

Comments on old-growth harvesting in BC

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Regarding: <https://engage.gov.bc.ca/oldgrowth>

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I am a hydrogeologist and engineer, and my work has given me extensive exposure to forestry and watershed science. Also, in working as a water scientist based in Williams Lake, I have become familiar with how BC Timber Sales operates.

Having examined old-growth large-tree forests on Vancouver Island, Coastal BC (Great Bear Rainforest), and also various areas in the Interior Wet Belt (including Cariboo Mountains in the approximate vicinity of McBride), I must admit that high-productivity, low-elevation old-growth forests (the kind where ultra-large trees are found or can be expected occur, even if just occasionally) in particular are tremendously valuable from the viewpoints of biodiversity protection (hence long-term ecosystem resilience in the face of climate change), as well as watershed hydrogeology, carbon storage and for other reasons (such as ecotourism) too. I note that taking all these functions into account requires taking the whole-ecosystem perspective.

I note that these types of old-growth areas have good soil and ample moisture as their prerequisites. These areas tend to be found on valley bottoms and partly up the slopes. These attributes also make these trees easily accessible to loggers—but they are also valued by species such as bears and other wildlife.

Also, it is important to remember that sloped areas are most vulnerable to erosion. Logging also changes the hydrologic regime in such a way that downstream flooding becomes more likely. Although loggers leave woody debris on the slopes in a sort of mulch, such mulching does not guarantee long-term protection against erosion.

Moreover, during open burning of slash wood or decay of that “mulch”, carbon release from these areas proceeds for an extended period of time (at least 13 years). Net carbon release continues until new trees have grown, and this assumes that planting is done properly and promptly (which from my own fieldwork I know is not always the case). Given the urgency of reducing our carbon emissions, this provides another reason to preserve old-growth forests, since these serve as long-term carbon sinks.

I have tried to group my additional thoughts into sections, albeit many topics are interrelated.

BC Timber Sales

I am aware that BC Timber Sales has been portrayed by some as an organization eager to cut down the biggest trees, but I see BCTS as an entity that is understaffed and also underequipped.

I note that BCTS's in-forest role is specifically timber cruising. And, timber-cruising is defined as determining the current volume of merchantable timber in a sample (or series of samples) of a given plot of land. This is extrapolated to the entire plot of land. I see multiple issues here.

The fundamental problem is two-fold: firstly, because timber-cruising is based on examining a sample, it is easy for variations in tree composition to be missed. For example, if an area containing unusually old, large trees happens to occur outside of a sampled location, these trees would be ignored (but they would be seen later by environmental activists, with the result being a tarnished reputation for the government agency).

Secondly, I note that BCTS staff are trained to focus on forestry from the industrial perspective (i.e. trees as timber with a dollar value), they do not have the background to make ecosystem-related decisions in old growth areas. Again, the problem is that BCTS is simply not equipped to assess ecosystems. *If we only look at tree size, then we will miss the importance of how the trees (all trees, all sizes) function as integral parts of the ecosystem in which they reside.*

My suggestion here is relatively simple: during forest assessments (timber cruising), BCTS staff should be accompanied by biologists-ecologists from the Resource Management side of FLNRORD. Addressing this staffing shortage should be the first priority. (Note: it may be feasible to hire summer students with biology and environmental-science backgrounds to help out here. This would be for senior biologists to decide.)

So, FLNRORD Resource Management will need to hire a significant number of biologists. The number of biologists hired should be sufficient to accompany all timber cruisers in old-growth areas: firstly for BCTS, and ultimately for all timber-cruising that is done. (I note that a lot of timber cruising is done by private consultants for logging firms, and this type of "privatization" generates potential conflict-of-interest concerns, because consultants sometimes have a vested interest in more encouraging more logging and less protection of forests.)

I will delve further into the need for the ecosystem-based approach subsequently.

Clarity of Quantification Methodology

Another concern is the lack of commonality of reference points in referring to forest stands. This can easily generate confusion.

Let us take Vancouver Island as an example. Here it is frustrating when the BC Forests Minister Doug Donaldson says that “50% of the old growth, or more than 520,000 hectares, on Vancouver Island has been protected”. After doing “flyover” with Google Earth and also Planet Explorer and finding this figure difficult to reconcile with the satellite imagery, I felt compelled to do more reading.

To my dismay, I soon discovered that Minister Donaldson’s figure means only 50% of the *remaining* old growth. This is not a mere matter of semantics, because as the “loggable” amount is progressively consumed, eventually the formally protected area ends up being all that is left—*even though during that logging alone, the actual amount of old growth has been halved.*

Moreover, the government’s numbers refer to all old growth, not just the “big tree areas”. Thus Donaldson’s figures include high-altitude scrub as well as bogs, none of which have the sizeable trees that are so tremendously valuable as habitat.

The need for accurate, detailed, publicly available high-resolution-zoomable online mapping, showing the habitat quality, immediately becomes clear, because only such high-quality mapping can show where the truly unique habitat (i.e. low-elevation, high-productivity rainforests) is located. Plus, we need such mapping all across the province...not just Vancouver Island, not just the Great Bear Rainforest. High-resolution satellite overviews should also be included. I will return to this topic in more detail later.

On Vancouver Island alone, I have read that we are harvesting about 10,000 hectares of big-tree (high-productivity) old growth every year. This equates to an area 10 kilometres by 10 kilometres. Keeping in mind that these high-productivity tend to only occur in valley bottoms, this is really adding up in a hurry. (Incidentally, regarding the often-heard call for more jobs, I saw first-hand these logs of Yellow Cedar being marshalled at Sayward, in 2018. Countless logs pre-selected and marked by offshore buyers were plainly visible. Why is such high-value timber not being finished here in Canada, to employ Canadian workers? *If the goal is to employ as many Canadians as possible, then maximizing local here-in-BC employment of all wooden products would generate far more employment than cutting more trees faster.*)

The University of Victoria Environmental Law Centre report notes that, on Vancouver Island, in high-productivity areas, less than 10 per cent of the original old growth remains and an even

smaller amount is formally protected. This figure is alarming, yet it is also eminently credible in light of the foregoing.

Need for Ecosystem-Based Approach (i.e. not just the big trees)

The need for ecosystem-based assessments for every high-productivity old-growth harvesting proposal is due to the reality that we need to consider these types of areas (known to the general public as being “where the big trees grow”) as being entire ecosystems. These are low-elevation high-productivity areas on Vancouver Island, in the Coastal regions (including, but not limited to, the Great Bear Rainforest), and in the Interior Wet-Belt areas.

In other words, while it is great to have a registry of big trees (the Big Tree Registry, or BTR, as hosted by UBC), there are several problems with simply focusing on the individual big trees that have garnered media attention. Among the concerns of this approach are the following:

1. In even the most productive biogeoclimatic zone with ample precipitation, the frequency at which ultra-large trees appear can be quite variable. For this reason, it is difficult for timber-cruisers and biologists to find all of the “mega trees” unless a very detailed “search-and-rescue-style” search is done (which of course would be enormously labour-intensive). But ecosystem-based assessments are inherently more meaningful as well as more manageable from a labour standpoint, since then focus is on finding the types of areas where the most productive, most biodiverse ecosystems are to be found (and these are what merit the highest priority of protection).
2. Focusing on individual big trees ignores the reality that trees grow as part of forests. So, even if individual “Big Trees” are protected, they are rendered vulnerable by logging around them. Roots can be damaged and soil compacted by heavy machinery. Strong winds can cause limb breakage. Logging activity can also spread diseases and insects.
3. Preserving whole intact ecosystems (e.g. entire valleys) also opens the door to ecotourism. In contrast, saving only individual big trees (and harvesting the areas around them) leaves the BC Government with a black eye, particularly when ecologically minded tourists arrive (since they expect to see intact, healthy forests).
4. Whole ecosystems have tremendous habitat value in terms of preserving biodiversity and enabling land mammals to migrate. What is needed is large areas of high-quality habitat that are well-connected. Logging roads and other infrastructure disrupt this continuity

and render many species vulnerable to predators (and also hunters). So, to seriously protect the most valuable habitat, we have to leave entire watersheds road-free.

5. Intact watersheds (e.g. entire valleys) have great hydrologic value. Healthy forests, including the trees as well as the soil and deeper geologic layers, collectively serve as sponges that hold rainfall and ensure that precipitation is converted to high-quality groundwater, which in turn provides the stream baseflow that is so critical during dry periods. (Additionally, in high-elevation areas of those watersheds, the snow itself performs this storage function too.) And, that stream baseflow is crucial to coldwater fisheries, which depend on cool, clear water for spawning and survival. (The solubility of oxygen declines as water gets warmer.)
6. Intact watersheds also function at the ecosystem scale. The relationship between coldwater fish and insect larvae provides an example here. Insect larvae are critical food for young fish fry, but those insect larvae will only be numerous in a stream in a healthy forest and healthy watershed. If the valley bottom is logged, then the stream and its insect larvae (and consequently its fish populations) will not be as vigorous. (Leaving a 30-metre buffer along the stream, a formal guideline that I have often seen being ignored, is not enough.)
7. Intact watersheds and ecosystems have maximum resilience against diseases and insect pests. In contrast, saving only the ultra-big trees makes them vulnerable to pests.
8. Intact ecosystems are better able to adapt to climate change, because they have a deeper “reserve of biodiversity”. As climate change gradually forces species to adapt or migrate, having a sufficiently large reservoir of genetic diversity is more crucial than ever. This includes everything: trees, plants, land animals, and aquatic animals as well.
9. Over time, medium-sized trees will gradually grow to the size of big trees. In a given valley containing both medium-sized and ultra-big trees, if we cut down all of the former, then we lose the succession. Future generations, centuries down the road, will thus be deprived of healthy forests of big trees.
10. Maintaining a robust “biodiversity reservoir” also enables future researchers to find genetic variants of trees (and other plants) that are more able to survive wildfires, adapt to climate change, and fend off diseases.
11. Biodiversity is greatest in old-growth forests, which are far, far more diverse than “monoculture tree farms”. With this in mind, biodiversity reservoirs also provide a research basis for future medicines for human ailments. For example, tomorrow’s antineoplastic (tumour treatment) or antibiotic might be found in a rare lichen that only grows in certain deep-forest old-growth areas. Many of these species have not been fully

characterized. We cannot afford to destroy this priceless genetic heritage for the sake of short-term economic gain.

12. Preserving only individual big trees would generate a dessication effect that would eliminate the dark-and-moist microclimate of the deep forest that is essential to certain species (such as the still-to-be-discovered species of lichen in the preceding example). The same microclimate-alteration concerns could also apply to other species as well, for example birds, amphibians, forest-floor plants, and so on.

Once again, old-growth forests are so much more than just “standing timber”. *The true value of a healthy old-growth forest ecosystem simply cannot be measured in board-feet.*

Old-Growth Management Areas (OGMAs)

In forestry, the original intent of OGMAs was to preserve forests so that they grow to full age and remain that way. The average member of the general public would interpret this to mean that OGMAs would remain static in perpetuity.

However, in practice, OGMAs can in fact be shuffled at the discretion of timber managers. The definition of OGMAs boils down to the assumption that trees are fully grown at a certain arbitrary time point (e.g. 80 years), despite the proven fact that the biggest trees are many centuries old—as a careful counting of trees rings will show. And, some of these trees are a thousand years old.

Such old trees (which are often equated with diameter, a distinction that misses the variation in growth rates with precipitation, soil attributes, elevation, and other aspects) fulfill a unique ecological niche in their respective forest zones. This requires truly long-term thinking.

Consider that a 1000-year-old tree is 250 times as old as the length of a standard four-year political term of office, or 50 times the length of a forester’s 20-year career in the role as timber-supply manager. These transcendental time scales again make it clear that OGMAs should not be moved around by foresters.

Conversely, whenever an OGMA is proposed, ecosystem biologists should be consulted first. Again, BC Timber Sales is not equipped to make OGMA decisions on its own.

Furthermore, the distribution and sizing of OGMA needs to take into account the ecosystem role, including habitat continuity and connectivity. Again, ecosystems biologists are needed.

Furthermore, OGMA should represent the same distribution of habitat subtypes as was the case pre-harvesting. It is not appropriate for timber managers to simply designate all areas of “no merchantable timber” as OGMA, while zeroing in on harvesting all the prime-habitat, high-productivity valley lands (which is where the largest trees grow).

Also, OGMA need to be large enough to take into account the increase in wildfire activity that climate change is already bringing. Updates to designation criteria are clearly needed. This is a crucial topic in its own right: if a devastating mega-wildfire hits a certain OGMA area that is the “bare minimum” in terms of size, then there is no “spare area” to maintain OGMA functioning in the long term.

Similar concerns also apply to diseases and climate-change-induced habitat shift.

In other words, given the increase in wildfires (with further increases expected in the future), we actually need more OGMA areas than ever before.

First Nations and pristine rainforest old growth:

I have already noted that old-growth forests need to be managed for the long term, not political cycles. And, in this vein, Indigenous people should have full input, especially given their cultural views of forests being sacred in the long term.

However, I find it alarming to read that logging firms (and also BCTS) may be cherry-picking which Indigenous groups to consult. I think there needs to be unanimous agreement from all Indigenous groups in the area at large on whether logging should proceed. Such consultation should be large-area-wide, therefore not just the nearest First Nations band.

Another key reason for the intrinsic need to contact multiple First Nations groups is that, as noted earlier, habitat connectivity must be taken into account. Unanimous approval from all First Nations groups within a certain radius (e.g. 400 kilometres), plus also approval from ecosystem biologists (on staff with FLNRORD Resource Management) should first be required before a pristine virgin rainforest old-growth area can be considered for harvesting.

Having such a large “radius of approval” also brings other benefits. Firstly, this approach serves to further unite multiple First Nations towards a common goal. Secondly, this approach also leverages Traditional Knowledge-based approaches.

I note that traditional knowledge is in itself an untapped resource. Indigenous peoples collectively constitute a wealth of information regarding the past history of these old-growth forests, and given that valley bottoms are most likely to have been used by Indigenous peoples for a variety of uses (including hunting, seasonal settlements, cultural ceremonies, burial grounds, cultural trees, and so on) over millennia, the gathering of traditional-knowledge insights regarding these old-growth tracts must be made a priority.

The biggest trees have cultural value to First Nations for canoes and totem poles and other cultural essentials. So, these ultra-large trees should be preserved, and not just the trees themselves, but also the surrounding area.

The number of big trees (cultural trees) being preserved for Indigenous uses alone should number far more than just a few dozen. In fact, given what has been lost so far and given the ongoing march of climate change, I think it would be fair to require that all of the remaining unlogged valley bottoms and middle elevations containing big trees (either known or reasonably expected to contain, as determined by ecosystem biologists or ecologists) to be immediately preserved, or at least until detailed ecological assessments can be done on them individually.

Furthermore, given how the high-productivity attributes of low-elevation rainforest areas attracted First Nations people many centuries ago, it should be apparent that highly detailed, rigorous archaeological assessments would be very much appropriate before timber-harvesting can be considered in such areas.

The Coastal (Great Bear) Rainforest as template for rest of BC

In the Coastal Regions, I find it worrisome when the Great Bear Rainforest (GBR) is promoted in such a way that leaves many people (both citizens and visitors) with the impression that the entire GBR designated area has been protected. In reality, only roughly a third of the gross GBR area is protected. From my observations, this means that clear-cutting could be done everywhere where it is economically feasible. Moreover, the GBR protects only a relatively small portion of the coastal rainforest area as a whole.

Looking back at the past 20 years, one aspect that I note which was not fully appreciated when the GBR efforts were first initiated is the role of climate change, including habitat shifts and also mega-wildfires. As I touched on earlier, these climate-change-exacerbated concerns mean that more virgin forest needs to be protected, not less. So, the GBR protected areas need to be enlarged. For example, many of the areas that were originally designated for harvesting and mining now need to be given full protection.

Old Growth in the rest of BC

The insufficient-protected-area concerns apply across all of the rainforests across all of BC, not merely those that happen to be situated within convenient travelling distance of the major urban centres.

Also, because we share this planet with other species, we owe it to those species to ensure that we leave sufficient and undisturbed habitat for them. Humanity, as a result of its immense power over the planet's fate, thus has a moral obligation to all the other species on the planet. Loggers thus need to be reminded that forests are not merely there for their economic uses. *To state the topic even more bluntly, rural logging-industry-based communities cannot claim the forests as belonging solely to them.* (In my personal opinion, all the forests should be seen as belonging to Indigenous peoples.)

The topic of focal species is also important. Focal species, including certain species of birds and large land mammals, need large contiguous areas of unbroken habitat, as they have had for millennia. Here the need for a more holistic approach to conservation is obvious.

Furthermore, in the long term, expanded protections for old growth areas should not be limited specifically to the most productive rainforest (even though rainforest protection needs to be the highest priority given the recent economic impetus for accelerated harvesting—and also keeping in mind that rainforests have the highest biodiversity value of all of BC's forests).

I also note that for some species of wildlife (such as ungulates, including Caribou), the connectivity between old-growth areas is essential to enable seasonal migrations to occur. I note that some species are particularly sensitive to habitat fragmentation by logging roads. (Caribou are a notable example here, since wolves use logging roads as superhighways to very efficiently attack entire herds. While shooting wolves is a popular band-aid solution, the major cause is excessive penetration of roads into remote habitat.)

Entire swaths of unbroken, unfragmented habitat thus need to be maintained in order to ensure the long-term survival of such species. Therefore, existing logging roads would need to be replanted and returned to forest (not simply “deactivated” with earth piles).

Multiple published reports have noted that many other species are also at risk, but little is known about the distribution of their prime habitat. So, there is still a huge amount of research work to be done, but no scientists are available to do it. But given these huge knowledge gaps, and given how habitats are shifting due to climate change, the Precautionary Principle should be invoked—which means that a great many more areas need to be protected automatically.

Implications: Less Logging, but More Ecotourism Options

I am well aware that setting aside more area for tourism means that less timber-harvesting revenue will result. But we cannot forget that tourism already employs twice as many people as timber. And, as someone who has hiked the backwoods, I can assure you that there is clearly a huge reservoir of *untapped opportunity for growth in tourism, in particular ecotourism and Indigenous (Aboriginal) tourism.*

Moreover, tourism is long-term sustainable whereas harvesting of old-growth trees (centuries old) is tantamount to mining (since such trees cannot regrow to their former size in the time-frames typically allowed for cutblocks). Looked at in this way, in the long run, it actually makes more economic sense to idle more mills.

The money we could make by increasing tourism in old-growth areas (with attractions such as hiking trails, guided tours, partnerships with First Nations, etc.) would be more than the revenue from stumpage fees. But again, we need to take the longer-term view, so we need to think beyond the current political cycle and the current economy. This means looking beyond the short-term bonanza of immediate profits from stumpage fees.

Ecotourism brings long-term sustainability benefits in other ways too. Carbon capture, ecosystem services (i.e. biodiversity reservoirs, future medicinal discoveries, etc.), also hydrology erosion prevention, healthy coldwater fish habitat...all those functions are automatically preserved alongside ecotourism. But they will be in quickly whittled away if the clearcutting of high-productivity areas is permitted to continue.

GIS Mapping that needs to be done

In my opinion, the BC Government GIS staff need to produce detailed maps that clearly show where the high-productivity (“big-tree-friendly”) forests were (originally, i.e. starting a century ago) and what is remaining today. The highest priority must be the rainforest-containing areas. This includes all of Vancouver Island, all of the BC Coast (not just the Great Bear Rainforest), and all of the Interior Wet Belt areas (which are numerous and have yet to be fully mapped).

Again, I strongly feel that the general public needs to see detailed mapping that shows all the high-productivity forest areas—both those that have been logged to date and those that have not been. Year-by-year, the logging of high-productivity rainforest habitat needs to be made easily visible in such a way that the average citizen can understand the rate of loss.

The mapping resolution should enable zooming into detail to see individual stands, and annual satellite imagery should be included as a layer, in conjunction with colour outlines that clearly show the quality and productivity of the habitat.

My suggestions for such mapping include the following:

- These areas need to be visited in person or high-resolution aerial imaged (i.e. Lidar via drone, with suitable post-processing).
- Given how much of the forest-assessment work has historically been outsourced to contractors hired by logging firms, and given how this type of outsourcing can generate potential conflict-of-interest concerns, I strongly feel that all such assessment work should be done with at least one BC-FLNRORD biologist or ecologist involved.
- As noted earlier, and given the above, BC Forests needs to increase its staffing of ecosystems-and-habitat biologists (or ecologists).
- The mapping must also show cutblock-by-cutblock mapping of the areas that have been cut and that are scheduled to be cut. This should be updated as the information becomes available to staff in final form. These datasets could be taken from BCTS RESULTS database, as well as from comparable datasets from all wood-products firms that have operations in any of the rainforest-containing areas in BC (including Vancouver Island, BC Coast, and Interior Wet Belt). This ensures province-wide openness and transparency with regards to economic activities occurring in the forests.

Thank you for the opportunity to provide public input into the Old Growth Strategic Review.

Yours truly,
Michael Frind, MSc., PEng.