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Old Growth Policy for Ontario's Crown Forests

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PREFACE

The *Old Growth Policy for Ontario's Crown Forests* (old growth policy) contributes to the achievement of the Ministry of Natural Resources (MNR) strategic policy directions stated in a number of provincial policies and laws. The policy documents include the MNR *Statement of Environmental Values* (MNR 1995), *Beyond 2000* (MNR 2000), *Nature's Best — Ontario's Parks & Protected Areas: the Framework & Action Plan* (MNR 1997), and the *Policy Framework for Sustainable Forests* (MNR 1994). The *Provincial Parks Act*, the *Public Lands Act*, the *Crown Forest Sustainability Act*, the *Planning Act*, the *Aggregate Resources Act*, the *Mining Act*, the *Environmental Bill of Rights*, and the *Environmental Assessment Act* provide the regulatory support required to implement the old growth policy. The conservation of old growth in Ontario's Crown forests will support provincial contributions to national efforts aimed at conserving biological diversity, maintaining ecological processes, and sustaining the use of Canada's forest resources.

The old growth policy and the report *Old Growth Forest Definitions for Ontario* (old growth definitions report) have been prepared to comply with Term and Condition 103 (a) of the *Reasons for Decision and Decision: Class Environmental Assessment by the Ministry of Natural Resources for Timber Management on Crown Lands in Ontario* as approved by the Environmental Assessment Board on April 5, 1994. The old growth policy and the old growth definitions report also respond to the final report of the Old Growth Forests Policy Advisory Committee, *Conserving Ontario's Old Growth Forest Ecosystems* (MNR 1994).

The old growth policy supports commitments made in the *Ontario Government Response to the Consolidated Recommendations of the Boreal West, Boreal East and Great Lakes-St. Lawrence Round Tables* (Ontario Government 1999). It also supports implementation of the *Ontario's Living Legacy Land Use Strategy* (MNR 1999) and the *Ontario Forest Accord* (MNR 1999). In addition, the old growth policy contributes to provincial commitments under the *Canadian Biodiversity Strategy* (Environment Canada 1995) and the *National Forest Strategy* (CCFM 1998).

Note to the Reader

The report *Old Growth Forest Definitions for Ontario* (MNR 2003) is accessible on the MNR Ontario's Forests public website:
http://ontariosforests.mnr.gov.on.ca/publications.cfm

(Scroll down the page and look under the heading "Resource Documents", then click on the title) or in print from the MNR Natural Resource Information Centres in Toronto and Peterborough (1-800-667-1940).

EXECUTIVE SUMMARY

The *Old Growth Policy for Ontario's Crown Forests* (old growth policy) will be used by policy developers, resource management planning teams, resource managers, specialists, and practitioners to guide decisions about future old growth forest conditions during MNR land use, natural heritage protection, and forest management planning processes.

The old growth policy provides provincial directions for the identification and conservation of old growth conditions and values for major tree species or forest community associations (forest communities) present in Ontario's Crown forests. It is built on the two-pronged approach established in *A Conservation Strategy for Old Growth Red and White Pine Forest Ecosystems* (MNR 1995). Old growth conditions in Ontario's Crown forests will be identified using the descriptions set out in the report *Old Growth Forest Definitions for Ontario* (MNR 2003).

The *Old Growth Policy for Ontario's Crown Forests* and the report *Old Growth Forest Definitions for Ontario* (old growth definitions report) have been prepared to comply with Term and Condition 103 (a) of the *Reasons for Decision and Decision: Class Environmental Assessment by the Ministry of Natural Resources for Timber Management on Crown Lands in Ontario* (Environmental Assessment Board 1994).

The purpose of the old growth policy is to direct how MNR will ensure that old growth conditions and values are present in Ontario's Crown forests in order to conserve biological diversity at levels that maintain or restore ecological processes, while allowing for sustainable development now and in the future.

The old growth policy includes a conservation strategy that describes how MNR will provide for the conservation of old growth across Ontario's forest landscapes (ecoregions). The conservation strategy also describes how the old growth policy should fit with MNR policy directions and legal authority for land use planning, natural heritage protection and forest management planning on Crown lands within the Area of the Undertaking for the Timber Class Environmental Assessment as well as a number of existing and recently regulated protected areas now covered by the Ontario's Living Legacy planning area.

The objectives for conserving old growth conditions through natural heritage planning in provincial parks and conservation reserves are:

- To identify the representative amounts of forest ecosystems, including old growth stands, for forest communities that should be present in each ecodistrict within provincial parks and conservation reserves within their natural geographic ranges and allow these protected sites to evolve subject to natural ecological processes.
- To contribute to the maintenance of red and white pine, including old growth stands, by providing for the protection and/or restoration of at least one representative forest stand (ecosite) of old growth red and white pine in each ecodistrict in provincial parks and conservation reserves that lie within their natural geographic ranges — now and in the future.

The objectives for conserving old growth conditions in forest management units are:

- To identify, consider, and provide for forest age class structure needed to maintain functional old growth ecosystem conditions in forest units (ecosites) for all forest communities (provincial forest types) within their natural geographic ranges in each management unit as part of future forest conditions.
- To contribute to the maintenance of red and white pine, including old growth stands, within their natural geographic ranges by maintaining no less than the 1995 amount (in hectares) of red and white pine while permitting a sustainable harvest of red and white pine — now and in the future.

The old growth policy also outlines a number of initiatives that will be pursued over the next five years to provide a landscape management perspective for the conservation of old growth. These initiatives will include the revision and development of forest management guides,

modelling of natural disturbances and landscape patterns in a geographic context (spatial analysis) for forest management planning, and ongoing improvements to the MNR planning system.

In the next few years, MNR will complete the consolidation of 36 forest management guidelines into a set of six guides, of which three specify a hierarchy of spatial scales. In the future, the new landscape, stand, site, and silviculture guides will address biological diversity and wildlife habitat, including old growth ecoregion requirements affecting forest ecosystem composition, structure and function.

Over the next few years, MNR will continue to work on spatial simulation modelling approaches for emulating natural disturbances and landscape patterns for forest management planning. When available, spatial simulation modelling will be coupled with the old growth definitions for each ecosite described in the old growth definitions report. The results will be used to develop probabilities for old growth distribution, abundance and persistence.

Over the next five years, the MNR land use planning system will continue to be improved by integrating ecologically based policy and program directions such as the old growth policy with Crown land use planning directions for ecoregion based planning units. These improvements and the MNR adaptive management approach to policy development will contribute to the progressive improvement of old growth conservation in Ontario's Crown forests over the long-term.

The old growth policy is scheduled for review in five years. It may be updated sooner, if required, to reflect any significant changes in Ontario's forest policy, legal authority, or program delivery.

ACKNOWLEDGEMENTS

The *Old Growth Policy for Ontario's Crown Forests* represents an ongoing collaborative, innovative, and adaptive approach to policy development that began in the early 1990s.

The Ministry of Natural Resources (MNR) wishes to recognize the work of the members appointed to the Old Growth Forests Policy Advisory Committee and the scientific advisory committee that assisted the policy advisory committee with its investigations in the early-to-mid-1990s. The old growth policy has been prepared in response to the final report of the Old Growth Forests Policy Advisory Committee, *Conserving Ontario's Old Growth Forest Ecosystems* (MNR 1994).

MNR wishes to thank the Old Growth Policy Team, the Old Growth Forest Definitions Report Team, the many technical and expert peer reviewers, and the members of the public who helped develop the report *Old Growth Forest Definitions for Ontario* (MNR 2003) and the old growth policy.

MNR wishes to acknowledge Norm Iles from Domtar Inc. and Colin Hewitt from Abitibi-Consolidated Company of Canada who participated in the testing of methodology for the forest management planning process.

MNR would also like to thank the members of the Provincial Forest Policy Committee for their advice and support during the development of the old growth policy.

1.0 INTRODUCTION

Globally, old growth forests have been the focus of public concerns about maintaining ecological processes, conserving biological diversity, ensuring development is sustainable, and slowing climate change. Old growth forests are linked to all these issues. They are diverse biological communities that are affected by human activity, which tend to change ecosystems from their natural state.

MNR is committed to sustaining long-term forest health,[1] as well as the long-term availability of forest resources for forest users and forest-dependent communities. This means that, for the entire range of forest communities[2] present in Ontario's landscapes their old growth must also be conserved. Old growth in forest ecosystems are the residual forest trees and forest stands that have been spared catastrophic disturbance caused by the natural processes that define and create the types of forests present in Ontario's forest landscapes. These processes include wildfire, insects, diseases, and wind and ice storms.

This document *Old Growth Policy for Ontario's Crown Forests* (old growth policy) provides provincial directions for the identification and conservation of old growth conditions and values for forest communities present in Ontario's Crown forests. The old growth policy is built on the two-pronged approach established in *A Conservation Strategy for Old Growth Red and White Pine Forest Ecosystems* (MNR 1995). This approach provides for natural heritage protection (i.e. maintenance, protection and/or restoration of a representative portion of existing old growth in parks and conservation reserves) and forest management planning (i.e. maintenance, protection and/or restoration of managed forests while permitting a sustainable harvest).

The old growth policy is organized into the following sections.

- Background
- Old growth policy directions
- Identifying old growth in Ontario's forests
- Old growth conservation strategy
- Schedule for application in forest management planning
- Area of policy application
- Sunset review

Policy developers, resource management planning teams, resource managers, specialists and practitioners will use the old growth policy to guide decisions about future old growth forest conditions during MNR land use, natural heritage and forest management planning processes.

2.0 BACKGROUND

For the past two decades, old growth has been the subject of growing public attention in Ontario.

In the mid-1980s, the harvesting of old growth forest, primarily in the Temagami area, raised environmental concerns about old growth that gained public attention. In response to these concerns, MNR exercised caution by deferring a number of red and white pine sites across the province from timber harvesting in the early 1990s.

In 1990, MNR responded to growing public concerns about old growth preservation with the Old Growth Forest Policy Project, part of the MNR *Sustainable Forestry* initiative. That same year, MNR changed its corporate strategic directions to reflect global concerns about maintaining ecological processes, conserving biological diversity, and ensuring that development is sustainable. Meanwhile, timber management activities on Crown Lands in Ontario were being reviewed through public hearings under the *Environmental Assessment Act*. The hearings — the Class Environmental Assessment (EA) for timber Management on Crown Lands in Ontario — were known as the Timber Class EA.

1. *Crown Forest Sustainability Act*, Section 2

2. The report *Old Growth Forest Definitions for Ontario* (MNR 2003) provides definitions of old growth for major tree species or forest community associations present in Ontario. For the purposes of the old growth policy, "forest communities" will be used to refer to "major tree species or forest community associations".

In 1992, the Minister of Natural Resources appointed an Old Growth Forests Policy Advisory Committee (policy advisory committee) to make recommendations for ensuring the continued presence of old growth in Ontario's forest ecosystems. The members who were appointed to the policy advisory committee were selected to represent the full range of public opinion on this issue. They included representatives of the forest and mining industries, labour, First Nations, and environmental and conservation groups as well as faith and education communities. An Old Growth Science Committee was also appointed to assist the public advisory committee. The members of the science committee represented government, academia and environmental non-government organizations.

From 1992 to 1994, the old growth policy advisory committee consulted with interested groups and individuals. The committee built consensus among these groups, identified Ontario's old growth values, developed options, and made recommendations to the minister about the conservation of old growth in forest ecosystems, initially for red and white pine, and then for all major tree species.

In May 1993, the policy advisory committee submitted an interim report to the minister — *Conserving Old Growth Red and White Pine*.

In 1994, the policy advisory committee submitted its final report to the minister — *Conserving Ontario's Old Growth Forest Ecosystems*. The committee recommended a number of measures:

- the development of an ecological context for the conservation of old growth in Ontario's forest landscapes;
- working definitions of old growth suitable for Ontario forest conditions;
- the conservation of old growth through natural heritage protection and forest management planning;
- an integrated evaluation framework;
- research, education, and information to improve knowledge and understanding of old growth in forest ecosystems;
- an adaptive ecosystem approach to management; and
- effectiveness monitoring.

The committee also identified a variety of ecological, social, cultural, and economic values that the people of Ontario attribute to old growth forests (Figure 1).

In May 1994, the EA Board approved the MNR Timber Class EA subject to 115 legally binding conditions. Condition 103 set out five requirements (clauses a to e). Condition 103 (a) requires an old growth policy to provide an environmentally sound conservation strategy and definitions of old growth specific to Ontario forest conditions to be completed by May of 2003.

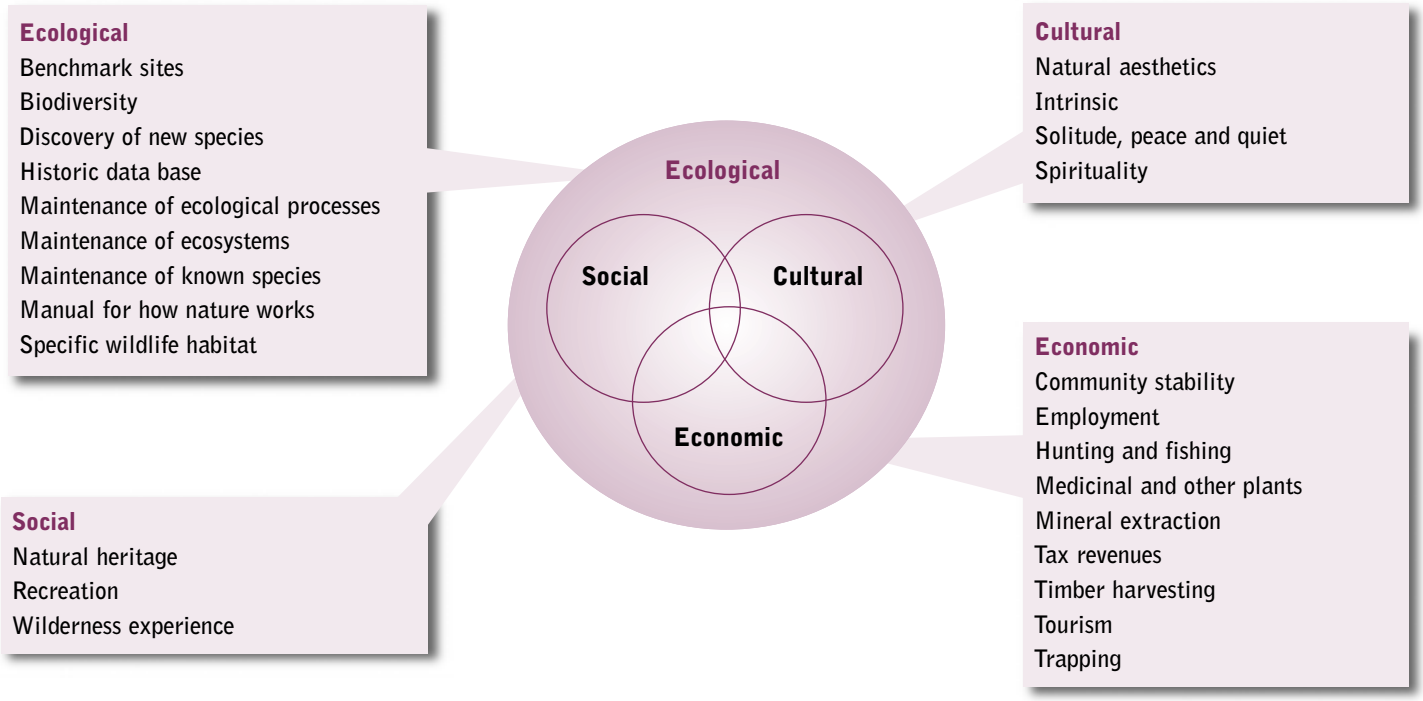
> *"There is a broad public concern about the potential loss of these [old growth] ecosystems. While old trees have historical and cultural significance to many people, others place tremendous value on protecting and studying the diversity of organisms in an 'old growth' ecosystem. Still others regard 'old growth' forest as overmature trees that should be harvested. ... Old growth ecosystems are important because they are the ultimate expression of the natural processes which define and create our forest environment and the particular ecological characteristics of those species and associated flora and fauna. They are the ultimate expression of the 'natural forest".*
>
> (Environmental Assessment Board, 1994, p. 385)

In 1994, conservation reserves were established as a new Crown land use designation through a regulation under the *Public Lands Act* and the withdrawal of these lands from staking under the *Mining Act*.

In May 1995, MNR released *A Conservation Strategy for Old Growth Red and White Pine Forest Ecosystems* in response to Timber Class EA Condition 103 (c)[3] and the policy advisory committee's interim report. The strategy outlined a two-pronged approach for conserving red and white pine across their natural range. It provided for the maintenance, protection and/or restoration of a representative portion of

3. For a more detailed description of how the MNR has complied with Condition 103 see Ministry of Natural Resources, 2002. *A Review by the Ministry of Natural Resources Regarding the Class Environmental Assessment for Timber Management on Crown Lands in Ontario – "MNR's Timber Class EA Review"*. Toronto: Queen's Printer for Ontario, pp. 226-229.

Figure 1 Old Growth Forest Values



Source: MNR, 1994. *Conserving Ontario's Old Growth Forest Ecosystems*. Prepared by the Old Growth Forest Policy Advisory Committee. Toronto: Queen's Printer for Ontario, page. 17.

existing old growth red and white pine in parks and protected areas. It also provided for the maintenance, protection and/or restoration of red and white pine while permitting a sustainable harvest of red and white pine in forest management units outside parks and protected areas.

After the release of the red and white pine conservation strategy, the status of the red and white pine sites deferred from timber harvesting in the early 1990s was assessed in response to Condition 103 (d). Since 1995, the majority of these sites have been protected along with an additional 100,000 hectares of existing old growth red and white pine sites in conservation reserves, special zones in existing provincial parks, and provincial park expansions.

In 1995-1996, *A Conservation Strategy for Old Growth Red and White Pine Forest Ecosystems* (MNR 1995) was incorporated into the requirements of the *Forest Management Planning Manual for Ontario's Crown Forests* (FMPM; 1996, Appendix V, pp. APP-19-21). The manual was published in regulation under the *Crown Forest Sustainability Act* (1994) in 1996. Since then, forest management plans have been incorporating management directions concerning old growth conditions and values in accordance with the manual.

In 1997, MNR released *Nature's Best — Ontario's Parks & Protected Areas: the Framework & Action Plan* (MNR 1997) — the MNR strategic policy directions for natural heritage protection. Red and white pine are identified as special natural heritage values, which warrant protection in provincial parks and conservation reserves.

Later that same year, MNR released the draft *Conservation Strategy for Old Growth Forest Ecosystems on Crown Lands in Ontario* (MNR 1997, unpublished) for public review and comment through the

Ontario Environmental Bill of Rights Registry. Further work on this draft policy was put on hold while MNR efforts were focused on the *Lands for Life* initiative.

From 1997 to 1999, MNR undertook the *Lands for Life* initiative. It was a major land use planning exercise that involved considerable public consultation and the engagement of Regional Round Tables (advisory committees composed of stakeholder representatives). The initiative was intended to provide strategic directions for the management of Crown lands and waters covering 45 per cent of the province (39 million hectares). The resulting directions are contained in *Ontario's Living Legacy Land Use Strategy* (MNR 1999). The strategy resulted in the creation of an additional 2.4 million hectares of parks and protected areas in the Ontario's Living Legacy planning area, which covers the Area of the Undertaking for the Timber Class EA. As a result, the amount of existing protected old growth forest has increased.

From 1998 to 2001, MNR completed working definitions of old growth. The *draft report Old Growth Forests Definitions for Ontario — a work in progress* (MNR 2002) was released for public review and comment through the Ontario Environmental Bill of Rights Registry in March 2002. The draft old growth definitions report described criteria and standards for identifying old growth conditions. The report was widely circulated for technical and expert peer review. The draft old growth definition report was finalized when the old growth policy was finalized.

This old growth policy, which replaces the previous 1997 draft, was released in March 2003 for public review and comment through the Ontario Environmental Bill of Rights Registry. It was finalized in May 2003 to comply with Timber EA Condition 103 (a).

3.0 OLD GROWTH POLICY DIRECTIONS

3.1 Goal

To ensure that old growth conditions and values are identified and present in Ontario's Crown forests for conserving biological diversity at levels that maintain or restore ecological processes, while allowing for sustainable development now and in the future.

3.2 Principles

Old growth exists in all forest ecosystems: Old growth is a functional condition of forest communities present in Ontario.

Transience of old growth characteristics: Forest ecosystems are dynamic entities where processes such as site disturbances and forest ageing (succession) foster forest regeneration. This means that old growth is transient on any particular landbase.

Natural heritage values: Old growth societal values will be considered as a part of MNR land use, natural heritage, and forest management planning processes.

Contribution of parks and protected areas: Old growth conditions and values found in Ontario's provincial parks and protected areas will contribute to old growth objectives for managed Crown forests where old growth conditions and values make a functional contribution within a forest landscape context.

Sustainable development: Old growth conditions should be present and ecologically functional in Ontario's forest ecosystems, and should be managed for a balance of ecological, social, cultural, and economic benefits.

Forest health: The presence of ecologically functional old growth is an indicator of healthy forest ecosystem complexity and is important to the well-being of future generations of Ontarians.

Biological diversity (biodiversity): There is a distinct biological diversity that is only associated with old growth forests, and this biodiversity differs among forest types.

Sustainable forest management: Old growth values in Ontario's forests will be conserved through sustainable forest management practices.

Fire management: Prescriptions for managing future old growth conditions should include consideration of the role of fire in the maintenance and renewal of forest stands and forest communities.

Wildlife habitat and associated ecological values: The conservation of old growth conditions in Ontario's forests is important for wildlife habitat and associated ecological values.

Ecological sustainability: The impacts and implications of human activities on forest communities present in Ontario and their old growth conditions and values will be identified and mitigated through:

- an adaptive approach to ecosystem management, coupled with precautionary measures applied to prevent functional changes to ecosystems where uncertainty remains;
- the use of the best available knowledge and tools (e.g. inventory, the best available science, local knowledge, public involvement, applied research, appropriate technologies and applications) the use of new data, information and knowledge (e.g. updated and refined inventories, appropriate science, local knowledge, sound available data and information, public involvement, applied research, improved and new technologies and applications) during each successive forest management planning cycle;
- recognition that provincial parks and protected areas will contribute to, but not be wholly dependent on, the provision of old growth;
- development of silvicultural regimes for old growth maintenance, rehabilitation, and progression; and
- acceptable management practices for use in parks, protected areas, and forest management units.

Consensus: Decision-making should be based on consensus among all affected interests wherever possible for appropriate spatial scales and a number planning periods.

4.0 IDENTIFYING OLD GROWTH IN ONTARIO'S FORESTS

Old growth is a functional condition of a forest ecosystem that embodies a unique set of physical features and characteristics in dynamic forest ecosystems. Old growth features and characteristics typically include the following:

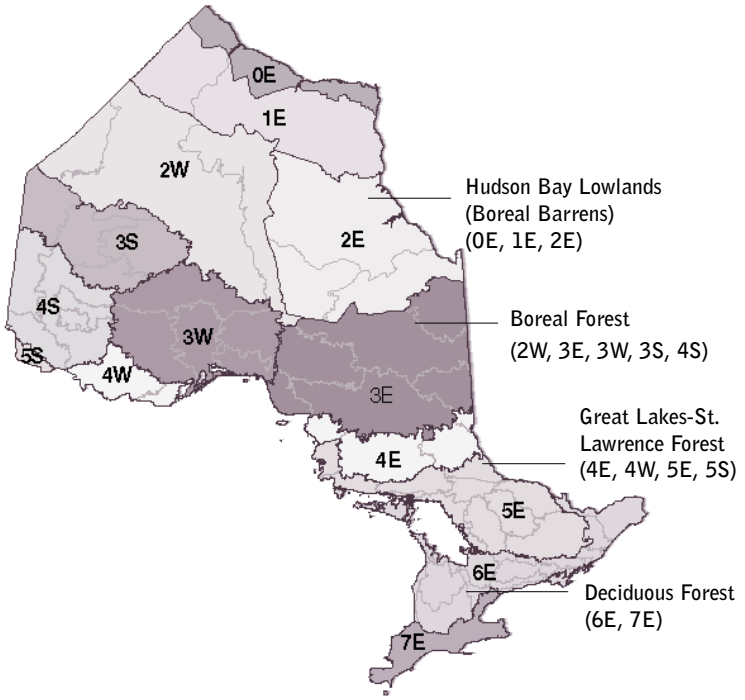
- a complex forest stand structure (e.g. old trees for the ecosite,[4] large tree size and wide spacing, multiple canopy layers and gaps, and rates of change in species composition);
- large dead standing trees (snags), accumulations of downed woody material, up-turned stumps, root and soil mounds, and accelerating tree mortality; and
- ecosystem functions (e.g. stand productivity, nutrient cycling, and wildlife habitat) that are different from earlier stages of forest development.

For more information about old growth features and characteristics, refer to the old growth definition report.

Old growth conditions in Ontario's Crown forests will be identified using the age-of-onset and duration periods defined in the report *Old Growth Forest Definitions for Ontario* (MNR 2003). The age-of-onset and duration periods were developed based on existing old growth forest data compiled from a variety of available databases. Since Ontario data are not available for any of the features and characteristics listed above, old growth features and characteristics were inferred from research plot data stratified by ecoregion. Following stratification, the Ontario Ecological Land Classification (ELC) was applied (Figure 2).

4. An ecosite is comparable to a forest stand, or forest unit, or provincial forest type. Refer to the Glossary for definitions of these three terms.

Figure 2 Ontario Forest Region and Ecoregion Boundaries



See Appendix 1 for a more detailed description of the Ontario ELC. The glossary provides definitions for each ELC scale.

The ELC describes and classifies ecologically distinct areas of the province. Each research plot was identified by ELC ecosite membership and all analysis of old growth trends was conducted on an ecosite basis. The ecosite data was examined to determine diameter and volume growth rates for all species on all ecosites, the maximum diameter and volumes achieved for all species on all ecosites, the point at which the rate of growth in forest stands is minimal, and tree/stand mortality begins.

Old growth age-of-onset – The age-of-onset is the estimated minimum threshold age at which each major tree species or forest community association in an ecosite begins to be dominated by old growth conditions. The analysis was designed to seek size and structural transition points for each forest ecosystem and species reflecting the accumulation of large dead standing trees (snags), accumulations of downed woody material, tip-ups and mounds, and stand mortality. This approach captures the main characteristic of old growth systems - that is, the dominant species achieves the maximum size for the site conditions. In addition, the percentage of rot in the main stem and average stand height were used as indicators of an old growth "onset" age.

Old growth duration – The duration or persistence of old growth for a given ecosite (for major tree species or forest community associations) is the length of time that the old growth conditions will normally persist in a defined landscape unit in the absence of major stand replacing disturbances. Old growth duration periods were estimated from literature on forest succession and mortality, and the mortality relationships in the plot data. The estimates of duration or persistence of old growth for a given ecosite are based on the difference between the age-of-onset and the age at which the dominant species ceases to occupy at least 30 per cent of the basal area of the forest stand. The estimates were initially calculated from the maximum ages attained, by species and ecosite, across the range of collated plots. In addition, results of studies from the growth and yield literature, mortality data, successional studies, forest fire frequency records and expert opinion were used to estimate duration.

In Ontario, the following general forest successional trends are well documented:

- late successional tree species such as sugar maple and eastern hemlock are dominant species that will persist over centuries;
- mid-successional tree species such as eastern white pine and white spruce appear stable over long periods of time; during that time they may exhibit old growth characteristics if not subject to catastrophic events (minor changes in species composition, stand structure and ecosystem function do occur over time); and
- early successional tree species such as poplar and jack pine take advantage of conditions for establishment soon after major disturbances like fire, and tend to have shorter life spans.

5.0 OLD GROWTH CONSERVATION STRATEGY

The current approaches to natural heritage protection and forest management planning provide a solid foundation for the conservation of representative old growth ecosystems in Ontario's Crown forests. The old growth conservation strategy outlines how MNR will provide for the representative conservation of old growth conditions and values attributed to the forest communities present in Crown forests in each ecoregion. The strategy is described in sub-sections on natural heritage protection, forest management planning, and further developments on landscape management. The following discussion is provided to help frame the context for the strategy; it also discusses areas where additional work will be pursued over the next five years.

MNR carries out land use planning on Crown lands to make ecologically based decisions about natural resource management, and establish where and how Ontario's Crown lands and natural resources should be managed to meet MNR goals and objectives. These objectives are related to forests, natural and cultural heritage, resource-based tourism, fish and wildlife, Crown land recreation, and a range of other resources, values and activities. The process involves the integration of policy and program directions with Crown land use planning, and resource management and operational planning.

MNR policy and program directions – The long-term health of the forest and the long-term availability of forest resources on Crown lands in Ontario for forest users and dependent communities depend on decisions about forest management. Those decisions are guided by the following factors:

- the broad policies and priorities set by the Ontario government as a whole, and MNR specifically, which influence decisions about ecological sustainability, the conservation of biological diversity, and the sustainable development of Crown forest lands and resources;
- the widely accepted goals, principles and objectives set out in Ontario government and MNR policies, legislation and regulations collectively referred to as Ontario's forest policy and legal framework;
- the stewardship arrangements between the MNR and its business partners; and
- cooperation with the scientific and academic communities; the forest, mining and tourism industries; labour; Aboriginal peoples; and environmental and conservation groups.

MNR policy directions and legal authority for natural heritage protection and forest management planning will guide MNR land use planning, and resource management and operational planning, for the conservation of old growth conditions and values in Ontario's Crown forests.

Crown land use planning and directions – Crown land use planning identifies land uses to support the objectives of the Ontario government and MNR related to forests, natural and cultural heritage, resource-based tourism, fish and wildlife, Crown land recreation, and a range of other resources, values and activities. This process is intended to help provide sustainable environmental, social and economic benefits to the people of Ontario. The decision-making process involves setting objectives, gathering and analyzing information, developing and assessing planning options, and approving and implementing the planning decisions. Public consultation is an essential part of the process.

Resource management and operational planning – MNR also provides for resource management and operational planning at the local level. Local planning is guided by the policies, strategies and directions contained in land use strategies and other broader strategies. Resource management decisions made at the local level indicate where specific resource management programs will occur and how particular resources will be managed and used. Forest management plans and park management plans are examples of local plans.

5.1 Natural heritage protection

MNR defines Ontario's 'natural heritage' as the ecological and geological diversity in the province. Ecological diversity refers to both terrestrial and aquatic diversity. Terrestrial diversity in Ontario's natural heritage areas — provincial parks, conservation reserves, and other protected areas such as national parks and areas of provincial interest — is based on representation in all of Ontario's ecoregions and ecodistricts.

Since the release of *A Conservation Strategy for Old Growth Red and White Pine Forest Ecosystems* (MNR 1995), MNR has emphasized incorporating representative areas of red and white pine old growth stands into parks and protected areas in two ways:

- identifying old growth red and white pine forests as special natural heritage values in *Nature's Best — Ontario's Parks & Protected Areas: the Framework & Action Plan* (MNR 1997); and
- conserving red and white pine forests across their natural range by protecting and restoring a representative portion of existing old growth red and white pine forests in provincial parks and conservation reserves.

In 1999, the total area of Ontario's provincial parks and conservation reserves in the Ontario Living Legacy (OLL) planning area was increased to 12 per cent. *Ontario's Living Legacy Land Use Strategy* (MNR 1999) outlines the requirements for completing Ontario's system of natural heritage areas, and managing the landscapes within the OLL planning area in a manner that supports ecological sustainability. The *Ontario Forest Accord* (MNR 1999) and *Room to Grow — Final Report of the Ontario Forest Accord Advisory Board on Implementation of the Accord* (MNR 1999) provide for the establishment and management of these new protected areas and support the need to complete Ontario's system of natural heritage areas.

Recently, MNR developed a Crown land use atlas to consolidate the variety of land use directions for most Crown lands in the OLL planning area.[5] The atlas brings together existing approved directions and makes them easily accessible. At the moment, the atlas depicts Ontario's natural heritage areas — both existing and unregulated provincial parks and conservation reserves.

Over the next few years, operational direction statements and management planning documents will be prepared for existing and new protected areas (i.e. provincial parks and conservation reserves). These operational plans will guide management activities, projects or prescriptions that are compatible with protecting natural heritage values in the protected areas. It should be noted that commercial forest management operations are excluded from parks and protected areas with the exception of Algonquin Provincial Park.

Objectives for conserving old growth conditions in provincial parks and conservation reserves:

- To identify representative amounts of forest ecosystems, including old growth stands, for forest communities that should be present in each ecodistrict within provincial parks and conservation reserves within their natural geographic ranges and to allow these protected sites to evolve subject to natural ecological processes.
- To contribute to the maintenance of red and white pine, including old growth stands, by providing for the protection and/or restoration of at least one representative forest stand (ecosite) of old growth red and white pine in each ecodistrict in provincial parks and conservation reserves that lie within the natural geographic ranges of red and white pine — now and in the future.

When forest ecosystems are inventoried in protected areas (i.e. provincial parks, conservation reserves, and other protected areas) the ELC based Forest Resources Inventory will be used to assess and report on old growth forest conditions. Old growth forest within parks and conservation reserves can contribute to meeting landscape level objectives for the maintenance of old growth

5. The atlas is available in print form. It is also accessible on the Ministry of Natural Resources public Internet site at http://crownlanduseatlas.mnr.gov.on.ca

conditions subject to the goals and objectives of each park or conservation reserve.

Natural heritage protection that represents old growth will be assessed as part of the MNR natural heritage gap analysis. Should old growth representation be incomplete, Ontario Parks will determine how these gaps may be filled in provincial parks and conservation reserves according to OLL requirements for the completion of Ontario's system of natural heritage areas.

An assessment of the probabilities of natural succession and natural disturbances will be required to identify future old growth forest conditions in provincial parks and conservation reserves. Since old growth is not self-sustaining, but transient on any particular landbase, MNR will need to develop and maintain a comprehensive forecast of the rate at which expected disturbances would deplete existing old growth stands. MNR will also need to accompany this forecast with information on the succession of younger stands into older age classes in parks and protected areas. Using the forecast and information on succession, conclusions should be reached about the probability of parks and protected areas providing continuous future old growth representation.

5.2 Forest management planning

Forest management planning provides for the sustainable management of Crown forests in management units designated under the *Crown Forest Sustainability Act* (1994). Sustainable forest management is outlined in the principles set out in the *Policy Framework for Sustainable Forests* (MNR 1994) and the *Crown Forest Sustainability Act* (1994). These principles provide for the conservation of large, healthy, diverse and productive Crown forests and their associated ecological processes and biological diversity by emulating natural disturbances and landscape patterns while providing for a continuous, predictable flow of benefits.

Since the release of the strategy *A Conservation Strategy for Old Growth Red and White Pine Forest Ecosystems* (MNR 1995), MNR has placed an emphasis on maintaining, protecting and/or restoring existing red and white pine old growth stands, while permitting a sustainable harvest of red and white pine in management units outside parks and protected areas. This has been accomplished in accordance with the *Forest Management Planning Manual* (MNR 1996).

The *Forest Management Planning Manual* (MNR 1996) provides planning directions for forest management and operational practices in management units. The manual provides instructions for the following practices:

- describing various forest values and forest cover conditions;
- developing management objectives and targets, and forecasting regeneration and tending requirements;
- protecting values;
- a prescriptive process for establishing a planning team, soliciting public input and meeting information requirements;
- developing and analyzing alternative management strategies; and
- monitoring, assessing and reporting on the achievement of objectives.

In accordance with the *Forest Management Planning Manual* (MNR 1996), forest management plans provide for forest sustainability in each management unit consistent with MNR policy and program directions, higher-level land use strategies, and forest management guides. A forest management plan sets the direction and authority for forest operations in each forest management unit. All forest operations on Crown lands, including harvesting must be conducted in accordance with an approved forest management plan.

Objectives for conserving old growth conditions in forest management units are:

- To identify, consider and provide for the forest age class structure needed to maintain functional old growth ecosystem conditions in forest units (ecosites) for all forest communities (provincial forest types) within their natural geographic ranges in each management unit as part of future forest conditions.

- To contribute to the maintenance of red and white pine within their natural geographic ranges by maintaining no less than the 1995[6] amount (the total number of hectares) of red and white pine, while permitting a sustainable harvest of red and white pine — now and in the future.

Old growth forest in parks and conservation reserves can contribute to meeting objectives for maintaining old growth conditions and values for the forest management unit. Where a park or conservation reserve straddles management unit boundaries the portion of the protected area that is situated within the boundaries of the management unit may be considered. Where a park is adjacent to a management unit (i.e. not included within any management unit boundary) direction for the old growth contribution that the park will make within the landscape unit(s) for the purposes of forest management planning may be provided through regional level planning directions (see section 5.3.3). The rationale for including or not including parks and conservation reserves to meet old growth objectives should be stated in the forest management plan.

MNR will develop consistent requirements for old growth conservation in forest management planning to ensure minimum standards and effectiveness in old growth conservation objectives, and strategies over the long term. These requirements will be communicated through a Forest Management Planning (FMP) Note. The direction will include the following:

- old growth red and white pine forest communities will be identified on the values maps;
- old growth forest stands, forest units, or ecosites for all forest communities (provincial forest types) will be identified based on the old growth definitions report;
- old growth in all forest units (or ecosites) will be identified as a portion (per cent) of current and future forest conditions;
- current old growth conditions will be compared with future forest conditions to describe changes in forest cover as a context for determining desired future forest conditions and benefits;
- historic forest condition will be compared with current forest condition as a context for determining desired future forest conditions and benefits;
- current, future and historic forest conditions will be used to guide the development of old growth objectives and targets that protect and/or restore, the distribution and abundance of each forest community towards their natural geographic ranges;
- the minimal level of red and white pine will be no less than the 1995 amount, current levels of red and white pine will be maintained, and future levels will be based on desired forest condition determined through a process (similar to the one used to set old growth objectives and targets for forest communities) that will be documented in the plan;
- old growth as habitat for selected wildlife species will be considered as part of the sustainability assessment of alternative management strategies; and
- the distribution of old growth to be maintained across the forest landscapes or ecoregions within the management unit will be considered.

The purpose of the FMP Note will be to provide additional technical advice for planning teams when addressing old growth policy requirements for forest management planning. The FMP Note will outline how old growth conditions and values for forest units (or ecosites) in the management unit will be considered for the following parts of the forest management planning process: values, setting objectives, historic forest condition, setting old growth targets, and old growth spatial distribution. The old growth FMP Note will be reviewed and updated as required to reflect ongoing work (refer to Chart 1 Old Growth Policy Application – Schedule of activities in support of forest management planning in section 6.0) that may affect forest management planning.

6. Implementation of the *Old Growth Red and White Pine Conservation Strategy for Crown Lands in Ontario* (MNR 1995) was phased-in, beginning with those forest management plans that were being developed from 1995 on. The amount of red and white pine to be maintained as a minimum was defined as the amount available in the updated inventory prepared for each forest management plan.

The following additional directions are provided for old growth as habitat, and for the distribution, abundance, and persistence of old growth in forest landscapes.

Old growth as habitat – MNR uses the habitat of selected wildlife species as indicators for assessing the forest sustainability of alternative management strategies considered during the development of a forest management plan. Old growth forests contribute to portions of the habitat or life cycle requirements of many species. A review of the literature has revealed that no known wildlife species is exclusively dependent on old growth forests for its survival.[7] However, of the many wildlife species that frequent old growth forests, five have been identified as preferring old growth forests as defined in the old growth definition report for an important phase of their life cycle. These five wildlife species are: the black-backed woodpecker (Boreal and Great Lakes-St. Lawrence forest regions), the red-breasted nuthatch (east half of the Boreal Forest Region), the ruby-crowned kinglet (Great Lakes-St. Lawrence Forest Region), the lynx (denning only) (Boreal and Great Lakes-St. Lawrence forest regions), and the black bear (foraging only) (Boreal and Great Lakes-St. Lawrence forest regions). MNR regional lists of selected wildlife species will be revised to include these species. By placing these five species on the appropriate MNR selected species list, they will be considered when forest sustainability is assessed during the preparation of forest management plans.

Forest management guidelines have been developed for caribou, marten and pileated woodpecker habitat. These species use late successional forests and old growth forests for some of their habitat needs. These guidelines will continue to be used in forest management planning until such time as they are revised (see section 5.3.1).

Distribution, abundance and persistence of old growth in forest landscapes – The ability to simulate changes in forest composition, structure and ecosystem function is an important requirement for establishing objectives and targets for desired forest condition and benefits in forest management planning. At the moment, estimates of forest growth, forest resource yields and forest succession are generated from sources such as forest growth and yield studies, literature, expert advice, local knowledge, published and unpublished research and monitoring programs. The estimates are used to anticipate how natural events such as fire frequency and severity will affect forest conditions in the future. These non-spatial projections are then used to draft objectives for the purposes of forest management planning.

A non-spatial predictive model that employs a variety of yield curves and successional rules is used to project possible future forest conditions. The impacts of predicted changes in forest condition are then examined. Age class constraints can be used in the model to maintain a natural range of forest structure and composition.

MNR is currently examining spatial simulation modelling approaches (see section 5.3.2) for use in forest management planning.

5.3 Further developments for landscape management

Landscape management requires planners and resource managers to know how much of a particular value is appropriate for a specific landscape unit. They must also set directions or make decisions about how to distribute a value among various management units within a forest landscape or ecoregion. Landscape management also requires a very long-term perspective that looks centuries into the future. Perspective is important for understanding and managing all the aspects of dynamic forest ecosystems, including landscape patterns, age class structures and ecosystem composition.

A landscape management perspective for the management of Ontario's Crown forests, including the conservation of old growth will evolve over the next five years. This will occur as MNR proceeds with the revision and development of forest

7. Ministry of Natural Resources, 2002. *Draft Wildlife Requirements for 'Old Growth' Forest in Ontario* – Report to Ontario Ministry of Natural Resources Old Growth Policy Team, prepared by Margaret McLaren, Southcentral Science Section (MNR unpublished), 33 pp.

management guides, analysis of natural disturbances and landscape patterns for forest management planning, and ongoing improvements to the MNR planning system.

5.3.1 Revision and development of MNR forest management guides

Forest management plans deal with forest composition at the local management level. In the next few years, MNR will complete the consolidation of 36 forest management guidelines into a set of six guides, of which three specify a hierarchy of spatial scales. The six guides will provide standards and guidelines for managing forest landscapes, forest stands, forest sites, silvicultural requirements, tourism values, and cultural heritage values.

As MNR consolidates the 36 forest management guidelines, a shift will be made from the current featured species approach to maintaining a natural range of forest structure and composition at all scales of ecosystem management (known as a coarse/fine filter approach[8]). The featured species approach requires the identification of selected wildlife species or species of concern and the modification of forest management techniques and operations to provide or protect the habitat requirements for these species. The coarse/fine filter approach captures the requirements for a broad range of species (both plants and animals) by maintaining a broad range of forest conditions. In the future, the new landscape, stand, site and silviculture guides will address a number of needs including old growth requirements.

Landscape guide: At the broadest scale, the landscape guide will emulate natural disturbance patterns to manage for biological diversity. The landscape guide is intended to deal with how much and where a particular value (e.g. old growth) is appropriate or needed in a given landscape. The guide will include old growth ecoregion requirements affecting forest composition, structure and ecosystem function (i.e. wildlife habitat), and landscape-level requirements in other existing forest management guidelines. Improved spatial analysis will be needed for the landscape-level requirements.

Stand guide: The stand guide is intended to address the pattern of harvest blocks, the residual patch pattern and composition of residual patches, and riparian reserves. Old growth conditions required by wildlife (e.g. residual patches of adequate size and adjacent habitat factors for food and shelter) will be addressed at this scale.

Site guide: The site guide is expected to address structural conditions such as super canopy trees, cavity trees, residual stems and/or snags and site management. Old growth conditions required by wildlife that live in trees (e.g. nesting, roosting, resting, and refuge opportunities) will be addressed at this scale.

Silviculture guides: Silviculture guides describe management practices for forest renewal. Tree marking practices assist in providing for functional old growth conditions — for example, by keeping some larger diameter trees in uneven-aged forest stands.

MNR is developing these concepts and approaches in consultation with the Provincial Forest Technical Committee, an advisory committee of government and non-government technical experts.

5.3.2 Spatial analysis of natural disturbances and landscape patterns for forest management planning

MNR is working on the development of landscape management approaches that use spatial simulation modelling and data compatible with geographic information systems. Theoretical models provide a framework for examining the role of various disturbance agents and management actions in vegetation change. These models can be used to help make decisions by producing a predictive map of what future landscapes could look like. These future conditions can then be used to define acceptable

8. Ministry of Natural Resources, 2002. *Forest Management Guide for Natural Disturbance Pattern Emulation, Version 3.1.* Toronto: Queen's Printer for Ontario, p. 1.

levels or thresholds for natural variations in patterns of landscape ageing and species occurrence. Modelling can be improved over time as better science, information and knowledge are developed.

Although knowledge is imperfect, spatial simulation modelling can be used along with the best available science, information and knowledge to predict old growth forest conditions in landscape units. MNR has examined some spatial models that have been developed to predict the ageing of forests and identify natural disturbances and landscape patterns. The examinations have revealed that old growth can be projected in the Boreal Forest region. More work and better information and standards are required to produce modelling tools that can simulate the diverse old growth conditions and major disturbances in the Great Lakes-St. Lawrence and Deciduous Forest regions. In the Boreal Forest region, the amount of old growth on the landscape is primarily dependent on the frequency, probability and distribution of fires that destroy forest overstory. In the Great Lakes-St. Lawrence Forest region, the frequency and severity of disturbances must be factored in (e.g. fire, insects, diseases, wind and ice storms).

When available, spatial simulation modelling will be coupled with the age-of-onset and duration periods defined for each ecosite in the old growth definitions report. The modelling will emulate natural disturbance and landscape patterns to develop probabilities for old growth distribution, abundance and persistence. MNR anticipates that the conservation of representative old growth ecosystems in each ecoregion can be based on an assessment of natural disturbances and landscape patterns for a projected period of time, which removes all human influences. The assessment should generate seamless results, capable of being used at local, regional and provincial levels. The assessment will employ a variety of available sources of environmental data. The results should include the following:

- probabilities for natural variation in landscape ageing patterns, species occurrence (area in hectares), and distribution in each ecoregion;
- area estimates of how much old growth should be expected as a per cent of total forest cover (abundance);
- probabilities for the long-term retention of old growth patterns (e.g. areas with a low risk of major disturbances), and the identification of forest stands or multiple stands (forest units or ecosites) within the most probable landscapes for retaining current and future old growth conditions. These stands will be identified using the age-of-onset and duration criteria described in the old growth definition report that are present and/or should be present in each forest unit or ecosite or provincial forest type (persistence); and
- compare future old growth forest conditions with current and historic forest conditions (rarity).

It will be important to understand the relationship between the supply of younger stands and the area, distribution, abundance and persistence of old growth over the long-term.

The information and tools required to predict future old growth forest conditions across landscapes and assess how much old growth is appropriate for each ecoregion will include the following:

- the definitions of old growth age-of-onset and duration for forest communities by forest unit or ecosite or provincial forest type;
- natural resource data;
- geographic information systems;
- probable levels of natural disturbances (e.g. wildfire, wind and ice storms, insects and disease); and
- spatial predictive simulation modelling approaches and tools.

Appendix 1 describes the landscape units that will be used in support old growth spatial analysis.

When available, MNR will provide to forest management planning teams the landscape level estimates and probable ranges of the abundance of old growth for the forest communities that should be expected in each ecoregion (as a per cent of overall forest cover area). The information will be used to do the following:

- assist in setting any old growth objectives and targets for ecoregions;
- adjust forest management planning objectives and targets, if necessary and appropriate;

- guide decisions about the distribution of future old growth conditions based on persistence probabilities; and
- provide an additional tool for assessing the sustainability of the alternative management strategies considered during the development of a forest management plan.

MNR anticipates that the results of the old growth spatial analysis can eventually be used for natural heritage protection, forest management planning and ongoing improvements to the MNR planning system.

5.3.3 Planned improvements to the MNR planning system

Over the next five years, the MNR land use planning system will continue to be improved by integrating ecologically based policy and program directions with Crown land use planning directions for ecoregion based planning units. The strategies are intended to provide a broader, more consistent context for decisions about managing natural resources. Interest groups, associations, Aboriginal peoples, governments, industries, other stakeholders and the public will have an opportunity to participate in the development of these landscape level planning strategies. The planned improvements are intended to assist in the integration of both ecologically based provincial policies (such as old growth), and feedback from monitoring, assessment and reporting. This integration will ensure that ecoregion objectives and targets are being achieved.

5.3.4 Adaptive approach to policy development

MNR has adopted an adaptive approach to policy development. This approach involves progressively improving management policies through a built-in learning process. As new data, information, scientific knowledge and technology become available, they may be considered for future improvements to policy and management approaches. Lessons learned from implementing management activities will be used to make future improvements to the old growth policy.

The following reporting requirements will be necessary to support and provide input to future reviews and revisions of the old growth policy and to provide the public with information on old growth conservation in Ontario's Crown forests.

Forest resources of Ontario reporting – The MNR will generate a series of five-year snap-shots of the Forest Resources Inventory and document the results in the state of the forest report. The current report *Forest Resources of Ontario 2001* is included as an appendix in the *State of the Forest Report*, 2001 (MNR 2002). This information will be organized and analyzed every five years in the state of the forest report. The results of this analysis will indicate the following:

- trends in the quantity and distribution of old growth in ecoregions; and
- trends in the per cent of an area classified as old growth in provincial parks, conservation reserves and forest management units.

State of the forest reporting – An initial assessment of old growth in Ontario's forests is described in the *State of the Forest Report*, *2001* (MNR 2002). This assessment revealed the following:

- old growth forests represent 21 per cent (8,350,000 hectares) of all forest types across most forest regions on inventoried forest lands, but less than one per cent of the total forest area in southern Ontario; and
- about half of Ontario's existing old growth forests are situated in provincial parks, conservation reserves, and other protected areas.[9]

This assessment was based on the existing Forest Resources Inventory and the age-of-onset of old growth conditions for forest community associations described in the draft report *Old Growth Forests Definitions for Ontario — a work in progress* (MNR 2002).

The status of old growth in Ontario's forests will continue to be highlighted in future Ontario state of the forest reports. The quality and reliability of this information will improve over time. The Ontario state of the forest reports enable MNR to support provincial commitments under the *National Forest Strategy* and *Canadian Biodiversity Strategy* for the

9. MNR, 2002. *State of the Forest Report*, *2001.* Toronto: Queen's Printer for Ontario, Chapter 3 - Criteria and Indicator Reports, pp. 3-18 to 3-22.

maintenance of ecological processes, the conservation of biological diversity and the sustainable use of Canada's forest resources.

6.0 SCHEDULE FOR APPLICATION IN FOREST MANAGEMENT PLANNING

The old growth policy is built on the two-pronged direction established in *A Conservation Strategy for Old Growth Red and White Pine Forest Ecosystems* (MNR 1995). The old growth policy provides for the representative conservation of old growth for the forest communities present in Ontario's Crown forests, including red and white pine.

MNR will replace *A Conservation Strategy for Old Growth Red and White Pine Forest Ecosystems* (MNR 1995) with the old growth policy. However, the red and white pine conservation strategy will remain in effect for those forest management plans approved and in effect prior to 2006. The old growth policy will be incorporated into the development of forest management plans beginning with those plans scheduled for approval in 2006. Chart 1 outlines a schedule of activities required to support the application of the old growth policy to the process of forest management planning.

For the purposes of natural heritage planning in provincial parks and conservation reserves, the old growth policy replaces the direction for the protection of red and white pine, including old growth stands in *A Conservation Strategy for Old Growth Red and White Pine Forest Ecosystems* (MNR 1995).

7.0 AREA OF POLICY APPLICATION

The old growth policy will apply to Crown lands (Figure 3) within the Area of the Undertaking for

Chart 1 Old Growth Policy Application — Schedule of activities in support of forest management planning

Spring 2003	*Old Growth Forest Definitions for Ontario* finalized.
	MNR initiates transfer of Boreal Forest spatial simulation modelling tools for regional MNR old growth pilot testing.
	MNR initiates development of Great Lakes-St. Lawrence Forest spatial simulation modelling tools for old growth landscape-level analysis.
Summer 2003	MNR to update regional selected wildlife species lists as described in subsection 5.1.2.
	MNR to develop forest management training requirements for old growth conservation.
Fall 2003	MNR to initiate delivery of training programs for old growth policy requirements for forest management plans being developed for approval in 2006. The program direction will be updated as required.
	2006 forest management planning teams to initiate planning process. Note: Start-up dates will vary for each team.
2004 and beyond	Application of spatial simulation modelling results for old growth will be incorporated into forest management planning. It is anticipated that the spatial simulation modelling results will be phased into forest management planning, beginning with the development of plans for approval in 2007 and beyond.

the Timber Class EA (Figure 4) and in a number of existing and recently regulated protected areas now covered by the Ontario's Living Legacy planning area (Figure 5).

No directions are provided in the old growth policy for the MNR Far North or Southern Ontario planning areas (Figure 5).

MNR recognizes that other provincial government ministries have a mandate to allocate, regulate and manage certain natural resources and their uses on Crown forest lands. For example, mineral exploration and development is authorized by the *Mining Act* administered by the Ministry of Northern Development and Mines, and land use development on private, public and Crown lands is authorized through a provincial policy-led planning system under the *Planning Act* administered by the Ministry of Municipal Affairs and Housing.

MNR does not have the legal authority to apply the old growth policy on forest lands owned by the federal government or private individuals. MNR will respect and honour treaty and Aboriginal rights when making and implementing plans. The implementation of MNR plans will not prejudice the outcome of any land claims being negotiated by Ontario and Canada.

8.0 SUNSET REVIEW

The *Old Growth Policy for Ontario's Crown Forests* is scheduled for review in five years. It may be updated sooner, if required, to reflect any significant changes in Ontario's forest policy, legal authority, or program delivery.

Figure 3 Crown and private land ownership in Ontario

87 per cent of the land in Ontario is held under Crown ownership (unshaded areas). 13 per cent of the land is held under private ownership (shaded areas).

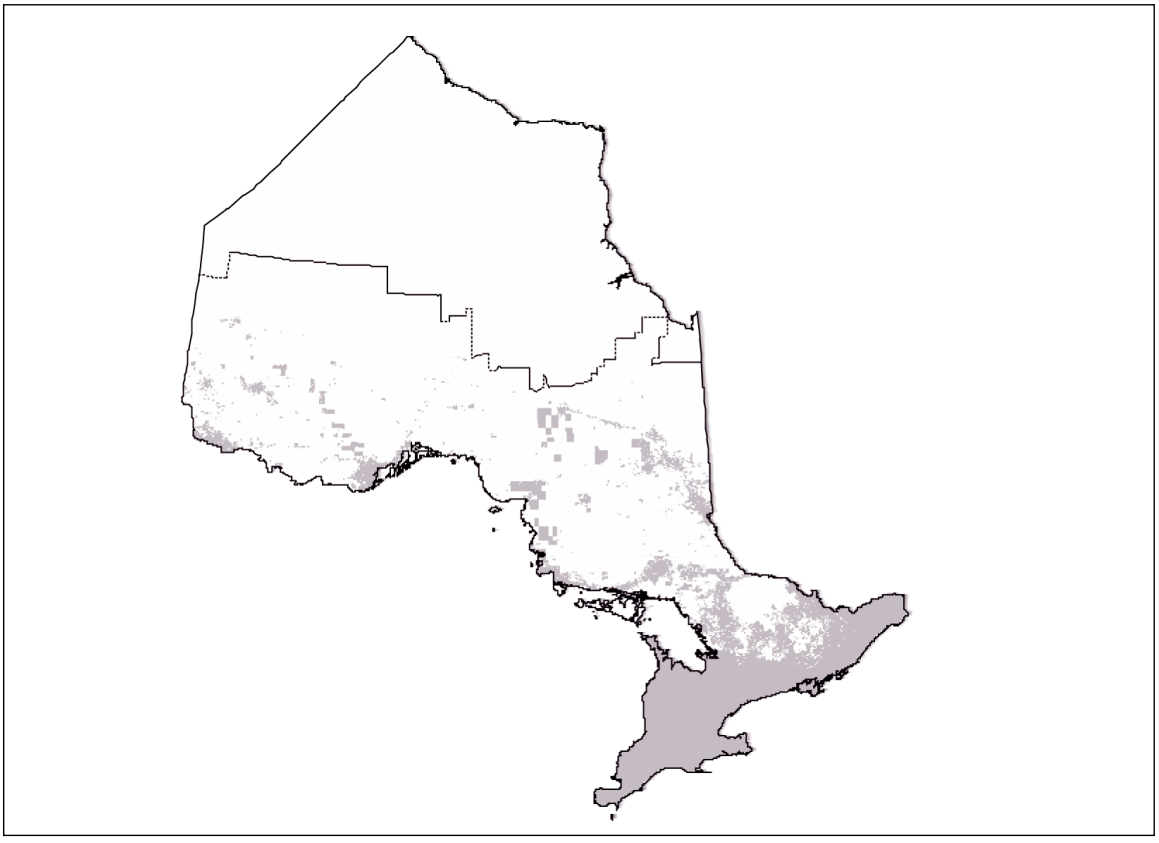


Figure 4 Area of the Undertaking for the Timber Environmental Assessment

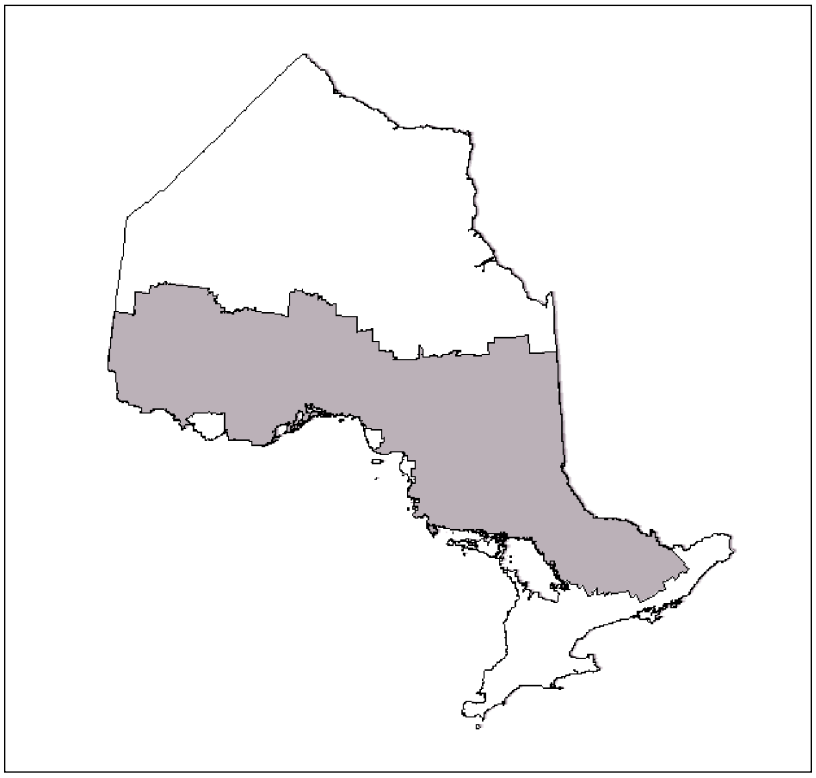
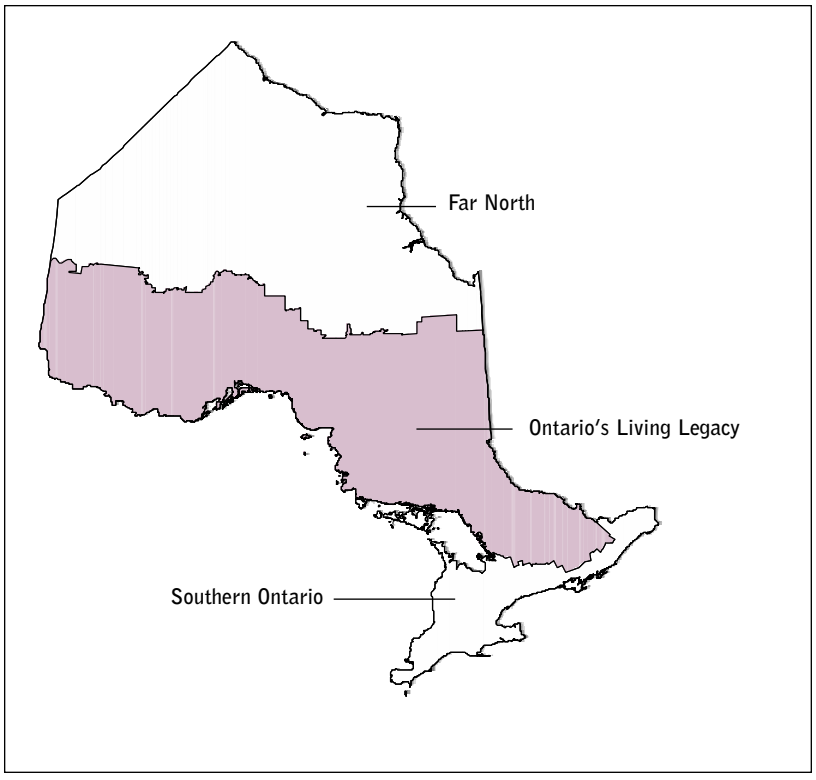


Figure 5 MNR planning area



APPENDIX 1

Ontario Ecological Land Classification

There are 14 ELC ecoregions and 67 ecodistricts in Ontario (Figure 6).

Eight of the ecoregions are situated within the Area of the Undertaking for the Timber Class Environmental Assessment, now covered by the Ontario's Living Legacy planning area. For the purposes of old growth analysis at the forest landscape level, four of these eight ecoregions are subdivided along ecodistrict boundaries (Figure 7). These subdivisions were made to accommodate local and regional variations in physiography. These modifications affect ELC Ecoregions 3E, 3W, 4S and 5E, which are subdivided to account for variations in the following:

- disturbance rates for fire cycles;
- forest ecosystem processes (e.g. forest succession rates vary among forest types);
- the influences of climate (e.g. wind, ice, precipitation and temperature);
- dominant soils (e.g. the clay belt north of Timmins); and
- major differences in physiography (e.g. bedrock-dominated versus till and glaciolacustrine landscapes).

ELC Ecoregions 4S (Ecodistricts 1 and 6) and Ecodistrict 5S2 are combined because only Ecodistrict 2 in Ecoregion 5S is situated in Ontario.

Figure 6 Ecozones, Ecoregions and Ecodistricts of Ontario

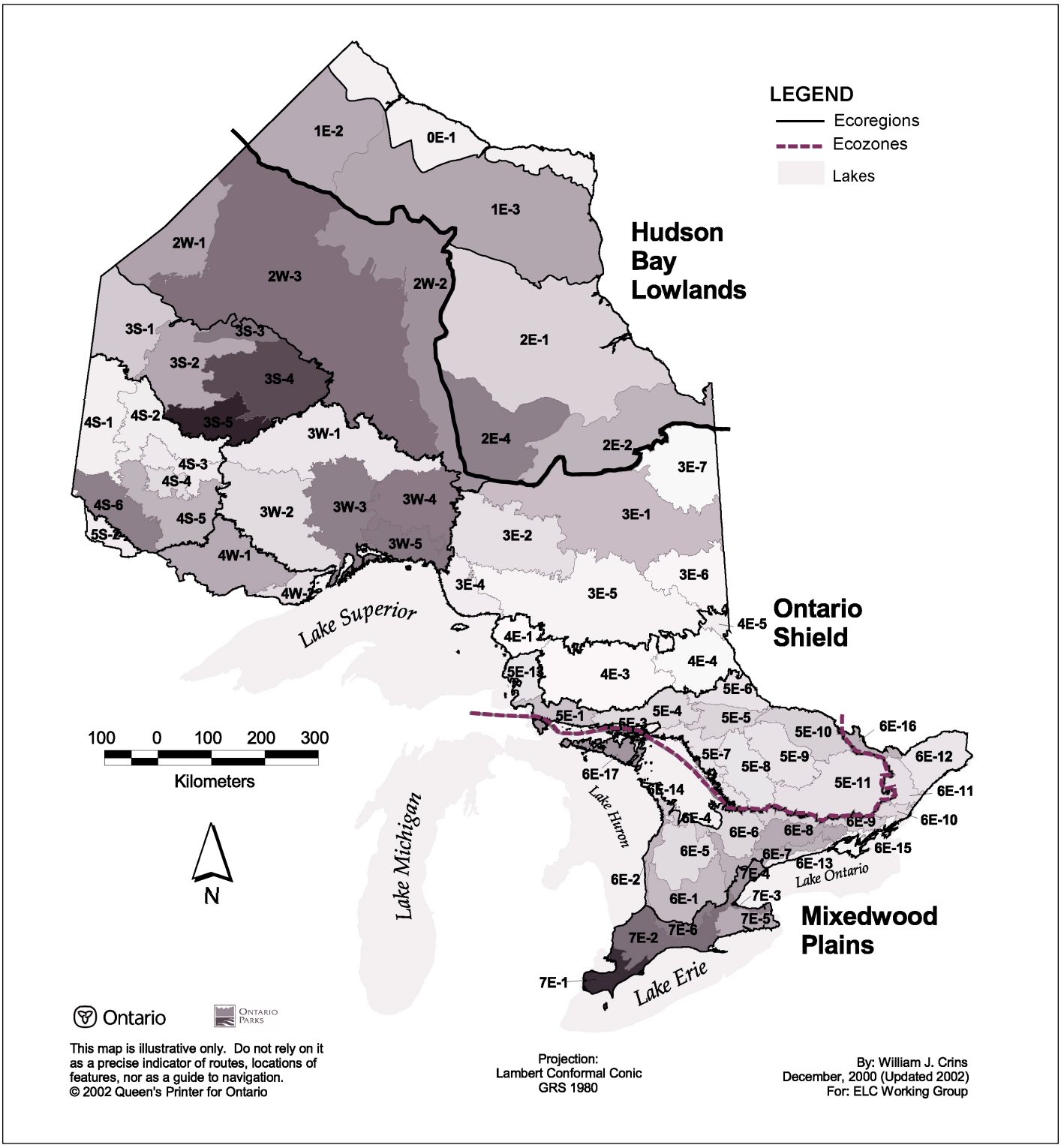
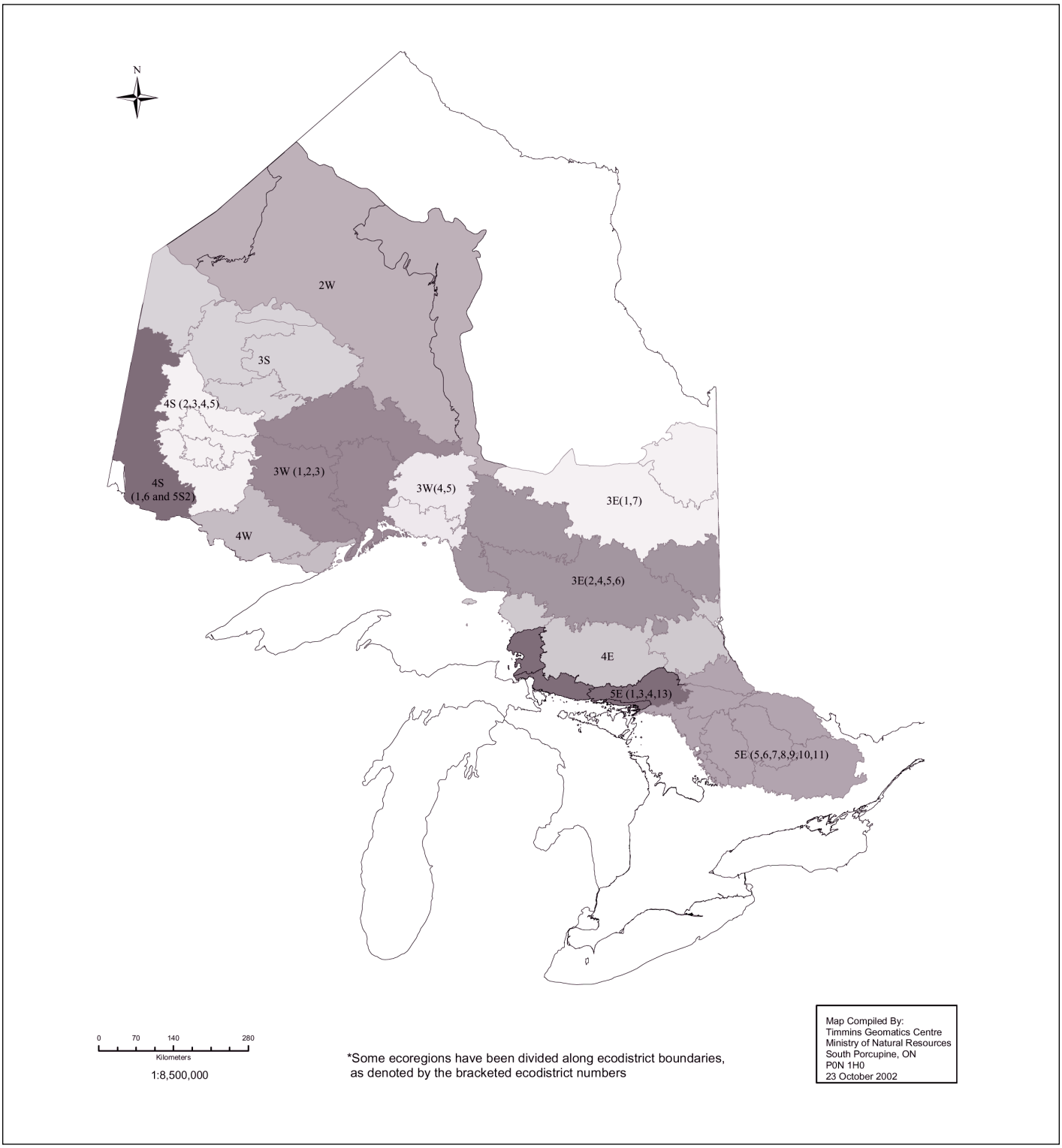


Figure 7 Landscapes used in Old Growth analysis defined by aggregated ecodistricts



GLOSSARY

The purpose of this glossary is to define and to explain terms used in this document. The definitions have been taken fully, modified or adapted from the sources referenced. Abbreviated references used throughout the document and for the sources of terms used the document are abbreviated as follows:

CCFM Canadian Council of Forest Ministers

CFSA Statutes of Ontario, 1995. *Crown Forest Sustainability Act*, 1994. (Chapter 25), Section 3.Toronto: Queens Printer for Ontario.

D&D Dunster, J and K. Dunster. 1996. *Dictionary of Natural Resource Management*. University of British Columbia Press.

EAB Environmental Assessment Board, 1994. *Reasons for Decision and Decision: Class Environmental Assessment by the Ministry of Natural Resources for Timber Management on Crown Lands in Ontario*. Toronto: Ontario Environmental Assessment Board, report number EA-87-02.

ELC Ecological Land Classification

FC Forestry Canada, 1992. *Silvicultural Terms in Canada*. Ottawa: Science and Sustainable Development Directorate, Forestry Canada.

FMPM Ministry of Natural Resources, 1996. *Forest Management Planning Manual for Ontario's Crown Forests*. Toronto: Queen's Printer for Ontario, Glossary.

FRAP Ministry of Natural Resources, 2003. *Forest Resource Assessment Policy*. Toronto: Queen's Printer for Ontario, Glossary.

FRI Forest Resources Inventory

GIS Geographic Information System

GPD Ministry of Natural Resources, 1995. *The Guide to Policy Development*. Toronto: Queen's Printer for Ontario.

MNR Ministry of Natural Resources

MNR '90s Ministry of Natural Resources, 1991. Direction '90s. Toronto: Queen's Printer for Ontario.

OLL Ontario's Living Legacy

DEFINITIONS

Age class – One of the intervals into which the age range of forest stands is divided for classification and use. (FMPM)

Area of the Undertaking – The area within the geographic boundaries of the area of the undertaking is all land and water within forest management unit boundary lines. The northern boundary is generally the northern limit of current commercial timber operations; the southern boundary is generally the limit of the forest on Crown land. Of that area, 385,000 square kilometres (or 38.5 million hectares) is Crown land subject to the undertaking, and is referred to as the "Area of the Undertaking" in this Decision. (FMPM)

Biological diversity (Syn.: Biodiversity) – The variability among living organisms from all sources including *inter alia* terrestrial, marine and aquatic ecosystems and the ecological complexes of which they are part this includes diversity within species, between species and of ecosystems. (FMPM.)

Canopy – The more or less continuous cover of branches and foliage formed collectively by the crowns of adjacent trees. (FC)

Community (ecological) – An integrated group of species inhabiting a given area and influencing one another's distribution, abundance, and evolution. (FMPM)

Conservation – Conservation "embodies preservation, maintenance, sustainable utilization, restoration and enhancement of the natural environment". (World Conservation Strategy, 1980). Quoted in MNR '90s, p. 5).

Management of the human use of the biosphere so that it may yield the greatest sustainable benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations, and includes the preservation, maintenance, sustainable utilization, restoration and enhancement of the environment. Modern conservation theory incorporates the notion that what is to be conserved is not so much the physical state of an ecological system as the ecological

processes by which that state is created and maintained. (FMPM)

Crown forest – A forest ecosystem or part of a forest ecosystem that is on land vested in Her Majesty in right of Ontario and under the management of the Minister of Natural Resources. (CFSA)

Evapotranspiration – The movement of water from the soil, an individual plant, or plant communities to the atmosphere by evaporation of water from the soil and transpiration of water from plants. (D&D)

Even-aged structure – A forest stand or forest type in which relatively small age differences exist between individual trees. The differences in age are usually 10 to 20 years; if the stand will not be harvested until it is 100 to 200 years old, larger differences up to 25% of the rotation age may be allowed. (FMPM)

Forest – 1. (Ecology) A plant community predominantly of trees and other woody vegetation, growing more or less closely together;

2. (Silvicultural Management) An area managed for the production of timber and other forest products, or maintained under woody vegetation for such indirect benefits as protection of site or for recreation.

3. (Forest Diversity) An aggregate of stands. (FMPM)

Forest ecosystem – An ecosystem in which trees are or are capable of being a major biological component. (Section 3 CFSA)

Forest health – The condition of a forest ecosystem that sustains the ecosystem's complexity while providing for the needs of the people of Ontario. (Section 3 CFSA)

Forest inventory – A survey of an area to determine such data as area, condition, timber, volume, and species, for specific purposes such as planning, purchase, assessment, evaluation, management, or harvesting. (FMPM)

Forest management plan (FMP) – A document containing pertinent information and prescriptions by means of which forest policy, aims, and objectives are translated into a continuity of specific treatments on a management unit for a specified period of years.

Current Plan or Currently Approved Plan: An approved forest management plan that is in the implementation stage of the planning period.

Past Plan or Previous Plan – The expired forest management plan for the planning term immediately preceding the current plan/planning term. (FMPM)

Forest Model – A computer-based simulation that within definable parameters forecasts the development of the forest and the resources that becomes available from a forest through time.

Forest models simulate forest development in response to both natural forces (growth, succession, disturbances) and active intervention (harvesting, renewal, tending).
(FMPM)

Forest Resource – Trees in a forest ecosystem, any other type of plant life prescribed by the regulations that is in a forest ecosystem, and parts of or residue from trees in a forest ecosystem. (Section 2 CFSA)

Forest Resources Inventory (FRI) – A resource inventory conducted for each management unit on average every twenty years. The FRI divides the area into a number of components, such as water, non-forested, non-productive forest, and productive forest; and further classifies each component by ownership/land use categories. The FRI provides descriptive information about the timber resource on each management unit (e.g. stand age, stand height, species composition, stocking level) in the form of interpreted aerial photographs, forest stand maps and a set of standard inventory ledgers referred to as reports. (FMPM)

Forest Stand (Syn. Stand) – A community of trees possessing sufficient uniformity in composition, constitution, age, arrangement, or condition to be distinguishable from adjacent communities. (FMPM)

Forest Type – A group of forested areas or stands of similar composition; forest types are usually separated and identified by species composition and often by height and crown closure classes. (FMPM)

Forest Units – An aggregation of forest stands for management purposes, which have similar species composition, develop in a similar manner (both naturally and in response to silvicultural

treatments), and are managed under the same silvicultural system. (FMPM).

Geographic Information System (GIS) (Also see Spatial or Spatial Database) – An information system that uses a spatial database to provide answers to queries of a geographical nature through a variety of manipulations, such as sorting, selective retrieval, calculation, spatial analysis, and modelling. (FMPM)

Habitat – An area with the combination of resources (food, over, water) and environmental conditions (temperature, precipitation, presence or absence of predators and competitors) that promotes occupancy by individuals of a given species (or population) and allows those individuals to survive and reproduce.

Regional wildlife habitat matrices define three categories of habitat. Note that the habitat types used in these matrices are based on regional forest ecosystem classifications.

Preferred Wildlife Habitat: Habitat types in which the species is almost always found where the type occurs within the species' geographic range. It is assumed, but not always proven, that these habitat types are the most important to reproduction.

Marginal Wildlife Habitat: Habitat types where a species may be found at low densities most of the time, or at higher densities periodically. Depending on the species, marginal habitat may or may not be important to reproduction. Marginal habitats may contribute to the continuity of populations, preventing them from becoming isolated only in "islands" of preferred habitat.

Unused Wildlife Habitat: Habitat types in which a species will rarely be encountered and which are not used for reproduction.
(FMPM)

Indicator – A selected measurable variable that relates to a specific forest sustainability criterion (pl. criteria). Indicators are used in the determination and assessment of forest sustainability and to report on progress. (FMPM)

Indicators are used to demonstrate how well Ontario is practising sustainable forest management.

Landscape – A heterogeneous land area composed of a cluster of interacting ecosystems that is repeated in similar form throughout.

A landscape is normally defined by geomorphology or climate.
(FMPM)

Maintenance – The forest management activities of tending and protection, which are carried out to ensure the survival and development of a forest to maturity. (FMPM)

Management unit – All or part of a Crown forest which has been designated as a management unit for the purposes of the *Crown Forest Sustainability Act* (1994). (FMPM)

Monitoring – The collection and analysis of data over extended periods of time. It provides information on past and present ecological, social, cultural, and economic trends, and a basis for predictions about future conditions. (FMPM)

Natural forest – A forest that has evolved and reproduced itself naturally from organisms previously established, and that has not been significantly altered by human activity. (FMPM)

Non-spatial – Refers to information stored in a form or format that is not directly usable by geographic information systems (e.g., hard-copy maps or tabular datasets). (FMPM)

Objective – An object of action, an end as a cause of action. (FMPM)

Old growth – Old growth is a functional condition of a forest ecosystem that embodies a set of physical features and characteristics, in dynamic forest ecosystems. Old growth features and characteristics typically include the following:

- a complex forest stand structure (e.g. old trees for the ecosite, large tree size and wide spacing, multiple canopy layers and gaps, and rates of change in species composition);
- large dead standing trees (snags), accumulations of downed woody material, up-turned stumps, root and soil mounds, and accelerating tree mortality; and
- ecosystem functions (e.g. stand productivity, nutrient cycling, and wildlife habitat) that are different from earlier stages of forest development.

Old growth conditions in Ontario's Crown forests will be identified at Ontario Ecological Land

Classification scales using the age-of-onset and duration periods described in the report *Old Growth Forest Definitions for Ontario* (MNR 2003). For more information about old growth features and characteristics, refer to the old growth definition report.

Ontario Ecological Land Classification (ELC):

Ecozone – Units representing variations in climate and bedrock that are reflected in the overall trends in diversity and occurrence of ecosystems across North America. There are three major subdivisions in Ontario.

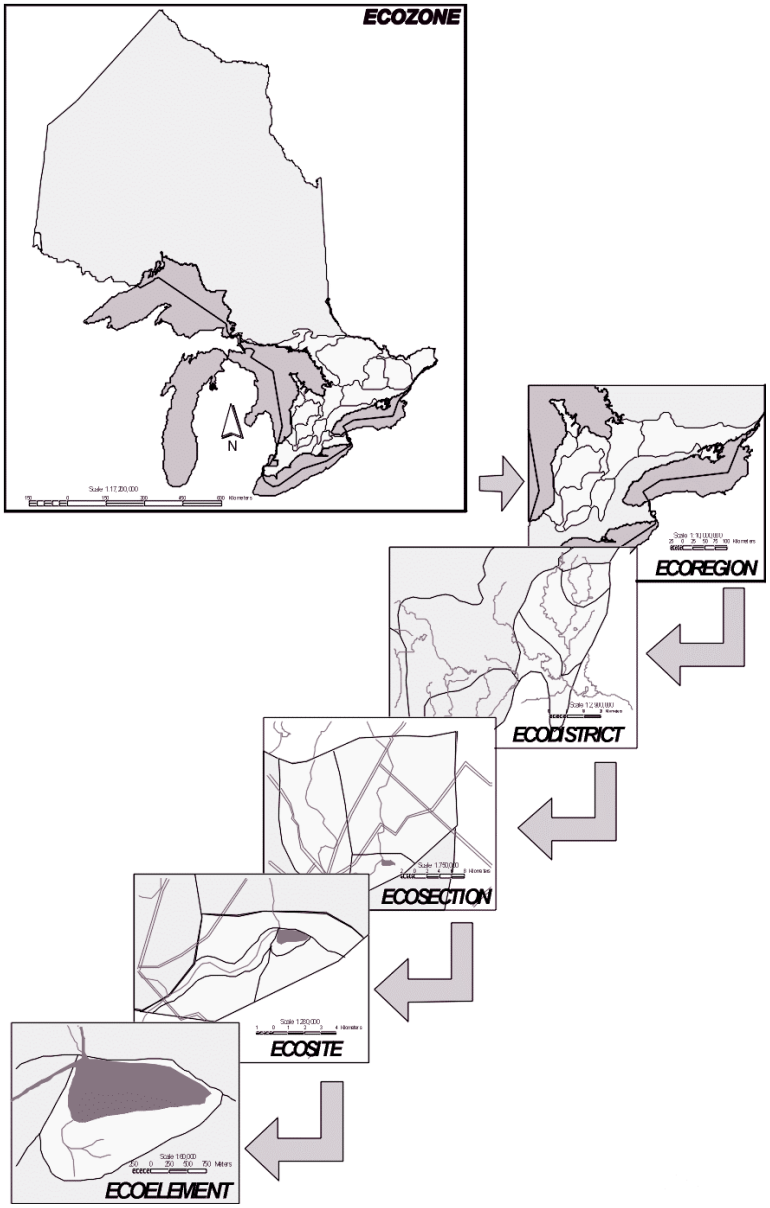
Ecoregion – Sub-subdivided units of ecozones primarily based on macro-climatic features such as seasonal precipitation, temperature regimes and evapotranspiration. Some boundaries have been modified by major bedrock and landform differences in certain parts of the province. Ecoregions help to explain provincial patterns of primary productivity, distributions of living things and patterns of soil development throughout Ontario.

Ecodistrict – Sub-divided units of ecoregions based on sub-regional landform patterns, physical geography, landscape complexity, and climate trends caused by landforms, such as lake effect areas. Each ecodistrict can be characterized by a specific combination of physical landform features, dominant soil types, major vegetation patterns and growing regimes.

Ecosection – Tangible, spatial, landscape inventory units defined in terms of the recurring patterns of soil parent materials (the basic materials that form soil, such as bedrock), moisture, topography and landform. Each ecosection comprises component ecosites occurring at sub-regional scales. There is a very strong relationship between this level, the parent material, and local landforms.

Ecosite – A fine-scale spatial inventory unit defined by the recurring patterns of one or more vegetation and soil types within a specific landscape context. The most appropriate map scale for this unit is 1:10,000 - 1:20,000. It is the primary scale for corporate-level inventory and the development of interpretation for natural resource planning and delivery.

Ontario Ecological Land Classification System



Conceptual diagram for illustration purposes only.

Ecoelement – Very fine scale units containing particular vegetation and soil types. They are combinations of plots in different locations grouped according to their statistical similarity. These units are useful for detailed types of inventory and many types of interpretations.

Ontario's Living Legacy planning area – This area was defined when *Ontario's Living Legacy Land Use Strategy* (MNR 1999) was developed. It encompasses the Area of the Undertaking for the Timber Environmental Assessment, as well as the addition of five large parks bordering this area (Figure 4).

Policy – A policy is a statement of intended direction developed for the purpose of guiding present and future actions and decisions. (GPD, p. 1.1)

Provincial forest types – MNR has developed a forest classification of eight provincial forest types to consistently compare information about Ontario's Crown forests, across multiple management units in support of broader provincial and regional policy and planning objectives developed through the MNR planning system. These broad forest types represent a mix of forest cover required for silviculture, wildlife habitat and a sustainability assessment requirement for use at broad planning levels.

The Provincial Forest Types is an ecologically based forest classification system of traditional Forest Resources Inventory (FRI) information (forest types). This forest classification is based on species composition as well as understory vegetation and soils and fits into the Ontario's Ecological Land Classification. It is needed to describe general forest composition at the management unit level for broad regional and provincial level planning and reporting purposes. The provincial forest types and their use are described in the *Forest Resource Assessment Policy* (MNR 2003, glossary).

Silvicultural treatment – Silvicultural treatment is an activity, whether biological or managerial, through which a forest operations prescription is met. (FMPM)

Spatial or spatial database (Syn.: Geographic Information System) – A collection of interrelated geographically referenced data stored without unnecessary redundancy to serve multiple applications as part of a geographic information system. (FMPM)

Species – A singular or plural term for a population or series of populations of organisms that are capable of interbreeding freely with each other but not with members of other species. (FMPM)

Strategic policy – Strategic policy includes two types of statements:

Statements of direction or intent include comprehensive frameworks, broad directional statements, or program directions. They provide long-term direction an on-going philosophical base (e.g. *MNR Statement of Environmental Values*, *Policy Framework for Sustainable Forests*, and *Nature's Best*).

Statements of dimension or scope include targets or levels of service, strategies for implementing policies, and schedules in the medium term or longer term. They provide links to administration and management (e.g. MNR Forest Resource Assessment Policy).
(GDP, p. 2.2)

Strategy – The means or steps to achieving an objective. (FMPM)

Succession – Changes in species composition in an ecosystem over time, often in a predictable order. (FMPM)

Super canopy – Super canopy is a descriptive term applied to widely spaced very large trees that are much taller than the average height of the surrounding forest cover. For example, it is not uncommon to find scattered very large/tall and very old white pine trees scattered throughout a forest of much younger and shorter sugar maple trees. These super canopy trees are often evidence of a much older and larger cohort of trees that have persisted on the landscape after surviving a disturbance that has affected the remainder of the land (e.g. a forest fire or harvesting that some trees survived).

Sustainable forest management – The management of forest ecosystems to maintain a healthy forest ecosystem which provides a continuous, predictable flow of benefits. Indicators of forest sustainability

criteria are incorporated into strategic decision-making and into the periodic assessments of both forest and socio-economic conditions. Forest operations are conducted in a manner that conserves forest health and minimizes undesirable effects on the physical and social environments. (FMPM)

Target – Targets for old growth condition will be described in terms of acceptable ranges for the ecoregion-based landscapes delineated in Figure 6. These ranges can be expressed as either a specific numerical target range (in hectares), or the change relative to current levels (e.g. no net decrease from current levels, or increase by x%). MNR will develop the target ranges considering the feasibility for monitoring.

Uneven-aged structure – A forest, stand, or forest type in which intermingling trees differ markedly in age. The differences in age in an uneven-aged stand are usually greater than 10 to 20 years. (FMPM)

Value – *In relation to Values Mapping:* A benefit or condition of the forest that is linked to a specific geographic area, that could be of interest from various points of view, and which may need to be protected as a results of timber management activities.

In relation to Indicators of Forest Sustainability Criteria and Objective Achievement: The numerical measure of a quantity or a number denoting magnitude. (FMPM)

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Please note that many of the MNR forest management publications are available online from the Ontario's Forests public internet site at http://ontariosforests.mnr.gov.on.ca/publications.cfm