.





Specific to hauling, the Company is utilizing Central Tire Inflation (CTI) technology to extend the hauling season. Also, the Company has developed timber harvest sequencing to balance the haul distance during the planning horizon.

### 8.1.3 Temporary In-Block Roads

Concerns have been identified regarding the impact of temporary haul roads developed to extract wood from harvest areas. In the Pembina Forestlands, in-block road building is estimated to be in the range of 3% of the total harvested areas. This is based on analysis of roads over several years.



Strategies for regenerating temporary in-block roads are described in Appendix 8-1. In addition, regeneration performance on temporary in-block roads will be monitored to assess impacts in terms of stocking and performance of regeneration. The monitoring protocol for temporary in-block road monitoring is described in Appendix 8-1.

The following establishment survey information will be required by Weyerhaeuser from all operators for the analysis to be undertaken: Opening number; strata declaration (block); all information collected for each 'R' plot; season of operation during initial harvest; reclamation strategy applied to roads.

### 8.1.4 Salvage

Weyerhaeuser remains committed to using salvage (dead or dying) timber. The primary concerns in the utilization of dead timber are:

- ◆ for deciduous timber, the effect of moisture loss on wood ultra-structure, the ability to accommodate the timber in drying processes, and increased wood decay; and
- ◆ for coniferous timber, wood degradation from insects and introduced pathogens, and physical damage associated with moisture loss.

The amount and location of dead timber are operational factors that may determine the feasibility of use. Regardless, the most important objective is prompt harvesting and utilization after the time of injury or mortality.

Not all fire-killed areas will be harvested. Some areas will remain intact so that they can be represented on the landscape.





### 8.1.5 Green-up Constraints

Green-up constraints are applied in the TSA with the assumption, based on previous studies, that harvest areas are sufficiently regenerated and provide sufficient hiding cover for large game species. The spatial harvest sequence has accounted for green-up, therefore no height requirements for regenerating stands are necessary during ground rule development.



The amount of structure (See Appendix 8-2) that remains in harvest areas after logging has increased substantially. This includes snags, green tree retention, understory protection and lesser vegetation along adjacent right-of-ways. The retention of variable vertical structure, along with the growth of regeneration, contributes to the screening capacity of the site.

The green-up constraints used in the management units are as follows:

- ◆ In FMUs E2, W5, and W6, the green-up period used for pure conifer (C) blocks is 15 years (two periods). For the remaining strata (CD, DC, and D), the green-up period is ten years (one period). (See Volume II, Chapter 6.)
- ◆ In FMU E1, no green-up period was applied, in lieu of leaving additional merchantable retention.
- ◆ An additional period is allowed for green-up in the early years of sequencing to alleviate concerns regarding green-up in periods one and two of the SHS.

### 8.1.6 Understorey Protection

Understorey protection will be practiced across the FMA and Non-FMA areas as described previously. Techniques will vary depending on the assumptions made in the Timber Supply Analysis and the characteristics of the understorey. Understorey protection can be described as either 'planned' or 'avoidance'. The approved AVI will provide direction for all strategies. A higher level of protection may be made as a result of field calls, however it is not mandatory to do so.

#### 8.1.6.1 Planned Protection

Planned protection of understorey will occur when the TSA assumptions dictate that understorey is recognized in future yields. This occurs only within the 'switch' stands where the yield curves are pointed to the understorey, not the overstorey. All other stands revert to the same cover group at age zero and start to grow.

The following 'switch' stands are recognized in Edson:

- ◆ E1/E2/W5/W6: Overstorey pure 'D' stands with a crown closure of 'A' and an understorey of > 'A' crown closure; and
- ◆ W6: Overstorey pure 'D' stands with a crown closure of > 'A' and an understorey of > 'A' crown closure and having a valid forest cover type of C, CD or DC present.

In the TSA, these 'switch' stands are identified as the "Storey of Primary Management" (see Table 2-10 in the Landbase Assignment document in Volume II of the DFMP). During operations, planned protection should target a retention of more than 50% undamaged conifer stems as compared to the pre-harvest conditions. Acceptable stems are greater than two



metres in height at time of harvest, have 50% or more live crown, and show good health and vigor. Understorey protection success will be measured during the normal establishment survey procedure.

#### 8.1.6.2 Avoidance Protection

Avoidance protection will occur in all other stands not identified as requiring 'planned' protection. Operator awareness will be the main tactic used to avoid damage to conifer understorey. No pre-survey work is required. Understorey protection success will be measured during the normal establishment survey procedure.

#### 8.1.7 Transition Assumptions for Regenerating Stands

The sustainable harvest level set in this plan is based on the assumption that harvested stands will regenerate to prescribed density and composition after harvest. The transition assumptions for regenerating stands are as follows:

- ◆ Pre-harvest stands with an A, B, C or D density will regenerate to a C density post harvest. The C density regeneration objective is assumed to align with the 80% stocking target in the regeneration standards.
- ◆ Regenerating stands are assumed to have the same broad cover group composition as the pre-harvest stand overstorey. C, CD, DC and D regeneration standards are assumed to align respectively with C, CD, DC, and D broad cover group compositions
- ◆ An exception to regeneration stand composition assumptions is where the understorey composition is used to determine the species of primary management. In this case, the regenerating stand is assumed to have the same composition as the understorey broad cover group.

#### 8.1.8 Silviculture

The Forest Management Agreement gives Weyerhaeuser the right to grow timber and carry out reforestation programs. The agreement also requires Weyerhaeuser to progressively reforest all land cut over by the Company. In addition, a goal of this management plan is to increase the sustainable harvest level of deciduous and coniferous timber from the FMA Area. These rights, responsibilities, and goals are supported by a set of regeneration assumptions, silviculture strategies, and reforestation standards.



The provincial regeneration standards (C, CD, DC, D) will be used to evaluate the performance of regenerating harvest areas until alternative regeneration standards are developed and approved that specifically link regeneration standards to yield stratum (see Section 10.6).

To use resources efficiently while maintaining relative proportions of coniferous, mixedwood, and deciduous stands, certain factors should contribute to reforestation decisions.

These considerations include, but are not limited to:

- ◆ Site suitability and stand condition
- ◆ Declining deciduous stand condition and associated low natural regeneration potential
- ◆ Residual immature coniferous trees



- ◆ Regenerating stand stocking and condition

To effectively integrate these considerations into the operational decision making process while supporting the assumptions of future forest composition, an exchange of areas between different stand type strata following Provincial Policy may be considered. There are not anticipated to be any major shifts in leading species across the landscape resulting from the implementation of the silviculture strategies description in Appendix 8-3.

To sustain the productivity of the forest growing stock, a strategy of prompt regeneration will be used. Planning regeneration activities prior to harvest and scheduling treatments as soon as logistically feasible after harvest will facilitate prompt regeneration. Planting and natural seeding will be used to establish coniferous seedlings. Where planting of coniferous seedlings is used to regenerate C, CD, and DC openings, a target of 1400, 1000, and 800 stems per hectare (SPH) will be used in prescribing planting density. For C stratum openings 1400 SPH is deemed adequate to meet the associated regeneration standard while accounting for normal levels of mortality. Where higher levels of mortality are suspected after planting, openings will be monitored to support early detection and remedial action. Distribution of seedlings for CD and DC openings can be either an even distribution of 1000 and 800 SPH respectively or concentrating higher density planting of an area proportionally less than the entire block. A typical application of this would be to plant the road and decking areas of a DC block at 1400 SPH to the extent that 60 percent of the block is planted. This equates to an average planting density of 840 SPH, which correspond with the guideline of a target of 800 SPH.

When establishing a planting density for specific openings, factors of pre-harvest understorey or post-harvest advanced regeneration and ingress potential will be considered. Ingress potential will be evaluated based on seed source and seedbed conditions. Target planting densities may be adjusted for specific site conditions in recognition of these factors. Adjusted planting densities will be presented in the Silviculture Annual Operating Plan.

All regenerating stands will pass an establishment standard. If an opening does not pass the establishment standard then one or more of the following tactics will be employed to address the failed status.

- ◆ Re-treat using combinations of site preparation, planting, or tending,
- ◆ Leave stands to grow where height performance is the cause for failure, and
- ◆ Change the opening stratum declaration.

Balsam fir and alpine fir are considered an acceptable crop tree for coniferous species. Fir species constitute a part of the inventory and their presence is incorporated in the development of yield curves. Merchantable fir is utilized as a component of the coniferous harvest. Where understorey fir exists in an opening it is often retained to provide value in aesthetics, habitat, structure, and fibre production.

The primary harvesting system used is patch cutting with variable retention, with subsequent reforestation activities to provide for a sustainable timber harvesting landbase. Patch cutting involves the removal of a majority of merchantable stems from the harvest area. As part of this harvesting system Weyerhaeuser will be employing the Stand Level Ecological Guidelines that provide for both vertical and horizontal structure to be left on the harvest area.



### 8.1.9 Incidental Coniferous and Deciduous Timber Replacement Strategies on the FMA

Section 25 of the FMA agreement addresses incidental coniferous and deciduous timber upon the FMA. The DFMP has recognized this commitment by incorporating strategies within the Timber Supply Analysis that will account for incidental components upon the FMA, as well as the primary species supporting both the deciduous and coniferous Annual Allowable Cuts.

Silviculture activities will be undertaken that contribute to the sustainability of the incidental components of the stands. These activities will be applied at various levels and will include:

- ◆ Establishment of coniferous trees on new harvest areas that do not support deciduous regeneration, most notably on roads and non-satisfactorily restocked areas.
- ◆ Avoidance of conifer understorey during logging operations in the deciduous landbase.
- ◆ Protection of some of the deciduous component in regenerating stands when tending coniferous harvest areas.

Review of establishment and performance survey results of pure 'C' and 'D' declared blocks will occur periodically to document the incidental replacement strategies effectiveness. The growth and yield program will also help monitor the effectiveness of these strategies.

### 8.1.10 Marginal Stands

During the net down stage of the Timber Supply Analysis (TSA), pure black spruce stands (defined as stands having a black spruce content of greater than 70%) and stand types with between 10 and 20% larch content were excluded from the net productive landbase. Timber operators recognized that these stands were more difficult to regenerate than other stands in the net productive landbase while also providing timber volumes found at the lower end of the merchantable limit.

It was recognized, however, that some of the timber operators operating on the FMA were anxious to access some of this forested landbase, thereby providing additional annual allowable cut (AAC) volume.

To manage the opportunity for such additional volumes, the following apply:

1. Pure black spruce stands and stands with minor components of larch (<30%) are not part of the net productive landbase as defined in the Net Down document found in Volume II (TSA) of the DFMP.
2. The opportunity to access stands that are merchantable to current utilization standards. Selected stands are those that, as a minimum, are 14 meters in height and greater than 'A' density.
3. As described in the TSA, the volumes available for harvest for each operator were determined as follows:  
$$\text{Average volume hectare/rotation age} \times \text{stratum area} \times \text{AAC\%}$$
4. The stands are not spatially recognized in the approved Spatial Harvest Sequence (SHS). If planned for harvest in any Final Harvest Plan (FHP), they will be viewed as a variance (addition to the SHS).





5. All merchantable volume harvested from this stratum is chargeable to the marginal stand AAC as described in the TSA in Volume II.
6. Unharvested volume from this stratum will not be carried forward into the next periodic cut period or quadrant.
7. Access of this stratum will be reviewed during the preparation to the next DFMP to see whether it should be included into the net productive landbase.
8. The decision to access marginal stands contributing to the marginal stand AAC will be made annually by each operator with the submission of the Annual Operating Plan (AOP).

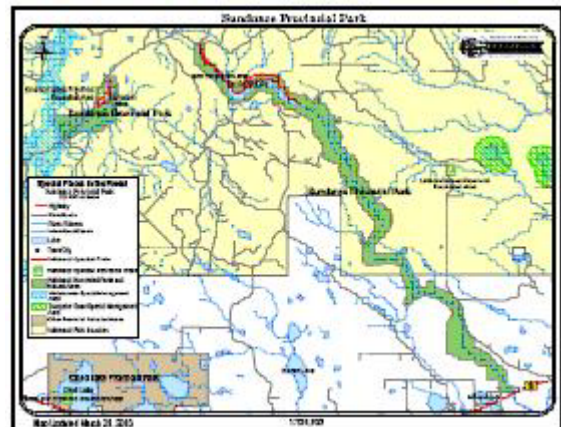
### 8.1.11 Potentially Productive Area

Potentially productive landbase has been identified during the landbase netdown process. These areas will be visited on the ground in an attempt to classify them prior to the next DFMP, as either productive or non-productive forest landbase.

### 8.1.12 The Sundance Provincial Park Special Management Zone

A 500-metre Special Management Zone surrounds Sundance Provincial Park. The purpose of this zone is to protect the ecological integrity of the Park without unduly restricting industrial activity.

The following guidelines (or most currently approved version) will be applied to forest management activities occurring on lands lying within 500 metres of the boundary of Sundance Provincial Park.



### Access

1. No new permanent access.
2. All block roads are to be rolled back immediately following logging or site preparations.
3. No new gravel pits.

### Timber Harvesting

1. Harvesting should be planned to maintain the range of forest vegetation, age classes, and stand structures appropriate for the area.
  - i. Natural disturbance patterns should be mimicked as closely as possible,
  - ii. Maintain the deciduous and coniferous forest types, appropriate to their historic presence,
  - iii. Uneven-aged or mixedwood stands should be harvested in a manner to perpetuate this condition (e.g., shelterwood harvesting, small patch retention, green tree and snag retention, understorey protection, etc.), and
  - iv. Even-aged stands will be harvested to regenerate stands of the same condition (e.g. clearcutting to promote even-aged stands).
2. Detailed block plans and ecological assessments should be done, for each block, prior to harvest.
3. Visual Sensitivity analysis should be done, for each block, prior to harvest.



4. Minimize soil disturbance and retain a protective cover of vegetation and/or duff layer.
5. Stump-side processing is preferred except where it might impede reforestation.
6. Harvesting design should consider fuel management to reduce the risk of a catastrophic fire on the provincial park.

### **Silviculture**

1. High importance should be placed on protecting advance growth.
2. Natural reforestation methods should be used where they will reliably reforest the area (dragging pine for naturals, suckering of aspen).
3. Where planting is prescribed, use seed sources adapted to the site.

#### **8.1.13 Chip Lake Fire Regeneration Protocols**

In the spring of 1998, an area of approximately 11,000 hectares burned south of Chip Lake in West Central Alberta. More than half the fire occurred in the Edson FMA, while the remaining portion occurred in the adjacent white zone. The gross fire boundary (as identified by SRD at the time) was utilized to identify impacted stands. No attempt was made to delineate burned versus non-burned (green) areas within the fire boundary.

During the development of the detailed forest management plan, strategies were utilized that allowed the burned, un-salvaged and productive landbase within the boundary of the 1998 Chip Lake Fire (W6) to be retained within the net landbase. Stands were given an age of minus 10, while all other stand attributes remained the same (i.e. species content, crown close, etc.). The assumptions made were 1) stands regenerate naturally after fire, and 2) that regeneration establishment generally occurs within 10 years of fire occurrence.

A commitment was made to verify that these areas did meet the assumptions used in the plan (as described above). Based on this commitment, the following outlines Weyerhaeuser's monitoring process to validate the assumptions prior to the development of the next DFMP. The following process, however, may not be required if a new AVI has been completed in the interim.

- a) Delineate burned and un-salvaged productive landbase boundaries (as described in the net down document in Volume II – Timber Supply Analysis) using standard black and white aerial photography. The minimum polygon size delineated will be 2.0 hectares. Each polygon will be identified using a unique number similar to ARIS (e.g. 5-15-051-0101-CLF).
- b) All burned and un-salvaged polygons identified in (a) will be surveyed at full intensity as outlined in Table 5.1 on page 48 of the Alberta Regeneration Survey Manual (May 1, 2000 Orange Book). Areas identified as green (actually unburned in the 1998 fire) will be excluded from this process, but will be used to refine the actual burn boundary.
- c) Surveys are considered 'pre-establishment' surveys, and imply no liability on behalf of Weyerhaeuser or its partners to successfully regenerate the polygons to the provincial standard of 80% or more.
- d) Minimum acceptable deciduous crop tree height will be 120 cm; minimum acceptable coniferous crop tree height will be 30 cm; there will be no minimum density requirements, therefore plot densities will not be required during the surveys.



- e) The information recorded for the plot will only indicate whether the plot is stocked first to deciduous, then to conifer and lastly to NSR. Therefore plot level broad cover group (BCG) assignment will be determined by the presence or absence of a deciduous crop tree. The assumption made is that any deciduous within a plot will dominate the plot into the future recognizing there are no free-to-grow commitments being made.
- f) Polygon level BCG assignment (based on 'e') will be consistent with those used in the TSA;

D = deciduous stocking  $\geq 80\%$  and coniferous stocking  $< 20\%$   
 DC = deciduous stocking  $\geq 50\%$  and leading while coniferous stocking  $\leq 50\%$   
 CD = conifer stocking  $\geq 50\%$  and leading while deciduous stocking  $\leq 50\%$   
 C = coniferous stocking  $\geq 80\%$  and deciduous stocking  $< 20\%$

- g) Crown Closure Assignment – Total stocking in (e) will define the Crown Closure assignment to be applied in each polygon

<u>Crown Closure</u>	<u>Minimum Total Stocking Percent</u>
B	$< 80\%$
C	$\geq 80\%$

- h) Strata Determination – the stratum assignment for each polygon will be based on (f - BCG) and (g - CC) as defined and calculated above
- i) Yield Class assignment – Natural yield curves as described in the TSA will be used to assign yield based on the individual polygons.

### 8.1.14 Petroleum

#### Integration, Salvage and Afforestation Opportunities with the Petroleum Sector

There are 3 components of Weyerhaeuser’s approach to recognizing the impact of the petroleum sector upon the FMA. They include:

1. Minimizing the impact through coordinated land use planning
2. Accounting for timber losses resulting from industrial activity
3. Wellsite and road reclamation program

#### **1. Minimizing losses through coordinated land use planning**

Weyerhaeuser is committed to applying the multiple-use concept to ensure that the timber harvesting landbase in the Unit is sustainable over the long term. The goal of integrating with the management activities of other resource users will be achieved by the continued commitment to the Provinces policy of Integrated Resource Planning (IRP). The policy recognizes that managing one resource affects the management of other resources. The IRP process determines how the resource management objectives are to be achieved by establishing resource management guidelines.

The company’s intent is to establish and maintain clear lines of communication with all major industrial players across the FMA’s. Major developments (main all-weather permanent roads) by both industries tend to bring them together to insure that impacts across the landscape are minimized where possible. SRD plays a major function in insuring that this co-ordination and planning occurs. The development of common corridors are an example of an end product resulting from this communication and coordination.



All industrial dispositions, when they occur on the FMA, are referred to the company for consent. Each disposition is reviewed for potential impacts on Company operations (i.e. research plots, permanent sample plots, road systems, etc.) and approved, amended or rejected accordingly. Company concerns are usually directed to the disposition holder and/or to SRD when appropriate.

## **2. Accounting for Losses due to Industrial Activity**

Existing seismic lines and other lands cleared for industrial use (i.e. well sites, LOC's, pipelines) are removed during the land base net down stage of all Timber Supply Analyses.

For dispositions occurring after the net timber supply analysis, an estimate of timber volume to be removed due to the activity is based on the amount of area removed from the FMA. The estimated volume is then charged against FMA production for that year. In other words, the amount of annual allowable cut available for Weyerhaeuser on an annual basis is reduced by the amount of volume estimated to have been removed from the FMA through this process.

## **3. Well site and Road Reclamation**

Well sites and roads to well sites that are no longer required by the energy sector do not need tree cover established on them prior to the dispositions being cancelled and returned to the FMA. In 2005, Weyerhaeuser began working cooperatively with the energy sector to vegetate these areas to tree cover, using a portion of the money the company has collected through the timber damage assessment process to fund this work.

In the long term, the goal is to have all abandoned wellsites without a reclamation certificate, along with their associated road, pipeline and electrical rights of ways, reforested to trees. The intent is to work cooperatively with the energy sector during the reclamation process; the energy company will do the site preparation work, Weyerhaeuser will do the tree planting.

Starting in 2005, a program of reforesting abandoned industrial sites that have already received reclamation certificates has been implemented. In these instances, Weyerhaeuser will be responsible for both site preparation and tree planting. A specific schedule for reforesting these sites has not been established yet.

As well, Weyerhaeuser will be involved in two different strategies looking at wellsite reclamation:

1. Participation in the SRD Site Recovery Project.
2. Sponsoring research by Dr. D McNabb to better understand soil properties associated with these sites.

Additionally, Weyerhaeuser is considering joining an existing study group involving Alberta-Pacific Forest Industries (Al-Pac) and various oil & gas companies in North-east Alberta if deemed useful to our program.

It needs to be emphasized that at this time that the initial goal of this program is to re-establish forest cover, not timber production. The long-term performance of trees on reclaimed well sites is not well understood. We need to develop an understanding as to whether the sites can be brought to or near to the stated goal of equivalent capability for survival and growth. Weyerhaeuser is currently working with SRD to establish treatment, and perhaps monitoring,





protocols that would likely result in acceptable regeneration survival and growth on these particular sites.

### 8.1.15 Periodic and Quadrant Reconciliation Volumes

The Plan has attempted to address over/under production estimated to have occurred prior to May 1, 2004 for all operators. These estimated production levels were determined for each FMU and for both of the primary species.

The volumes used in the TSA (see Chapter 6 for actual numbers used) are only the best estimate at the time of the TSA. Actual volumes will vary upon completion of periodic audits completed by SRD. Therefore, actual approved periodic cuts will be determined by SRD at the end of each cut period. The volumes in the TSA are only used as a proxy.

### 8.1.16 Cut Control Periods and Periodic Cut Calculations

#### 8.1.16.1 Weyerhaeuser

The FM Agreement defines the period allowable cut as “the total of the annual allowable cuts approved for a five-year cut control period” (Section 1.1h). Any periodic overproduction will be accounted for in subsequent periods as described in section 17(2) of the FM Agreement. Weyerhaeuser will balance the specific FMU aac’s by following the approved SHS.

#### The cut control periods for the FMA 9700035 area as follows:

- ◆ Period one - July 1<sup>st</sup>, 1997 to June 30<sup>th</sup>, 2002
- ◆ Period two - July 1<sup>st</sup>, 2002 to June 30<sup>th</sup>, 2007
- ◆ Period three - July 1<sup>st</sup>, 2007 to June 30<sup>th</sup>, 2012
- ◆ Period four - July 1<sup>st</sup>, 2012 to June 30<sup>th</sup>, 2017

#### The cut control periods for the DTA E910001 area as follows:

- ◆ Period one - July 1<sup>st</sup>, 1997 to April 30<sup>th</sup>, 2002
- ◆ Period two - May 1<sup>st</sup>, 2002 to April 30<sup>th</sup>, 2007
- ◆ Period three - May 1<sup>st</sup>, 2007 to April 30<sup>th</sup>, 2012
- ◆ Period four - May 1<sup>st</sup>, 20012 to April 30<sup>th</sup>, 2017

Periodic or Quadrant annual allowable cuts, without inclusion of any carry over/under volumes, will be derived from the approved AAC’s. The approved AAC’s are as per approved Preliminary Forest Management Plan (PFMP) or the approved Detailed Forest Management Plan (DFMP).

#### FMA periodic cuts are calculated as follows:

- ◆ Period One =  $[0.83 (304/365 \text{ days} - \text{July } 1^{\text{st}}/97 \text{ to April } 30^{\text{th}}/98) \times \text{PFMP}] + [4.17 (4 \text{ years plus } 61/365 \text{ days}) \times (\text{PFMP aac} - \text{decrease in aac in W06 resulting from the Chip Lake Fire})]$
- ◆ Period Two =  $[2.833 (2 \text{ years plus } 304/365 \text{ days} - \text{July } 1^{\text{st}}/02 \text{ to April } 30^{\text{th}}/05) \times \text{PFMP aac}] + [2.167 (2 \text{ years plus } 61/365 \text{ days} - \text{May } 1^{\text{st}}/05 \text{ to June } 30^{\text{th}}/07) \times \text{DFMP aac}]$  if the DFMP is approved prior to May 1<sup>st</sup> 2006 or



- ◆ Period Two =  $[3.833 (3 \text{ years plus } 304/365 \text{ days} - \text{July } 1^{\text{st}}/02 \text{ to April } 30^{\text{th}}/06) \times \text{PFMP aac}] + [1.167 (1 \text{ year plus } 61/365 \text{ days} - \text{May } 1^{\text{st}}/06 \text{ to June } 30^{\text{th}}/07) \times \text{DFMP aac}]$  if the DFMP is approved after April 30<sup>th</sup>, 2006
- ◆ Period Three = 5 X DFMP aac
- ◆ Period Four = 5 X DFMP aac

**Non-FMA allocation periodic cuts are calculated as follows:**

- ◆ Period One = 4.8332 (4 years plus 304/365 days – July 1<sup>st</sup>/97 to April 30<sup>th</sup>/02) X PFMP aac
- ◆ Period Two =  $[3 (\text{May } 1^{\text{st}}/02 \text{ to April } 30^{\text{th}}/05) \times \text{PFMP aac}] + [2 \times \text{DFMP aac} - \text{May } 1^{\text{st}}/05 \text{ to April } 30^{\text{th}}/07]$  if the DFMP is approved prior to May 1<sup>st</sup> 2006 or
- ◆ Period Two =  $[4 (\text{May } 1^{\text{st}}/02 \text{ to April } 30^{\text{th}}/06) \times \text{PFMP aac}] + [1(\text{May } 1^{\text{st}}/06 \text{ to April } 30^{\text{th}}/07) \times \text{DFMP aac}]$  if the DFMP is approved prior to April 30<sup>th</sup>, 2006
- ◆ Period Three = 5 X DFMP aac
- ◆ Period Four = 5 X DFMP aac

### 8.1.16.2 Quota Holders

The current cut control period for **Alberta Newsprint, Blue Ridge Lumber Inc., and Millar Western Industries** is:

- ◆ Current Period - May 1<sup>st</sup>, 2001 to April 30<sup>th</sup>, 2006
- ◆ Subsequent Period - May 1<sup>st</sup>, 2006 to April 30<sup>th</sup>, 2011

Quadrant cuts for the three companies are calculated as follows:

- ◆ Current Period  $[4 (\text{May } 1^{\text{st}}/01 \text{ to April } 30^{\text{th}}/05) \times (\text{PFMP aac minus aac decrease effect May } 1^{\text{st}}/98 \text{ due to Chip Lake Fire})] + (1 [\text{May } 1^{\text{st}}/05 - \text{April } 30^{\text{th}}/06) \times \text{DFMP aac}]$  if the DFMP is approved to May 1<sup>st</sup>, 2006 or
- ◆ Current Period  $[5 (\text{May } 1^{\text{st}}/01 \text{ to April } 30^{\text{th}}/06) \times (\text{PFMP aac minus aac decrease effect May } 1^{\text{st}}/98 \text{ due to Chip Lake Fire})] + [0 \times \text{DFMP aac}]$  if the DFMP is approved after April 30<sup>th</sup>, 2006
- ◆ Subsequent Period 5 (May 1<sup>st</sup>, 2006 to April 30<sup>th</sup>, 2011) X DFMP aac

The current cur control period for **Edson Timber Products Ltd. (ETP)** are:

- ◆ Current Period - May 1<sup>st</sup>, 2002 to April 30<sup>th</sup>, 2007



- ◆ Subsequent Period - May 1<sup>st</sup>, 2007 to April 30<sup>th</sup>, 2012

Quadrant cuts for **ETP** are calculated as follows:

- ◆ Current Period [3 (May 1<sup>st</sup>/02 to April 30<sup>th</sup>/05) X approved PFMP aac] + [2 (May 1<sup>st</sup>/05 to April 30<sup>th</sup>/07) X DFMP aac] if the DFMP is approved prior to May 1<sup>st</sup>, 2006 or
- ◆ Current Period [4 (May 1<sup>st</sup>/02 to April 30<sup>th</sup>/06) X PFMP aac] + [1 (May 1<sup>st</sup>/06 to April 30<sup>th</sup>/07) X DFMP aac] if the DFMP is approved after April 30<sup>th</sup>, 2006
- ◆ Subsequent Period 5 (May 1<sup>st</sup>, 2007 to April 30<sup>th</sup>, 2012) X DFMP aac

The cut control period for **Cold Creek Timber Ltd. (CCTL)** are:

- ◆ Current Period - May 1<sup>st</sup>, 2004 to April 30<sup>th</sup>, 2009
- ◆ Subsequent Period - May 1<sup>st</sup>, 2009 to April 30<sup>th</sup>, 2014

Quadrant cuts for **CCTL** are calculated as follows:

- ◆ Current Period - 5 X 10,000 (fixed volume of conifer)
- ◆ Subsequent Period - 5 X 10,000 (fixed volume of conifer)

The current cut control period for **EDFOR** are:

- ◆ Current Period - May 1<sup>st</sup>, 2005 to April 30<sup>th</sup>, 2010
- ◆ Subsequent Period - May 1<sup>st</sup>, 2010 to April 30<sup>th</sup>, 2015

Quadrant cuts are calculated as follows:

- ◆ Current Period [5 (May 1<sup>st</sup>/05 to April 30<sup>th</sup>/10) X DFMP aac] if the DFMP is approved prior to May 1<sup>st</sup>, 2006 or
- ◆ Current Period [1 (May 1<sup>st</sup>/05 to April 30<sup>th</sup>/06) X PFMP aac] + [4 (May 1<sup>st</sup>/06 to April 30<sup>th</sup>/10) X DFMP aac] if the DFMP is approved after April 30<sup>th</sup>, 2006
- ◆ Subsequent Period May 1<sup>st</sup>, 2007 to April 30<sup>th</sup>, 2012

### 8.1.16.3 Community Timber Program

The cut control periods for the **Edson E2 CTP** are:

- ◆ Current Period - May 1<sup>st</sup>, 2001 to June 30<sup>th</sup>, 2007
- ◆ Subsequent Period - July 1<sup>st</sup>, 2007 to June 30<sup>th</sup>, 2012



Periodic cuts for **Conifer** are calculated as follows:

- ◆ Current Period [4 (May 1<sup>st</sup>, 2001 to April 30<sup>th</sup>, 2005) X PFMP aac] + [2.167 (2 years plus 61/365 days – May 1<sup>st</sup>, 2005 to June 30<sup>th</sup>, 2007) X DFMP aac] if the DFMP is approved prior to May 1<sup>st</sup>, 2006 or
- ◆ Current Period [5 (May 1<sup>st</sup>, 2001 to April 30<sup>th</sup>, 2006) X PFMP aac] + [1.167 (1 year plus 61/365 days – May 1<sup>st</sup>, 2006 to June 30<sup>th</sup>, 2007) X DFMP aac] if the DFMP is approved prior to April 30<sup>th</sup>, 2006
- ◆ Subsequent Period 5 (July 1<sup>st</sup>, 2007 to June 30<sup>th</sup>, 2012) X DFMP aac

Periodic cuts for **Deciduous** are calculated as follows:

- ◆ Current Period [6.167 (6 years plus 61/365 days – May 1<sup>st</sup>, 2001 to June 30<sup>th</sup>, 2007) X 1,500 (fixed volume of deciduous)]
- Subsequent Period 5 (July 1<sup>st</sup>, 2007 to June 30<sup>th</sup>, 2012) X 1,500 (fixed volume of deciduous)]

The cut control periods for **conifer** for the **Cold Creek Lobstick Loggers Association W5 CTP** are:

- ◆ Current Period - May 1<sup>st</sup>, 2001 to June 30<sup>th</sup>, 2007
- ◆ Subsequent Period - July 1<sup>st</sup>, 2007 to June 30<sup>th</sup>, 2012

Periodic cuts are calculated as follows:

- ◆ Current Period [4 (May 1<sup>st</sup>, 2001 to April 30<sup>th</sup>, 2005) X PFMP aac] + [2.167 (2 years plus 61/365 days – May 1<sup>st</sup>, 2005 to June 30<sup>th</sup>, 2007) X DFMP aac] if the DFMP is approved prior to May 1<sup>st</sup>, 2006 or
- ◆ Current Period [5 (May 1<sup>st</sup>, 2001 to April 30<sup>th</sup>, 2006) X PFMP aac] + [1.167 (1 year plus 61/365 days – May 1<sup>st</sup>, 2006 to June 30<sup>th</sup>, 2007) X DFMP aac] if the DFMP is approved prior to April 30<sup>th</sup>, 2006
- Subsequent Period 5 (July 1<sup>st</sup>, 2007 to June 30<sup>th</sup>, 2012) X DFMP aac

The cut control period for **deciduous** for the **Cold Creek Lobstick Loggers Association W5 CTP** are:

- ◆ Current Period - May 1<sup>st</sup>, 2001 to June 30<sup>th</sup>, 2007
- ◆ Subsequent Period - July 1<sup>st</sup>, 2007 to June 30<sup>th</sup>, 2012

Periodic cuts are calculated as follows:

- ◆ Current Period [6.167 (6 years plus 61/365 days – May 1<sup>st</sup>, 2001 to June 30<sup>th</sup>, 2007) X 4,000 (fixed volume of deciduous)]



- ◆ Subsequent Period 5 (July 1<sup>st</sup>, 2007 to June 30<sup>th</sup>, 2012) X 4,000 (fixed volume of deciduous)

The cut control period for **conifer** for the **Cold Creek Lobstick Loggers Association W6 CTP** are:

- ◆ Current Period - May 1<sup>st</sup>, 2001 to June 30<sup>th</sup>, 2007
- ◆ Subsequent Period - July 1<sup>st</sup>, 2007 to June 30<sup>th</sup>, 2012

Periodic cuts are calculated as follows:

- ◆ Current Period [6.167 (6 years plus 61/365 days – May 1<sup>st</sup>, 2001 to June 30<sup>th</sup>, 2007) X 18,252 (fixed volume of conifer)]
- ◆ Subsequent Period 5 (July 1<sup>st</sup>, 2007 to June 30<sup>th</sup>, 2012) X 18,252 (fixed volume of conifer)

The current cut control period for **deciduous** for the **Cold Creek Lobstick Loggers Association W6 CTP** are:

- ◆ Current Period - May 1<sup>st</sup>, 2001 to June 30<sup>th</sup>, 2007
- ◆ Subsequent Period - July 1<sup>st</sup>, 2007 to June 30<sup>th</sup>, 2012

Quadrant cuts are calculated as follows:

- ◆ Current Period [6.167 (6 years plus 61/365 days – May 1<sup>st</sup>, 2001 to June 30<sup>th</sup>, 2007) X 17,591 (fixed volume of deciduous)]
- ◆ Subsequent Period 5 (July 1<sup>st</sup>, 2007 to June 30<sup>th</sup>, 2012) X 17,591 (fixed volume of deciduous)

### 8.1.17 Weyerhaeuser Non-FMA Volume Chargeability

In 1997, Weyerhaeuser was issued a Deciduous Timber Allocation (DTA) designated as DTA E910001. This allows Weyerhaeuser access to volumes outside of the FMA but within Deciduous Forest Management Unit (DFMU) E91 (i.e. on grazing dispositions within FMUs E1, E2, W5 and W6).

All harvested volumes originating from either FMA # 9700035 or DFMU E91 will be charged against the FMA as they are delivered. At the end of each year, or periodically as agreed to with Alberta, the chargeability will be transferred from the FMA to the DTA in an amount equal to the AAC of the DTA.

Upon approval of the DFMP, DTA E910001 will be cancelled, and individual DTA's will be issued for each of FMU's E1, E2, W5 and W6. Coniferous Timber Quotas (CTQ's) will be issued for each of the FMU's E1, E2 and W6. As the MTU has 100% of the conifer cut in W5, no CTQ is required by Weyerhaeuser.

The new allocation volumes to be assigned to Weyerhaeuser will be calculated as being proportional to Weyerhaeuser's entire FMU cut. By example, in FMU E2, Weyerhaeuser's



conifer AAC is 14.91%. Therefore, SRD should recognize that Weyerhaeuser is assigned 14.91% of the conifer volume from the sustainable conifer harvest level from the non-FMA area in E2. This process is consistent with the process approved in the Preliminary Forest Management Plan, and used to determine the existing deciduous volume in DTA E910001.

The sum total of the FMA AAC and the non-FMA AAC must equal the total FMU AAC, as described below:

$$\text{FMA AAC} = \text{FMU AAC} - \text{non-FMA (grazing) AAC}$$

## 8.2 Landscape Strategies

### 8.2.1 Biodiversity, Wildlife and Fisheries Resources

Weyerhaeuser's goal # 2 to ***"maintain forest diversity at the stand and landscape level in terms of structure, composition, and function"***, is intended to:

- ◆ provide habitat for all species,
- ◆ improve our knowledge of the response of fish and wildlife to our forest management activities, conserve habitat for rare and endangered species, and
- ◆ maintain a forest of all different age classes over the period of the Plan.



### 8.2.2 Biodiversity

In a general sense, the term "biological diversity" refers to the variety of life and the processes that support it. However, the term encompasses concepts that differ in context and scale. Biological diversity may refer to genetic diversity within a species, to the diversity of species within communities, or to the diversity of communities across landscapes and regions. On different spatial scales, the diversity of species and communities reflects a complex set of environmental conditions (topography, climate, soil, etc.) that change over time. Forest ecosystems are complex and dynamic mosaics of vegetation patches varying in size, composition, age structure and distribution. Their dynamic heterogeneity is driven by natural processes (e.g., succession), by stand-replacing events (e.g., fire, insect outbreaks, or disease epidemics), and by disturbances that occur on smaller scales (e.g., mortality of individual trees). Depending on site-specific environmental conditions (e.g., soil, topography, climate), plants and animal species occur in different assemblages (communities) according to the stage of succession, the time since disturbance, and the scale (i.e., extent, intensity) of that last disturbance. To some degree, species are adapted to the disturbance regime of the region they inhabit. Hence, it is widely believed that the long-term sustainability of the forest ecosystem and the ecological requirements of most species can be addressed by emulating the inherent natural processes of disturbance and succession characteristic of a site and/or a region. Natural disturbance processes result in the maintenance of a variety of stand sizes, seral stages and stand attributes and structures across landscapes (*coarse filter approach*), within the range of natural variation in the system (i.e., the *"natural disturbance model"*).

In accordance with the principles espoused by the Alberta Forest Legacy and the Canadian Biodiversity Strategy, Weyerhaeuser will address concerns about the conservation of





biodiversity by adopting a coarse filter approach. This requires managing the forest ecosystems as a whole, recognizing their dynamic nature, the autecology and successional patterns of the major tree species, and the dependence of all biota on the presence of a variety of structures and seral stages widely distributed over a forested landscape. The coarse filter approach requires:

- a) planning and operating over large landscapes;
- b) maintaining landscape interspersion, diversity, and connectivity, and minimizing fragmentation;
- c) retaining structural diversity at the stand level; and
- d) implementing a monitoring and adaptive management strategy so that new information is gained quickly and this information results in changes to management strategies.

Consistent with the above concepts, in its progress towards ecologically sustainable forest management practices in Alberta, Weyerhaeuser has developed operationally-based ecological guidelines. These guidelines have been integrated with timber supply analysis, operational considerations, and societal values, within the forest management planning process. The guidelines will also be used in the development of the operating guidelines for the FMA.

The coarse filter approach will be complemented by a fine filter component to address the habitat needs of feature species<sup>4</sup> and both approaches will be integrated in Weyerhaeuser's forest management plans.

#### 8.2.2.1 Fish and Wildlife

The main strategy to address specific wildlife and fisheries concerns will follow the guidelines contained in the Integrated Resource Plans (IRP) for the region. These Plans identify primary fisheries and wildlife resource concerns for the FMA area, and outline critical wildlife habitat (Zone 2 areas). The IRP management guidelines reflect potential concerns and benefits from forest management activities.



The general guidelines are summarized as follows:

- a) Sportfish populations and habitat will be protected by minimizing contact between resource developments and streams, by maintaining water quality and by reclaiming disturbed sites.
- b) Disturbance of wildlife populations during sensitive time periods will be minimized.
- c) Fish and Wildlife Division will continue to review and provide input for government referrals on land use activities with potential for impact on wildlife and fisheries resources. Emphasis will be placed on avoiding unnecessary negative impacts and on working co-operatively with resource users to take advantage of opportunities for habitat enhancement.
- d) Harassment and habitat destruction around colonial nesting sites, aeries, den sites and mineral licks will be minimized.
- e) Disturbance of wildlife will be reduced by managing access.

IRP guidelines pertinent to forest management and specific to the FMA are summarized below. Some of these guidelines are consistent with Weyerhaeuser's coarse filter approach to maintain biodiversity.

<sup>4</sup> "Feature" species are those are rare, threatened, endangered or of social value.



- a) A number of Zone 2 Critical Wildlife areas are identified in the Region. These are intended to protect winter ranges, migratory routes for ungulates, and aquatic environments for fisheries.
- b) The forest should be managed to maintain a broad range of species and age classes, which will optimize wildlife productivity (and hence biodiversity).
- c) Watershed protection and water quality must be carefully maintained during timber harvesting operations. Problems resulting from timber harvesting must be corrected.
- d) Habitat areas that are critical for the indicated fish populations must be protected. These areas are expected to occur in the major watercourses of the FMA area, however the IRPs acknowledge that more specific information on key habitat areas is needed.

### 8.2.3 Operational Planning Considerations

FMA specific ground rules on planning, harvesting and reclamation will be implemented to protect fish and wildlife habitat during timber harvesting operations. These ground rules are negotiated by SRD and the timber operators and, in addition to protecting habitat, also support the broader IRP guidelines and integrate with forest management objectives. Weyerhaeuser has developed “Stand Level Ecological Guidelines” (Appendix 8-4) that will be used as a resource during FMA ground rule development. The guiding document used to develop these guidelines is entitled: “Ecologically Based Forest Management, The Conservation of Biodiversity in Weyerhaeuser Canada Forest Management Areas in Alberta, December 1997” (Appendix 8-5). The guidelines will be used as a resource during the development of operating ground rules.

Several factors are particularly important in operational planning considerations:

- A. Stand retention;
- B. Old growth strategy;
- C. Harvest Patterns;
- D. Harvest Area Design;
- E. Recognition of areas of special importance to plants and wildlife species;
- F. Timing of operations; and
- G. Fisheries habitat.

Each of these factors is discussed below.

#### A) Stand retention

The retention of trees, snags and woody debris in harvest areas is a significant component of ecologically based forestry.

- a) Retaining trees within harvest areas creates harvest designs that more closely mimic post-disturbance conditions and therefore lessen the impact of logging on ecosystem structure and function. Tree clumps and snags increase the structural diversity of the regenerating stand, retain some later seral conditions such as a multi-layered canopy, provide a future supply of large snags and down logs, and increase micro-site variability for a more diverse plant understorey. They also provide ecological sites (refugia) from which unaffected plant and animal species can disperse onto the surrounding harvest area.







- b) Snags (dead trees) play a very important role in a functioning forest ecosystem. In addition to their value in recycling nutrients, snags provide habitat for many species of plants, invertebrates, birds and mammals. The absence of snags is a major limiting factor for cavity nesting birds, influencing their occurrence and distribution. Retention of large snags on cut-over areas may be prescribed to provide habitat for cavity nesters.
- c) Woody debris left in piles and dispersed over the block provides valuable hiding and nesting cover for a variety of small mammals.

In order to achieve or maintain stand level structural diversity, the following general principles will be followed:

- a) Safety is a primary concern and must be ensured at all times as noted in the Alberta Forest Products Association tree retention guidelines (Residual Trees in Harvest areas Guidelines).
- b) Effort will be made to retain some form of vertical structure in all harvest areas. The amounts may vary as site conditions and site-specific objectives allow.

Retention of structure within harvest areas is site-specific. Wet sites, unmerchantable areas and understorey protection provide opportunities to retain various structural components (clumps, etc.) and contribute to stand diversity in the regenerating forest. This practice will also protect soil and sensitive sites that may harbor rare plants and small wildlife species.

Retention opportunities are available on a site-specific basis and depend on:

- ◆ preharvest stand condition;
- ◆ topography;
- ◆ identified values;
- ◆ operational and economic feasibility.

Several retention options are available for consideration by the operations planner and supervisor:

- ◆ snags;
- ◆ single green trees;
- ◆ patches varying in size, shape and location of unmerchantable and merchantable trees;
- ◆ coarse, down woody debris (including brush pile retention).



Merchantable retention can vary over any particular harvest area to achieve an average targeted amount. The monitoring program estimates the percent of merchantable volume retained as compared to the amount of volume available for harvest at 100% removal on a block-by-block basis (Appendix 8-2).

Merchantable retention can vary on any particular harvest stand area from zero to ten percent or more. For E1, the target for merchantable retention is 8%. For the remaining FMUs, the target is 3%.



## B) Old growth strategy

Forest ecosystems are a complex mosaic of stands of different age, structure and composition, reflecting a continuous process of renewal through establishment, growth, death and re-establishment. Natural disturbance events such as fire, insects and disease, play a critical role in maintaining a balanced forest ecosystem and functioning ecological processes.

Late and very late seral stages (“old growth”) are an important component of forests and landscapes. They not only provide habitat for numerous “old growth”-dependent species, but their presence is considered essential to the long-term sustainability of forest ecosystems.

This section outlines Weyerhaeuser’s approach to the maintenance of “old growth” in the Edson FMA area.

### *A definition of old growth*

There is no widespread agreement on what constitutes “old growth” forest. Peterson<sup>5</sup> listed 26 different definitions from different authors and geographic areas. In general, all definitions refer to “old growth” as being a unique successional stage in the life of a plant community, where the structural and compositional features support specific “old growth” ecological processes.

*The State of Canada’s Environment* classified “old growth” forests where trees are 140 years or older (Watson 1993). This contrasts with the 275-300 year range for coniferous forests referred to by Achuff (1989) for Canada’s five Rocky Mountain National Parks. In the United States, the Forest Service has characterized old growth as “*later stage(s) in forest development which may be distinctive in composition but are always distinctive in structure from earlier (young and mature) successional stages*”<sup>6</sup>. However, Hunter and White (1997), after an extensive review of numerous studies on forest ecology and development, concluded that there is no evidence of the existence of distinct thresholds between what might be called a mature forest and “old growth.” According to Hunter and White (1997), forest succession and development is a continuum of changes in structure and composition where no specific age can provide an “*unambiguous threshold on which to base a definition.*”<sup>7</sup>

The absence of an age where “mature forest” can be distinguished from old growth does not imply that older stands are similar to younger ones or that older stands do not provide important ecological and wildlife values due to unique structural and compositional characteristics. On the contrary, the absence of a discrete age for distinguishing between mature forest and “old growth” suggests that managers need to identify the characteristics that make older stands valuable and to manage for this ecological uniqueness. The work of Hunter and White would also suggest that these unique characteristics will vary by ecosystem and at times ecosites. To date, there are no templates that can be used in all situations.

<sup>5</sup> Peterson, E.B., Peterson, N.M. and Enns, K.A. 1995. Guidelines for old forest management in Elk Island, Jasper, Yoho, Kootenay, Banff, and Waterton Lakes National Park. Prepared for Canadian Heritage, Parks Canada, Alberta region. 78pp.

<sup>6</sup> Moir, W.H. 1992. “Ecological concepts in old-growth forest definition”. Old-growth forests in the Southwest and Rocky Mountain regions. Proc. Of a workshop. Arizona, USDA General Tech. Rep. RM-213. Pp. 18-23.

<sup>7</sup> Hunter, M.L. Jr. and White, A.S. 1997. Ecological thresholds and the definition of old-growth forest stands. *Natural Areas Journal* 17(4): 292-296.



Further, “old-growth” attributes that provide ecological and social values may be reached at different ages depending on the:

- 1) site-specific ecology of the forest stand;
- 2) successional stage and disturbance history;
- 3) structural and compositional characteristics;
- 4) relative contribution to the forest landscape; and
- 5) the relative rarity of this stage of development.

The quality of the growing space (Site Index) is also an important factor because trees grow larger, faster on better sites. The management of late seral stages may depend on their specific degree of structural diversity, on what Spies and Franklin<sup>8</sup> called an index of “old-growthness.” Many of the preceding considerations also apply to all other successional stages.

### *DFMP approach*

Fire is a natural abiotic factor that has played an important function in the development of the forest ecosystem. Fires have been important in maintaining the diversity and vigor of the forested foothills, as they have in many other regions of Alberta.<sup>9</sup> Young forests, almost all of which are the results of past fires, are characterized by thick stands of small lodgepole pine or aspen, depending on the site. These stands support a large number of wildlife and plant species. Very late stands (120 years or older) occur on sites that have escaped recent forest fires and are usually dominated by long-lived and large white spruce and fir, with a sparse, well-shaded understory. These stands may contain organisms native to this geographic area but which are found nowhere else due to the characteristics of these stands. More importantly, these organisms may contribute significantly to the overall biodiversity of the region and, further, they may be important to the ecological maintenance of these ecosystems.

Because fire is an important factor in boreal forest ecosystems, an age-class distribution similar to the one that results from periodic burning is an essential feature of responsible forest management. In that context, Weyerhaeuser will work toward achieving a forest age distribution similar to what would occur under more natural conditions. This distribution will attempt to achieve a more desirable balance between environmental, economic, and social values.

Restoring a pre-1900 age-class distribution would produce a forest where most stands would be very young. The reduction in the abundance of older-aged stands would potentially reduce the diversity of wildlife species dependent on late seral stage forest. However, an age-class distribution, such as the one dominant today, results in large expanses of forest reaching old age with an increased risk of fire, insect infestation or disease outbreak. The aging forests also limits availability of early seral stages and, hence, the habitat for wildlife species that depend on those stages.

In planning for future forest landscapes, Weyerhaeuser will attempt to maintain a range of age structures consistent with the inherent ecological processes characteristic of each natural subregion. These natural subregion-specific age structures will determine the percentage of forest in late to extremely late seral stages that will be maintained over the planning horizon.

<sup>8</sup> Spies, T.A. and Franklin, J.F. 1988. Old growth and forest dynamics in the Douglas-fir region of western Oregon and Washington. *Natural Areas Journal* 8(3): 190-201.

<sup>9</sup> Kelsall, J.P., Telfer, E. S. and Wright, T.D. 1977. The effects of fire on the ecology of the Boreal Forest, with particular reference to the Canadian north: a review and selected bibliography. *Can. Wildl. Serv. Occasional Paper*. 32.



The amount and distribution of older seral stages (see Volume I, section 3.1.9.2 *Age class and seral stage description*) are highly influenced by topography and climate, which influence landscape-burning patterns (Andison<sup>10</sup>, and Feunekes<sup>11</sup>). The amount and distribution will likely vary, depending on elevation, aspect, slope and soil moisture. Generally, late seral stages are more likely to be found on sites with higher levels of soil moisture; such as on northwest, north-northeast and east facing slopes. South and southwest facing slopes and well-drained sites have the highest chance of being burned. Hence, these sites burn more frequently and are the least likely to support older forest stands (White<sup>12</sup>).

While the amount of forest retained in older seral stages is important, its spatial distribution in relation to younger forest stands and its occurrence in a variety of patch sizes over the landscape are critical. Therefore, Weyerhaeuser will attempt to maintain a range of patch sizes of older seral stages, including a number of patches larger than 125 hectares (if possible based on current landuse levels), in each Landscape Management Unit throughout the planning horizon.

### *Amount of forest in late seral stages*

In the absence of an agreed upon definition of “old growth”, Weyerhaeuser will ensure that a certain amount of forest older than “rotation age”<sup>13</sup> will always be present within the Edson FMA (late seral stages (Table 8-3): >90 years for conifers and >80 year old for deciduous, see Volume I, section 3.1.9.4 *Age class and seral stage description*). In addition to the amount retained past rotation age, Weyerhaeuser will attempt to maintain a percentage of past-rotation forest in the very late seral stage (>110 and 120 year for deciduous and conifer dominated forests, respective).

**Table 8-3 BCG by Age Definitions for Late Seral Stages**

Broad Cover Groups	Seral Stage (≥) (years)		
	Late (L)	Very Late (VL)	Over mature (OM)
Dec	71	111	---
DC	71	111	---
CD	91	121	171
Pine (PI)	91	121	171
CX	91	121	171
Spruce/Pine (Sw/PI)	91	121	171
Spruce (Sw)	91	121	171

<sup>10</sup> Andison, D. W. 1997. Landscape fire behaviour patterns in the Foothills Model Forest. Foothills Model Forest Report. Hinton, Alberta. 63 pp.

<sup>11</sup> Feunekes, U., Rogeau, M. P. and White, C.A. 1993. A fire growth model for the Central Rockies Ecosystem. Pages 47-59 in White, C.A. and Achuff, P.L., tech cords. Proc. Of the Central Rockies ecosystem interagency fire management workshop, Feb. 23-25, 1993, Lake Louise, Alberta. Parks Canada, Banff, Alberta.

<sup>12</sup> White, C.A. 1985. Wildland fires in Banff National Park, 1880-1980. Parks Canada. Nat. Parks Br., Ottawa, Ontario. Occasional Paper #3

<sup>13</sup> Rotation is defined by the Society of American Foresters (1958) as “the period of years required to establish and grow timber crops to a specified condition of maturity”.

**Table 8-4 Seral Stage Definitions**

Coniferous - C & CD		Deciduous - D & DC	
Seral Stage	Age (years)	Seral Stage	Age (years)
Early	0 to 10	Early	0 to 10
Immature	11 to 40	Immature	11 to 40
Mature	41 to 90	Mature	41 to 70
Late	91 to 120	Late	71 to 110
Very Late	121 to 170	Very Late	111 to 170
Over-Mature	171+	Over-Mature	171+

Late and very late seral forests of each type will be maintained within each natural subregion to accommodate plant and wildlife species dependent on these older forest types.

A research project in February 2001 indicates that the age of onset of structural characteristics typical of old-growth conditions in the Upper Foothills ecoregion of west-central Alberta is variable, but appears to occur between 160 and 180 years.<sup>14</sup> As a result of that research, Weyerhaeuser will identify the location of stand 170 years of age or older. Based on their current amount within each Subregion, an initial amount will be retained while additional research will be conducted to assess their biological and ecological value.

In the Lower Foothills natural subregion, minimum retention levels will be 5% of the late seral class, of which 1% is in very late seral stage (>120 years). This retention level will apply to all plant species associations except white spruce and lodgepole pine. This is because pure white spruce usually only occurs in the older seral stages (in the younger stages it occurs mainly in mixedwood stands). The minimum retention levels for pure white spruce are increased to 10% for the late seral stage of which 2% is in very late seral stage (>120 years). In contrast, lodgepole pine stands are usually of a fire origin and stands older than 90 years are unlikely to remain on a landscape for a significant length of time. For that reason, minimum retention amount for lodgepole pine is 1%.

In the Upper Foothills, the minimum levels of late seral stages are higher, thus reflecting the naturally longer fire cycle, and higher probability that older stands remain in the landscape for longer periods. In this Subregion, minimum retention levels are as follow: for deciduous and mixed wood stands, 5% of the late seral stage (>70 and 90 years, respectively), of which 2% will be in the very late seral stage (>110 and 120 years respectively); for lodgepole pine forests, 2% of the late seral stage (>90 years), of which 1% will be in the very late seral stage (>120 years) and 0.5% will be overmature. The minimum retention for lodgepole pine-white spruce forests increased to 10% for the late seral class (>90), to 5% for the very late seral class (>120) and 2.5% for overmature reflecting successional trajectory from pine to spruce dominated forests. The minimum retention for white spruce (or Engelmann spruce) is increased to 15% for the late seral class, 5% for the very late seral class and 2.5% for the overmature class.

The following minimum retention amounts reflect ecological requirements at the natural subregion level (Table 8-5). The amounts were derived from analysis of the current age class distribution, a coarse level assessment of historical trends, and natural disturbance patterns of

<sup>14</sup> Morgantini, L. E. and Kansas, J.L. 2003. Differentiating mature and old-growth forests in the Upper Foothills and Subalpine Subregions of west-central Alberta. *The Forestry Chronicle*. 79(3): 602-612.



each natural subregion. In addition to these minimum amounts, timber operators will protect rare old stands as they are identified within the FMA area. Furthermore, practices to retain stand level structure in harvest areas (see (i.e., retention of large live and dead trees) will provide structural diversity in regenerating forests and create some old forest structures throughout the rotation. Similarly, residual patches of >0.5 ha should retain some old forest characteristics in harvest areas immediately after harvest, while smaller patches and single residual trees may create old forest structures late in rotation (J. Schieck<sup>15</sup>).

**Table 8-5 BCG by Landbase constraints applied in the TSA**

Broad Cover Groups	Landbase Constraints (% of total BCG that must be maintained over time)					
	Lower Foothills			Upper Foothills		
	L (%)	VL (%)	OM (%)	L (%)	VL (%)	OM (%)
Dec	5	1	---	5	2	---
DC	5	1	---	5	2	---
CD	5	1	---	5	2	---
Pine (PI)	5	1	---	2	1	0.5
CX	5	1	---	10	5	2.5
Spruce/Pine (Sw/PI)	5	1	---	10	5	2.5
Spruce (Sw)	10	2	---	15	5	2.5

### Research and monitoring

The strategy to address the maintenance of “old growth” is based on the best current understanding of ecological processes and is a first step towards ecologically based forest management. Approaches and strategies may change as our knowledge base expands.

Ultimately, the success of ecologically based forest management in maintaining biodiversity and the sustainability of forest ecosystems hinges on better understanding forest ecosystem processes, local disturbance regimes, and the range of natural variation in forest structure and diversity. To meet this objective, Weyerhaeuser in Alberta is supporting and sponsoring numerous university-based research initiatives that are being used to continuously adjust and improve current strategies and guidelines.

In acknowledgment of the uncertainty surrounding forest ecosystems and our still limited understanding of ecological processes and animal-plant relationships, Weyerhaeuser in Alberta is committed to continuously assess the potential impact of its operations and monitor to ensure that specific forest management objectives are met.

The objectives of research and monitoring are to:

- ◆ measure compliance with the strategy;
- ◆ assess the effectiveness of the strategy in meeting biodiversity objectives;
- ◆ understand the difference in structure and composition of old stands of different ages;

<sup>15</sup> Schieck, Jim. Provincial biodiversity Specialist Resource Conservations & Planning Branch Fisheries and Wildlife Management Division, Natural Resource Service, Edmonton. September 27, 2000, letter to Jim Allen, Wildlife Biologist, Rocky Mountain House regarding Weyerhaeuser Old Growth Strategy.





- ◆ identify wildlife species that depend on late seral stages and maintain their habitat in amount sufficient to support viable populations; and
- ◆ identify and protect a representation of very old stands that may be ecologically unique.

### C) Harvest Patterns

To maintain forest diversity at the stand and landscape level, Weyerhaeuser has employed the following techniques in the TSA to establish the harvest pattern across the SYU Area:



- ◆ multiple pass harvesting at the landscape level;
- ◆ a forest stand-replacing silviculture system (patch cut with variable retention);
- ◆ dispersed logging by sequencing stands across the SYU;
- ◆ identification and protection of unique habitat types;
- ◆ maintenance of late, very late and extremely late seral stages, and
- ◆ a wide range of block sizes and shapes.

The number of harvest areas, their distribution over the landscape and the amount of timber harvested in an area may vary to meet the needs of interior habitat species for large areas of unfragmented forest, to conserve biodiversity, ensure ecological sustainability, and to meet the needs of key wildlife species.

### D) Harvest area design at the Operational Planning Stage

The design of harvest areas is another primary tool to conserve biodiversity and protect wildlife, their habitat and the landbase in general. Harvest areas are designed to follow natural terrain features and contours as well as timber type boundaries. This benefits wildlife by maintaining the natural edges as well as adjacent protective cover and by minimizing watershed damage, blowdown and aesthetic impacts.

Harvest area shapes result from the design and operations directly associated with the approved spatial harvest sequence. The boundary of the forest stands primarily defines the shape of the harvest area. Terrain features, access, water source areas and stand structure are all taken into account. Fish and wildlife values are also considered in the final design and operations.

The dimensions and shapes of harvest areas will vary. Irregular block shapes are preferred because they minimize lines of sight. The range of size of harvest areas will vary depending on their irregular shapes and on the number of patches of timber left as cover for wildlife. The key objective in design is to ensure sufficient contiguous protective cover and use of the regenerated area.

Harvest area design will also attempt to erase existing harvest patterns (i.e. checkerboard designs) and combine small blocks.

**E) Recognition of areas of special importance to plants and wildlife species**

In a forest ecosystem, many unique sites can host rare plant communities and/or species and provide habitat for small mammals, amphibians, reptiles, and invertebrate species. When these sites (e.g., nest sites of raptors or other species such as heron) are identified, they will be integrated into forest management planning.

Buffers of standing timber are usually prescribed for important wildlife habitat areas such as:

- a) key wildlife travel corridors,
- b) key wildlife ranges, and
- c) fisheries.

The size and location of the buffer is governed by the need to provide protective cover and minimize disturbance. Buffers may be selectively logged where a visual impediment is maintained.

**F) Timing of operations*****i. Ungulate winter range***

On key ungulate winter ranges, operations are preferably scheduled for summer, late fall or early winter to avoid disturbing animals during critical periods when energy reserves are low. Area timing restrictions are outlined on the "Fish and Wildlife Division Referral Map for Geophysical Programs in the Rocky Clearwater Forest, February, 1990" or revisions.

If unavoidable, these areas will be operated through means that would:

- a) Compress the period of activity to reduce impacts on wildlife.
- b) Harvesting operations within such areas at any one time may be minimized to allow ungulates access to escape terrain and to provide continuing secure habitat.
- c) Harvesting operations should occur as early in the winter as possible.

***ii. Breeding bird habitat***

To avoid impacts on most bird species, harvesting should avoid the period April 1 to July 31. The intent is to allow birds to reach the fledging stage, thereby increasing their capacity to move away from any disturbance. If this is not possible, the following will be done to minimize impacts on nesting birds:

1. minimize the amount of harvesting during this period to as small as possible,
2. harvest as late as possible in this period,
3. delay harvesting in pure deciduous and mixedwood stands as much as possible; this would avoid the areas with the highest nesting activity, and

prioritize pure conifer stands, with preference of logging spruce before pine.

**G) Fish Habitat**

Fish habitat is protected by minimizing stream siltation and providing continued flow throughout the year on permanent watercourses that may be used by fish at various times in their life cycle. Increased sediment load in the water may interfere with the growth of surviving aquatic plants and small invertebrates that provide cover and food for fish, respectively. Once settled, sediment can smother fish eggs on spawning beds and change groundwater flow patterns that affect the availability of oxygen to eggs over the winter. Suspended sediment can also irritate the respiratory system of fish and make them susceptible to disease. Fish will change their





movements to avoid sediment plumes and this may interfere with daily movements for rearing or feeding or major migrations for spawning or overwintering.

Protective measures for fisheries will be consistent with the operating ground rules that are currently being developed.

#### **8.2.4 Grizzly Bear**

The grizzly bear (*Ursus arctos*) is classified as 'may be at risk' in Alberta and as a species of 'special concern' by COSEWIC (Committee on the Status of Endangered Wildlife in Canada). The province is currently (June 2005) reviewing a draft version of the Grizzly Bears Recovery Plan. Included in the recovery plan are draft versions of the 'habitat' and 'mortality risk' maps. These maps have been made available to any interested parties. These maps do not however cover all of the affected grizzly bear areas in the Province. They do cover portions of the Pembina FMA's. Weyerhaeuser is committed to using the habitat maps as they are developed.

Due to their nature, the habitat and mortality risk maps, based on Resource Selection Functions models, cannot be applied at a strategic level and hence were not used during the development of the Pembina (Edson and Drayton Valley) DFMPs. The maps will be used as operational tools to adjust harvest designs (e.g. cutblock shape and size) and road alignment, consistent with the location of Grizzly Conservation Areas (GCAs). Draft guidelines for habitat, access and intense human activity management have been created for areas both inside and outside of Grizzly Conservation Areas (GCAs), as follows:

##### **Habitat Management**

Inside the GCAs, reclamation will consider grizzly forage plant preference where appropriate. Re-vegetation and reclamation activities, with the exception of temporary in-block roads that are to be reforested in concert with their harvest areas, will consider grizzly forage plant preference where appropriate. Outside of the CGA, companies will consider similar re-vegetation strategies.

##### **Access Planning**

The development of permanent roads require coordination between all operators within a GCA. Use existing access whenever available and practical. Alternatives to all-weather roads will be pursued, with such things as winter or temporary roads. Forest planners will follow targets for open-road densities that have been set at 0.6 km/km<sup>2</sup>, with the intent to limit road densities to remain below these thresholds.

Inside GCAs, when developing road corridors, all opportunities will be taken to avoid quality habitat without compromising environmental standards. If roads must be built within the areas of high quality, then mitigating factors will be pursued. Activities would include restricting access, temporary roads, or timing constraints.

In areas outside of the GCA, the preference will be for use of existing roads, winter access, temporary roads and other alternatives to all-weather roads. If long-term access is required, coordinated plans will be developed to meet the guidelines. Targets for open-road densities have been set at 1.2 km/km<sup>2</sup>.

In areas outside of the GCAs, road corridors will attempt to avoid high quality habitat. If unavoidable, then mitigating factors will be required, including some or all of the following: low traffic volumes, temporary roads, timing activities, etc.



### **Season of Harvest**

Within the GCA, winter is the preferred season of harvest. If non-winter operations are unavoidable, operating in areas of expected high bear use, such as valley bottoms during the spring, will be avoided. For areas outside of the GCA, winter is also preferable to summer operations.

### **8.3 Access Management**

The Forest Management Agreement states that the Minister reserves ***“the right of others to travel, hunt, fish, and otherwise use the said lands for recreational purposes, subject only to necessary restrictions approved by the Minister for the purpose of prevention of accidents, fire control, protection of wildlife and seasonal protection of roads.”***<sup>16</sup>



In this plan, access is defined as ***“any land route that allows travel by anything other than foot”***<sup>17</sup>. This would include all-weather roads, temporary and seasonal roads, power lines corridors, pipelines, and geophysical survey lines. Modes of travel could include motor vehicle, ATV, snow machine, motor or pedal bike, and horse.

#### **8.3.1 Values, Issues and Recreational Activities in the Forested Areas**

The 1999 Values and Issues Survey completed by Weyerhaeuser was designed to help in the construction of the goals for the Detailed Forest Management Plan (DFMP). It also gives some direction in regards to access management.

Two of the five highest regarded values of the 1999 survey (159 respondents) are wildlife and wildlife habitat at 89.3% and recreation at 67.9%. Many of the recreational activities that are enjoyed in forested areas require some degree of access. These include hiking (43.4%), hunting (34%), fishing (27.7%), quading (23.3%), snowmobiling (19.5%), and biking (7.5%). These activities involve either motorized or non-motorized transportation. Other activities, such as bird watching, wildlife viewing, berry picking, nature walks, trail rides, snowshoeing and photography require varying degrees of access.

There were a number of issues raised that involved access. Some of the more common themes were: access management, wildlife habitat protection, wilderness preservation, road use by the public, and, indirectly, fisheries management.

#### **8.3.2 Access Management upon the FMA**

Access management practices on the Forest Management Area (FMA) are intended for the protection of wildlife and fisheries habitat, as directed by Alberta Sustainable Resource Development (ASRD).

The Northern East Slopes (NES) Region of ASRD has been delineated into Wildlife Zones for the purposes of controlling timing of industrial activity or access development. There are a total of eight zones, of which seven can be found in the Edson FMA.

<sup>16</sup> Weyerhaeuser Edson Forest Management Agreement, 1997.

<sup>17</sup> Scott, Paul.2001.



Four of the zones have timing restrictions, primarily from January 1st through April 30th of each year. During this period, most animals have high-energy needs but food availability is low. Thus there is a need to minimize disturbance due to man's activities. The Zone F timing restrictions from April 1 to September 30th of each year are required to protect nesting and young rearing of waterfowl.

Four zones require access control in the form of gates on all-weather roads, rollback on conventional seismic lines (geophysical survey lines) and/or low impact seismic only. These control measures are intended to limit the amount of year-round access by the general public to important wildlife habitat while still allowing for resource extraction.

Access can also be managed through pro-active discussions with other industrial users. Logistical common corridors for long-term high quality road development should occur. The use of existing linear features (seismic, powerline, road ROW, etc.) should also be maximized where practical and safe to do so.

### **8.3.3 Shining Bank Buck for Wildlife Area Access Management Plan**

The Fish and Wildlife Division and Weyerhaeuser initiated the Shining Bank Buck for Wildlife Area Access Management Plan in the summer of 1999. Representatives of Fish and Wildlife Division, Weyerhaeuser, Land and Forest Service (LFS) and the oil and gas industry developed the plan.

The intent of the plan was to limit the fragmentation of an area that is significantly important regionally and provincially for its moose habitat, along with healthy populations of elk and deer. As well, it was also the intent to minimize the number of permanent roads throughout the area. The intent was not to limit off highway vehicle (OHV) access beyond current regulations. Close proximity to a large urban centre (Edmonton) makes the area vulnerable to overexploitation from unregulated harvesting (poaching). In addition, roads and road traffic create disturbances for wildlife that result in the loss or avoidance of primary habitat.

The area was divided up into five (5) access control zones, and a number of guidelines were established:

- ◆ Each zone was allowed only one entry/exit point for a primary access route without some other form of access control,
- ◆ Short-term access (less than one year) would be allowed, with decommissioning of roads prior to abandonment,
- ◆ No gates were required on the primary access route into each zone,
- ◆ No high grade roads could connect access zones,
- ◆ If a high grade road is required, other than a designated primary route, a locked gate must be installed to control access,
- ◆ Seismic activity would be low impact, preferably hand cut, portable, and
- ◆ Utility corridors (pipelines, transmission lines, etc) would have effective access control for all motorized vehicles unless low grade access is required to well sites, harvest blocks, etc.

### **8.3.4 Tactics for Access Management**

The strategies and tactics used in the development of access control are different for each operating area. Both should be linked tightly with the management objectives of an area. These objectives will be defined through the whole planning process.



The following tactics could provide access control through:

- ◆ Silvicultural treatment of geophysical disturbances within harvest area areas: this would include site preparation and planting. This would also create limitations for travel through these areas to protect investments in place.
- ◆ Manned or unmanned gates.
- ◆ Watercourse crossing removal.
- ◆ Timing and tenure of road class.
- ◆ Physical construction of obstructive barriers such as berms, cross ditches, and roll-back.
- ◆ Use of legislation, such as Forest Land Use Zones and Ministerial road closures.
- ◆ Condition of roads.
- ◆ Width of roads.
- ◆ Snow in (unplowed roads).
- ◆ Decisions around the necessity of the road, as well as location.

## 8.4 Watersheds

### 8.4.1 Watershed Analysis

Weyerhaeuser has developed an internal process to report, and if required, analyze FMA watersheds for possible hydrologic issues. The objective of the process is to limit any unintended effects that forestry activities would have on the yield of water from the watershed.



#### 8.4.1.1 Process

##### Step #1.

All fourth-order watersheds will be reviewed to determine if more than 40% (see Appendix 8-6 for supporting documentation) of the forested and potentially forested areas of the watershed are in timber stands of less than:

- a) 35 years of age for predominantly conifer stands, or
- b) 20 years of age for predominantly deciduous/mixedwood stands.

These ages are considered the age at which such stands are at hydrologic recovery.

Table 8-6 describes the results of the review for the FMA. Additional information can be found in Appendix 8-6.

##### Step #2.

If yes, then the watershed will first be analyzed using a model called the “Effective Clear-cut Area” (ECA) model, developed by Dr. Uldis Silns at the University of Alberta. The model simulates the cumulative effects of timber harvest and timber growth over time, on water yield from a watershed.

##### Step #3.

If the result of this analysis indicates that water yield will increase by more than 20%, then either the harvest plan will be modified, or, a further analysis will be conducted.

**Step #4.**

This second analysis will be done using the Water Resource Evaluation of Non-Point Silvicultural Sources (WRENSS) model. WRENSS examines more variables than ECA, and is expected to provide a more detailed analysis. A WRENSS analysis provides estimates of potential changes to annual water yield, peak flows for a range of different return periods (i.e. 2 yr-100 yr events) and estimates of ECA based on basal area recovery and water yield recovery. Evaluation of these parameters will help minimize the hydrologic effects of forest harvesting.

A threshold of 20% is used as an “acceptable increase” in annual water yield and peak flow for return periods of 3-4 years based on analysis of the variability of flows<sup>18</sup> obtained from a statistical analysis of flows in the Grande Cache-Grande Prairie region. Based on existing research these limits are considered to be conservative in providing protections to downstream users and aquatic habitat. However, further research is needed to confirm and define the effects and linkages between changes in flow and aquatic habitats.

**Step #5.**

If WRENSS analysis indicates water yield increases are still greater than 20%, then either harvest plans will be modified or, a peak flow analysis will be conducted.

The purpose of peak flow analysis is to determine the likelihood and duration of a flooding event. Thresholds limits for a flooding event are unknown at this time, and individual cases will need to be discussed within Annual Operating Plan reviews.

**8.4.1.2 Process Improvement**

Currently, most precipitation and flow input data for the models above, comes from major watersheds in the Province. Weyerhaeuser has implemented a Small Watershed Assessment Program (SWAP) using sites on all three Weyerhaeuser FMAs.

The purpose of the study is to better understand the hydrology of smaller streams. The sites compare hydrological variables in both harvested and non-harvested watersheds over time on typical small streams.

The data collected will be used to refine the models to more closely reflect actual conditions during the analysis process.

---

<sup>18</sup> “Variability of Precipitation and Streamflow, Grande-Cache – Grande Prairie and Discussion of Guidelines for Water Yield and Peak Flow Increases, Prepared for Weyerhaeuser Canada by Watertight Solutions Ltd. Edmonton, March 2005.



**Table 8-6 Areas used to determine impacts on water yields within a fourth-order watershed upon the FMA (Step #1).**

Watershed Name	1 Total Watershed Area (ha)	2 Historical Cutover Area (ha)	3 Historical Burn Area (ha)	4 SHS Area (ha) for Periods 1 and 2	5 Total Area (ha) (2+3+4)	Estimated % of Forested Area as defined by Step #1 (5/1)	Code
Athabasca	1,354	0	0	7	7	0.5	A
Bear	13,723	474	0	2,136	2,610	19.0	B
Bigoray	39,653	5,175	8,228	2,524	15,927	40.2	C
Cairn	2,008	121	0	219	340	16.9	B
Carrot	12,612	1,900	0	918	2,818	22.3	B
Carrot Tower	4,391	368	0	49	417	9.5	B
Chevron	2,366	507	0	65	572	24.2	B
Chip	42	5	10	0	15	37.0	A
Coyote	23,996	1,935	15	1,795	3,745	15.6	B
Cricks	6,928	1,067	0	552	1,619	23.4	B
Cynthia	4,274	521	0	377	899	21.0	B
Deer Hill	4,688	610	0	622	1,232	26.3	B
East Pembina	22,034	1,160	7	2,071	3,238	14.7	B
Edson	6,021	1,244	0	217	1,461	24.3	B
Edson North	116	30	0	1	31	26.8	A
Embarras	2,100	58	0	139	197	9.4	B
Erith	21,984	1,023	0	1,277	2,300	10.5	B
Fairless	836	0	0	160	160	19.2	B
Fickle	1,482	271	80	59	410	27.7	A
Graham	4,691	959	0	959	1,918	40.9	C
Granada	2,185	10	0	189	199	9.1	B
Groat	486	0	0	64	64	13.2	B
Half Moon	18,626	3,053	0	904	3,957	21.2	B
Hanlan	65	0	0	16	16	24.6	A
Hardluck	8,527	976	0	649	1,625	19.1	B
Hinton	699	0	0	0	0	0.0	B
Kathleen	2,203	246	0	336	582	26.4	B
Ladd	2,096	75	0	554	629	30.0	B
Lobstick	15,409	1,149	0	1,796	2,945	19.1	B
Mason	693	32	0	45	77	11.1	B
McLeod	33,523	2,405	0	607	3,012	9.0	B
Miller	1,238	79	0	214	293	23.7	B
Minnow	13,257	1,958	0	1,085	3,043	23.0	B
Moose	9,831	313	0	34	347	3.5	B
Obed	6,761	441	0	139	580	8.6	B
Oldman	5,363	448	0	182	630	11.7	B
Paddle	1,496	267	0	187	454	30.4	A
Paddy	21,903	1,471	97	1,716	3,284	15.0	B
Pembina	12,265	1,260	0	1,791	3,051	24.9	B
Poison	3,639	563	36	225	824	22.7	B
Rally	1,951	282	0	220	502	25.7	B
Rat North	30,908	1,769	0	1,998	3,767	12.2	B
Rat South	17,817	1,377	0	1,364	2,741	15.4	B
Raven	9,378	0	0	1,062	1,062	11.3	B
Sang	17,379	1,753	0	1,012	2,765	15.9	B
Shiningbank	1,031	68	0	85	158	14.8	B
Sinkhole	13,736	2,004	64	545	2,613	19.0	B
Slide	2,689	454	0	473	927	34.5	B
Sundance	12,076	552	0	54	606	5.0	B
Swartz	16,736	805	0	327	1,132	6.8	B
Tom Hill	4,285	619	0	435	1,054	24.6	B
Trout	1,220	0	0	122	122	10.0	B
West Eta	13,398	430	1,196	1,400	3,026	22.6	B
Whitefish	8,166	1,211	0	941	2,152	26.4	B
Zeta	20,707	1,374	0	2,658	4,032	19.5	B
<b>GRAND TOTAL</b>	<b>507,041</b>	<b>44,872</b>	<b>9,733</b>	<b>37,576</b>	<b>92,181</b>		

Codes:

- A: areas identified as less than 10% in FMA
- B: areas identified below threshold of 40% of the area less than a certain age in the worst case scenario (harvest SHS today)
- C: areas identified that are above threshold limit of 40% of the areas less than a certain age in the worst case scenario (harvest SHS today)





## **8.5 Integrating Timber Operators**

All timber operators will follow the Pembina (Edson and Drayton Valley FMA's) operating ground rules.

### **8.5.1 Quota Holders**

#### **Edson Timber Products (ETP)**

ETP is scheduled in pure 'C' stands in E1. Deciduous must be directed to Weyerhaeuser. Historically the company has harvested out of the Svedburg H.D.A., and scheduled to do so for the life of this plan.

The quota percent for ETP will be increased in E1 from 3.41% to 4.7% effective the year of AAC approval (i.e. May 1<sup>st</sup>, 2006). This will recognize past commitments made by Weyerhaeuser to ETP during the original FMA negotiations.

#### **EDFOR (Formally part of Edson CTP)**

EDFOR is scheduled primarily in 'C' and 'CD' stands in E2. Traditionally, Weyerhaeuser did all the planning when this was the CTP group, however, as a quota, all planning will now be done by that organization.

Due to the complex allocation of each AAC component (i.e. primary and incidental conifer) between EDFOR, the CTP group and Weyerhaeuser, the area of greatest beneficiary of combining primary AAC and the average incidental AAC for the first decade is in FMU E2. In developing the Spatial Harvest Sequence (SHS) for all E2, the intent was to keep EDFOR and the MTU in predominately coniferous blocks and Weyerhaeuser in predominately deciduous blocks. In doing this, it became apparent that the deciduous production of the coniferous blocks would greatly exceed allocation limits. All deciduous volume generated by EDFOR must be directed to Weyerhaeuser and is chargeable to Weyerhaeuser's total AAC.

#### **Alberta Newsprint Company Ltd. (ANC)**

ANC is scheduled primarily in the Wolf Lake LMU in W6. They access the 'C', 'CD' and 'DC' stands during harvest. Deciduous is directed to Weyerhaeuser with some sharing of logging opportunities between both companies. In the ANC sphere of interest, the company is expected to plan all blocks using total chance planning, coordinating the planning of pure 'D' blocks with Weyerhaeuser.

#### **Blue Ridge Lumber (BRL)**

BRL is scheduled primarily in the Carrot Creek LMU in W6 with some residual planned blocks residing in the Wolf Lake LMU. They access the 'C', 'CD' and 'DC' stands during harvest. Deciduous is directed to Weyerhaeuser with some sharing of logging opportunities between both companies. In the BRL sphere of interest, the company is expected to plan all blocks using total chance planning, coordinating the planning of pure 'D' blocks with Weyerhaeuser.

#### **Cold Creek Timber Ltd. (CCTL) (Formally part of Cold Creek CTP)**

CCTL is scheduled primarily in 'C' and 'CD' stands in the Cynthia LMU. Deciduous volume harvested by CCTL is charged directly against the W6 Cold Creek CTP deciduous cut. Alternatively, CCTL may make arrangements with the W6 Cold Creek CTP group to harvest the deciduous concurrent to the conifer harvest.





## Millar Western Industries (MWI)

Millar Western is scheduled primarily in 'C', 'CD' and 'DC' blocks in W6 in the Carrot Creek LMU. They also must direct deciduous to Weyerhaeuser.

### 8.5.2 Community Timber Program (CTP)

#### Edson CTP – E2

The Edson CTP group accesses volume from conifer predominate stands. Small stands of pure 'D' scheduled to be operated by Weyerhaeuser in the SHS may be re-assigned to the CTP group to provide the necessary deciduous volumes. Traditionally, Weyerhaeuser has planned all harvest areas through to the design approval stage, however EDFOR has accepted this responsibility.

#### Cold Creek CTP – W5

The Cold Creek CTP group accesses all primary and incidental conifer from the unit, as well as all incidental deciduous from C, CD and DC stands. Traditionally Weyerhaeuser has planned all harvest areas through to the design approval stage.

#### Cold Creek CTP – W6

The CTP group harvests primarily coniferous (C and CD) stands in the Nojack South and Granada Harvest Design Areas in the Cynthia LMU. Some 'D' stands are also scheduled to be issued as DTP's. All conifer and deciduous volumes are charged to this allocation. As well, deciduous volumes harvested by CCTL are charged to the CTP allocation in this FMU. Traditionally, Weyerhaeuser has planned all harvest areas through to the design approval stage.

### 8.5.3 Data Sharing

The Company will, at the request of the Quota holder, provide copies of the original digital forest inventory (Alberta Vegetated Inventory – AVI) files and covertime volume tables produced by the Company to AVI standards as per our data sharing agreement with the Province of Alberta. Also at the request of the Quota holder, the Company will make copies of the updated digital AVI files and covertime volume tables produced by the Company to AVI standards for a particular year or any previous year. This will be done at no charge if the Quota holder has funded the cost of AVI updates for that year necessitated by activities of the Quota holder according to the normal schedule for updating defined in the Data Sharing Agreement.

### 8.5.4 Reporting

All operators must supply information to Weyerhaeuser in support of Section 9, "Monitoring". The initial report will not be required until one full year of operations has occurred and will be completed the following spring to align with the SFMP annual report.

Therefore, upon DFMP approval, the first annual report will be completed in the spring of 2006, with the review of activities from July 1<sup>st</sup>, 2004 to June 30<sup>th</sup>, 2005. The operating year for the FMA is July 1<sup>st</sup> to June 30<sup>th</sup> of each year. The operating year for the Quota Holders and CTP groups is May 1<sup>st</sup> to April 30<sup>th</sup>.



## 8.6 Stakeholder Involvement

### 8.6.1 WeyFAC

The Weyerhaeuser Forestry Advisory Committee will continue to contribute to the direction of management practices on the Edson FMA. Forest management issues will be discussed with the group as scheduled during the regular meetings.



The advisory group also acts as a sounding board for other issues that the company may not be aware of. Some of these issues are brought to the forefront annually at the start of each season, and are ranked according to importance by the committee.

### 8.6.2 Quota Holder/CTP Group

As forest management issues arise as a result of the DFMP, further discussions will most likely take place with these groups. Weyerhaeuser understands its obligations to the Crown to fulfill the volume-based requirements of other timber operators on the FMA area. Quota holders and CTP groups are also represented on the FAC.

Data sharing agreements with these companies may be negotiated. Forest depletions will be updated annually, while the landuse layers are updated continuously. Records must also be maintained in an accurate manner. To be able to accurately monitor and report on situations within the FMA, Weyerhaeuser is required to do much of the work. In order to fulfill this requirement, it is likely that Weyerhaeuser will require silviculture records from volume-based tenure holders operating in the FMA.

### 8.6.3 Trapping

Weyerhaeuser is committed to involving the trapping community in harvest design development and implementation. It is understood that timber harvesting can directly and immediately affect the habitat of furbearers harvested by trapping.<sup>19</sup> Weyerhaeuser will work with the trappers to minimize the impact of timber harvesting on the trapping sector.

Weyerhaeuser will consult individual registered trappers during the harvest plan development to discuss:

- ◆ location of proposed harvesting areas (harvest area and landscape levels) as part of the sequencing output from this Plan, the General Development Plan, and Annual Operating Plan (AOP) submissions;
- ◆ harvesting methods including stand retention levels, harvest patterns, recognition of unique areas, and timing;
- ◆ access (location, reclamation, and control methods);
- ◆ clean-up requirement such as brush pile retention; and
- ◆ reforestation activities and timing.

<sup>19</sup> Proulx, Gilbert. A Review of the Effects of Logging on Furbearers Inhabiting the Alberta Forest Regions Managed by Weyerhaeuser Canada Ltd. 1998



Reasonable effort will be made to contact the trapper in person to discuss the development of the harvest design and to obtain pertinent information from the trapper such as cabin locations, unique areas, location of lines and traps, etc. Follow-up contact with the trapper will be made prior to submission of the AOP to review the final harvest design. Any unresolved issues between Weyerhaeuser and the trapper will be communicated in the AOP to Sustainable Resource Development. The company will also arrange follow-up consultation with the registered trapper after harvesting to review plan implementation and interpretations.

As a member of the Alberta Forest Products Association, Weyerhaeuser will support the intent and guidelines of the Alberta Trappers Compensation Program Policy and Procedures. The Alberta Trappers Compensation Program provides a framework for compensating trapline operators of Registered Fur Management Areas for trapping business losses related to industrial activity. The Company will try to resolve any short-term disruption issues with the trapper prior to the issue being referred to the Compensation Board.

To ensure that the Company can meet the obligations noted above, Weyerhaeuser will request that Sustainable Resource Development provide a list and map of the trappers and traplines that operate within Weyerhaeuser's allocated Crown sources. In addition, Sustainable Resource Development participates in the Compensation Program by providing information to help determine eligibility requirements for the "temporary disruptions" compensation program.

#### 8.6.4 Grazing

In 2002, Alberta Sustainable Resource Development produced a draft document entitled "*Guidelines for Integrating Timber Harvesting and Domestic Grazing in the Green Area*" (Appendix 8-7). Weyerhaeuser is currently implementing these guidelines on all planning and harvesting areas overlapped by grazing dispositions (permits, licenses and leases) being managed by Weyerhaeuser Edson Forestlands staff.



Timber operators and the grazing disposition holder(s) will develop joint Silviculture-Range Working Plans (SRWP). These plans set periods of harvesting and grazing, provide for cost sharing of cross fencing projects, and schedule joint inspections (before, during, and after operations). These joint plans are signed off by both parties prior to commencing operations.

A new set of Timber and Grazing Integration Guidelines is currently under review, with expected completion in the very near future. When approved, these Guidelines will replace the 2002 Guidelines currently in use.

#### 8.6.5 General Public

Weyerhaeuser is committed to the involvement of all interested parties pertaining to forest management issues. The Public Involvement Plan documents a number of avenues for input by the public.



## 8.7 *Unique Findings*

### 8.7.1 **Archeological and Historical Information**

In developing the archeological procedure the Company has implemented the following strategies:

- 1) Incorporate a predictive model to identify areas of potentially significant archeological resources.
- 2) Pursue a management procedure that describes the steps to follow in the identification and reporting of significant archeological sites and finds.

The Company's harvesting plans are available for public review. This allows the public to identify archeological and ecological resources and concerns specific to an area of harvesting and to the FMA in general.

### 8.7.2 **Unique Sites**

The following policy has been developed by Weyerhaeuser specifically but is general enough to be acceptable to all operators on the FMA.

#### **Policy for the Protection of Rare Physical Environments:**

##### **Purpose**

To provide recognition of and management guidelines for the protection of rare physical environments.

##### **Rare Physical Environments**

Within the DFA are rare physical environments that host rare plant communities and/or species, and also provide habitat opportunities for small mammals, amphibians, reptiles and invertebrate species. Rare physical environments may also refer to unique geological formations or land forms markedly different from the surrounding area.

Examples of these sites include rock outcrops, small patches of forest remnants from previous fires, large diameter down logs and hibernacula.

##### **Policy Statements**

- 1) Weyerhaeuser will protect rare physical environments at the stand level, as outlined in the stand level ecological guideline (found in EMS Operational Controls).
- 2) Rare physical environments of regional significance will be identified during the development of Detailed Forest Management Plans and / or at the harvest design phase of operations. Plans to protect the unique features of these areas will be developed. These plans may include:
  - ◆ Excluding operations from the area
  - ◆ Placing special notation on the area (e.g. PNT)
  - ◆ Modifying operations in terms of harvest pattern, method and /or timing

Annually, Weyerhaeuser will review its plans to protect rare physical environments and solicit public input through the FAC. Locations will be tracked using the Geographic Information System (GIS).



### **8.7.3 Rare, Endangered or Threatened Animal Species**

Work will continue to gather baseline (raptors, songbirds, furbearers) and update information relating to all species upon the FMA. This work should help to identify RET species on the FMA. Management practices will then be put in place to insure the preservation of these species, to the best of our ability.

Weyerhaeuser will co-operate in the development and implementation of Provincial 'Species at Risk' recovery plans when directed on a species assumed or known to occur on the FMA.

## **8.8 Forest Protection and Health**

### **8.8.1 Insects and Disease**

Weyerhaeuser is part of the Northern East Slopes Region Integrated Pest Management Working Group. Weyerhaeuser has an insect and disease coordinator that participates in provincial meetings on insects and disease. These forums provide an opportunity for discussion of issues related to insects and disease. This is especially important because of the gap that has been created by the Canadian Forest Service pulling away from their commitment to a monitoring program. This puts an onus on the forest industry and ASRD to address I/D monitoring.

ASRD has supplied Weyerhaeuser with a number of "Insect & Disease Report Card" forms (FP213A) to be used by field crews undertaking a number of surveys on the FMA. This would include the establishment of permanent sample plots, temporary sample plots, and regeneration surveys. The insect and disease coordinator will collect all reports as they are completed. Significant outbreaks are reported to SRD as encountered.

Weyerhaeuser will also work with the Forest Management Branch in a co-operative effort as they implement their forest pest monitoring program, which has been strengthened since the Forest Insect and Disease Survey (FIDS) of Northern Forestry Centre, Canadian Forest Service, Natural Resources Canada has been disbanded. Aerial surveys for defoliation and surveys with pheromones have been the main monitoring tools used by the Forest Health Branch.

### **8.8.2 Noxious Weeds**

The invasion of noxious weeds in the forested areas of the Municipal Districts and Counties continues to be a concern. Weyerhaeuser recognizes that its timber harvesting operations are a potential mechanism for spreading such weeds and will cooperate with the Municipal Districts, Counties, Alberta government and other stakeholders in the control of noxious weeds in its operating areas.

Hand picking and disposal will be promoted for spot encounters; however Weyerhaeuser will use chemical control methods under permit as deemed necessary.





### 8.8.3 Fire Protection

Weyerhaeuser will continue to work cooperatively with government agencies at the provincial and municipal levels to protect the forest values entrusted to the Company. Weyerhaeuser's objectives in fire management are to protect:

- 1) human life,
- 2) communities,
- 3) sensitive watersheds and soils,
- 4) natural resources, and
- 5) infrastructure.



Operationally, Weyerhaeuser will inform or solicit advice from Public Lands and Forests Division about:

- ◆ opportunities for harvest designs to minimize the potential spread of fire. The Forest Fire Behavior Prediction System will be the basis for the decision model. Fire protection objectives will still be considered, although they conflict with our harvest design objectives, such as aesthetics or wildlife considerations;
- ◆ salvage of merchantable timber that has been damaged or killed by fire, as this will be a priority of utilization;
- ◆ the use of prescribed fire as a silviculture tool. Weyerhaeuser does not currently use this silviculture tool, however, it may be considered in the future. Weyerhaeuser will cooperate with other agencies in their use of prescribed fire for the purposes of research or vegetation management, provided that precautions are taken to ensure that no timber is at significant risk; and
- ◆ annual or short-term operational strategies for fire management that will be included in the Annual Fire Plan, the AOP plans, and/or at the harvest design stage.

Weyerhaeuser will also participate in the Foothills Firesmart Committee. The Committee brings together individuals from different industrial partners and SRD to actively pursue the opportunity to reduce fire spread potential in selected locations.

Weyerhaeuser has participated actively in some of the following activities:

- ◆ strategically placed harvest areas near Lodgepole,
- ◆ thinning of mature trees to reduce dense canopy cover,
- ◆ brushing of pipelines to provide better fire guard potential, and
- ◆ mowing of pipeline/powerline ROW adjacent to roadways and facilities.

### 8.9 Tree Improvement Program

Two Tree Improvement programs are currently being developed within cooperatives for use on Weyerhaeuser's Drayton Valley and Edson Forest management areas:



- ◆ White Spruce, *Picea glauca* using native selections is called 'Region 1' and administered through Huallan Seed Orchard Company (HASOC).
- ◆ Aspen, *Populus tremuloides*, uses both native and hybrids and is called 'Aspen breeding region 2' and administered through Western Boreal Aspen Corp. (WBAC).



Each program follows 'Standards for Tree Improvement in Alberta' and has an associated controlled Parentage plan. Both programs were initiated prior to the May 2003 Standards being approved and are in transition. Plans are in draft form and both will be submitted to SRD within next year. Brief details for each programs are as follows:

### White spruce

- ❖ White spruce program started in 1993 with the provincial government and three other industry partners (Canadian Forest Products, Hinton Wood Products a division of West Fraser mills, Millar Western Forest Products, and ANC Timber).
- ❖ Orchard was established in 2000 and is located west of Grande Prairie.
- ❖ Genetic test series were establish in 2001 at four locations to test selected parents progeny. Weyerhaeuser has one test on Drayton FMA in TWP 44 Rge. 7, which is 8 ha. in size.
- ❖ First evaluation of test at or after age 14 in 2015 following rule: 4 years plus 10% of expected rotation.
- ❖ Genetic gain from first generation will be between 2 and 5%, until 2015 evaluation.
- ❖ Cone production from orchard has started and full production target is 2007 to 2010.
- ❖ Deployment area will be all conifer site types on FMA up to 1200m in elevation.
- ❖ First generation of seed will be deployed on 50% of area.
- ❖ Second generation orchard is currently being developed through first generation.





## Aspen

- ❖ Aspen program started in 1993 and in addition Weyerhaeuser currently has three other members (Daishowa Marubeni, Ainsworth Lumber, and Footner Forest Products) involved in the program.
- ❖ Facilities for breeding were developed in 1996.
- ❖ First breeding started in 1998.
- ❖ First genetic test (clonal trial) established in 2001.
- ❖ First genetic test to evaluate progeny from breeding established in 2001.
- ❖ First evaluation of tests at or after age 7 in 2008.
- ❖ Two test sites have been developed; one on private land north of Drayton Valley and a second location on Drayton Valley's FMA north-west of Cynthia in Twp 50 Rge 11. A third test site is being planned for Edson FMA in Twp 55 Rge 17.
- ❖ Plan is to establish a series of operational plantations. They will not exceed 17 ha. as per the Standards for Tree improvement on an FMA. This will start in 2006 and end in 2011.
- ❖ Operational testing will investigate several deployment scenarios:
  - Nursery production of clones.
  - Hybrids with natives, both mixtures and clonal blocks.
  - Stock types, planting densities, and site preparation techniques.
- ❖ Monitoring will be intensive and several attributes associated with trial series evaluated:
  - Relative growth performance of native and hybrids.
  - Regeneration of improved stock after harvest.
  - Gene flow between improved stock and natives.
- ❖ Cut blocks for plantations over next three years are identified northwest of Cynthia in Eta Lake HDA (Twp 50 Rge 10).
- ❖ See Appendix 8-8 for more complete description of 2006 to 2011 series plantations.
- ❖ Plantations on FMA will utilize clones of superior trees from testing.
- ❖ Gain from material will benefit from both intensive silviculture and genetics.
- ❖ Plantations are expected to achieve Mean Annual Increments (MAI) of 8m<sup>3</sup> ha. per year.

### 8.10 Ground Rule Development

In 2001, Weyerhaeuser became a member of the Steering Committee for the Whitecourt Zonal Operating Ground Rules (OGR). Committee membership included the following organizations or companies:

- ❖ Weyerhaeuser Company Limited (Edson)
- ❖ Alberta Newsprint Company (Whitecourt)
- ❖ Blue Ridge Lumber (1981) Limited (Blue Ridge)
- ❖ Millar Western Forest Products Ltd. (Whitecourt)
- ❖ Mostowich Lumber Ltd. (Fox Creek)
- ❖ Spruceland Millworks Ltd. (represented by the SRD)
- ❖ Cold Creek Community Timber Program (represented by the SRD)
- ❖ Edson CTP Community Timber Program (represented by the SRD)
- ❖ Edson Timber Products Ltd. (represented by the SRD)
- ❖ Cold Creek Timber Ltd. (represented by the SRD)
- ❖ Fort Assiniboine Community Timber Program (represented by the SRD)
- ❖ Sustainable Resource Development (SRD) (Whitecourt, Edson, Edmonton)



Zonal Ground Rules development included the following areas:

- ❖ Weyerhaeuser Edson FMA,
- ❖ Alberta Newsprint Company FMA,
- ❖ Blue Ridge Lumber (1981) FMA,
- ❖ Millar Western Forest Products FMA, and
- ❖ Non-FMA forest management units W11, W01, W02 and E01 in the White Area.

In the spring of 2005, the OGR Steering Committee developed a new set of operating Ground Rules, with the main focus being the Blue Ridge Lumber FMA. The new Provincial template was used to develop the Ground Rules. The intent of Weyerhaeuser is to use the Blue Ridge Ground Rules (July 2005) as a template to negotiate a new set of Ground Rules for the Weyerhaeuser Pembina DFMPs (Edson and Drayton Valley FMA's).

Until that time, the Edson FMA Ground Rules used are those approved in 2002, with modifications agreed to in 2003 and 2004.

### **8.11 Education and Training**

Education and training exercises will involve Weyerhaeuser Forestlands staff and contractors. Programs will target providing staff and contractors with adequate skills and knowledge to implement the Forest Management activities described in this plan.

Forestland contractors include those undertaking the following activities on the FMA for Weyerhaeuser:

- harvesting,
- reclamation,
- road building,
- site preparation,
- block and road layout,
- pre-harvest assessments,
- post-treatment assessments, and
- regeneration establishment and performance surveys.

Most of the training will be awareness training. As an example, individuals will have to be trained on the recognition and importance of unique species on the FMA to insure ensure appropriate management obligations are carried out.

### **8.12 Landuse Update Process**

The following describes the series of events that occur to update disturbances on the FMA:

#### **Industrial Landuse Activities**

The updates to the landuse layer occurs for those lands within the FMA. Non-FMA landuse activities are the responsibility of SRD.

- ◆ Landuse application request is consented to by Weyerhaeuser.
- ◆ Survey disposition (paper copy) is sent to contractor who digitizes the disposition and also calculates the Timber Damages (TDA).



- ◆ The digital version of the disposition is then loaded into the “TDA polygon” layer in our GIS.
- ◆ Every three months (1/4 year) all of the landuse dispositions in the TDA polygon layer are cross-referenced against the LSAS data to update attribute info.

### Harvesting Activities

- ◆ In June of each year areas harvested in the previous AOP are flown at a 1:20,000 scale and photographed.
- ◆ Images are developed, printed and scanned to provide ortho-rectified imagery as well as hard copy prints.
- ◆ Harvest area boundaries are digitized on screen by contractor and shapefiles (with new calculated areas) sent to Weyerhaeuser for loading into GIS.

### Fires and Other Natural Disturbances

- ◆ Large fires are flown by SRD during fire suppression activities.
- ◆ Company incorporates GIS shapes, provided by SRD, into database.
- ◆ Currently no other natural disturbances (wind events, insect infestations, disease outbreaks, etc.) are captured for updating. The company will make use of digital layers as provided by SRD.

### 8.13 Re-Inventory of AVI

The next DFMP is scheduled for 2014. The following schedule outlines the activities to occur to re-inventory the AVI:

- ◆ 2007: identify prime contractor to complete the re-inventory of AVI to current government standards,
- ◆ 2008: Obtain appropriate aerial photography for FMA,
- ◆ 2009-2010: complete the re-inventory of AVI to approved standards and complete the government approval process,
- ◆ 2001: start using new AVI in the DFMP process, and
- ◆ May 1<sup>st</sup>, 2014: planned new DFMP approved by SRD.

Aspects of AVI re-inventory (done on a 10- to 20-year cycle) include the following:

- a) Changes in vegetation e.g. species, heights, densities,
- b) Base features changes e.g. hydrography, roads, etc., and
- c) Many features must be retained from the original inventory e.g. cutblock boundaries.

Resource Information and Management Branch (RIMB) is responsible for setting, publishing and periodically updating standards e.g. AVI 2.1 Interpretation Standards. AVI/forest inventories, including updates, must meet or exceed these standards. RIMB staff also audit AVI data and information to assure that standards are met.

The SRD Planning Standard sets standards for inventory data used in support of DFMP preparation.





## 9 PERFORMANCE MONITORING

An essential component of adaptive forest management is an effective monitoring program. Each objective will be monitored to assess management success. By monitoring these objectives and comparing actual forest condition and development with planning forecasts, variances with the objectives can be identified.

Monitoring will be an ongoing process integrated with regular operations of the Company. It will address the basic aspects of:

- ◆ Tracking actual activities versus planned activities,
- ◆ Tracking actual responses to forest management activities compared to expected responses,
- ◆ Identifying impacts arising from changes in assumptions, terms of reference or unplanned events, and
- ◆ Correcting activities or practices when required.

A variety of data sources including temporary and permanent sample plots, post harvest surveys, and experimental research plots, will be used to monitor forest condition and development.

Adaptive management also implies adjusting the course of action relative to the variances identified in monitoring. There is an opportunity to make operational adjustments within the implementation of the management plan. These operational adjustments may take the form of corrective activities or compensating activities. The corrective actions directly address the identified shortcoming or variance identified. A prime example of this type of activity would be re-treatment of a regenerating harvest area to meet a particular reforestation standard. An additional operational adjustment tactic would be compensation. This activity would indirectly address the identified variance by way of modifying plans. An example of a compensating adjustment could be re-classification of harvest areas to meet reforestation standards.

Reports of monitoring results and variances will be included in annual reports, stewardship reports (every five years) and future DFMP submissions.

### 9.1 *Timber Supply Sensitivity Analysis (validation of assumptions)*

- ❖ **Harvest sequence:** A comparison of the approved SHS to actual areas cut will occur during the development of the next DFMP. Yearly reviews will not give an accurate picture of what is occurring across the FMA due to the flexibility in allowing operators to move across the landscape in an efficient and timely manner.
- ❖ **Regeneration Lag:** Will be recalculated each subsequent DFMP.
- ❖ **Cull percent:** The percentage cull on both deciduous and coniferous timber is a rolling average based on a number of years worth of data collection. The cull percent as it will apply to the next DFMP will be a result of another 6 years worth of data, but is expected to remain the same for a substantial number of years. Due to



the aging nature of the forest, it might be suspected that cull will increase slightly in the near term before starting to trend downwards as the forest approaches a more regulated appearance.

❖ **Impacts of Temporary roads:** See “Protocols” in section 8.1.3

## 9.2 *Regeneration Standards*

Regenerating stand covertypes will be assigned prior to harvest and harvest areas will be reforested to standards defined for each strata (C, CD, DC, and D). Harvest areas will have surveys completed no later than years five, eight or fourteen, depending upon the survey standard being applied.



## 9.3 *Annual Performance Monitoring Reports*

The annual performance report presents the planning and operating activities in the previous year. It also tracks cumulative results from the time of DFMP implementation, which will be July 1<sup>st</sup>, 2004. Upon completion, the report will be reviewed with WeyFAC.

To simplify data requirements for Quota Holders and CTP groups it is suggested that data requirements reflect operating periods, May 1<sup>st</sup>-April 30<sup>th</sup>.

The content of the annual performance report may be adjusted from time to time, at the start of a tracking year, upon the mutual agreement between Weyerhaeuser, Alberta Sustainable Resource Development, and the other Timber Operators.

Information summarized below will also be provided by Alberta Sustainable Resource Development and other timber operators on the Edson FMA.

The report will include, but will not be limited to, the following:

- a) Harvest production summaries (area and volume by operator and species by allocation) by operating period (OP).
- b) Summary of reforestation activities (area of site preparation, number of seedlings planted, area of stand tending, area of chemical treatments (by application type)) by calendar year (CY).
- c) Area summary of land withdrawals and additions (SFMP<sup>20</sup> – AR<sup>21</sup>).
- d) Significant natural disturbance events (i.e. windthrow, fire, insect and disease) by CY.
- e) Activities on afforestation and EFM (hectares) by CY.
- f) Summary of incidental replacement strategies on pure ‘C’ and ‘D’ blocks (establishment and performance survey results) by CY.

<sup>20</sup> Sustainable Forest Management Plan

<sup>21</sup> Annual Report



- g) Cumulative variance of the SHS by LMU (from GDP) by OP.
- h) Compliance infractions and mitigation factors by CY.
- i) Summary of inventory work (timber and non-timber) including depletions for landuse and fire, PSPs and TSPs, wildlife and fisheries by CY.
- j) List of research (includes annual report of summary of expenditures of \$0.25 per metre of drain by WeyCo.) by OP.
- k) Summary of public involvement initiatives (this would include the annual WeyFAC report) by FAC year.
- l) Summary of involvement in Provincial “*Species at Risk*” Recovery Plans (CSA #11) by CY.
- m) DFMP Objectives (as identified in Chapter 7) and indicators – as defined in each.

#### 9.4 **Stewardship Report Contents**

##### **Purpose:**

- ◆ To summarize the previous five annual reports;
- ◆ To discuss opportunities for change or adjustments in forest management practices that have been identified;
- ◆ To provide the public with an overall assessment of the DFMP progress, i.e. “Are we doing what we said we would do?”
- ◆ To identify deviations to the approved plan;
- ◆ To undertake analysis of unacceptable deviations as identified by the Company and Alberta; and
- ◆ To provide corrective actions.

##### **Content:**

The content of the Stewardship Report may be adjusted over time with mutual agreement between SRD and the Company. Therefore, the Report will include, but may not be limited to the following items:

- ◆ Review DFMP objectives and the TSA assumptions to:
  - Identify emerging trends or issues,
  - Identify deviations from the approved plan,
  - Track all variances to the SHS; where the 20% threshold (by LMU, by decade) is exceeded, an assessment will be made to identify the impacts to the affected objectives and resulting AAC implications,
  - Describe any analysis that has been undertaken of deviations, and
  - Describe the corrective actions to be taken.

#### 9.5 **DFMP Objectives and Associated Indicators**

The following indicators as they relate to DFMP objectives will be used. Most of these indicators are currently being reported in the Annual Report to the Weyerhaeuser Sustainable Forest Management Plan (to CSA standard Z809-02 or updated). The Annual Report will be used to supplement the Annual Performance Monitoring Report and the Five-year Stewardship Report to minimize duplication of effort.





Timber operators will be required to provide information in this chapter that can be used in both the DFMP annual report and the GFMP annual report. Each indicator below will be reported by all operators (ALL) or just Weyerhaeuser (WY).

### Goal #1: Fibre Supply

- ◆ **1.1a Harvest level (m3 per year and m3 per cut control period): (ALL)** Report annual and cumulative harvest volumes by species group (CSA # 54, 69, 70).
- ◆ **1.1b Percent harvested area meeting provincial regeneration standards (% SR/year): (ALL)** Report annually the percent of blocks sufficiently regenerated to the provincial establishment and performance standards (CSA # 38, 57).
- ◆ **1.1c Regenerated lag time (%/year): (ALL)** Report annually the % of area that are silviculturally treated within two years of harvest (CSA # 58).
- ◆ **1.2a Utilization of timber as per TSA (# warnings or penalties/year): (ALL)** Report annually the number of warnings or penalties received from Alberta regarding poor utilization standards.
- ◆ **1.2b Identification of significant windthrow (ha/year): (ALL)** Report annually areas of significant windthrow that have occurred on the FMA. Salvage opportunities will be reviewed as events are identified (CSA # 23, 28).
- ◆ **1.4 Area and severity of insect and disease attack (hectares per year/species): (WY)** Report annually the area of significant outbreaks affected by known insects or diseases. Co-operate with the SRD in identifying and quantifying outbreaks (CSA # 25, 26).
- ◆ **1.5 Area damaged by fire (hectares per year): (WY)** Report annually fire activity upon the FMA area (CSA # 27).
- ◆ **1.6 Net loss of productive landbase (hectares per year): (WY)** Report annually the amount of landbase removed or returned to the FMA as a result of industrial landuse activities. This would include pipelines, well sites, transmission ROWs, land withdrawals, etc. (CSA # 42, 43, 44, 45, 46, 48, 55)

### Goal #2: Forest Diversity

- ◆ **2.1a Percent of older seral stages (% by area/seral group): (WY)** Report at each subsequent DFMP the current percentage by area of seral groups as defined in the TSA (CSA #2).
- ◆ **2.1b Interior older forests (ha/DFMP): (WY)** Report each subsequent DFMP the amount and location of older interior forests that require protection/avoidance during each 10-year operational planning horizon (CSA # 5).
- ◆ **2.2 Harvest Patch size variation: (ha/max/min/and average/year): (ALL)** Report annually by AOP year. The silvicultural records system (ARIS) will be used (CSA # 5).
- ◆ **2.3a Variable amounts of structure within harvest openings (m3/year): (ALL)** Report annually the amount of retention remaining after harvest across the landscape. In FMU E1, the average should approach 8% merchantable



retention, while E2, W5 and W6, merchantable retention should approach 3% (CSA # 3, 4).

- ◆ **2.3b Variable amounts of down woody material (% retention/year):** (ALL) Report annually on the estimated percent of logging debris left onsite. Random piles resulting from logging debris accumulation will be left unburned. On average, there will be one pile every 4 hectares. Blocks will be assessed within one year, or after brush pile disposal has been completed (CSA # 33).
- ◆ **2.3c Areas of unsalvaged fire-killed timber (ha/year):** (WY) Report annually the amount of fire-killed area left unsalvaged (CSA # 3).
- ◆ **2.4 Protection of riparian area (# warnings or penalties /year):** (ALL) Report annually any warnings or penalties that are received from Alberta, or any EIR produced internally by the company(s) (CSA # 35).
- ◆ **2.5 Tree Species Diversity (hectares by Broad Cover Group and density class):** (WY) Report at each subsequent DFMP (CSA # 1).
- ◆ **2.6a List of Rare, Endangered or Threatened species (list updated annually):** (WY) Annually update the list of flora and fauna that may/does occur on the FMA. (CSA # 11, 14)
- ◆ **2.6b Biodiversity /wildlife status as determined by (report) (reports/by):** (WY) Report annually on trends in biodiversity indicators (change in birds<sup>22</sup>, nocturnal raptors and furbearers<sup>23</sup> species<sup>24</sup> occurrence) based on FMA-wide surveys conducted every 3 years. Document summarizing specific research/monitoring projects developed in conjunction with Fish and Wildlife Division and other Research Agencies, such as the University of Alberta (CSA # 8, 9, 10).
- ◆ **2.7 and 2.8 Research and training on ecological processes and classification (list of research and training activities):** (WY) Document continuing research and training efforts and outlining specific research/monitoring projects developed in conjunction with government agencies (CSA # 68, 88).

### Goal #3: Ecosystem Capacity

- ◆ **3.1a Range of coarse woody material left on site (range/year):** (ALL) Report annually on the range (low, medium and high) of post-harvest slash on cutovers based on a sample of harvest areas (CSA # 3).

<sup>22</sup> The selection of bird species as biodiversity indicators is suggested by various studies conducted across Canada by independent researchers and by researchers studying within the Sustainable Forest Management Network (*Kneeshaw et al. 2000. Towards Sustainable Forestry: A proposal for indicators of SFM inspired by Natural Disturbance. Sustainable Forest Management Network Publications. 58 pp.*) As outlined in the report: "Forest Bird Communities represent 70% of all vertebrate forest dwelling species of fauna. Furthermore, bird species react to changes in stand conditions as well as to cumulative changes at the regional scale.

<sup>23</sup> Furbearer species (American marten, fisher, weasel, etc.) are a second guild of wildlife species that will be used to monitor whether through forest management a variety of stands of different sizes and ages are maintained across the landscape. Furbearers, particularly American marten, require structural components at the stand level (e.g. woody debris) as well as certain amount of older forest stands widely distributed.

<sup>24</sup> Weyerhaeuser is supporting University of Alberta research (Dr. John Spence) aimed at assessing whether invertebrate species, particularly carabid species, can be used as practical indicators of biodiversity conservation at the stand level with regard to the retention of patches that emulate fire skips in fire driven forest ecosystems. Two research projects have been conducted in the Weyerhaeuser Grande Prairie/Grand Cache FMA. The results are now being analyzed.



- ◆ **3.1b Logging debris retained (% retention/year):** (ALL) Report annually the estimated percent of logging debris retained either by not burning or by spreading back over the harvest area (CSA # 33, 41).
- ◆ **3.2a Instances of excessive soil disturbances (Environmental Incident Report (EIR)):** (ALL) Report annually the instances of excessive soil disturbance. Mitigating strategies that deal with individual occurrences of disturbance will be documented as part of the internal reports (CSA # 29, 30).
- ◆ **3.2b In-block roads (% of total block area/year):** (ALL) Report annually the average % of disturbance of all blocks in the AOP year (CSA # 31).

#### Goal #4: Watersheds

- ◆ **4.1a Adverse impacts due to soil entering streams (EIR/year):** (ALL) Report annually the number of Environmental Incident Reports (EIR) documented regarding soil or other deleterious substances (CSA # 35, 36).
- ◆ **4.2a Water quality (EIR/year):** (WY) Annually monitor potential sources of sedimentation that will affect water quality for fish spawning by maintaining crossings inventories (CSA # 37, 38).
- ◆ **4.2b Water quantity measurements (number of watersheds measured/year):** (WY) Report annually on the watersheds selected to measure baseline flows. Selected watersheds will be monitored pre-and post-harvest (CSA # 39).

#### Goal #5: Public Accountability

- ◆ **5.1 Ongoing community consultation through WeyFAC (# meetings/year):** (WY) Report annually the number of meetings held by the Weyerhaeuser Forest Advisory Committee (WeyFAC) during the calendar year (CSA # 81, 83).
- ◆ **5.2a Issues or Concerns (type/year):** (ALL) Report annually on issues and concerns as they arise. Outstanding issues will be highlighted (CSA # 80, 82).
- ◆ **5.2b Aboriginal Consultations (#/year):** (ALL) Report annually the number of consultations of harvest designs with affected Aboriginal groups (First Nations and Métis) (CSA #72, 73, 74, 75, 76, 77).
- ◆ **5.3 Public awareness (type/year):** (ALL) Report annually the number and type of public awareness events (CSA # 59, 60, 80, 82, 84).

#### Goal #6: Resource Integration

- ◆ **6.1 Visually sensitive areas (# final harvest plans/year):** (ALL) Report annually the number of Final Harvest Plans completed using aesthetic management techniques (CSA # 50).
- ◆ **6.2 Stakeholder consultation (#/year):** (ALL) Report annually on consultations with other industrial users and stakeholders during the harvest design stage (CSA # 51, 52, 61, 82).

#### Goal #7: Unique Sites

- ◆ **7.1 Archeologically significant sites inventoried as identified are protected or conserved (number of sites identified/year):** (ALL) Report annually the



number of new archeological sites identified. A baseline inventory of known sites is established, and updates will occur as sites are identified (CSA # 53).

- ◆ **7.2 Unique ecological sites are protected and conserved (number of sites identified/year):** (ALL) Report annually the number and type of unique ecological sites identified. An inventory of known sites has been established, and updates will occur as sites are identified (CSA # 21, 22).
- ◆ **7.3 Protect Aboriginal Cultural Sites (%/year):** (ALL) Report annually the percent of known sites protected that reflect historical, cultural or spiritual significance. All known sites should be kept confidential and should not be placed on maps that would be distributed to the general public (CSA # 78, 79).

#### **Goal #8: Increasing Timber Supply**

- ◆ **8.1 Ongoing research impacting the FMA (list/year):** (WY) Report annually a list of research underway during the calendar year (CSA # 32, 68).





## 10 FUTURE CONSIDERATIONS

Future considerations should be viewed as opportunities outside of this DFMP. In themselves, they should not impede approval of the remaining components of the DFMP.

### 10.1 *Insects and Disease*

When warranted, Weyerhaeuser will participate with research involving the Forest Health Branch and other industry partners to develop strategies and techniques to mitigate damage to the forest resource from forest insects and diseases. Before control measures are implemented, it is imperative to truly understand and quantify the impact to the forest resource and evaluate the potential risks (e.g. ecological), when implementing a control program. The monitoring program, therefore, is critical in building a knowledge set over time that will allow Weyerhaeuser to rank the importance of various insects and diseases in terms of their potential impact on the forest resource.

The Forest Management Branch is developing a predictive modeling tool that will enable stands to be assessed for hazards related to the Mountain Pine Beetle. The entire FMA should be mapped to identify key areas on the FMA that could be threatened by this beetle. A model for Armillaria is also being developed.

### 10.2 *Long-term Harvesting and Grazing Implications*

Objectives for forage production must be balanced with objectives for fibre production. Further review is required to understand the impact of grazing operations on timber values, and vice versa. The impact of harvesting on AUMs (overstocking of deciduous blocks) and grazing on AACs (under stocking of cutovers) are assumed but not well documented. The realization is that there are impacts on both. Flexibility must be built into higher-level plans that deal with the impacts on both AUMs and AACs.



Weyerhaeuser is currently working on a Grazing Pilot Project that analyses the potential for grazing upon the FMA. The group is currently reviewing the options available on a temporal and spatial basis.

Weyerhaeuser is not opposed to grazing within the FMA. However, due to the potential impacts of grazing on long-term forest productivity, there are some conditions that should be applied on all new requests for grazing dispositions.





Individuals requesting a grazing disposition within the FMA must agree to and abide by a joint Silviculture-Range Working Plan (SRWP). The SRWP may include but not be limited to:

- ◆ Deferred grazing period (1 – 3 years),
- ◆ Rotational grazing period (1 – 3 years),
- ◆ Harvest sequence, number of harvest passes, and number of blocks,
- ◆ Cost sharing of cross fencing,
- ◆ Access retention after operations,
- ◆ Site improvements that will benefit both parties,
- ◆ Joint inspections at the request of either party, and
- ◆ Remedial silvicultural action on affected areas.

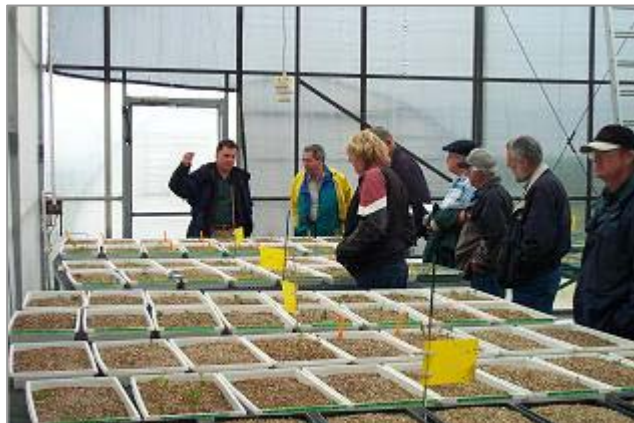
Fence line clearing on the perimeter fences should be limited to a maximum of 10 metres, and cross fencing should be limited to five (5) metres or less. This will allow adequate access for fencing as well as movement of cattle along the fence-line, while limiting the amount of productive land lost. The grazing disposition holder should also take advantage of existing openings for fence placement (i.e.: seismic lines, pipeline ROWs, roads, etc.) if appropriate.

Finally, grazing operators must realize that forest communities change over time. As vegetation types change, either through natural or manmade processes, carrying capacities, in regards to grazing, change. It is unrealistic to assume that the carrying capacity of grazing units is static over time, and is unaffected by changes in vegetation communities, either by disturbance, or through time. Plan updates should occur that recalculate grazing carrying capacity at the time of disposition renewal to reflect these changes.

### 10.3 *Enhanced Forest Management*

Development of an enhanced forest management program for future implementation on the SYU Area is continuing. As such this Plan does not incorporate the benefits of enhanced forest management activities. The intent of the enhanced forest management program for the period of this plan is to establish trials to:

- ◆ gain operational experience in implementing these activities;
- ◆ demonstrate the results of these activities; and
- ◆ provide a basis for evaluating the forest response to these activities.







The enhanced forest management activities are focused in the following areas:

- ◆ coniferous understorey planting;
- ◆ density management through spacing and cleaning;
- ◆ incremental increased stocking of satisfactorily reforested sites;
- ◆ rehabilitation of low density stands currently not included in the productive forest landbase; and
- ◆ tree improvement (white spruce program, hardwood program).

Knowledge gained from these trials will aid in determining an appropriate enhanced forest management strategy for submission in future detailed forest management planning.

Weyerhaeuser continues to provide both in-kind and financial support to a number of initiatives with the general objective of building capacity to support the rational implementation of enhanced forest management. Weyerhaeuser is a member of and participates in the following organizations:

- ◆ Western Boreal Growth and Yield Cooperative (WESBOGY)
- ◆ Foothills Growth and Yield Association (FGYA)
- ◆ Mixedwood Management Association (MWMA)
- ◆ Hualien Seed Orchard (HASOC)
- ◆ Western Boreal Aspen Coop (WBAC)

Weyerhaeuser also collaborates and is involved with the:

- ◆ Sustainable Forest Management – Centre of Excellence
- ◆ University of Alberta Institute for Enhanced Forest Management

#### **10.4 Forest Inventory and Timber Supply Analysis**

This type of work may include, but is not limited to:

- ◆ enhancement of forest inventory information for certain areas of the SYU Area
- ◆ cooperation with other agencies on landscape management assessments (e.g. fire management, land use developments)
- ◆ improving timber supply modeling capacity

#### **10.5 Ecological Sustainability**

As described in the DFMP, future initiatives regarding ecological sustainability will focus on those activities designed to further knowledge of forest ecosystems and the impacts of forest management. This would encompass monitoring trends in biodiversity indicators, assessing the range of natural variation, and contributing to specific research / monitoring projects developed in conjunction with Fish and Wildlife Division and other research agencies.

#### **10.6 Alternative Regeneration Standards**

Weyerhaeuser has communicated a commitment to pursue alternative regeneration standards for FMA operations in Alberta. A 'first approximation' of the alternative regeneration standards will be developed in 2006. In accordance with communication with ASRD, once these alternative regeneration standards are approved, they will be used to evaluate regeneration performance until 2010. In 2010, a 'second approximation' of alternative regeneration standards will be submitted to ASRD. Also, any adjustment in harvest levels associated with regeneration performance will be deferred until 2010.



## 10.7 *Research and Long-term Monitoring*

Research and long-term monitoring is an ongoing process for many companies that have a Forest Management Agreement. Prior to the FMA, Weyerhaeuser also funded research in the Edson Quota Allocation areas. Some of this research was specific to Edson while other research is more general in nature and can be applied across any of Weyerhaeuser's timber holdings in Alberta.

During the development and discussions leading up to the final Detailed Forest Management Plan, it became very evident that there were many information gaps still present in forest management and forest management practices. Weyerhaeuser will continue to participate in research projects and monitoring to try to fill these gaps.

The following is a list of some of the research, monitoring, or inventory programs either completed or in progress on the FMA.

- Chip Lake fire research
- Sustainable Forest Management Research
- Effects of livestock, wildlife and harvesting on aspen regeneration and forage supply
- Stand condition and site factors affecting the regeneration of healthy and overmature aspen
- Furbearers monitoring surveys
- Owl monitoring surveys
- Songbird monitoring surveys
- Fisheries surveys
- Sponsorship of the Intensive Forest Management Centre
- NIVMA (Northern Inventory Vegetation Management Association)
- Wesbogy (Western Boreal Growth & Yield Co-op)
- Aquatic invertebrates
- Tree improvement program
- Small watershed assessment program
- Foothills growth and yield
- Centre for enhanced forest management

## 10.8 *Adjustment of Salvage Chargeability and Tracking*

### **Current Situation:**

Current practices that account for industrial losses will be followed until such time as there is an agreement in place between both parties,

Currently, existing seismic lines and other lands cleared for industrial use (i.e. well sites, LOC's, pipelines) are removed during the landbase net down stage of all Timber Supply Analyses.

For dispositions occurring after the net timber supply analysis, an estimate of timber volume to be removed due to the activity is based on the amount of area removed from the FMA. The estimated volume is then charged against FMA production for that year. In other words, the amount of annual allowable cut available for Weyerhaeuser on an annual basis is



reduced by the amount of volume estimated to have been removed from the FMA through this process. Issues with this approach include:

- Volume from the non-productive landbase is charged against annual allowable cut.
- Volumes available to Weyerhaeuser and other forest operators are impacted on a short-term basis by the level of oil and gas activity on the FMA. The forest industry has little control over how much activity occurs or how much volume is required to be salvaged by the energy sector and made available for purchase.

**Proposed:**

There is a need to ensure that the combined impacts of the forest industry and energy sector does not result in over-harvesting of the timber resource as measured by the approved AAC.

Weyerhaeuser would like to change how future industrial losses are accounted for, starting in 2006, to be more consistent with how other losses (fire losses for example) are accounted for. Quota Holders should be given the opportunity to review the process prior to approval by SRD as this may impact the chargeability of salvaged purchased by them.

This process could be as follows:

- a) Industrial activities identified on the landbase (seismic lines, well sites and other industrial clearings) will be removed from the net landbase during timber supply analysis at each DFMP.
- b) Timber salvaged from industrial clearing will be tracked as it crosses the scale and charged against FMA production accordingly.
- c) The amount of newly cleared area resulting from these industrial activities will be tracked on an annual basis. The area will be tracked by the Unit that contributed to the approved AAC calculation (as an example, by FMU in Edson and by FMA in Drayton Valley).

Should the cumulative amount of new area cleared since the last timber supply analysis (or other mutually agreed upon date) exceed 2.5% of the total productive forest landbase prior to the next DFMP submission, Weyerhaeuser will confer with Alberta on implications to the approved AAC. Weyerhaeuser is committed to a reduction of the approved AAC of an equivalent percent as determined above for the duration of the DFMP and/or until a new AAC has been calculated, or will undertake an analysis of the cumulative effects of landuse activities since the establishment of the current AAC and the relative impacts of such activities.

Further discussion is required between the company and SRD to finalize a new method acceptable to all parties, and Weyerhaeuser recognizes that approval of the DFMP does not imply that the above proposal is also approved.





## **APPENDIX 8-1**

# **MONITORING PROTOCOL FOR THE ESTABLISHMENT AND GROWTH OF TREE ON TEMPORARY ROADS**







**Monitoring Protocol  
for the  
Establishment and Growth of Trees  
on Temporary Roads  
upon the Weyerhaeuser Pembina  
(Edson and Drayton Valley) FMA's**

March 17, 2005

Approved April 29, 2005 by Robert Stokes

Revised February 2, 2006

**Background:**

Weyerhaeuser temporary in-block roads make up approximately 2.8% of cut block area in both of the Pembina FMA's (Sept. 22, 2004 – Robert Stokes).

Since the early 1990's, Weyerhaeuser has reclaimed, de-compacted, rolled-back, and where necessary, planted or seeded these roads to promote regeneration throughout the cut block. Under current direction from SRD, the Annual Allowable Cuts for timber operators within these FMA's will be reduced by a corresponding amount (2.8%) unless they agree to the following proposals (Sept. 22, 2004 - Stokes):

- 1. Provide monitoring criteria and monitor to measure the early establishment of regeneration on temporary roads,**
- 2. Provide monitoring criteria and monitor to measure the growth of established seedlings on the temporary roads, and**
- 3. Provide details of silvicultural strategies to be used to reclaim roads in the "Silviculture Strategy Table" provided to Weyerhaeuser on March 12, 2004.**

The following outlines strategies to complete the above requirements.

**Intent #1:** To monitor the stocking level of regeneration upon temporary roads within cut blocks on the Edson and Drayton Valley FMA's.

Trees established along the transition zone between the road and block will influence the growing space of both the block and the reclaimed road surface. At rotation age, crown canopy extent should occupy most of the growing space available, independent of whether the tree was directly growing on the road surface or is found in the transition zone. Established stocking on the road surface itself would further add to crown closure.

**Sampling Strata:** A total of eight (8) strata will be sampled on both FMA's. They include:

- ◆ Blocks operated under non-frozen conditions (skid clearance before December 1<sup>st</sup> in the operating year) X Broad Cover Groups – 1 X C, CD, DC and D = 4 strata
- ◆ Blocks operated under frozen conditions (skid clearance after December 1<sup>st</sup> in the operating year) X Broad Cover Groups – 1 X C, CD, DC and D = 4 strata



---

**Sampling Intensity:** Weyerhaeuser and the established timber operators will undertake 100% sample of all blocks undergoing an establishment survey during 2005 and 2006 as follows:

- ◆ Plots falling on roadways will be uniquely (with an 'R') identified. To be identified as an 'R' plot, the plot center **must** fall on the road surface, subject to the surveyor's interpretation during the survey. All trees falling within plots with the plot centre on the road will be tallied to reflect stocking on the road, whether they are physically on the road or adjacent to the road.
- ◆ Estimate # plots contributing to analysis is = 600 blocks X 64 plots per block X .028 = 1075 plots

**Data Analysis:**

- ◆ All 'R' plots will be dumped into the 8 individual strata.
- ◆ Upon completion of surveys in the initial year, simple t-test to test the difference between strata or "equivalence tests" will be carried out.
- ◆ Problems encountered during the first survey season will be addressed to provide direction to the 2006 sampling year. Weyerhaeuser and established timber operators are expected to fulfill this commitment for 2006.
- ◆ At the end of two years, data will be summarized by the strata as described above.

**DFMP Implications:**

- ◆ Results, if required, may be used to indicate impacts on AAC for the next (2007+) DFMP

**Intent #2A:** Weyerhaeuser to monitor the growth of established seedlings upon reclaimed temporary roads within cut blocks on the Edson and Drayton Valley FMA's using the PSP program

**Sampling Strata:**

- ◆ No pre-stratification will occur
- ◆ The proposed monitoring program for regenerating stands will see plots established on a grid basis
- ◆ Some of the plots will fall on portions of reclaimed road surfaces if and when the grid allows

**Data Analysis:**

- ◆ Information from these "roadway" plots will be weighted to the area of roadways found within the strata and accounted for in future yields



---

**Intent #2B:** Weyerhaeuser to monitor the growth of established seedlings upon reclaimed temporary roads within cut blocks on the Edson and Drayton Valley FMA's with designated experiments.

**Background**

Dr. Dave McNabb has completed a research project that collected growth information that tested the planting of pine seedlings on in-block temporary roads that were either 1) ripped, 2) rolled back, or 3) ripped and rolled back in the early 1990s. Data was collected in the fall of 2004, and is currently being compiled into a report, scheduled for completion in the spring of 2005.

**Expanded Research Proposal:**

Dr. McNabb will work with Weyerhaeuser silviculture professionals in defining the bounds of the expanded research proposal that will be scientifically sound.

Weyerhaeuser is committed to the establishment of 4 additional replicated sets of plots, for a total of 5 (including the previously described plots established by McNabb) no later than the end of 2006. The purpose of these plots is to assess the growth response of operational treatments. Therefore the experimental design will be limited to those treatments currently used for road reclamation and control plots.

**Intent #3:** The Detailed Forest Management Plan to provide details of silvicultural tactics to be used to reclaim roads and decking areas in the "Silviculture Strategy Table" provided to Weyerhaeuser on March 12, 2004.

Weyerhaeuser will insure that the table will include the selected tactics. In general, the tactics are as follows:

- ◆ Temporary roads hauled on during non-frozen periods of the year will be de-compacted, and/or rolled back, and planted or seeded where necessary
- ◆ Temporary roads hauled on during frozen periods of the year are rolled back, and planted or seeded where necessary.

Paul Scott  
Forest Management Planner  
Pembina Forestlands  
Edson





**APPENDIX 8-2**

**EDSON FMA  
STAND LEVEL RETENTION  
MONITORING REPORT: 2000 – 2004**





**APPENDIX 8-3**

**STRATA LEVEL SILVICULTURE STRATEGIES FOR THE  
EDSON FMA**







**Appendix 8-3: Silviculture Strategies for the Edson FMA**

Regenerating Stand Objectives				Regenerating Stand Treatments				
Yield Stratum	Species Group	Site Class	Crown Closure	Estimated 10 year Area (Hectares)	Establishment		Maintenance	
					Stand Conditions	Tactics	Stand Conditions	Tactics
1,2,3,4	Conifer Dominated C and CD Lower Foothills	Good	A, B, C, D		<ul style="list-style-type: none"> <li>➤ Spruce and/or pine</li> <li>➤ Moist sites</li> <li>➤ Competitive vegetation</li> </ul>	Site prep and plant conifer Or Straight plant conifer if site prep not possible C (1400-2000 SPH) CD (1000 SPH)	Where conifer crop trees exist and competition is great enough to cause concern that survival or performance may be jeopardized	Tend (herbicide and/or mechanical) stands to release conifer component.  Retain some deciduous component to reflect CD standard and some component of incidental deciduous.
					<ul style="list-style-type: none"> <li>➤ Spruce and/or pine</li> <li>➤ Well drained sites</li> <li>➤ Low competition</li> </ul>	Plant conifer with no site preparation C (1400-2000 SPH) CD (1000 SPH)		
					<ul style="list-style-type: none"> <li>➤ Pine dominated</li> <li>➤ Well drained sites</li> <li>➤ Low competition</li> </ul>	Site preparation for natural seeding (drag)		
5, 6, 7, 8	Conifer Dominated C and CD Lower Foothills	Medium	A, B, C, D		<ul style="list-style-type: none"> <li>➤ Spruce and/or pine</li> <li>➤ Moist sites</li> <li>➤ Competitive vegetation</li> </ul>	Site prep and plant conifer Or Straight plant conifer if site prep not possible C (1400-2000 SPH) CD (1000 SPH)	Where conifer crop trees exist and competition is great enough to cause concern that survival or performance may be jeopardized	Tend (herbicide and/or mechanical) stands to release conifer component.  Retain some deciduous component to reflect CD standard and some component of incidental deciduous.
					<ul style="list-style-type: none"> <li>➤ Spruce and/or pine</li> <li>➤ Well drained sites</li> <li>➤ Low competition</li> </ul>	Plant conifer with no site preparation C (1400-2000 SPH) CD (1000 SPH)		
					<ul style="list-style-type: none"> <li>➤ Pine dominated</li> <li>➤ Well drained sites</li> <li>➤ Low competition</li> </ul>	Site preparation for natural seeding (drag)		



Regenerating Stand Objective				Regenerating Stand Treatments				
Yield Stratum	Species Group	Site Class	Crown Closure	Estimated 10 year Area (Hectares)	Establishment		Maintenance	
					Stand Conditions	Tactics	Stand Conditions	Tactics
9	Conifer Dominated C and CD Lower Foothills	Poor	A, B, C, D,		<ul style="list-style-type: none"> <li>➤ Spruce and/or pine</li> <li>➤ Moist sites</li> <li>➤ Competitive vegetation</li> </ul>	Site prep and plant conifer Or Straight plant conifer if site prep not possible C (1400-2000 SPH) CD (1000 SPH)	Where conifer crop trees exist and competition is great enough to cause concern that survival or performance may be jeopardized	Tend (herbicide and mechanical) stands to release conifer component.  Retain some deciduous component to reflect CD standard and some component of incidental deciduous.
					<ul style="list-style-type: none"> <li>➤ Spruce and/or pine</li> <li>➤ Well drained sites</li> <li>➤ Low competition</li> </ul>	Plant conifer with no site preparation C (1400-2000 SPH) CD (1000 SPH)		
					<ul style="list-style-type: none"> <li>➤ Pine dominated</li> <li>➤ Well drained sites</li> <li>➤ Low competition</li> </ul>	Site preparation for natural seeding (drag)		
10, 11, 12, 13	Conifer Dominated C and CD Upper Foothills	Good	A, B, C, D		<ul style="list-style-type: none"> <li>➤ Spruce and/or pine</li> <li>➤ Moist sites</li> <li>➤ Competitive vegetation</li> </ul>	Site prep and plant conifer Or Straight plant conifer if site prep not possible C (1400-2000 SPH) CD (1000 SPH)	Where conifer crop trees exist and competition is great enough to cause concern that survival or performance may be jeopardized	Tend (herbicide and/or mechanical) stands to release conifer component.  Retain some deciduous component to reflect CD standard and some component of incidental deciduous.
					<ul style="list-style-type: none"> <li>➤ Spruce and/or pine</li> <li>➤ Well drained sites</li> <li>➤ Low competition</li> </ul>	Plant conifer with no site preparation C (1400-2000 SPH) CD (1000 SPH)		
					<ul style="list-style-type: none"> <li>➤ Pine dominated</li> <li>➤ Well drained sites</li> <li>➤ Low competition</li> </ul>	Site preparation for natural seeding (drag)		



Regenerating Stand Objective					Regenerating Stand Treatments			
Yield Stratum	Species Group	Site Class	Crown Closure	Estimated 10 year Area (Hectares)	Establishment		Maintenance	
					Stand Conditions	Tactics	Stand Conditions	Tactics
14, 15, 16, 17	Conifer Dominated C and CD Upper Foothills	Medium	A, B, C, D		➤ Spruce and/or pine	Site prep and plant conifer	Where conifer crop trees exist and competition is great enough to cause concern that survival or performance may be jeopardized	Tend (herbicide and/or mechanical) stands to release conifer component.  Retain some deciduous component to reflect CD standard and some component of incidental deciduous.
					➤ Moist sites	Or		
					➤ Competitive vegetation	Straight plant conifer if site prep not possible C (1400-2000 SPH)		
18	Conifer Dominated C and CD Upper Foothills	Poor	A, B, C, D		➤ Spruce and/or pine	Plant conifer with no site preparation	Where conifer crop trees exist and competition is great enough to cause concern that survival or performance may be jeopardized	Tend (herbicide and mechanical) stands to release conifer component.  Retain some deciduous component to reflect CD standard and some component of incidental deciduous.
					➤ Moist sites	C (1400-2000 SPH)		
					➤ Competitive vegetation	CD (1000 SPH)		
					➤ Spruce and/or pine	Site preparation for natural seeding (drag)		
					➤ Moist sites	Site prep and plant conifer		
					➤ Competitive vegetation	Or		
➤ Spruce and/or pine	Straight plant conifer if site prep not possible C (1400-2000 SPH)	Where conifer crop trees exist and competition is great enough to cause concern that survival or performance may be jeopardized	Tend (herbicide and mechanical) stands to release conifer component.  Retain some deciduous component to reflect CD standard and some component of incidental deciduous.					
➤ Moist sites	CD (1000 SPH)							
➤ Competitive vegetation	Plant conifer with no site preparation C (1400-2000 SPH)							
18	Conifer Dominated C and CD Upper Foothills	Poor	A, B, C, D		➤ Pine dominated	Site preparation for natural seeding (drag)	Where conifer crop trees exist and competition is great enough to cause concern that survival or performance may be jeopardized	Tend (herbicide and mechanical) stands to release conifer component.  Retain some deciduous component to reflect CD standard and some component of incidental deciduous.
					➤ Well drained sites	CD (1000 SPH)		
					➤ Low competition	Site prep and plant conifer		
18	Conifer Dominated C and CD Upper Foothills	Poor	A, B, C, D		➤ Spruce and/or pine	Straight plant conifer if site prep not possible C (1400-2000 SPH)	Where conifer crop trees exist and competition is great enough to cause concern that survival or performance may be jeopardized	Tend (herbicide and mechanical) stands to release conifer component.  Retain some deciduous component to reflect CD standard and some component of incidental deciduous.
					➤ Moist sites	CD (1000 SPH)		
					➤ Competitive vegetation	Plant conifer with no site preparation C (1400-2000 SPH)		
18	Conifer Dominated C and CD Upper Foothills	Poor	A, B, C, D		➤ Pine dominated	Site preparation for natural seeding (drag)	Where conifer crop trees exist and competition is great enough to cause concern that survival or performance may be jeopardized	Tend (herbicide and mechanical) stands to release conifer component.  Retain some deciduous component to reflect CD standard and some component of incidental deciduous.
					➤ Well drained sites	CD (1000 SPH)		
					➤ Low competition	Site prep and plant conifer		



Regenerating Stand Objective					Regenerating Stand Treatments			
Yield Stratum	Species Group	Site Class	Crown Closure	Estimated 10 year Area (Hectares)	Establishment		Maintenance	
					Stand Conditions	Tactics	Stand Conditions	Tactics
22, 23, 24, 25	Deciduous Dominated D and DC Lower Foothills	Good	A, B, C, D		➤ Mixedwood DC	Site prep and plant conifer in selected areas 800 SPH Straight plant conifer in selected areas	Where conifer crop trees exist and competition is great enough to cause concern that survival or performance may be jeopardized	Tend (herbicide and mechanical) stands to release conifer component.  Retain some deciduous component to reflect DC standard where applicable
					➤ Pure D	LFN	None	None
26, 27, 28, 29	Deciduous Dominated D and DC Upper Foothills	Good	A, B, C, D		➤ Mixedwood DC	Site prep and plant conifer in selected areas 800 SPH Straight plant conifer in selected areas	Where conifer crop trees exist and competition is great enough to cause concern that survival or performance may be jeopardized	Tend (herbicide and/or mechanical) stands to release conifer component  Retain some deciduous component to reflect DC standard where applicable.
					➤ Pure D	LFN	None	None
30	Deciduous Dominated D and DC Lower Foothills Upper Foothills	Poor	All classes		➤ Mixedwood DC	Site prep and plant conifer in selected areas 800 SPH Straight plant conifer in selected areas	Where conifer crop trees exist and competition is great enough to cause concern that survival or performance may be jeopardized	Tend (herbicide and mechanical) stands to release conifer component.  Retain some deciduous component to reflect DC standard where applicable..
					➤ Pure D	LFN	None	None



Weyerhaeuser

DFMP 2004-2014  
April 2006

Regenerating Stand Objective				Regenerating Stand Treatments						
Yield Stratum	Species Group	Site Class	Crown Closure	Estimated 10 year Area (Hectares)	Primary Species					
Preharvest Condition				Regenerating Stand Treatments						
Yield Stratum	Inventory Species Group	Site Class	Crown Closure	Estimated 10 year Area (Hectares)	Site Conditions	Tactics	Stand Conditions	Tactics	Maintenance	
In-block Temporary Roads	C, CD, DC or D	Good Medium Poor	A, B, C, D	Approximately 2.8% of all areas included in strata 1 thru 30	➤	Hauled during non-frozen period; Pure C and Mixedwood DC/CD	Decompact and/or roll-back and plant or seed with conifer	1400 SPH	Decompact and/or roll-back and plant or seed with conifer	1400 SPH
					➤	Hauled during frozen period; Pure C and Mixedwood DC/CD	Roll-back and plant or seed with conifer	1400 SPH	Decompact and/or roll-back and plant or seed with conifer	1400 SPH
					➤	Hauled during non-frozen period; pure D	Roll-back and plant or seed with conifer	1400 SPH	Decompact and/or roll-back and plant or seed with conifer	1400 SPH
					➤	Hauled during Frozen period; Pure D	Roll-back and LFN or plant or seed with conifer or deciduous	1400 SPH	Decompact and/or roll-back and plant or seed with conifer	1400 SPH
19, 20, 21* (Switch Stands)	Pure Deciduous Overstorey with Understorey C, CD and DC Switch * Stands Lower Foothills Upper Foothills	Good Medium Poor	B, C, D		➤	Pure C Mixedwood CD and DC	Planned Understorey protection and fill in plant conifer where necessary	Where conifer crop trees exist and competition is great enough to cause concern that survival or performance may be jeopardized	Tend (herbicide and/or mechanical) stands to release conifer component Retain some deciduous component to reflect DC standard where applicable.	
					➤	Spruce Wet sites Competitive vegetation	Site prep and plant spruce or pine	Where conifer crop trees exist and competition is great enough to cause concern that survival or performance may be jeopardized	Tend (herbicide and/or mechanical) stands to release conifer component	
Marginal Stands	Stands with > 70% SB Or stands with < 30% LT	Poor	B, C, D		➤	Spruce Wet or moist sites	Straight plant spruce or pine	Where conifer crop trees exist and competition is great enough to cause concern that survival or performance may be jeopardized	Tend (herbicide and/or mechanical) stands to release conifer component	
					➤					

\* Switch stands area assumed to return to understorey Broad Cover Group (BCG) and 'C' Crown Closure

General Comments to Silviculture Strategies Tables:

1. Conifer species planted currently are Sw and Pl, and
2. Four seed zones cover the FMA. Seed storage amounts for white spruce and Lodgepole Pine are adequate to support reforestation activities for a ten-year period.
3. Crown Closures are assumed to transition all to 'C' density.
4. Site Prep, other than drag, is expected to raise the planting bed (mounding).
5. Reforestation of in-block temporary roads will be consistent with the "Monitoring Protocol for the Establishment and Growth of Trees on Temporary Roads upon the Weyerhaeuser Pembina (Edson and Drayton Valley) FMAs".







## **APPENDIX 8-4**

# **STAND LEVEL ECOLOGICAL GUIDELINES**





## **APPENDIX 8-5**

# **ECOLOGICALLY BASED FOREST MANAGEMENT: THE CONSERVATION OF BIODIVERSITY IN WEYERHAEUSER CANADA FOREST MANAGEMENT AREAS IN ALBERTA, DECEMBER 1997.**





## **APPENDIX 8-6 FOURTH ORDER WATERSHED CALCULATIONS**





## **APPENDIX 8-7**

# **GUIDELINES FOR INTEGRATING TIMBER HARVESTING AND DOMESTIC GRAZING IN THE GREEN AREA, Feb. 2002**







## **APPENDIX 8-8**

# **HARDWOOD TREE IMPROVEMENT FIVE-YEAR PLAN**





---

**Hardwood Tree Improvement Five-Year Plan  
2005 – 2010**

**First draft: Tim Gylander**

**Edited: Bruce Macmillan**

**Submitted: Rick Watson**

**September 2005**

---

**Purpose**

- To address both supply and security of fibre to manufacturing facilities Weyerhaeuser is pursuing a hardwood tree improvement and silviculture program.

---

**Goals, mid term program goals are too:**

- Validate the potential for genetically improved aspen and aspen hybrids plantations.
- Establish business case for deployment on: green zone, white zone government, and white zone private.
- Build capacity to enable operational deployment of improved aspen .

---

**Objectives, in 2010 program will have achieved:**

- Relative genetic ranking of selected genetically improved aspen and preliminary results for aspen hybrids.
- Estimated growth and yield projection for plantations
- Forecast AAC uplift, evaluate deployment scenario options
- Establish 70 ha of aspen plantations on crown land using genetically improved aspen and aspen hybrids



**Milestones,** *in 2010 program will have achieved:*

### **Genetics**

---

#### **Materials:**

- Increase current native selections within breeding region from 264 to 400.
- Work with foreign agencies to acquire 30 sources of exotic material for aspen hybrid breeding.

---

#### **Testing**

- Rank 344 native clones in genetic tests and take top 10% for use in breeding
- Establish progeny tests from successful breeding of top 10% of clonal selections.
- Establish hybrid progeny tests on 3 sites

### **Deployment**

---

#### **Policy**

- Draft Controlled parentage plan to government in 2006, and approved plan by 2010.
- Government will accept our plantations as basis for approving operational deployment of improved material

---

#### **Silviculture**

- Process in place to achieve eighty percent plantation survival at year five.
- Strategies in place to address browse issues.
- Planting stock cost less than sixty cents per tree.
- Process in place to have site preparation and stand maintenance cost within 10% of benchmark.

---

#### **Plantations**

- Starting 2006 establish one 17 ha plantation per year using top 10% tested selections planted as clones
- Link and incorporate growth and yield of plantation into FMA timber supply analysis.
- Identify optimum deployment areas for plantations within FMA