Detailed Forest Management Plan

2004 – 2014

Volume I

Chapter 1: Introduction

Chapter 2: Influences on the Plan

Chapter 3: General Description of the FMA Area

Chapter 4: Weyerhaeuser Forest Management Philosophy and the Planning Process

Chapter 5: Resource Management Goals

Weyerhaeuser Company Ltd.

Edson, Alberta

Foreword

This is Volume I 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

List of Tables

List of Figures

List of Maps

List of Appendices

ACRONYM LIST

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

MAI:	Mean Annual Increment
NIVMA:	Northern Interior Vegetation Management Association
PHA:	Pre-Harvest Assessment
PLFD:	Public Lands and Forests Division
PSP:	Permanent Sample Plot
PNT:	Protective Notation
PTA:	Post-Treatment Assessment
RET:	Rare, Endangered or Threatened
RLTAP:	Rolling Long Term Access Plan
SFM:	Sustainable Forest Management
SHS:	Spatial Harvest Sequence
SRD:	Sustainable Resource Development
SYU:	Sustained Yield Unit
TDA:	Timber Damage Assessment
WESBOGY:	Western Boreal Growth & Yield Co-Op
WeyFAC:	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 in 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 that 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 km2 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 it 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.

F

Fauna: Animal life.

Feature species: Those species that are rare, threatened, endangered or of social valueFine 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: Forestland 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 round wood 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 o 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.

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As with any large undertaking, many different people, representing many different disciplines, organizations, viewpoints, and philosophies have taken part in this planning process.

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- DFMP Lead Planning Team,
- Quota Holder-Community Timber Program DFMP Sub-Group, and
- Weyerhaeuser Forest Advisory Committee.

DFMP Lead Planning Team

The Lead Planning Team was established in the summer of 1997, concurrent with the establishment of FMA#9700035. The Team acted as the main steering body for the development of the 1998 Preliminary Forest Management Plan and the Detailed Forest Management Plan.

Members included:

- Tom Varty, Weyerhaeuser Edson, Forestlands Superintendent
- Paul Scott, Weyerhaeuser Edson, FMA Planner
- Neil Stevens, Weyerhaeuser Edmonton, Timber Supply Analyst
- Mark Messmer, Weyerhaeuser Edmonton, Timber Supply Analyst
- Bruce Macmillan, Weyerhaeuser Edmonton, Silviculture Forester
- Norm Volk, Weyerhaeuser Edmonton, GIS Co-ordinator
- Luigi Morgantini, Weyerhaeuser Edmonton, Forest Ecologist
- John Witham, LFS Yellowhead District, Timber Management Forester
- Jan Ficht, Fish and Wildlife Division, Edson, Biologist
- Margarete Hee, LFS Northern East Slopes Region, Forester-In-Charge
- Stephen Wills, LFS Edmonton, Planning Forester
- Jack Heidt, LFS Edmonton, Regional Resource Analyst, and
- George Sterling, Fish and Wildlife Division, Edson, Regional Fisheries Biologist.

Others participated in the Lead Team Planning Process on a revolving basis. These included:

- Wayne Johnson, LFS North East Slopes Region, Planning Forester
- Darren Tapp, LFS Edmonton, Regional Resource Analyst
- Ian Whitby, Weyerhaeuser Slave Lake, FMA Planner, and
- George Robertson, LFS Northern East Slopes Region, Forester-In-Charge.

Quota Holder/Community Timber Program DFMP Sub-Group

The Sub-Group was established in the spring of 1998.

The purpose of the Sub-Group was two-fold:

1. To provide input and review of the DFMP, and
2. To define the opportunities for input and the products for review.

Members included:

- Tom Varty, Weyerhaeuser Edson, Forestlands Superintendent
- Paul Scott, Weyerhaeuser Edson, FMA Planner
- Neil Stevens, Weyerhaeuser Edmonton, Timber Supply Analyst
- Bruce MacMillan, Weyerhaeuser Edmonton, Silviculture Forester
- John Witham, LFS Yellowhead District, Timber Management Forester
- Jan Ficht, Fish and Wildlife Division, Edson, Biologist
- Margarete Hee, LFS Northern East Slopes Region, Forester-In-Charge
- Stephen Wills, LFS Edmonton, Planning Forester
- Jim McCammon, Alberta Newsprint Company, Woodlands Superintendent
- Daryl D'Amico, Blue Ridge Lumber Inc., Planning Forester
- Jonathan Russell, Millar Western Forest Products Ltd., Chief Forester
- Dave Chaluk, Edson Timber Product Ltd., Operations Manager
- John Nyssen, Edson CTP/ small manufacturers, mill owner
- Erich Ploentzke, Edson CTP/ small loggers, owner/operator
- Brett Foisy, Cold Creek CTP, owner/operator, and
- Kelly Fluet, Edson CTP, EDILA Planning and Operation Forester.

Weyerhaeuser Forest Advisory Committee (WeyFAC)

The Weyerhaeuser Forest Advisory Committee was established in the spring of 1998 to provide organized and regular input into Weyerhaeuser's forest planning and operations. The group was made up of individuals and organizations representing a broad spectrum of forest dependent interests.

Members included:

- Andy Stanton, Yellowhead County
- Mal Goldie, Town of Edson
- Arlan Delisle, Town of Edson (past member)
- Margaret Kidner, Alberta Trappers Association
- Erich Ploentzke, Alberta Trappers Association (past member)
- Rob Jolly, Education
- Donna Heine, Education (past member)
- Diana Bainbridge, Education Alternate (past member)
- Marshall Hoke, Recreation
- Ron Christie, Oil and Gas
- Lee Davis, Grazing
- Dave Chaluk, Quota Holder
- John Nyssen, Edson CTP
- Laurie Camps, Cold Creek CTP
- Dan Berry, Weyerhaeuser OSB Mill Employees
- Rick Gardiner, Weyerhaeuser OSB Mill Employees (past member)
- Jerry de Winter, Youth (past member)
- Cindy Sarin, Youth (past member)
- Liz Jankovic, Youth (past member)
- Carl Hunt, Trout Unlimited
- Wim and Jeannette Visser, Edson and District Oldtimers (past members)
- Lyle Benson, Facilitator, and
- John Witham, Land and Forest Division.

Weyerhaeuser also contracted out portions of the development and data collection processes to the following companies:

- Silvacom Ltd.
- Timberline Forest Inventory Consultants
- GISmo Solutions
- West Sky Resources
- P. Atfield Consulting
- Alpha Wildlife Research and Management Ltd.
- The Tree Tracker Ltd.
- Silkstone Environmental
- Geographic Dynamics Corporation
- Canyon Resources Ltd., and
- Aspen Ecological Consulting.

Post-2001 Plan Submission to Final Submission 2005

In the spring of 2002, SRD formally responded to the 2001 DFMP submission. Since that time, the following individuals have also been involved in updating and reviewing the revised submission of the Edson DFMP:

- Glenn Buckmaster, MSC, Senior Resource Analyst, (1053877 Alberta Limited)
- Greg Behuniak, Weyerhaeuser Alberta
- Rick Watson, Weyerhaeuser Alberta
- Pat Wearmouth, Weyerhaeuser Alberta
- Wendy Crosina, Weyerhaeuser Alberta
- Geoff Clarke, Timberline Forest Inventory Consultants
- Janis Braze, Timberline Forest Inventory Consultants
- Chris Hampel, Timberline Forest Inventory Consultants
- Steve Reed, Silvacom Ltd.
- Brad Kilgour, Weyerhaeuser Pembina
- Fulton Smyl, Weyerhaeuser Pembina
- Heather Schneider, Weyerhaeuser Pembina
- Dave Swindlehurst, Weyerhaeuser Pembina
- Kerri MacKay, Weyerhaeuser Pembina
- Tim Burns, Blue Ridge Lumber Inc.
- Brian Davies, Blue Ridge Lumber Inc.
- Greg Branton, Alberta Newsprint Company
- John Giezen, Cold Creek Community Timber Program
- Dave Cobb, EDFOR
- Kevin Vander Haeghe, SRD Edson
- Beverly Wilson, SRD Edmonton
- Darren Aitkin, SRD Edmonton,
- Grant Klappstein, SRD Edmonton
- Debbi Chapman, Foothills Forestry Consulting Ltd.

Special acknowledgement goes to Michelle Andersen, with The Tree Tracker Limited, whose undertaking of the editing and printing of the multitude of draft versions was beyond the call of duty.

Paul Scott
Forest Management Planner
Weyerhaeuser, Alberta
RPF # 398

Executive Summary

This Detailed Forest Management Plan (DFMP) has been developed for the Forest Management Agreement (FMA) Area for FMA # 9700035, and as well for most grazing dispositions (i.e. grazing permits, licenses and leases but excluding Grazing Reserves) imbedded within the boundary of the FMA and covered by Deciduous Timber Allocation DTA E910001. This area comprises four Forest Management Units: E1, E2, W5 and W6.

The DFMP utilizes a comprehensive and detailed land and vegetation inventory (Alberta Vegetation Inventory) updated to the summer of 2004. The FMA Area straddles the Lower Foothills and Upper Foothills natural sub-regions. Elevation ranges from approximately 900 metres in the southeast to approximately 1500 metres at the north end of the FMA. A predictive ecosite classification of the FMA Area was completed in summer 1999.

The Gross FMA Area (includes the legally defined FMA area and the non-FMA overlapping grazing dispositions, Parks, etc.) is approximately 510,000 hectares. About 55% of the total area has been classified as productive landbase for the purposes of timber supply. Forest growing stock is approximately 40% deciduous and 60% coniferous. Deciduous and mixedwood forests predominate in the eastern parts of the FMA Area, and coniferous forest in the western and southwestern portions of the FMA.

Prior to approval to this plan, operators have taken direction from the approved 1998 Preliminary Forest Management Plan.

The term of this plan is from May 1st, 2004 to June 30th, 2014. The approved Annual Allowable Cut becomes effective as of May 1st, 2006. The timber operating year is defined as May 1st to April 30th.

A team of Weyerhaeuser resource managers participated in the development of this Plan, with active participation by Alberta Sustainable Resource Development (PFLD and F&W). A timber operator sub-group, including all quota holders and CTP groups, also actively participated in the development of the timber supply section of the plan and provided input into the remainder of the plan as it was developed.

Throughout the development of the DFMP, Weyerhaeuser followed the Public Involvement Plan for FMA 9700035 (approved June 2nd, 1998; updated October 15th, 2001). The Public Involvement Plan consisted of three distinct phases. Phase One was designed to facilitate input and reviews towards the establishment of the DFMP goals. Phase Two facilitated the input and review towards the development of specific objectives and strategies that best met the intent of the DFMP Goals. The third and final phase of the Public Involvement Plan involves ongoing consultation regarding operational activities with stakeholders and members of the public after the DFMP has received approval and implementation has begun. Weyerhaeuser's ongoing Forest Advisory Committee (WeyFAC) has been involved extensively in the public involvement process during the development of the DFMP.

The DFMP text (including appendices and maps) includes three volumes, with a total of 10 chapters.

Volume I

Chapter 1 – Introduction giving a brief overview of the FMA Agreement and DFMP development.

Chapter 2 – Influencing documents used in the development of the DFMP.

Chapter 3 - General Description of the FMA and surrounding area: provides a comprehensive description of all physical aspects of the FMA and the surrounding areas included in the SYU. This includes:

- physical features (ecological information, elevation, topography, soils);
- landscape patterns (age class distribution, forest types, patch sizes);
- fish and wildlife;
- water;
- historical resources;
- anthropogenic uses; and
- forestry manufacturing facilities.

Chapter 4 – Forest Management Philosophy and the Planning Process: provides a review of Weyerhaeuser corporate hierarchy and company management philosophy, including vision, values, policy and principles.

Chapter 5 – Forest Management Goals: Includes a short review of previous Forest Management Plans and the Preliminary Forest Management Plan approved on February 1, 1999. Describes the values and issues identified during the early stages of plan development.

A total of eight goals were derived reflecting the values identified. These goals are:

1. Fibre Supply: Ensure the Weyerhaeuser's Edson and Drayton Valley facilities remain globally competitive with respect to fibre supply from the FMA area while recognizing the other facilities share similar desires.
2. Forest Diversity: Maintain forest diversity at the stand and landscape level in terms of structure, composition, and function.
3. Ecosystem Capacity: Maintain the productive capacity of the forest ecosystem.
4. Watersheds: Maintain the process and function of watersheds.
5. Public Accountability: Improve public acceptance of forest management activities.
6. Resource Integration: Integrate forest management activities with the needs of other resource users.
7. Unique Sites: Protect unique archeological and ecological sites.
8. Increasing the Timber Supply: Increase the sustainable harvest level of deciduous and coniferous timber.

Volume II

Chapter 6 – Timber Supply Analysis: provides a comprehensive review of the determination of the net productive landbase, the development of yield curves, the calculation of Annual Allowable Cuts (AACs), and the spatial harvest sequence for FMA #9700035, as well as associated AACs to be applied to DTAs, CTQs and CTPs.

Volume III

Chapter 7 – Forest Management Objectives and Strategies: Outlines the corresponding objectives, strategies and tactics to meet the goals described in Chapter 5.

Chapter 8 – Implementation Plan: Selected strategies are expanded upon to better describe how the approved DFMP will be implemented throughout its term.

Chapter 9 – Monitoring: Description of the annual and stewardship reports. All objectives have been assigned an indicator with an associated variable.

Chapter 10 – Future Considerations: Reviews selected opportunities that will be reviewed with future DFMPs in mind.

The proposed Annual Allowable Cut levels for the entire DFMP Unit are: 384,494 m3/year of coniferous and 316,334 m3/year of deciduous (Table E- 1). These harvest levels would be divided between Weyerhaeuser and the different timber operators, as outlined in Table E-2.

Table E- 1 Proposed Harvest Levels

FMU	Coniferous Landbase			
	(Periods 1 and 2)		(Periods 3 and 4)	
	Primary Conifer Vol (m^3/yr)	Incidental Decid Vol (m^3/yr)	Primary Conifer Vol (m^3/yr)	Incidental Decid Vol (m^3/yr)
E1	65,749	12,357	65,749	12,431
E2	39,685	6,842	39,685	9,086
W5	22,351	11,441	22,351	10,970
W6	164,392	61,682	164,392	54,447
FMA	**292,177**	**92,322**	**292,177**	**86,934**
FMU	**Deciduous Landbase**			
	(Periods 1 and 2)		**(Periods 3 and 4)**	
	Primary Decid Vol (m^3/yr)	**Incidental Conifer Vol (m^3/yr)**	**Primary Decid Vol (m^3/yr)**	**Incidental Conifer Vol (m^3/yr)**
E1	23,520	21,853	23,520	17,655
E2	79,791	36,967	79,791	35,669
W5	38,066	7,895	38,066	8,206
W6	82,634	25,602	82,634	19,939
FMA	**224,012**	**92,317**	**224,012**	**81,468**

* Cull: 3% for coniferous, 7% for deciduous Stand retention: 3% for E2, W5, W6; 8% for E1

† Period 1 includes carry-over/overcut volumes. For W6 only the coniferous landbase volumes for periods 1 and 4 represent and additional 10% surge cut.

Table E-2 Allocation of Volume by Forest Operator

FMA		Volume (m3/yr) Periods 1 and 2	
		Coniferous	Deciduous
Company		Total	Total
Weyerhaeuser		154,651	251,231
Cold Creek TL		10,000	0
E2 MTU		885	1,500
W5 MTU		30,246	15,441
W6 MTU/CTP		18,252	17,591
ANC		70,919	0
Blue Ridge		31,021	0
EDFOR		62,457	0
ETP		3,090	0
Millar Western		1,151	0
	Sub-Total	**382,672**	**285,763**

Non-FMA	Coniferous	Deciduous
Company	Total	Total
Weyerhaeuser	1,823	30,571
Sub-Total	**1,823**	**30,571**

Total	**384,494**	**316,334**

1 INTRODUCTION

The Province of Alberta and Weyerhaeuser Company Limited signed Forest Management Agreement (FMA) # 9700035 (Appendix 1-1) on June 11th, 1997, with a commencement date of July 1st, 1997. The FMA gives Weyerhaeuser *"the right to establish, grow, harvest and remove timber thereon on a perpetual sustained yield basis"*.[1] Previous to this agreement, Weyerhaeuser operated in the Edson area under the quota tenure system.

As part of the agreement, Weyerhaeuser was required to prepare a Preliminary Forest Management Plan (PFMP). The PFMP provided direction for harvesting and reforestation activities on the FMA for an interim period until a Detailed Forest Management Plan (DFMP) was approved and implemented. The PFMP was submitted in June of 1998, and approved by the Province on February 1st of 1999.

The Edson facilities commenced operations in October of 1983. Originally owned by Pelican Spruce Mill Ltd., the complex, which manufactures oriented strand board (OSB), was purchased by Weyerhaeuser in the fall of 1988. Annual production at the mill averages 415 million square feet (3/8 inch basis) of oriented strand board (OSB). Wood volume deliveries are approximately 568,000 m3 per annum. Eighty percent of the delivered volume is trembling aspen, with the remainder being balsam poplar (18%), white birch (1%) and small-diameter lodgepole pine (1%).

Pembina (Edson and Drayton Valley) Forestlands also directs a majority of the coniferous timber and a small percentage of the deciduous volume it harvests from FMA 9700035 and Deciduous Timber Allocation DTAW130001 (within Millar Western's FMA) to the Weyerhaeuser sawmill and OSB facilities in Drayton Valley, Alberta.

The development of this plan has occurred using a planning team approach. This team is made up of individuals from Weyerhaeuser's Edmonton Forestlands, Weyerhaeuser's Pembina Forestlands, the Yellowhead District of the PLFD, the Edson District of the Alberta Fish and Wildlife Division, the North Eastern Slopes Region in Whitecourt and the Forest Management Division in Edmonton (see acknowledgements).

The Province has reserved timber rights for Quota Holders and individuals accessing timber through the Community Timber Program (CTP). The Quota Holders and the CTP groups were active participants in the development and review of this DFMP with the establishment of the Quota Holder and CTP Sub-Group as of April 1998. The Terms of Reference for the Sub-Group can be found in Appendix 1-2. Appendix 1-3 documents the meetings held under the mandate of this group.

Several issues appeared during the development of the DFMP. Issues and divergence of opinions were resolved using the conflict resolution process as defined in the Sub-Group Terms of Reference. The documentation for these issues can be found in Appendix 1-4.

[1] Forest Management Agreement Order-In Council 257/97

The Public is involved in the development of forest management plans. Weyerhaeuser has accomplished this through the implementation of the Public Involvement Plan (PIP). The Weyerhaeuser Forest Advisory Committee (WeyFAC) is a major component of the public involvement strategy as outlined in the PIP. Components of the DFMP were reviewed with the group to receive feedback and input. Appendix 1-5 provides an example of the type of annual report produced for the group.

The three Quota Holders (Alberta Newsprint Company (ANC), Blue Ridge Lumber (BRL) and Millar Western (MWI)) in FMU W6 implemented their own review of the Timber Supply in 2002. Documents from this review can be found in Appendix 1-6. Based on the review, Alberta Sustainable Resource Development (ASRD) provided specific direction to Weyerhaeuser to incorporate several timber supply protocols in the current DFMP.

2 INFLUENCES ON THE PLAN

There are many influences that provide direction for forest management in the Province of Alberta. These influences can be divided into three main categories: legislative, policy and the public.

Legislative documents carry the weight of either Provincial or Federal elected officials, while policy documents provide direction for management and operations.

Some documents have a lasting legacy, such as the Forests Act, the Federal Fisheries Act, A Policy for Resource Management of the Eastern Slopes, and the Coal Branch Sub-Regional Integrated Resource Plan. Others are continuously evolving, such as the Timber Management Regulations, Alberta Timber Harvest Planning and Operating Ground Rules, the Forest Management Planning Manual, and internal Company documents.

2.1 Legislative Influences

2.1.1 Forests Act

The Forests Act of Alberta directs the management of the timber resources of the Province.

The Act provides the Lieutenant Governor-in-Council with the opportunity to create regulations governing the following:

- the control and issuance of timber dispositions,
- the establishment of Crown charges,
- reforestation and afforestation, and
- the management and use of forest land.

The Act also gives the Minister the right to make regulations that govern logging methods and wood utilization standards. Through the regulations, the Minister can divide land into Forest Management Units, and determine annual allowable cut levels within each unit. The Minister may also dispose of Crown timber by means identified in the Timber Management Regulation, and cancel or suspend a Forest Management Agreement.

2.1.2 Timber Management Regulation

The Timber Management Regulation, as directed by the Forests Act, governs the following:

- the determination of annual allowable cuts (AAC) for Quota certificates,
- the allowance for the harvest of incidental tree species,

- the prescription of Crown Dues for all forest products,
- the submission of fly-over photography for all cut-over land within the FMA, and
- the reforestation standards.

2.1.3 Forest Management Agreement

The Forest Management Agreement is an agreement between the Province of Alberta and Weyerhaeuser. The main features of the Agreement are:

- to recognize Weyerhaeuser's need for continuous operation of plant site facilities and to provide for a perpetual sustained yield of timber for such operations,
- to define three (3) volume supply areas,
- to allow the company the right to establish, grow, harvest and remove timber on the Forest Management Agreement (FMA) area,
- to reserve the rights of the Crown for others to travel, hunt, trap, graze, fish and otherwise use the land,
- to direct Weyerhaeuser to follow sound forest practices including landscape elements for the purpose of achieving and maintaining a perpetual sustained timber yield,
- to direct the company to seek public input into all FM plans as well as review by Quota holders,

- to direct the scheduling of areas available for harvest by licensees and permittees,
- to undertake forest inventories to AVI standards,
- to implement a growth and yield program,
- to operate in accordance with the established ground rules,
- to account for incidental coniferous and deciduous growing stock, and ensure that these components are being sustained, and
- to implement an intensive silviculture program to increase the AAC.

2.1.4 Quota Certificates and Deciduous Timber Allocations

Quota certificates confer rights to a percent of the conifer AAC in an FMU while Deciduous Timber Allocation's confer the rights to a volume of deciduous AAC in an FMU, or is an area based AAC within an FMU. Both certificates recognize the percent of Forest Management Unit AAC that has been allocated to the Company. Additional conditions also apply:

- utilization standards,
- species chargeability,
- wood chip direction,
- quadrant volumes, and
- manufacturing facilities.

2.1.5 Forest and Prairie Protection Act (Part I and II) and Regulations

The Forest and Prairie Protection Act and the Regulations set about to protect the forest resource from fires, insects and diseases. The Act and the Regulations prescribe the following:

- the opportunity to close the forest to public entry where fire danger warrants,
- the requirement for fire control plans with required equipment,
- the ability to address prevention and control of injurious forest tree pest infestations, and
- the requirement for slash hazard reduction.

2.1.6 Federal Navigable Waters Protection Act

This Federal Act administers waterways that are navigable within Canada, and describes processes for maintenance of navigable waterways.

2.1.7 Federal Fisheries Act

This act regulates fisheries. The primary objective affecting forest management areas in this act is to control deleterious substances from entering fish bearing watercourses.

2.1.8 Historical Resources Act of Alberta

This act governs the archeological, historical and palaeontological resources of Alberta.

2.2 Policy Influences

2.2.1 A Policy for Resource Management of the Eastern Slopes — Revised 1984

This document outlines management goals and objectives for the Eastern Slopes Region of Alberta. It focuses on the following: watershed management, wildlife, fisheries, recreation, timber, rangeland, agriculture, tourism, mineral resources, and cultural and ecological resources. Management guidelines place the highest priority on watershed management, as well as stressing the integration of users on the landscape for the benefit of present and future Albertan's. Regional land use zones that require particular attention such as protection, resource management, and development are identified. Refer to Map 2-1 for Eastern Slopes Integrated Plan Zonation.

2.2.2 Coal Branch Sub-Regional Integrated Resource Plan (IRP)

The Coal Branch IRP covers the west half of FMU E2 and all of E1. The plan is to be used as a guide for resource managers who operate in the area. Three of eight land use zones are contained within the FMA: multiple use, general recreation, and critical wildlife.

The primary intent of the IRP is "to achieve long-term, continuous, social and economic benefits by providing for the optimal use of all available resources, while maintaining the overall integrity of the natural environment and the high aesthetic value of the area".

The Coal Branch Plan includes two Resource Management Areas (RMAs) within the Edson FMA. They are:

1. The Yellowhead Corridor RMA
2. The Edson - South Pembina RMA

These RMAs have more specific objectives and guidelines than those for the entire Coal Branch IRP.

2.2.3 Alberta Forest Legacy: Implementation Framework for Sustainable Forest Management

This document outlines the expectations of Albertans for the present and future economic, social and environment benefits to be derived from the forest resources of Alberta. Sustainable development, incorporating an adaptive approach to forest management, is the primary goal.

Four management intensities that strive to meet economic, ecological and social needs include:

1. extensive or multiple use,
2. heritage (Special Places 2000),
3. facility (recreational, industrial, or community), and
4. enhanced (intensive).

The social options will be pursued through the participation of the public in resource management planning, by annual stewardship reporting, and by incorporating adaptive forest management.

2.2.4 Special Places 2000: Alberta's Natural Heritage

This document outlines the Special Places 2000 program. The four goals of Special Places 2000 are:

1. preservation,
2. outdoor recreation,
3. heritage appreciation, and
4. tourism and economic development.

Map 2-1 Eastern Slopes Integrated Plan

The Alberta government is committed to honouring current tenure holders, with issues being addressed through the management planning process.

2.2.5 Watershed Management in the Paddle River Headwaters

This report outlines management criteria for the headwaters of the Paddle River. The primary reason for the guidelines is to help alleviate seasonal flooding of the Paddle River flood plains area.

The headwaters area is classified into three zones: 1) Critical; 2) marginally critical; and 3) non-critical. Timber management guidelines are most stringent in the critical zone (winter operations only, 2/3 of forest must be greater than 20 years old). Provincial ground rules are followed in the non-critical and marginally critical zones.

2.2.6 Status of Alberta Wildlife

This document has two primary purposes:

1. To act as a baseline reference for prioritizing management programs for wildlife species and their habitats.
2. Documenting the current status of wildlife species in Alberta.

2.2.7 Ecologically Based Forest Management: The Conservation of Biodiversity in Weyerhaeuser Canada Forest Management Areas in Alberta

Weyerhaeuser's management practices follow three guiding principles:

1. Maintain landscape diversity and stand structure within the range of natural variability;
2. Conserve habitat for threatened and endangered plant and wildlife species; and
3. Allow for integration of societal needs and expectations.

2.2.8 Canadian Biodiversity Strategy

The Strategy states five goals:

- conserve biodiversity and use biological resources in a sustainable manner,
- improve our understanding of the need to conserve biodiversity and use biological resources in a sustainable manner,
- promote an understanding of the need to conserve biodiversity and use biological resources in a sustainable manner,
- maintain or develop incentives and legislation that support the conservation of biodiversity and the sustainable use of biological resources, and
- work with other countries to conserve biodiversity, use biological resources in a sustainable manner and share equitably the benefits that arise from the utilization of genetic resources.

2.2.9 Weyerhaeuser Internal Documents

Weyerhaeuser has published a number of documents that outline the company's pursuit of excellence in forest policy, the environment, and forest stewardship.

These include, but are not limited to, the following:

- Policy on the Environment,
- Best Management Practices,
- Our Reputation: A Shared Responsibility,
- Weyerhaeuser Core policies, and
- Balance and the Environment.

2.2.10 Alberta Timber Harvest Planning and Operating Ground Rules — 1994

The intent of the Ground Rules is to provide direction to timber operators and to staff of Alberta Sustainable Resource Development regarding planning, operations, implementation, and monitoring of timber operations on Crown land in Alberta. This document arises from negotiations between timber operators and Alberta Sustainable Resource Development, and is normally revised every five years or as Forest Management Plans are updated.

2.2.11 Weyerhaeuser Edson Ground Rules 2002

The intent of the Ground Rules is to provide direction to timber operators and to staff of Alberta Sustainable Resource Development regarding planning, operations, implementation, and monitoring of timber operations on Crown land in Alberta. This document was the result of negotiation between Timber Operators and ASRD resulting in the 2002 Yellowhead Core Ground Rules, from which this document takes direction.

2.2.12 Interim Forest Management Planning Manual — April 1998

The Planning Manual acts as a general guide for long-term forest management planning. It outlines the requirements for the Preliminary Forest Management Plan, the Terms of Reference for the development of the Detailed Forest Management Plan, the Public Involvement Plan, and the Detailed Forest Management Plan. It directs the development of an implementation strategy, as well as requirements for performance monitoring and stewardship reporting.

2.2.13 Alberta Forest Planning Manual – Consultation Draft, February 2004

This manual and the associated annexes and interpretive bulletins comprise the upcoming standard for preparing and implementing future Forest Management Plans in Alberta. The manual is currently being reviewed (September 2004) by the Alberta Forest Products Association (AFPA) and other Forest Industry operators prior to full implementation. Components of the manual are being included in this plan at the direction of ASRD.

2.2.14 Forest Management in Alberta: Response to the Report of the Expert Review Panel

The report outlines the responses of the Alberta Government to the panel of Forest Management experts in relation to the following topics:

- integration,
- public involvement,
- Forest Conservation Strategy,
- planning,
- protected areas,
- timber management,
- reforestation and silviculture,
- inventory, information and research, and
- staffing, funding and department organization.

2.2.15 CAN/CSA Z-808-96, A Sustainable Forest Management System: Guidance Document

This document provides the framework for designing and implementing a voluntary system to promote sustainable forest management of defined forest areas in Canada.

The following items are outlined:

- values,
- criteria and critical elements,
- goals and indicators,
- objectives, and
- forest practices.

2.2.16 CAN/CSA Z-809-96, A Sustainable Forest Management System: Specifications Document

This document describes the Canadian Council of Forest Ministers (CCFM) criteria and critical elements that define sustainable forest management in a National context, and details the Sustainable Forest Management System requirements.

2.2.17 Sustainable Forest Management Plan

This document was developed by Weyerhaeuser in 2003 to meet one of the requirements of the CSA Sustainable Forest Management System – Standard CAN/CSA-Z809-96. The plan was developed based on a public consultation process and is applicable to the Edson Defined Forest Area, or the legal interpretation of area defined under FMA # 9700035.

2.2.18 Canada Forest Accord

The Accord outlines the beliefs, visions and commitments to sustainable forest. Signatories to the accord include the Government of Canada, Alberta and the remaining Provinces and Territories of Canada, and representatives of the Canadian forest community. The Accord outlines the goal for sustainable forests, which is "to maintain and enhance the long-term health of our forest ecosystems, for the benefit of all living things both nationally and globally, while providing environmental, economic, social and cultural opportunities for the benefit of present and future generations".

2.2.19 National Forest Strategy 1988-2003: Sustainable Forests, A Canadian Commitment

The National Forest Strategy outlines the beliefs, visions and goals for sustainable forests across Canada. Strategic priorities are identified for a five-year period commencing in 1998. These priorities will guide policy and actions of the forest community within Canada through to the year 2003.

Nine strategic directions are indicated:

1. Forest ecosystems: Multiple values
2. Forest management: Practicing stewardship
3. Public Participation: Many voices
4. The Forest Industry: A global competitor
5. Forest Science and Technology Management: A team approach
6. Communities and the Workforce: Living with change
7. Aboriginal Peoples: Issues of relationship
8. Private Woodlands: A growing opportunity
9. The Global View: Canada on stage

2.2.20 Forest Soil Conservation: Alberta Forest Products Association/Land and Forest Service Task Force Report

The report acts as a guideline and working tool for both industry and government personnel. It is used to assist in planning and making field assessments and to guide operational decisions that address potential impacts on forest soils.

2.2.21 Alberta's Commitment to Sustainable Resource and Environmental Management

This report outlines the vision of the Provincial Government regarding the sustainability of Alberta's resources and the natural environment. The visions include:

- A shared vision that clearly sets out Albertan's' expectations and goals for a sustainable future,
- Clear and detailed messages or direction for the public, industry and government as to how Alberta's resources are to be managed and protected,
- A clear and understanding decision-making process that ensures that decisions are fair, informed and made in a timely manner, and

- Legislation and policy that reflects modern approaches, including firm but fair enforcement mechanisms, and that are regularly reviewed and revised to ensure that they are effective and efficient.

2.2.22 Canadian Council of Forest Ministers' Defining Sustainable Forest Management: A Canadian Approach to Criteria and Indicators — 1995

The document outlines the process and commitments made in the National Forest Strategy. A series of 6 criteria and a number of indicators have been established. The criteria and indicators are intended to:

- Describe forest management and to provide measurement for it,
- Provide direction for conservation, management and the sustainable use of the forests,
- Provide clear direction in terms of certification, and
- Develop common terms of sustainability.

2.3 Quota Holder and Community Timber Permit Program Influences

In the early summer of 1996, the W6 Working group was established to facilitate the review and approval of a new AAC for FMU W6. All affected timber operators, including the Quota Holders and the CTP group, along with ASRD, were involved in the discussions. Over the next 16 months the group met approximately 15 times. In October of 1997, SRD indicated that the group would be disbanded, and the AAC would remain as previously calculated in 1986 draft FMU W6 Forest Management Plan. ASRD was going to begin a process to "carry out an independent AAC determination and verification process for W6" (Henderson, Oct. 30, 1997).

In 1998, Weyerhaeuser established a group of interested timber operators to be involved in the review of the timber supply analysis as it was developed. During the original plan development (April 1998 - June 2001), a total of 26 meetings were held among participants.

Several post-submission meetings occurred to review of the W6 alternative strategies proposed by the W6 Quota Holders and the Forestry Corp. Based on the analysis completed by the Forestry Corp, six additional strategies were proposed by the Quota Holders, of which SRD accepted four. In a letter dated June 12th 2002, SRD requested that Weyerhaeuser incorporate the selected four strategies within a revised timber supply analysis.

In August of 2003, Weyerhaeuser commenced the timber supply analysis once again. Between March 2004 and December 2005, at least nine meetings were held with all or some of the timber operators on the FMA regarding the new timber supply analysis. The new timber supply analysis took much of what was agreed to in the original analysis, and included the new strategies as directed by SRD. The final preferred scenario was shared with them on November 14th, 2005.

2.4 Public Involvement

The influence of the public upon the planning process occurs on a continuing basis. Input has occurred in varying degrees through a variety of processes.

Weyerhaeuser has a Public Involvement Plan (PIP) that has been updated and approved by the Regional Director of Public Lands and Forests Division for the Foothills Area of Alberta Sustainable Resource Development. The goal of the public involvement process is to solicit public review and input into Weyerhaeuser's forest management plans.

The objectives of the Public Involvement Plan are:

- To involve the public in a review of the Detailed Forest Management Plan,
- To identify current values and related issues that are associated with the forest land base of the FMA,
- To incorporate public input into the planning process, and
- To commit to an ongoing public involvement process in the development of Weyerhaeuser's forest management plans as a means of improving the management of Alberta's forests for the benefit of the people of Alberta.

A major component of the PIP is the involvement of the Weyerhaeuser Forest Advisory Committee (WeyFAC), a local advisory group established in the spring of 1998. The FAC provided comments to the plan throughout it's development. Appendix 2-1 provides documents relating to their input.

3 GENERAL DESCRIPTION OF THE FMA AND AREA

The total area of FMA # 9700035 is 509,122 hectares (Map 3-1). Areas that are excluded for timber supply analysis purposes include the following:

- Lands that are covered by grazing dispositions that were issued or in-process prior to the establishment of the FMA - Weyerhaeuser manages these areas for their deciduous timber through a Deciduous Timber Allocation (DTA E910001). The coniferous timber is managed through Coniferous Timber Quotas (CTQs) or Commercial Timber Permits held by a number of other companies or individuals.
- Special Places – there are three areas within or adjacent to the FMA that have been approved under the Special Places designation. These include Sundance Valley, Obed Lake and Fickle Lake.

The FMA is bordered on three sides by four (4) different FMAs (Figure 3-1). To the north, FMU W13 is managed by Millar Western Forest Products Ltd., whose facilities in Whitecourt produce pulp and dimension lumber. To the west, FMUs E3N and E4N are managed by West Fraser Timber Ltd., whose facilities in Hinton produce pulp and dimension lumber. To the southwest, FMU E1N is managed by Sundance Forest Products Ltd., whose facilities produce both lumber and value-added products. Finally, to the south, FMU R4 is managed by Weyerhaeuser, Drayton Valley Division, whose facilities manufacture oriented strand board (OSB) and dimension lumber.

The FMA is divided into geographically distinct areas as follows:

- Part of Forest Management Unit E2 is west of Edson. This western portion of E2 has been traditionally known by its Miscellaneous Timber Unit (MTU) title, “Medicine Lodge”.
- Part of Forest Management Unit E2, north of Edson, is traditionally known as “Grande Prairie Trail” and “Tom Hill Tower”.
- All of Forest Management Units E1, W6 and parts of E2 and W5, to the south and east of Edson, form one contiguous area divided by Wolf Lake Road, and
- Most of Forest Management Unit W5, is located to the northeast of Edson and north of Niton Junction.

These four areas are physically separated by two White Area Forest Management Units, E01 and W01. These management units integrate land that is privately owned with land that is owned by the Crown. The primary use for Crown land within the White Area is cattle grazing, with timber production being secondary. E01 and W01 do not currently have annual allowable cuts assigned. Timber production is generally confined to smaller own-use permits issued by the PLFD, or to larger permits sold through an auction process.

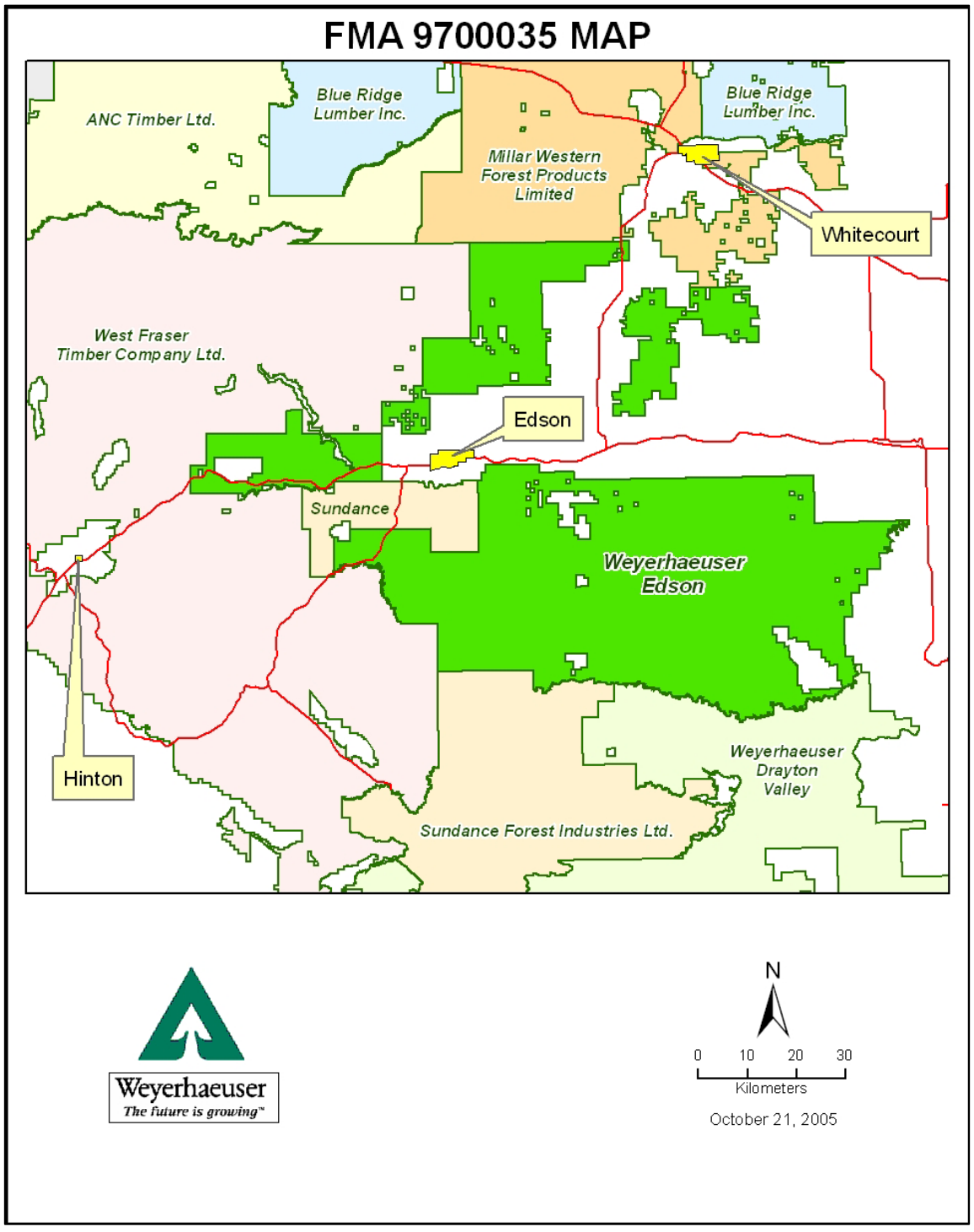

Figure 3-1 FMAs in North Central Alberta

Map 3-1 FMU E1, E2, W5 and W6 Base Features

The FMA can generally be thought of as having two distinct environments: a physical environment dominated by natural process, and a social environment dominated by human activity.

3.1 Physical Environment

3.1.1 Natural Regions

The FMA area lies within the Foothills natural region of west-central Alberta. Both sub-regions, the Lower and Upper foothills, are represented, with the Lower Foothills predominately covering the area. The Upper Foothills can be found at the extreme north end of the FMA adjacent to the Millar Western Forest Products FMA, and at the extreme southwest corner adjacent to the Sundance Forest Industry FMA.

Alberta is currently redefining the Natural Subregion boundaries, with a report expected to be completed in late 2005.

3.1.2 Climate

The climate within the area of the FMA is considered to be sub-humid continental, with long cold winters followed by moderately mild summers. The mean annual precipitation is roughly 47 centimetres, of which approximately 75% falls in the summer months as rain. There are approximately 76 frost-free days. The western and northern portions of the FMA are generally cooler in the summer months and warmer in the winter months than the eastern and southern portions. This may be a result of the generally higher elevations in the west and north, and the effect of winter Chinooks that pass through the region.

3.1.3 Physiography

The FMA lies within the Interior Plains Region, situated just east of the Western Cordillera Region. The Interior Plains is further divided into two divisions: the Alberta Plains and the Alberta Plateau Benchlands (Figure 3-2).

The Alberta Plains Division is generally found below the 900-metre mark Above Sea Level (ASL). The bedrock surface is comprised of very gently tilted Mesozoic and Tertiary strata. It is overlaid with varying thickness of glacial deposits, including ground moraine, lacustrine deposits and dunes.

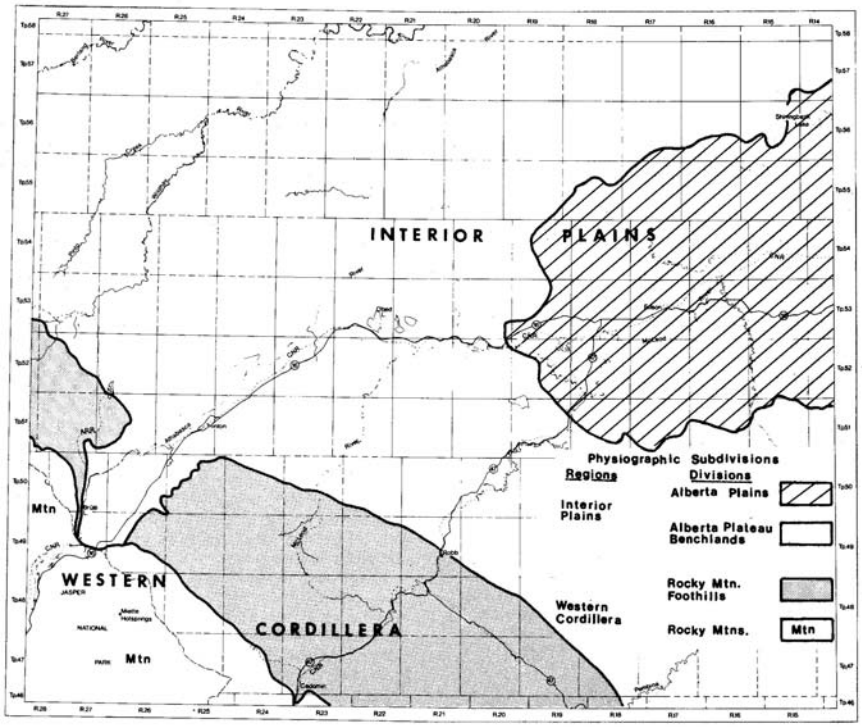

Figure 3-2 Physiographic Regions of West-Central Alberta (Source: Soil Survey, Hinton-Edson Area, Page 13)

The Alberta Plateau Benchland Division is generally found between the 900 - 1300 metre mark ASL, with some hills approaching the 1500 metre level (See Map 3-2). It is underlaid by very gently dipping Cretaceous and Tertiary strata.

3.1.4 Geology

The bedrock of the area is of the Paskapoo Formation from the Palaeocene age (60-65 million years old). It consists of weakly consolidated beds of sandstone and siltstone with interbedded strata of shale, coal, and chert conglomerate.

The entire area was covered by glaciers. These glaciers originated from either the east as Continental glaciers, or from the west as Cordillera glaciers. The principal deposits from these glaciers included till, lacustrine sediment, and glaciofluvial sediment.

Scattered about the area can also be found pre-glacial gravels and post-glacial deposits that include alluvial, aeolian, colluvial, and organic material.

Map 3-2 Contours - 50 Meter Interval

3.1.5 Soils

The types of soils found in the area are a direct result of different soil forming processes. These processes modify the parent material via the interaction of climate, biological activity, relief, drainage, and time.

The predominate soils of the area are orthic gray luvisols, bleached orthic gray luvisols, bisequa gray luvisol, and gleysols. The luvisols are identified by the migration of clay downwards through the soil to form a distinct layer of enriched clay material, while the gleysols are found in very poorly drained sites.

Soils and soil texture greatly influenced the ecosite classification as defined in Appendix 3-1. (Also see the Ecosite Classification Map 3-3).

3.1.6 Water Resource

All rivers that drain the FMA area are part of the Athabasca Drainage Basin. These waters drain into the Arctic Ocean via the Mackenzie River. The Major rivers in the area include the McLeod, Erith, Embarrass, Paddle, Lobstick, and Pembina.

There are also a number of relatively small lakes scattered throughout the area. These include Minnow, Sinkhole, Wolf, Fickle, Long, Shiningbank, Obed, Surprise and Bear Lakes.

3.1.6.1 Delineation of Watersheds

In the spring of 2004, Weyerhaeuser contracted GISmo Solutions Ltd. of Edmonton to create watershed layers for FMA # 9700035.

Utilizing the new Provincial Streams layer, GISmo tagged all watercourses with a Strahler order number, starting at the headwaters. Watersheds were then created using streams at the 4th order, in effect creating 4th order watersheds (Map 3-4).

Subsequently, all 4th order watersheds were given unique names. The watershed name, where possible, was linked to the predominate stream (i.e. Rat East) for the watershed. When this was not the case, names of historical or local significance were applied.

The project was completed in June of 2004 (Appendix 3-2 Watershed and Streams Classification Project – Edson/Drayton Valley, June 30. 24 pp) The completed coverage defining watershed boundaries transcended the FMA boundaries as a general rule. As a result, some watersheds are only partially within either FMA (Table 3-1).

Table 3-1 Fourth-Order Watersheds Overlapping FMA 9700035

Watershed Name (Fourth Order)	Full Watershed Area (Ha)	FMA 9700035 Internal[1] Watershed Area (ha)	Non-FMA 9700035 External[2] Watershed Area (ha)	Percent of Watershed[3] within the FMA 9700035	Percent of Watershed outside the FMA 9700035
Athabasca	30,235	1,354	28,882	4.5%	95.5%
Bear	19,370	13,723	5,648	70.8%	29.2%
Bigoray	47,254	39,653	7,602	83.9%	16.1%
Cairn	16,773	2,008	14,765	12.0%	88.0%
Carrot	27,809	12,612	15,197	45.4%	54.6%
Carrot Tower	4,456	4,391	65	98.6%	1.4%
Chevron	2,366	2,366	0	100.0%	0.0%
Chip	4,015	42	3,973	1.0%	99.0%
Coyote	25,506	23,996	1,510	94.1%	5.9%
Cricks	7,020	6,928	92	98.7%	1.3%
Cynthia	4,274	4,274	0	100.0%	0.0%
Deer Hill	12,601	4,688	7,913	37.2%	62.8%
East Pembina	84,394	22,034	62,361	26.1%	73.9%
Edson	32,895	6,021	26,874	18.3%	81.7%
Edson North	9,979	116	9,863	1.2%	98.8%
Embarras	20,685	2,100	18,585	10.2%	89.8%
Erith	31,643	21,984	9,659	69.5%	30.5%
Fairless	3,189	836	2,354	26.2%	73.8%
Fickle	15,148	1,482	13,666	9.8%	90.2%
Graham	9,375	4,691	4,684	50.0%	50.0%
Granada	2,185	2,185	0	100.0%	0.0%
Groat	2,615	486	2,129	18.6%	81.4%
Half Moon	19,868	18,626	1,242	93.7%	6.3%
Hanlan	12,814	65	12,749	0.5%	99.5%
Hardluck	15,259	8,527	6,733	55.9%	44.1%
Hinton	3,131	699	2,432	22.3%	77.7%
Kathleen	6,796	2,203	4,593	32.4%	67.6%
Ladd	4,104	2,096	2,008	51.1%	48.9%
Lobstick	82,705	15,409	67,295	18.6%	81.4%
Mason	1,202	693	510	57.6%	42.4%
McLeod	146,046	33,523	112,523	23.0%	77.0%
Miller	2,039	1,238	801	60.7%	39.3%
Minnow	14,950	13,257	1,693	88.7%	11.3%
Moose	14,607	9,831	4,777	67.3%	32.7%
Obed	12,499	6,761	5,738	54.1%	45.9%
Oldman	14,759	5,363	9,396	36.3%	63.7%
Paddle	15,497	1,496	14,001	9.7%	90.3%
Paddy	23,895	21,903	1,992	91.7%	8.3%
Pembina	81,869	12,265	69,604	15.0%	85.0%
Poison	25,052	3,639	21,412	14.5%	85.5%
Rally	3,346	1,951	1,394	58.3%	41.7%
Rat North	30,908	30,908	0	100.0%	0.0%
Rat South	17,817	17,817	0	100.0%	0.0%
Raven	16,442	9,378	7,065	57.0%	43.0%
Sang	23,182	17,379	5,804	75.0%	25.0%
Shiningbank	7,847	1,031	6,816	13.1%	86.9%
Sinkhole	14,674	13,736	938	93.6%	6.4%
Slide	4,682	2,689	1,993	57.4%	42.6%
Sundance	39,222	12,076	27,146	30.8%	69.2%
Swartz	24,698	16,736	7,962	67.8%	32.2%
Tom Hill	10,453	4,285	6,168	41.0%	59.0%
Trout	1,523	1,220	303	80.1%	19.9%
West Eta	13,398	13,398	0	100.0%	0.0%
Whitefish	15,671	8,166	7,505	52.1%	47.9%
Zeta	20,707	20,707	0	100.0%	0.0%
Total	**1,155,450**	**507,039**	**648,412**	**43.9%**	**56.1%**

1 Area of watershed within the boundaries of the FMA 9700035
2 Area of watershed outside of the boundaries of the FMA 9700035
3 Watersheds with >90% outside FMA, by area, will not be analyzed for harvesting impacts

Map 3-3 Ecosite Classification

Map 3-4 Fourth Order Watershed

3.1.7 Major Vegetation Types

3.1.7.1 Lower Foothills

The Lower Foothills Natural Subregion is primarily composed of pure or mixed stands of aspen (*Populus tremuloides*), balsam (black) poplar (*Populus balsamifera*), lodgepole pine (*Pinus contorta*) and white spruce (*Picea glauca*). The FMA includes a transitional area between the aspen-white spruce dominated stands of the boreal mixedwood forest, and the pine dominated stands of the Upper Foothills.

The area is also dominated by the presence of common woody and herbaceous vegetation. This would include low bush cranberry (*Viburnum edule*), prickly rose (*Rosa acicularis*), green alder (*Alnus crispa*), Canada buffalo berry (*Shepherdia canadensis*), wild sarsaparilla (*Aralia nudicaulis)* and dewberry (*Rubus pubescens*). Two grass species, wild hairy rye grass (*Elymus innovatus*) and marsh reed grass (*Calamagrostis canadensis*), are also common throughout the region.

3.1.7.2 Upper Foothills

The Upper Foothills subregion is composed primarily of pure or mixed stands of lodgepole pine and white spruce. Black spruce is also more common than in the Lower Foothills, either in pure (wetter sites) or mixed (with lodgepole pine) form. Aspen is generally found on warmer, south-facing slopes.

Common woody vegetation includes labrador tea (*Ledum groenlandicum*), tall bilberry (*Vaccinium membranaceum*), bog cranberry (*Vaccinium vitis-idaea*), and green alder (*Alnus crispa*). Herbs and grasses are less diverse than those found in the Lower Foothills.

3.1.8 Fish and Wildlife Resources in the FMA

Weyerhaeuser has undertaken a number of initiatives since 1998 in an attempt to obtain baseline information on the fish and wildlife resources within the FMA area. Research and inventory initiatives include nocturnal raptors, songbirds, fish and furbearer surveys. These inventories are aimed at providing initial benchmark on species occurrence and distribution across the FMA. A compilation of the survey results can be found in Appendix 3-3.

3.1.8.1 Birds

Bird surveys were conducted in the Edson FMA during the late winter and spring of 2000 and again in 2003. 163 bird species were confirmed to occur in the Edson FMA. Based on an analysis of bird distribution, there is the potential that over 200 species may occur in the FMA. Survey reports can be found in Appendix 3-4 and 3-5.

a) Resident Birds

Resident birds are those species of birds that do not migrate. Ten percent of all birds detected during surveys were resident species. Seventeen species of a potential total of twenty-five resident bird species were detected (Table 3-2).

Some of the most common resident birds were: Red-breasted nuthatch, Gray Jay, Black-capped Chickadee, Boreal Chickadee and Ruffed Grouse.

b) Migrants

Migrants are those species that migrate into the FMA during the summer months.

Migratory birds are the most common on the Edson FMA, with 58% of the birds identified during the surveys falling into this group (Table 3-3). The most common species among this group were the Yellow-rumped Warbler, Tennessee Warbler, Chipping Sparrow, Swainson's Thrush, and the Ruby-Crowned Kinglet.

c) Woodpeckers

Woodpeckers are birds that are specifically adapted to chisel through bark and wood. A total of seven species of woodpecker are known to occur on the FMA (Table 3-4): black-backed woodpecker, downy woodpecker, hairy woodpecker, northern flicker, pileated woodpecker, three-toed woodpecker, and yellow-bellied sapsucker.

d) Species Associated with Older Forests

There are a number of bird species that prefer late seral forest conditions. Those identified on the FMA included the Red-breasted Nuthatch, Yellow-rumped Warbler, Pine Siskin, Gray Jay, Golden-crowned Kinglet, Ruby-crowned Kinglet, Three-toed Woodpecker, Black-throated-Green Warbler, White-winged Crossbill, Brown Creeper, Rose-breasted Grosbeak, Pileated Woodpecker and Winter Wren.

e) Owls and Raptors

Surveys were conducted in late winter and early spring of 1999-2000, and again in 2003 with the objective of determining the species occurrence and distribution across the FMA.

Nine species of owls are believed to occur in the FMA (Table 3-5). These included the Northern Saw-whet, Great Gray, Boreal, Barred, Great-horned, Northern Pygmy, Northern Hawk Owl, Long-eared Owl and the Short-eared owl. More information can be found in Appendix 3-5.

As part of the owl survey, other raptors were also identified. These included the Red-tailed Hawk, Rough-legged Hawk, Bald Eagle, Golden Eagle, Merlin, Northern Harrier, American Kestrel, Northern Goshawk and Osprey.

Table 3-2 Resident Birds that Occur on the Edson FMA (highlighted in green)

Common Name	Scientific Name	COSEWIC Status	AB Status Rank (2004 or most current date)	Legal Designation (provincial & national)
Black-billed Magpie	*Pica hudsonia*		Secure	
Black-capped Chickadee	*Poecile atricapilla*		Secure	
Blue Grouse	*Dendragapus obscurus*		Secure	
Blue Jay	*Cyanocitta cristata*		Secure	
Boreal Chickadee	*Poecile hudsonica*		Secure	
Brown Creeper	*Certhia americana*		Undetermined	
Clark's Nutcracker	*Nucifraga columbiana*		Secure	
Common Raven	*Corvus corax*		Secure	
Common Redpoll	*Carduelis flammea*		Secure	
European Starling	*Sturnus vulgaris*		Exotic/alien	
Evening Grosbeak	*Coccothraustes vespertinus*		Secure	
Gray Jay	*Perisoreus canadensis*		Secure	
Gray Partridge	*Perdix perdix*		Exotic/alien	
House Sparrow	*Passer domesticus*		Exotic/alien	
Mountain Chickadee	*Poecile gambeli*		Secure	
Pine Grosbeak	*Pinicola enucleator*		Secure	
Red Crossbill	*Loxia curvirostra*		Secure	
Red-breasted Nuthatch	*Sitta canadensis*		Secure	
Ring-necked Pheasant	*Phasianus colchicus*		Exotic/alien	
Rock Dove (Rock Pigeon)	*Columba livia*		Exotic/alien	
Ruffed Grouse	*Bonasa umbellus*		Secure	
Sharp-tailed Grouse	*Tympanuchus phasianellus*		Sensitive	
Spruce Grouse	*Falcipennis canadensis*		Secure	
Steller's Jay	*Cyanocitta stelleri*		Secure	
White-breasted Nuthatch	*Sitta carolinensis*		Secure	
White-tailed Ptarmigan	*Lagopus leucurus*		Secure	
White-winged Crossbill	*Loxia leucoptera*		Secure	
Willow Ptarmigan	*Lagopus lagopus*		Secure	

Table 3-3 Migrant Birds that Occur on the Edson FMA (highlighted in green)

Common Name	Scientific Name	COSEWIC Status	AB Status Rank (2004 or most current date)	Legal Designation (provincial & national)
Alder Flycatcher	*Empidonax alnorum*		Secure	
American Avocet	*Recurvirostra americana*		Secure	
American Bittern	*Botaurus lentiginosus*		Sensitive	
American Crow	*Corvus brachyrhynchos*		Secure	
American Dipper	*Cinclus mexicanus*		Secure	
American Goldfinch	*Carduelis tristis*		Secure	
American Tree Sparrow	*Spizella arborea*		Secure	
American (Water) Pipet	*Anthus rubescens*		Secure	
American Redstart	*Setophaga ruticulla*		Secure	
American Robin	*Turdus migratorius*		Secure	
Baltimore (Northern) Oriole	*Icterus galbula*		Undetermined	
Bank Swallow	*Riparia riparia*		Secure	
Barn Swallow	*Hirundo rustica*		Secure	
Bay-breasted Warbler	*Dendroica castanea*		Sensitive	
Belted Kingfisher	*Ceryle alcyon*		Secure	
Black and White Warbler	*Mniotilta varia*		Secure	
Black Tern	*Chlidonias niger*	Not at risk	Sensitive	
Black-billed Cuckoo	*Coccyzus erythropthalmus*		Undetermined	
Blackburnian Warbler	*Dendroica fusca*		Sensitive	
Blackpoll Warbler	*Dendroica striata*		Secure	
Black-throated Blue Warbler	*Dendroica caerulescens*		Accidental/vagrant	
Black-throated Green Warbler	*Dendroica virens*		Sensitive	
Blue-headed (Solitary) Vireo	*Vireo solitarius*		Secure	
Bobolink	*Dolichonyx oryzivorus*		Sensitive	
Bohemian Waxwing	*Bombycilla garrulus*		Secure	
Bonaparte's Gull	*Larus philidelphia*		Secure	
Brambling	*Fringilla montifringilla*		Accidental/vagrant	
Brewer's Blackbird	*Euphagus cyanocephalus*		Secure	

Table 3-3 Migrant Birds That Occur on the Edson FMA (Continued)

Common Name	Scientific Name	COSEWIC Status	AB Status Rank (2004 or most current date)	Legal Designation (provincial & national)
Brewer's Sparrow	*Spizella breweri*		Sensitive	
Brown-headed Cowbird	*Molothrus ater*		Secure	
Bullock's (Northern) Oriole	*Icterus bullockii*		Undetermined	
California Gull	*Larus californicus*		Secure	
Canada Warbler	*Wilsonia canadensis*		Sensitive	
Cape May Warbler	*Dendroica tigrina*		Sensitive	
Caspian Tern	*Sterna caspia*	Not at risk	Sensitive	
Cedar Waxwing	*Bombycilla cedrorum*		Secure	
Chipping Sparrow	*Spizella passerina*		Secure	
Clay-coloured Sparrow	*Spizella pallida*		Secure	
Cliff Swallow	*Petrochelidon pyrrhonota*		Secure	
Common Grackle	*Quiscalus quiscula*		Secure	
Common Nighthawk	*Chordeiles minor*		Sensitive	
Common Snipe	*Gallinago gallinago*		Secure	
Common Tern	*Sterna hirundo*	Not at risk	Secure	
Common Yellowthroat	*Geothlypis trichas*		Secure	
Connecticut Warbler	*Oporornis agilis*		Secure	
Cordilleran Flycatcher	*Empidonax occidentalis*		Undetermined	
Dark-eyed Junco	*Junco hyemalis*		Secure	
Double-crested Cormorant	*Phalacrocorax auritus*	Not at risk	Secure	
Dusky Flycatcher	*Empidonax oberholseri*		Secure	
Eastern Kingbird	*Tyrannus tyrannus*		Secure	
Eastern Phoebe	*Sayornis phoebe*		Secure	
Fox Sparrow	*Passerella iliaca*		Secure	
Franklin's Gull	*Larus pipixcan*		Secure	
Golden-crowned Kinglet	*Regulus satrapa*		Secure	
Golden-crowned Sparrow	*Zonotrichia altricapilla*		Secure	
Gray Catbird	*Dumetella carolinensis*		Secure	

Table 3-3 Migrant Birds That Occur on the Edson FMA (Continued)

Common Name	Scientific Name	COSEWIC Status	AB Status Rank (2004 or most current date)	Legal Designation (provincial & national)
Gray-crowned Rosy Finch	*Leucosticte tephrocotis*		Secure	
Great Blue Heron	*Ardea herodias*		Sensitive	
Greater Yellowlegs	*Tringa melanoleuca*		Secure	
Harris' Sparrow	*Zonotrichia querula*		Secure	
Hermit Thrush	*Catharus guttatus*		Secure	
Hoary Redpoll	*Carduelis hornemanni*		Secure	
Horned Lark	*Eremophila alpestris*		Secure	
House Wren	*Troglodytes aedon*		Secure	
Killdeer	*Charadrius vociferus*		Secure	
Lapland Longspur	*Calcarius lapponicus*		Secure	
Lazoli Bunting	*Passerina amoena*		Secure	
Le Conte's Sparrow	*Ammodramus leconteii*		Secure	
Least Flycatcher	*Empidonax minimus*		Secure	
Lesser Yellowlegs	*Tringa flavipes*		Secure	
Lincoln's Sparrow	*Melospiza lincolnii*		Secure	
Loggerhead Shrike	*Lanius ludovicianus*	Threatened	Sensitive	Threatened (Federal Species at Risk Act)
Magnolia Warbler	*Dendroica magnolia*		Secure	
Marbled Godwit	*Limosa fedoa*		Secure	
Marsh Wren	*Cistothorus palustris*		Secure	
Mountain Bluebird	*Sialia currucoides*		Secure	
Mourning Dove	*Zenaida macroura*		Secure	
Mourning Warbler	*Oporornis philadelphia*		Secure	
Northern Mockingbird	*Mimus polyglottos*		Secure	
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*		Secure	
Northern Shrike	*Lanius excubitor*		Secure	
Northern Waterthrush	*Seiurus noveboracensus*		Secure	
Olive-sided Flycatcher	*Contopus cooperi*		Secure	

Table 3-3 Migrant Birds That Occur on the Edson FMA (Continued)

Common Name	Scientific Name	COSEWIC Status	AB Status Rank (2004 or most current date)	Legal Designation (provincial & national)
Orange-crowned Warbler	*Vermivora celata*		Secure	
Ovenbird	*Seiurus aurocapillus*		Secure	
Palm Warbler	*Dendroica palmarum*		Secure	
Philadelphia Vireo	*Vireo philadelphicus*		Secure	
Pine Siskin	*Carduelis pinus*		Secure	
Purple Finch	*Carpodacus purpureus*		Secure	
Purple Martin	*Progne subis*		Sensitive	
Red-eyed Vireo	*Vireo olivaceus*		Secure	
Red-winged Blackbird	*Agelaius phoeniceus*		Secure	
Ring-billed Gull	*Larus delawarensis*		Secure	
Rose-breasted Grosbeak	*Pheucticus ludovicianus*		Secure	
Ruby-crowned Kinglet	*Regulus calendula*		Secure	
Ruby-throated Hummingbird	*Archilochus colubris*		Secure	
Rufous Hummingbird	*Selasphorus rufus*		Secure	
Rusty Blackbird	*Euphagus carolinus*		Secure	
Sandhill Crane	*Grus canadensis*		Sensitive	
Savannah Sparrow	*Passerculus sandwichensis*		Secure	
Say's Pheobe	*Sayornis saya*		Secure	
Sedge Wren	*Cistothorus platensis*	Not at risk	Sensitive	
Short-billed Dowitcher	*Limnodromus griseus*		Undetermined	
Snow Bunting	*Plectrophenax nivalis*		Secure	
Solitary Sandpiper	*Tringa solitaria*		Secure	
Song Sparrow	*Melospiza melodia*		Secure	
Sora	*Porzana carolina*		Secure	
Spotted Sandpiper	*Actitus macularia*		Secure	
Sprague's Pipit	*Anthus spragueii*	Threatened	Sensitive	Threatened (Federal Species at Risk Act)
Swainson's Thrush	*Catharus ustulatus*		Secure	

Table 3-3 Migrant Birds That Occur on the Edson FMA (Continued)

Common Name	Scientific Name	COSEWIC Status	AB Status Rank (2004 or most current date)	Legal Designation (provincial & national)
Swamp Sparrow	*Melospiza georgiana*		Secure	
Tennessee Warbler	*Vermivora peregrina*		Secure	
Townsend's Solitaire	*Myadestes townsendi*		Secure	
Townsend's Warbler	*Dendroica townsendi*		Secure	
Tree Swallow	*Tachycineta bicolor*		Secure	
Upland Sandpiper	*Bartramia longicauda*		Sensitive	
Varied Thrush	*Ixoreus naevius*		Secure	
Veery	*Catharus fuscescens*		Secure	
Vesper Sparrow	*Pooecetes gramineus*		Secure	
Violet-green Swallow	*Tachycineta thalassina*		Secure	
Warbling Vireo	*Vireo gilvus*		Secure	
Western Meadowlark	*Sturnella neglecta*		Secure	
Western Tanager	*Piranga ludoviciana*		Sensitive	
Western Wood-pewee	*Contopus sordidulus*		Secure	
White-crowned Sparrow	*Zonotrichia leucophrys*		Secure	
White-throated Sparrow	*Zonotrichia albicollis*		Secure	
Willet	*Catoptrophorus semipalmatus*		Secure	
Wilson's Phalarope	*Phalaropus tricolor*		Secure	
Wilson's Warbler	*Wilsonia pusilla*		Secure	
Winter Wren	*Troglodytes troglodytes*		Secure	
Yellow Rail	*Coturnicops noveboracensis*	Special Concern	Undetermined	Special Concern (Federal Species at Risk Act)
Yellow Warbler	*Dendroica petechia*		Secure	
Yellow-bellied Flycatcher	*Empidonax flaviventris*		Undetermined	
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*		Secure	
Yellow-rumped Warbler	*Dendroica coronata*		Secure	

Table 3-4 Woodpeckers that Occur on the Edson FMA (highlighted in green)

Common Name	Scientific Name	COSEWIC Status	AB Status Rank (2004 or most current date)	Legal Designation (provincial & national)
Black-backed Woodpecker	*Picoides arcticus*		Sensitive	
Downy Woodpecker	*Picoides pubescens*		Secure	
Hairy Woodpecker	*Picoides villosus*		Secure	
Northern Flicker	*Colaptes auratus*		Secure	
Pileated Woodpecker	*Dryocopus pileatus*		Sensitive	
Three-toed Woodpecker	*Picoides tridactylus*		Secure	
Yellow-bellied Sapsucker	*Sphyrapicus varius*		Secure	

Table 3-5 Owls and Raptors that Occur on the Edson FMA (highlighted in green)

Common Name	Scientific Name	COSEWIC Status	AB Status Rank (2004 or most current date)	Legal Designation (provincial & national)
American Kestrel	*Falco sparverius*		Secure	
Bald Eagle	*Haliaeetus leucocephalus*	Not at risk	Sensitive	
Barred Owl	*Strix varia*		Sensitive	
Boreal Owl	*Aegolius funereus*	Not at risk	Secure	
Broad-winged Hawk	*Buteo platypterus*		Sensitive	
Cooper's Hawk	*Accipiter cooperii*	Not at risk	Secure	
Golden Eagle	*Aquila chrysaetos*	Not at risk	Sensitive	
Great Grey Owl	*Strix nebulosa*	Not at risk	Sensitive	
Great Horned Owl	*Bubo virginianus*		Secure	
Gyrfalcon	*Falco rusticolus*	Not at risk	Secure	
Long-eared Owl	*Asio otus*		Secure	
Merlin	*Falco columbarius*	Not at risk	Secure	
Northern Goshawk	*Accipiter gentilis*	Not at risk	Sensitive	
Northern Harrier	*Circus cyaneus*	Not at risk	Secure	

Table 3-5 Owls and Raptors that Occur on the Edson FMA (Continued)

Common Name	Scientific Name	COSEWIC Status	AB Status Rank (2004 or most current date)	Legal Designation (provincial & national)
Northern Hawk Owl	*Surnia ulula*	Not at risk	Secure	
Northern Pygmy Owl	*Glaucidium gnoma*		Sensitive	
Northern Saw-whet Owl	*Aegolius acadicus*		Secure	
Osprey	*Pandion haliaetus*		Sensitive	
Peregrine Falcon	*Falco peregrinus*	Threatened	At risk	Threatened (AB Wildlife Act, Federal Species at Risk Act)
Prairie Falcon	*Falco mexicanus*	Not at risk	Sensitive	
Red-tailed Hawk	*Buteo jamaicensis*	Not at risk	Secure	
Rough-legged Hawk	*Buteo lagopus*		Secure	
Sharp-shinned Hawk	*Accipiter striatus*	Not at risk	Secure	
Short-eared Owl	*Asio flammeus*	Special Concern	May be at risk	
Snowy Owl	*Bubo scandiaca*	Not at risk	Secure	
Swainson's Hawk	*Buteo swainsoni*		Sensitive	

f) Waterfowl

Several bird species in the FMA Area (Table 3-6) require water as an essential part of their habitat, including the Barrows Goldeneye, Trumpeter Swan, Sandhill Crane and Great Blue Heron.

A bird classified as "sensitive" that has a strong association with clean, fast-flowing water, is the American Dipper. This bird will nest on ledges beside or near the water body. If streams remain open through the year, the American Dipper will often overwinter in the area. These birds are sensitive to water quality and may be negatively affected by pollution.

Two of the remaining species, the Great Blue Heron and the Sandhill Crane, have fairly specific habitat requirements. The Great Blue Heron is found in and about open, shallow water, including lake edges, streams, rivers, ponds, sloughs and marshes. They nest near the shoreline or on islands surrounded by water. Herons are colonial birds that return each year to the same breeding grounds, and prefer to nest high in aspen, black poplar or white spruce trees. Their populations are under pressure and consideration should be given to protecting their habitat from human disturbance.

The Sandhill Crane is another species that requires large marshes, bogs, and sloughs for successful breeding. They often feed in open areas adjacent to wetland, such as meadows or older harvested areas. This species returns to the same breeding ground each year, and requires secluded and undisturbed sites for nesting. There were up to six recorded observations of the Sandhill Crane during the 2000 bird surveys. Both the Great Blue Heron and the Sandhill Crane are on the provincial list and are considered "sensitive" species.

Trumpeter Swans are a migratory bird, and the few sightings in the FMA Area may be attributed to birds on route to their summer nesting grounds or on their way south for the winter. Although these birds are not generally found in the Edson area, their occasional presence is important. There are a small number of lakes known to have been used for nesting purposes in the past that are given expanded buffers in the Timber Supply Analysis.

The Barrows Goldeneye is a waterfowl species that is unique to the Rocky Mountain/Foothills natural region. They are commonly found throughout the FMA Area, occupying ponds, sloughs and small lakes.

3.1.8.2 Furbearers

In addition to trapping information (84 trap lines), Weyerhaeuser supported winter track surveys were completed across the FMA during the winter of 1999/2000, and again in 2002/2003. A number of furbearers were identified (Table 3-7), including the snow-shoe hare, fisher, red squirrel, short-tailed weasel, marten and the red fox. More information can be found in Appendix 3-6.

Table 3-6 Waterfowl that Occur on the Edson FMA

Common Name	Scientific Name	COSEWIC Status	AB Status Rank (2004 or most current date)	Legal Designation (provincial & national)
American Coot	*Fulica americana*	Not at risk	Secure	
American Green-winged Teal	*Anas crecca*		Secure	
American Wigeon	*Anas americana*		Secure	
Barrow's Goldeneye	*Bucephala islandica*		Secure	
Blue-winged Teal	*Anas discors*		Secure	
Bufflehead	*Bucephala albeola*		Secure	
Canada Goose	*Branta canadensis*		Secure	
Canvasback	*Aythya valisneria*		Secure	
Cinnamon Teal	*Anas cynoptera*		Secure	
Common Goldeneye	*Bucephala clangula*		Secure	
Common Loon	*Gavia immer*	Not at risk	Secure	
Common Merganser	*Mergus merganser*		Secure	
Eared Grebe	*Podiceps nigricollis*		Secure	
Gadwall	*Anas strepera*		Secure	
Greater Scaup	*Aythya marila*		Secure	
Harlequin Duck	*Histrionicus histrionicus*		Sensitive	
Hooded Merganser	*Lophodytes cucullatus*		Secure	
Horned Grebe	*Podiceps auritus*		Sensitive	
Lesser Scaup	*Aythya affinis*		Secure	
Long-tailed Duck (Oldsquaw)	*Clangula hyemalis*		Secure	
Mallard	*Anas platyrhynchos*		Secure	
Northern Pintail	*Anas acuta*		Secure	
Northern Shoveler	*Anas clypeata*		Secure	
Pied-billed Grebe	*Podilymbus podiceps*		Sensitive	
Redhead	*Aythya americana*		Secure	
Red-necked Grebe	*Podiceps grisegna*	Not at risk	Secure	
Ring-necked Duck	*Aythya collaris*		Secure	

Table 3-6 Waterfowl that Occur on the Edson FMA (Continued)

Common Name	Scientific Name	COSEWIC Status	AB Status Rank (2004 or most current date)	Legal Designation (provincial & national)
Ruddy Duck	*Oxyura jamaicensis*		Secure	
Surf Scoter	*Melanitta perspicillata*		Secure	
Trumpeter Swan	*Cygnus buccinator*	Not at risk	At risk	Threatened (AB Wildlife Act)
Tundra Swan	*Cygnus columbianus*		Secure	
Western Grebe	*Aechmophorus occidentalis*		Sensitive	
White-winged Scoter	*Melanitta fusca*		Sensitive	
Wood Duck	*Aix sponsa*		Secure	

Table 3-7 Furbearers that Occur on the Edson FMA

Common Name	Scientific Name	COSEWIC Status	AB Status Rank (2004 or most current date)	Legal Designation (provincial & national)
Fisher	*Martes pennanti*		Sensitive	
Least Weasel	*Mustela nivalis*		Secure	
Long-tailed Weasel	*Mustela frenata*	Not at risk	May be at risk	
Marten	*Martes americana*		Secure	
Mink	*Mustela vison*		Secure	
Northern Flying Squirrel	*Glaucomys sabrinus*		Secure	
Red Fox	*Vulpes vulpes*		Secure	
Red Squirrel	*Tamiasciurus hudsonicus*		Secure	
Short-tailed Weasel (Ermine)	*Mustela erminea*		Secure	
Snowshoe Hare	*Lepus americanus*		Secure	
Wolverine	*Gulo gulo*	Special Concern	May be at risk	

3.1.8.3 Large Carnivores

The grizzly bear roams the western and southern portions of the FMA. Over the last five years, the Foothills Model Forest (Hinton, AB) has been coordinating a multi-stakeholder research project on the grizzly bear population to determine long-term strategies for its conservation (Table 3-9). The project has produced habitat maps for grizzly bears on portions of The Edson FMA.

Furbearer surveys were conducted during the winter of 2000 and again in 2003. During these surveys, several large carnivore tracks were identified. The most frequent large carnivore track count recorded was the Lynx, which increased from 12 tracks in 2000 to 23 tracks in 2003. The Lynx found during these surveys were generally associated with immature pine and spruce stands. Coyotes were the next most frequent large carnivore, with 9 tracks in 2000 and 18 in 2003, and were generally associated with mature mixedwood and immature coniferous sites. Wolves, another large carnivore in the Edson FMA, showed 3 tracks in 2000 and 4 in 2003, all within a variety of forest types. Cougar, a less frequent large carnivore, showed 2 tracks in 2000 and 1 track in 2003. Black bears are also known to occur within the boundaries of the Edson FMA area.

3.1.8.4 Small Mammals

Very little is known about small mammals on the FMA (Table 3-10). No known natural bat hibernacula exist within the FMA. The only bat species in the FMA with a confirmed sighting is the little brown bat. A University of Alberta research project supported by Weyerhaeuser immediately south of the Edson FMA was carried out to provide further information on bat populations in the region.

3.1.8.5 Ungulates

Populations of elk, moose, mule deer and white-tailed deer exist across the FMA (Table 3-11). They provide substantial hunting revenues throughout Alberta, as well as the communities within and proximal to the FMA. Table 3-8 presents population numbers for moose and elk in the Wildlife Management Units (WMU) that overlap the Edson FMA. No estimates are available for the two deer species.

Table 3-8 Current Population Estimates of Moose and Elk in the Specific WMUs*

WMU	Moose	Elk
337	747	150
338	1150	425
340	680	250
346	4380	550
348	1388	615
Total	**8345**	**1990**

Both moose and elk area strongly associated with early seral stage forest, particularly deciduous and mixed wood stands, and riparian areas within river valleys. Given protection from unregulated harvest, populations should increase as older forest stands area harvested and regenerate.

Recent surveys show that moose populations have decreased in WMUs 338 and 340. This is likely due to a combination of factors; more accurate recent surveys and higher estimated levels of unregulated hunting resulting from increasing amounts of new roads (Sources: Fish and Wildlife Division).

The moose populations are still recovering from a die-off due to a high wood tick infestation and the high density of access roads within the FMA makes moose vulnerable to over harvest. As a result current moose hunting seasons are restrictive, based on permits only. Elk herds in the Edson FMA have increased steadily in the past three decades. In an attempt to limit population growth, particularly in farmland areas, a permit-based harvest of cows has been in place since 1994.

The highest density of elk in the Edson FMA is found along the farmland/forest edge. The highest concentrations of moose are in the eastern two thirds of the FMA, where deciduous forests and muskegs are common. The Shiningbank Buck for Wildlife Area is a regionally and provincially significant moose range.

3.1.8.6 Herpetofauna

Herpetofauna (reptiles and amphibians Table 3-12) are widely distributed across the FMA. The species believed to be present include the western toad, wood frog and the boreal chorus frog. Weyerhaeuser has supported a University of Alberta research project within the Drayton Valley FMA, immediately south of the Edson FMA.

3.1.8.7 Fisheries

The FMA Area supports a number of diverse sport fish species (See Table 3-13) such as Arctic Grayling, Mountain Whitefish, Bull Trout, Athabasca strain Rainbow Trout, Goldeye, Burbot, Northern Pike, Walleye, Yellow Perch and Lake Whitefish.

Non-sport fish also inhabit drainages within the FMA. These include the long-nosed dace, pearl dace, finescale dace, northern redbelly dace, emerald shiner, lake chub, fathead minnow, trout, perch, longnose sucker, white sucker, slimy sculpin, spoonhead sculpin, and brook stickleback.

The most widely distributed sport fish species found in lakes in the FMA is the northern pike, with lesser amounts of walleye, yellow perch, burbot and lake whitefish.

The Northern East Slopes (NES) Cooperative Fisheries Inventory Program (CFIP) is a multi-agency project implemented in 1998 in order to sample prioritized waters for fish population and fish habitat data. Partners involved in the 2000 inventory program included the Alberta Conservation Association (ACA), Alberta Sustainable Resource Development (ASRD), Weyerhaeuser, and other industrial partners. The goals of the inventory program were to determine the open water distribution and relative abundance of fish in East Slopes Streams and to record aquatic habitat variables and relate them to the distribution and abundance of fish in East Slopes streams.

Since 2000, the ACA has sampled over 275 sites within Weyerhaeuser's FMA area. The three drainages that were sampled included Trout Creek in FMU E2, Bigoray River in FMU W6 and Rodney Creek in FMU E1. The data collected has been entered into the provincial fisheries database, the Fisheries Management Information System (FMIS). This program continued through 2003 on the Edson Weyerhaeuser FMA area. In 2001, 72 sites were sampled in the following drainages: Paddle River (W5), Poison Creek (W5) and Rat Creek (W6). In 2003, 50 sites were sampled in the Pembina River and Paddy Creek. In 2002, there were 83 sites sampled in Wolf Creek (E1).

Table 3-9 Carnivores that Occur on the Edson FMA

Common Name	Scientific Name	COSEWIC Status	AB Status Rank (2004 or most current date)	Legal Designation (provincial & national)
Black Bear	*Ursus americanus*	Not at risk	Secure	
Canada Lynx	*Lynx canadensis*	Not at risk	Sensitive	
Cougar	*Felis concolor*		Sensitive	
Coyote	*Canis latrans*		Secure	
Grizzly Bear	*Ursus arctos*	Special Concern	May be at risk	
Wolf	*Canis lipus*	Not at risk	Secure	

Table 3-10 Small Mammals that Occur on the Edson FMA

Common Name	Scientific Name	COSEWIC Status	AB Status Rank (2004 or most current date)	Legal Designation (provincial & national)
Arctic Shrew	*Sorex arcticus*		Secure	
Badger	*Taxidea taxus*	Not at risk	Sensitive	
Beaver	*Castor canadensis*		Secure	
Big Brown Bat	*Eptesicus fuscus*		Secure	
Bushy Tailed Woodrat	*Neotoma cinerea*		Secure	
Columbian Ground Squirrel	*Spermophilus columbianus*		Secure	
Dusky Shrew	*Sorex monticulus*		Secure	
Golden-mantled Ground Squirrel	*Spermophilus lateralis*		Secure	
Heather Vole	*Phenacomys intermedius*		Secure	
Hoary Bat	*Lasiurus cinereus*		Secure	
Hoary Marmot	*Marmota caligata*		Secure	
Least Chipmunk	*Tamias minimus*		Secure	
Little Brown Bat	*Myotis lucifugus*		Secure	
Long-eared Bat	*Myotis evotis*		Secure	
Long-legged Bat	*Myotis volans*		Undetermined	
Long-tailed Vole	*Microtus longicaudus*		Secure	

Table 3-10 Small Mammals that Occur on the Edson FMA (Continued)

Common Name	Scientific Name	COSEWIC Status	AB Status Rank (2004 or most current date)	Legal Designation (provincial & national)
Masked Shrew	*Sorex cinerus*		Secure	
Meadow Jumping Mouse	*Zapus hudsonius*		Secure	
Muskrat	*Ondatra zibethicus*		Secure	
Northern Bog Lemming	*Synaptomys borealis*		Secure	
Northern Long-eared Bat	*Myotis septentrionalis*		May be at risk	
Pika	*Ochotona princeps*		Secure	
Porcupine	*Erithizon dorsatum*		Secure	
Pygmy Shrew	*Sorex hoyi*		Secure	
Raccoon	*Procyon lotor*		Secure	
River Otter	*Lutra canadensis*		Secure	
Shrew	*Sorex spp*		Secure	
Silver-haired Bat	*Lascionycteris noctivagans*		Secure	
Southern Red-backed Vole	*Clethrionomys gapperi*		Secure	
Striped Skunk	*Mephitus mephitus*		Secure	
Vole	*Clethrionomys spp.*		Secure	
Water Shrew	*Sorex palustris*		Secure	
Water Vole	*Microtus richardsoni*		Sensitive	
Western Jumping Mouse	*Zapus princeps*		Secure	
Woodchuck	*Marmota monax*		Secure	

Table 3-11 Ungulates that Occur on the Edson FMA

Common Name	Scientific Name	COSEWIC Status	AB Status Rank (2004 or most current date)	Legal Designation (provincial & national)
Bighorn Sheep	*Ovis canadensis*		Secure	
Elk (Wapiti)	*Cervus elaphus*		Secure	
Moose	*Alces alces*		Secure	
Mountain Goat	*Oreamnos americanus*		Secure	
Mule Deer	*Odocoileus hemionus*		Secure	
White-tailed Deer	*Odocoileus virginianus*		Secure	

Table 3-12 Amphibians and Reptiles that Occur on the Edson FMA

Common Name	Scientific Name	COSEWIC Status	AB Status Rank (2004 or most current date)	Legal Designation (provincial & national)
Boreal Chorus Frog	*Pseudacris maculata*		Secure	
Canadian Toad	*Bufo hemiophrys*	Not at risk	May be at risk	
Columbia Spotted Frog	*Rana luteiventris*	Not at risk	Sensitive	
Long-toed Salamander	*Ambystoma macrodactylum*		Sensitive	
Northern Leopard frog	*Rana pipiens*	Special concern	At risk	Threatened (AB Wildlife Act); Special Concern (Federal Species at Risk Act)
Red-sided Garter Snake	*Thamnophis sirtalis*		Sensitive	
Wandering Garter Snake	*Thamnophis elegens*		Sensitive	
Western Toad	*Bufo boreas*	Special concern	Sensitive	Special Concern (Federal Species at Risk Act)
Wood Frog	*Rana sylvatica*		Secure	

Table 3-13 Freshwater Fish that Occur on the Edson FMA

Common Name	Scientific Name	COSEWIC Status	AB Status Rank (2004 or most current date)	Legal Designation (provincial & national)
Arctic Grayling	*Thymallus arcticus*		Sensitive	
Brassy Minnow	*Hybognathus hankinsoni*		Undetermined	
Brook Stickleback	*Culaea inconstans*		Secure	
Brook Trout	*Salvelinus fontinalis*		Exotic/alien	
Brown Trout	*Salmo trutta*		Exotic/alien	
Bull Trout	*Salvelinus confluentus*		Sensitive	
Burbot	*Lota lota*		Secure	
Cisco	*Coregonus artedi*		Secure	
Cutthroat Trout	*Oncorhynchus clarki*		Secure	
Cutthroat Trout (westslope)	*Oncorhynchus clarki lewisi*	Threatened	Secure	

Table 3-13 Freshwater Fish that Occur on the Edson FMA (Continued)

Common Name	Scientific Name	COSEWIC Status	AB Status Rank (2004 or most current date)	Legal Designation (provincial & national)
Fathead Minnow	*Pimephalus promelas*		Secure	
Finescale Dace	*Phoxinus neogaeus*		Undetermined	
Flathead Chub	*Platygobio gracilis*		Secure	
Goldeye	*Hiodon alosoides*		Secure	
Iowa Darter	*Etheostaoma exile*		Secure	
Lake Chub	*Couesius plumbeus*		Secure	
Lake Sturgeon	*Acipenser fulvescens*	Endangered	Undetermined	
Lake Whitefish	*Coregonus clupeaformus*		Secure	
Longnose Dace	*Rhinichthys cataractae*		Secure	
Longnose Sucker	*Catostumus catostumus*		Secure	
Mountain Sucker	*Catostumus platyrynchus*	Not at risk	Secure	
Mountain Whitefish	*Prosopium williamsoni*		Secure	
Northern Pike	*Esox lucius*		Secure	
Northern Redbelly Dace	*Phoxinus eos*		Sensitive	
Pearl Dace	*Margariscus margarita*		Undetermined	
Pygmy Whitefish	*Prosopium coulteri*		May be at risk	
Quillback	*Carpiodes cyprinus*		Undetermined	
Rainbow Trout	*Oncorhynchus mykiss*		Secure	
Sauger	*Stizostedion canadense*		Sensitive	
Shorthead Redhorse	*Moxostoma macrolepidotum*		Secure	
Slimy Sculpin	*Cottus cognatus*		Secure	
Spoonhead Sculpin	*Cottus ricei*	Not at risk	May be at risk	
Spottail Shiner	*Notropis hudsonius*		Secure	
Trout Perch	*Percopsis omiscomaycus*		Secure	
Walleye	*Stizostedion vitreum*		Secure	
White Sucker	*Catostumus commersoni*		Secure	
Yellow Perch	*Perca flavescens*		Secure	

3.1.9 Landscape Patterns and Structure

3.1.9.1 Natural Range of Age Class Distribution

In northern forests, fire plays an important function in determining the variety of vegetation patterns observed on the landscape. The type, duration, severity and size of fire determine post-fire vegetation composition and succession (Johnson 1992). However, fires and fire regimes differ greatly across and within geographical regions, and are influenced by a number of factors including climate, weather, vegetation composition, stand age, topography and others (Rogeau 1996).

The distribution of age classes across a landscape, and hence the amount of late seral stages, will vary depending on the length of time since the last fire disturbance and the fire cycle of the region[2].

Based on the fire regime of a region, the relative contribution of stands of different ages on a landscape is believed to follow a theoretical negative exponential curve where the age class distribution is represented by a high percentage of young age classes, an exponentially declining percentage of older age classes and a relatively small percentages of very old stands (Johnson and Gutsell 1994).

However, while on a theoretical level the age-class distribution may approach a negative exponential distribution reflecting a long-term average, at any one point in time the relative amount of various age-classes may vary significantly. As suggested by Andison (1997, 1998) in his research along the foothills of Alberta, the historical range of variation in age-class distribution is wide and there is not a “natural” age class distribution representative of a landscape. In his simulations, Andison showed, for instance, that in the Upper Foothills Natural Subregion the percentage of young (0-40 year old) stands may represent with equal probability 0 to 70% of a landscape, while older forest stands (140-200 year old) could represent anywhere from 0 to 15%. Despite the wide range of probability of representation by individual age classes, older forest classes had a smaller range of representation in any simulated age class distribution than younger stands, indicating the lower likelihood of older stands occurring on fire-driven landscapes.

In Alberta, fire regimes differ among natural subregions depending on “climate, tree species dominance, and even historical lightning strikes” (Andison 2000). Natural subregions with cooler, wetter climates and less lightning activity have longer fire cycles. This has been documented by Andison in his work on natural disturbance along the foothills of Alberta and is well described by the following Table 3-14.

[2] Fire cycle is defined as “the number of years required to burn over an area equal to the entire area of interest” (Merrill and Alexander 1987, Johnson and Gutsell 1994).

Table 3-14 Overview of some Characteristics of Natural Sub-Regions of the Foothills Model Forest (Andison, D., 2000)

	Lower Foothills	Upper Foothills	Subalpine
Fire Cycle	65 - 75	80 - 90	130 - 190
% Area in Patches >2,000 ha	33	76	66
Lightning hits / 1,000 ha	58	48	11
Growing degrees days	1121	880	903
mm Rain / yr	403	370	328
mm snow / yr	144	162	233

The differences in lightning strikes, growing-degree days and amount of rain and snow among the natural subregions are rough indications of the increased risk of ignition, fire growth, length of fire season and forest flammability (Beckingham et al. 1996). In this context, the Lower Foothills would appear to have a high ignition probability, since this subregion has the most lightning strikes and the highest number of growing degree days. This suggests that the Lower Foothills subregion burns fairly often, but in relatively small patches. This can be explained by the much greater lightning activity, which is known to produce more fire starts; however, higher levels of precipitation reduce the chances of any single fire becoming very large. The size of fires is also influenced by the nature of the vegetation dominant in the Lower Foothills. Deciduous forests, which are common here, tend to limit the spread of fires due to their high moisture content in the summer (Fechner and Barrows 1976). In the Upper Foothills and Subalpine natural subregions, fire activity tends to be more intense due to a combination of historical ignition probabilities, topography, vegetation and fire weather indicators.

3.1.9.2 Current Age Class Distribution

The current age-class distribution in the Edson FMA (Figure 3-3) is the result of an effective fire suppression program over the last 50 years. It is not an ecologically sustainable age class distribution as it does not reflect the natural processes controlling plant association development in this region. The amount of older forest stands (>100 year old) in the Lower and Upper Foothills is likely well beyond the natural range of variation that is expected to occur in these fire-driven ecosystems (Andison 1998).

The current age of stands in the FMA area varies from 0 to 160 years, with less than 1% older than 170 years. As shown in the following graph, a large amount of the forest (the peaks in the graph) in this FMA seem to have established in the years 1880-90 and 1920-30. The current age distribution of this FMA reflects the fire history prior to European settlement (also see Map 3-5).

Map 3-5 Age Class Distribution

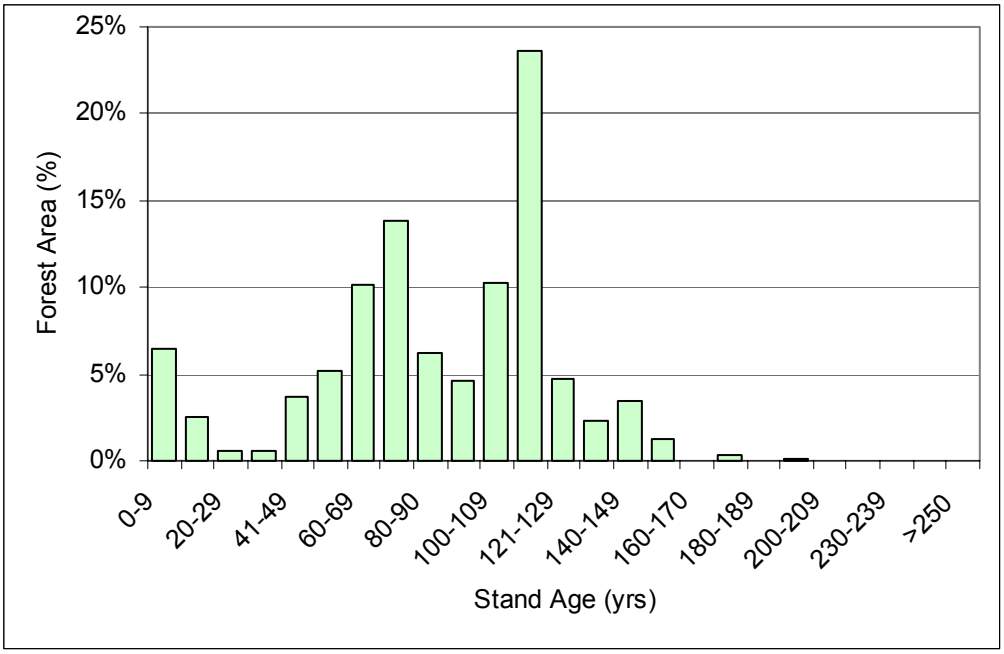

Figure 3-3 Current Age Class Distribution of Forest in the Edson

Fire is an important event in the ecology of the Edson FMA area. The FMA area extends mostly over one natural subregion -- the Lower Foothills – with a small area in the Upper Foothills subregion (Figure 3-4). These two natural subregions differ due to climate, topography, soil and parent material. The environmental conditions and the resulting natural fire regime are also reflected in different forest landscapes.

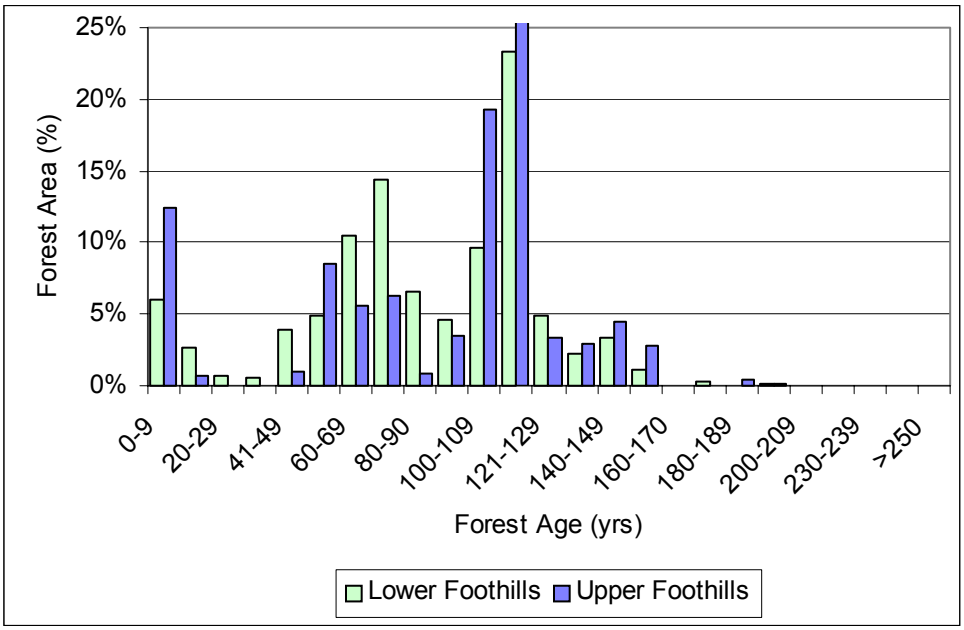

Figure 3-4 Current Age Class Distribution of Forests in the Edson FMA, by Subregion

The forests in the Lower Foothills natural subregion are a mosaic of aspen and poplar stands interspersed with white spruce and lodgepole pine. Further to the west, in the Upper Foothills subregion, forests are dominated by extensive stands of conifers -- lodgepole pine and white spruce. In both subregions, large expanses of black spruce and tamarack forests are common in poorly drained areas.

As previously described, due to the difference in topography and climatic conditions, the two natural subregions have historically experienced distinct disturbance regimes (Andison 1997). In the Lower Foothills, forests burned frequently (fire cycle approximately 50-75 years), but fires were rarely very large. In this region, forest stands rarely survived much beyond 120 years. Further to the west in the Upper Foothills, the forest burned less frequently (fire cycles approximately 60-90 years). In general, fires were more catastrophic, covering large areas that included stands of varying age (White 1985, Johnson and Larsen 1981, Rogeau 1996).

The different disturbance regimes among the natural subregions is evident in their specific age class distribution.

In the Lower Foothills natural subregion, the distribution of forest stands 60 to 150 year old seems to be more evenly distributed than in the Upper Foothills. In the latter, the age class distribution suggests three main fire disturbance periods, in 1930-40, 1880-1890 and 1850. The difference between the two subregions may reflect more frequent and less catastrophic fire events in the Lower Foothills than in the Upper Foothills. This is also suggested by the higher amount of older stands that occur in the Upper Foothills natural subregion.

The limited number of stands less than 40-50 years of age in the Lower and Upper Foothills natural subregions in fire-driven ecosystems is a serious concern not only in terms of ecological processes but also because it indicates limited habitat availability for wildlife species that depend on early seral stages.

There is also a natural void of older deciduous age classes, as highlighted in Figure 3-5. A description of the seral stage classification used can be found in Section 3.1.9.4.

3.1.9.3 Description of Land Management Units within the FMA

For the Detailed Forest Management Plan, the FMA area was divided into six areas that Weyerhaeuser has termed Landscape Management Units (LMUs).

These units include the:

- Edson Unit: all of the E2 FMU within the FMA.
- Beaver Meadows Unit: north portion of the W5 FMU within the FMA.
- Moose Creek Unit: all of the E1 FMU within the FMA.
- Wolf Lake Unit: southwest portion of the W6 FMU.
- Carrot Creek Unit: north-central portion of the W6 FMU.
- Cynthia Unit: east portion of the W6 FMU.

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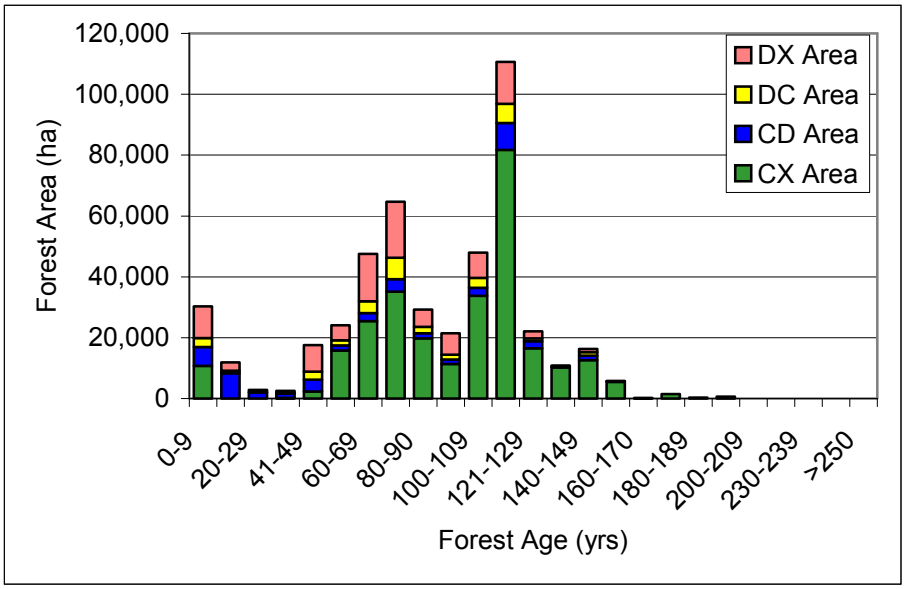


Figure 3-5 Age Class Distribution by Broad Cover Group for the Edson FMA

The specific purposes of developing the LMUs were to:

- Set objectives most appropriate for that landscape, but aligned with the entire FMA area,
- Provide spatial opportunities for conflicting goals,
- Stratify the landscape because of varying physical, social, or economic characteristics,
- Allow for areas of emphasis distributed across the landscape,
- Simplify administration, and to
- Link the DFMP to operational implementation.

The division of the FMA into LMUs involved the following steps:

1. Production of thematic maps of the FMA area,
2. Analysis of thematic maps and data-sets to determine differentiation of units based on physical, social, or economic characteristics,
3. Production of draft Landscape Management Unit boundaries,
4. Determination of initial concerns and/or objectives for each LMU, and
5. Review of draft LMUs and their boundary with Weyerhaeuser Planning Team, Fish and Wildlife Division and Public Lands and Forests Division.

As it is outlined in several sections, the LMUs differ ecologically as well as in terms of industrial development footprint.

Ecologically, as shown in Figure 3-6, the LMUs show interesting differences in the relative abundance of ecosites. In the Edson Unit and the Beaver Meadows LMUs, about 50% of the area is represented by well to moderately well drained ecosites (Moist/medium LF-e, UF-e, LF-e/f and UF-e/f), generally occurring on level ground or along ridges from the crest to mid slope positions. These ecosites support a variety of types, largely dominated by aspen. Stands where pine or white spruce are dominant are not uncommon. Understorey vegetation is typically diverse, ranging from alder, low-

bush cranberry, rose and bracted honeysuckle, to forbs such as wild sarsaparilla, bunchberry, and fireweed. These Ecosites represent only 27 and 31% of the area in the Wolf Lake and Moose Creek LMU. Conversely, very wet/poor and very wet/medium-rich (LF-k/l; LF-l/m; UF-k/l and UF-k/l) represent 36% of the Wolf Lake LMU, a significantly higher percentage than found in the Edson Unit LMU (21%). These ecosites mostly consist of bog and fen complex, largely occurring on poor to poorly drained organic soils or where the water table is not far from the surface. Forest stands are characterized by either stunted black spruce or a large expanse of tamarack.

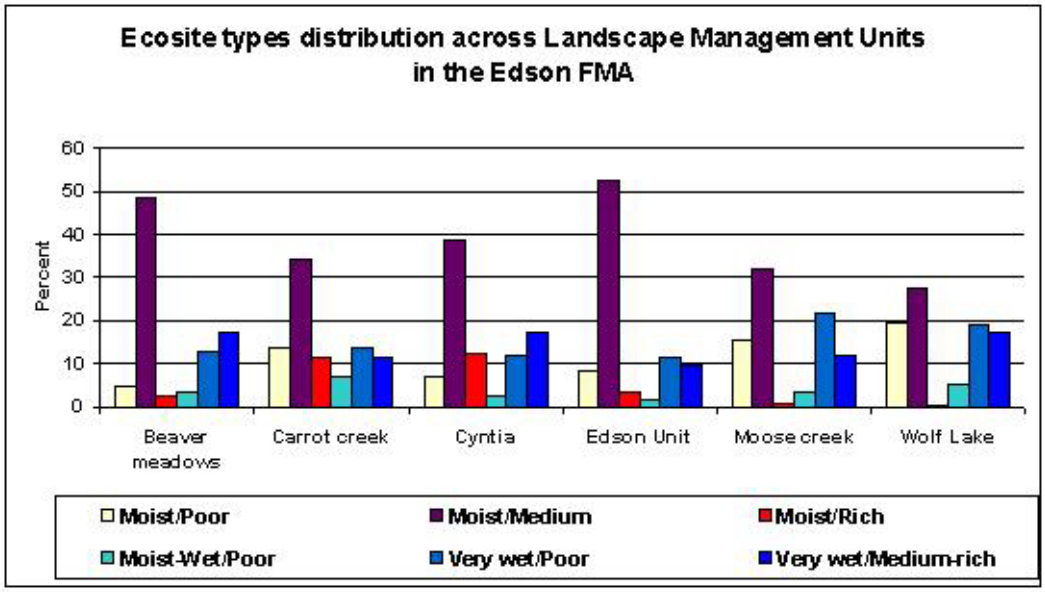


Figure 3-6 Ecosite Types Distribution Across Landscape Management Unit in the Edson FMA

Landscape Characteristics

Forest ecosystems are complex and dynamic mosaics of vegetation patches that vary 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 at smaller scales (e.g. mortality of individual trees).

The variety and juxtaposition of forest and non-forested stands in a landscape[3] provide habitat for all wildlife species in a specific region. Landscape characteristics that provide habitat features include the range of forest age classes, the size and shape of patches[4] in each age class, and the variety in overstorey and understorey structure and floristic composition.

In order to develop harvest designs that maintain heterogeneous forest ecosystems (away from cut/leave patterns), current and historic landscape diversity need to be described and quantified through the use of spatial statistics. To that objective,

[3] Landscapes are defined as "mosaic{s} where a mix of local ecosystems or land uses is repeated in similar form over a kilometers-wide are" (Forman, 1996).
[4] A patch can be defined as "a relatively heterogeneous nonlinear area that differs from its surroundings" (Forman, 1996. Land Mosaics. Cambridge University Press, Page 642).

Weyerhaeuser retained GISmo Solutions Limited to provide detailed Landscape Analysis of all Landscapes Management Units.

Landscape Analysis was done through the Patch Analyst 2.0 program developed by researchers at Lakehead University as part of the Sustainable Forest Management Network research program at the University of Alberta. Patch Analyst is an extension to the ArcView® GIS application that facilitates the spatial analysis of landscape patches and the modeling of attributes associated with patches. Patch Analyst (Grid) includes a user interface to FRAGSTATS[5] , as well as separate spatial based analysis functions.

For landscape analysis purposes, and given the disturbance-driven nature of the forest ecosystem in the Edson FMA area, a patch was defined as a vegetation stand of the same age regardless of its floristic composition. Numerous patch metrics were calculated, including mean and median patch size, patch size coefficient of variance and standard variation, edge density, mean shape index, fractal dimension, interspersion and juxtaposition, Shannon's diversity index, and core area index. These landscape diversity indices measure the current (1999) spatial heterogeneity of each Landscape Management Unit. However, the Edson FMA area is dissected by many linear corridors (power lines, pipelines, roads, etc.) that, over time, have altered the number, distribution, sizes and shapes of forest stands. The amount of linear disturbance currently on the landscape does not naturally occur in forest landscapes. In this context, it is reasonable to infer that the current landscape diversity may not reflect a naturally functioning forest ecosystem and may not provide enough habitat diversity to meet the needs of all wildlife species.

To better understand the natural diversity of each Landscape Management Unit, spatial analysis and modeling were used to remove all linear corridors from each landscape and recreate the forest mosaic that most likely existed prior to 1960. The year 1960 was selected based on the earliest year of land disposition within the land use data set. An example for the Cynthia LMU is provided in Figure 3-7 and Figure 3-8. Landscape analysis was then conducted on the recreated forest mosaic and compared with the current conditions.

[5] FRAGSTATA is a statistical package that quantifies landscape structure through numerous metrics including: area, patch density, size and variability metrics: edge, shape, core area, and diversity metrics: and contagion and interspersion metrics (McGarigal, Kevin & Marks, Barbara J. 1995. FRAGSTATS: spatial pattern analysis program for quantifying landscape structure. Gen. Tech. Rep. PNW-GTR-351. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. Page 122.

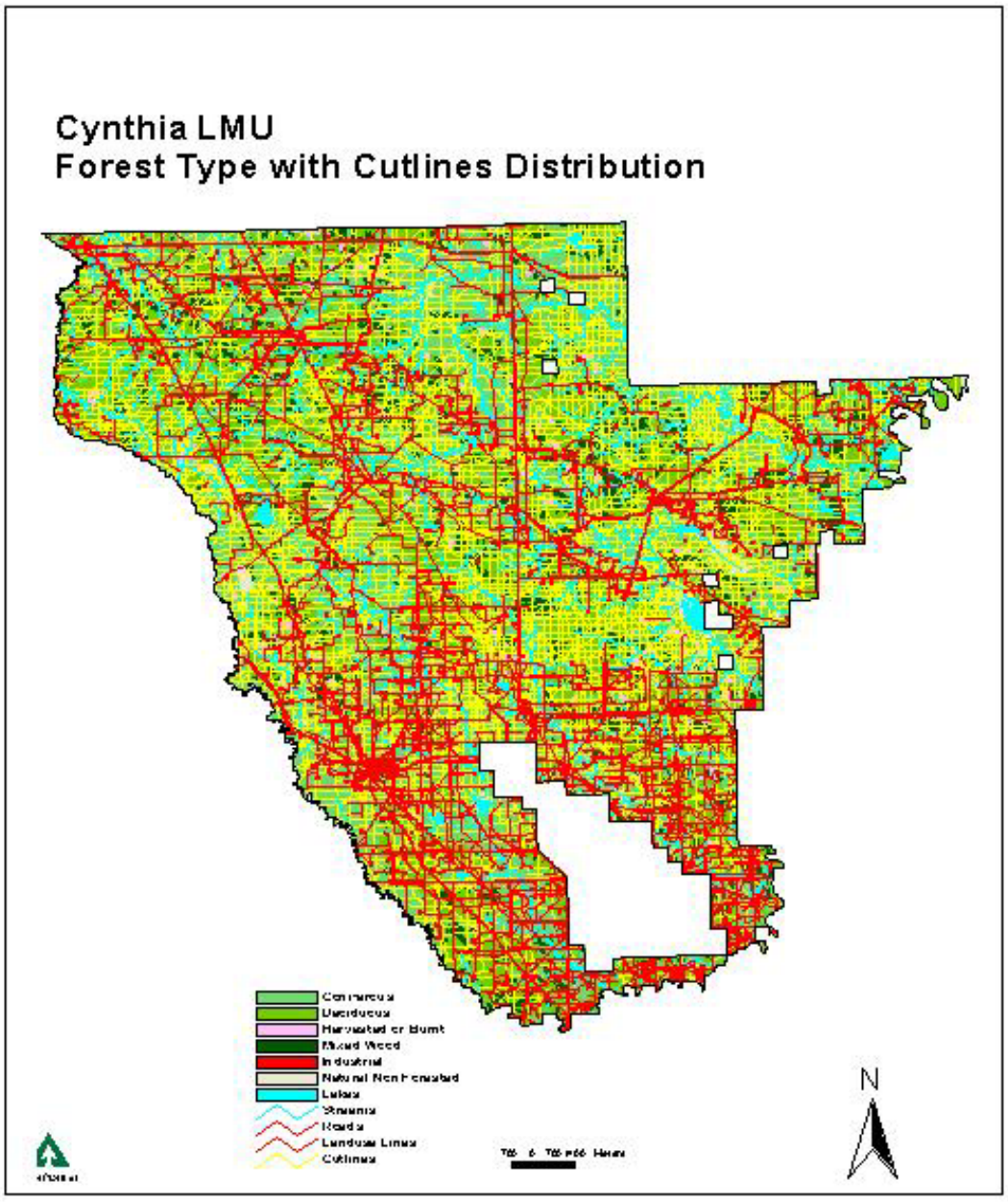


Figure 3-7 Forest Cover Distribution for Cynthia LMU in 1999

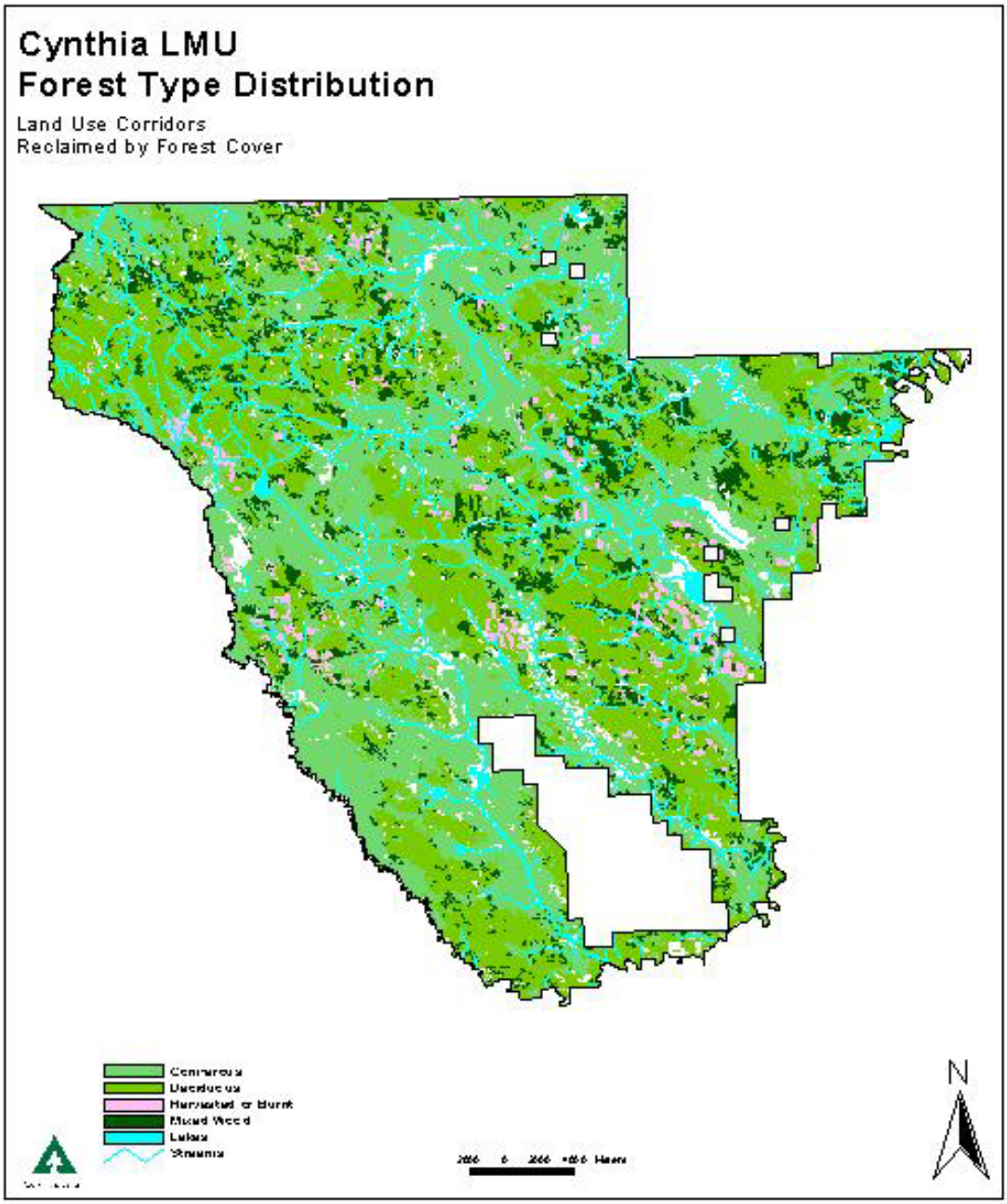


Figure 3-8 Forest Cover for the Cynthia LMU Prior to 1960 Based on GIS Removal of Industrial Footprints

Landscape analysis shows that the current landscape diversity of the Edson FMA area has been significantly altered by linear disturbances. Figure 3-9 shows the degree of patch fragmentation that results from roads, pipelines and power lines. In LMUs such as Carrot Creek and Beaver Meadows, the percent increase in the number of patches is relatively small (70 and 87%, respectively); in other LMUs such as Cynthia the percent increase reaches 300%.

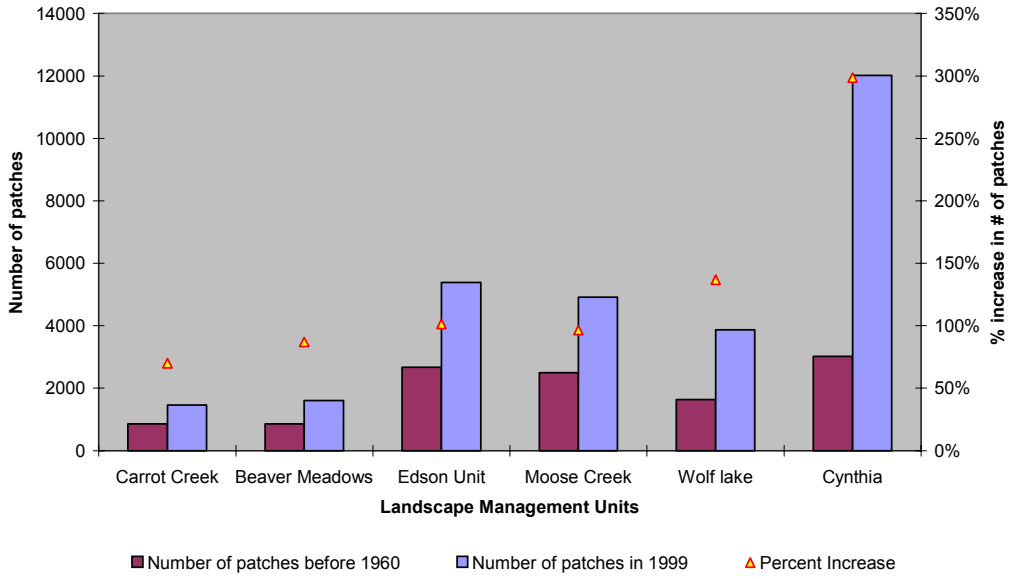


Figure 3-9 Changes in Number of Patches Within Landscape Management Units Caused by Linear Disturbances (Pipelines, Powerlines Roads, etc.)

The high degree of landscape fragmentation is reflected in many other Landscape Indices (GISmo) such as the average patch size (Figure 3-9 and Figure 3-10).

As shown in Figure 3-10, the current average patch size ranges between 9 and 25 hectares. This contrasts with average patch sizes prior to 1960 (Figure 3-11). More importantly, the range of patch sizes in each individual LMU, as represented by the standard deviations, is considerably less in current landscapes from what the range used to be prior to the 1960s. These results indicate less variability in patch size in current landscapes and, hence, decrease habitat opportunities for interior-dependent wildlife species.

The shift from large patches to small ones and the loss of large unfragmented expanses of forests is shown in Figure 3-12 with the Cynthia LMU. The current landscape composition shows that 80% of the total 11958 patches are less than 10 ha in size and that no patch is larger than 500 ha. The loss in landscape diversity resulting from linear disturbances is further shown in Figure 3-13. There is very little difference in average patch size between seral stages, quite in contrast to historical conditions.

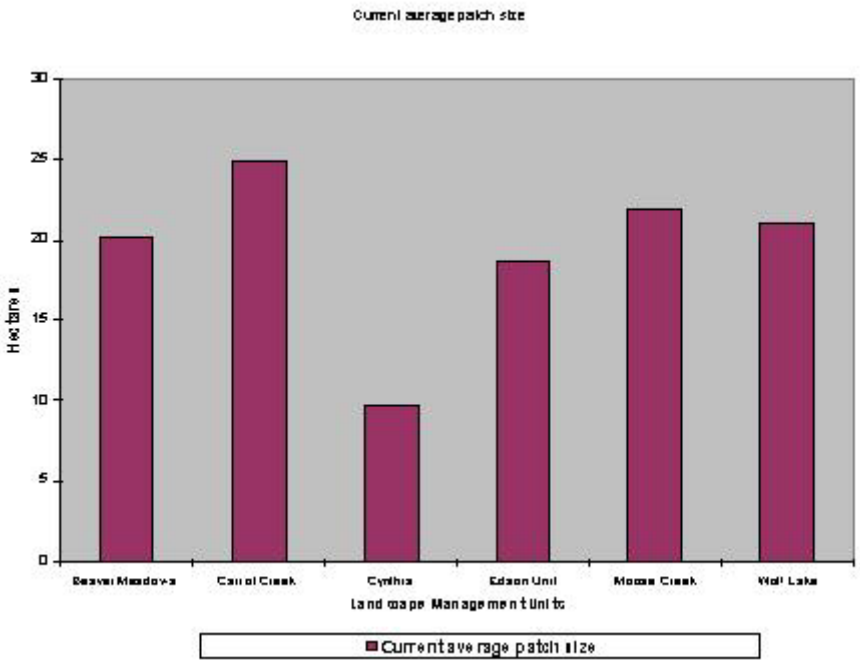


Figure 3-10 Current Average Patch Sizes and Standard Deviations

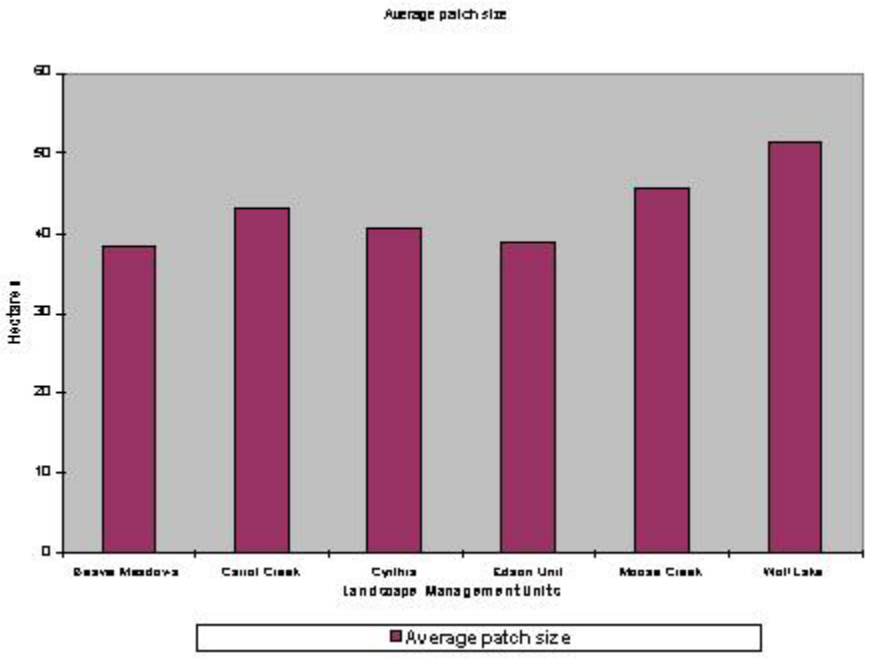


Figure 3-11 Historic Patch Size and Stand Deviations

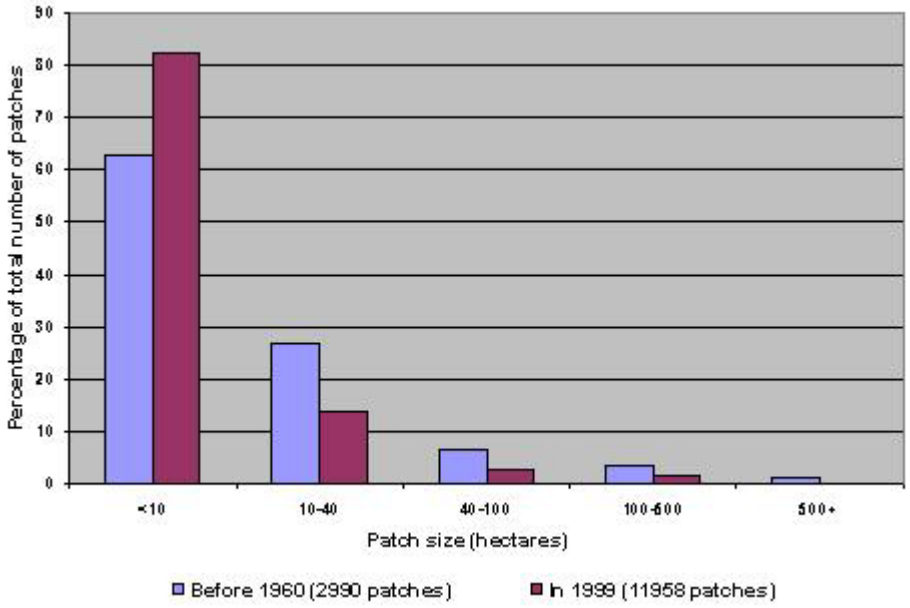


Figure 3-12 Changes in Patch Size Associated with Linear Disturbance in the Cynthia LMU

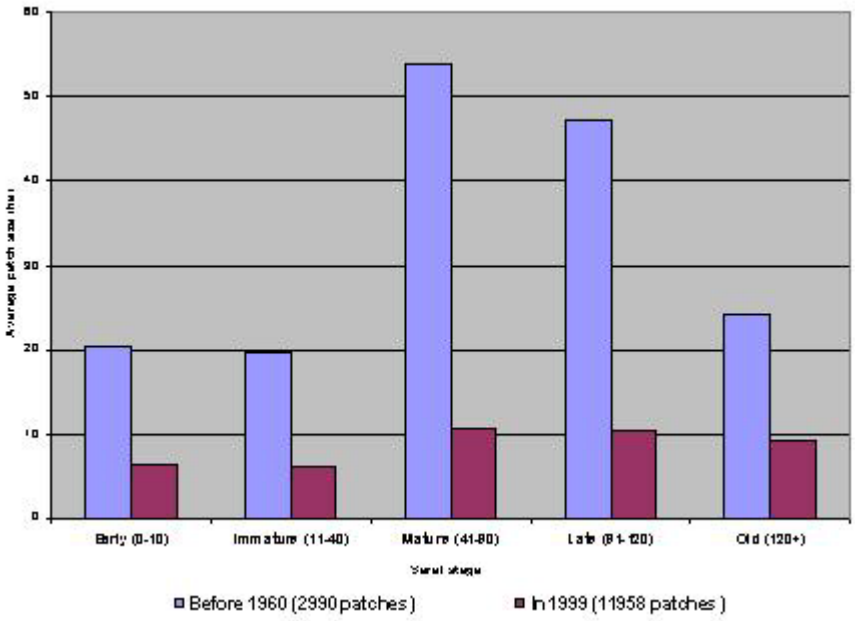


Figure 3-13 Average Patch Size of Seral Stages Before 1960 and in 1999 in the Cynthia LMU

3.1.9.4 Age class distribution in the Six Land Management Units

The age classes for conifer predominate stands are grouped into seral stages as follows:

Early seral stage – defined as stands between establishment and 10 years old, representing the period from disturbance to initial crown closure.

Immature seral stage – defined as stands between 11 and 40 years old; in other words when the stands first start to reach merchantability (e.g. for commercial thinning).

Mature seral stage – defined as stands between 41 and 90 years old.

Late seral stage – defined as stands between 91 and 120 years old.

Very late seral stage – defined as stands between 121 and 170 years old.

Overmature seral stage – defined as stands greater than 170 years old.

Table 3-15 describes the age class distribution by Landscape Management Unit by seral stage for conifer.

The age classes for deciduous predominate stands are grouped into seral stages as follows:

Early seral stage – defined as stands between establishment and 10 years old, representing the period from disturbance to initial crown closure.

Immature seral stage – defined as stands between 11 and 40 years old.

Mature seral stage – defined as stands between 41 and 70 years old.

Late seral stage – defined as stands between 71 and 110 years old.

Very late seral stage – defined as stands between 111 and 170 years old.

Overmature seral stage – defined as stands greater than 170 years old.

Table 3-16 describes the age class distribution by Landscape Management Unit by seral stage for deciduous.

Table 3-15 Age Class Distribution by LMU by Seral Stage for Conifer (C & CD) that Meets "Old Growth" Eligibility Criteria (Chapter 6)

Age Classes	Obed Provincial Park	Beaver Meadows	Carrot Creek	Cynthia	Edson	Moose Creek	Wolf Lake	Grand Total
0-9	1	1,529	977	3,958	2,026	2,586	5,848	16,925
10-19	75	916	461	2,767	1,543	2,051	457	8,271
20-29		295		39	764	821	48	1,967
30-39		42	18	150	848	485	31	1,573
41-49		1,500		1,006	580	2,110	960	6,155
50-59	54	506	19	2,244	5,411	8,800	395	17,429
60-69	226	6,946	1,162	8,769	4,931	2,740	3,351	28,126
70-79	765	3,668	2,820	6,684	10,152	7,379	7,748	39,215
80-90	41	2,268	639	5,261	3,190	4,543	5,549	21,491
91-99	33	1,445	1,021	2,167	2,488	4,957	736	12,847
100-109	407	4,066	3,540	5,514	7,964	7,532	7,374	36,397
110-120	221	4,475	4,709	14,392	7,967	35,671	23,136	90,571
121-129		1,558	1,555	2,513	3,378	5,785	4,064	18,852
130-139		490	878	1,689	955	2,169	4,419	10,600
140-149	557	704	1,905	5,323	4,717	157	763	14,125
150-159	124	95	115	458	462	1,055	3,335	5,644
160-170						156	14	170
171-179		164	64	518	114		638	1,497
180-189		2	14	19	7		225	267
190-199		101	5	257	18	3	270	655
200-209				6	3		10	19
210-219								
220-229		8		17		19		44
230-239				6			2	8
240-249								
>250		1		2				3
Total	**2,502**	**30,777**	**19,903**	**63,758**	**57,517**	**89,020**	**69,373**	**332,850**

Early	Immature	Mature	Late	Very Late	Overmature	Total
16,925.3	11,811.2	112,415.8	139,814.1	49,390.1	2,493.4	332,850.0
5.1%	3.5%	33.8%	42.0%	14.8%	0.7%	100.0%

Table 3-16 Age Class Distribution by LMU by Seral Stage for Deciduous (D & DC) that Meets the "Old Growth" Criteria (Chapter 6)

Age Classes	Obed Provincial Park	Beaver Meadows	Carrot Creek	Cynthia	Edson	Moose Creek	Wolf Lake	Grand Total
0-9		2,363	1,250	3,352	3,808	1,707	871	13,350
10-19		355	612	1,168	935	329	229	3,628
20-29	0	52	13	627	96	29	74	890
30-39	2	235	179	102	252	127	29	926
41-49		2,588	1,234	1,653	3,615	1,203	1,065	11,358
50-59	13	2,594	416	740	1,132	1,618	145	6,659
60-69	13	3,967	1,565	7,373	3,976	312	2,208	19,413
70-79	163	4,536	1,596	10,037	7,182	1,003	975	25,493
80-90		2,498	244	1,928	1,453	890	693	7,705
91-99	25	712	173	1,419	5,346	521	453	8,650
100-109	10	1,591	829	1,047	6,182	639	1,313	11,611
110-120	51	863	470	2,632	9,239	4,170	2,596	20,022
121-129		315	913	916	409	272	446	3,271
130-139		127	22	33		19	14	216
140-149		32	474	1,373	303	5		2,187
150-159				96				96
160-170								
171-179							15	15
180-189								
190-199								
200-209								
210-219								
220-229								
230-239								
240-249								
>250								
Total	**277**	**22,828**	**9,990**	**34,495**	**43,930**	**12,843**	**11,127**	**135,489**

Early	Immature	Mature	Late	Very Late	Overmature	Total
13,350.2	5,443.9	37,430.1	53,458.2	25,790.8	15.4	135,488.6
9.9%	4.0%	27.6%	39.5%	19.0%	0.0%	100.0%

3.1.9.5 Forest Types—By Cover Group and Leading Species

The broad cover group information for the FMA area and for each landscape management unit is presented in the following tables (Table 3-17 and Table 3-18) and spatially on the Broad Cover Group Map (Map 3-6). Broad cover group is defined by the predominance of coniferous and/or deciduous in a given stand:

- Coniferous - stands with at least 80% conifer,
- Coniferous/Deciduous - stands with at least 50% and less than 80% conifer,
- Deciduous/ Coniferous - stands with at least 30% and no more than 50% conifer, and
- Deciduous - stands with less than 30% conifer.

Table 3-17 Broad Cover Group for the FMA Area

Broad Cover Group	% of FMA forested area
Deciduous—D	21.4%
Deciduous / Coniferous—DC	7.9%
Coniferous / Deciduous—CD	9.3%
Coniferous—C	61.3%

Table 3-18 Broad Cover Group by Landscape Management Unit by Percentage

LMU	Coniferous	Coniferous/ Deciduous	Deciduous/ Coniferous	Deciduous
Moose Creek	77.9%	9.5%	4.6%	8.0%
Edson Unit	45.9%	10.1%	12.0%	32.0%
Beaver Meadows	47.9%	8.3%	10.0%	33.7%
Wolf Lake	80.7%	5.4%	4.3%	9.7%
Carrot Creek	53.8%	10.8%	9.8%	25.6%
Cynthia	51.7%	11.1%	9.0%	28.1%

Map 3-6 Broad Cover Group

Based on leading species information from the Alberta Vegetation Inventory for the FMA area, the following tables (Table 3-19 and Table 3-20) represent a summary of tree species on the FMA area and Land Management Units. A map representing the predominant tree species (leading in AVI) is provided on Map 3-7.

Table 3-19 Tree Species on the FMA Area

Leading Species	% of FMA Forested Area
Aspen	16.7%
Balsam Poplar	10.9%
Birch	1.7%
Balsam Fir	6.6%
Black Spruce	10.0%
Lodgepole Pine	3.3%
Tamarack	5.0%
White Spruce	29.2%

Table 3-20 Tree Species by Landscape Management

LMU	Aw	Pb	Bw	Fb	Sb	Pl	Lt	Sw
Beaver Meadow	28.6%	5.1%	1.6%	0.0%	19.3%	12.6%	13.5%	6.5%
Carrot Creek	13.0%	7.6%	3.6%	0.1%	20.4%	25.3%	8.9%	7.1%
Cynthia	15.8%	8.3%	5.6%	0.2%	17.5%	10.1%	13.8%	15.3%
Edson	34.9%	0.5%	0.1%	0.0%	18.6%	16.9%	8.8%	6.8%
Moose Creek	9.0%	0.3%	0.2%	0.0%	32.0%	30.4%	10.8%	6.4%
Wolf Lake	6.9%	3.1%	1.3%	0.1%	26.7%	27.4%	14.4%	8.4%

3.1.10 Rare, Endangered or Threatened (RET) Plant Species

The Temporary Sample Plot (TSP) data provides some information that can be used as an aid in determining the existence of rare or endangered species upon the FMA. The only caveat to this would be that the information applies primarily to forested landbase.

3.1.11 Fire

3.1.11.1 History

The recorded history of fire upon the FMA is short in comparison to the history of fire that has actually occurred across the landscape. The province has been collecting fire history data since the 1930s. Table 3-21 is the review of the fire history in the FMA since 1930. A map of the fire history by decade is in Map 3-8.

Table 3-21 Fire History of Alberta Since 1930 (Class "E' Fires ≥ 50 ha)

Decade	Area Burned (ha)	Number of Class 'E' Fires
1930-1939	0	0
1940-1949	44,338	18
1950-1959	30,030	11
1960-1969	4,152	3
1970-1979	0	0
1980-1989	1,278	1
1990-1999	8,556	4

3.1.11.2 Risk

Fuel Types

Weyerhaeuser has completed a Fuel Type Behavior Prediction (FBP) potential fuel type map (Map 3-9). Descriptions of the fuel types are provided in Table 3-22.

Table 3-22 Fire Behavior Prediction Relative Proportions

FBP Code	Fuel Type	% of FMA Area
C-1	Spruce-Lichen Woodland	0.60
C-2	Boreal Spruce	48.21
C-3	Mature Jack or Lodgepole Pine	6.44
C-4	Immature Jack or Lodgepole Pine	0.27
C-7	Ponderosa Pine-Douglas Fir	0.03
D-1	Leafless Aspen	25.58
M-1	Boreal Mixedwood-Leafless	6.10
NF	Non-Forested	5.30
O1a	Grass	6.76
S-1	Jack or Lodgepole Pine Slash	0.00
WA	Water	0.69
Unknown	N/A	0.01

Map 3-7 Leading Species

Map 3-8 Fire History

Map 3-9 Fuel Type – Fire Behavior Predictions (FBP)

Crowning Susceptibility Model (CroSuM)

The Crown Susceptibility Model (Table 3-23) utilizes AVI similar to the FBP system. The Model assigns an overall susceptibility rating to each AVI polygon based on a scoring range, spatially delineating those areas with the highest susceptibility to crowning. The model assesses AVI attributes associated with the components of crowning. These include cover type, crown closure (density), ladder fuels (vertical fuel continuity) and crown bulk density. Map 3-10 shows the CroSuM output for the unit.

Table 3-23 Crowning Susceptibility Rating Distribution in the FMA Area

Rank	% of FMA Area	FMA Area (ha)
Extreme	2.48%	12,630
High	25.05%	127,592
Low	23.21%	118,235
Moderate	38.48%	195,997
No Data	10.78%	54,918
Grand Total	**100.00%**	**509,372**

3.1.12 Insect and Disease History

Historically the FMA has been relatively free of large-scale devastating insect and disease infestations. As forests age, the potential is very high for biotic agents such as insects, diseases and animals to impact the timber resource.

The deciduous resource, which is generally mature to over-mature, is under the greatest threat as it is susceptible to stem decay. The impact of stem decay increases with the age of the tree. It is also susceptible to large outbreaks of defoliators such as the forest tent caterpillars, large aspen tortix, and the bruce spanworm. The regenerating stands are also susceptible to shepherd's crook and ungulate browse.

Numerous animals and pathogens impact the coniferous resource, the occurrence of which is not significant at this time.

Major Hardwood Insects and Diseases

The list below is not exclusive, but it summarizes the species that are perceived to be most threatening to the hardwood resource:

1. Defoliators [Forest Tent Caterpillar (*Malacosoma disstria*), Large Aspen Tortix (*Choristoneura conflictana*), Bruce Spanworm (*Operophtera bruceata*),
2. Shepherd's Crook (*Venturia macularis* and *populina*), and
3. Stem decay (*Phellinus tremulae* and *Peniophora polygonia*).

Major Softwood Insects and Diseases

The list below is not exclusive, but it summarizes the species that we perceive are most threatening to our softwood resource:

1. Mountain Pine Beetle (*Dendroctonus ponderosae*)
2. Armillaria Root Rot (*Armillaria*)
3. Root Collar Weevil (*Hylobius warreni*), and
4. White Pine Weevil—Terminal Weevil (*Pissodes strobi*)

Table 3-24 describes the potential impacts these species may have on the forest resource.

Table 3-24 Potential Impacts of Some Specific Species on the Forest Resource

Impact Agent	Impact
Hardwood Defoliators ▪ Forest Tent Caterpillar ▪ Large Aspen Tortix	Larval feeding causing defoliation may result in a reduction in growth and even mortality.
Leaf and Twig Blight of Aspen and Poplar (Shepherd's Crook)	Tender shoots of young trees are attacked and top growth is affected.
Stem Decay	Early decay will cause staining, but advanced decay will cause portion of stem to be unmerchantable. In addition, trees will be more vulnerable to breakage from windthrow if stem decay is advanced.
Ungulate Browsing	Young shoots are chewed off resulting in a reduction in growth and potential form problems.
Mountain Pine Beetle	This species can have devastating impacts as it will kill mature pine trees. This has been the case in B.C. and Banff National Park.
Armillaria Root Rot	This is thought to be one of the most important diseases in regeneration conifer stands as the disease can kill young trees. Larger trees can be infected, but generally this results in a reduction in growth.
Root Collar Weevil	Larva feed on the phloem in the root collar area, and will kill trees if feeding completely girdles the tree. Younger trees are more susceptible to dying.
Impact Agent	Impact
White Pine Weevil (Terminal Weevil)	This species attacks white spruce in Alberta, and damages the terminal leader causing a reduction in height growth, and potential forked tops.

Map 3-10 Crown Susceptibility Model CroSuM Ranking

3.2 Social Environment

3.2.1 Population Centres

The main population centre within the Forest Management Agreement area is the Town of Edson. The population of Edson in 1997 was 7,399, making it the third largest town in the Province of Alberta. There are also a number of very small communities scattered about the area. These include Marlboro, Obed, Millar's Lake, Pinedale Estates, Hattonford, Niton Junction, Carrot Creek, Nojack, Mackay, Peers and Cynthia (Figure 3-1).

Edson is located 200 kilometres west of Edmonton, 105 kilometres southwest of Whitecourt, and 90 kilometres east of Hinton.

3.2.2 Settlement History

3.2.2.1 Edson

Edson started out in 1910 as Heatherwood, a stopping point on the Grand Trunk Pacific (GTP) Railway line. It was renamed in 1911 in honour of Edson J. Chamberlain, General Manager of the GTP. On September 21, 1911, it was incorporated as the Town of Edson.

Edson was established at the beginning of the century as a consequence of railway construction. At the turn of the twentieth century, the railroad was generally the only means to move people and supplies through the country. The big push at the time was the development of the transcontinental railway to Vancouver through the Yellowhead Pass. The railway also brought with it demand for labourers for construction of the line, fuel (coal), and for building material (ties). The high demand for labour and the associated services swelled the population of Edson at the early stages of its development.

In 1938, Claynett Ltd. from Edmonton built a clay processing facility in Edson. This facility made use of local clay sources found by the McLeod River. The plant utilized the clay to process filtration clays for use in Turner Valley and for the refining of medicinal clays for toiletries and soaps; however operations lasted only several years before the facilities closed.

Lumber was also in high demand from this area. In 1938, there were 18 lumber camps scattered throughout the area.

Oil and gas became prominent players in the development of Edson in the 1960's with the construction of the Talisman Gas Plant. Major gas pipelines were also built through the area as gas was transported to Vancouver.

The population of Edson during the last 9 decades was as follows:

- 1911 - 800
- 1920 - 600
- 1930 - 1547
- 1951 - 2000
- 1961 - 3108
- 1975 - 4253
- 1981 - 5671
- 1997 - 7399
- 2001 - 8500

3.2.2.2 Carrot Creek

The name “Carrot Creek” is taken from the original name known as “Root River”, or the Cree term of “Oskatash-sipe”. The bitterroot plant, oskatask, grows along the creek bank, which the native Cree used for medicinal purposes.

Settlement of the area started shortly after the turn of the century, with the actual community starting around 1910-1912 when the railways passed through the area. The cutting of railroad ties created much of the employment in the early years. After 1919, demand for ties decreased, and a shift to sawmilling occurred. Many landowners purchased small sawmills to produce lumber for local use.

Discovery of oil and gas in 1963 introduced the area to the petroleum industry.

3.2.2.3 Marlboro

The hamlet of Marlboro owes it existence to the establishment of a cement plant owned and operated by the Edmonton Portland Cement Company. It commenced operations in 1913, but shut down due to market conditions in 1935. The smoke stack for the plant is still evident today from the Yellowhead Highway.

3.2.2.4 Coal Branch

Coal was discovered between 1906 and 1912 in the area know locally as the Coal Branch. Major coal discoveries included Mountain Park in 1909, Luscar in 1911, and Cadomin in 1912. Underground mining started shortly thereafter, but decreased substantially in the 1950s due to the conversion of locomotives from coal to diesel.

Today, two major coal mines, Coal Valley and Obed, operate within close proximity to the FMA. The Coal Valley facility has a capacity of 2.4 million tonnes per year. Between 1978 and 1996, the mine shipped over 30 million tonnes of coal to markets in North America and Asia to be used mainly by electrical power companies. The mine is an open pit operation, versus the underground method that was commonly used in the early part of the 20th century. The coal seams being mined range from two to nine metres in thickness.

3.2.2.5 Other Communities Past and Present

There are or were many small hamlets scattered throughout the area. They include:

- Anselmo (named after Anselmo, Nebraska, home town of the first post master)
- Cynthia
- Galloway (named after D.E.Galloway, assistant to the President of the Grand Trunk Railway)
- Haddock (named after Maude Haddock, local pioneer and first post mistress)
- Hattonford
- Mackay (named after J.C. Mackay, contractor for the CNR)
- Mahaska (named after a county in Iowa, that was originally named after an Indian Chief)
- McLeod Valley (named after the McLeod River, which was named after N. McLeod, a North West Company fur trader)
- Miller's Lake
- Niton (named after a Grand Trunk Railway contractor)
- Obed
- Peers
- Pioneer (previously known as Mussel)
- Shining Bank (name refers to the yellow clay bank of the hills, which shine like gold and is visible for kilometres)
- Yates (named after a chief clerk in the Treasurer's office of the Grand Trunk Railway)

3.2.3 Aboriginals

3.2.3.1 Alexis Nakota Sioux Nation

Based in Glenevis (Lac St. Anne), Alberta, the origin of the Alexis Stoney lies far to the east, where the Assiniboine group detached themselves from the rest of the Siouan family. Sioux is an abbreviation of Nadouessioux, a French corruption of the name (Nadowe-is-iw) given them by the Chippewa; it signifies snake or adder, and metaphorically enemy. Research among the Alexis people in the 1960s ascertained that the band is comprised largely remnants of the Wood or Swampy Ground Assiniboine described in various pre-reserve accounts of observers in the Edmonton area.

Hunting, trapping, fishing, and gathering in the parkland along the North Saskatchewan River formed the basis of their economic system. The current reserve is located approximately central to their pre-reserve territory which stretched possibly as far north as Lac La Biche and west into the Jasper National Park.

In the north, the three bands which came under Treaty Six all chose reserves in their traditional hunting areas. Alexis' band, with 42 families, took a reserve on the shores of Lac St. Anne, while Paul's band settled on Lake Wabamun. Initially, Sharphead's followers were at Pigeon Lake but when the fisheries failed in 1883, they were induced to take a reserve on Wolf Creek, just south of the present town of Ponoka.

3.2.3.2 The Métis Association of Alberta

The Métis people are recognized as one of Canada's three Aboriginal peoples in the Canadian Constitution. The Métis are the descendants of the children of First Nations people and the early European adventurers, explorers and fur-traders who came to Canada in the 17th and 18th centuries.

In 1938 the Alberta Government set aside twelve blocks of land in Northern Alberta specifically for the benefits of Métis people. The colony at Marlboro was one of four later rescinded by the Government of Alberta.

The Region III Council, based in Calgary, and Zone IV Council located in Edmonton represent the Métis people living within Weyerhaeuser's Edson Defined Forest Area.

3.2.4 Access History

The main access (excluding the railways) through the FMA is Yellowhead Highway #16 that provides access east and west to both Edmonton and British Columbia. Secondary Highways include #748 (Bear Lake Road, North Road), #47 (Robb Highway), #751 (Mackay Highway), #32 (Peers Highway) and #753 (Cynthia Highway). There are also many resource roads, including the Petro Can Road (W6), the Wolf Lake Road (W6 and E1), the Talisman Road (E1), and the Tom Hill Tower Road (E2).

3.2.5 Historical Use of the Forest

Aboriginal use of the area is not well recorded. The Wood Cree lived for some time in the Chip Lake area. Early trappers established trading posts in Edmonton (1795) and Jasper (1813). The Chip Lake area was a major source of beaver pelts during the fur trade era.

The area was generally settled by non-aboriginals at the beginning of this century. A second influx of settlers occurred in the 1930s, as people escaped the harshness of the dry prairie and came further west to re-establish themselves.

A great deal of the forest was exploited to produce railway ties for the two major railroads passing through the area at the turn of the century. As demand for ties diminished, small sawmills were set up to produce lumber for local use as well as for export.

Archeological and Historical Information

Archeological and historical features are protected through the Historical Resources Act of Alberta. Archeological resources are defined in the Act as, "a work of man that is primarily of value for its prehistoric, historic, cultural or scientific significance and is or was buried or partially buried in land in Alberta". A historic resource is defined in the Act as "any work of nature or of man that is primarily of value for its palaeontological, archeological, prehistoric, cultural, natural, scientific or aesthetic interest".

To date, 19 sites have been identified as containing archeological remnants. The sites are distributed in the following manner:

E1 - 5 sites
E2 - 12 sites
W5 - 0 sites
W6 - 2 sites

A majority of the sites (15) are classified as prehistoric, while the remainder is unclassified. The type of site is described as: isolated (3), campsite (8) or scattered (8).

Isolated Sites:	these generally contain small flakes found in isolated areas
Camp sites:	these types contain cultural material or fire cracked rocks
Scattered Sites:	material is collected along a transect

3.2.6 Historical Resources Predictive Model

On November 14th, 2000, the Assistant Deputy Minister of Alberta Community Development (ACD), Dr. W. J. Byrne, directed all forest companies to develop strategies to comply with the Historical Resources Act. (Letter from Les Hunt, ACD, to AFPA, November 7th, 2003). The Act protects and regulates palaeontologic, pre-historic and historic sites.

Following receipt of this letter, Weyerhaeuser, beginning in the spring of 2001, began actively formulating a company-wide strategy to deal with the Historical Resources Act. Other forest companies (Sundance Forest Industries, Ainsworth Lumber, and Alberta Plywood) were approached to participate in the development of a Regional Management System regarding these resources.

The final project encompassed two stages:

1. Overview information comprising currently known resources and a GIS based predictive model for individual FMAs.
2. A management system for historical resources.

Stage 1: Known Sites and Predictive Model [6]

For the Edson FMA, all known sites were identified and described. These known sites were used to calibrate the GIS predictive model to gain a level of confidence for applicability. The end result was a terrain (eg. Degree of slope, proximity to flowing water) based model “to predict the location of pre-contact archeological sites” (pg 56, Historical Resource Management System, Golder Associates. 2002). The model predicts the likelihood of resources being present in three categories: high, moderate and low. The model will be re-calibrated at the end of three years based on three years of field surveys.

[6] Weyerhaeuser Drayton Valley FMA Historical Resources Predictive Model. Nov. 2002. Golder Associates. Pp 101.

The model classified the FMA with regard to pre-contact historical archeological resources as follows: 8.5% classified as having high potential, 25.3% classified as having moderate potential, and 66.2% classified as having a low potential.

Map 3-11 is of the historic resources.

Stage 2: Management System [7]

The management responses expected are as follows:

- Areas of high potential: avoidance or referral to a historical resource consultant (archeologist) who will review the sites pre-activity during frost-free and snow-free conditions using aerial photography to direct the appropriate field inspections.
- Areas of moderate potential: avoidance; or referral to historical resource consultant for post-activity review during frost-free, snow-free conditions.

3.2.7 Demographics

The population of Edson is evenly split by gender. The town has a population that is generally young, with a large group of people in the twenty-five to forty-five age group. A demographic profile for the work force in the town of Edson is in Appendix 3-7. A figure showing the age-class distribution of the males and females in Edson is in Appendix 3-8.

3.2.8 Visual Resources

The FMA area is very diverse, with areas of flat muskeg interspersed with rolling terrain covered with lodgepole pine, trembling aspen and white spruce. Cultivated land can also be found interspersed throughout the landscape, but is more generally found along the major and secondary paved highways.

The FMA is divided roughly into north and south sections by the Yellowhead Highway. This is a heavily used highway with traffic traveling west into the foothills and the mountainous terrain of British Columbia, or east towards Edmonton and Eastern Canada. The first glimpse of the Rockies as one travels westward occurs east of Edson. Traveling from the north, the mountains come into view at the Fulham Hill.

The traffic on the Yellowhead is steady throughout the year. In the winter, traffic is heading into the mountains in pursuit of wintertime recreational activities, namely downhill skiing and snowmobiling. During the summer months, recreational vehicles tend to be the main mode of transport on the highway.

Visual landscape modelling has been used in specific harvest designs, primarily within the E2 FMU, where terrain is quite variable. Potential candidates in the FMA would include: Yellowhead Corridor, Shiningbank Hills, Obed Hills, and recreation sites, to name a few.

[7] Historical Resources Management System. Dec. 1992 Golder Associates, 85 pp.

3.2.9 Recreation Resources

3.2.9.1 Camping

The area supports a number of recreational camping areas. These include Obed Lake, Wolf Lake, and Fickle Lake, which are administered by Alberta Community Development, and Bear Lake, Shining Bank Lake, and Long Lake, which are administered by Yellowhead County.

3.2.9.2 Day Use Areas

There are a number of day use areas scattered along the Yellowhead Highway. These are generally used for quick stops to prepare meals and for short rests. The day use areas include Miller Lake, Hornbeck and Nojack.

3.3 Economic Resources

3.3.1 Forest Industry

The impact of the forest sector on the economic well being of the Province of Alberta as a whole, and to the Edson and District area in particular, has been well documented. According to the Alberta Forest Products Association, approximately two billion dollars is spent every year on salaries, construction, contracting expenses, research and development, and woodlands operations. In Alberta, approximately 48,000 jobs are tied to the forest industry. The forest industry generates more than $12 billion in revenue, and is a major economic contributor in about 50 towns and cities across the Province, with 12 communities considered forest dependent. Table 3-25 outlines a breakdown of spending by the forest industry in the Province.

The forest industry in the Edson Area is made up of a few large facilities and many smaller operators. There are in excess of 50 small facilities in relatively close proximity to the FMA (ASRD, 2000). Many of these facilities access timber from the FMA through the Community Timber Program, as well as from private land and industrial salvage. Some of these smaller operators have been in operation for several generations.

There are many wood processing facilities that rely on the flow of timber from the FMA. These facilities include pulp mills, sawmills, oriented strand board plants and post and pole operations, to name a few.

Table 3-25 Breakdown of Spending by AFPA Members in 1997

AFPA Membership Survey		
Expenditure Area	***Amount***	***Percent of Total***
➢ Salaries	$368,155,400	18.1%
➢ Capital Expenditures	$383,070,000	18.7%
➢ Property Taxes	$61,719,500	3.0%
➢ Energy Costs	$103,314,100	5.0%
➢ Woodlands Operations	$616,660,000	30.1%
➢ Road Construction	$22,813,900	1.1%
➢ Contracting Expenses	$480,002,500	23.5%
➢ Research and Development	$10,535,100	0.5%
TOTAL	**$2,046,270,500**	**100.0%**

Source: Alberta Forest Products Association

Table 3-26 lists the major facilities that utilize timber from the FMA.

Table 3-26 Major Wood Processing Facilities Accessing Wood from the Weyerhaeuser Edson FMA Area (m^3)

Wood Processing Facility	Type of Facility	Mill Production				Estimated Volume of Wood Produced from FMA		Mill Start-up Date
		Metric Tonnes Pulp	MM FBM Lumber	MM SF 3/8" OSB	MM SF 3/4" MDF	Conifer	Deciduous	
Alberta Newsprint Company(1)	Pulp Mill	245,000				80,456	N/A	1990
Blue Ridge Lumber(1981) Inc.	Sawmill		250			35,186	N/A	1975
Ranger Board	MDF Plant (3/4")				120			1986
Millar Western Forest Products Ltd.	Sawmill		198			1,306	N/A	1980
Millar Western Forest Products Ltd.	Pulp Mill	260,000				N/A	N/A	1988
Weyerhaeuser Edson	OSB Plant			415,000		N/A	181,513	1984
Weyerhaeuser Drayton Valley	OSB Plant			402,000		N/A	40,000	1987
Weyerhaeuser DV	Sawmill		157			122,718	N/A	1987

Map 3-11 Archeological Potential

In the Town of Edson, the economic affect of the forest sector is also evident. Table 3-27 outlines the affect of the tax base on the Town of Edson.

Table 3-27 Town of Edson Municipal Tax Breakdown for 1997

COMPANY	TAXES PAID ($)	PERCENT OF TOTAL
Weyerhaeuser	$516,510	15%
Telus	$118,698	3%
Northwestern Utilities	$67,704	2%
TransAlta Utilities	$64,079	2%
Nova Corp.	$48,668	1%
TransMountain Pipeline	$38,647	1%
Canadian National Railways	$38,924	1%
Superior Hotel (Guest House)	$32,436	0%
Oshawa Holdings (IGA)	$25,111	0%
Other Taxpayers – Residential	$1,697,901	50%
Other Taxpayers - Commercial	$615,511	18%
Other Taxpayers - Ind., Mach. and Equip	$112,127	3%
Other Taxpayers - Linear	$35,990	1%
Total Municipal Taxes	**$3,412,306**	**100%**

Source: Town of Edson

The Edson Weyerhaeuser OSB facility contributes substantially to the well being of the Town of Edson and Yellowhead County. The residences of the employees at the mill are equally divided between Edson and the County. Table 3-28 shows how the Edson Weyerhaeuser facility economically impacts Edson and the surrounding County.

Table 3-28 Economic Impact of the Edson Weyerhaeuser Mill Employees on the Town and County for the Period of 1990 through 1998

YEAR	WAGES	$ TO LOCAL VENDERS	TAX	# OF PEOPLE EMPLOYED
1990	6,158,000	-	362,000	-
1991	6,613,000	-	420,000	-
1992	7,509,000	-	424,000	144
1993	8,331,000	-	464,000	157
1994	8,709,000	-	498,000	160
1995	9,403,000	1,382,457	592,000	160
1996	9,539,000	2,271,022	586,000	163
1997	9,991,000	2,161,212	809,000	163
1998	10,724,000	1,884,000	683,000	169

Source: Weyerhaeuser

Weyerhaeuser is also an active member when it comes to community support. The company donates both money and material to non-profit organizations, individuals and groups seeking contributions from businesses in and around Edson.

Since 1995, the company has donated to a wide range of causes. Appendix 3-9 highlights those groups or individuals who have benefited from corporate donations.

Table 3-29 outlines the dollar value of contributions made on behalf of Weyerhaeuser since 1995.

Table 3-29 Total Value of Donations Made by Weyerhaeuser to Local Individuals or Organizations Between 1995 and 1999

YEAR	AMOUNT $
1995	11,354
1996	12,642
1997	13,544
1998	16,226
1999	25,117

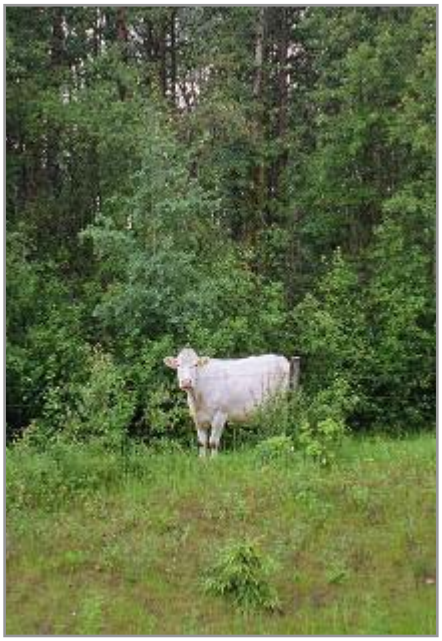
3.3.2 Tourism

Tourism continues to increase in importance throughout Alberta, and in particular the area surrounding Edson. The Yellowhead Highway is a part of the TransCanada Highway system. As a result, there is continuous traffic flowing through the area, traveling west to Jasper National Park and British Columbia, and east to Edmonton and beyond to Saskatchewan and eastern Canada.

A number of recreational activities and facilities have been established to capture some portion of this large economic potential. Some of the facilities include the East of Edson RV Park, Aspenhill Country Lodge, and Silver Summit.

Facilities originally constructed to serve the local community are also benefiting from increased tourism. These include the Hornbeck Cross-country Ski Trails and the local golf course.

3.3.3 Grazing



The grazing community utilizes the FMA mainly in two of the FMUs, those being E2 and W5, and minimally in E1 and W6. The disposition types include grazing permits, licenses and leases. Permits are based on one-year tenures, while grazing licenses and grazing leases are based on tenures of 10 years. Grazing dispositions are a fundamental necessity for some operators who rely on provincial lands to supplement the feeding of their cattle or horses during the summer months. Table 3-30 and Table 3-31 define the extent of grazing dispositions overlapping the FMA boundary. A map of the grazing dispositions is found in Map 3-12.

Table 3-30 Percentages of Area* Overlapped by Grazing Dispositions on the Conifer Landbase (1999)

Conifer Landbase						
FMU	**Net Landbase****	**Within FMA**	**Permits**	**Licenses**	**Leases**	**Total**
E1	37,364	99.90%	0.10%	0.00%	0.00%	100.00%
E2	20,954	92.02%	0.36%	6.43%	1.19%	100.00%
W5	15,349	89.58%	0.00%	8.32%	2.10%	100.00%
W6	87,249	99.53%	0.00%	0.46%	0.01%	100.00%
Total	160,916	157,050	112	3,025	729	

* as determined by Weyerhaeuser for the Preliminary Forest Management Plan
** as determined by the landbase assignment in the TSA

Table 3-31 Percentages of Area* Overlapped by Grazing Dispositions on the Deciduous Landbase (1999)

Deciduous Landbase						
FMU	**Net Landbase****	**Within FMA**	**Permits**	**Licenses**	**Leases**	**Total**
E1	17,295	99.85%	0.15%	0.00%	0.00%	100.00%
E2	46,451	85.40%	0.74%	11.03%	2.83%	100.00%
W5	17,408	71.98%	3.06%	18.97%	5.99%	100.00%
W6	38,989	97.82%	0.00%	1.98%	0.20%	100.00%
Total	120,143	107,560	903	9,198	2,482	

* as determined by Weyerhaeuser for the Preliminary Forest Management Plan
** as determined by the Timberline net down process in the DFMP

3.3.4 Trapping

Traplines cover all of the FMA (Map 3-13). The activity upon individual traplines varies dramatically, with some areas being trapped regularly, while others have only sporadic trapping pressure applied.

The type of fur pursued annually varies, with the main harvested species being marten, mink, fox, wolf, lynx, fisher, otter, and beaver.

3.3.5 Oil and Gas Processing Facilities

One of the most prominent land uses on the FMA area is oil and gas development. The area overlaps, in whole or in part, six defined oil and gas fields. Development is intensive in some portions of the area and can have a significant impact on forest management, as well as contributing to the cumulative impact on other resources. Continuing development for oil and gas resources is expected.

As shown in Table 3-32 and Table 3-33, the intensity of industrial development varies significantly across Landscape Management Units with fewer developments and less linear disturbance in the Moose Creek and Beaver Meadows LMUs. The variation is graphically described in Figure 3-14 and visually on Map 3-14. The intensity of oil and gas development in the LMUs will influence the forest management practices that will be implemented.

Table 3-32 Oil and Gas Developments on the FMA Area

LMU	Wellsites		Public Facilities		Other Industrial Sites	
	No.	Total Area (ha)	No.	Total Area (ha)	No.	Total Area (ha)
Beaver Meadow	158	222.5	0	0.0	9	19.40
Carrot Creek	66	104.8	2	16.0	4	11.80
Cynthia	1525	3108	10	7.5	119	183.10
Edson	261	399.1	6	251.8	6	91.60
Moose Creek	221	354	0	0.0	20	40.00
Wolf Creek	271	1118	0	0.0	35	232.20
EntireFMA	**2502**	**5306.4**	**18**	**275.3**	**193**	**578.1**

Source: GISMO

Map 3-12 Grazing Dispositions

Map 3-13 Registered Fur Management Areas

Map 3-14 Industrial Landuse

Table 3-33 Linear Disturbance on the FMA Area

LMU	Roads (km)	Cutlines (km)	Pipelines (km)	Total linear disturbance	Linear disturbance/km^2
Beaver Meadows	178.9	931	160.2	1270.1	3.71
Carrot Creek	168.9	1581	112.27	1862.1	4.99
Wolf Lake	486.3	3608	540.7	4635	5.21
Moose Creek	598.2	3288	617.2	4472.9	3.95
Edson Unit	432.4	5053	518	6257.8	5.55
Cynthia	1440	6566	2005	9313	7.13
Entire FMA	**3304.7**	**21027**	**3953.37**	**27810.9**	**5.38**

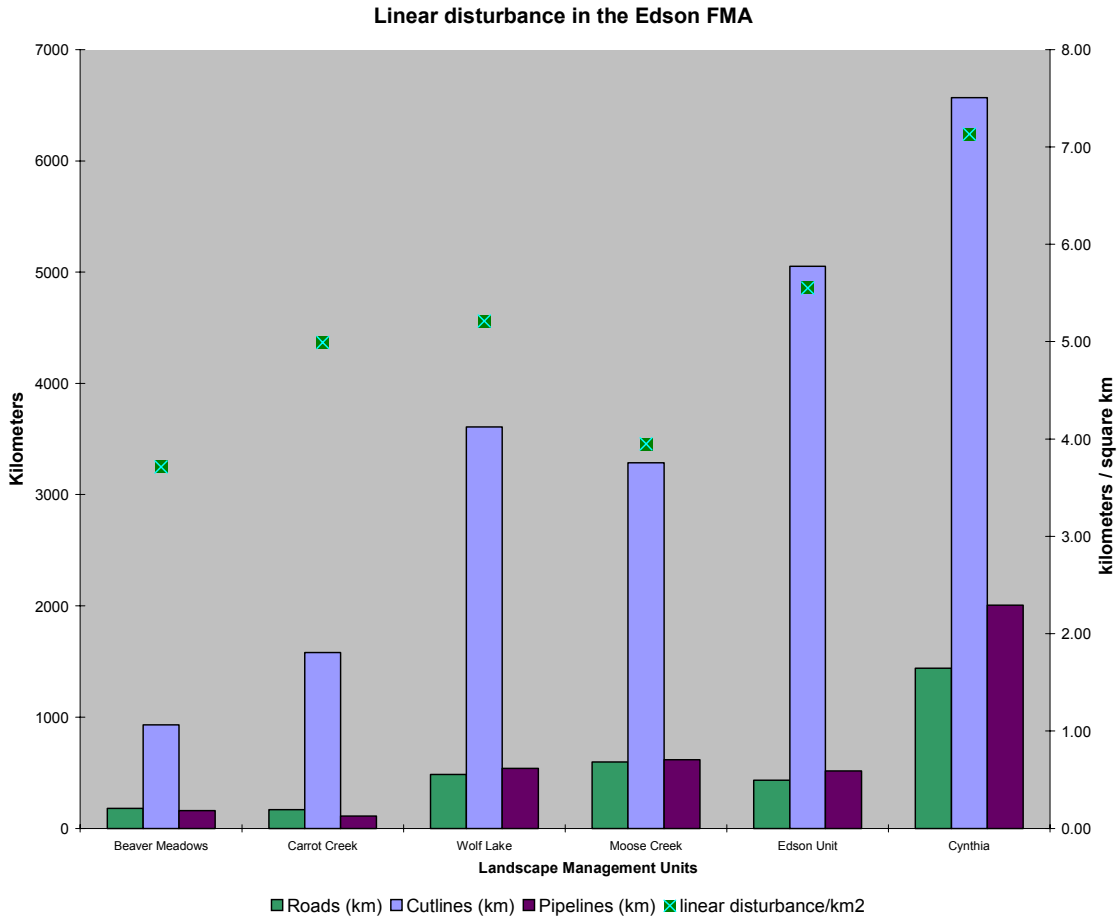


Figure 3-14 Linear Disturbance on the FMA Area (2004)

3.3.6 Hunting, Guiding and Fishing

The Edson Weyerhaeuser FMA is a popular area for fishing and hunting. From 1997 to 1999 an average of 1804 moose hunters and 4333 elk hunters per year hunted the five Wildlife Management Units (WMUs) within the FMA (Fish and Wildlife Division, unpublished data).

Within the established hunting WMUs, there are a number of active guiding outfits. These outfits obtain substantial economic benefit by providing guiding services to out-of-province and non-residential hunters who hunt throughout the FMA.

A survey conducted in 1994 by Fish and Wildlife Division, Fisheries Management Division, reported that 455,495 angling days (9% of the provincial total for the year) occurred in Fish Management Area 4. The FMA comprises about 15% of this Fish Management Area. As well, three of the 14 most popular rivers for fishing in the Province of Alberta are within or adjacent to the FMA. These were the Athabasca, McLeod and Pembina rivers.

4 WEYERHAEUSER FOREST MANAGEMENT PHILOSOPHY AND THE PLANNING PROCESS

4.1 Weyerhaeuser Philosophy

Weyerhaeuser prides itself in being a progressive company, responding to the needs and desires of a very large constituency. This constituency is comprised of its parent company, Weyerhaeuser Company Limited, based in Tacoma, Washington, and its international shareholders, employees, suppliers and customers. The people of Canada and Alberta, and more particularly, the local Edson and District populations are also members of Weyerhaeuser's constituency.

Natural resources can also be defined as being constituents of Weyerhaeuser. Currently, all land where timber is harvested by Weyerhaeuser in the Province of Alberta is public land, held in trust for the betterment of the people of Alberta. These natural resources include air, soil, water, flora and fauna.

Weyerhaeuser's vision statement is:

"To be the best forest products business in the world and a global leader among all industries".

Associated with this vision is the mission to:

"Produce superior returns for shareholders by focusing on our customers and working safely to:

- *grow and harvest trees,*
- *manufacture and sell forest products, and*
- *build and sell homes".*

Mindful of these statements, Weyerhaeuser's Environmental Policy is:

"It is Weyerhaeuser's core policy that employees at all levels will work to ensure that we comply with applicable environmental laws, regulations and other requirements to which the company commits, and to continually improve our environmental performance wherever we do business.

Employees are accountable for ensuring compliance with applicable laws and for managing and operating our businesses to conform to the company's goals of:

- *Practicing sustainable forestry.*
- *Reducing pollution.*
- *Conserving natural resources through recycling and waste reduction.*

Expectations

In conducting our business, we are committed to:

- *Understanding and responding to public-health and environmental impacts of our operations and our products.*
- *Ensuring employees are trained and empowered to actively participate in the company's environmental management process.*
- *Actively supporting environmental research and technological advancement and, where appropriate, adopting innovative practices and technology.*
- *Promoting the development and adoption of environmental laws, policies and regulations that are balanced, are technologically sound, and use incentive-based approaches for improving environmental performance.*
- *Managing forestlands for the sustainable production of raw materials while protecting water quality; fish and wildlife habitat; soil productivity; and cultural, historical and aesthetic values.*
- *Continually improving our processes for reducing wastes and emissions to the environment.*
- *Conserving energy and natural resources be maximizing recycling and byproduct reuse.*
- *Using the company's environmental management systems to manage the environmental aspects of all timberlands and manufacturing operations.*
- *Adopting internal standards for situations not adequately covered by law or regulation or where we believe more stringent measures are necessary to protect the environment."*

Weyerhaeuser's overall management approach is to practice sustainable forest management, which is defined as:

> *"Weyerhaeuser manages its forests for the sustainable production of wood and wood products that meet our customers' needs. We are committed to independent certification of our forest management and to meet the principles and objectives of applicable forest certification systems. The elements of Weyerhaeuser's standard apply to company-owned and –managed lands worldwide.*
>
> - *We harvest at sustainable rates over the long term.*
> - *We encourage the use of nontimber products and services from the forest.*
> - *We reforest promptly after harvesting by planting within the first available planting season, not to exceed 24 months, or by planned natural-regeneration methods within five years or as provided in an applicable license.*
> - *We employ reliable processes in using forest chemicals to meet our silvicultural and environmental objectives in compliance with applicable laws, best management practices (BMPs), and label directions and in conformance with applicable certification standards.*

- *We protect soil stability and ensure long-term soil productivity by using equipment and practices appropriate to the soil, topography and weather to minimize erosion and harmful soil disturbance.*
- *We use forestry practices and technology to retain organic matter and soil nutrients.*
- *We maintain healthy forests and minimize losses caused by fire, insects and disease.*
- *We meet or exceed applicable water-quality laws and BMPs to protect water quality, water bodies and riparian areas.*
- *We protect water quality by practicing sound road construction and maintenance.*
- *We protect a diversity of habitats for wildlife and contribute to conservation of biological diversity through practices or programs that address habitat diversity and conservation of plants and animals at multiple scales in accordance with applicable certification programs or other locally accepted standards.*
- *We protect threatened and endangered species and cooperate with government agencies to determine how our forestlands can contribute to their conservation.*
- *We consider aesthetic values by identifying sensitive areas and adapting our practices accordingly and in conformance with applicable certification standards.*
- *We identify special ecological, geologic, cultural and historical sites and manage them in a manner appropriate for their unique features.*
- *We minimize waste in our harvesting".*

4.1.1 Environmental Management System (EMS)

Weyerhaeuser has established and implemented an Environment Management System (EMS) as of 2002. The EMS outlines standards and procedures for its employees and contractors to achieve the requirements of the company's Environmental Core Policy. Employees are accountable for the company's environmental performance and compliance with environmental legal requirements. Forestlands' functions, activities and tasks are guided by clearly defined guidelines and operational controls.

4.1.2 CSA Certification

In 2002, Weyerhaeuser, using the Forest Advisory Committee (WeyFAC) for public input, developed a Sustainable Forest Management Plan (SFMP) reflecting public values, objectives, indicators and targets to CSA standard Z809-96. The plan was reviewed and updated in 2004.

In 2005, the SFMP was reviewed and updated to the newer CSA standard Z809-02, again using WeyFAC to provide input into the plan.

Generally the SFMP takes direction from the DFMP. However, in the future, the SFMP will influence revisions to the DFMP and associated ground rules.

4.2 Scope of Planning

The scope of planning for the management of forest resources on the Edson Forest Management Agreement area is:

> **To plan for forest harvesting and renewal activities and their integration with other forest values until the next DFMP, which is scheduled for submission no later than June 30th, 2014, is approved.**

In concert with this scope is Weyerhaeuser's intent to plan for and practice sustainable forest management that strikes a balance between ecological, societal, and economic values. Identifying the desired balance of values and adopting an appropriate management strategy to deliver these values is the purpose of the management planning process.

4.3 Resource Analysis

The resource analysis component of developing the management plan has been an iterative process of applying alternative strategies in order to meet a set of objectives related to the goals. Each successive iteration had adjustments made to either the objectives or the strategies, or both. Finally, a set of objectives and strategies was selected that best met the intent of the goals.

Figure 4-1 demonstrates the relationship of the resource analysis process in the management planning process.

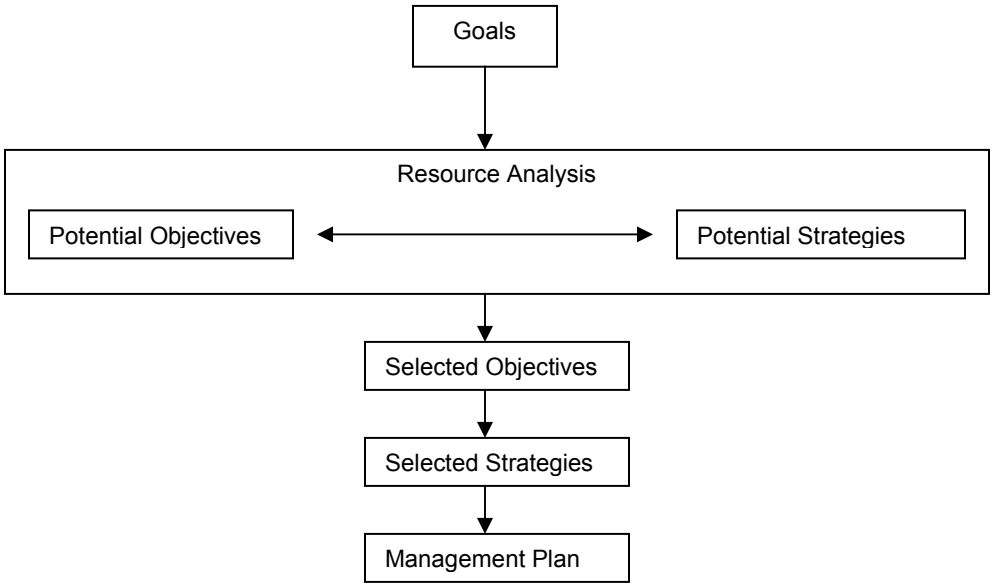


Figure 4-1 Management Planning Process

4.4 Management Approach

Weyerhaeuser practices the principle of adaptive management (Figure 4-2). Adaptive management can be described as a learning approach to management that incorporates the experience gained from the results of previous actions and decisions. Our application of adaptive management has the following elements:

- objective driven - the management plan is a series of activities that result in meeting a set of desired forest conditions and benefits;
- strategic and operational links - the strategic plan provides relevant direction for operational plans;
- monitoring - key result variables are monitored to assess the accuracy of forecasts; and
- analysis and adjustment - plans are renewed based on the knowledge gained through analyzing the variance between forecast and actual responses.

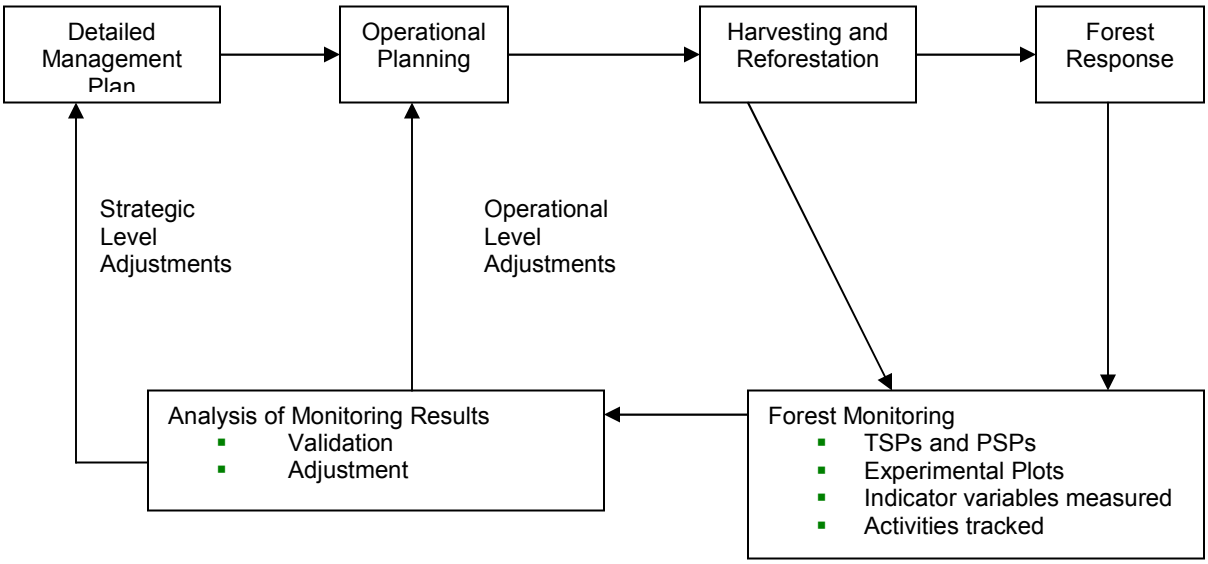


Figure 4-2 Adaptive Forest Management

5 RESOURCE MANAGEMENT GOALS

Upon signing the FMA document in June of 1997, Weyerhaeuser prepared a Preliminary Forest Management Plan (PFMP—June 1998) for the Crown's approval (received February 1st, 1999). The PFMP's goals, objectives and strategies reflected those found in the approved or draft versions of the Forest Management Unit (FMU) plans at the time. The intent of the PFMP was to provide direction for harvesting and reforestation activities on the FMA for an interim period until the Detailed Forest Management Plan (DFMP) was approved and implemented.

5.1 Previous Plans

5.1.1 Forest Management Unit (FMU) Plans

The over-riding objective of older Forest Management Unit (FMU) plans was the management of Alberta's timber land base to establish and maintain "sustainable timber supplies" to meet present and future demand, while also ensuring resource integration to achieve maximum public benefit. FMU plan objectives were either Provincial or localized in nature.

Provincial Objectives:

Provincial objectives from older plans were consistent throughout Alberta. The following objectives were present in the E1, E2 and W5 FMUs:

- To identify a timber land base for the planned harvest of coniferous and deciduous timber, recognizing the multiple resources of the forest,
- To ensure that the planned utilization of Alberta's forest resources is based on the most recent forest inventory provided by Phase III,
- To determine a level of harvest that recognizes forest industry and community needs as well as a high level of timber utilization,
- To renew existing quotas based on the revised Annual Allowable Cut (AAC) for a second 20 year term effective May 1st, 1986 according to the provisions of the Quota Policy and the Guidelines for the establishment of long-term timber supply levels in Alberta,
- To allocate and sequence the approved AAC, and
- To sustain and enhance timber yield through prompt reforestation, stand management, and afforestation of non-stocked lands.

Specific Objectives of the E1 FMU (approved 1986)

The following objectives were specific to the E1 FMU:

- To define a timber land base that considers multiple resources including water, recreation, grazing, fish, and wildlife,
- To establish the utilization of coniferous timber at the 15+/11 cm. Standard for all quota holders,
- To integrate deciduous and coniferous timber harvesting operations within overlapping spheres leading to a fuller utilization of the E1 AAC,

- To provide existing quota holders with the size and quality of coniferous timber that suit the existing manufacturing facilities, including posts and poles, railway ties, dimension lumber, and woodchips,
- To provide Weyerhaeuser with the size and quality of deciduous timber required for the manufacture of oriented strand board,
- To average haul distances and associated costs for each quota holder, and
- To provide the established group of local timber permittees and local residents with both coniferous and deciduous timber suitable for their own use or re-sale to existing sawmill operators and Weldwood of Canada Ltd.

Specific Objectives of the E2 FMU (approved 1986)

The following objectives were specific to the E2 FMU:

- To determine a timber land base that considers multiple resources including water, recreation, grazing, fish, and wildlife,
- To establish the utilization of coniferous timber at the 15+/11 cm standard for quota holders,
- To integrate deciduous and coniferous timber harvesting operations within overlapping spheres leading to a fuller utilization of the E2 AAC,
- To provide the quota holders with the size and quality of coniferous timber required for the manufacture of dimension lumber, post and pole, rails, and wood chips,
- To provide Weyerhaeuser with the size and quality of deciduous (aspen) timber required for the manufacture of oriented strand board (OSB), and
- To provide the established group of local timber permittees and local residents with both coniferous and deciduous timber suitable for their own use or resale to existing sawmill operators and Weldwood of Canada Ltd.

Specific Objectives of the W5 FMU (never approved)

The following objectives were specific to the W5 FMU:

- To create a new W5 FMU to replace the old FMU which has been amalgamated with W4 and W7 to form W9,
- To provide the local residents with both coniferous and deciduous timber suitable for their own use or re-sale to existing sawmill operators and Weyerhaeuser's Oriented Strand Board (OSB) plant,
- To re-allocate the timber resources in the new W5 FMU area as the result of the amalgamation of the old W5 FMU with W7 and W9,
- To utilize this FMU plan as part of the timber management input into the Cold Creek and Whitecourt-Blue Ridge Integrated Resource Plans,
- To review this plan in 1991 and 1996, and if necessary, to recalculate the AAC and adjust the AAC allocations, since this unit is fully committed,
- To integrate coniferous and deciduous timber harvesting within overlapping MTU/DTA spheres leading to a fuller utilization of the W5 AAC, and
- To provide Weyerhaeuser with the size and quality of deciduous timber required for the manufacture of OSB.

Specific Objectives of the W6 FMU (never approved):

The draft FMU plan for W6 was never completed. The AAC for the unit was derived from the timber supply analysis done by Alberta Sustainable Resource Development. The planning document, including objectives for the unit, was never completed.

5.1.2 Weyerhaeuser FMA Preliminary Forest Management Plan (1998)

In the Preliminary Forest Management Plan, a goal was defined as: *"a broad, general statement that describes a desired state or condition related to one or more forest values".*

The following goals provided guidance for forest management activities for the duration of the PFMP:

1. To sustain the timber resource,
2. To integrate other resource values associated with the FMA area,
3. To continue to make available a timber supply from the FMA area, and
4. To increase our knowledge and skills in forest management.

Strategies were defined as: *a statement of the broad activity or mind-set designed to achieve the goals.* The following strategies guided forest management activities for the duration of the PFMP:

1. To follow existing legislation and policy,
2. To adopt the timber supply analysis from the existing Forest Management Unit Plans,
3. To support forest research, and
4. To implement innovative forest management activities.

Objectives were defined as clear, specific statements of results or conditions to be achieved through implementation of the management plan. The following objectives guided forest management activities for the duration of the PFMP:

1. Harvest levels will be those identified in the Forest Management Unit (FMU) plans for E1, E2, W5 and W6,
2. The allocation of harvest volumes will be determined by the Forest Management Agreement, Deciduous Timber Allocations, Coniferous Timber Quotas and permits,
3. Timber will be harvested according to the planned sequence,
4. Timber operators will plan and operate in compliance with the Alberta Timber Harvest Planning and Operating Ground Rules,
5. Operational plans will address recommendations brought forward in the referral process,
6. Operations will comply with approved plans,
7. Weyerhaeuser's Enhanced Forest Management trials will be implemented,
8. Stands will be reforested to reflect C and D density levels,

9. Reforestation tactics will provide for a balance of regenerating stand types that generally reflects the species composition of pre-harvest stands,
10. The regeneration of stands will be initiated within two years of harvest, and
11. Operational plans will address the concerns of all stakeholders.

5.2 National and International Planning Scenarios

The inclusion of Sustainable Forest Management in the FMA has been the result of an evolutionary process. In 1987, the Brundtland Commission released a report entitled "Our Common Future", which focused on the world's forests and sustainable development. Further to this, in 1992, the United Nations Conference on Environment and Development, known as the "Earth Summit", was held in Rio De Janeiro, Brazil. At the summit, world leaders committed to sustainable development that combined economic development, social needs, and ecosystem maintenance.

In 1992, following this International lead, Canadians, represented by the Canadian, Provincial, and Regional Governments, as well as non-government organizations, signed the Canada Forest Accord. This accord outlined the commitment to achieve sustainable forest management in Canada. This same group also made commitments to a National Forest Strategy, entitled "Sustainable Forests: A Canadian Commitment", which outlined values, goals and a number of action items for Canada. These action items included the completion of an ecological classification of forest lands, a network of protected areas representative of Canada's forests, a desire to broaden the inventory of other forest values, and the development of a set of national indicators to measure sustainable forest management.

In 1995, the Canadian Council of Forest Ministers (CCFM) produced a list of criteria and indicators that would aid in the achievement of sustainability of Canada's forests. The criteria and indicators framework listed the following six criteria:

1. Conservation of biological diversity,
2. Maintenance and enhancement of forest ecosystem condition and productivity,
3. Conservation of soil and water resources,
4. Forest ecosystem contributions to global ecological cycles,
5. Multiple benefits to society, and
6. Accepting society's responsibility for sustainable development.

Attached to these six criteria were 22 elements and 83 indicators.

The Edson Detailed Forest Management Plan utilizes local values as the criterion for establishing goals. From these goal statements arise the objectives, strategies and tactics that will guide the management activities upon the FMA until the next Detailed Forest Management Plan is approved. Indicators, or the measurable variables, are assigned to each objective.

5.3 Detailed Forest Management Plan Values and Issues

During the development of this plan, a number of values and issues were identified. A value is defined as ***"a principle, standard, or quality considered worthwhile or desirable", while an issue is described as "a matter of wide public concern"***.

A number of avenues were used to arrive at an extensive array of values and issues present throughout the FMA. These avenues included:

- mailed out surveys to the Edson Weyerhaeuser Mill employees
- mailed out surveys to staff at Alberta Sustainable Resource Development (ASRD)
- surveys placed in the two local Edson newspapers
- surveys distributed to the Weyerhaeuser Forest Advisory Committee (WeyFAC)
- surveys distributed during the Edson and District Sustainable Communities Initiative Summit for the Vision 2025 Project
- open houses in Edson, Fulham and Mackay
- a Citizenship survey conducted by Weyerhaeuser in 1996
- ongoing discussions with WeyFAC

The values and issues identified by the above process are listed in Appendix 5-1. The values identified are grouped into three main categories:

- ecological
- economical
- societal

5.3.1 Ecological Values and Related Issues

The identified ecological values focused on the themes of wildlife and wildlife habitat, fish and fish habitat, diversity of the forest for forest flora and fauna, ecosystem integrity, and preservation of natural sites for future generations.

Some of the related issues for these ecological values were:

- amount and distribution of wildlife and wildlife habitat
- creating extensive long term access that increases pressure on wildlife and their habitats
- protection of riparian zones for fisheries
- increased erosion causing sedimentation in watercourses
- damage to the environment through logging practices
- decreased species diversity due to forestry practices
- the availability of some old growth forest
- the impairment of water quality and quantity
- the cumulative impact of many users on the forest ecosystem

- sustainability of the resource
- reforestation efforts
- lack of diversity in cutovers
- use of herbicides
- introduction of genetically modified trees

Ecological values will be integrated into the planning process through guidelines that are based on the following principles:

1. Maintain landscape diversity and stand structure within the range of natural variability,
2. Conserve habitat for threatened and endangered plant and wildlife species, and
3. Minimize the potential impact of forest harvesting on other values (e.g. watershed, wildlife, water, etc.).

5.3.2 Economic Values and Related Issues

The identified economic values focused on the themes of sustainability, multiple use, and economic benefits from the forests from both primary and secondary users.

Some of the related issues for these economic values were:

- profits being put before people,
- logging industry having too much power,
- manage for more than just timber,
- economic impact on other users of the forest,
- efficient utilization of forest resources, and
- impact on grazing and agriculture.

Economic values will be integrated into the planning process through guidelines that are based on the following principles:

1. Adoption of a management strategy that recognizes economic needs of other stakeholders, and
2. Provision for an acceptable return to Weyerhaeuser shareholders with respect to fibre supply from the FMA while recognizing that other companies have similar respective principles.

5.3.3 Societal Values and Related Issues

The identified societal values focused on the themes of aesthetics, access, recreation, enjoyment of the forest, and public information and input.

Some of the related issues for these societal values are:

- clear cutting,
- pollution,
- poaching,
- public awareness of logging and reforestation activities,
- too much access into the forest,
- meaningful public input,
- access management,
- log haul safety,
- maintaining current access through the forest i.e. for hiking, quading, snowmobiling, cycling, horseback riding,
- reforestation standards,
- aboriginal and cultural uses, and
- keeping areas clean and tidy.

Societal values will be integrated into the planning process through:

1. A public involvement process that ensures the public has an opportunity to convey to Weyerhaeuser their issues and concerns on forest management; and
2. Adherence to government legislation and policy.

5.4 Proposed Goals

Ecological, societal and economic values will be represented in the management planning process by a series of goals, with associated objectives, strategies and tactics (Chapter 7).

The following goals will be in place for the duration of the planning period.

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.

The intent of Goal #1 is to:

- Recognize the values of jobs, economic distribution, and supply of wood,
- Provide an acceptable return to Weyerhaeuser's shareholders,
- Provide an economic return to Alberta,
- Maintain Weyerhaeuser's economic viability in order to contribute to the local economy,
- Maintain access to and security of the timber resource,
- Provide for low cost, good value timber, and
- Recognize the rights and needs of other timber operators.

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

The intent of Goal #2 is to:

- Recognize the values of: biological diversity, wildlife and habitat, old growth, protected areas, ecosystem integrity, trees, and vegetation,
- Conserve habitat for rare and endangered species,
- Maintain habitat for all plants and animals,
- Improve knowledge of ecological processes and the responses of fish and wildlife to forest management activities, and
- Maintain biodiversity and old growth across the landscape.

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

The intent of Goal #3 is to:

- Recognize the value of soil productivity,
- Maintain soil productivity, and
- Maintain nutrient cycling processes.

Goal 4: Maintain the process and function of watersheds.

The intent of Goal #4 is to:

- Recognize the values of: water quality, fisheries, water quantity, healthy watersheds, and functional riparian areas,
- Maintain the structure and function of riparian areas, and
- Maintain within the natural range of water quantity and quality.

Goal 5: Improve public acceptability of forest management activities.

The intent of Goal #5 is to:

- Recognize the values of: education and public information
- Obtain input and advice from the public on forest management activities,
- Communicate with the public to improve understanding about the forest and forest management activities,
- Demonstrate commitment to and progress towards improving skills in forest management and knowledge of ecosystem process,
- Recognize and align practices with social values, and
- Manage in a socially acceptable manner.

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

The intent of Goal #6 is to:

- Recognize the values of: multiple use, aesthetics, recreation, tourism, safe enjoyment of forest, camping and related activities, access,
- Cooperate on access issues related to forest management activities,
- Work cooperatively with other resource users,
- Minimize impacts on potential recreational and tourism opportunities
- Minimize visual impacts,
- Cooperate with all land neighbors, and
- Work proactively to build mutually beneficial relationships with First Nations and Métis groups.

Goal 7: Protect unique archeological and ecological sites.

The intent of Goal #7 is to:

- Recognize the value of protection of unique sites, and
- Protect or conserve significant ecological and archeological sites as they are identified.

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

The intent of Goal #8 is to:

- Recognize the values of reforestation and long-term sustainability,
- Improve timber utilization,
- Improve forest yield,
- Decrease loss of timber from natural causes, and
- Maintain or increase the area of forested land that is dedicated to timber production.

APPENDIX 1-1

WEYERHAEUSER EDSON FOREST MANAGEMENT AGREEMENT # 9700035

APPENDIX 1-2

TERMS OF REFERENCE OF THE WEYERHAEUSER, QUOTA HOLDER AND COMMUNITY TIMBER PERMIT PROGRAM SUBGROUP

TERMS OF REFERENCE
OF THE WEYERHAEUSER,
QUOTA HOLDER AND COMMUNITY TIMBER
PERMIT PROGRAM SUB-GROUP

FOR THE DEVELOPMENT OF THE

EDSON FOREST MANAGEMENT AGREEMENT #9700035

DETAILED FOREST MANAGEMENT PLAN

Weyerhaeuser Canada (Alberta)

JUNE 1, 1998

Prepared by: Paul Scott
Forest Management Planner
Weyerhaeuser Canada

TABLE OF CONTENTS

1. INTRODUCTION

With the signing of the Edson Forest Management Agreement, Weyerhaeuser accepted the responsibility of forest management planning on an area previously administered by the Province of Alberta.

As planning affects other timber operators within the FMA, it became paramount that they be involved in the planning process. With this in mind, a majority of operators were contacted to solicit direction as to their involvement in the development and review of the detailed plan. The individuals contacted showed interest in the formation of a sub-group that would be their avenue for input into the planning process .

2. STRUCTURE OF THE SUB-GROUP

On April 30th, 1998, representatives of the Quota Holders and the Community Timber Permit Program (CTP) that operate within the boundaries of Weyerhaeuser's Edson FMA met to establish a Terms of Reference for the sub-group.

Table 1 lists the timber operating companies and communities that lie within Weyerhaeuser's FMA boundaries.

Table 1: Quota holders and Community Timber Program (CTP) advisory communities within the boundaries of the Edson FMA

QUOTA HOLDER/CTP
Alberta Newsprint Co.
Blue Ridge Lumber Inc.
Edson Timber Product Ltd.
Millar Western Ltd.
CTP Edson
CTP Cold Creek

The sub-group will review the plan sections as they are prepared by the Lead Planning Team. The Lead Planning Team (Table 2) is responsible for developing the plan to the point were input and review is required.

Table 2: Weyerhaeuser Edson Forest Management Plan Lead Planning Team

TEAM MEMBER	DESIGNATION
Tom Varty – Weycan	Woodlands Manager
Paul Scott - Weycan	Forest Management Planner
Neil Stevens - Weycan	Timber Supply Analyst
Bruce MacMillan - Weycan	Silviculture Forester
Luigi Morgantini - Weycan	Forest Ecologist
Norm Volk - Weycan	GIS coordinator
Ian Whitby - Weycan	Forest Management Planner
John Witham - LFS	Timber Management Forester
Jan Edmonds - NRS	Biologist
Wayne Johnson - LFS	Silviculture Forester

Figure 1 shows the structure of the planning team and the relationship of the sub-group to the planning team.

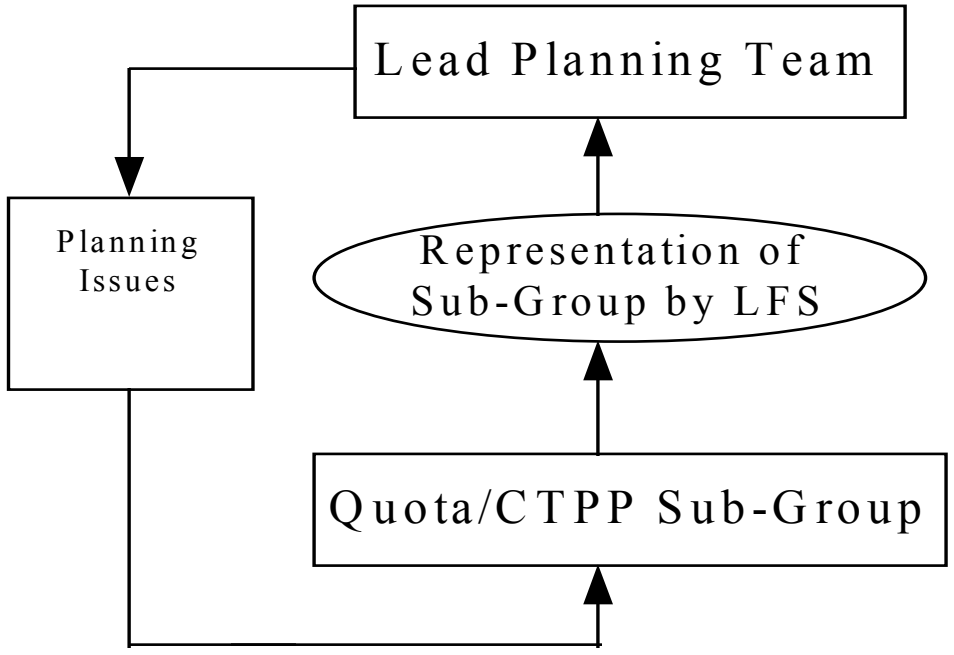


Figure 1. Planning Team Structure

3. TERMS OF REFERENCE OF THE SUB-GROUP

5.5 3.1 Purpose:

A.) To provide input and review of the Detailed Forest Management Plan, and

B.) To define the opportunities for input and the products for review.

5.6 3.2 Members

Table 3 lists the organizations and representatives that will be involved in the sub-group

Table 3: Representation within the Quota Holder\ CTP Sub-Group

Organization	Representative
Alberta Newsprint Co.	Greg Branton
Blue Ridge Lumber Inc.	Daryl D'Amico
Edson Timber Product Ltd.	Dave Chaluk
Millar Western Ltd.	Jonathan Russell
CTP Edson - small manufacturers	John Nyssen
CTP Edson - small loggers	Erich Ploentzke
CTP Cold Creek	Brett Foisy
Weyerhaeuser Canada	Paul Scott
Weyerhaeuser Canada	Neil Stevens
Weyerhaeuser Canada	Tom Varty
Land and Forest Division	John Witham
Land and Forest Division	Wayne Johnson

5.7 3.3 Member responsibilities

As stated in the Interim Forest Management Planning Manual - Guidelines to Plan Development - April 1998, "This review and facilitation process is done on the principle that all parties will be reasonable in their expectations and activities during the plan review and approval". Specific timelines will be expected to be met so that the planning process can move along in an orderly fashion.

3.3.1 Quota Holders:

The Quota Holder representatives are expected to represent the interest of their company. The individual(s) must have the authority of the company they represent in making decisions that will be binding.

3.3.2 CTP Members:

The representatives of the Community Timber Program (CTP) are expected to represent the interest of the users of the Community Timber Program, and be able to make decisions that are binding. The member(s) must be able to dedicate sufficient time to the process to allow for the required knowledge base to be established and maintained.

3.3.3 Weyerhaeuser:

The representatives from Weyerhaeuser are expected to represent the interest of the company in the discussions, with the understanding that Weyerhaeuser is the author of the Detailed Forest Management Plan, and has the greatest cumulative stake in the process. The individual(s) must have the authority of the company in making decisions that will be binding.

3.3.4 Land and Forest Division:

Representatives of the Land and Forest Division are expected to participate in the discussion in a manner that they act as a resource to the group. They will ensure that the direction of the sub-group stays within the boundaries of Provincial Acts and Regulations, and Provincial policies. The Forest Division will be expected to represent the issues and positions of the sub-group to the Lead Planning Team.

4. GROUND RULES

A. Meetings will be held on an as-needed basis

B. The recording of minutes will be the responsibility of Weyerhaeuser. Minutes will be sent out to all participants after each meeting, and checked for accuracy at the commencement of the next scheduled meeting.

C. Action commitments will be identified and tracked in the minutes.

D. The next meeting's agenda will be sent out with the minutes from the previous meeting.

5. CONFLICT RESOLUTION

Where a dispute arises between two or more parties, the issue will be identified to the sub-group. The following steps will then be used to resolve the dispute:

- proponents of a recommendation or view will supply a written submission to the Regional Director outlining the recommendation or view, along with accompanying documentation, within 5 working days;
- opponents of the recommendation or view will supply a written submission to the Regional Director outlining their objections to the recommendation or view, along with supporting documentation, within 5 working days;
- the Regional Director will review the documentation as provided, and shall submit, to all members of the sub-group, a written declaration outlining the Provinces position in regards to the dispute, within 20 working days of the dispute being identified;
- the decision of the Regional Director will be binding upon all parties.

4. CONCLUSION:

None of these options precludes the opportunity of communicating or meeting independently with Weyerhaeuser's planning staff or the Lead Planning Team.

The greatest desire for Weyerhaeuser is that all players have an opportunity for input into the planning process, with the understanding that there is a finite opportunity for input. To ensure a smooth transition from the Preliminary Forest Management Plan to the Detailed Forest Management Plan, it is hoped that this process will aid in the eventual acceptance of the plan by the Land and Forest Division and the Natural Resource Services, and in turn, by the People of Alberta.

APPENDIX 1-3

MEETINGS OF THE QUOTA HOLDER SUBGROUP

DFMP SUB-GROUP ACTIVITIES

ORGANIZATION	REPRESENTATIVE
Weyerhaeuser	Paul Scott Tom Varty Neil Stevens Bruce Macmillan Glenn Buckmaster – Contactor
Alberta Newsprint Company .	Jim McCammon Greg Branton
Blue Ridge Lumber	Daryl D'Amico Brian Davies Tim Burns
Millar Western Industries	Jonathan Russell
Edson Timber Products Ltd.	Dave Chaluk
Cold Creek MTU	Brett Foisy John Giezen Laurie Camps
Edson Small Loggers Assn.	Erich Ploentzke Kelly Fluet Dave Cobb
Edson Small Manufacturers Assn.	John Nyssen
PLFD	John Witham – Yellowhead District Kevin Vander Haeghe – Foothills Bill Tinge – Foothills Margarete Hee – Northern East Slopes Region Stephen Wills – Edmonton Jack Heidt - Edmonton
F&W	Jan Ficht

The following activities occurred during the development of the 2001 DFMP:

DATE	ACTIVITY	PARTICIPANTS	COMMENTS
April 30, 1998	Sub-Group Initial Meeting: • Review of the Preliminary Forest Management Plan	Paul Scott, Neil Stevens, Don Sarin, Wayne Johnson, Dave Chaluk, Erich Ploentzke, Daryl D'Amico, Brett Foisy, Greg Branton, John Nyssen Minutes by Michelle Andersen	The group reviewed the PFMP and supplied comments. Discussed the scope of this group, and the development of a Terms of Reference also
May 29, 1988	Sub-group meeting • Review Terms of Reference for the DFMP • Review the Terms of Reference to the Sub-group	Paul Scott, John Nyssen, Erich Ploentzke, Dave Chaluk, Greg Branton, Ian Whitby, Neil Stevens, John Witham, Daryl D'Amico, Wayne Johnson Absent: Jonathan Russell, Brett Foisy, Tom Varty Minutes by Michelle Andersen	The Group approved the Terms of Reference for this group. Approved the Terms of Reference for the DFMP
September 15, 1998	W6 creek classifications	Mailed out to: Greg Branton, Daryl D'Amico, Jonathan Russell, Brett Foisy, John Witham	Maps sent out highlighting creek classification in the W6 FMU.
November 18, 1998	Permanent Sample Plot manual sent out	Mailed out to: Greg Branton, Daryl D'Amico, Dave Chaluk, Jonathan Russell, Brett Foisy, John Nyssen	PSP manual outlines Weyerhaeuser data collection criteria
March 12, 1999	Ecosite classification document mailed out	Mailed to: Greg Branton, Daryl D'Amico, Jonathan Russell, Brett Foisy, John Nyssen, Erich Ploentzke, John Witham, Dave Chaluk	For information only.
April 28, 1999	Sub-group meeting • Review Psp program • Review Tsp program • Review Regenerated Stand Surveys • Review Section 2: Influences for the DFMP • Review Section 5: Goals for the DFMP	Paul Scott, Bruce MacMillan, Jim McCammon, Jonathan Russell, Dave Chaluk, John Nyssen, John Witham, Erich Ploentzke, Brett Foisy, Tom Varty, Steve Wills Absent: Daryl D'Amico, Neil Stevens, Margarete Hee Minutes by Michelle Andersen	PSP manuals sent to all timber operators Weyerhaeuser discussed doing approximately 2000 plots this yield (TSP's) Bruce did a presentation on Weyerhaeuser's Mixedwood Management Philosophies Weyerhaeuser lead a discussion of the Eight goals established to date.
June 10, 1999	Sub-group meeting Review goals from last meeting Identification of upcoming issues with this group	Paul Scott, John Nyssen, Tom Varty, Neil Stevens Absent: Margret Hee, Bruce MacMillan, Jim MacCammon, Jonathan Russell, Dave Chaluk, John Witham, Erich Ploentzke, Brett Foisy, Stephen Wills Minutes by Paul Scott	Discussion on the goals presented at the last meeting. Discussion on the Mixedwood presentation of last meeting. Listing of upcoming issues

DATE	ACTIVITY	PARTICIPANTS	COMMENTS
January 18, 2000	Sections 2 and 3 mailed out for review and comments	Mailed to: Greg Branton, Daryl D'Amico, Jonathan Russell, Dave Chaluk, Erich Ploentzke, John Nyssen and Brett Foisy	Input requested by March 1, 2000 at the latest.
February 2, 2000	Sub-group meeting Discussion on the Goals, Objectives and Strategies of the DFMP	Paul Scott, Tom Varty, Neil Stevens, Jim McCammon, Daryl D'Amico, Jonathan Russell, Erich Ploentzke, John Nyssen, John Witham, Brett Foisy, Margret Hee, Jan Ficht, Kelly Fluet Absent: Dave Chaluk Minutes by Michelle Andersen	Review of Goals, Objectives and Strategies with Tactics to follow next meeting.
March 7, 2000	Sub-group meeting: Discussion on revised Goals, Objectives and Strategies, as well as tactics	Paul Scott, Neil Stevens, John Witham, John Nyssen, Erich Ploentzke, Kelly Fluet, Ray Hilts (in place of D'Amico) Absent: Tom Varty, Jim McCammon, Brett Foisy, Margarete Hee, Jan Ficht. Minutes by Michelle Andersen	Review Section 5 of the Draft DFMP (goals, objectives, strategies and tactics) with changes being made to the document and sent out to group as version#4.
June 12, 2000	Half day meeting with BRL and ANC at the Weyerhaeuser office in Edson. Topics covered land base determination, past logging history, inventory	Paul Scott, Tom Varty, Neil Stevens, Jim McCammon, Daryl D'Amico Minutes by Paul Scott	Minutes were sent out. Both ANC and BRL sent e-mails clarifying positions according to minutes, however minutes weren't changed.
June 23, 2000	Presentation on Net land base determination, Mixedwood management model, and silviculture regimes	Paul Scott, Tom Varty, Neil Stevens, Bruce MacMillan, Jim McCammon, Daryl D'Amico, Margarete Hee, Jan Ficht, John Witham, John Nyssen, Erich Ploentzke, Brett Foisy, Kelly Fluet, Jonathan Russell, Brian Davies (BRL), Geoff Clarke(Timberline) Missing: Dave Chaluk, Stephen Wills Minutes by Michelle Andersen	The dispute mechanism was invoked for three areas of concern: 1. AVI 2. Quota commitments 3. AAC's embedded within the goals statement
July 13, 2000	Review of planning protocols, and strategies for the base run	Paul Scott, Tom Varty, Neil Stevens, Bruce MacMillan, Jim McCammon, John Witham, John Nyssen, Kelly Fluet, Stephen Wills, Brian Davies (BRL), Geoff Clarke (Timberline) Missing: Dave Chaluk, Daryl D'Amico, Margarete Hee, Jan Ficht, Jonathan Russell, Erich Ploentzke, Brett Foisy Minutes by Krista Beier	Reviewed protocols from the previous FMU plans. Discussed and agreed upon baseline run protocols.

DATE	ACTIVITY	PARTICIPANTS	COMMENTS
August 10, 2000	Reviewed the following: • Silviculture decision matrix • Regenerated stand analysis • Yield curve development • Alternative scenerios	Paul Scott, Tom Varty, Bruce MacMillan, Jim McCammon, John Witham, John Nyssen, Fred Priesley Wright, Kelly Fluet, Brian Davies (BRL), Geoff Clarke (Timberline), Frank Lui (Timberline), Stephen Wills, Darren Tapp Missing: Dave Chaluk, Neil Stevens, Jonathan Russell, Erich Ploentzke, Darly D'Amico, Jan Ficht, Margarete Hee Minutes by Michelle Andersen	Revised several baseline protocols. Discussed the letter from Mike Poscente. Bruce wrote another letter concerning the use of Smrs versus the regenerated stand data. No feedback to date. Concerns raised by forest service regarding the desire by some companies to apply for carryover in W6, and the implied impact of doing so. Jim and Darrly to revise alternative scenerio based on Franks presentation of the yield curve development.
August 23, 2000	List potential alternate scenerios for the W6 FMU	Paul Scott, Daryl D'Amico, Jim McCammon, Geoff Clarke (Timberline)	Reviewed proposal by Jim and Daryl regarding the subsequent runs in W6. Outlined potential alternative runs beyond the baseline run (see fileW:/fma/planning/dfmp/tsa/alternate runs in w6.doc for details)
Sept. 6, 2000	Ecosite Classification – Site logix Landbase netdown Regeneration analysis	Paul Scott, Bruce MacMillan, Jim McCammon, Fred Priestly-Wright, Kelly Fluet, Rob O'Keefe (Timberline), Frank Liu (Timberline), Stephen Wills, John Beckingham, Brian Westlowski, Mitch Yaremko, Vince Krebbs, Dave Kent, Mark Messmer, Luigi Morgantini, Don Carr, Jack Heidt, Doug Walker, Missing: Dave Chaluk, Jonathan Russell, Daryl D'Amico, Jan Ficht, Margarete Hee, John Nyssen, Brett Foisy, John Witham, Tom Varty Minutes by Michelle Andersen	Scenarios provided by ANC were reviewed for opportunity of further work.
September 20, 2000	Landbase netdown Alternate Scenarios	Jan Ficht, Andre Bachman, Bruce MacMillan, Mark Messmer, Jack Heidt, Jim McCammon, Daryl D'Amico, Stephen Wills, Geoff Clarke, Paul Scott, Margarete Hee, Kelly Fluet, Brain Oaks, John Nyssen. Missing: Tom Varty, Dave Chaluk, Jonathan Russell, Brett Foisy, John Witham Minutes by: Michelle Andersen and Laurie Schneider	General reviews of the netdown process and some preliminary AACs. Further review of alternate scenarios.

DATE	ACTIVITY	PARTICIPANTS	COMMENTS
October 13, 2000	Field trip to review moderate and marginal stands	Paul Scott, Tom Varty, Bruce MacMillan, Mark Messmer, Jim McCammon, Daniel Chicoine, Daryl D'Amico, Stephen Wills, Jack Heidt, Darren Lapp, John Witham, Kelly Fluet	The group went to a number of level 2 and 3 (moderate and Marginal sites) in w6. At the end the day, only BRL, ANC said they would operate those type of stands.
October 24, 2000	Alternative Scenarios	Geoff Clarke, Daryl D'Amico, Jonathan Russell, John Witham, Margarete Hee, Jan ficht, Stephen Wills, Jack Heidt, Luigi Morgantini, Bruce MacMillan, Fred Priestly-Wright, Paul Scott, Mark Messmer, Kelly Fluet, Jim McCammon Missing: Tom Varty, Dave Chaluk, John Nyssen, Brett Foisy Minutes by: Michelle Andersen and Laurie Schneider	Presentation by Geoff on netdowns and Scenarios to date, with associated AACs.
November 7, 2000	Alternative Scenarios	Daryl D'Amico, Geoff Clarke, Paul Scott, Fred Priestly-Wright, Jack Heidt, Stephen Wills, John Nyssen, Kelly Fluet, Mark Messmer, Tom Varty, Margarete Hee, Jan Ficht, Missing: Dave Chaluk, Bruce MacMillan, Jim McCammon, Brett Foisy Minutes by: Laurie Schneider	Weyerhaeuser reviews additional options. It was decided to write Poscente a letter stating progress to date, outlining Weyerhaeusers position that it has reviewed enough scenarios and it is time to pick a preferred scenario.
November 22, 2000	Mailed out section 4, "Philosophy" and section 5 "Goals" to all Quota Holders and CTP groups	Daryl, Jim, Jonathan, Dave Chaluk, John Nyssen, Brett, Fred, and Kelly	No comments back by December 7, 2000
November 22, 2000	Mailed out Section 7 "Objectives and Strategies" for the DFMP	Daryl, Jim, Jonathan Russell, Dave Chaluk, John Nyssen, Brett, Fred, and Kelly	Comments received from Fred and Jonathan, with deferral of comments from Jim and Daryl

DATE	ACTIVITY	PARTICIPANTS	COMMENTS
December 12, 2000	Alternate Scenarios Poscente letter Carryover volumes	Paul, Tom, Jan, Jack, Geoff Clarke, John W., Stephen, Kelly, John N., Daryl, Jim, Mark, Rob O'Keefe, Absent: Jonathan, Dave, Erich, Bruce, Brett, and Fred. Minutes by Laurie Schneider	The group reviewed Poscente's Dec. 11 letter. Several items need to be clarified by the LFS in response to Jim's concerns. Reviewed current status of scenarios and first opportunities to look at alternate flow policies. Reviewed impacts of carryover wood. Operators agreed to carryover any volume over next ten-year period to smoothen out the impacts, especially in W6, a unit already under duress.
Jan. 11, 2001	Section 7: Objectives and strategies of the DFMP Alternate scenarios	Paul Scott, Tom Varty, Jonathan Russell, Jim McCammon, Daryl D'Amico	Group reviewed Section 7 of the DFMP (objectives and strategies for Goal #1 only); editorial changes made Quota holders requested landbase data to do a shadow analysis of the TSA. Weyerhaeuser said they would get back to. Discussed the preferred scenario (minimum block size and deviation period: companies would reply.
February 1, 2001	Meeting with MW, ANC and BRL for objectives and strategies (section 7)	Paul Scott, Jonathan Russell, Daryl D'Amico, Jim McCammon	Discussed opportunity to inclusion of additional objectives under goals 1 and 8 Quota holders to supply comments on goals, objectives and strategies by February 9, 2001
June 27, 2001	Meeting with MW, ANC, BRL, WY and LFS to review sequencing strategies for W6	Ray Hilts, John McCaully, Jim McCammon, Greg Branton, Daryl D'Amico, Tim Burns, Paul Scott, Mark Messmer, John Witham	Talked in general terms about where companies wanted to access their volumes from in W6. In general, everyone wanted the average profile, no better or worse. Mark to provide data to show the average over the next 15 years.

The following activities occurred after the submission of the 2001 DFMP and prior to the submission of the 2005 DFMP:

DATE	ACTIVITY	PARTICIPANTS	COMMENTS
Dec 6, 2001	Meeting between SRD and Weyerhaeuser	Bob Winship, Fulton Smyl, Bruce Macmillan, Doug Sklar, Daryl Price, Stephen Wills, Robert Stokes	Review issues outstanding from both the Edson and DV DFMP submissions. • Separation of DFMP TSA and W6 Quota Holder activities with Forestry Corp Inventory deficiencies
Spring 2002	Forestry Corp investigation of W6 timber Supply	ANC, BRL and MWI	W6 Quota Holder hired Ted Gooding from Forestry Corp to run a series of alternative scenarios for W6
June 10, 2002	SRD response to W6 Quota Holder/ Forestry Corp proposal	Doug Sklar	Accepted 4 items for Weyco when re-doing the TSA.
March 16, 2004	Review of updated W6 Net Down Process	Paul Scott, Fulton Smyl, Greg Branton, Daryl D'Amico, Brian Davies, Bill Tinge, Raymond Low, Stephen Wills, Glenn Buckmaster	Review of W6 net landbase with Quota Holders: differences between 2001 and 2004
June 2, 2004	Review of Minimum harvest ages for Conifer in W5	Paul Scott, Glenn Buckmaster, John Giezen, Laurie Camps	Reviewed opportunities to change minimum harvest age for the new DFMP from where we were in 2001
Dec 14,2004	Net landbase review	Paul Scott, Glenn Buckmaster, Jack Dickson, Dave Cobb, John Giezen, Laurie Camps, Wayne Tetz, Greg Branton, Kevin Vander Haeghe, Stephen Wills, Jan Ficht, Daryl D'Amico, Brian Davies, John Nyssen	Review of Net Down
May 20, 2005	AAC review	Paul Scott, Glenn Buckmaster, John Giezen, Wayne Tetz, Daryl D'Amico, Tim Burns, Bill Tinge, Peter Winther, Amanda Hamelink, Dave Cobb, John Nyssen	Review of AAC to date; SHS to be sent out to all operators for review; draft version of volumes I and III distributed for comments;
July 2005	Spatial Harvest Sequence Review	Bill Minary for W5 and W6 CTP groups, Paul Scott; review with Peter Winter from ANC	Minary: Comments on SHS; nothing outstanding, generally good to go ANC; adjustments made to the SHS to account for South Rat Creek design and remainder of the Wolf Lake LMU
July 28, 2005	SHS review in E2	Dave Cobb, John Nyssen, Paul Scott, Glenn Buckmaster	Review opportunities to enhance E2 SHS; if <2% impact based on manipulation of SHS, then OK
September 20, 2005	SHS review of W6	Paul Scott, Tim Burns	Review of opportunities for SHS in the Carrot Creek LMU for BRL. Will make suggested changes for one final run.

DATE	ACTIVITY	PARTICIPANTS	COMMENTS
November 2, 2005	Review of Volumes I and III by timber operators	Greg Branton, Daryl D'Amico, Jonathan Russell, Dave Cobb, Dave Chaluk, John Giezen, Wayne Tetz, Kevin Vander Haeghe, Steve Wills	Request that comments to plan be returned to Paul by November 18th ▪ ANC comments received Nov. 20 ▪ BRL ▪ MWI ▪ EDFOR ▪ CCTL ▪ Cold Creek CTP ▪ ETP
November 14, 2005	Review of AAC and Preferred scenario	Paul Scott, Glenn Buckmaster, Kevin Vander Haeghe, Amanda Hamelink, Greg Branton, Brian Davies, Daryl D'Amico, Dave Cobb, John Giezen, Greg Behuniak, Rick Watson, Fulton Smyl	Review of the TSA in entirety, with focus on the preferred scenario, and the resulting AAC and SHS.
January 13, 2006	Reviewing Outstanding concerns from review of Nov. 1, 2005 of Volumes I and III ▪ Silviculture Strategies Table ▪ Alternative Regeneration Standards	Paul Scott, Bruce Macmillan, Steven Wills, Dave Cobb, Greg Branton, Daniel Chicoine, Brian MacDonald	Silviculture Strategies Table amended with agreement from timber operators; Bruce to take to Marty Obyrne for SRD sign-off
January 26, 2006	Review Outstanding concerns from review of Nov. 1, 2005 of Volumes I and III ▪ Temp road monitoring Protocol ▪ Conifer Understorey Protection ▪ Incidental replacement strategy ▪ Marginal stands ▪ Industrial activity ▪ Structure retention ▪ Old growth strategy ▪ Quota holder involvement ▪ Monitoring	Paul Scott, Greg Branton, Daryl D'Amico, Dave Cobb	Points 3-10 from Jan 13 agenda reviewed ▪ Generally two areas of disagreement continue, those being merchantable structure retention, and conifer understorey protection

APPENDIX 1-4

DISPUTE RESOLUTION FOR THE QUOTA HOLDER SUBGROUP

APPENDIX 1-5

WEYERHAUESER FAC DOCUMENTS SUPPORTING PUBLIC INPUT INTO THE DFMP

WEYERHAEUSER FOREST ADVISORY COMMITTEE

ANNUAL REPORT

SEPTEMBER 2003 TO JUNE 2004

TABLE OF CONTENTS

LIST OF APPENDICES

1 INTRODUCTION

The Weyerhaeuser Forest Advisory Committee (WeyFAC) was established in March of 1998. The Committee is an integral part of Weyerhaeuser's public involvement process, as outlined in the approved Public Involvement Plan (revised September 1, 2001).

The Committee members are selected one of several ways:

1. Representative organizations are approached to join the Weyerhaeuser Forest Advisory Committee. Interested organizations are asked to nominate individuals that would attend meetings on a regular basis to represent the views of the organization.
2. Individuals (Members-at-Large) from the community are approached by Weyerhaeuser to be on the Committee.
3. Interested individuals can approach Weyerhaeuser, who will forward their names to the current Committee for acceptance.

The Committee has both voting and non-voting members. Voting members are those individuals that represent an organization or are Members-at-Large. Non-voting members include the facilitator, Weyerhaeuser Forestlands Staff, and the Management Planning Forester of Sustainable Resource Development.

During the year the Committee has been involved in the CSA process of developing a Sustainable Forest Management Plan for the Edson Defined Forest Management Area.

2 SCHEDULED MEETINGS

WeyFAC met 10 times over a span of 10 months, starting in September of 2003. Table 1 summarizes meeting dates and attendance of voting members during the reporting period. Table 2 summarizes attendance of voting members since inception of the Committee.

Table 1 Meeting dates and attendance records for the past reporting period (voting members only)

MEETING DATE	ATTENDANCE
September 10, 2003	9/14
October 08, 2003	9/14
November 12, 2003	7/14
December 10, 2003	7/14
January 14, 2004	7/14
February 11, 2004	7/14
March 12, 2004	10/14
April 16, 2004	6/14
May 14, 2004	10/14
June 11, 2004	8/14

The average attendance figure during the year for voting members was 57%, with a range of 43% to 71%.

Table 2 Attendance records for all reporting periods (voting members only)

97/98	98/99	99/00	00/01	01/02	02/03	03/04
83%	61%	73%	63%	68%	73%	57%

Michelle Andersen provided facilitation while Laurie Schneider took the minutes of each meeting.

3 PRESENTATIONS

Many issues have been identified and prioritized over the years. The following list of presentations has addressed some of the issues. Weyerhaeuser has also presented portions of the proposed Detailed Forest Management Plan (DFMP) to the group. During 2002 and 2003, the group was heavily involved in creating the Sustainable Forest Management Plan (SFMP) for the Edson Defined Forest Area (DFA).

March 1998 to June 1998

- Preliminary forest management plan review: Paul Scott (APRIL 1998)
- Information about the FMA: Paul Scott and Andre Bachman (APRIL 1998)
- Sustainable yearly harvest: Neil Stevens (MAY 1998)

September 1998 to June 1999

- Grazing dispositions: Cam Lane (OCTOBER 1998)
- Forest Resource Enhancement: Dave Kent (NOVEMBER 1998)
- Municipal Infrastructure: Steve Lamaroux (DECEMBER 1998)
- Integration of timber operators: Paul Scott (JANUARY 1999)
- Exceptions - Provincial Ground Rules: Paul Scott and John Witham (FEBRUARY 1999)
- Goals, values and issues for the Detailed Forest Management Plan: Paul Scott (MARCH-MAY 1999)
- Field Trip: Tom Varty and Paul Scott (JUNE 1999)

September 1999 to June 2000

- Presentation on Watershed Analysis: Richard Rothwell (SEPTEMBER 1999)
- Presentation on Mixedwood Management: Bruce MacMillan (OCTOBER 1999)
- Review of the 1999 ForestCare Audit: Don Carr (NOVEMBER 1999)
- Review of the Public Involvement Plan: Paul Scott (DECEMBER 1999)
- Wildlife: Luigi Morgantini (JANUARY 2000)
- Goals, objectives and strategies: Paul Scott (FEBRUARY 2000)
- Overview of ISO, CSA and FSC: Don Carr (MARCH 2000)
- Fire History: Peter Murphy (APRIL 2000)
- Riparian management: Lorne Fitch (APRIL 2000)
- Fire Management: Ray Olsson (MAY 2000)
- Field trip: Electro-fishing and mill tour (JUNE 2000)

September 2000 to June 2001

- Ecosite Classification System - John Beckingham, Geographic Dynamic Corp.(SEPTEMBER 2000)
- Timber Supply Protocols – Mark Messmer, Weyerhaeuser (OCTOBER 2000)
- Regenerated Stand Analysis – Paul Scott, Weyerhaeuser (OCTOBER 2000)
- Riparian Management/ Old growth – Luigi Morgantini, Weyerhaeuser (NOVEMBER 2000)
- Status of the Timber supply analysis – Paul Scott, Weyerhaeuser (DECEMBER 2000)
- Detailed Forest Management Plan – Paul Scott, Weyerhaeuser (JANUARY 2001)

- Chip Lake Bird Study – Dave Stepniski, Masters student, University of Alberta (FEBRUARY 2001)
- Environmental damage on Private Land – Mark Chileen, Weyerhaeuser (MARCH 2001)
- Advanced fire planning – Herman Stegahouse, Dennis Cox, LFS (APRIL 2001)
- Independent Sustainability critic – Jim Schleck, Natural Resource Services (MAY 2001)
- Alberta Conservation Association – 2000 Fisheries Study – Rich Rudolf (MAY 2001)
- Field trip – flight to Deer Hill, Pioneer Site, Whitecourt Mountain, Tom Hill Tower (JUNE 2001)

September 2001 to April 2002

- Ground Rules (OCTOBER 2001/ MARCH 2002)
- Yellowstone to Yukon (Y2Y) (NOVEMBER 2001)
- Resource Road Planning – John Kerkhoven (DECEMBER 2001)
- Cumulative Impacts – Dan Farr (JANUARY 2002)

May 2002 to June 2003

- CSA Terms of Reference (MAY 2002)
- CSA Matrix of Values, Goals, Indicators and Objectives (MAY 2002)
- CSA Matrix (JUNE, JULY, AUGUST, SEPTEMBER 2002)
- Biological Diversity – Luigi Morgantini (SEPTEMBER 2002)
- Forest Genetics – Pat Wearmouth (SEPTEMBER 2002)
- Watershed monitoring – Pat Wearmouth (SEPTEMBER 2002)
- CSA Matrix (OCTOBER, NOVEMBER, DECEMBER 2002)
- Watershed Monitoring – Dr. Rich Rothwell (DECEMBER 2002)
- Review of Sustainable Forest Management Plan (MARCH, APRIL, MAY 2003)
- Field trip to the Nojack Thinning Trails (JUNE 2003)

September 2003 to June 2004

- Central Rockies Wolf Project - Margaret Kidner (SEPTEMBER 2003)
- Countervail Duties – Mark Storie (ASRD) and Bob Winship (Weyerhaeuser) (OCTOBER 2004)
- Oil Field Reclamation – Bill Tinge (ASRD) (DECEMBER 2003)
- World Wolf Conference – Margaret Kidner and Wilma Behrens (DECEMBER 2003)
- Sustainability – Bruce Macmillan (Weyerhaeuser) (JANUARY 2004)
- Watershed Issues - Rich Rothwell (Watertight Solutions) and George Sterling (ASRD – Fisheries) (FEBRUARY 2004)
- Herbicides – Milo Mihajlovich (Vegetation Management Specialist) (MARCH 2004)
- Forest Advisory Group Study Results – John Parkins (MARCH 2004)
- Herbicides – Dave Kent (Weyerhaeuser) (APRIL 2004)
- Sustainable Forest Management Plan – Paul Scott (MAY 2004)
- Joint Field Trip with DV Advisory Group – Tree Improvement Centre and herbicide treatment areas (JUNE 2004)

4 Sustainable Forest Management Plan

During the development of the Sustainable Forest Management Plan for the Edson Defined Forest Area (DFA), a number of concerns/deficiencies arose that were brought forward at the end of the process. The following list briefly identifies these issues, however offers no response at this time:

- Need benchmark areas of an appropriate size.
- Sustainability for the mill when 45% of the raw material is accessed from outside the DFA.
- Smoke (air pollution) as a result of slash pile burning.
- Base line data collection by watershed monitoring.
- Lack of technical knowledge of some forest practices.

5 WeyFAC Impacts on Weyerhaeuser operations

During the summers of 2000 thru 2003, Weyerhaeuser supported the Alberta Conservation Association in assessing fisheries and their habitats in the following waterways: Trout Creek, Bigoray River and Rodney Creek in 2000; Groat and Rat Creeks in 2001; Wolf Creek and it's tributaries in 2002; and Paddy creek with three unnamed creeks just to the north of Paddy Creek in 2003. This information will be used as baseline data for future reference. It can also be compared to previously collected Provincial data.

Weyerhaeuser has also committed to an ongoing inventory of all watercourse-crossing structures. Sites will be visited annually until Weyerhaeuser has received final clearance from the Land and Forest Division.

The Detailed Forest Management Plan has now been submitted. Members had opportunities to review, in detail, the proposed goals, objectives and strategies that will guide forest management upon the FMA in the current decade.

Members actively participated in the development of the Sustainable Forest Management plan in developing the Values, Indicators and Objectives for the plan.

6 CONCLUSIONS

WeyFAC held a total of 10 meetings in this reporting period (September 2003 to June 2004). The following issues were discussed:

- Herbicides
- Sustainability
- Water quantity and quality

The last session for the year involved a field trip to the Tree Improvement Center and past herbicide treatment areas.

APPENDIX 1

WEYFAC - Weyerhaeuser Forest Advisory Committee

ORGANIZATION	NAME
VOTING MEMBERS	
Yellowhead County	Bill Velichko
Town of Edson	Carlo Klemm
Town of Edson (alternate)	Jim Gomuwka
Alberta Trappers Ass.	Margaret Kidner
Alberta Trappers Ass. (alternate)	Wilma Behrens
Education	Rob Jolly
Recreation	Errol Bowren
Oil and Gas	Ron Christie
Grazing Community	Lee Davis
Quota Holder	Daryl D'Amico
Quota Holder (alternate)	Dave Chaluk
Edson MTU	John Nyssen
Cold Creek MTU	Laurie Camps
Trout Unlimited	Carl Hunt
Woodlot Association	Curtis Brinker
Aboriginal Representation	Alfred L'Hirondelle
Aboriginal Representation	Darwin Alexis
NON-VOTING MEMBERS	
Facilitator	Michelle Andersen
Recorder	Laurie Schneider
Weyerhaeuser Forestlands	Tom Varty
Weyerhaeuser Forestlands	Fulton Smyl
Weyerhaeuser Forestlands	Paul Scott
Pubic Lands and Forests Service	Bill Tinge/ Raymond Low
Sustainable Resource Development – Fish and Wildlife	Jan Ficht

APPENDIX 2

Edson Weyerhaeuser Forest Advisory Committee (WeyFAC)
Terms of Reference

Approved: September 2003

Review date: September 2004

1. Purpose

The Weyerhaeuser Forest Advisory Committee was established to provide organized and regular input into Weyerhaeuser's forest planning and operations. WeyFAC was established to select issues, consider and recommend actions and policies. WeyFAC is not a decision making body. Weyerhaeuser will, however, formally respond to every recommendation raised with documented reason for acceptance, modification, or rejection.

In 2002, WeyFAC agreed to accept responsibility for providing public input related to certification of the Sustainable Forest Management System to CSA Z809 – 96 standards. The Defined Forest Area (DFA) to which the Sustainable Forest Management System will be applied to is the Weyerhaeuser Forest Management Agreement Area Edson.

2. Membership

Active Members (Voting)
Active Members are selected by a local organization from within the communities within the region to represent the views of that organization or comment on WeyFAC. Active members may also include invited organizations and/or individuals. The membership of the group was reviewed and revised to ensure that all those with interests in the DFA had the opportunity to participate. Maximum number of members is fifteen (15).

Alternate Members (Voting)
Alternate Members are selected by a local organization from within the communities within the region to attend meetings and represent the views of that organization when the Active Member is unable to. Alternates are given voting power when the Active Member is not in attendance.

Standing Members (Non-Voting)
Standing members are representatives of Weyerhaeuser Forestlands Division and the Land and Forest Division and Fish and Wildlife.

Ad Hoc Members (Non-Voting)
Ad Hoc committees may be established from time to time to focus on specific issues and to allow greater community involvement by citizens who are directly affected by those issues. Ad Hoc committee members are invited only for the duration of the issue and are selected based on equitable representation.

Observer Status Members (Non-Voting)
People interested in observing should contact Weyerhaeuser prior to the meeting. Observers will be accepted based on the mutual agreement of WeyFAC and Weyerhaeuser.

Other
Opportunity remains for the addition of new members to WeyFAC, upon expression of interest and acceptance by Active Members of the Weyerhaeuser Forest Advisory Committee. Designation of member status will be determined on a case-by-case basis.

3. Procedures and issue management

A. WeyFAC will select and prioritize issues that could deal with any or all aspects of Weyerhaeuser's forest planning and operations. At the end of each issue recommendation, a new issue will be dealt with. Weyerhaeuser may also present issues that they would like examined.

B. WeyFAC will develop and implement its own action plans to address selected issues. Weyerhaeuser, Alberta Sustainable Resources and/or other government departments will participate in the discussions to present their own viewpoints on issues.

C. Documented positions or recommendations from WeyFAC's investigations will be presented to Weyerhaeuser for response.

D. Weyerhaeuser will seriously consider the recommendations of WeyFAC, then discuss them with the group and respond in writing.

E. All issues, positions and recommendations arising from WeyFAC will be documented and tracked, along with Weyerhaeuser's responses.

F. Weyerhaeuser will provide an Annual Report to WeyFAC at the September meeting on tracking the issues, recommendations and responses that arose over the preceding year and on WeyFAC's impact on Weyerhaeuser's operations.

G. Related to CSA, WeyFAC will provide input on:

    1. The identification of values, goals and indicators.
    2. The setting of objectives.
    3. Design of the Sustainable Forest Management System, monitoring systems and evaluation process.
    4. Review of the performance evaluations and recommendations for improvement.
    5. Provision of feedback to interested parties about the DFA, particularly the results of performance evaluations related to the critical elements of the Canadian Council of Forest Ministers criteria.
    6. Documentation and communication of reasons for all significant decisions.
    7. Selection of the preferred forecast.

H. Weyerhaeuser will provide a CSA annual report providing updates to the SFMP and results from the previous year's indicators/objectives.

4. Facilitator Responsibilities

A. Weyerhaeuser will provide a facilitator for the drafting of values, goals, indicators and objectives. The facilitator will assume the responsibilities of the chair and the role of official spokesperson.

B. The Facilitator will control WeyFAC meetings providing people the opportunity to speak and to be listened to.

C. The Facilitator has the authority to confer observer status to people who show up at the door for meetings. Also, at a meeting, the Facilitator may ask for comments from the observers.

D. The Facilitator has the authority to end discussion and evoke closure.

E. In the event the Facilitator does not show up for a meeting, the active membership may elect a designated Chair for that meeting.

5. Member Responsibilities

A. WeyFAC members will strive to educate themselves on all aspects of the issues being discussed.

B. Members will try to:

- listen to and respect others' opinions
- understand others' views
- speak directly
- attend scheduled meetings
- use common sense

C. Members will try to represent their own views, the views of the public, as well as those of the organization they represent on WeyFAC, distinguishing between each where appropriate.

D. If a member misses three meetings in a row without due cause, the group they represent may be asked either to reconsider its membership, or to replace the member with someone more able to participate. A member-at-large may be replaced by open invitation, with the approval of the group.

E. If a member is unable to attend a WeyFAC meeting, that person will inform Michelle Andersen at 723-2157 or Laurie Schneider at 723-4705.

F. Members will attempt to go back to their organizations to acquaint them with the background and issues being discussed and to gather their opinions from this informed perspective.

G. Members will keep their organizations up to date on the progress and documentation of the issues being discussed, along with the responses from Weyerhaeuser.

H. Members will deliver on assignments they accept.

6. Norms/Ground Rules for Conducting Meetings

A. Members will show up on time.

B. Regular meetings (2nd Wednesday of the month) will start at 6:00 p.m. and finish at 9:00 p.m. on time, unless a different time and format are mutually agreed to. Supper will start at 5:30 p.m. Members who are unable to attend supper will let Michelle or Laurie know beforehand. Meetings will start in September and end in June.

C. Decisions will be developed by consensus building techniques, voting only as a last resort. Consensus does not mean that you have to be in 100% agreement with the decision, but that you can live with the decision. If consensus cannot be reached, then the two or more positions will be recorded and brought forward.

D. Minutes, submissions and correspondence will be taken and distributed to members and alternates. This distribution may be by e-mail, fax or regular post.

E. Action commitments will be identified in the minutes and on the agenda and tracked.

F. At the end of each meeting, the agenda for the next meeting will be set. The agenda may be modified at the beginning of the meeting.

G. A quorum of 30% of the Active Membership is needed.

H. The flow of the minutes will not be verbatim, but rather follow a general discussion, recommendations, indicators, and action steps.

I. The next meeting agenda will be sent with the previous meeting's minutes.

J. Silence means agreement.

K. Recording for the purpose of minutes is allowed.

7. Other Information

A. Weyerhaeuser will provide support including meeting logistics, meals, travel reimbursement, meeting summaries etc. Dinner will be part of the WeyFAC meeting, unless agreed otherwise.

B. Active Members who are not paid by an organization to attend meetings will be paid an honorarium of:

- $60 / meeting for meetings lasting up to 4 hours
- $120 / meeting for meetings lasting between 4 and 8 hours
- $180 / meeting for meetings exceeding 8 hours

Weyerhaeuser will reimburse members 35 cents per kilometer traveled to and from meetings. For reimbursement, Active Members are expected to invoice Weyerhaeuser for expenses related to CSA meetings, after each meeting.

C. With prior approval by Weyerhaeuser, members may receive money for out-of-pocket expenses, travel, lodging, meals, etc. for WeyFAC supported conferences, workshops, tours, etc.

D. In addition to those responsibilities identified in section 3, Weyerhaeuser commits to providing WeyFAC with background and resource information as needed to support effective discussion related to the CSA role.

8. Changes to the Terms of Reference

A. The Terms of Reference will be reviewed at least once a year.

B. By agreement amongst WeyFAC members, the Terms of Reference may be amended, deleted, added to or changed at any time.

APPENDIX 1-6

QUOTA HOLDER REVIEW OF THE W6 TIMBER SUPPLY – 2002

APPENDIX 2-1

DOCUMENTS SUPPORTING FAC INVOLVEMENT IN DEVELOPMENT OF THE DFMP

APPENDIX 3-1

ECOSITE CLASSIFICATION

APPENDIX 3-2

WATERSHED BOUNDARIES DELINEATION AND STREAM CLASSIFICATION, June 30, 2004

Watershed and Stream Classification Project
for
Weyerhaeuser Edson/Drayton Valley

Data Entities / Process Descriptions

The project context overview is presented in the form of VISIO diagram with corresponding data entities and process outline descriptions. Several, more detailed flow diagrams are intended as documentation and as a guide for project execution and for communication with client on specific data issues, tasks and selected solutions.

The following diagrams were generated:

WEYER_P0_OVERVIEW	-	Project overview flow diagram
WEYER_P1_HYDRO_NET	-	Correction / Classification of single line stream network
WEYER_P2_DEM	-	Creation of hydrologically corrected DEM
WEYER_P3_WATERSHEDS	-	Creation of watershed polygons and related attributes

1.0 Data Entities Descriptions

D1 **Base Features DEM** ARC/INFO grids (NAD83, UTM zone 11 geo-referencing in e00 format) for requested 1:50K sheets with 25 meter resolution. Data was delivered as a seamless grid.

D2 **Base Features Hydrography** Source Base Features Project hydrography was delivered as seamless SLNET and as seamless polygon information directly from RDD.

D3 **Weyerhaeuser Study Area Boundaries** ArcView Shape files of the Edson and Drayton Valley FMA Area.

D4 **Hydrologically Corrected DEM** This data entity represents DEM adjusted by a TOPOGRID process using final, adjusted and corrected single line network, contours and lakes. It is an ARC/INFO grid coverage for study area with a 25m resolution (NAD83, UTM zone 11 geo-referencing), and a 3m fill for error reduction.

D5 **DEM Derived Flow Accumulation Grids** These coverages represent stream flow accumulation as derived from DEM (D4).

D6 **Hydrologically Correct Filled DEM** This data entity represents a filled version of corrected DEM: Several ARC/INFO processes are used, including a FILL function. It is an ARC/INFO grid with 25m resolution (NAD83, UTM zone 11 geo-referencing).

D7 **DEM Derived Flow Accumulation Grids** These coverages represent stream flow accumulation as derived from filled DEM (D6).

D8 **HillShade** A hillshade grid created from the hydrologically adjusted surface with 35, 50 and 2 parameter values for sun location and vertical exaggeration.

D9 **Single Line Hydrography** Attributed single line stream network with all primary and secondary flows. Arcs correspond to Base Features elements (and have BF-ID link). Strorder attributes are added.

D10 **Simplified Single Line Hydrography** Fully attributed single line stream network built with primary flows only. In addition to Strahler order, and group attributes the area accumulation attributes are calculated. The arcs of this single line network are unsplit, in such way that nodes exist on lake boundary, and also at the inflow of (removed) secondary streams. This data set is used for creating watersheds.

D11 **Watershed Polygons** Polygons of watershed drainage areas, associated with individual arcs. Strahler classification and grouping attributes are transferred from the corresponding arcs. Strahler group regions are added.

D12 **Class 4 (and higher) Watersheds** Watersheds of Class 4 supplemented by components of higher class Watersheds for Weyerhaeuser study area (Drayton Valley and Edson) Individual watersheds have preliminary unique names.

D13 **Class 3 (and higher) Watersheds** Watersheds of Class 3 supplemented by components of higher class Watersheds for Weyerhaeuser study area (Drayton Valley and Edson) Individual watersheds have preliminary unique names.

D14 **Data/Process Documentation** ArcView data display project, VISIO process. Diagrams, data set documentation, overview plot.

2.0 Processes

P1 Correction / Classification of hydro network

In this process the single line network is validated against BF specification and agreement with DEM data. Validated are proper Primary/Secondary attributes, connectivity and directionality of streams, then agreement with TOPOGRID processes and watershed creation processes. All detected issues and changes are recorded for client's approval.

P1.2 Create seamless DEM

Sub-process of creation of required DEM. Grid MOSAIC process may be applied to create a seamless coverage.

P1.2.3 Create Contour Validation of source DEM quality by 5m contours. If edge miss-match detected data is re-requested from data distribution or repaired locally.

P1.3 **Prepare Lakes** Lakes are extracted from hydrography polygon coverage (as large lakes are used in topogrid)

P1.4 SLNET Preparation & QC Validation against BF specification, addition of Strahler attributes (connectivity test), and clip to study area Hydro QC: P/S flows, sinks/sources, directionality, gaps, zingers, adding missing centerlines & connections.

P1.5 Hydro/DEM QC process
Validation and edits related to discrepancies of SLNET and DEM. If SLNET is used in the TOPOGRID process the terrain may be significantly modified, where streams are set to flow in the wrong direction. The flows derived of DEM are also suggesting possible missed connectivity segments.

P1.6 Client Validation
Some changes have to be validated by client according as per field check or local knowledge of area.

P1.7 Simplification Process
This process is used to extract only primary flows and to reduce segmentation of arcs to lake features only, so hydro network is more suitable for the watershed creation process. This process includes also Strahler stream classification and grouping (used for aggregation of future watersheds by stream class).

P2 Create Hydrologically Correct Digital Elevation Model

P2.1 Validation of input contours (for source terrain edge-match and other errors)

P2.2 TOPOGRID: An ARC/INFO process that enforces proper definition of the terrain using the stream network directionality, large lakes and contours as input.

P2.3 Derive accumulation flow (stream adjustment – connect)

P2.4 Validation of output contours (stream adjustment – flip) and flows.

P2.5 FILL A combination of ARC/INFO processes including fill function, that removes sink areas in the terrain to enforce complete drainage.

P2.6 Derive accumulation flows of AF_TOPO DEM. Some flows may be used to complete connectivity of network or to revise primary / secondary coding and connections.

P2.7 Derive watersheds and validate drainage basins with arcs connectivity.

P2.8 Validate flow lines and hydrography consistency.

P2.9 Create hillshade

P3 Create Watershed Information

P3.1 Create Watersheds

P3.1.1 Create Watershed Polygons. Each stream is assigned a drainage area.

P3.1.2 Create individual "atomic" Watershed Polygons

P3.1.3 Aggregation of Polygons into Strahler Groups, Create Regions.

P3.1.4 Extraction of Order 3, 4 and higher polygons.

P3.1.5 Process of Local Sliver Edits

P3.1.6 Naming of Watersheds

P3.2 Data \ Process Documentation

Functional descriptions of watersheds related entities

E1 Hydrography Information

Natural and man made water and water related features correspond to streams, rivers, water bodies (lakes, glaciers, reservoirs), barriers (dams, falls)

- Allows to store point, line and polygon attributes and classifications.
- Allows for query, display and mapping of hydrography.
- Allows to visualize approximated watershed area.

E2 SLNET

Topologically connected water flow segments corresponding to streams (segments) and water bodies representation lines (centerlines)

- Allows to navigate network (up / dowstream).
- Allows for linking arc attributes to corresponding drainage areas.
- Allows to aggregate drainage area (flow etc) in hydrography network.
- Allows certain analysis and modeling processes (route creation, Strahler classification).
- Maintains a link and integrity between water bodies and stream network (centerlines).

E3 ROUTES (not created for this project)

Grouped and inter-connected water flow segments corresponding to complete sections of streams with a specific Strahler Order (embedding centerlines)

- Allows for data locating and classification using unique measurement system. (and database structures independent of spatial data partitioning)

- Allows for linking more "global" attributes (ie total stream section length, highest magnitude, Strahler order).
- Allows for aggregated and more complex analysis (ie. where does a stream start, what stream connects to what major flow, at what distance etc)

E4 DEM

Digital representation of terrain allows GIS processes to display and analyze information. Usually as regular grid lattice, but alternative format as TIN, points, breaklines etc.

- Allows to identify basins , sub basins, non draining areas.
- Supports calculation of flow direction and accumulation.
- Allows to define derived flow lines (drainage network). It is not necessarily corresponding to observed hydrography (but may represent flow connectivity corrections).
- Allows to create drainage areas for specific points.
- Allows to create drainage areas for specific arcs (and certain polygons).
- Allows for digital manipulation and analysis including enhancements and changes to terrain representation (filling, topogrid enhancements, smoothing noise removal).

E5 Hydrologically corrected DEM (TOPO surface)

Digital representation of terrain related to and reflecting hydrology features.
Could be a result of adjustments by GIS processes (such as TOPO flow enforcement, lake "flattening" etc) .

- Generation of derived flow lines closely resembling hydrography data used in the adjustment process.
- Allows for analysis and corrections of initial source DEM, SLNET and hydropoly data.

E6 Fully Draining DEM ("Filled" TOPO surface)

Digital representation of terrain modified for a more complete draining by adjusting (raising) elevation of all or selected depression areas and imperfections.
A result of digital manipulation GIS processes (such as FILL function).

- Generation of additional derived flow lines that may resemble flood condition.
- Creation of fully draining surface model for specific analysis.
- Allows for analysis and corrections of initial source and TOPO surface DEM, SLNET and hydropoly data. (eg adjustments to lake elevations underestimated in TOPO)

Watershed and Streams Classification Project
Weyerhaeuser – Edson / Drayton Valley

Delivery Data Set Description

The intention of this document is to describe deliverables requested by the client, summarize applied procedures, and to outline possible future opportunities arising from interim products created for this project.

The project goal was to outline watershed basins in Weyerhaeuser FMA suitable for forest management planning activities while consistent with government-approved approach.

Specific project objectives were to:

- Apply Strahler classification to stream network consistently with processes used on government and related projects.

- Delineate reasonable accuracy watersheds and create a seamless division of study area into class 4 and higher, and class 3 and higher sub-basins. Both polygon coverage supplements individual class 4 or 3 sub-basins with remaining portions of class 5, 6, 7 … basins.

- Cooperate with client to define unique naming schema for all watershed areas within FMA.

Strahler classified streams and named watersheds are prime deliverables from this project, but within its scope other valuable interim products were also created. Corrected Base Features Single Line Network with pre-designed routes, Hydro-corrected DEM, and detailed watersheds are examples of data sets that could provide further information and be utilized for more extensive analysis. Other watershed related projects have additional deliverables for drainage area accumulation analysis, routes for event modeling, gradient based reaches for detailed stream classification etc.

The following documentation of deliverables (and corresponding data display project) is intended to depict prime deliverables requested by client. Some interim data are included to demonstrate process or to support discussion on future opportunities and more extensive analysis.

Analysis of upstream areas for stream crossing, modeling events on routes, interactive waterlease delineation, and even construction of hydrocodes could progress from the created data sets. GISmo Solutions Ltd would welcome and opportunity to review other Weyerhaeuser client requirements and to explain available options.

Weyer CDROM Data Description

This CDROM contains single line hydrography, hydrography polygons, and Digital Elevation Model (DEM) data as binary ARC/INFO coverages (line, polygon, and grid types) prepared within the ARC/INFO 8.2 environment. An ArcView 3.2 project, for data overview, and critical files in e00 export format are also provided. The projection and datum is UTM Z11, NAD 83 with double precision accuracy maintained throughout all processes.

GISmo Solutions Ltd. used data provided by the Base Features Project, Resource Data Branch and Alberta Sustainable Resource Development.

The general information, including this data set description document, is located in the OVERVIEW sub-directory. This sub-directory also contains the Edson and Drayton Valley study area boundaries, and an ArcView project file allowing for easy display of provided information.

Weyer CDROM

The following directories and files are provided on the delivery CDROM:

DEM, Detail_wsd, E00_ZIP, Hydrography, REF_ED_FACET, Watersheds, BF_Edit, and Overview,

DEM

This directory contains seamless source DEM coverage and some processed terrain information.

Specific files are as follows:

Ff_wey_enh	A hydrologically corrected "Fully filled" DEM provided as a seamless source data for study area.
wey_hsh	A hillshade grid created from the hydrologically adjusted surface with 35, 50 and 2 parameter values for sun location and vertical exaggeration.
Fpalin	A flow accumulation lines grid indicating patterns of flow on ff_wey_enh (used in the QC process for validation of hydro network). Grid has a 25 m resolution and 50 cells threshold.
Hc_wey_enh	A hydrologically corrected DEM enhanced with a 3m partial fill (for error reduction) provided as a seamless source data for study area.
Ppalin	A flow accumulation lines grid indicating patterns of flow on hc_wey_enh, Grid has a 25 m resolution and 50 cells threshold.
info	ARC/INFO directory required for binary data structures.

Detail_wsd

This directory contains a single line hydrography network for interim processes and watersheds from fully filled terrain.

Sln_temp A simplified single line stream network for the study area. Segmentation of arcs (by pseudo nodes) is reduced to lake features (secondary flow attachment nodes are retained). Additional attributes for flow accumulation are added.

Wey_fwsd Watershed drainage polygon coverage corresponding to filled terrain

E00_ZIP

This directory contains the following ARC/INFO e00 files:

We_hydpol.e00
We_slnet.e00
Wey_wsd3.e00
Wey_wsd4.e00

Hydrography

This directory contains corrected hydrography data originally delivered from the Base Features project. All data sets were provided as seamless coverages (E00) with unique BF-id identifiers. "WE" is a prefix that was assigned for the extended study area and used to create the hydro-corrected DEM.

we_slnet A seamless SDE extracted set of SLNET data from RDB Data Distribution.

we_hydpol Seamless SDE extracted set of Hydro Polygons from RDB Data Distribution.

info ARC/INFO directory required for binary data structures.

Ref_ED_FACET

This directory contains reference class 3 and class 4 watersheds that were created by Facet for the Foothill Model Forest in the Edson area. These datasets were assembled by GISmo from the delivery detailed shape polygon coverages by extracting and combining sub-basins of class 3 and higher (Ed_wsd3) and class 4 and higher (Ed_wsd4).

Ed_wsd3 Watersheds of Class 3 supplemented by components of higher class watersheds for Edson area (with partial overlap to DV area)

Ed_wsd4 Watersheds of Class 4 supplemented by components of higher class watersheds for Edson area (with partial overlap to DV area)

Info ARC/INFO directory required for binary data structures.

Watersheds

This directory contains the delineated watershed polygon coverages created by GISmo Solutions Ltd for the Edson and Drayton Valley Area. These dataset represent sub-basins of class 3 and higher (wey_wsd3) and class 4 and higher (wey_wsd4). These basin boundaries were created using a hydro-corrected DEM and an ARC/INFO watershed delineation processes.

Wey_wsd4 Watersheds of Class 4 supplemented by components of higher class

Watersheds for Weyerhaeuser study area (Drayton Valley and Edson) Individual watersheds have preliminary unique names.

Wey_wsd3 Watersheds of Class 3 supplemented by components of higher class Watersheds for Weyerhaeuser study area (Drayton Valley and Edson) Individual watersheds wsd4 names and unique internal counters for future construction of final names.

Info ARC/INFO directory required for binary data structures.

BF_EDITS

This directory contains coverages and database tables (.dbf format) indicating significant changes to the Base Features repository information. These changes represent required adjustments to the original Base Features datasets as validated by the data authorities. A complete list of features that have other minor attribute changes required to construct proper routes or to obtain a desired functionality (i.e. simplification of braiding patterns of primary /secondary flows) is also provided.

Specific files are as follows:

BF_MOD_DEL Coverage with deleted Base Features elements (if required) Examples of such elements on other data sets are features that required spatial modification (i.e. split or extension) except for flipped elements where BF-id is not changed, all spatially modified elements will have a deleted feature in BF_MOD_DEL and corresponding added feature(s) in BF_MOD_ADD coverage.

BF_MOD_ADD Coverage with added features (if required) Examples of such elements on other data sets are spatially modified features corresponding to the deleted elements and features that were added following data authorities instructions. Stream or lake representation lines may be added to connect flows to main stream network.

BF_FLIP Coverage contains arcs that required flow directionality change **(**i.e original data is incorrectly directed upstream). A number of lake flow representation lines belong to this category. To find these features in the corresponding Single Line Network SLNET, elements have the bf_edit attribute set to “flip”.

BF_MISC Coverage contains elements with important changes to the critical Base Features attributes. The key changes represented in this dataset are name attribute changes and major Primary/ Secondary flow updates.

Note: The PS_flow BF attribute is never changed. Updates to a primary/secondary flow designations are stored in SEC_SEG attribute.

BF_EDITS.dbf This table contains a list of BF_IDs for all features that were modified (i.e . edits change the value of Base Features attributes) and have defined edit detail information. Edits to most of these elements are not related to enforcing of Base Features standard, but rather to providing additional functionality.

Examples are:

To allow for simplification of watersheds in braided stream area some elements are reset to secondary flows (edit_det = “miscoded P/S”).

To allow for building of routes with a proper measure along streams (without starting segments in lakes and double line rivers) names are deleted or added to certain features (edit_det = “name del” or “name added”).

Overview

This directory contains an outline of the study area, data documentation, and an ArcView 3.2 project for information display. Upon opening the ArcView 3.2 project, additional information about each View’s data display can be found in the View Properties Comment Field (located in the View Menu – Properties). These views are also discussed further in this document.

5.8 Specific files are as follows:

dv_bdy Drayton Valley study area boundary.

ed_bdy Edson study area boundary.

Wey_watersheds_des.doc Microsoft WORD file, data description document.

Wey_watersheds.apr An ArcView 3.2 project providing data overview.

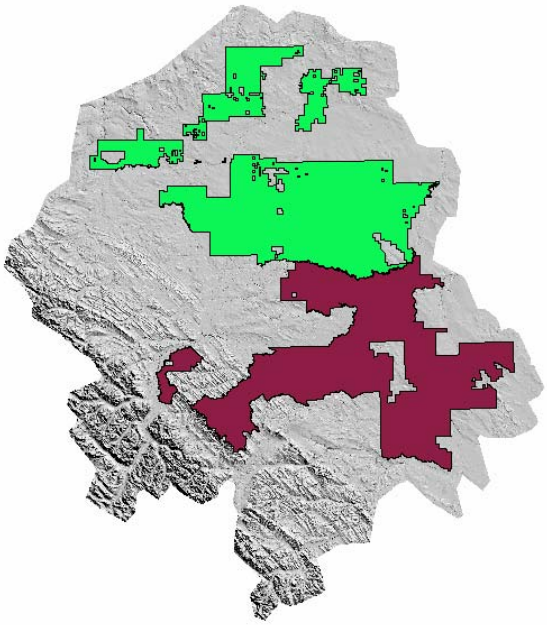
Visio diagrams

Process/Entity documentation

The following views are provided in the **wey_watersheds.apr** project for client's reference:

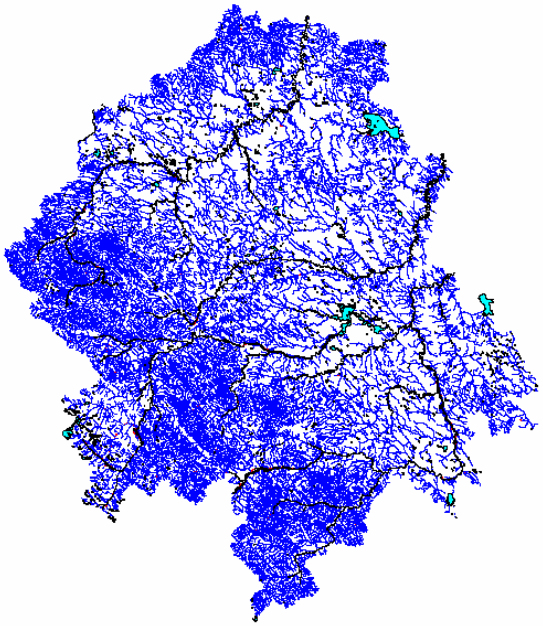
01 Overview.

This view provides an overview of the Weyerhaeuser Study Area:
Drayton Valley – Red, Edson – Green.



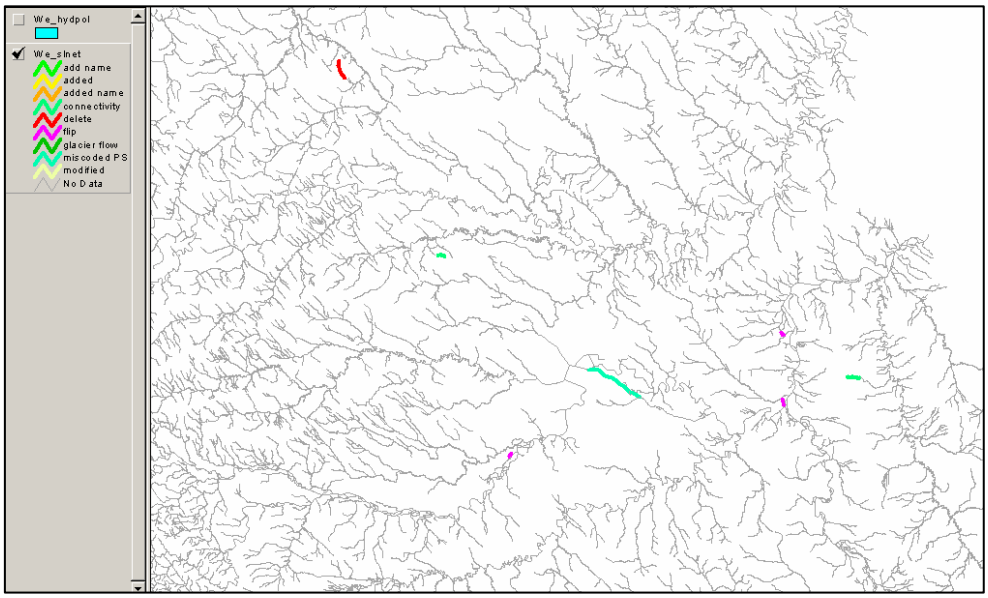
02 Hydrography.

This view shows an overview of the source Base Features Data: the Single line stream network with primary and secondary flows.



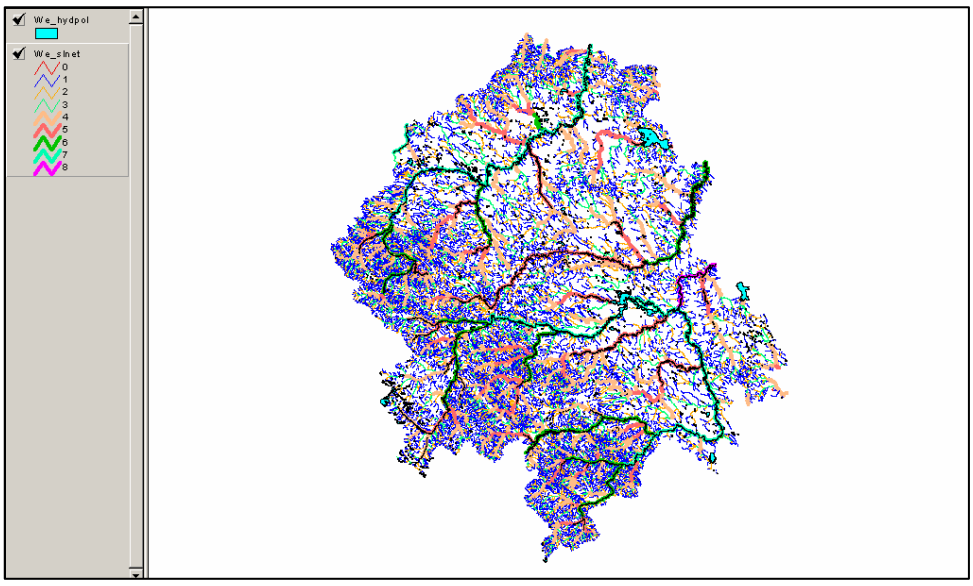
03 Validation of Hydrography.

Depicted here are some examples of locations where corrections were suggested on the single line stream network. Such corrections include miscoded data and flipped flows. To find these locations in the we_slnet dataset, display by attribute EDIT_DET.



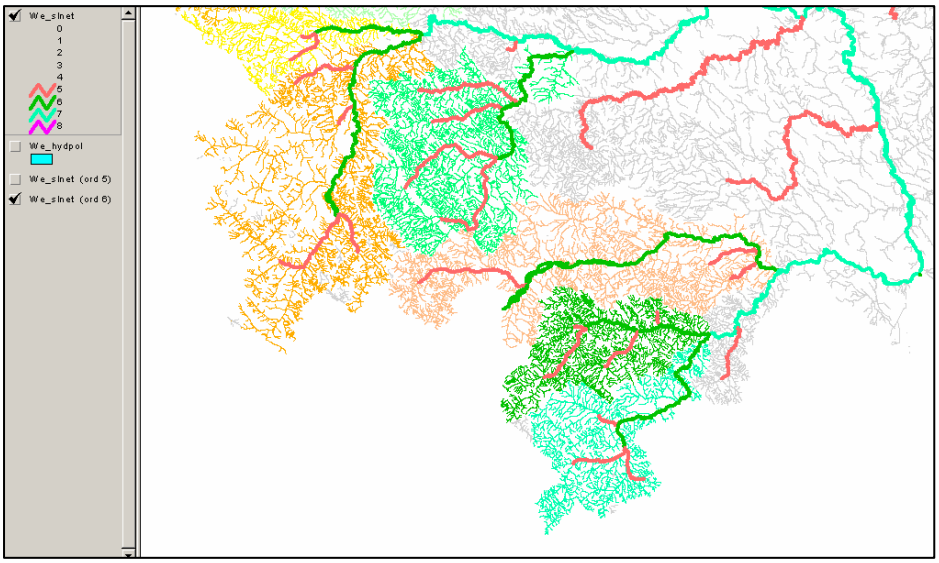
04 Strahler Classification

In this view, both streams and corresponding watershed polygons have Strahler order and grouping attributes. For example an ORD4 grouping attribute identifies a unique class 4 stream (last arc) that is draining a given area.



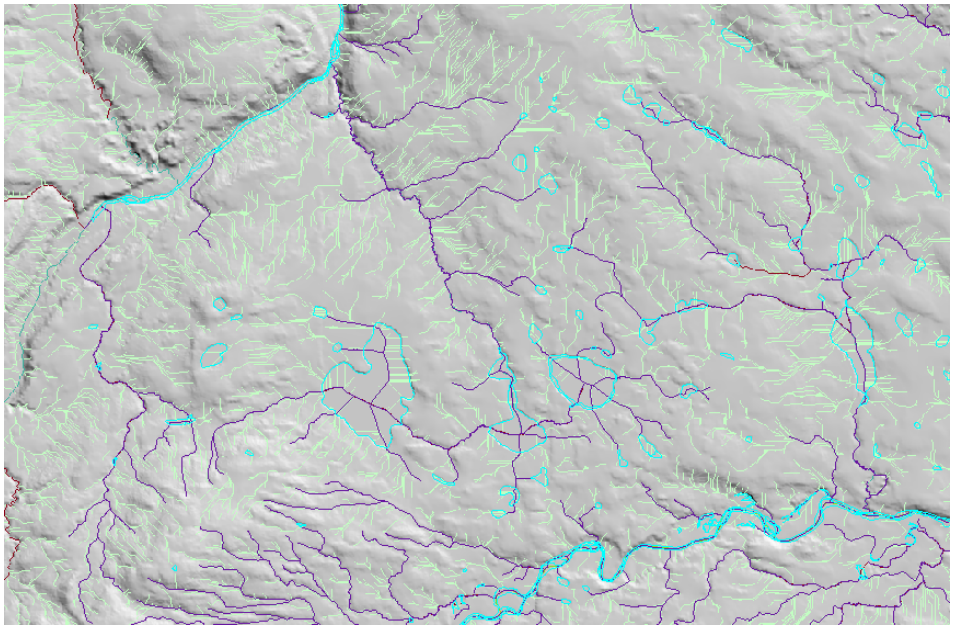
05 Strahler Grouping

Here, both streams and corresponding watershed polygons have Strahler order and grouping attributes. For example, ORD4 grouping attribute identifies a unique class 4 stream (last arc) that is draining a given area.



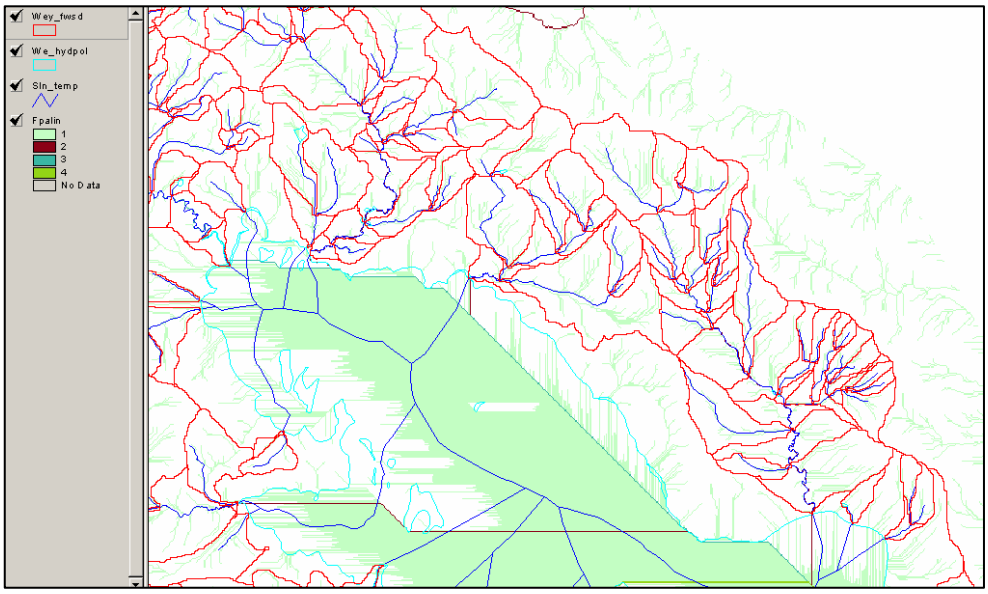
05 Hydro correction of DEM

This is a digital representation of terrain related to and reflecting hydrology features. Here, the generation of derived flow lines closely resembling hydrography data used in the adjustment process. This data was used for analysis and correction of the initial source DEM, slnet and hydropoly data.



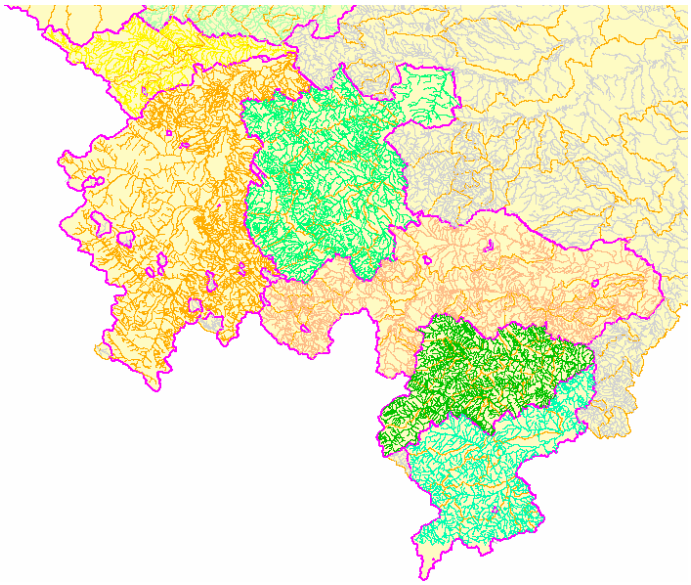
07 Detailed Delineation of Catchment Areas

This view shows the polygons of watershed drainage areas associated with individual arcs (from simplified network). Strahler classification and grouping attributes were transferred from the corresponding arcs.



08 Watersheds Grouping

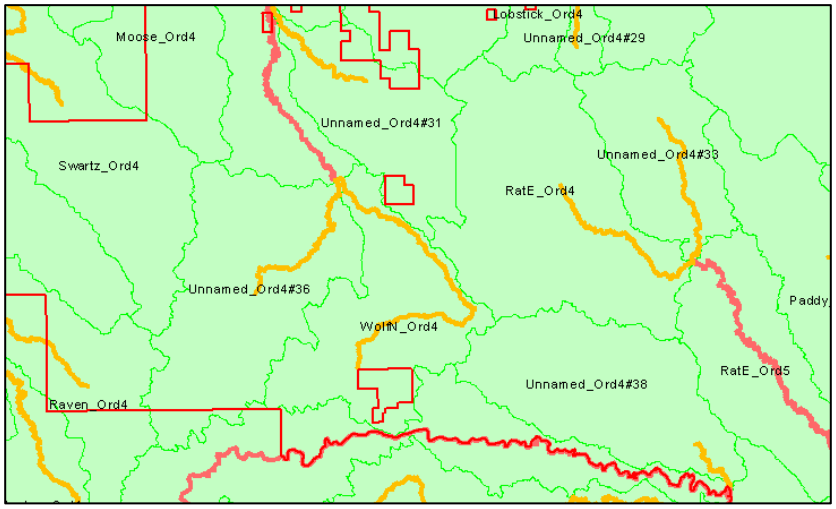
Displayed here, individual polygons of the detailed watershed coverage were grouped (into regions) as per Strahler order class and parent flow. Boundaries of class 6 regions correspond to class 6 hydrography sub-networks. Boundaries of class 4, 5, 6 and higher were used to assemble and attribute wey_wsd4 coverage, and boundaries of class 3, and higher were used to assemble wey_wsd3 coverage.



09 Naming Watershed Sub-basins

Sub-basin names were constructed from main stream or river and corresponding Strahler class.

There were a number of unnamed class 3 and 4 sub-basins and some duplicated stream names (eg. RatCreek, Crooked Creek). Upon two sessions with Weyerhaeuser representative Paul Scott, names were clarified, and were necessary, some names were redefined.



Detailed Descriptions of Delivered Tabular Information

The following details item descriptions for attributes found in delivery datasets:

WE_SLNET.AAT

NAME	ITEM DEFINITION			ITEM DESCRIPTION
FNODE#	4	5	B	From-node sequence number.
TNODE#	4	5	B	To-node sequence number.
LPOLY#	4	5	B	Left polygon sequence number.
RPOLY#	4	5	B	Right polygon sequence number.
LENGTH	8	18	F5	Length in coverage units.
WE_SLNET#	4	5	B	Arc internal sequence number (record number).
WE_SLNET-ID	4	5	B	Arc feature identification.
FEATURE_CODE	10	10	C	Base Features Project Attributes (BFA).
FEATURE_TYPE	30	30	C	BFA
NAME	80	80	C	BFA
SOURCE	6	6	C	BFA
CAPTURE_DATE	8	10	D	BFA
PS-FLOW	1	1	C	BFA
BF_ID	8	16	F3	Base Features identification
SEC_SEG	1	1	C	Secondary Segment flag "P", "S". If BF data was not changed in the QC process it corresponds to PS-FLOW attribute.

NAME	ITEM DEFINITION			ITEM DESCRIPTION
BF_EDIT_FL	1	1	I	Flag from correction process values
EDIT_DET	15	15	C	Edit detail – description corresponding to BF_EDIT_FL: Add Name Added Added Name Connectivity Delete Flip Glacier Flow Miscoded PS (Primary/Secondary) Modified No Data
STRAL_PF	8	7	F	Strahler class for primary flows only
STARTORDER	2	6	B	Attribute controlling classification for external inflows
STRORDER	2	6	B	Strahler class (1 - 8 in this set).
ST_NROU	2	2	B	Flag to start a construction of a new route in unnamed double line channels
ERRORS	20	20	C	Error messages from initial route creation (name and P/S errors)
STARTLENGTH	4	8	B	Attribute allows for adjusting route construction priority on inflowing streams
SEG_NO	4	6	B	Sequential upstream segment number (route design attribute)
HI_ORD	4	6	B	Highest Strahler order (route design attribute)
DOM_NU	4	6	B	Route ID (route design attribute)
DOM_ID	4	6	B	Route ID of corresponding primary route (route design att. on S flow)
NEWROUTFLAG	2	1	B	New Route required flag (route design attribute)
NEW_ROUTE	2	2	I	New Route required flag (set by operator) 1 start new route on primary fork. 2 new route allowing for flow continuation where new name introduced. Attribute controls accumulation through the network
ORD8	4	5	B	Strahler order 8 grouping attribute
ORD7	4	5	B	Strahler order 7 grouping attribute
ORD6	4	5	B	Strahler order 6 grouping attribute
ORD5	4	5	B	Strahler order 5 grouping attribute
ORD4	4	5	B	Strahler order 4 grouping attribute
ORD3	4	5	B	Strahler order 3 grouping attribute
ORD2	4	5	B	Strahler order 2 grouping attribute
ORD1	4	5	B	Strahler order 1 grouping attribute

SLN_TEMP.AAT

NAME	ITEM DEFINITION	ITEM DESCRIPTION
FNODE#	4 5 B	From-node sequence number.
TNODE#	4 5 B	To-node sequence number.
LPOLY#	4 5 B	Left polygon sequence number.
RPOLY#	4 5 B	Right polygon sequence number.
LENGTH	8 18 F 5	Length in coverage units.
SLN_TEMP#	4 5 B	Arc internal sequence number (record number).
SLN_TEMP-ID	4 5 B	Arc feature identification.
SLN_POU	4 6 B	
BF_ID_LK	8 16 F 3	BF_ID link to most downstream BF feature related to simplified stream and corresponding catchment polygon
NEW_ROUTE	2 2 I	New Route required flag (set by operator) 1 start new route on primary fork. 2 new route allowing for flow continuation where new name introduced. Attribute controls accumulation through the network
CNT_BF_ID	8 16 F3	BF_ID of a controlling segment in multi segment lake or riv.channel
DISS_BF_ID	8 16 F3	BF_ID of a controlling segment to be used in dissolve process
FEATURE_TYPE	30 30 C	Base Features Project Attributes (BFA).
ORG#	4 5 B	Arc internal sequence number of original sln_temp before any edits.

WEY_FWSD.PAT

NAME	ITEM DEFINITION	ITEM DESCRIPTION
AREA	8 18 F5	Polygon area in coverage units. Set to 0 for point features
PERIMETER	8 18 F5	Perimeter in coverage units Set to 0 for point features
WEY_FWSD#	4 5 B	Polygon sequence number (record number).
WEY_FWSD-ID	4 5 B	Polygon feature identification.
GRID_CODE	4 8 B	Base Features Project Attributes (BFA).
STRORDER	4 5 B	Strahler class (1 - 8 in this set).
ORD8	4 5 B	Strahler order 8 grouping attribute
ORD7	4 5 B	Strahler order 7 grouping attribute
ORD6	4 5 B	Strahler order 6 grouping attribute
ORD5	4 5 B	Strahler order 5 grouping attribute
ORD4	4 5 B	Strahler order 4 grouping attribute
ORD3	4 5 B	Strahler order 3 grouping attribute
ORD2	4 5 B	Strahler order 2 grouping attribute
ORD1	4 5 B	Strahler order 1 grouping attribute

WEY_WSD3.PAT

NAME	ITEM DEFINITION	ITEM DESCRIPTION
AREA	8 18 F5	Polygon area in coverage units. Set to 0 for point features
PERIMETER	8 18 F5	Perimeter in coverage units Set to 0 for point features
WEY_WSD3#	4 5 B	Polygon sequence number (record number).
WEY_WSD3-ID	4 5 B	Polygon feature identification.
NEW_W_OR	16 16 I	
NEW_W_NAM	50 50 C	Sub-basin names constructed from main stream or river and corresponding Strahler class
NEW_STR	5 5 I	Corresponding Strahler class
NEW_W_NAM_3	40 40 C	Sub-basin names constructed from main stream or river, corresponding Strahler class and Unit number of class3 within class 4
CLIENT_NAME	40 40 C	Sub-basin names provided by client
FMA_OVERLAP	1 1 C	Flag indicating overlap with FMA

WEY_WSD4.PAT

NAME	ITEM DEFINITION	ITEM DESCRIPTION
AREA	8 18 F5	Polygon area in coverage units. Set to 0 for point features
PERIMETER	8 18 F5	Perimeter in coverage units Set to 0 for point features
WEY_WSD4#	4 5 B	Polygon sequence number (record number).
WEY_WSD4-ID	4 5 B	Polygon feature identification.
NEW_W_OR	16 16 I	
NEW_W_NAM	50 50 C	Sub-basin names constructed from main stream or river and corresponding Strahler class
NEW_STR	5 5 I	Corresponding Strahler class
CLIENT_NAME	40 40 C	Sub-basin names provided by client
FMA_OVERLAP	1 1 C	Flag indicated overlap with FMA

APPENDIX 3-3

FISH AND WILDLIFE RESOURCES

Fish and Wildlife Resources in the FMA Area

In 1999, Weyerhaeuser initiated extensive surveys of wildlife species within the Edson FMA. These surveys are providing an initial benchmark for future monitoring and assessment of natural changes in the occurrence and distribution of wildlife species, and to detect changes as related to forest management activities. All wildlife and plant data collected is being integrated in a data management system linked to the Geographic Information System (GIS).

Wildlife Resources

The FMA Area is known for its abundant wildlife resources and for its value for hunting and other non-consumptive forms of outdoor recreation, such as camping and hiking. Hunting by Treaty Indians in the Area is also a significant activity. The Area lies within two Natural Subregions (Upper Foothills and Lower Foothills Subregions). This diverse environment supports a wide range of forest types from pure aspen stands to mixedwood and pure conifer stands as well as muskeg and riparian areas. This diversity supports a wide range of wildlife and plant species. The McLeod, Pembina, Athabasca and Elk River valleys serve as an important feature for many of the species that occur within the FMA Area.

During the winter of 1999-2000 and continuing through the summer of 2000, Weyerhaeuser Company undertook an intensive field research program aimed to provide baseline data that will be used as benchmark for future monitoring. Some of the data is needed at the stand level of our ecologically based forest management approach to assess relationships between species and stand structure. Other data provides fine-filter inventory information that will help Weyerhaeuser plan its forest management to integrate threatened wildlife species as well as species of recreational value.

Avifauna

Bird surveys were conducted in the Edson FMA during the late winter and spring of 2000 by Aspen Ecological Consulting. A total of 154 bird species were recorded during this period. The species found encompass a wide range of avian diversity, belonging to as many as 15 of the 17 taxonomic “Orders” found within Alberta. Based on an analysis of available information on bird distribution, there are approximately 193 species that may occur within the region.

Forest Breeding Bird Communities

During the spring forest breeding bird survey, there were 77 species actively breeding in the area. The 10 most common species accounted for 60% of the bird community sampled. The 5 most common species were Tennessee Warbler, Yellow-rumped Warbler, White-throated Sparrow, Chipping Sparrow, and Red-breasted Nuthatch. The top four most abundant birds in the Edson FMA study often rank as high from other studies in Alberta on boreal forest birds. All of these species, except the Red-breasted Nuthatch, are migratory. Many of the species detected in the study were rare and constitute only a small percentage of the total bird community. For example, 24 species were counted fewer than 5 times during the season. These species may be considered more sensitive to forest management practices, due to their rarity. Some of these

species include Pileated Woodpecker, Winter Wren, Cape May Warbler, Northern Oriole, and Le Conte's Sparrow. Conversely, the 5 most common species made up 1,297 (or 40 percent) of the birds detected. Many forest bird communities found in other regions display the same structure (few common / many rare). Occasionally, the ranking of bird species changes from year to year within the same location. This may be due to a variety of factors including; species specific population dynamics, dispersal patterns, changes to the available habitat, weather patterns, etc.

Note: Actual densities of birds are reported but it must be understood that they can be highly variable among habitat types and sampling methods used. Relative abundance patterns are a better indicator of the bird communities. Nonetheless, they are reported in order for the reader to gain an appreciation for the actual numbers of birds that may exist in a given area.

Resident Birds

Fourteen percent of all the birds detected were permanent residents (*i.e. non-migratory*). Out of a possible 35 species of permanent residents, only 15 species were detected during the spring bird survey. Many of the species which were not detected (e.g., owls, some woodpeckers, Northern Shrike) occur or likely occur in the FMA, but spring bird survey techniques were considered in appropriate for sampling these. The most common resident species detected in the study were; Red-breasted Nuthatch (17.6/ km^2), Gray Jay (12.8/ km^2), Black-capped Chickadee (4.2/ km^2), Boreal Chickadee (2.7/ km^2), and Ruffed Grouse (2.3/ km^2). Many of the Gray Jay and chickadee observations were of juveniles or family groups, which elevated the relative abundance value when compared to those species whose counts rely only on observations of territorial males singing. The total number of residents observed was 456 from 288 stops (50.4/km^2). In general, resident species occur at lower densities than their migratory cousins do since the allocation of resources through the harsh northern winters is the main limiting factor for population growth, and hence, usually defines the carrying capacity of the resident populations. For many residents, it is important to maintain the Mixedwood component of the mixedwood boreal forest, to ensure thermal cover for those species typically requiring deciduous dominated sites. It should be noted that eight of the fourteen resident species detected on the spring bird surveys were primary cavity nesting species (including the Red-breasted Nuthatch, Chickadees, and various woodpeckers. *See section on Cavity Nesting Species*). These species are typically associated with older stands, and stands with deciduous trees at varying densities.

Short-distant Migrants

Thirty-nine percent of all the birds detected during the spring bird survey were short-distant migrants (*i.e. most individuals of the species migrate to areas north of the Tropic of Cancer [e.g., United States, Northern Mexico, Gulf States]*). The actual number of species observed in the forested survey areas was 28. These included (starting with most common); Yellow-rumped Warbler (34.4/ km^2), White-throated Sparrow (27.4/ km^2), Pine Siskin (17.2/ km^2), Ruby-crowned Kinglet (10.4/ km^2), Golden-crowned Kinglet (9.5/ km^2), American Robin (7.8/km^2), and Dark-eyed Junco (7.4/ km^2). The total number of short-distant migrants observed was 1232 from 288 stops (or 136/ km^2). Many short-distant migrant species (although not all) are considered habitat generalists, whereby the birds may successfully breed in a variety of habitat types. Short-distant migrants often arrive on their breeding ranges to set up territories earlier than the neo-

tropical migrants, and tend to stay longer through the year. This gives them an advantage for breeding opportunities, since a failed attempt at breeding may be followed by a second attempt. In some cases, certain short-distant migrants may attempt to breed twice in a single season (e.g., American Robin). All of the neo-tropical migrant species do not have this option. Although many species of short-distant migrants are not a high priority for conservation, several are of concern since they have experienced continent-wide declines (e.g., Purple Finch), or have specific habitat requirements (e.g., *preference for old-growth*: Winter Wren, Yellow-rumped Warbler, Golden-crowned Kinglet, Varied Thrush; preference *for non-riparian forest*: Yellow-rumped Warbler).

Neo-tropical Migrants

Neo-tropical Migrants (NTMs) (those species that migrate to regions of the tropics in the Western Hemisphere) were the most common birds by migratory group in the Edson FMA. There were 34 species of neo-tropical migrants counted during the forest survey. A total of 1,480 NTM birds were detected at the 288 survey stops (164/ km^2). The most common NTM birds were; Tennessee Warbler (42.4/ km^2), Chipping Sparrow (21.6/ km^2), Swainson's Thrush (13.5/ km^2), Ovenbird (12.2/ km^2), Mourning Warbler (10.2/ km^2), Least Flycatcher (9.3/ km^2), Red-eyed Vireo (6.7/ km^2), Rose-breasted Grosbeak (6.1/km^2), Alder Flycatcher (5.9/ km^2), and Warbling Vireo (5.4/ km^2).

Many of the NTM birds that occur in the Edson FMA are known to be experiencing long-term declines at a continental scale; however, little is known on regional trends for these species. The declines have been attributed to various factors, including; loss of winter habitat in the tropics, degradation (e.g., fragmentation) and loss of breeding habitat in Canada and the United States. Some of the species that occur in the FMA and have experienced continent-wide declines are Common Nighthawk, Olive-sided Flycatcher, Tennessee Warbler, Mourning Warbler, Blackpoll Warbler, American Redstart, Western Tanager, Rose-breasted Grosbeak, Lincoln's Sparrow, Clay-coloured Sparrow, and Chipping Sparrow. Note that a species in decline may not necessarily be rare (e.g., Tennessee Warbler), but still a concern due to the decline. Many of the neo-tropical migrant birds are considered to be sensitive to fragmentation effects. Some of these species include Black-throated Green Warbler, Ovenbird, Western Tanager, Rose-breasted Grosbeak. Although it is not (yet) a large concern in forests of Western Canada, the Brown-headed Cowbird is known to parasitise the nests of many neo-tropical migrants (e.g., Yellow Warbler, vireos, flycatchers), and some short-distant migrants. Female Brown-headed Cowbirds lay one egg per host nest, and may lay up to 40 eggs in one season. Nest parasitism causes failed nest attempts within the host species, and is attributed to the decline of several North American NTMs. The expansion of agricultural practices into, and along the edge of, the "Green Zone" (Provincial Lands designation) may facilitate an increase in the frequency of nest parasitism. The Brown-headed Cowbird was observed 16 times in the Edson FMA, and tended to be confined to the eastern portions.

Many of the neo-tropical migrants may be important for the role they play in controlling forest insect pest populations. Several warblers may respond to increases in Spruce Budworm outbreaks (both Eastern & Western) by increasing brood size and opportunistically feeding on the increase of insects. Some of these species which occur in the Edson FMA include Cape May Warbler, Tennessee Warbler, and Bay-breasted Warbler. Another neo-tropical migrant, the Baltimore Oriole (formerly Northern Oriole), is known to do the same thing but with Forest Tent Caterpillars. In both instances, the

response by these bird does not necessarily control the insect outbreak, but may reduce the magnitude of the outbreak, as well as aiding in decreasing the frequency of outbreaks over the long-term.

Cavity Nesting Species

Cavity nesting birds make up an important assemblage of birds, as several other species (birds and mammals) rely heavily on abandoned nesting holes previously excavated by primarily by woodpeckers, and partly by chickadees and nuthatches, for nesting or roosting cover. The excavators are usually referred to as "primary cavity nesters" and those that use the holes but cannot make them themselves are usually called "secondary cavity nesters". Some of the obligate secondary cavity nesters that occur in the FMA include; Northern Saw-whet Owls, Northern Pygmy Owls, Boreal Owls, Tree Swallows, Mountain Bluebirds. Many other species commonly use woodpecker excavations for nesting, but do not necessarily require them for successfully breeding. Some of these secondary cavity nesters include; Northern Hawk Owl, American Kestrel, Buffleheads and Goldeneyes (ducks), Red Squirrels and Flying Squirrels, as well as many species of bats.

There were 13 species of cavity nesters in the FMA counted during the forest survey (but see wetland survey and owl survey). Another species, the Brown Creeper, which favors tree condition similar to those of cavity nesters, but nests within the space between the bark and wood rather than an excavated hole, was also detected during these surveys. Of the 13 species detected, 9 were primary cavity nesters, for a total of 309 birds (or 34.0/ km^2). There were only 15 other secondary cavity nesting species detected on the spring survey. Primary cavity nesters noted were; Red-breasted Nuthatch (17.7/ km^2), Yellow-bellied Sapsucker (5.1/ km^2), Black-capped Chickadee (4.2/ km^2), Boreal Chickadee (2.8/ km^2), Hairy Woodpecker (2.1/ km^2), Northern Flicker (1.1/ km^2), Three-toed Woodpecker (0.8/ km^2), Downy Woodpecker (0.3/ km^2) and Pileated Woodpecker (0.1/ km^2). Secondary cavity nesters included; Tree Swallow (1.2/km^2), Bufflehead (0.4/ km^2), House Wren (0.1/ km^2), and American Kestrel (0.1/ km^2). Note that these numbers may be less accurate than the other species in the forest bird survey as the breeding season is earlier for many them (i.e. residents), or the birds do not lend themselves to the methods used (i.e. Bufflehead, American Kestrel).

Many woodpeckers have quite specific habitat requirements, which often include; large diameter of trees for nesting, large home range size, amount of decay in nesting or foraging trees, and presence of wood-boring beetles. Most cavity nesting birds prefer trees that are dead or in a state of decline (i.e. heart-rot present). These conditions are usually met in forest stands that have exceeded the mature age class and recruitment of snags has developed rapidly. These habitat conditions are often met in late seral stages stands or in mature forest stands following fire (un-salvaged).

Many of the cavity nesting species, are also known to be important for other reasons of ecosystem health. One example involves the ability of some species of woodpecker to lower population densities of bark beetles. The black-backed Woodpecker is thought to respond to the presence of fires in the landscape by dispersing in nomadic fashion, and selecting these sites based on density of wood-boring beetles. Another example of the importance of a cavity nesting species involves the chickadees. Black-capped Chickadees lead mixed species flocks of insectivorous residents (nuthatches, creepers, other chickadees) through the winter and spring, to areas through the forest that have

good foraging conditions (the mixed species flocks also provide added protection from avian predators). These resident species, along with many species of returning migrant insectivorous birds, are often attracted to the patches of forest where chickadees lead foraging bouts.

Several of these species are of concern for conservation and forest management. The Black-backed Woodpecker, and Pileated Woodpecker appear of the Provincial Yellow B list, due to long-term declines and/ or their dependence on old-growth forest conditions. The Northern Flicker (woodpecker) and the Boreal Chickadee have also been experiencing long-term declines but have not yet made it onto the provincial list of Species of Concern.

Species Associated with Older Forest

Species detected in the Edson forest bird survey that are known, or are suspected of preferring late seral stages conditions include; Red-breasted Nuthatch, Yellow-rumped Warbler, Pine Siskin, Gray Jay, Golden-crowned Kinglet, Ruby-crowned Kinglet, Three-toed Woodpecker, Black-throated-Green Warbler, Magnolia Warbler, White-winged Crossbill, Brown Creeper, Rose-breasted Grosbeak, Pileated Woodpecker, and Winter Wren. (See section on Raptors for more late seral stage species).

Wetland Bird Communities

Wetland bird surveys were conducted in the Edson FMA at a variety of small lakes, sections of large rivers, and open wetland meadows. 100 species were detected during these surveys, of which 18 could be classified as waterfowl (e.g., ducks, geese, swans). Other groups of species occurring in these areas include; wading birds (11 species), gulls and terns (4 species), raptors (5 species), woodpeckers (4 species), songbirds (Order Passeriformes) (55 species), and other miscellaneous birds (3 species). Birds were classified as either; those requiring water for some aspect of their lives (other than drinking and bathing), those strongly associated with wetland habitats but not necessarily associated with needing water, and those birds observed within 100 metres of the wetland in the surrounding upland forest.

A total of 995 birds were observed during the wetland bird survey. Of those birds that require water for some part of their lives (e.g., food source, have physiological adaptations to living on with water), 29 species occurred in the area. Some of the most commonly encountered species that require water include; Black Tern (71/ colonial species), Bonaparte's Gull (66/ colonial species), Mallard (55), Red-winged Blackbird (38), Common Goldeneye (35), Common Loon (23), Red-necked Grebe (18), Canada Goose (14), Blue-winged Teal (12), Common Merganser (12), Northern Shoveler (10), and American Coot (9). Another 14 species occur in the area that are strongly associated with wetland habitats which include; Tree Swallow (40 forage over water), Spotted Sandpiper (29 / particularly common along moving water), Greater Yellowlegs (17), Cliff Swallow (11 colonial nesting / forage over water), Common Snipe (10), Barn Swallow (9 / forage over water). Other birds which require water or are strongly associated with water, but occur in lower densities include; Bald Eagle, Osprey, Great Blue Heron, Western Grebe, Trumpeter Swan, Barrow's Goldeneye, Hooded Merganser, Sora, Solitary Sandpiper, Belted Kingfisher, Swamp Sparrow, Northern Waterthrush, Killdeer, and Sandhill Crane. Many of the species that are strongly associated with wetlands, and those that require water as an essential part of their habitat, also use

forest as nesting habitat. As an example, Great Blue Heron nest high in tree canopies of large spruce or poplars. These birds (as are many other colonial nesting birds [e.g., Bonaparte's Gull, Black Tern, Cliff Swallow, and Bank Swallow]) are highly sensitive to disturbance during the nesting period and require some form of protection. Another example is the cavity nesting ducks, which include; Hooded Merganser, Bufflehead, and Goldeneyes. These cavity nesting ducks require large diameter cavities created by either Northern Flickers, or preferably Pileated Woodpeckers. Nest trees are often close to water, but may be located more than 1 kilometer away. Other species which may nest in trees, or away from the water (i.e. in areas where logging can occur) include Mallard, Canada Goose, Bald Eagle and Osprey, Solitary Sandpiper, and Tree Swallow.

Many of the remote small lakes and ponds in the Foothills and the adjacent Mixedwood Boreal Forest east of the Rockies are important areas for the "Threatened" Trumpeter Swan. These swans were first recorded in 1978 when wide-spread arial surveys began. Population sizes increased to 37 individuals, half of which were cygnets (juveniles). Trumpeter Swans are highly sensitive to disturbance and Swan Lakes require protection with wide (no-use) buffer zones (200-800metres).

The small lakes and wetlands in the boreal and foothill forest often act as important breeding areas during droughts on the prairies. Periodically, drought conditions on the prairies force waterfowl (especially members of the dabbling duck family) to seek stable conditions found further north. Even though the levels of productivity are generally lower than a typical year from breeding grounds further to the south and east, the wetlands further north act as a rescuing effect and assist in long-term population stability.

Many species of songbirds that nest in upland sites were observed more frequently in and around the wetlands than in the forest. Some of these species include; Western Wood Pewee, American Robin, Common Yellowthroat, Song Sparrow, Lincoln's Sparrow, Tree Swallow, Barn Swallow, and Le Conte's Sparrow. Most of these species are often associated with open areas, with shrub and/ or grass dominated vegetation complexes, rather than dominated by trees. Perhaps the most notable example of a bird that is usually known for inhabiting forest and forest edges, but not necessarily, riparian areas, is the Western Wood Pewee.

Raptors

Daytime and Night-time owl surveys were conducted in the Edson FMA during the late winter of 2000. Incidental observations of other raptors (i.e. hawks) were noted during these surveys and are also summarized here. Nine species of owls are thought to occur in the FMA, eight of which were observed during the surveys. In order of most common to least common, these were; Northern Saw-whet Owl (43), Great Gray Owl (31), Boreal Owl (25), Barred Owl (22), Great-horned Owl (21), Northern Pygmy Owl (5), Northern Hawk Owl (1), and Long-eared Owl (1). The only species that was expected to occur (Short-eared Owl) was not detected as the survey was designed to preferentially sample forest-dwelling birds. The Short-eared Owl commonly nests in abandoned fields, or areas of extensive natural meadows, and occasionally peatlands. The number of Great Gray Owls in this survey is likely not representative of a long-term average, as this year was a peak year for Great Gray Owl irruptions (An irruption is a periodic long-distance movement). In the case of Great Gray Owls, many individuals that typically occur as far north as the boreal-taiga transition zone, often fly south in search of a stable food supply. The Great Gray Owl is highly dependent on small mammals (specifically

Microtus species of voles) and these animals are subject to cyclical population dynamics (i.e. 3-4 year cycle). It is uncertain whether or not the south-bound individuals successfully breed in the south, but many of those observed in the Edson area exhibited territorial behaviour. In the Chip Lake Salvage Logging Study, field crews identified 5 nests in less than 80 km^2**.** The Great Gray Owl is listed as Vulnerable by COSEWIC and appears on the Provincial *Blue List*.

All of the owl species identified above either require (Boreal Owl, Northern Saw-whet Owl, Northern Pygmy Owl), frequently use (Barred Owl, Great Gray Owl, Northern Hawk Owl), or occasionally use (Great-horned Owl, Long-eared Owl) tree cavities for nesting. The smaller owls that require cavities invariably use former nest sites of the Northern Flicker or Pileated Woodpecker. The larger species tend to use naturally hollowed out portions of trees, which are usually found in large-diameter balsam poplar snags. Often, the Great Gray Owl, Great-horned Owl, and Long-eared Owl make use of abandoned stick nests, constructed by Ravens, Crows, or various Hawk species.

Most owls occur at low densities, and are therefore naturally rare. Some species such as the Barred Owl and Boreal Owl have very large home ranges and do not appear to do well in disturbed forests (i.e. fragmented, lots of cutblocks, linear corridors, etc,). It may be important to provide large tracts of un-disturbed mature and over-mature forest to maintain these species. Other owl species are often found in a variety of habitat types and are thought to be stable in human-altered landscapes (i.e. Great-horned Owl). In most cases, we still do not know enough about the complex habitat requirements or population dynamics of forest-dwelling owls.

The Northern Pygmy Owl was observed on several occasions in the Edson FMA. This species typically occurs in conifer dominated (pine) forest in the western forests of the Rocky Mountains and West Coast. This species is Canada's smallest owl, but despite its small size, it often takes prey up to twice its own weight. It feeds on a variety of prey including insects, small mammals, and a variety of songbirds. Provincially, its status is *Un-determined*.

Many other raptor species are thought to occur in the area. During the owl surveys, many species were seen, including Red-tailed Hawk, Rough-legged Hawk, Bald Eagle, Golden Eagle, Merlin, Northern Harrier, American Kestrel, Northern Goshawk, and Osprey. Most of these secondary raptor observations were likely of individuals on migration. The Rough-legged Hawk, and probably the Golden Eagle, breeds much further north than the Edson FMA. During the Spring Forest Breeding Bird Survey, the Red-tailed Hawk was the most frequently encountered raptor. Another species, the Broad-winged Hawk, was also detected in this period. During the Edson Christmas Bird Count (1980-1997), the Northern Goshawk and the Great Gray Owl were the most commonly counted raptors. The Christmas Bird Count also has a Peregrine Falcon on record. Peregrine Falcons are known to breed not far from the Edson FMA (e.g., Brazeau Reservoir) and could occur in the region. Other species that were not counted, but likely occur in the FMA include smaller cousins of the Northern Goshawk; both the Sharp-shinned Hawk and the Cooper's Hawk. Both of these species have been counted on local "routes" for the North American Breeding Bird Survey. These two species were not detected on the spring survey, likely because of their extremely secretive nature. Both the Sharp-shinned Hawk and the Cooper's Hawk are short-distant migrants.

Herpetofauna - The herpetofauna in the Edson FMA although not diverse, represent a critical biotic element of the foothill ecosystem. Anurans are good indicators of ecosystem health, due to their life cycle, in terrestrial and aquatic environments. In many wetlands, anurans (western toads, wood frogs, striped chorus frog etc.) are among the most abundant vertebrates, and are vital to the food web. Boreal toads are undergoing a dramatic decline in much of its North America range, in Alberta; their status is unknown.

Ungulates

Elk – Elk populations in the Edson FMA are monitored by aerial winter surveys conducted every second year. The surveys were flown along the McLeod River from Edson to Whitecourt and also include areas that experience elk depredation problems. In 1996, a total of 438 elk were observed on winter elk surveys along the McLeod River. Elk densities obtained from aerial surveys conducted in WMUs that are within the Edson FMA boundary vary from 0.02/km2 to 0.43/km2.

Moose – The most recent aerial surveys of WMUs with portions in the Edson FMA, have recorded moose densities at 0.65 animals/km^2. The Northern Moose Management Program began in 1993 to gather information on moose populations in northern Alberta. Portions of the study area fall within the Edson FMA. Aerial surveys and cow tracking are used to collect information on moose populations. An annual survival rate of cow and calf moose was 89.8% and 79.3% respectively.

Mule and White-tailed Deer - Both white-tailed deer and mule deer are moderately abundant in the Area. Aerial surveys were not specifically conducted for deer in the Edson FMA. Incidental observations of deer were recorded in all ungulate surveys, and an estimate of densities is 0.18/km2 and 0.09/km2 for white-tailed deer and mule deer respectively

Carnivores/Furbearers - Nine species of furbearers and forest carnivores occur within the Weyerhaeuser Edson FMA. Based on the 1999/00 winter track survey, conducted by Alpha Wildlife Research & Management, snowshoe hare is the most abundant mammal recorded in the survey. Snowshoe hare tracks were abundant and present in all habitat types. Red squirrels tracks were also very abundant. Fisher tracks seem to be more frequent in the same habitat as 2 of its main prey species, red squirrel and snowshoe hare. Most fisher tracks were located in mid-seral and mature stands. Short-tailed weasel tracks were the second most abundant carnivore and unexpectantly associated with the early seral stage and areas with little overhead cover. Due to the low number of detections, this winter track survey did not allow analysis of habitat used by marten, lynx, cougar and canids.

There are 84 registered traplines within the FMA. In 1998, red squirrel, beaver, weasel/ermine, coyote and muskrat were the most common species taken on individual traplines. Beaver and muskrat were taken on all traplines, red squirrel and coyote on all but one and weasel/ermine on all but two. Fox, fisher, wolves, mink, marten, lynx, black bear, badger, wolverine, skunk, raccoon and otter were taken in different proportions.

Gray Wolf - Wolves occur through the FMA. Most of the knowledge comes from a study of 10 gray wolves in West Central Alberta. Ranges of three wolves that were monitored

as a result of the wolf transplant to Yellowstone and Idaho fell within the FMA boundary (McLeod River, Oldman Creek and Obed Lake).

Grizzly Bear – The home ranges of grizzly bears in Alberta includes western portions of the Edson FMA. The Foothills Model Forest initiated a comprehensive research project east of Jasper National Park with the aim to improve our knowledge base on this species and ensure its long-term conservation.

Small Mammals - Little is known on small mammals. No known natural bat hibernacula exist within the Edson FMA. Six species commonly reported in the area are big and little brown bats, silver-haired, hoary, long-legged and long-eared bats.

Fish Fauna

The FMA Area supports a diverse fish fauna, ranging from native cold water sport fish species such as Arctic grayling, mountain whitefish, bull trout, Athabasca strain rainbow trout to cool water species such as goldeye, burbot, northern pike, walleye, yellow perch and lake whitefish. Non-native brook, brown and rainbow trout have also been stocked into many lakes and streams in the FMA in the past to provide recreational fishing opportunities. Non-sport fish species known to exist in drainages throughout the FMA include: longnose dace, pearl dace, finescale dace, northern redbelly dace, emerald shiner, lake chub, fathead minnow, trout perch, longnose sucker, white sucker, slimy sculpin, spoonhead sculpin, and brook stickleback.

In general, fisheries production in the streams and rivers in the FMA is limited by the colder water and the shorter growing season. Sport and non-sport fish species are found in habitat ranging from large rivers to small tributary streams. Larger rivers tend to be important for migration, overwintering, rearing, and spawning purposes and the smaller tributary streams are often important as spawning and rearing areas. Recreational angling is active at lakes, rivers and streams located within the FMA Area. Most of the recreational fishing pressure on the flowing waterbodies occurs on the larger rivers and streams. Access to streams and lakes in the FMA are very good, as many roads and cutlines exist.

There is a lack of current fisheries data in the FMA and very little historical information exists, therefore it is difficult to identify seasonal distribution of species, relative abundance, presence/absence and locations of critical fish habitat. Very little current site specific data exists on most of the flowing waterbodies; however, inventory data being collected in the present year will begin to address some of the data gaps. Historically, many of the rivers and streams in the FMA were considered to be good Arctic grayling fisheries. Arctic grayling numbers have declined in many of the streams in recent years due to a number of factors, which may include overfishing, habitat degradation and industrial expansion.

The most widely distributed sport fish species found in the lakes throughout the FMA is northern pike, which provides good fishing opportunities for anglers. Walleye, yellow perch, burbot and lake whitefish are other species of sport fish that can be caught at some lakes in the FMA.

APPENDIX 3-4

REPORT OF THE 2000/2003 BREEDING BIRD SURVEYS

APPENDIX 3-5

REPORT OF THE 2003 OWL SURVEY FOR WEYERHAEUSER'S EDSON FMA AREA

APPENDIX 3-6

OCCURRENCE OF FURBEARERS IN WEYERHAEUSER'S EDSON FMA - 2003

APPENDIX 3-7

DEMOGRAPHIC PROFILE OF EDSON

Demographic Profile of the Edson Labour Force

Characteristics	Edson			Alberta		
	Total	Male	Female	Total	Male	Female
Labour force characteristics of the pop. age 15 years and older						
Average total income of persons reporting income ($)	25,159	34,451	14,747	26,138	33,129	18,850
Persons in the employed labour force	3,590	2,055	1,535	1,379,710	750,840	628,865
1996 unemployment rate (%)	9.1	6.6	12	7.2	7.3	7.1
1996 participation rate (%)	73.1	80.7	65.4	72.4	79.3	65.5
Industry characteristics of the population age 15 years and over						
Who have worked since January 1, 1995						
Total - all industries	3,875	2,175	1,695	1,461,360	798,685	662,670
Persons in agriculture and other resource-based industries (primary)	635	575	60	170,145	122,205	47,940
Persons in manufacturing and construction industries (secondary)	665	575	90	222,040	177,945	44,095
Persons in service industries (tertiary)	2,570	1,035	1,540	1,069,170	498,530	570,635

Source: Stats Can

APPENDIX 3-8

AGE-CLASS PROFILE OF MALES AND FEMALES IN EDSON

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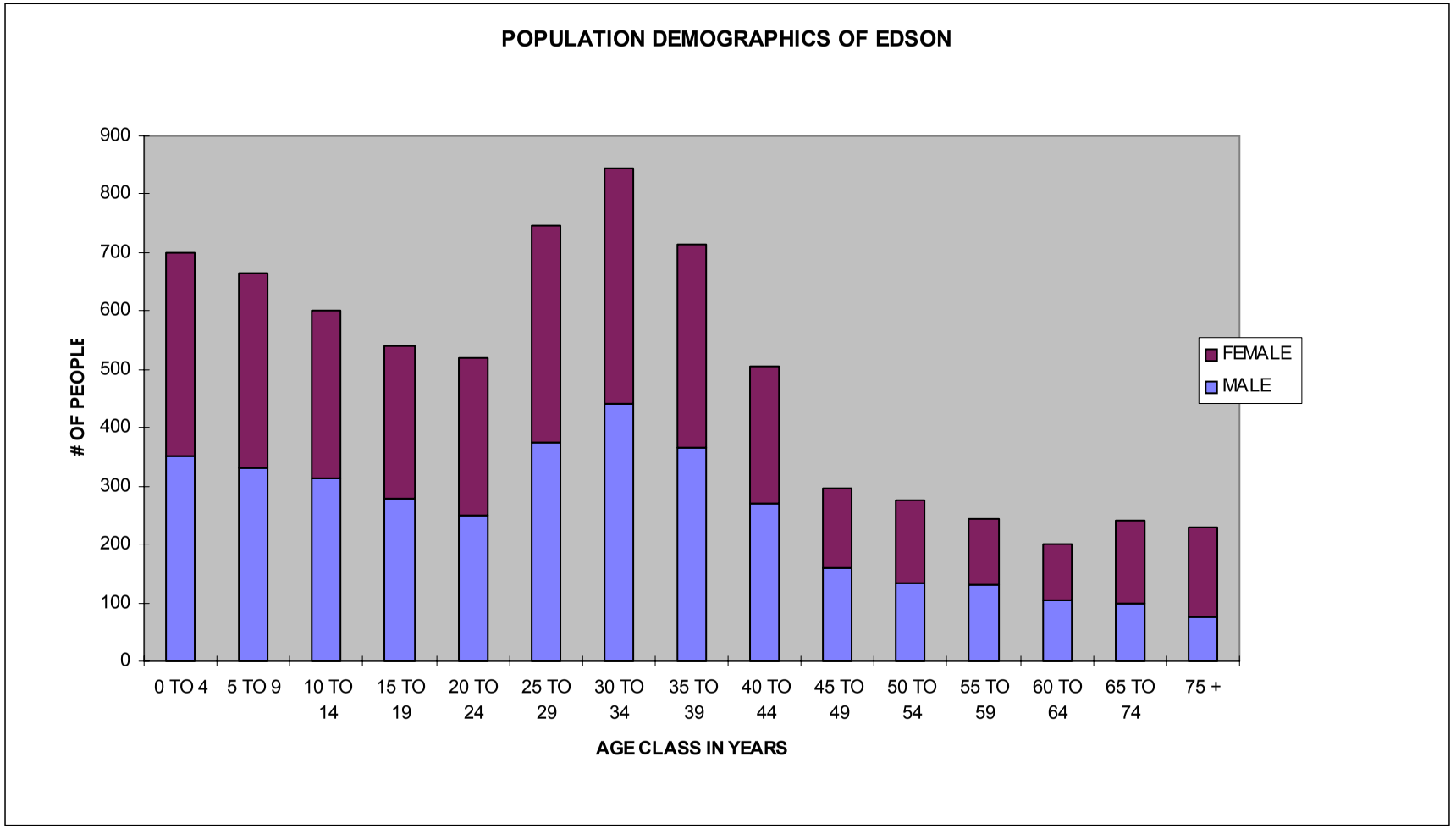
POPULATION DEMOGRAPHICS OF EDSON
OF PEOPLE
900
800
700
600
500
400
300
200
100
0
0 TO 4
5 TO 9
10 TO 14
15 TO 19
20 TO 24
25 TO 29
30 TO 34
35 TO 39
40 TO 44
45 TO 49
50 TO 54
55 TO 59
60 TO 64
65 TO 74
75 +
AGE CLASS IN YEARS
FEMALE
MALE

APPENDIX 3-9

ORGANIZATIONS RECEIVING DONATIONS FROM WEYERHAEUSER 1995-2004

APPENDIX 5-1

VALUES AND ISSUES IDENTIFIED