

When Nova Scotians are asked what they envision by the term “old growth”, most describe large, old trees. Some mention the unique, open understory, deep shade, or a moss-covered forest floor. They may speak of trees of enormous heights, wildlife habitat, spiritual oases, and inherent beauty. But forests of this nature in the Old Growth Forest Policy likely represent only ~ 0.3 % or less of crown forests. If so, one may ask what is contained in the remaining 8 % of the acclaimed, albeit still low percentage, old growth across Nova Scotia crown forests? Why does the draft Old Growth Forest Policy not indicate how much actual old growth is present across the province?

I am writing to provide comments on the draft “*Old-Growth Forest Policy for Nova Scotia*” released on Nov 9, 2021. The Old Growth Forest (OGF) Policy functions as an update to the “*Interim Old Forest Policy*” by NSDNR (1999) and a successive draft form “*Nova Scotia’s Old Forest Policy*” (2012). This third version, like the previous two versions will do little to protect further loss of old growth, but many readers will not be able to allocate time to the careful investigative style reading required to detect issues with the policy. Most of us lead busy lives, and we yearn for a government department that we can entrust to write policy documents that carry out what they say they will do in earnest, with an integrity we should expect from department of Natural Resources and Renewables (NRR) but cannot achieve under the current mindset of this department.

Old growth is extremely limited on NS crown land, reported as only 8 % in the 1950s and declining to a dangerously low ~ 0.3 % in 2012. We can assume that it may be even lower now, but the revised draft OGF policy is bereft of details and updated statistics, despite it being easier than ever to generate this information from spatial analyses. Regardless, the urgency of protecting old growth is even greater, recognizing the “twin crises “of nature, i.e., unprecedented biodiversity losses and the global climate change emergency. The OGF policy must make greater reference to this current context and recent additional stressors that contribute to an increased need to protect highest possible amounts of old forests.

Consider that this Old Growth Forest policy must serve to protect far more than trees, extending conservation to many suites of OGF-associated species. We are witnessing ongoing losses of habitat required to support old forest-associated species. As well, the old forests are best at mitigating climate change. Old growth forests can sequester and store far more carbon from greenhouse gas than younger forests. Scientific justifications and citizen awareness have reached highest levels for recognizing the importance for protecting our last old forests. Once these legacy old growth forests are gone, there will be little chance to experience them again within our lifetimes.

The draft policy does not adequately address this importance, and leaves far too much mature, tolerant forests to *harvesting* instead of to other functions we need to sustain life. It will leave small old growth patches completely unprotected, and many other old growth stands will not meet the rigidly high criteria of the NRR-devised and much-criticized old growth assessment criteria.

Unfortunately, I must conclude that the latest policy draft will do little to conserve the last of our old forests without fundamental changes and increased oversight in its completion.

This submission outlines some major concerns and suggested approaches/solutions for attaining old growth forest goals and higher levels of conservation through a strengthened OGF Policy that will protect old growth into the future.

The importance of old growth must be more clearly emphasized. Language used in the draft policy about old growth having indispensable value was well said, but it needs further development to convey more of the unique role that old growth plays in carbon sequestration, what role these forests lend to aquatic ecosystems, mycelial networks that have developed through centuries, moisture retention, the many functions of old growth forest that cannot be substituted by younger forests. It should reference Mi'kmaq values for old growth and how it can serve in the recently released moose recovery plan.

Over-riding principles and goals from new legislation must be incorporated into OGF policy-

Lahey recommended the strengthening of Old Forest targets. The draft OGF policy has set no targets beyond the original 8 %, which was inadequate.

The draft policy must include consideration of the new context of Environmental Goals and Climate Change Reduction (EGCCRA) legislation which calls for “*conserving at least 20% of the total land and water mass of the province by 2030 as protected areas and other effective area-based conservation measures*” (Section 10a). As well, Section 10(c) prioritizes “*biodiversity and the sustainability of ecosystems*”. This obviously includes old growth stands of many types that persist in far too low amounts (likely < 0.3 %) to be considered “*sustainable*”.

- The goal stated above in the new legislation of EGCCRA should cause NRR to work in tandem with ECC (both provincial government departments) to achieve the 20 % goal as there is obvious overlap between the OGF policy and other protection goals, or alternatively, result in the OGF policy to be completed even more efficaciously by moving the finalization of the OGF policy to ECC-Protected Areas Branch.

Lahey recommended that steps should be taken to improve the abundance and conservation of old forests. He did not put a cap on this recommendation at eight percent. **The OGF policy objective requires a fundamental alteration:** While it states that it is to conserve old growth forests on public land and ensure that a network of the best old forest restoration opportunities is established, the *approach* to “*old forest restoration*” must be dismantled and fully re-proposed. The policy relies on forests > 40 years old in existing protected areas to contribute > 90 % of the old growth (and restoration opportunities) as the first choice for meeting old growth, with lands outside protected areas used to fill any remaining gaps. This is irresponsible and disingenuous because it does not represent the most appropriate nor fastest way to protect and increase old growth.

The new policy must place emphasis on meeting actual/presently-existing old growth protection targets through assigning all the currently old and unprotected forests on Crown lands to the OGF policy. Why? Because we need old growth forests NOW, not 100 years from now when the young forests inside protected areas may actually become old. The old forests remaining on all Crown lands, many of which occur far greater in age and biodiversity value than what is presently allocated to the old forest policy protected areas layer-these forests must be protected NOW under OGF policy before they are harvested and incur more biodiversity loss. (Adding insult to injury, we are currently burning much of our old growth forests for ‘firewood’ and biomass for electricity. Therefore, we are not losing a great deal of profit from these low-grade products by refraining from cutting any more mature and old forests that should be allocated to OGF.)

One of the fastest and easiest ways to improve old growth beyond the actual ~0.3 % (recognizing that is not the precise number, but none was provided) is to lock down all forests on Crown land that are above 100 years old. These stands hold far better prospects of becoming old growth than many of the forests in protected areas that are only in early successional stages presently and must pass to late succession tolerant forest types before showing many signs of becoming OGF.

The 8% old growth minimum limit should be increased to a minimum of 25 % as an objective. Eight percent old growth is an inadequate and ineffective old growth target that has no basis in science nor the context of natural Acadian forest. Of even greater concern is that we actually do not currently have 8 % old growth on public lands, but rather a much lower figure of perhaps 0.3 %. In any case, even if we did have 8 % old growth, it would provide inadequate buffering ability/ i.e., safe thresholds for long-term protection of biodiverse components and features associated with these rare old growth systems. An adequate 'buffer' is needed to ensure that we do not further lose rare species found in old growth situations. No one knows whether today's climate-altered disturbance regimes will allow the young forests to become old growth, so it is best to rely on the precautionary principle and increased reliance on the oldest age classes we currently have and protect all of them. It is possible that a hurricane, wildfire, or infestation may wipe out the very last of OGF in some places. We should not commit a reckless and irresponsible gamble with our last old growth. *Starting with the real quantities of old growth (amounts not currently revealed to us) would enable us to see the increases of old growth over time and assess true progress.

"More old growth is required to ensure there is truly enough to sustain the additional stressors and disturbances that are pending in the future." We will most assuredly witness rapid losses of some of our most cherished and oldest stands in the next decade.

Redefine OGF policy objectives. The department conveys a sense that the policy objective is to conserve a small, obligatory amount of OGF in a minute set of museum pieces that are then allocated to 'protected areas'. In contrast, we need to change the perspective, and strive toward an *increasingly larger component of older forests* on the landscape, which can be worked in using ecological forestry practices (with no cheating this time- by using wide extraction routes that are not included in final BA tallies, and building more hauling roads with clearcuts on either side, etc.), with the ability to remove some valuable stems or other forest products where/when needed, all the while maintaining a dynamic landscape and forest biodiversity. Such careful management cannot be entrusted to NRR and certainly not to industry such as WestFor, but can be overseen by an independent body who will not be in conflict of interest and who is educated on forestry, forest ecology including landscape-level ecology, SAR species, and carbon sequestration. We really can conduct ecological forestry, maintaining biodiversity in older forest stands, but it requires a mandatory shift in personnel and entrenched, traditional attitudes. The departmental mindset is too narrow to adopt this vision.

The central deception built into the draft OGF Policy: The draft OGF policy makes misleading claims that will deceive many readers who are too rushed to investigate beyond the clever prose to see what is achieved on the ground, and how new criteria proposed in the policy to define old growth will cause the province to *fail* in securing any further old growth opportunities. It borders on untruthfulness, using phrases such as,

“Currently, [] the Old Forest Policy has achieved that 8% goal for each ecodistrict and now has over 430, 000 ha of forest identified on Crown land which conserves a network of old forest restoration opportunities and remnant old growth (>125 years old).”

“Old forest restoration opportunities”? It’s easy to not even notice these words. How old are the forests that are considered “restoration opportunities”? Artful prose can easily mislead us to think that most of the 8 % is greater than 125 years old.

Will readers understand that the 430, 000 ha of forest “identified” (rather than ‘protected’) on Crown includes National Parks, which have nothing to do with provincial forest management? And is it common knowledge that “OGF” identified by NRR in provincial protected areas includes- coastal, blown down spruce-fir forests, and many very young forests in general? Likely not, as one is led to believe that the work is nearly done, with a full 8 % old growth protected everywhere across NS.

The policy defined old-growth forest “conceptually as late-successional forest ecosystems that evolve through long periods of forest development”. Yet many of the forests included in the 8 % are early successional and very young. Many of those areas will require a century or more to attain old growth character. Meanwhile we need old growth NOW, to address declining species that rely on old forests and to mitigate climate change. We cannot afford to wait 40-100 years from now for old growth to return to our landscapes to provide life-sustaining ecosystem services to humans and our native biodiversity. It is a blatant falsehood to claim that NRR has already attained the meagre objective of 8 % old growth or near old growth.

The draft OGF policy misrepresents the state of old forests on crown land by assigning large areas of young, early-successional forests as "Old Forests" in the policy, associated Story Map, and on the Provincial Landscape Viewer maps.

Authors of the OGF policy have written yet a 3rd version of this policy that is biased towards economic pressures rather than addressing ecological needs first. They have acted contrary to a key recommendation by the Independent Forest Review whereby ecosystem health was the first priority rather than economic interests.

What is the alternative? It would be much more valuable and responsible to select older and late successional stands that persist on the landscape presently to contribute toward old growth forest targets (which should be much higher than 8 %). Government is failing us in protecting forests such as those shown in the photo (Figure 2) as old growth, ignoring the pleas of its citizens to save forests such as this from forestry practices that consistently remove tree volumes that are too high and are harmful to the ecosystem. (See Appendix A.)

A proposed two-stage accelerated process to protect the *real*, remaining old growth forest and increased the percentage of old growth:

1. Identify and conserve all existing old growth on Crown land that is 100 + years old, including small patches.
 - Begin by conducting a simple GIS analysis
 - Issue immediate instructions to Crown licensees and harvest operators to avoid harvesting 100 + yr old trees.
 - Use an accelerated (simplified) old growth forest scoring evaluation, as part of *both* this OGF policy, as well as to evaluate forests that may be assigned to the 20 % protected areas strategy

under EGCCRA. Consider speeding up old growth evaluations by using trained personnel from other organizations who can work without economic/industrial biases.

- Consider utilizing tree-marking in some multi-aged stands where it is necessary to identify smaller clumps or individual trees that are 100+ yrs within a stand where there may be uncertainty of tree age. (Having observed a professional tree marker at work in NS, I can vouch for this not requiring a huge time-demand, especially if the only instruction is to indicate presence of old trees not to cut.) Many forests would not require such scrutiny because they are relatively young, as evidenced on the Provincial Landscape Viewer- Forest Development Class database.
- Buffers should be included in cases where old growth inclusions that are vulnerable to windthrow (e.g., tall, old red spruce) that are growing in an otherwise younger stand under harvest.

2. After protecting existing old growth at 100 + years, the next priority for improving abundance and conservation of old forests is to conserve as much forest as possible in the next age category (80-100 years). This will most quickly increase actual old growth (perhaps requiring 10-20 yrs to achieve old growth), rather than sticking to the draft policy approach where very young forests in protected areas, some as young as 40 years old, may take a century or two, or perhaps never actually achieve old growth, while the 80-100 year old forests on the unprotected portion of crown land will be sent to sawmills. Forests in the 80-100 year class will most often have the best attributes for biodiversity and conservation. If this approach is not taken to accelerate transition to true old growth much of which will otherwise be harvested, i.e., those opportunities will be lost.

- The widening of riparian buffers (as yet unaddressed by NRR, but a recommendation of Lahey that buffers be further investigated for most appropriate widths) could also greatly aid in restoration of old growth. It is surprising this was not mentioned in the draft policy. Wide riparian buffers, many already containing some old trees can quickly aid in restoring old growth, and of great importance- connectivity, rare species dispersal (aiding biodiversity), and wildlife movement.

Ecological forestry-part of the answer: Adoption of Ecological Forestry on the largest portion of the triad lands should provide a mechanism for increasing old growth, as well as the connectivity required. Ecological forestry should leave more habitat than traditional industrial harvests, thereby contributing to conservation of old forest biodiversity over time. However, industrial forestry in the decade-long delay to switching to multi-aged, ecological forestry has resulted in most of the forests that should be part of the matrix lands having been clearcut and otherwise harvested so that ecological forestry options for restoring OGF will be unavailable until many decades have passed. Still, a long-term vision should include ecological forestry as part of the contributing answer to increasing old growth out into the future.

The two aged stumps left in situ are flagged and clearly visible



Figure 1 Officially NOT old growth according to stringent OGF scoring methods, but MUCH closer to being 'old growth' than what is included in vast expanses of young forests in protected areas that are recovering from human disturbances.

The inequity of the OGF policy is demonstrated in these photos. Harvested trees aged in tolerant hardwood forest ranging from 120 and 138 years and some greater than 138 years. Red spruce exceeded 125 years. This stand would make a strong contribution to old growth forests but won't meet extremely rigid criteria of old forest scoring. NRR insists that stands like this be logged. Meanwhile, many of "old growth forests" that are allocated to the meagre 8 % target are very young, early successional forest, such as the forest in the photo below from Cloud Lake Wilderness area, that will need to progress to the next successional stage and will require another century or more to become old growth. All the while, the mills receive the more valuable forests above.



Figure 2 OLD GROWTH at Cloud Lake Wilderness area, though clearly young and early successional, requiring at least a century or more to become old growth.

Involve ECC in OGF Policy. In fact, ask them to *lead* completion of the OGF policy while they work simultaneously with the new 20 % protection goal from EGCCRA.

Nova Scotians deserve government personnel working on behalf of the people and natural resources; personnel who can be entrusted to ensure ecological stewardship of old forests without misleading statistics and comments; government that takes great care of the best remaining mature to old growth forests so that the most valuable crown forests are harvested. This cannot be achieved using many of the current NRR staff. This policy offers concrete evidence of a long line of deception witnessed through the past 12 years. I believe staff at ECC-Protected Areas Branch would be more suited to complete an old growth forest policy since they are in less conflict of interest with industrial forest interests, and they do not have dual roles of protection and harvesting.

Given the goals of EGCCRA and broad challenges and goals, the policy requires completion in full collaboration ECC -Protected Areas Branch, especially given that ECC is the department where the majority of Old Forests are protected.

Old growth protected under law.

Permanent protection of old growth must be accompanied by legislation with regulations and stiff penalties against cutting or harming old growth. Policy is only an initial step to protecting old growth.

‘Old growth forest coordinator’ position (*yet another new position funded by the tax payer?*) **is rejected** because the public no longer entrusts NRR as the department that solely manages forests on unprotected Crown lands, and particularly OGF that is irreplaceable and holds extremely high ecological value. Instead, consider replacing the coordinator role with a small committee of existing and qualified personnel from both ECC-Protected Areas and NRR, as well as university, or an NGO personnel who have old growth forest ecology knowledge. Or possibly allocate this to an independent third party, i.e., the Medway Community Forest, Mi’kmaq Forestry Initiative, or MTRI. Given the poor leadership and the misleading statements contained within this draft policy and Story Map, there is limited appetite to have NRR continue to lead this important file, nor prepare ‘educational learning material’ on OGF.

Section 5.2.1: The removal of old growth designations due to disturbances or other reasons is sharply rejected. This further demonstrates NRR’s primary interest is in harvest allocations rather than conservation. It also highlights the need for old growth to receive regulatory designation under law to protect these valuable patches. It would be unacceptable to salvage cut or otherwise harvest the old growth stand. Old growth forest, even when the majority of trees are lost through disturbance, remains of high conservation value. There are many important components to an old growth system besides just trees. Modern science recognizes that only ~ half the living forest is above ground. Mycelial networks and carbon stores underground, long established through centuries, remain essential components of old growth. These are other old growth values beyond trees to protect. Furthermore, even the purest of hemlock or beech stands, for example, will have other tree species growing among them. They are also part of the old growth stand and must be allowed to remain.

There were some recent erroneous statements by Forests Nova Scotia and industry regarding the carbon cycle and instilling fear of carbon releases after trees die. Only the aspects of the carbon cycle that were convenient to bolster harvest justifications were referenced. (This should be countered with proper statements on the Carbon cycle on NRR’s website and educational material.)

Research David Foster and other ecologists in the USA on hemlock stand dynamics that were attacked by HWA infestation, concluded that forests were damaged far less and recovered faster when *not* salvage cut after an insect infestation-caused mortality:

“Any level of human manipulation exacerbates these impacts and reduces effectiveness of the damaged forest to effect this ecological transition in species, structure, and function. ...broadscale salvage logging or the pre-emptive harvesting of the declining trees can interrupt the process of forest continuity and recovery in significant ways. In the well-intentioned effort to improve the situation, clean up the mess, our management and restoration activities frequently exert a much greater impact on the ecosystem than the disturbance itself. Harvesting of the dying or damaged trees kills them instantly and removes their structure. This compromises the ongoing capacity of the forest to take up nutrients and moisture and often damages the many surviving plants. In such operations, seldom are only dead and dying trees removed. [] Of equal importance, any type of operation requires access to the forest to transport equipment into and logs out of the site. At a minimum, this necessitates the cutting of additional trees to create work areas and skid trails. At an extreme it can result in the creation of an additional road network. Once human intervention proceeds, what started as a [] biological disturbance rapidly becomes a major harvesting activity.”

- Foster (2014) Hemlock: A forest giant on the edge.

Foster (2014) also stated that widespread hemlock mortality in the USA represented an overall fire hazard for only a very brief period because fine fuels rapidly decomposed. This fire risk was similarly found to be only fleeting in the balsam fir forests killed by budworm in NS (Peché 1993).

What do Nova Scotians want?

An alternative vision for old growth forest protection for Nova Scotia would have an old growth forest (OGF) policy that protects old growth in earnest, that reports actual existing old growth (not 40 + year old stands) and contains a logical pathway to immediately protect the last patches of old growth, no matter how small or compromised. To have as much old growth protected as possible, especially given the modern context of how many old growth trees will die from climate change stressors and invasive species. To devise an OGF policy that integrates and combines forces with the new protection goals in EGCCRA.

Who? Assign staff from ECC to lead the final protection of old growth and have NRR verify all Crown harvests through ECC. Lahey has stated that ecological goals supersede economic ones. Thus this power shift must occur. It's the only way we will meet the goals when the NRR staff are still finding ways after 3 years to avoid making the changes needed and incurring still more damage to natural resources. Make use of NGOs, such as MTRI, or request expertise from MCFC or MFI to accelerate old growth forest protection, completing spatial and field inventories, etc.

Increase old growth beyond the existing ~0.3 % (or whatever infinitesimally small percentage that presently persists) to a minimum of 25 % and higher if possible on Crown land by immediately protecting all remaining 100+ year old forests on Crown. Issue immediate instructions to harvesters (who should not be harvesting any Crown lands anyway until Lahey recommendations are ready to be fully implemented on the ground, as requested by 1000s of citizens across NS).

Protect remaining old growth forest

- Set aside all forests on Crown lands over 100 years old until landscape level planning is completed. This will ensure that no more old growth or 'near old growth' is harvested that may contain valuable species.
- Modify and simplify old growth scoring criteria. Ensure it can be carried out in haste.
- In areas deficient of old growth, protect stands 80-100 years old or even younger if need be, so that efforts are accelerated towards achieving some old growth as soon as possible.
- No harvesting will be carried out on single stems or pockets of old growth. Tree marking can assure no accidental harvesting of older stems.
- Adopt an old growth age threshold of 100 years so that new forest allocations can more easily be added to the old growth portion.
- Add additional old growth criteria that define OGF besides age for situations where disturbances kill some of the overstory old growth.
- Once stands are defined as old growth, protect them beyond policy with legislation so there are serious and costly repercussions for 'accidentally' harvesting these stands.

Improve Transparency

- Request that NRR report age class information (as they once did), to improve transparency and to demonstrate true amounts of old growth forest protection.
- Assign staff from ECC Protected Areas branch to lead all old growth policy decisions and to finalize the draft OGF policy to improve public trust and government accountability. The public has completely lost faith in NRR staff ability to manage old growth.
- Openly share OGF scoring on all assessed stands, no matter whether they passed or failed.

Modify old growth scoring criteria.

Old Growth scoring criteria must be adjusted to meet objectives of rapidly incorporating additional old growth and to meet biodiversity objectives.

- The proposed elevation of stand ages will disqualify many old growth stands. Instead, lower to 100 years to ensure increased old growth forest on the landscape.
- Canopy openness may disqualify old growth stands. Given the recent blowdown events, many high value old growth forests feature large gaps. Hence the amount of canopy closure cannot be an absolute criterion.
- Allow old growth stands to be accepted of all sizes. Stand size minimums should not be a criterion (proposed at minimum 1 ha). So little old growth remains, that all of it is valuable, regardless of stand size, although it is recognized that larger stands are less fragmented and foster higher ecological integrity.
- BA of the stand should not be an absolute criterion since nutrient poor soils and otherwise poor growing conditions can severely stunt growth. Employ other old growth features such as furrowed bark, high structural diversity, lichen and bryophyte associations, coarse wood, etc.- there other features in various combinations that can indicate old growth.
- Place sample plots during old growth scoring assessments in representative old growth pockets (rather than placing randomly). One of the means in which a stand that clearly features old growth is disqualified under the extremely rigid criteria the department uses to score old growth is from using random plots. One of the three sample plots can easily fall into a blown down section of forest. This greatly lowers the score achieved and can cause an old growth stand to be excluded. The criteria must become less stringent since they are causing the loss of even more old growth forest that is extremely valuable. (Corbett Lake is just such an example.) With increased hurricanes that accompany climate change and invasive insects decimating many stands, almost no stands will qualify in future unless we change some of the scoring criteria.

Evaluating old-growth forest attributes through the PTA field assessments is an ineffective procedure and should instead be evaluated using a knowledgeable, independent, third party, such as staff from MTRI, the MCFC, universities, Nature Nova Scotia, or Healthy Forest Coalition. Why not PTA techs? 1) Forest technicians who typically conduct PTAs may hold affiliations with mills or be biased toward harvest. They generally work in haste to complete the PTA evaluations, focused on spp composition and volumes. As a consequence, they rarely notice wildlife signs or old growth features, as evidenced by previous PTA submissions. They also have less training/interest in recognising such features. Moose tracks, browse, scats, comments of massive old growth sugar maple presence on clearcut blocks (personal observation), special features, all are easily missed by the forest tech who rapidly gathers other essential data.

Drop the unnecessary distractions and lengthy, complex approaches that are not direct or concrete actions immediately required to protect old growth. NRR staff conduct tasks that are not directly required for old growth protection and actions to protect more shade-tolerant, late-successional forests that could contribute to old growth. All the while, time passes and more of these forests fall rapidly to harvesting. It's difficult not to interpret these actions as stalling tactics so that mills receive more of the high volume and higher value wood. Late mature and multi-aged old growth forests are the highest volume stands and are therefore sought out by the sawmills. I provide some examples of distractive activities below.

The department places far more emphasis on red oak, red maple and balsam fir than is required, as these trees flourish under increased anthropogenic disturbance regimes. The latter two species are perceived as ‘weeds’ by some foresters. Yet the department indicated an interest in pursuing research on these forests that are not typically lacking, and not what should make up the bulk of OGF protection. Research on coastal black spruce forests, regeneration issues with red oak, and red maple that is now prolific nearly everywhere as an outcome of increased disturbances. Yet here is where the department has indicated it would like to allocate more research under ‘old growth’ management activities, all the while that late successional forests fall under heavy harvesting. Such research interests are out of touch with what is needed for old growth forest management and are likely industry-driven.

Another distraction by the OGF policy team was examining pathways for the restoration of old forest and old forest characteristics in the SGEM. But the SGEM is not designed to restore old growth. It is a tool to use for harvesting. I suggest examining the “Restoration pathways” in the SGEM (e.g., p. 122), which prescribes heavy cutting (only 20 % retention in some cases) and planting, and/or leaving extremely small portions of the forest as “permanent reserves” under otherwise far too heavy removals to allow old growth to ever be restored.

An examination of the wording for “restoration” in the SGEM fosters the conclusion that this is not the tool that can address the need for protection of old growth. The restoration keys in the SGEM will never achieve old growth. In any case, we need immediate protection of old growth, not a slow, ‘working toward old growth’ over centuries.

Instead of allocating energy toward these “distractions’ outlined above, time be far better spent on finding the last remnants of old growth stands and protecting them, regardless of size, rigid old growth scoring criteria, or signs of recent stumps. We need all the remaining stands NOW to mitigate the forces of climate change and to curb huge biodiversity losses.

Section 5.2.2: Knowledgeable members of the public and other provincial government department personnel should be welcomed to assist in finding new candidate forests that can become old growth in landscapes that fall “significantly” short of the meagre 8 % old growth quota. This section appears elitist, assigning any further old growth forest considerations solely to NRR employees. Crown lands are also managed by employees of ECC who will be examining candidate sites for attaining 20 % protection. In the past staff from MTRI have assessed old growth, and can do so in future. There may be great interest from MFI staff.

Accelerated assessments are required on the existence of remaining old forests across all unprotected Crown lands. I do not accept this be carried out under the PTA system, but rather targeted field assessments, that are aided by GIS spatial analysis and possibly LiDAR. Forest resource inventories that are regularly conducted in NS can be improved to collect OGF information and identifying the long-lived trees that can develop into OGF. NRR continues to state they do not have age class information and will not produce graphs such as that included in Figure 1. However, I believe they could produce this information as they once did, even if the dataset is not 100 % accurate. One can imagine, however, that production of updated graphs on forest age classes would be very damning to the self-professed successes stated in the draft OGF policy.

- Simplify the Old Forest scoring method currently in use (Stewart et al. 2003). It has been criticized through the years by many users.

Section 5.3. The public does not entrust NRR capacity to remove forests from the Old Forest Policy Layer unless it is to remove the currently young and/or early successional stands that should never have been placed in the Old Forest Layer in favour of protecting true old growth stands.

Section 5.5 After the Biodiversity Act fiasco, it was concluded that biodiversity responsibilities would apply mainly to Crown land. Hence this Old Growth Forest Policy must also begin with protecting as much old growth as possible on Crown lands.

Section 6 Because lands designated as old growth will be only under policy rather than legislation with enforceable regulations, there is only the ability to “detect” violations. It is unlikely there will be legal repercussions. Furthermore, there is an almost total absence of enforcement by Conservation Officers on forest lands presently. CO priorities must change to better protect forests and biodiversity.

The real, remaining old growth patches are logged while we are distracted by the 8 %. There are remaining areas of tolerant old forest that should be considered ‘old growth’ on Crown land that were logged and are still not allocated to the old growth layer. Why? I must conclude that it is because of the wood value to the mills. Corbett Lake area is such a place, not allocated to the old growth layer despite advanced age of the trees. The forestry practices there resulted in a very wide road that fragmented an otherwise beautiful stand between two lakes, and cutting that resulted in blowdown that is not allowing the stand to maintain its former shade tolerant character, but reverted it to a predominance of early successional growth. And so, this public land did not receive ecological forestry, nor did it get identified as old growth or even near old growth to become old growth one day. (See Appendix A)

Transparency

- The public needs to be presented with much clearer facts about the state of Old Growth and old forest biodiversity in NS than was presented in the draft policy and associated [Story Map](#)
- The policy must share the scientific justification used for this policy, such as why 8 % is the correct number based on the science.
- Science-based information must be shared in a timely manner on all old growth forest assessments, including those stands that did not qualify, as well as any related research data.
- Data on old growth forest scoring must be shared before final decisions are made to allocate the stand to harvesting
- We read only partially transparent statements such as “*over 1000 ha of Bowater Old Forest, and over 1000 ha old forest restoration additions [were found] to complete 8% targets*”. But we are not shown where these forests are located exactly and are left to question whether there may be far more than 1000 ha of old forest or nearly old growth forest, but the policy took only the minimum amount required for its quota. More transparency is required.
- **Details are missing in the policy.** The policy lacks a lot of the detail, generating a feeling of purposefully being kept in the dark. For instance, it does not state just how much old growth, that is true old growth and where it actually exists throughout the province. What percentage of old growth now exists after the outcomes under the preceding draft old forest policies? The public could use an update on earlier figures quoted in previous reports.

Invasives: Hemlock woolly adelgid and Emerald ash borer will both destroy old forests and a policy should incorporate and account for that. Some old growth hemlock and beech forests are already dead or close to it. The old forest policy mapping includes areas with infested hemlock. The policy does not address any compensatory mechanisms of these great losses. Obviously, this is because the authors

realize that it means that more old growth needs to be protected and this conflicts with harvest plans and would ultimately reduce wood supply. This runs counter to the implementation objectives of Lahey.

Allow additional patches of old growth regardless of whether they have received some type of silviculture or harvest within the last 30 years. The OGF policy definition does not include “managed stands”, according to the department. Why not? When we have so little remaining old growth, we cannot afford to be too choosy. I can only guess that this criterion was suggested in order to keep the more lightly managed forests for the mills that contain lots of higher value trees. This does not comply with Lahey recommendation of placing ecological interests ahead of industrial wants. Those mature, near old growth and old growth stands that contain a few stumps here and there are needed for carbon sequestration more than anything else right now. **Omit the managed stand clause from the draft OGF Policy and allow such forests to contribute toward much-needed old growth.**

There is no scientific justification for that criterion. A partially harvested old growth stand can still retain significant patches of OGF and associated features such as coarse woody debris, snags, etc. and remains valuable for old forest-associated species. The rare lichen species or orchid won't discriminate if there are a few stumps. This restriction can only be interpreted as a means to reject more of the valuable old forest from the old growth quota so that it is freed up for mill harvests. Most of Nova Scotia has been cut at one time or another, with almost no forests having escaped human-caused wildfire or the axe. We cannot afford to be choosy about the last patches while under a biodiversity crisis and carbon sequestration needs.

Add Old Growth Forest of any patch size. I reject the policy requirement that forests be a minimum of 1 hectare. There is no basis for this, and some small forest patches have surprisingly high ecological value, with species assemblages and a mycelial network that has built up over centuries. The current reality is that many OG forests are small, patchy remnants, and the increased biodiversity losses render them of increased value than perhaps a few years back.

These small patches should have opportunity over time to expand outward; a vision that is entirely possibly within the context of the ecological forest matrix. These small patches can form an extremely valuable 'seed' in forest restoration pathways.

A number of years ago, I found a small patch of old growth sugar maple in a stand that was about to be clearcut. A tiny pocket of sugar maples had survived a wildfire that had destroyed all the forests around them, with the recovering forests now much younger and only beginning to show signs of advancing from early successional stages. (It should have been allowed to further recover and be subjected to less destructive forestry practices, considering the low soil nutrient budget, etc.) My comments submitted to DNR went nowhere, and the forest was clearcut, though they suggested that the sugar maples could have been ribboned off. The small patch of old growth was not maintained to foster some rare diversity of older growth features and structural diversity on the site. This was extremely damaging.

Reject the newly proposed 'age loophole'.

Authors of the OGF policy stated that they redefined ages of old growth to follow an ecologically-based definition of climax forests and age, that-

“implementing a range of ages for specific forest groups, [which] strengthened efforts to conserve, restore, and promote old-growth forests in Nova Scotia.

Apparently, this new increase in ages is what NRR believes “*merits the new name, An Old Growth Forest Policy for Nova Scotia*”. To this I say “any excuse will do” for devising a new loophole so that more forest stands do not qualify as old growth and can be allocated to the mill quota.

Raising age minimums for many tree species will ultimately disqualify more old growth forests. This is extremely inappropriate given the dire present state of forest biodiversity and lack of advanced age classes on the landscape. There are extremely low levels of mature and old forests anywhere.

Many of our old forests exist presently as diminished versions of a once much older and larger old growth ecosystem. Forest harvesting, human-caused wildfires and introduced pathogens and insects have reduced their dominant age and distribution. They are nonetheless still of much greater value than many of the young, early successional forests currently mapped as “old forest”. There also have been intense windstorms in the past that have caused many forests to be less than 140 years, though they are growing toward older stages now.

Reject Table 9.2.1 on age thresholds. The ages assigned to each species association or species in Table 9.2.1 are not well justified. The increase in the minimum age from 125 to 140 years for Tolerant Hardwood, Spruce-Hemlock/hemlock dominant Highland/yellow birch dominant) will exclude many old growth stands, remembering that old growth, or ‘old forest’ was originally recognized at 125 yrs. There are old forests in the 100-125 year range that possess important old growth features, particularly structural features (e.g. cavities, large snags) required by many wildlife species.

Solution? Replace the new age threshold scheme with a minimum age of 100 years. This is presently more appropriate because it would allocate more old growth or near old growth to the old growth quota and provide the ecosystem services required to meet climate change and biodiversity loss issue- far more so than the young 40 year + age forests that make up much of the current 8 % and contain little of the conservation value required in the present crises.

Erroneous predictions of future old growth: We cannot assume that young, 40 + year old, early successional forests, or even 40 + year old late successional forests found in protected areas will become old growth one day, as the proposed approach by NRR of actually attaining 8 % old growth on the landscape. (And this while cutting the other already older stands down.) This is an unreliable strategy to assure we will have sufficient amounts of old growth (*still only a measly 8 %*) some day in the future about 100 years from now.

As a former biologist of Kejimikujik who has observed disturbance regimes over the past 27 years and having researched pre-European disturbance regimes, it is clear that not all park forests will attain old growth with the exception of some minor pockets, and even then it will be only with regards to some specific species. We can no longer assume the park land will support old growth hemlock, beech, or ash trees due to invasive species. Recent increases in wind and drought/fire disturbance frequencies stemming from climate change make it improbable to fully attain old growth. Hence, we should do our best to hold onto what old growth, or ‘near old growth’ stand that we already have on Crown lands and place them under immediate protection to conserve biodiversity.

Consultation from the MAC. As a member of the Minister’s Advisory Committee, this OGF policy was briefly presented to the group. At that time, I noted the draft was bereft of detail, such as updated statistics on old growth status, age class graphs (such as those presented in earlier work, e.g., Figure 1),

and spatial information. From this, I could not fully grasp the policy weaknesses but surmised they were present to be revealed later under a more thorough review.

However, the feedback I was able to provide regarding this policy was ignored. I had previously stated that inclusions of National Park lands (federally-owned land exempt from provincial management objectives) and all forest stands in protected areas more than 40 years of age were not acceptable management approaches or ‘short-cuts’ to protecting old growth forests on provincially-managed crown lands.

I also strongly expressed concern that invasive insects were presently destroying many of the current old growth forests. This fact makes it an absolute necessity of NRR to *augment* old growth allocations to buffer the pending losses. It is obvious that 8 % will never be sufficient to maintain old growth forest on the landscape. My concerns were not accounted for in the Policy, instead steadfastly ignored. This, despite clearly stating at two separate meetings that there will be immediate and unprecedented loss of old growth in the next 5-10 years from three invasive alien species: hemlock woolly adelgid, beech leaf-mining weevil, and emerald ash borer. This is a glaring omission requires clear acknowledgement in the new policy.

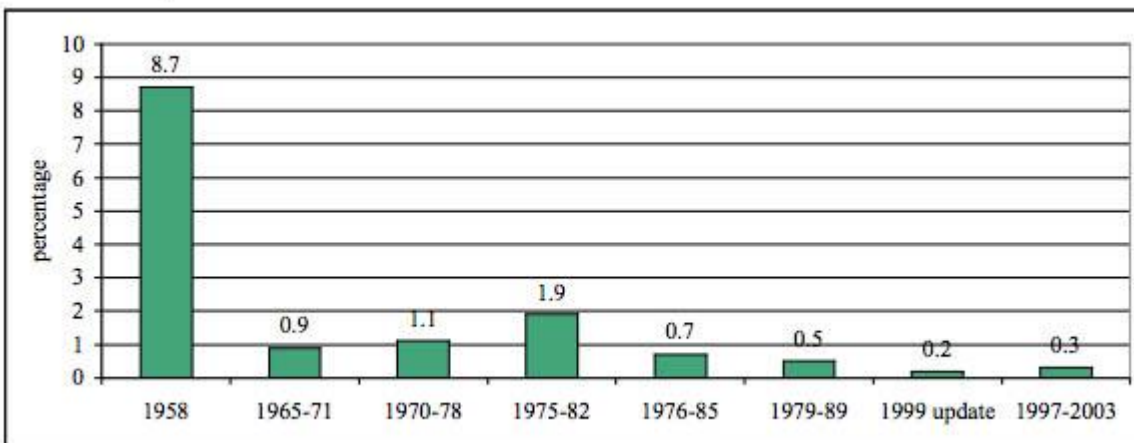


Figure 3 Provincial Forest Area more than 100 years old, Percentage of Total Forest Area, 1958–2003 From *GPI Atlantic 2008*

Landscape Level Processes: There is no reference to the large body of scientific literature on landscape level processes affecting forest biodiversity and wildlife movement/corridors and ‘stepping stones’ required to allow species to disperse, exchange genetics, etc.

Nova Scotia supported widespread old growth forests until they were burned over and logged, beginning significantly in 1783. Pit and Mound microtopography (hummocks and hollows on the forest floor) provide evidence that much more old growth existed in the past, possibly 80 % across NS. No one knows for certain, but it was certainly more than half old growth, not 8 %. The forest floor that features pit and mound topography indicates previous existence of old growth stands that were knocked down during high intensity windstorms and hurricanes. The hummocks formed by the root masses endure for many centuries. Many stands that were burned over or logged still feature this topography indicating

that the landscape is capable of growing large trees in old growth situations. I worked with Dr Ponomarenko and Peter Neily to examine some of these old growth structures.

We know they followed a previous stand of very old trees because of the presence of Pit and Mound Topography. Many of these stands would be excluded under the proposed policy. **The simplest way to solve that issue is to lower the minimum age to 100 years.** It makes sense to protect more habitat supportive of old forest species (re: previous post); and it makes sense technically, given the history of massive blowdowns in our forests.

Cease using blowdown as an excuse to salvage cut and further lower the amount of old growth present in NS. Blown down forests are common in NS, and they form an integral part of natural disturbance processes. Many old growth forests that remain today grew up from great hurricanes in the 1800s. However, most windstorms do not flatten all trees in the stand (some trees species and age classes are more resistant than others to tipping over, and topography and soil conditions can help with resistance to wind.) Blowdown remains an important natural process that essentially tills the soil when root masses turn the soil over. The resultant hummocks serve as natural seed bed, particularly in the exposed and freshly aerated mineral soil. The hummocks serve to trap water and slow it from flowing off the land.

One of the old growth stands that I am most familiar with in Kejimikujik National Park and National Historic Site was subjected to Hurricane Dorian in 2019. It knocked down some swaths of old growth trees. However, the residual stand still has value and retains its features intact. It remains of high value ecologically. It is also heavily infested with Hemlock Woolly Adelgid and will probably be dead in a couple of years if the trees are not injected. The point is that both of these disturbance agents should not detract from the fact that the stand remains “old growth” and is precious and rare. A tapestry of moss covers the understory and trees tower overhead. This remains a wildlife sanctuary.

In conclusion

A close examination of this 3rd draft policy aimed to conserve old growth concludes that while the department of Natural Resource and Renewables (NRR) may have worked very hard on the revised Old Growth Forest Policy, it has actually changed little since the 2012 draft, other than switching from the term “old forest” to “old growth”, and adding some new caveats that cause it to be even more difficult to add or support old growth forest on the landscape. Similar to the previous versions, this policy will not **deliver what the words on paper indicate at face value.**

The department of NRR has taken more than two decades to finalize an OGF policy and yet the most recent policy lacks concrete details, essentially providing no details through aid of maps and numbers that would inform the reader of current old growth status across the province and what has been accomplished in the past 20 years. We attribute this behaviour to the continued losses of old growth forest in the ensuing years while the department moved very slowly with this policy. It’s difficult not to conclude that the prolonged length of time, and ongoing losses of old, tolerant stands to the mills was not a bias towards economics. A total shift of work responsibilities and tasks between the provincial government departments is required with ecosystem and conservation needs transferred to ECC, with harvest planning expertise addressed with by NRR. Climate change emergency and biodiversity losses require drastic changes for achieving meaningful progress.

With greatest sincerity,

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