



Best Management Practices STAND LEVEL RETENTION

December 2012

This is one of a series of Best Management Practices (BMP) documents that guide the activities of BC Timber Sales Skeena Business Area. The goal of this BMP is to promote the ecological value of retaining stand structural elements in cut blocks and to provide general guidance and considerations when implementing aggregated (group) or dispersed retention in the Skeena Business Area. Stand level retention practices should be designed to retain biological legacies, such as large old trees, snags and downed logs. By retaining such structural elements at the time of harvest, habitat carrying capacity can be maintained and connectivity can be conserved across the landscape.

Safety:

- Prescriptions or layout must not compromise worker safety. Work exclusion zones may be required to address safety hazards that may be present.
- Consider biological anchors in the context of other engineering control points to optimize retention targets with harvesting safety and efficiency.

Design:

- Planning at multiple spatial scales can conserve and manage habitat for a range of species. Be aware of the landscape level targets and minimum legal requirements that apply to the subject stand (refer to the Forest Stewardship Plan in effect).
- Consider the operability of the stand and the landscape for timber development and consider what the impacts to the timber harvesting land base and timber supply may be for a range of possible designs.
- Use a diversity of retention strategies across sites and landscapes.
- Consider the interplay between spatial and temporal scales when designing and applying retention targets. Current and projected forest condition and development patterns need to be considered. **Table 1** presents a generalized framework to support assessing these considerations and applying them to the subject stand.
- At the stand level, well distributed 15% retention of basal area may be sufficient to retain features for biological legacies at the stand level. At the landscape level, long term retention levels < 35 % may present a high risk to meeting ecological objectives.
- Group retention patches > 1.5 ha in size may have more ecological value for mature forest dependent species (due to edge / micro-climate effects).

Distribution:

- Focus retention in groups where possible.
- Distribute retention throughout harvest units to adequately provide the connectivity function of biological legacies across the landscape. Assess the stand in the context of the landscape and consider the location of long-term retention areas that are expected to persist over the rotation versus short-term reserves that may be subject to future harvest (e.g. areas designed for multiple entries to meet visual or other objectives).
- Consider the application of the Retention Silviculture System, targeting a 50% forest influence target throughout the harvested area (forest or individual tree influence: the area within the net area to be reforested that is within one tree-length of a forested edge or individual standing tree).
- Mix retention with significant openings to encourage regeneration and the growth of preferred species. If applying dispersed retention, consider basal area retention levels less than $5\text{m}^2 / \text{ha}$ to limit negative effects on growth and yield.

Layout and Harvesting Considerations:

- For every stand, ask the question “what structural elements should be left behind as biological legacies and how much is appropriate”?
- Look for “biological anchors” such as rare, threatened or endangered ecosystems or target individual occurrences of trees that may be at the edge of their typical range (consider climate change impacts that may result in current climatic envelopes moving northwards or upslope).
- Apply co-location principles to maximize the ecological value of retention areas.
- Incorporate stand level features that reflect ‘local’ but limited habitat types e.g. riparian areas, wetlands, talus slopes, avalanche chutes, brush complexes, deciduous trees, etc.
- Incorporate wildlife habitat features such as mineral licks, wallows, dens, or nest trees.
- Retain trees with valuable attributes for wildlife such as large diameter (> 70 cm), large-limbed trees that may have evidence of use.
- Consider harvesting complexity and safety and retain areas of steep or gullied slopes, or sites that are otherwise challenging.
- Incorporate existing ‘de-facto’ retention areas that have been identified at the stand level in to the gross cut block area, to ensure they are tracked and managed over time (areas retained to meet cultural and heritage resource management objectives). Assign suitable retention type codes for information management purposes over time.
- To minimize windthrow, emphasize larger patches (> 1 ha) in topographically sheltered positions, minimizing perimeter length and edge exposure to prevailing winds. Avoiding all wind throw is generally not practical or necessary and dispersed retention of live standing trees (suitable assessed for worker safety hazards) may be designed to meet coarse woody debris objectives over time.
- Hemlock dwarf mistletoe infected trees left after harvesting pose a significant risk of growth loss to regenerating stands over time. Where this is a concern, conduct an infection severity assessment and design retention accordingly.

Table 1 – Stand Level Retention Targets and Considerations	
Low Stand Level Retention % may be suitable if:	<ul style="list-style-type: none"> • The landscape is of limited operability for timber development (due to e.g. Parks / Protected Areas or terrain attributes) and / or, • limited timber development has occurred and the landscape has a high level of intact natural forest. • The cutblock area is small e.g. < 1 ha. • At the stand level, significant biological anchors are few or are widely scattered. • Timber production is a high priority management objective.
Moderate Stand Level Retention % may be suitable if:	<ul style="list-style-type: none"> • The landscape currently has, or is expected to have, a moderate amount of intact natural forest over time. • At the stand level, significant biological anchors are present.
High Stand Level Retention % may be suitable if:	<ul style="list-style-type: none"> • The landscape is highly operable for timber development and / or, • Significant timber development has occurred in the landscape with low levels of stand level retention. • At the stand level, there are an unusually high or diverse number of biological anchors. • Management objectives for wildlife or other non-timber objectives are a priority. • The cutblock area is large (e.g. > 100 ha). Favor large group retention patches in a context of large cut blocks or limited intact natural forest in the landscape.

Stand Level Retention Targets that may be considered by the above Table range from < 15% (Low) to > 40 % (High) of the original stand basal area.

Sources of Additional Information:

- a) Variable Retention Decision Aid for Biodiversity and Habitat Retention, BC Journal of Ecosystems and Management (Volume 9 Number 2, 2008).

http://forrex.org/sites/default/files/publications/jem_archive/ISS48/vol9_no2_art1.pdf

- b) Guidance on Landscape and stand Level Structural Retention in Large-Scale Mountain Pine beetle Salvage Operations, Chief Forester (2005)

https://www.for.gov.bc.ca/hfp/mountain_pine_beetle/stewardship/cf_retention_guidance_dec2005.pdf

- c) Wildlife Tree Retention Management Guidance – see link in: FRPA General Bulletin No. 8 – Wildlife Tree Retention: Guidance for District and Licensee Staff (updated Dec. 2011)

<http://www.for.gov.bc.ca/ftp/HTH/external!/publish/web/frpa-admin/frpa-implementation/bulletins/frpa-general-no-8-wildlife-tree-retention-area-dec-2011.pdf>

- d) FRPA General Bulletin No. 15: Managing and Tracking Wildlife Tree Retention Areas Under FRPA (Updated Dec. 2011)

<http://www.for.gov.bc.ca/ftp/HTH/external!/publish/web/frpa-admin/frpa-implementation/bulletins/frpa-general-no-15-managing-and-tracking-wildlife-tree-retention-areas-under-FRPA-Apr-18-2008.pdf>

- e) Biodiversity Guidebook – Forest Practices Code of BC (1995)

<http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/biodiv/biotoc.htm>

- f) Dwarf Mistletoe Management Guidebook - Forest Practices Code of BC (1995)

<http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/dwarf/dwarftoc.htm>

- g) SRMP Planning Materials, Landscape Unit Planning Guide – Forest Practices Code of BC (1999)

http://archive.ilmb.gov.bc.ca/slrp/srmp/Background/lup_landscape.html

- h) How Retention Patches Influence Biodiversity in Cutblocks, Sustainable Forest Management Network Research Note Series No. 74 (2010)

http://www.sfmn.ales.ualberta.ca/Publications/~/_media/sfmn/Publications/ResearchNotes/Documents/RNEn74RetentionPatchesAndBiodiversityPyperetal.ashx

- i) Coast Information Team – Ecosystem Based Management

<http://www.citbc.org/ebm.html>

Stand Level Retention Best Management Practices
Appendix 1

Landscape Unit Operability Analysis
BC Timber Sales Skeena Business Area

Landscape Unit	Forested Land THLB %	Landscape Unit	Forested Land THLB %
Aaltanhash	0.00%	Kispiox South	56.29%
Anyox	0.00%	Kiteen	55.24%
Aristazabal	1.40%	Kitimat	41.89%
Babine	17.62%	Kitkiata	18.02%
Banks	2.49%	Kitlope Heritage Conservancy	0.00%
Bear	0.00%	Kitsault	36.31%
Beaver	62.34%	Kleanza - Treasure	67.77%
Belle Bay	9.17%	Klekane	1.28%
Big Falls	38.89%	Kowesas	8.28%
Bishop	26.54%	Ksedin	30.76%
Bowser	29.17%	Kshwan	0.00%
Brown	6.70%	Kumealon	17.19%
Brown Bear	69.23%	Kwinamass	0.00%
Butedale	0.00%	Kwinamuck	11.24%
Cambria Icefield	0.00%	Lakelse	61.17%
Campania	0.00%	Laredo	0.00%
Captain	14.46%	Lower Skeena	24.66%
Chambers	19.85%	Madely	42.13%
Chapple	0.60%	Marmot	33.52%
Clore	55.85%	McCauley	1.52%
Crab	0.00%	Middle Skeena North	44.82%
Cranberry	51.74%	Middle Skeena South	43.45%
Craven	12.07%	Monckton	3.16%
Dala	20.03%	Muskaboo	0.00%
Dasque	57.44%	Nass	0.12%
Dundas	0.00%	Nass River Kalum	11.99%
Exchamsiks	0.00%	Nelson - Fiddler	62.40%
Exstew	59.21%	Observatory East	3.98%
Falls	23.66%	Observatory West	4.23%
Foch	0.40%	Olh	0.92%
Gil	12.42%	Oweegee	26.24%
Gilttoyees	0.00%	Pa - aat	7.20%
Gitnadoix River RA	0.61%	Pearse	8.10%
Gitsegukla	20.05%	Porcher	11.57%
Green	0.00%	Quottoon	26.18%
Greenville	0.00%	Red Bluff	9.59%
Greenville - Kalum	0.00%	Sallysout	15.76%
Gribbell	17.85%	Scotia	35.33%
Hartley	9.33%	Skeena Islands	27.52%
Hawkes	20.75%	Skeena River Kalum	44.69%
Hawkesbury Island East	38.52%	Somerville	16.88%
Hawkesbury Island West	13.38%	Sparkling	4.42%
Helmcken	4.05%	Stagoo	5.28%
Hevenor	7.32%	Stephens	0.00%
Hirsch	36.97%	Surf	11.50%
Horetzky	17.54%	Suskwa	42.77%
Hot Springs	57.65%	Taylor - Damdochax	9.10%
Iknouk	0.00%	Tchitin	36.12%
Ishkheenickh	15.21%	Tintina	37.58%
Jesse - Bish	36.75%	Tolmie	0.74%
Johnston	23.29%	Triumph	32.14%
Kaien	16.37%	Trutch	0.00%
Kalum	62.41%	Tseaux	32.07%
Kasiks	0.00%	Tuck	10.03%
Kemano	7.40%	Union	14.00%
Khtada	27.21%	Upper Skeena	36.83%
Khutze	0.00%	Wedeeene	32.13%
Khutzymateen Park	0.00%	West Babine	53.51%
Khyex	8.66%	Whalen	23.24%
Kiltuish	2.39%	White	27.35%
Kinskuch	55.13%	Wildfire	30.10%
Kispiox North	20.37%	Average for all LU's (Total Area)	26.69%

Notes:

1. Analysis conducted August 9, 2012. See BCTS source file for more information:

P:\tsk_root\GIS_Workspace\mhoole\lCommon\Analyses\Adhoc\IntactNaturalForestByLU\Deliverables\BCTS_TSK_TE_NC_HA_IntactNaturalForestByLU_20120809.xlsx

2. Highest % THLB value is shaded 69.23%

3. Average value may be considered 'Moderate' operability 26.69%