

Review of Woodlot 1475 Forest Management

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May 31, 2015

Objective

Glen Dunsworth is an Ecological Consultant providing services in forest ecology, wildlife resource management, conservation biology, and strategic planning. He has over 36 years experience in the BC coastal forest industry with Macmillan Bloedel and Weyerhaeuser where he directed regeneration and biodiversity research and developed effective new strategic approaches to ecosystem based management. He has facilitation, organizational and project management experience in landscape and strategic planning.

The objective of this review was to assess how the current management practices in Woodlot 1475 compare to best management practices from an ecoforestry and conservation biology perspective and provide suggestions for improvement. It is important to note that the majority of the woodlot ecosystems reside within the Coastal Douglas-fir (CDF) Biogeoclimatic variant, one of the ecosystems of highest conservation concern in British Columbia. The CDF is a conservation focus because;

- The Coastal Douglas-fir biogeoclimatic zone (CDF zone) is the smallest and most at risk zone in BC and is of conservation concern (Biodiversity BC, 2008).
- The CDF zone is home to the highest number of species and ecosystems at risk in BC, many of which are ranked globally as imperiled or critically imperiled (BC CDC, 2012).
- The global range of the CDF lies almost entirely within BC, underscoring both its global uniqueness and BC's responsibility for its conservation.
- Of all the zones in BC, the CDF has been most altered by human activities. Less than 1% of the CDF remains in old growth forests (Madrone, 2008) and 49% of the land base has been permanently converted by human activities (Hectares BC, 2010).
- The trend of deforestation and urbanization continues and has resulted in a natural area that is now highly fragmented with continuing threats to remaining natural systems.
- Approximately 9% of the CDF zone is protected in conservation areas (MFLNRO, 2011).
- The extent of disturbance combined with the low level of protection places the ecological integrity of the CDF zone at high risk (Holt, 2007). (<http://www.sccp.ca/species-habitat/coastal-douglas-fir>).

Ecoforestry is "[forestry](#) that emphasizes [holistic](#) practices which strive to protect and restore [ecosystems](#) rather than maximize [economic productivity](#)."

(<http://en.wikipedia.org/wiki/Ecoforestry>) and thus is an appropriate guide to Best Management Practices for ecosystems of high conservation concern.

This summary was generated from a review of the following documents;

- W1475 reserve network maps (1:5000 and 1:7500)
- Rationale for pre-harvest prescription of Block 10_01 (W1475) document (July2010)
- Pre-harvest silvicultural prescriptions for Blocks; 10-01,10-02, 12-02, 12-04, 12-05, 13-01
- Woodlot 1475 Management Plan #1: 2006-2010
- BC Woodlot Planning and Practices Regulations

Introduction

Ecoforestry is the current modern alignment of ecological principles and forest management (Drengson and Taylor 1997). Largely this approach focuses more on what is left behind than what is taken from the forest and treats adequacy of forest harvest levels as what is left after key biological legacies and ecological services of the original forest structures are protected or retained. Some of the key principles of ecoforestry and conservation biology are:

- Retain structures and legacies rather than create them
- Keep representative pieces of stand and landscape structures
- Don't do the same thing everywhere
- Keep things connected using riparian protection and a permeable harvested matrix, avoid fragmentation at the stand and landscape level
- Protect endangered species habitat and endangered ecosystems
- Respect and manage for non-timber values such as recreation, aboriginal and cultural uses
- Eliminate practices such as pesticide application, clear-cutting and slash-burning

One of the issues of greatest concern with the modern industrial forest harvesting approach that has been applied to ecosystems on Vancouver Island for the last 50-60 years is large-scale progressive clear-cutting. The conservation concerns are related to the conservation Principles. Historic harvest practices restrict stand age cycles to what is termed biological or economic rotations. By removing all trees in a stand we remove key ecological structures such as snags and much of the downed wood. Key stand structures include; large live trees, snags, down wood, canopy cover, shrub and ground cover layers (Thomas 1979). In the Coastal Douglas-fir and Coastal Western Hemlock ecosystems these help sustain the majority of native, forest-dwelling vertebrates, with nearly all species requiring one or more of these habitat elements during their life cycle (Table 1).

Table 1. Use of habitat elements by native forest-dwelling vertebrates in Woodlot 1475 (%) (Bunnell and Dunsworth. 2009).

Ecosystem	Total species	Cavities	Downed Wood	Shrubs	Hardwoods	Species requiring at least one element
CDF	139	30.9	13.0	22.3	30.9	97.1
CWH	169	26.6	16.0	23.1	28.4	94.0

These structures were created over the life of a 150-500 year old forest. Woodlot management replaces this forest with a natural or planted forest that will be harvested again in 60-80 years. Thus, there is never sufficient time to regrow key stand structures normally developed through natural disturbance. These sustain biological richness and ecosystem function. At the landscape level, modern industrial forestry methods similarly lead to simplification of landscape patterns. Once the harvest cycle is complete the landscape consists of large patches of uniform age classes connected by narrow ribbons of riparian protection and a network of roads and altered drainage patterns. These new landscape patterns are often quite a departure from natural disturbance and may be limiting or hostile to the movement of some organisms and ecological processes (Lindenmayer and Franklin 2002).

Summary Review Comments

The following are summary comments of the review of management planning documents and maps for Woodlot 1475 (detailed comments and questions in Appendix 1). This summary relates the current harvest blocks and plans for future harvest to the Principles of ecoforestry and conservation biology mentioned above:

SAME THING EVERYWHERE

Maps, photos and prescriptions show the current blocks and near future planned blocks are approximately the same size (<5 ha). Retention levels are low at 8% and mostly located in the existing riparian reserves on the block edges. The altered landscape pattern in the landscape unit in which Woodlot 1475 resides favors large even-aged patches of forest < 80 years. A small number of small patches within the Woodlot would help improve overall landscape structure. However at the woodlot level, a few 5-10ha blocks would improve variability and complexity especially if the larger blocks had internal group retention (>0.5 ha).

KEEPING REPRESENTATIVE PIECES

The current non-harvestable reserve network consists of riparian reserves and management zones for streams and wetlands, and unstable terrain. The CDF conservation concerns focus on two, red-listed ecosystems that may not be well represented in these reserves- Douglas-fir/ Dull Oregon Grape (03) and Grand fir/Three leaved foamflower (06). In general the current reserves are dry or wet and few are on these more mesic sites. This could be addressed with focusing stand level retention on these ecosystems in future or these may be captured in economically isolated productive forest.

RETAIN STRUCTURES RATHER THAN CREATE THEM

The management plan uses short, economic rotations, and small blocks with limited group retention internal to blocks. Biological legacies (large coarse woody debris and snags) are largely retained in the reserve network outside harvest areas. Block edges adjacent to these reserves also often have standing dead snags and hazard trees removed, the narrower the reserves the more likely sanitation will be required. This significantly reduces the effectiveness of riparian reserves as a repository for large coarse woody debris and snags. With no adjacency constraints and small forest tenure there is a significant risk that large patches of single 20year age classes will quickly be a resultant. Given none of the blocks in a given age class will have internal retention they will continue to have uniform, simplified structure, reducing biological richness. Two possible solutions are; more internal group retention, or set a proportion of blocks on a double (160 year) rotation to allow key structures to develop.

KEEP THINGS CONNECTED, AVOID FRAGMENTATION

Again as above with no adjacency constraints, significant new roading, and 80+% of productive forest to be harvested on short rotations, the risks of fragmentation are relatively high. One of the best ways to reduce that risk is to use retention (primarily groups) in the harvested matrix. Amphibians and terrestrial gastropods will use groups as small as 0.5 ha as stepping-stones with downed wood and wet draws as transportation linkages between groups (Bunnell and Dunsworth 2009). To capture 0.5 -1.0 ha groups would require some proportion of larger blocks, this would improve the patch size profile and contribute to variability and complexity.

Suggestions for Improvement

In order to better meet the clearly stated conservation needs for the CDFmm portions of W1475 with particular focus on the acquisition and retention of late seral forest attributes and protection of threatened plants animal and ecological communities (CDC listings) the following are suggestions for Management Plan changes and associated responses by the Woodlot 1475 license holder;

1. **Establish a minimum level of ecological representation (retention) of 15%, half of which distributed across blocks**

Response- as you know 18.4% of the woodlot is already removed from the AAC calculation and considered retention so the first half of the suggestion can be met. The crux, as we've discussed, is having appropriate representation of the range of eco-sites within the woodlot as this 18.4% is made up primarily of riparian areas and higher, drier areas. My suggestion would be to implement points 2, 4 and 5 and then to review the retention levels during and following the next cut control period to see if we're getting appropriate representation through those strategies and whether the assumptions of the AAC are accurate. We can also look at whether some of what is designated as physically inoperable in the upper portion of the woodlot can be actually be harvested as this would allow more flexibility to reserve area in the lower portion of the woodlot without further impacting the AAC.

2. **Increase variation in retention levels among blocks over the rotation**

Response- this can be done. Further discussion is needed to clarify the level and range of variation, which I imagine doing prior to block layout and during review of pre-harvest prescriptions.

3. **Put 10% of blocks on double rotations**

Response- As a result of the current age class distribution the most recent AAC calculation and modeling shows that there will be 20 ha of the operable land base in the 141 - 250 year old age class by 2113 that suggests that this can be met.

4. **Use the 50% retention of RMZs to creatively protect trail network where trails run within or adjacent to RMZ (i.e. create portions of RMZ at 100% retention with others at 0% and still attain 50% within a stream segment)**

Response- Absolutely. This has been the intention all along and I imagine some further discussion to determine what creative solution will work best. I'm still of the mind, as are John and Dave, that a simple buffer on the Knarston Creek trail might not be the best and most creative solution.

Something along the lines of a maximum amount of block boundary within a minimum distance (e.g. no more than 100m of block boundary within 100m) within a 5 year cut control period (or something along those lines) and review of block plans with the LWAG/Parks and Rec Commission might be a workable compromise.

5. **Designate physically or operationally isolated wood as reserves (i.e. see portion North of Block 13-0, RMZ portion North of 12-04 and west of 12-05, wetland and RMZ north of P2 to stream confluence, and trail network buffer adjacent to toe of unstable terrain in south portion of woodlot). These are portions of the forest that become spatially isolated through block layout.**

Response- Yes, this can be done. It's primarily a mapping exercise but is useful to analyze in terms of ecosite representation in these areas and assumptions regarding the size of the operable land base. As mentioned under point 1 this might be a vehicle to achieving better reserve representation across blocks.

References

Bunnell, F.L. and G.B. Dunsworth, eds. 2009. Forest Biodiversity- Learning How to Sustain Biodiversity in Managed Forests. UBC Press, 349pg.

Drengston, Alan and D. Taylor, eds. 1997. Ecoforestry. New Society Publishers, 312pg.

Lindenmayer, D. B. and J.F. Franklin, eds. 2002. Conserving Forest Biodiversity- A Comprehensive Multi-scaled Approach. Island Press, 351pg.

Thomas, J.W., ed. 1979. Wildlife Habitats in Managed Forests: The Blue mountains of Oregon and Washington. USDA Forest Service Agricultural Handbook 553, Washington, DC.

Appendix 1

Questions and Comments (Review of Rationale for pre-harvest prescription of Block 10_01 (W1475) document (July2010));

- Why a rationale for block 10_01 and not the remainder? Or was the intent that this is an over-arching rationale for all blocks?
- Page 1, para1-several mentions of "every site within the CDFmm has the potential to contain threatened ecological communities" and yet the conservation efforts re protection have focused on riparian, wetlands and unstable terrain, all of which are statutory requirements. What incremental conservation has been done in blocks to protect the suggested ubiquitous threatened ecosystems? Did your biologists' reviews not find these ecosystems?
- Page1, Para 2- just a nomenclature check, Group retention silvicultural systems are generally groups >0.1ha and below that those small groups are considered dispersed retention. Many of the groups I have noted are small enough to be dispersed and it appears that the groups are on the edges? in Block 10-01 the groups appear to be at FC 10 and FC 11 as well as the RMZ near FC 08? Is it your intention to treat that RMZ as a reserve rather than 50 % retention?
- My issues with extensive use of dispersed retention are; provides limited protection of unique lichen and bryophyte communities, subject to blowdown (not a serious concern if fetch is low and blocks are small), not consistent with patterns of natural disturbance (fire tend to leave skips not dispersed trees). Judicious use to groups within blocks also helps greatly with visual aesthetics. I would favor more group retention, less dispersed. Can PHSPs show retention level as conventionally done, I appreciate these are mostly a regeneration planning document but the addition of two boxes on Page 1 for Retention Type and Retention level would be helpful.
- Page 1, Para. 2 Objectives- My focus here is on Objective 2- Maintain elements of the ecological community that exists within the CDFmm area of W1475, including plant species and structural diversity unique to later stage forests. This implies to me an understanding on your part that the primary limiting factor in CDFmm forests is later stage forest and their associated structures (i.e. >50cm green trees and snags, >50cm coarse woody debris, lichen and bryophyte communities). These later stage attributes are largely a function of age and unlikely to be attained within a short rotation regime (60-80 years) and so are best achieved through retention. You do use retention but the retention levels are consistently low, mostly dispersed and there is little use of in-block retention, limiting the amount and distribution of future later stage forest attributes. In the end it appears most of the retention will be concentrated on riparian reserves, wetland buffers and unstable terrain. This is a fairly limited subset of the existing site series in the CDFmm within W1475. In short I am not convinced your implementation of Objective 2 will be effective without a greater variety of retention levels and more in-block group retention.

- Page 1, Para 3- You mention here VILUP RMZ 34 and the "maintenance and recruitment of later seral forests and later seral forest attributes" and your commitment to maintain these attributes within Block 10-01 through retention of mature and veteran trees at 10 trees per hectare. See above points re retention. But more importantly I think this comment begs the question of sufficiency. It seems to me that VILUP RMZ34 strategy and your Objective 2 point at significant conservation concerns for the CDFmm which would suggest that appropriate forest harvesting would need to be something beyond the historical clear cut, short rotation Status quo. What I see planned and executed are a series of small and generally same size, low retention harvest blocks all planned within a short-rotation (60-80 year) planning regime. In short that doesn't seem to me that nothing significantly different is being done than would normally be done. Where are the incremental conservation actions that would support meeting the VILUP RMZ34 strategy?
- Page 2, para1- here you discuss the MP objectives including "retention of scattered mature trees, old growth attributes, and the creation of a variety of age classes and structural diversity." This seems unlikely in a short rotation regime, so are there longer rotations or multiple entries (i.e. uneven-aged silvicultural systems) planned? What is the age class structure now and what is the projected age class structure at rotation? You also mention in this para. that MOE will be consulted on appropriate levels of protection within the CDFmm. Has this been done? Has the response been documented and how do your levels of protection fit? It is important to remember throughout the CDFmm conservation discussion that distribution is as important as protection level.
- Page 2, para. 4- this discusses CDC red-listed communities in the CDFmm. You again note the high probability of finding re-listed plants animals and ecological communities. This begs the question of what your specific conservation strategy will be for finding and protecting these potentially numerous occurrences. These statements throughout the Rationale create an expectation on my part of a relatively high level and broad distribution of reserves. But what we see at the 1:500 mapping level is riparian reserves, RMZs, wetlands and unstable terrain protected and in the PHSPs at the stand level no indication of locations of ANY red-listed plants, animals or ecological communities in harvested blocks? so what is the protection strategy that addresses the CDC concerns in W1475?
- Page 2-Page 4- This is the discussion of the NatureServe Conservation Assessment. I didn't find this particularly helpful or compelling. There is no explanation of how the derived index is to be used to plan conservation needs. The derivation of the subjective scores for size, condition and context are not explained (i.e. how is landscape context derived and is a 2 a Fair and what does that mean?). In the end the analysis of element occurrence as Fair and no further commentary. So is Fair OK and mean no conservation concerns? Not very helpful but you suggest in para. 6 that this conservation evaluation was stimulated by concerns expressed by the FPB (2005) but that it is beyond a woodlot licensees influence to implement FPB recommendations. How did the conservation evaluation speak to the FPB concerns and it seems clear that given you are continuing to harvest CDFMM forests you Do have an influence on CDFmm conservation concerns. As mentioned above some of the things that the woodlot could do is a variety of rotation ages, a variety of retention levels and types and a broader reserve network.
- Page 4- has MOE completed the 1996 TEM mapping?

- Page 5, para.1- You point at the ILMB LUO for protection of five parcels of Crown land in the CDFmm as being close and perhaps sufficient protection that W1475 needs to do nothing beyond statutory protection requirements? is that why this is mentioned?
- Page 5, para.2- It is hard to imagine in the context of CDFmm conservation needs how harvesting 75-80% of the productive forest in the woodlot over the rotation is any form of protection that would meet the conservation needs of the CDFmm other than perhaps avoid it becoming condo's. The same argument could be made for making it a Park, no condo's and better yet the forest that remains grows old growth attributes :-)
- Page 5, para.6- this speaks to retention minimums stipulated in the WLPPR. Given the persistent conservation concerns over limited old growth attributes in CDFmm forests mentioned throughout the Rationale and given that one of the best forest management methods to achieve that objective within the harvested matrix is retention then why would the Woodlot manage retention to the 8% minimum? Shouldn't the minimum be higher and a commitment to provide variability around the mean?
- Page 5, para.7-Your CWD strategy of defaulting to the Regulations doesn't speak to CWD recruitment, particularly the recruitment of the more important CWD elements of large (>50cm) snags and downed wood. That is best achieved with a distribution of group retention or some dispersed throughout the harvested area. You might also consider a distribution rule like; all block will have >50% forest influence (within 1 TL of forest edge), or no more than 2 TL between groups and 4TL between dispersed trees. The point is 30cm downed wood will likely be gone half way through the rotation and there is no recruitment strategy for CWD within the harvested matrix.
- Page6- my focus here is on the second objective. Given the CDFmm conservation concerns re paucity of late seral attributes and significant levels of threatened animals, plant and ecological communities measuring your achievement of Objective 2 against implementation of WTPs and dispersed retention seem to me an issue of sufficiency, are you doing enough retention and is it well distributed. In my professional opinion retention is too low, should be more groups and better distributed across harvest blocks.