

Old-Growth Carbon Retention Dynamics

Old growth red and white pine forest stands in Temagami retain a significant inventory of sequestered atmospheric carbon dioxide which has accumulated over millennia. The living trees contain a huge biomass of heartwood, foliage and other living tissue but that is not the most substantial reservoir of bound carbon. Giant standing snags and downed logs composed of carbon based organic matter fixed in centuries past decompose slowly in the closed forest environment releasing CO₂ very gradually over many decades. But the largest stock of detained greenhouse gas resides in the forest soil, duff, litter and the coarse woody debris that accumulates on the forest floor. Although net productivity is low in these ancient systems it is well established in the scientific literature (reference have been provided to MNRF during FMP consultations) that old growth stands continue to accumulate and sequester carbon until they undergo major disruption.

Harvesting old growth (even utilizing the shelterwood cut system) disrupts ecosystem structure and function and results in the release over a period of weeks or months of substantial amounts of the carbon that has been accumulating in these stands. The large amount of carbon in the soil component is exposed to oxidation and accumulated dead woody debris rapidly decomposes on the surface of the harvested landscape along with the harvesting residuals, all of which release CO₂. Such greenhouse gas emissions would not be equivalent to fossil fuel emissions but they would be releases of carbon captured pre-industrial revolution that would contribute to the current crisis.

In consultations during the Declaration Order process MNRF consistently advanced the model that CO₂ was more rapidly taken up by the vigorous growth of the regeneration that occurs after cutting. The high net productivity of regenerating forest is not in dispute but it must be recognized that the timelines required to sequester the amounts of carbon initially released by old-growth harvest will be measured in centuries.

In addition, in their responses and in their planning guides and documentation the MNRF emphasizes that some portion of the carbon in

wood products from the forest will remain sequestered for many decades as manufactured goods retained by society. There is some truth to this, however, the quantity of carbon sequestered in this manner does not represent a large portion of the original organic matter present. On average, timber removed from a site is only about 50% of the living biomass. Of this quantity, bark, sawdust, cutting wastes, and finishing residues are disposed of resulting in a very small portion of the original carbon in the stand being fixed into long-lasting wood products.

The arguments that regenerating forest take up carbon rapidly or that manufactured wood products sequester some carbon for long periods are really moot in this context because they are only relevant if we cut the old growth and have to mitigate the release of the accumulated carbon. If we don't cut the old growth the forest will continue to retain the large amounts of carbon present for decades to come and continue to fix more CO₂ in modest amounts.

Requester's Concern Regarding the Planned Operation

Canada has ratified the Paris Accord on climate action and committed with other nations to a goal of reducing the net release of carbon dioxide equivalents to net zero by 2050. The intent is to keep the atmospheric CO₂ concentration to 450 ppm or less in order to keep the rise in global atmospheric temperature to less than 2°C at equilibrium. This is a challenging goal and involves massive reductions in the burning of fossil fuel and the consequent release of CO₂. Clearly there must be some dramatic changes in our society and economy and we will have start doing some things differently in the coming 3 decades. One of those things that must be done differently is forest management.

The problem is the Declaration Order based FMP process is insensitive to the considerations of how carbon retention is an important to society. As a class EA process it is too focused on timber management and deterministic in its process. Its decision making models do not reflect broader matters such as atmospheric or climate science. And there is no opportunity to consider the geopolitical context of the undertaking.

As a result the FMP is driven by long-term objectives to achieve a forest landscape reflective of pre-settlement forest conditions. There is no possibility to consider that a pre-settlement forest conditions are no longer relevant given the present and projected climatic changes. Neither is there the flexibility in the class EA process to allow substantive changes in silvicultural prescriptions such as not cutting old growth as a mechanism to contribute to the urgent need to reduce all CO₂ emissions in the critical 30 year period during which we terminate our dependence on fossil fuels.

There is the additional concern that cutting old growth stands is a decision which precludes future opportunities. The policy regime around sequestration of carbon is dynamic and in a state of flux internationally. There may be other opportunities in the next management cycle perhaps associated with an economic return for leaving forests intact. Forgoing the cutting of centuries old trees for 10 more years is a small concession given the consequences to climate change mitigation initiatives and potential future opportunities

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

Class EA was created to facilitate the evaluation and approval of undertakings which are repetitive and where the likely environmental impacts are known or well understood. The process has been utilized (not without controversy) for forest management in Ontario's Crown forest for 25 years. However, as described above given the changing climate geopolitical circumstances the existing Declaration Order is no longer able to fulfil the wise management provision in the purpose of the EAA:

"The purpose of the EAA is the betterment of the people of the whole or any part of Ontario by providing for the protection, conservation and wise management in Ontario of the environment."

An individual EA would remedy this deficiency. An Individual EA would require a description of:

- the environment that will be affected, directly or indirectly,
- the effects that will be caused to the environment,
- the actions necessary to prevent, prevent, change, mitigate or remedy the effects upon the environment by the undertaking, the alternative methods for carrying out the undertaking and alternatives to the undertaking, and
- an evaluation of the advantages and disadvantages to the environment of those alternatives

These requirements in Section 5. of the EAA speak precisely to what is required in this situation and conversely they highlight what is not possible within the process of the Declaration Order.

A clear alternative method of carrying out this forest management undertaking is to not cut old growth based on the arguments above. Not cutting old growth is a decision that would have significant socioeconomic as well as ecological implications so it could only be properly evaluated within the structure of an individual EA.