



**Woodlots BC**  
*Forests in Good Hands*

# Resilient Ecosystems

## INTEGRATING ECOSYSTEM RESILIENCE AND OLD FOREST ATTRIBUTES

### **ABSTRACT**

The topic of managing for Resilient Ecosystems is a broad and diverse topic. In this article, we'll discuss our path through the complexity and the base of our list of Old Forest Attributes.



## THE PATH

When we first sat down to discuss the topic of sustainability and resilience of old forests it became clear that it's a broad and diverse topic. Early on, after a few meetings and long phone conversations and brainstorming, there was an epiphany: **All ecological values of old forests are the same across the province - what changes is species, scale, size and age.**

For example, a cavity in a tree is very important. In northern BC, this might be found in an 80-year-old cottonwood with a diameter of 50 cm. On the coast, it looks significantly different, but it's still a hole in a tree.

So, we broke down all the attributes that are found in old forests that make these stands imperative in a healthy ecosystem. **These attributes are not renewable in the short term; they need time to develop.** In other words, that cute little fuzzy critter needs the crevice now; it can't wait 80 years for a new one to develop.

Replacement of attributes takes time but can be accelerated with thoughtful management procedures and practices. Like layering a good outfit (okay, maybe not all of you will get the metaphor), a cut block needs to consider time, space and shape. We easily picture shape and space across our landscape, but time is usually not considered. If you've left some old, when that falls, what will replace it with similar values?

## ECOLOGICAL VALUES OF OLD FORESTS

Using the diagram of Ecological Values (below), we developed a list of attributes that makes old forest critical habitat:

- Mixed Tree Species
- Standing Habitat Recruitment (Snags)
- Downed Habitat Recruitment (Coarse Woody Debris)
- Canopy Gaps (Horizontal Diversity)
- Complex Structure (Vertical Diversity)
- Individual Features, such as:
  - Perch Options
  - Teetertotter Logs
  - Soil Fauna

All these attributes are important to have in your woodlot, but what they look like and the amount you should retain is guided by your biogeoclimatic zone (BEC) and your natural disturbance type (NDT). For example, complex structure on the coast and most stands in the interior would have most layers but in areas such as IDF or PP where ground fires are common, very few stems in the lower layers would be expected.

# Ecological values of old forests: tree, stand, and landscape scales

## 🌲 Genetic

Old trees contain genetic information that makes them more resilient to disturbances like beetles, wildfires, and drought.

## 🌲 Biodiversity

Bark texture and canopy structure change with age, creating unique micro-habitats.

## Habitat

🌲 Old trees can survive and persist for a very long time, providing a range of unique habitats as decay and damage occurs.

🌲 Unique structures and habitat features develop over long periods of time that enhance biodiversity and support uncommon species and species at risk.

## 🌲 Historical

Old trees provide a source of information on historical climate conditions, disturbances, and cultural uses.

## 🌲 Sense of place

Attachment to a place that provides a feeling of connection.

## 🌲 Structural variability

Structural complexity is a product of long time scales and cannot be reproduced artificially.

## 🌲 Hydrology

Older stands intercept more snow, buffer run off, filter water, and provide shade to regulate stream temperatures.

## Carbon capture

🌲 Older trees allocate less carbon for above-ground growth, storing more carbon in stable below-ground reserves which contributes to climate stability more than young trees and wood products

🌲 Older stands store carbon in standing trees, downed and decaying wood, understory plants, forest floor, and below ground soil reservoirs.

## 🌲 Nutrient

Older stands have unique soil biodiversity including insects, bacteria, and fungi. Intact underground fungal networks enhance nutrient dynamics and the health of young trees.

## 🌲 Interconnected ecosystems

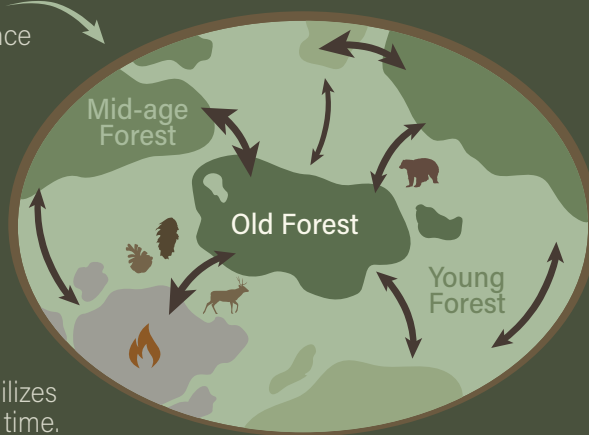
The size of old forest patches and distance between them influence how species establish, disperse, and move which promotes ecosystem integrity at different scales.

## 🌲 Functionality

The spatial arrangement of old forests influence how species and nutrients move around the landscape.

## 🌲 Resiliency

Biodiversity from old forest patches stabilizes disturbed patches via reduced recovery time.



## 🌲 Ecosystem variability

Spatial patterns influence landscape functionality, resiliency, and interconnections.

*Silviculture Systems, starting with harvest, need to consider time as well as shape and size. How will old forest attributes be replaced over time?*

## **ARE OLD FORESTS ATTRIBUTES RENEWABLE?**

We understand that over a rotation, forestry is renewable. However, during the early years, trees don't have the same features as when they are mature. These would be features such as bark, conks, cavities and rot. But these features and characteristics can be encouraged by promoting and managing for the various attributes of old forests across your woodlot. This would accelerate the renewal of old forest features.

The Ecological Values of Old Forests diagram identifies values that are not only attributes of individual old trees, but also the interconnectedness, hydrology functions and resiliency of a healthy forest.

The diagram is an anchor point - an image to remind us of the functions of forests, where age is important, and what features are valuable.

## **THROUGHOUT 2025**

Over the year we are going to share what we have found about how to incorporate each of these attributes into your harvest plans, how to still meet legislative requirements and show you examples with lessons learned.

Let's meet that objective of developing harvesting alternatives to create a tenure area that is resilient, containing old forest attributes that are available throughout the rotation. Let's look at old learnings in a new light and implement them with a new focus and new technology.

Each article will focus on a specific attribute, lessons learned or resiliency. We're in the process of setting up a webpage with all the information we share and resources we've found along the way. The intent of the page is to provide you with the base documents to use while writing plans for your woodlot or for interesting reading.

*Old forest values and objectives need to be clearly articulated, with less emphasis on the generic "Old Growth" label.<sup>1</sup>*

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<sup>1</sup> A New Future for Old Forests: page 42

# RESOURCES

Website: <https://woodlotsbc.ca/>

Facebook: Woodlots BC

Instagram: woodlotsbc

YouTube: @WoodlotsBC

A New Future for Old Forests: A Strategic Review of How British Columbia Manages for Old Forests Within its Ancient Ecosystems:

<https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/stewardship/old-growth-forests/strategic-review-20200430.pdf>

B.C.'s Draft Biodiversity and Ecosystem Health Framework:

<https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/biodiversity/bc-s-draft-biodiversity-and-ecosystem-health-framework>

[https://www2.gov.bc.ca/assets/gov/environment/biodiversity-habitat-management/draft\\_biodiversity\\_and\\_ecosystem\\_health\\_framework.pdf](https://www2.gov.bc.ca/assets/gov/environment/biodiversity-habitat-management/draft_biodiversity_and_ecosystem_health_framework.pdf)

Ecological Values Image:

[https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/stewardship/old-growth-forests/ecological\\_values\\_of\\_old\\_forests.pdf](https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/stewardship/old-growth-forests/ecological_values_of_old_forests.pdf)

Biodiversity Guidebook (Yes, the September 1995 version):

<https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/forestry/frep/frep-docs/biodiversityguidebook.pdf>

Landscape Unit Planning Guide (slightly newer, March 1999):

[https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/land-water-use/crown-land/land-use-plans-and-objectives/policies-guides/lup\\_guide.pdf](https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/land-water-use/crown-land/land-use-plans-and-objectives/policies-guides/lup_guide.pdf)

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A close-up photograph of a tree trunk showing concentric growth rings in shades of brown, tan, and dark blue. The rings are slightly wavy and create a circular pattern. A white rectangular box is overlaid on the right side of the image, containing text.

***Ecological Values are a variety  
of attributes that should be  
maintained across your  
woodlot, including your  
harvested stands.***