Maintaining and Recruiting Old Forest Attributes: Mixed Retention

What can Mixed Retention do for Maintaining and Recruiting Old Forest Attributes and Biodiversity? Well, since you asked!

Retention of any vegetation on treated/harvested areas is the backbone of a healthy ecosystem on your woodlot. If you work towards leaving vegetation of all sizes in clumps or scattered across your treated area, you will meet many, if not all of the attributes of an old forest.

Why Is This Important

Carbon and biodiversity are heavily linked to what is left on a treated site. Yes, some will blow down, but we can't let that stop us from leaving structure.

Trees and other vegetation sequester carbon dioxide (CO_2) from the air and break it apart into oxygen and carbon. Which is really handy for us, since we need oxygen to breathe! Interestingly enough, forests contain a higher concentration of oxygen than urban spaces. Maybe that's why a forest soothes our soul.

While the oxygen is released into the atmosphere, the carbon is converted to wood or sent down into the ground for storage or feedstock for below ground fauna. What is fauna in the soil, really, it's just dirt, isn't it?

We really haven't spent a lot of research time on forest soils. We know they are important, but the above ground flora (plants) and fauna (animals) get most of the attention. And fair enough, that is what we see and research has to start somewhere. The forest soil however, is starting to get the research attention. The forest soil contains a variety of life, from small microscopic mites to small mammals. Soils are very much alive, dynamic and incredibly complex. Below ground fauna sequesters carbon and as it happens soils are huge carbon sinks. Organic matter in soil provides nutrients for growth.

Our management has to go beyond "don't hurt the dirt" to how do we feed and sustain the life living in our forest soils.

Back in the tree tops, there are leaves (needles are leaves too) doing what leaves do, photosynthesising. Think of leaves as a solar panel, taking the sun and CO_2 and converting it to wood, sugar and oxygen. The sugar heads to the soil. The thing is, there is so much carbon (in the form of sugar) heading below ground, the tree stores some, but the rest feeds those microscopic animals (fauna) in the soil. If all the trees get removed from a wildfire or harvesting, then the forest soil fauna die. When soil fauna die, the soils emit carbon dioxide, exacerbating climate change.

Mixed Retention is the Solution to:

- Protect the health and vitality of the forest soils.
- Maintain the carbon in the soil.
- Support a healthy ecosystem above and below ground.
- Continue to sequester carbon.
- Simultaneously maintain and recruit old forest attributes.

Mixed retention maintains a robust vegetative network after treatment keeps carbon stored, is visually appealing and provides immediate habitat opportunity. It also maintains and/or recruits old forest attributes.

How Do We This

- Leave clumps of trees throughout the block.
- Leave clumps of shrubs.
- Keep trees of varying species and age with an 8-10 metre gap.
- If harvesting using conventional equipment, keep skidders on trails, rather than taking the direct route to the road.
- If harvesting using harvesters and forwarders, the areas between your trails will be full of vegetation.
- Keep the really large trees (especially ones that might be wind shook, not sound, or not a mill favourite) that look like they've got the potential to make cavities.
- In younger stands, or when commercial thinning, leave live smaller trees with scars or damage that will grow and provide some cavity opportunities later in life.
- Keep trees that will fall over throughout the rotation, this is a strategy to recruit CWD.

Next Level Forest Management

- Leave 8-10 metre spacing between mature trees, around 250 stems per ha.
- Try to leave fire resistant species
- Want to leave poles instead of mature trees, just leave a couple more.
- These trees keep the below ground fauna fed and therefore alive, keeping carbon stored.

Old Forest Attribute: Structure

A vibrant old forest tends to have a complex forest structure. This means it has a variety of species, ages, heights and sizes within the canopy. There are also gaps and clumps through out forests that are important as well for biodiversity and healthy ecosystems.

By maintaining mixed retention at the time of harvesting, you are maintaining or creating a stand of mixed ages, heights and size. The maintained clumps and gaps will develop into long term clumps and gaps through the rotation as well.

A clearcut brings a stand back to an age of zero, making it difficult to create a stand with old forest attributes. There is always something to leave, even if there is some mortality and blowdown, it is worth leaving as much behind as you can.

A Real-World Woodlot Example

Not just real-world, but a woodlot example! A Prince George woodlot decided to try something other than a clearcut with reserves. Something that would maintain the health and biodiversity of the woodlot ecosystem. They've moved from conventional harvest equipment to a full-size harvester/forwarder system. The intent was to maximize retention and create critter piles.

The logger, Krueger Resources, was directed, where safe & feasible, to leave;

- Under utilized sized trees that are undamaged to provide structural diversity.
- A target of 15-50 live understory stems per ha.
- Advanced regen and clumps of brush.
- All mature deciduous.
- Dry snags and stub trees.
- Build critter piles using researched criteria. Another Old Forest Attribute that will be discussed in a future article.

The harvested area looks very different than after clearcut with reserves used in the past on the woodlot. There are clumps and gaps throughout the block. It was also observed that the understory wasn't consistent through the entire stand. Some areas had a thicker understory and some areas had nothing to leave behind. This too increases complexity within the stand over time.

The hope of the licensee is that maintaining old forest attributes will increase biodiversity and thereby improve~~d~~ wildlife habitat.

Old Forest Treatment Outcomes

Within our woodlot example, they've left:

1. Gaps and Clumps: Mixed retention which is diversity of gaps and clumps. In other words, vertical diversity. Song birds love small gaps and who doesn't like song birds?
2. Horizontal Diversity: Mixed retention also gives horizontal diversity. There will be taller and shorter trees over the life of the block. As well as other benefits, this gives some visual breaks across the block. The public like to see trees left behind.
3. Carbon Storage: Carbon is continuing to be stored and sequestered. Keeping soil flora and fauna fed and active increases the health and vitality of the soil.
4. Leave Trees! So very important. Live or dead these trees will develop over time into snags and then CWD

The Future for the Old Forest Attributes Committee

You are going to see a theme over 2025 around Old Forest Attributes. The Resilient Old Forest Committee has broken down characteristics of Old Forests into attributes. These attributes may be on site, or they may be something you are going to develop in your stand over time. They also tend to overlap.

So as our 2025 cycles through all the excitement it is sure to bring, keep an eye out for really wordy articles about old forest attributes and resiliency of our forests. We aren't researching or creating anything new, we are highlighting old information found through literature reviews and treatment examples to your inbox. Keep your eye out for all the information to be posted on the www.woodlotsbc.ca website in the Resources menu.

We'll try to keep it engaging and short, but I am not promising anything!