Endangered Old-Growth White and Red Pine Forests in a Changing Climate

Old-growth white and red pine stands in the Temagami forest are endangered ecosystems with unique forest values that provide critical ecological structure and function that is of benefit to the biodiversity of the entire landscape. We acknowledge that MNRF makes efforts in its forest management planning to maintain old growth on the landscape both in the present and in the long-term. We may not agree on the extent of the old growth stands retained at any one time but the recognition of their essential function appears to be mutual. However, the reality and rapidity of climate change has changed the parameters involved in forest management planning and that has not been recognized or responded to within the Temagami FMP.

MNRF's knowledge about the science relating to climate has been advancing. In the document CCRR-44 Climate change projections for Ontario: An updated synthesis for policymakers and planners (2015) MNRF scientists use current climate models and scenarios to predict the likely future climate of Ontario. The models predict that the Temagami area will get warmer, especially in winter, and much wetter compared to 1971-2000. These changes will be apparent in the period 2011-2040 and get much more pronounced to the end of the century.

In an earlier publication, CCRR-16 Current and Projected Future Climatic Conditions for Ecoregions and Selected Natural Heritage Areas in Ontario (2010), a similar projection of climate models focused on how the growing conditions necessary for selected tree species would change in provincial parks. For Lady Evelyn Provincial Park in the Temagami site region the study projected that sometime after 2040 the growing conditions in the park would no longer provide suitable climate habitat for the the growth and establishment of black spruce as a species. The significance of this is unclear. While black spruce is not a major harvest species in the Temagami FMU it still has significance in wetter areas. What does the absence of suitable growing conditions mean? It clearly is undesirable to have black spruce stands decline or die. Does this mean that these stands should be salvaged and replanted with other species? Or conversely should they be protected to prolong their persistence on the landscape to support other

species that may be ecologically dependent. These are clear challenges to sustainable forest management. Regrettably, CCRR-16 makes no predictions regarding the future of old growth red and white pine.

How is Climate Change Mitigation and Adaptation applied in the Temagami Management Unit 2019-2029 Forest Management Plan?

The following excerpts taken from Supplementary Document 4 of the Long-Term Management Direction (LTMD) of the 2019-2029 Temagami Forest Management Plan. It explains the how climate change is considered in Temagami Forest Management Plan.

“The Crown Forest Sustainability Act (CFSA) provides the regulations that define how Crown forests are managed. The CFSA ultimately refers to a number of guides that provide the framework for forest management. Many of these guides, including the pivotal Forest Management Planning Manual (FMPM) have an objective for the resiliency of the forest:

“Healthy, resilient forests are best able to resist and adapt to climate change impacts. Ontario’s sustainable forest management framework has been designed to ensure a healthy, and therefore, resilient forest.”

This objective is consistent with Ontario’s Climate Change Strategy, which sets the goal of increasing the resilience of natural areas at the landscape, ecosystem, and species level. The logic behind this is; a healthy forest is a resilient one, and a resilient forest can adapt to change (such as alternate temperatures from historic levels, or alternate moisture climates from those historic levels) better than an unhealthy or unbalanced ones. This being said, if healthy forests are the ultimate goal, then what defines a healthy forest throughout time?

That direction comes partly from the Forest Management Guide for the Great Lakes-St Lawrence Landscapes. The Forest Management Guide for Great Lakes-St. Lawrence Landscapes is the primary guide applied in the development of the 2019-2029 Temagami FMP. Through the application of the guide a range of conditions of the forest (age and species) that were

possible prior to European settlement will describe a healthy forest conditions. The guide describes the pre-settlement condition based on historical records and mathematical modelling of how forest will grow and transition through time in the absence of human influences. Ultimately, the guide provides forest managers with target forest compositions (age and species) to achieve over time. These ranges are known as the Simulated Range of Natural Variation (SRNV) and are calculated for each forest management unit across the province through this guide and the Forest Management Guide for Boreal Landscapes. Through the implementation of these guides a forest that is within the ranges of the SRNV is a healthy, resilient forest; as such, the objectives of the Temagami LTMD is to create a forest condition that is within the SRNV in the short, medium and long term planning horizons."

Requester's Concern Regarding the Planned Operation

This last sentence of this excerpt highlights an important concept that must be emphasized. In order to achieve a healthy, resilient forest, the planning process uses a SRNV which is based on historical records of pre-settlement conditions. However, those pre-settlement climate conditions which fostered that historic healthy, resilient forest do not now exist and the climate will continue to change during the decade the FMP is in effect and in subsequent decades during which the regeneration created by the plans operational activities is expected to occur.

MNRF acknowledges in its own scientific works and public policy documents (Naturally Resilient: MNRF's Natural Resource Climate Adaptation Strategy (2017-2021)) that climate change is expected to profoundly impact the growing conditions in the Temagami FMU in the coming decades. They suggest that the temperature and moisture regimes may shift from Ecoregion 4E to those presently found in Ecoregion 6E. This is a radical and hugely disruptive change in growing conditions, yet there is no acknowledgement of this in the Temagami FMP nor is there discussion as to how this will impact existing old growth or regeneration after harvesting. How can this predicted perturbation be ignored? It puts into question the fundamental integrity of the basic models used to project

forest growth in order to produce the plan and it certainly undermines any claims that the plan will result in a resilient, sustainable forest.

Yet there is another aspect of the changing climate that profoundly impacts the future sustainability of the forest which is also absent from the FMP. That is the resulting change in the fire regime. A recent paper by Boucher et al. modelled the “Current and projected cumulative impacts of fire, drought and insects on timber volumes across Canada” They project that up to 30% of the wood volume is a risk to loss by fire for the area of the TMU by 2040 (using IPCC RPC 8.5 scenario). The future fire prognosis profoundly challenges the foundational assumptions of the plan.

The FMP adheres to the previous paradigm of maintaining old growth on the landscape of the TMU where a large portion of the landscape inventory of old growth is assigned to protected lands like parks and conservation reserves. The remainder is on the lands open to harvesting. This locks the landscape management of old growth into a rigid pattern. Last summer a large section of Lady Evelyn PP and adjacent management land was burned including many stands of old-growth red and white pine. If this fire had been larger and entirely contained in the park the inventory of old growth on the landscape would have been substantially reduced. Would that have initiated a reconsideration of the cutting plan in the FMP? Would old growth stands scheduled to be cut be removed until the implications of the change in the landscape could be assessed? A new fire regime created by the expected new climate has profound implications and a forest management plan must be demonstrably responsive to that.

How an Individual Environmental Assessment address these concerns in a way that the Class Environmental Assessment does not

Given these fundamental flaws the Temagami Forest Management Plan is inadequate and incomplete. There is clearly a need to consider broader issues and to include mechanisms that would allow the plan to respond to the radical changes induced by the changing climate that will threaten sustainability.

There has been some thought by MNRF on a policy response that would begin to address these challenges. The CCRR-44 referred to above report

contains a document entitled “Sustainability in a Changing Climate: An Overview of MNRF’s Climate Change Strategy (2011–2014).” That strategy contains a number of commitments which would seem to inform requirements in the forest management planning process Some of these include:

Transfer science and understanding to decision-makers to enhance comprehensive planning and management in a rapidly changing climate.

Use scenarios and vulnerability analyses to develop and employ adaptive solutions to known and emerging issues.

Encourage and support industries, resource users and communities to adapt, by helping to develop understanding and capabilities of partners to adapt their practices and resource use in a changing climate.

Evaluate and adjust policies and legislation to respond to climate change challenges.

These strategy initiatives represent the kind of thinking and the approach necessary to deal with the challenges presented to forest management planning by climate change. They may not be fully adequate to address the deficiencies identified but they are substantive. Unfortunately, they share one common character. They are not and cannot be part of the existing class EA (Declaration Order MNR-75). If the forest management planning process in the Temagami Management Unit is to meet the purpose of the EAA and provide for the protection, conservation and wise management in Ontario of the environment then a full individual EA which broadly addresses the issues is required.