



GLOSSARY OF TERMS

Aboriginal	The term Aboriginal peoples refers to organic political and cultural entities that stem historically from the original peoples of North America, rather than collections of individuals united by so-called 'racial' characteristics. The term includes the Indian, Inuit and Metis peoples of Canada. As well the term First Nation replaces the term Indian. (Report of the Royal Commission on Aboriginal Peoples)
Acquisition	The act of acquiring. Anything gained or acquired.
Adaptive Management	A dynamic planning or modeling process that recognizes the future cannot be predicted perfectly. In response to these imperfect predictions, planning and management strategies are modified frequently as better information becomes available.
Adjacency	Timber supply term for the action in the model to build blocks – distance from one block to another block.
AD Map	The access development map developed by Alberta-Pacific to assist in Integrated Landscape Management.
ADt	Air Dried Tonne
Aggregated Harvest Systems	Harvest planning that concentrates forestry activities in space and time. This results in large, generally contiguous patches of young forest that should better imitate large natural disturbance patterns created by fire.
ALCES	Alberta Landscape Cumulative Effects Simulator model used to demonstrate cumulative effects that industrial users are having in northern Alberta.
Alternative Silviculture Systems	A generic mixedwood silviculture system definition that describes systems designed to grow aspen and spruce on the same site, such as understory protection, underplanting and shelterwoods.
Ambient	The quality of physical parameters in the surrounding, external, or unconfined conditions (e.g., air temperature or pollution).
AME	Adaptive Management Experiment (http://www.ameteam.ca).
Annual Allowable Cut (AAC)	The amount of timber that may be harvested in a year as stipulated in the pertinent Forest Management Plan approved by the Minister of SRD under sustained yield management.

AOP	Annual Operating Plan
Aquatic System	Any body of water, such as a stream, lake, or estuary, and all organisms and nonliving components within it, functioning as a natural system.
Assemblage	A collection of organisms whose patterns of organization, with respect to competition, predation, mutualism, etc., are unknown.
AVI	Alberta Vegetation Inventory is a digital forest inventory that is replacing the old Alberta Phase 3 Inventory. (See Chapter 3)
Baseline Data	Data collected to reflect normal conditions and is used for comparison for data in result to changes or alterations made to the normal conditions over time.
Benchmark Area	An area in which baseline data is collected.
Biodiversity	The distribution and abundance of living organisms and the ecological complexes of which they are a part. This includes diversity within (genetic) and between species (number of species and structure of local system), and diversity ecosystems across a landscape.
Biochemical Oxygen Demand (BOD)	The amount of molecular oxygen in the water that is consumed by microorganisms during the process of decomposition. Higher amounts of organic matter in the water the more oxygen is required by organisms. BOD is used as an indicator of water pollution generated from organic wastes and is measured in parts per million of dissolved oxygen consumed.
Biota	The total number of flora and fauna found within a given area.
Bog	A cold, wetland ecosystem characterized by an accumulation of peat, acidic conditions, and the dominance of sphagnum moss. Usually accompanied by low shrub and sometimes stunted conifers.
Browse	Twigs or shoots of shrubs, or woody vines that are eaten by wildlife or livestock.
Buffer	A protected strip of vegetated land beside water courses and other important landscape features.
Canopy	A layer of foliage in a forested stand. This most often refers to the uppermost layer but can be used to describe lower layers of foliage in a multilayered forest stand.
Calibration	The act or process of determining certain specific measurements in a camera, instrument, or device by comparison with a standard.



Cellulose	The main structural and chemical component of cell walls in plants (approximately 50 per cent of the chemical constitution of wood).
CEMA	Cumulative Effects Management Association for the rural municipality of Wood Buffalo.
Clone	A population of individuals all originating asexually from the same single parent and, therefore, genetically identical.
Climax Stage	Vegetation that has reached a stable condition in a given site during a culminating stage in plant succession.
Coalesce	To grow or come together into one; blend.
Coarse Filter Approach	A research and management concept that assumes that by maintaining vegetative communities and landscape patterns and processes within the limits of natural variability will result in the maintenance of a full compliment of native plant and animal species.
Coniferous	Cone-bearing trees with needles or scale-like leaves. Often referred to as softwood.
Core areas	The interior portion of a contiguous forest area, not influenced by edge characteristics or properties.
Criteria and Indicators (C&I)	Criteria and indicators are used to define, measure and report on the forest values required to sustain and enhance the landscape. C&I are intended to provide a common understanding and scientific definition of sustainable forestry in Canada and provide a framework for describing and measuring the state of the forest, forest management practices, values and progress toward sustainability.
Crown Closure	That point in stand development when all the available crown space has been occupied with live foliage.
Cutblock	A specified area of merchantable timber with defined boundaries designated for harvest.
Deciduous	Tree and shrub species that lose their leaves annually. The wood of these trees are referred to as hardwood.
DFMP	Detailed Forest Management Plan
Dioxin and Furan	Dioxin is a general name given to a whole family of compounds. There are 210 different chlorinated dioxins and furans but two (2,3,7,8, TCDD and 2,3,7,8 TCDF) are the most important as they are carcinogenic (toxic) compounds.

Diversity	Diversity is an assessment of the number of species present, their relative abundance in an area, and the distribution of individuals among the species.
Duff	The layer of loosely compacted, decaying debris underlying the litter layer on the forest floor.
Ecosystem Management	The careful and skillful integration of ecological, economic, social and managerial principles in managing human activities within the forest ecosystems to produce, restore, or sustain ecosystem integrity and desired conditions, uses, products and services over the long-term.
Edge	A natural or human induced condition whereby two dissimilar plant communities (different vegetation types, successional stages, or vegetative conditions) meet.
Emergence	The appearance of a developing aerial part of a plant, particularly of a plant that has just germinated above the surface soil.
Emulate	To try to equal or surpass, especially by imitating.
Enhanced Forest Management (EFM)	EFM is undertaken to increase the productivity of stands above that of unmanaged stands or stands managed to basic forest management standards. Enhanced forest management involves silvicultural activities that increase the growth of stands, such as juvenile or commercial thinning, tree improvement, herbicides or fertilization. Selection of stands for EFM practices considers, among other things, the productivity (quality) of the site, potential for growth response, and the fit of the stand, and its associated characteristics, within the forest landscape.
Esker	A sinuous ridge of sand and gravel formed by water running through or under glacier or ice sheet tunnels.
Erosion	The wearing away of the land surface by running water, wind, ice, or other geological agents.
Expedite	To speed up the process or progress of; facilitate.
Extensive fire	Used to refer to spatial extent of disturbances by fire or logging . A disturbance that is wide spread.
Fauna	All animal life.
Fen	Peatland comprising of neutral to acidic accumulations of organic materials derived from sedges. A mineral rich water table persists very near the surface.

Fine Filter Approach	Biological research and management concept that focuses on individual species and their relationship to their habitat.
Fire Behavior	The manner in which fuel ignites, flame develops, and fire spreads and exhibits other related phenomena, as determined by the interaction of fuels, weather, and topography.
Fire Intensity	The magnitude and severity of a fire.
Fire Suppression	All activities concerned with controlling and extinguishing a fire following its detection.
Flora	All plant life.
Forb	A herbaceous plant with broad leaves, excluding the grass-like plants (e.g., buttercup, sunflower).
Forest Management Agreement (FMA)	A renewable agreement between the Alberta government and a company that grants that company the rights and obligations to manage, grow and harvest timber in a specified area on a sustained yield basis.
Forest Management Unit (FMU)	A defined area of forest land located in the Green Area of the province and designated by Alberta sustainable resource development (SRD) to be managed for sustainable timber yield.
Fragmentation	The carving into parcels or “fragments” of a natural landscape due to such things as cutlines, roads, and other types of clearings. This disturbance is thought to be a major threat to biodiversity because of the creation of barriers to species movement as well as edge effects.
General Development Plan (GDP)	A five year operating plan prepared, updated and submitted annually by the timber harvest operator.
Geographic Information Systems (GIS)	A discipline, system or profession focusing on the acquisition, handling, analysis, and display of land related data. It relies on computer equipment, procedures, personnel, and geographic data.
Gibberellins	Plant hormones that promote stem elongation of certain plants, increased growth and/or flowering and fruit (seed) formation.
Glacial Fluting	The process by which smooth, straight furrows running parallel to ice-flow are formed in bedrock by glacial abrasion.
Glaciation	The process by which landforms are constructed as a result of pressure and momentum of glaciers on and over the earth's surface during the last glacial period.

Glaciofluvial	Stratified outwash transported and deposited by glacial meltwaters that flow upon, within, under, or beyond the glacier.
Girdling	To destroy the conducting bark tissue all the way around a trunk, stem, branch, or root, thus preventing the movement of fluids bearing nutrients and photosynthetic products up or down the tree causing death of the affected part.
Goal	An ideal; a desired point; frequently defined in abstract terms. Goals are qualitative and are achieved by means of objectives.
G&Y	Growth and Yield
Hardwood	see Deciduous
Herbaceous vegetation	Vegetation that is usually forbs, grasses, or leafy plants.
Hybrid	Plant or animal offspring of a cross between two genetically dissimilar individuals.
Incidental Conifer	Conifer existing at a volume below what is considered merchantable on a stand basis, found in timber types dominated by a deciduous species.
Indicator Species	A plant or animal species able to provide early detection of a wide range of environmental change. Response may come in the form of the species presence or absence, change in its defined characteristics or behavior or by increased levels of toxins found within it.
Indigenous	Originating or occurring naturally in the place specified; native.
Ingress	The establishment of natural regeneration in an opening.
Integrated Landscape Management (ILM)	An initiative of Alberta-Pacific to assess cumulative impact effects, address and implement planning and coordination of industrial development in a manner that will reduce the cumulative effect of all activities on the landscape in terms of its size, intensity, distribution and duration.
Landscape	An expanse of natural or human-made scenery, comprising landforms, made features that, taken together, form a composite. A forest management unit (FMU), amalgamation of FMUs and/or the forest management agreement (FMA) area can be described as a landscape.
Landscape Fire Management	Assessment and analysis of a defined landscape (e.g. forest management unit) to reduce the risk and severity of fires to values at risk through the integration of fire into forest management planning and community protection.

Landscape Management	Assessment and analysis of the spatial and temporal patterns of landscape development; the processes leading to maintenance of the landscape mosaic; and the interactions, fluxes, and influences of these processes on biotic and abiotic components.
Landscape Metrics	Measurements of landscape pattern, including size, shape and adjacency of different habitat types and forest polygons.
License of Occupation (LOC)	A disposition assigned by the Crown to identify ownership and protect the rights of firms acting on the public landbase.
Lignin	The non-carbohydrate fraction of wood, lignin acts as a binding material in the intercellular layer of plant tissues. It is a complex polymer, and gives woody tissues structural rigidity. Chemically intractable and insoluble, it amounts to 14 to 35 per cent by weight of the cell wall material, and it is used mainly as a fuel in the pulping process.
Mesic	Pertaining to conditions of moderate moisture or water supply.
Mixedwood Stands	Stands containing both deciduous and coniferous species in overstorey (DC and CD classification).
Merchantable trees	A stand of trees is considered to be merchantable once it has reached a size, quality, volume, or combination of these that permits harvesting and processing.
Microclimate	The climate in the immediate surroundings.
Mixedwood Growth Model (MGM)	MGM is a realistic, individual tree-based stand growth model that is capable of summarizing both tree and forest stand characteristics
Mixedwood Management (MWM)	The managing of a forest to ensure that all its values are retained recognizing stands and landscapes with an emphasis on ecological site processes and functions.
Model 2	Landscape level monitoring (also referred to as -Model II), is a management by objective (MBO) system, that changes from stand level objectives (set by landbase designation) to a landscape level management system that strives through a forest management unit level credit/debit system to fulfill the overall objective of sustained yield. The new landscape monitoring system is currently a “project-in-process”.
Mosaic	In landscape ecology, the landscape mosaic is the pattern of different ages and types of ecosystems distributed across the landscape.

MWM	See Mixedwood Management
Mycorrhizae	A “fungal root” resulting from a symbiotic relationship between a fungi and the roots of a host plant, in which energy, water, and nutrients flow between the two structures. Many plants perform better when mycorrhizae are present, and in some cases, trees cannot grow, or grow poorly, without them.
Natural Disturbance	Natural disturbance in the boreal forest is mainly through wildfire, and a lesser degree by windthrow, flooding (e.g., beavers), drought, insect and disease cycles.
Non-vascular Plants	Nonvascular plants include algae, lichens, mosses, liverworts, as well as the fungi. Because they don’t generally have the structural support conferred by vascular tissue, nonvascular plants are essentially non-woody, small, and low-growing.
Objective	<ol style="list-style-type: none">1) The aims/results/ends forest Companies expect to achieve through the strategies outlined in the Forest Management Plan.2) Criteria used to select a firm’s activities and to evaluate performance.
Operating Ground Rules	A document, developed through a consensus building process of the Forest Management Task Force, that gives direction to the Companies and the staff of Alberta sustainable resource development (SRD) in keeping with the objectives and strategies of the Forest Management Plan for planning, implementation and monitoring timber operations on the FMA area.
Perpetual	Continuing or lasting forever or for an unlimited time.
Perpetuated	To make perpetual or enduring. To cause, to remain known, current, etc.
Pioneer Species	The first plant or animal species or community to colonize an unoccupied or disturbed area, thereby commencing a new ecological succession.
Protected Areas	An area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means. Protected areas generally exclude industrial activities.
Proximity	Timber supply model action used for scheduling blocks – defines how close a block can be to another block in the same period (i.e. 5 years) in the 200 year planning horizon.

Quota Holders	In this document the term refers to the four large sawmills that acquire conifer timber from the forest management agreement (FMA) area; Millar Western, Vanderwell, Alberta Plywood and Northlands.
Pre Harvest Assessment (PHA)	Pre-Harvest Assessment stands or strata are assessed prior to harvest for regeneration implications relating to soils, soil moisture, competition, conifer understorey, pest hazards and other site concerns.
Protected Area	Areas of varying size and ecotype that have some level of legal protection from human activity, industrial or otherwise.
Permanent Sample Plot (PSP)	A continuum of field data collection that measures forest tree and stand dynamics.
Reconnaissance	Generally, a broad-scale review of an area prior to undertaking a more detailed and systematic inventory or evaluation.
Refine	To improve or change by subtle or precise alterations.
Refinement	The act, effect, or process of refining.
Residual Conifers	Conifer left after harvest.
Riparian Areas	A vegetation zone influenced by groundwater, sub-irrigation areas where a high water table reaches and/or saturates the root zone or surface water, and which provides important habitat for fish and/or a variety of wildlife species. The vegetation is often a transition zone between aquatic habitat and upland terrestrial habitat.
Rotation Age	The number of years required to establish and grow timber to a specified condition or maturity.
Scarification	A silviculture practice involving the mechanical disruption of the soil surface in preparation for reforestation. Its purpose is to expose mineral soil to enhance conifer growth.
Senescence	The process of aging in mature individuals, typically toward the end of an organism's life.
Sequence	A listing of potential harvest areas made up of Alberta vegetation inventory (AVI) polygons (hectares and their associated volumes) that sum up to meet the annual allowable cut (AAC) targets for each of the major strata. It can help define the species profile of the AAC. It is at best, a forecasted harvest allocation prepared for each Forest Management Unit.



Seral Stage	Also called successional stages. In a forestry context, the series of plant community conditions that develop during ecological succession from bare ground to the climax stage.
Shelterwood	The gradual removal of an entire stand in a series of partial cuts that extend over a fraction of a rotation. The objective is to regenerate an evenaged stand under the existing canopy.
Silviculture	The theory and practice of controlling the establishment, composition, structure and growth of the forest.
Slash	Debris left as a result of forest and other vegetation being altered by forestry practices and other land-use activities. Slash includes materials such as logs, splinters or chips, tree branches and tops, uprooted stumps, and broken or uprooted trees and shrubs.
Sludge	Soft mud.
Snag	A dead standing tree at least 6 m in height. It may provide roosting or cavity nesting/denning opportunities for wildlife.
Socio-economic	Socio-economics is the combination of community values and attitudes, with economic sustainability (companies, products, income and activities).
Softwood	<i>see</i> Coniferous
Species Profile	The listing of Alberta vegetation inventory (AVI) stands or polygons that were forecasted within the Timber Supply Analysis (TSA) to meet the annual allowable cut (AAC). Each polygon has an associated forest composition with a leading species label. The AAC species profile can be altered within an acceptable variance per the forest management plan (FMP).
Species Richness	The number of species in a given area regardless of distribution.
Stand	A community of trees sufficiently uniform in species, age, arrangement and condition, and distinguishable as a group in the forest or other growth on the area.
Stand Structure	Stand structure is the physical form of the forest. Features of structure include live merchantable trees of all types and ages, standing dead trees (snags), downed logs, and non-merchantable vegetation (e.g. shrubs and grass). As stands age, the amount and type of structure they contain changes.
Stewardship Report	A report presented on a 5 year basis, with annual updates, that is designed to monitor commitments made in the management of a forest area and the long term trends of company activities.

Strategies	Those means/ specific initiatives by which the Forest Companies will meet identified objectives.
Structural Diversity	The diversity of forest structure both vertical and horizontal, that provides for a variety of forest habitats for plants and animals. The variety results from layering or tiering of the canopy and die-back, death, and ultimate decay of trees.
Succession	The replacement of one plant community by another in progressive development toward climax vegetation.
Sustained Yield	The quantity of a resource that can be produced continuously under a given management regime.
Symbiotic relationships	Generally, a long-term association between two different species living together. May be restricted to organisms that have mutually beneficial relationships (mutualism), but can also include commensalism and parasitism that would be harmful to one of the organism.
Synergy	Sharing of capabilities among any group of individuals or firms which produces performance which is greater than the performance which can be obtained if the units operate independently on one another. The “2+2=5” effect (i.e. Integrated Landscape Management; a “softer footprint”).
Tree List Generator (TLG)	A TLG can predict a tree list or stand table for each stand (Alberta vegetation inventory label) in the forest using statistical relationships developed from the temporary sample plots (TSP) and permanent sample plot (PSP) datasets. This results in an explicit database that provides stem counts, stem sizes (log populations), initial stand conditions and stand tables.
Timber Supply Analysis (TSA)	The process of establishing and annual allowable cut. This includes: the netdown process, harvest criteria identification, growth and yield curves and trajectory pathways.
Temporary Sample Plot (TSP)	Forest tree data collected in the field for yield analysis.
Topography	All natural and man-made surface features of a geographical landscape.
Total Suspended Solids (TSS)	Mostly tiny fragments of fibre and wood solids that escape in the wastewater from the mill.
Understorey	That portion of trees or other vegetation in a forest stand below the main canopy level.
Ungulate	Any hooved mammal. Includes species such as deer, moose, caribou and bison.

Vascular Plants	Plants having well-developed vascular components capable of transporting water, sugars, nutrients, and minerals between the absorbing tissue in the roots and the photosynthesizing tissue in the leaves.
Watershed	An area of land, which may or may not be under forest cover, draining water, organic matter, dissolved nutrients, and sediments into a lake or stream.
Western Boreal Forest (WBF)	A Ducks Unlimited Canada program.
WESBOGY	The Western Boreal Growth and Yield Cooperative is a Western Canada industry sponsored organization managed by the University of Alberta. The co-operative is involved in forest growth and yield issues in Western Canada's boreal forest. The cooperative facilitates coordinated research and development efforts in boreal forest growth and yield data sharing and also provides a forum for communications.
Windthrow	A tree uprooted or sheared off by the wind; also referred to as blowdown.



BIBLIOGRAPHY

- Alberta Government. 1990. An implementation framework for enhanced forest management in Alberta. Alberta Sustainable Resource Development. Available at: <http://www3.gov.ab.ca/srd/forests/fmd/legacy/legacy.pdf> [November 27, 2003]
- Alberta Government. 1998. Forest management planning manual. Alberta Sustainable Resource Development. Available at: <http://www3.gov.ab.ca/srd/forests/fmd/manuals/index.html> [November 2003]
- Alberta Government. 1999. Regional Sustainable Development Strategy for the Athabasca Oil Sands Area. Alberta Environment and Alberta Sustainable Resource Development. Available at: <http://www.gov.ab.ca/env/regions/rsds> [December 2003]
- Alberta Sustainable Resource Development. 2003. Interior Forest Analysis Procedure (DRAFT), Resource Analysis Section, Forest Management Branch, Public Lands and Forests Division (Author –T.Kobliuk).
- Alberta Environmental Protection. 1994. Natural regions and subregions of Alberta: summary. Alberta Environmental Protection. Publ. No. I/531., Edmonton, Alberta.
- Alberta-Pacific Forest Industries Inc. 2000. Detailed Forest Management Plan. Alberta-Pacific Forest Industries Inc., Boyle, Alberta.
- Alberta-Pacific Forest Industries Inc. 2000. Operating Ground Rules. Alberta-Pacific Forest Industries Inc., Boyle, Alberta.
- Alberta-Pacific Forest Industries Inc. 2000. Operators Guide to Stand Structure. Alberta-Pacific Forest Industries Inc., Boyle, Alberta.
- Andison, D.W. 2003. Natural levels of forest age-class variability on the Alberta-Pacific FMA. Bandaloop Landscape-Ecosystem Services, Belcarra, BC. Prepared for Alberta-Pacific Forest Ind.
- Ball, W.J. and N.R. Walker. 1995. Natural regeneration of white spruce after partial cutting and strip scarification in mature mixed white spruce–aspen stands, Manitoba Natural Resources Canada, Canadian Forest Service, Manitoba District Office, Winnipeg, Manitoba, and Manitoba Natural Resources, Forestry Branch, Winnipeg, Manitoba. Canada-Manitoba Partnership Agreement.
- Bergeron, Y., B. Harvey, A. Leduc, and S. Gauthier. 1999. Forest management guidelines based on natural disturbance dynamics: stand and forest-level considerations. *Forestry Chronicle* 75: 49-54.
- Canadian Forest Service. 1997. Criteria and Indicators of Sustainable Forest Management in Canada – Technical Report. Council of Forest Ministers , Canadian Forest Service, and Natural Resources Canada.



- Cumming, S.G., P.J. Burton, B. Klinkenberg. 1996. Boreal mixedwood forests may have no "representative" areas: Some implications for reserve design. *Ecography* 19: 162-180.
- Cumming, S.G. 1997. Landscape Dynamics of the Boreal Mixedwood Forest. Ph.D. thesis, University of British Columbia, Vancouver, British Columbia.
- Grumbine, R.E. 1994. What is ecosystem management? *Conservation Biology* 8: 27-38.
- Haney, A. and R.L. Power. 1996. Adaptive management for sound ecosystem management. *Environmental Management* 20: 879-886.
- Hannon, S.J. and C.A. McCallum. 2002. Using the focal species approach for conserving biodiversity in landscapes managed for forestry. Synthesis report. Sustainable Forest Management Network, University of Alberta, Edmonton, Alberta.
- Hannon, S.J. and F.K.A. Schmiegelow. 2002. Corridors may not improve the conservation value of small reserves for most boreal birds. *Ecological Applications* 12: 1457-1468.
- Harrison, S. and E. Bruna. 1999. Habitat fragmentation and large scale conservation: what do we know for sure? *Ecography* 22: 225-232.
- Hosie, R.C. 1979. Native Trees of Canada. Fitzhenry and Whiteside in co-operation with the Canadian Forestry Service (Environment Canada) and the Canadian Government Publishing Centre, Supply & Services, Markham, Ontario.
- Hunter, M.L., Jr. 1991. Coping with ignorance: The coarse filter strategy for maintaining biodiversity. In K.A. Kohn, editor. *Balancing on the Brink of Extinction - The Endangered Species Act and Lessons for the Future*. Island Press, Washington D.C.
- Hunter, M.L. and A. Calhoun, 1996 A Triad Approach to Landuse Allocation. In R.C. Szaro and D.W. Johnston, editors. *Biodiversity in Managed Landscapes: Theory and Practice*. Oxford University Press, New York.
- Jensen, M.E. and P.S. Bourgeron, editors. 1993. *Eastside Forest Ecosystem Health Assessment, Vol. 11 - Ecosystem management: principles and applications*. U.S. Dept. of Agriculture - Forest Service.
- Kimmins, J.P. 1987. *Forest Ecology, A Foundation for Sustainable Management* (2nd Ed.), Prentice-Hall Inc. New Jersey. 596 pp.
- Kimmins, J.P. 1991. *Sustainable Forestry: Can We Use And Sustain Our Forests?* Forest Industry Lecture Series Forestry Program. Forest Industry Lecture No. 27. University of Alberta, Edmonton, Alberta.
- Kimmins, J.P. 2002. Future shock in forestry – Where have we come from; where are we going; is there a “right way” to manage forests? Lessons from Thoreau, Leopold, Tofflers, Botkin, and Nature. *Forestry Chronicle* 28: 263-271.



- Lee, P. 2002. Stages of forest succession. Chapter 3 in Song, S.J., editor. Ecological basis for stand management: A synthesis of ecological responses to wildfire and harvesting. Alberta Research Council Inc., Vegreville, Alberta.
- Lee, P., C. Smyth, and S. Boutin. 2002. Large-scale planning of live treed residuals based on a natural disturbance-succession template for landscapes. Chapter 13 in Song, S.J., editor. Ecological basis for stand management: A synthesis of ecological responses to wildfire and harvesting. Alberta Research Council Inc., Vegreville, Alberta.
- Lee, P. and S. Boutin. 2003. Using Patterns of Live Tree Residuals After Natural Disturbances as a Template for Retention after Timber Harvest. Sustainable Forest Management Network 2003 Conference proceedings.
- Lee, P. and S. Crites. 1999. Early successional deadwood dynamics in wildfire and harvest stands. In Philip Lee, editor. Fire and Harvest Residual Project: The Impact of Wildfire and Harvest Residuals on Forest Structure and Biodiversity in Aspen-dominated Boreal Forests of Alberta. Alberta Research Council, Vegreville, Alberta.
- Lees, J.C. 1964. A test of harvest cutting methods in Alberta's spruce-aspen forest. Can. Dep. For., For. Res. Branch, Ottawa, Ontario. Publ. 1042.
- Lees, J.C. 1966. Release of white spruce from aspen competition in Alberta's spruce-aspen forest. Can. Dep. For., For. Res. Branch, Ottawa, Ontario. Publ. 1163.
- Lees, J.C. 1970a. Natural regeneration of white spruce under spruce-aspen shelterwood, B-18a forest section, Alberta. Can. Dep. Fish. For., Can. For. Serv., Ottawa, Ontario. Publ. 1274.
- Lees, J.C. 1970b. A test of silvicultural practices designed to secure reproduction in partially cut mixedwood stands in Alberta. Can. Dep. Fish. For., Can. For. Serv., For. Res. Lab., Edmonton, Alberta. Intern. Rep. A-31.
- Navratil, S., L.G. Brace, E.A. Sauder, and S. Lux. 1994. Silvicultural and harvesting options to favor immature white spruce and aspen regeneration in boreal mixedwoods. Natural Resources Canada, Canadian Forest Service, Northwest Region, Northern Forestry Centre, Edmonton, Alberta. Information Report NOR-X-337.
- Navratil, S. and P.B. Chapman, editors. 1991. Aspen management for the 21st century. Proceedings of a symposium held November 20-21, 1990, in Edmonton, Alberta, in conjunction with 12th annual meeting of the Poplar Council of Canada. Forestry Canada, Northwest Region, Northern Forestry Centre, Edmonton, Alberta, and Poplar Council Canada, Edmonton, Alberta.
- Navratil, S. 1996. Sustained aspen productivity on hardwood and mixedwood sites. In P.G. Comeau, G.J. Harper, M. Blache, J.O. Boateng, and K.D. Thomas, editors. Ecology and management of British Columbia hardwoods. Workshop Proceedings, December 1-2, 1993, Richmond, British Columbia. Natural Resources Canada, Canadian Forest Service, Pacific Forest Centre, Victoria, British Columbia, and B.C. Ministry of Forests, Victoria, British Columbia. Canada.-B.C. Partnership Agreement for Forest Resource Development. FRDA II Rep. 255.



- Odum, E.P. 1969. The strategy of ecosystem development. *Science* 164: 262-270.
- Overbay, J.C. 1992. Ecosystem Management. *In* Proceedings of the national workshop: taking an ecological approach to management. Salt Lake City, Utah. U.S. Department of Agriculture, Forest Service, Watershed and Air Management Branch, Washington, D.C. WO-WSA-3.
- Robinson, M., T. Garvin, and G. Hodgson. 1994. Mapping how we use our land: using participatory action research. Arctic Institute of North America, Calgary, Alberta.
- Rowe, J.S. 1972. Forest Regions of Canada. Canadian Forest Service, Ottawa, Ontario.
- Schmigelow, F.K.A. and M. Mönkkönen. 2002. Habitat Loss and Fragmentation in dynamic landscapes: avian perspectives from the boreal forest. *Ecological Applications* 12:375-389.
- Schneider, R.R. 2002. Alternative Futures: Alberta's Boreal Forest at the Crossroads. Federation of Alberta Naturalists, Edmonton, Alberta.
- Song, S.J., editor. 2002. Ecological basis for stand management: A synthesis of ecological responses to wildfire and harvesting. Alberta Research Council Inc., Vegreville, Alberta.
- Stelfox, J.B., editor. 1995. Relationships between stand age, stand structure, and biodiversity in aspen mixedwood forests in Alberta. Jointly published by Alberta Environmental Centre (AECV95-R1), Vegreville, AB, and Canadian Forest Service (Project No. 0001A), Edmonton, AB.
- Strong, W.L. and K.R. Leggat. 1992. Ecoregions of Alberta. Alberta Forestry, Lands and Wildlife, Land Information Services Division, Resource Information Branch, Edmonton, Alberta.
- Swanson, F.J., J.A. Jones, D.A. Wallin, and J.H. Cissel. 1993. Natural variability - implications for ecosystem management. *In* M.E. Jensen and P.S. Bourgeron, editors. Eastside Forest Ecosystem Health Assessment, Vol. 11 - Ecosystem management: principles and applications. U.S. Dept. of Agriculture - Forest Service.
- Taylor, S.P., R.I. Alfano, and L. Rankin. 1996. The effects of overstory shading on white pine weevil damage to white spruce and its effects on spruce growth rates. *Canadian Journal of Forest Research* 26: 306-312.
- Van Cleve, K., R. Barney, and R. Schlentner. 1981. Evidence of temperature control of production and nutrient cycling in two interior Alaskan black spruce ecosystems. *Canadian Journal of Forest Research* 11: 258-273.
- Walters, C.J. and C.S. Holling. 1990. Large-scale management experiments and learning by doing. *Ecology* 71: 2060-2068.