Variable Retention

Tailgate Training Posters

Developed by:

Symmetree Consulting Group

Weyerhaeuser
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Variable Retention (VR) Training

How to use Tailgate Training Posters

This set of posters is a tool for explaining and discussing key implementation issues on VR for field crews. Posters can be used individually or as a package for both scheduled and informal field training.

The content is a summary of key points from “SPs for VR: Guidelines for Designing Variable Retention—Layout and Silvicultural Prescriptions”.

Posters should be kept handy (such as behind the seat of your truck) so that you can use them for “on the spot” field discussions. They beat writing in the dust!

You may also find the posters helpful for tours with students or public groups.

Other training tools

- Videos on “The Variable Retention Approach” Weyerhaeuser (2000):
  - Introduction. A general overview of VR and the Coast Forest Strategy (17 minutes)
  - Part 1. Definitions, Ecological Rationale, Zoning, Economics, Highgrading, Regeneration and Pathogens, Windthrow (51 minutes)
  - Part 2. Harvesting Considerations: Safety, Layout, Helicopters, Cable Yarding, Leave Tree Damage, Communication, Monitoring (47 minutes)

- Part 1 & 2 are also available on CD in a Computer-Based Training format.


- Binders from the original VR Field training sessions (1998/1999). Copies of the “Participant’s Workbook” and “Reference Guide—Silvicultural Systems” are available in each Timberlands office.

Acknowledgements

The Tailgate Training posters were developed and field tested by Bryce Bancroft and Ken Zielke, Symmetree Consulting Group Ltd. Edits were made by Bill Beese with input from the VR Working Group of Weyerhaeuser, BC Coastal Timberlands. Thanks to Paul Picard for use of some digital images; Stillwater Timberlands for heli-logging photos; Production Magic for the cable yarding diagram from the VR Training Videos; and John Przeczek for original diagrams modified for VR illustrations.
Objectives – Why Variable Retention?

Issues behind the BC Coast Forest Strategy (Forest Project):

- Landscape Simplification, Biodiversity
- Clearcuts and Public Perception
- Species Concerns

Elements of the Coast Forest Strategy:

- Zones
  - Old Growth conservation
  - Key habitats
  - “Don’t do the same thing everywhere”

- Variable Retention
  - Legacies and Lifeboats
  - Social License

- Adaptive Management
Goals of VR

Weyerhaeuser’s three goals for VR:

1. Leave a legacy of old forest values.

   Examples: large and old trees, snags, multi-canopy structure, large woody debris, unique features

   TABLE shows minimums by zone. Landscape reserves are rough averages for BC Coastal tenures.

<table>
<thead>
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<th>Landscape area in reserves</th>
<th>Timber</th>
<th>Habitat</th>
<th>OG</th>
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<tr>
<td>28%</td>
<td></td>
<td>40%</td>
<td>70%</td>
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   Retention by block
   | 5% Dispersed, 10% Group   | 15%    | 20%     |

2. Maintain over 50% forest influence.

3. Practice good stewardship using the variable retention approach.

   Goal 3 includes: SAFETY, Forest Health, Windthrow, Visuals, Damage (soils, leave trees), Efficiency
Choosing what to leave

- **Anchors – using the concept of Control Points**
  - “Biological anchors”, some examples:
    - Snag patches or large old trees
    - Riparian areas
    - Rock outcrops
    - Unique ecosystems

- **Spatial distribution of retention**

**Steps**

1. Set Objectives
2. ID critical habitats or species at risk
3. Determine what you want to leave and why
4. Locate biological control points on map
5. Integrate with engineering control points
6. Determine final design (including visual aesthetics)
Mapping and layout

USE THE CONTROL POINTS TO ANALYSE LAYOUT OPTIONS:

- Locate optimum landing areas
- Determine optimal yarding and forwarding patterns
Focus most retention on groups

Why groups? They provide:

- Adequate space to grow the new forest (less growth impact vs. dispersed)
- More habitat features than single trees
- Easier falling and yarding

Clumps
(less than 0.25 ha)
Useful for small openings or where a group is not feasible

Groups (0.25 ha +)
Visual objective – when is it too open?

- **Guidance:**
  - Most retention is within the cutblock
  - Retention is well distributed
  As a general rule:
  - Maximum ~4 tree lengths between groups
  - Maximum ~2 tree lengths for dispersed retention

- **“BCTV test” helps evaluate final layout design**

- **Exception: Large Patch VR**
  - Use for: windthrow, forest health or steep cable yarding
  - Minimum of two 0.5 ha or one 1 ha patch for every 10 ha

Large patch VR examples
Danger Trees

- Are they being assessed?
- Options for danger trees:
  - Fall tree / eliminate risk
  - Create adequate no work zone
- Dangerous indicators but assessed as SAFE?
  - What procedure are you following for this?
  - Are you aware of company policies?
  - Why leave these trees?
- General safety reminders:
  - Ensure standing timber cannot fall on public roads and power lines
  - Create safe conditions for falling, yarding, loading, hauling and silviculture
Windthrow Management - Hazard Assessment

- **Assessment of Hazard**
  - Is the block exposed to problem winds?
  - Are there limitations to rooting?
  - Is the retention adapted to the wind?

- **Use Windthrow Assessment Field Cards:**
  - **Site/Soil Hazard** (topography, rooting, drainage)
  - **Edge Hazard** (windthrow history, species, stand density, tree height, crown size)
  - **Edge + Site/Soil = Biophysical Hazard**
  - **Wind Hazard** (existing windthrow, fetch length, Wind Exposure Index, Hazard Maps)
  - **Biophysical + Wind = Windthrow Hazard**

Look for trees adapted to wind exposure

Look for clues in plants

Edges and leave trees in well-drained deep soils

Minimize fetch between groups and between block edge and groups
Windthrow Management - Risk Assessment

Assess windthrow risk and consequences of exposed edges, groups and dispersed retention

Choices:
• Change layout of groups and/or block boundaries; use large patches
• Plan for salvage
• Accept blowdown*
• Edge treatment (pruning, topping)

* Remember: Windthrow isn’t all bad! It’s been happening for centuries, and many species need dead trees on the ground for habitat.
Windthrow Management - Treatments

Crown Modifications
Use sparingly:
- Manual topping, pruning
- Heli-pruning

Feathering
- Thinning within the first tree length (10% to 30% maximum)
- Keep most windfirm trees
- Don’t feather in dense stands of slender trees—can make it worse!
- Avoid high risk, poorly rooted stands

Salvage
- Anticipate prior to harvest
- Plan for it
- If SAFE and feasible:
  Try to keep windfirm trees & LEANERS
High-grading

Dangers of high-grading:
• Removes trees with the best **genes**
• Promotes **low quality or unhealthy** trees and species
• Undesirable trees **interfere with the growth** of desirable trees

Can Lead to:
- Degraded stand quality and growth potential, or
- Uneconomical future harvesting
= **Reduced future opportunities**

To Avoid High-grading:
• Groups or individual trees are distributed to provide suitable growing space
• The prescription has a plan to deal with the spread of disease or pests from leaf trees
• Where most trees are uncut, opportunities exist for future harvesting
Hemlock Dwarf Mistletoe

- Impacts on hemlock: reduced vigour, growth and wood quality; stem swelling can lead to breakage
- Does not live on dead trees or branches
- Area of potential spread is generally about 15 m around infected trees

Avoidance Strategies

- Leave other species if possible
  - Dispersed – select alternatives to hemlock
  - Groups - remove hemlock component on edges

- Assess hemlock leave trees and
  - Plant other species in 15 m infection zone, or
  - Remove source trees
Damage to leave trees – Assessment

Damage significance: Size, location and depth of wound
- Large or wide wounds (bark removed)
  - high % of the stem girdled, or
  - area of scar >400 cm² (20 x 20 cm)
- Low to the ground
- Gouges into the sapwood
- Into a root within 1 m of the stem

Is damage significant? As in most forestry questions
The answer begins with:
“It depends…”
We then ask
“On what?”

Species Susceptibility to Decay
Pathogens*  

High
- Broadleaf
  - Ba, Bg, Hw, Hm, Ss and Cw <60yrs
- Yc and Cw > 60 yrs
  - Fd, Pw
- Pl

Low
Damage to leave trees – Prevention

The longer stems are left on site +
The more times exposed to harvesting entries =

The higher the likelihood of wounding resulting in decay

Guidance to reduce wounding

- Restrict operating season (in the spring the sap flows…this can be critical!)
- Gain cooperation of operators – they are the key!!
- Match equipment size with timber and site conditions
- Match inter-tree spacing with log length--wider spacing allows longer log lengths
- Designate ‘rub’ trees or use protection
- Use directional falling (herringbone)

For more information see www.pfc.cfs.gc.ca
Ground-based Forwarding

- **Efficient layout** – there are often lots of options
- **Avoid excessive amounts of dispersed trees**
  - Use clumps and large individuals where most effective for retention
- **Maintain at least two tree lengths between groups to aid falling**
- **Avoid creating pinch points**
  - Maintain room for the wood volume that will pass through the area
- **Minimize detrimental soil disturbance**
Cable Yarding

- Group retention is preferred
- Place in logical areas for yarding
  - Poor deflection
  - Split lines
  - Allow yarder to angle behind
- Use “large patch VR” approach for difficult sites
- Leave extra dispersed retention in areas “too open”
  - Line up in direction of yarding
  - A small clump may do it
- Consider use of carriage to yard laterally behind mid-slope groups
- Avoid doing the same thing everywhere!
  - Different solutions for different sites
Helicopter Yarding

Conventional
- Many VR options are available, from group retention to group selection
- Arrange group or dispersed retention patterns to maintain efficient flight paths to the drop zone (e.g., triangular patches pointing upslope)
- Avoid situations where F&B is piled up against standing timber

Standing Stem Harvesting
- For sites where conventional heli or other systems are not feasible (terrain, wildlife, riparian, VQO); or, for extracting high-value stems in advance of conventional falling/yarding
- First identify the critical resource values to be protected on constrained sites
- Must address high-grading, growth and regeneration issues in the prescription
- Remove groups of trees, creating larger canopy openings whenever possible
- Consult the Weyerhaeuser SSH Guidelines
Multi-pass Harvesting

PLAN AHEAD

Objectives for multi-pass

• Visuals, green-up/adjacency constraints, markets
• Is two pass necessary? Can you achieve objectives with one pass?
• Three or more passes are required for Selection systems

Think about future entries when planning the first entry

• Consider objectives after future entries (silviculture, wildlife, harvesting, visuals…)
• Consider falling and yarding issues and damage to young regeneration for all entries (discuss with logging foreman)
• Consider efficiencies and costs
• Have a paper plan on file for all entries
• Use a spatial model for complex blocks