

Fort St. James Results Stand-level Biodiversity 2005 and 2006 sampling seasons

This document presents results from 42 blocks sampled using the FREP protocol in the 2005 and 2006 field seasons in the Fort St. James Forest District. This is a preliminary look at the data. A better assessment will be possible with a higher sample size (both FREP samples and baseline).

The tree indicator data is compared against baseline data. BEC subzones for the FREP sampled and baseline blocks used in this analysis are shown in the following table:

BEC Subzone	# of FREP Sampled Blocks	# of Baseline Cruise Blocks*
ESSFmv	4	10
SBSdk	1	0
SBSdw	14	64
SBSmc	3	72
SBSmk	5	26
SBSwk	15	10
Total	42	182

*obtained from British Columbia Timber Sales blocks, electronic plot data.

CWD data is compared between patch retention and harvest areas.

General Description of Fort St. James Blocks

- 42 blocks sampled
- 40 blocks with retention, 2 with less than 0.05% retention
- 1751.4 hectares (ha) total gross area
- 216.8 ha patch retention (12.4% retention)
- 64.9 ha of dispersed retention (basal area equivalent) (3.7% retention)
- 154.7 ha of constrained retention (54.9% of total retention is constrained)
- Area weighted average retention 16.1%
- 64 patches (64.6 %) of less than or equal to 2 ha
- 35 patches (35.4%) greater than 2 ha
- Average of 1.6 ecological anchors per hectare of patch retention (range 0 – 8.9)
- Average of 7.3% windthrow (9 blocks $\geq 10\%$, 20 $\leq 5\%$)
- 46 patches internal to cutblock boundary, 51 on the edge of the cutblock, 2 external and non-contiguous to the cutblock

The following pages show some cumulative distribution charts comparing average block indicators calculated from baseline data to average block indicators calculated from the 42 sampled cutblocks. A cumulative distribution is the data for each block ranked from lowest to highest value of the particular indicator. This is done separately (i.e. two lines) for the baseline data and the RSM sample data for a particular indicator. The distribution is presented as a percentage. In general, a retention curve equal to, or further to the right than the baseline curve is good for biodiversity. If the retention curve is very similar to

the baseline this may mean that retention areas are being chosen that represent the pre-harvest condition for the indicator in question. If the retention curve is further to the right than the baseline this may mean that retention areas are being chosen that contain a higher density of the indicator in question than the pre-harvest condition.

This is preliminary analysis since it is based on only 42 blocks.

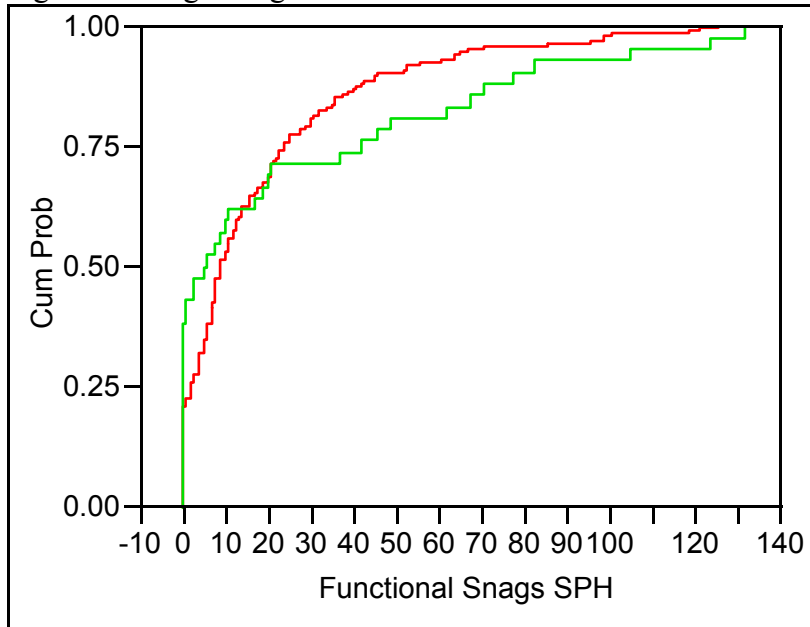
Snags >30 cm DBH and > 10 m ht

Large dead trees are important habitat for wildlife tree users. BC Ministry of Forests and Range (2005) indicated that the minimum size of a dead tree to be functional for bird reproduction is 20 cm DBH and 10 m height. Observations of nesting use of stubs by birds in the southern interior of BC indicated a preference for larger diameter (36–45 cm) (Harris 2001). The 30 cm diameter cut-off for this indicator was chosen because it met the functional dead tree description and was close to preferred diameters.

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Cruise	182	18.6751	24.9041	1.8460	15.033	22.318
Retention	42	24.5476	36.4880	5.6302	13.177	35.918

Figure 1: Large Snags



— Cruise
— Retention

Discussion: The retention line above is for the full 42 sampled blocks. The density of large snags in the full range of sampled FREP blocks is lower than the cruise line for the first 60% of the blocks, but a fair bit higher for the remaining blocks. The overall mean for the large snags found in the cruise blocks is lower than for the retention areas of the FREP sampled blocks.

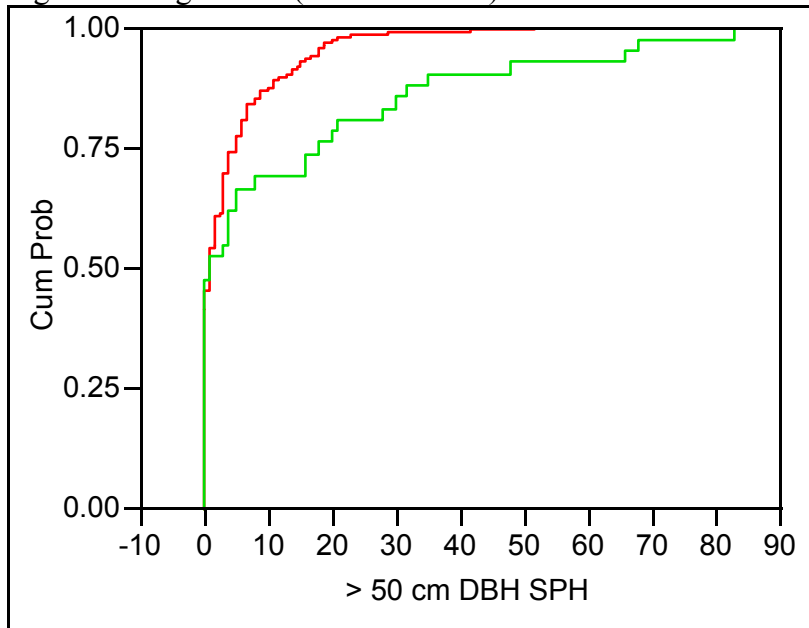
Trees larger than 50 cm DBH all BEC zones

Large size is one of the main considerations for determining a high value wildlife tree (Biodiversity Guidebook, Wildlife Tree Retention: Management Guidance). For this report on 2005 and 2006 RSM SLBD data, a 50 cm DBH or larger cutoff is used to define a large tree for all but the Coastal Western Hemlock BEC zone, where a 70 cm cutoff is used. For some areas of the province, a smaller cutoff to define a large tree is necessary, A 40 cm option will be implemented in future years.

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Cruise	182	3.9852	7.1430	0.5295	2.9405	5.030
Retention	42	12.2857	20.7285	3.1985	5.8262	18.745

Figure 2: Large Trees (alive and dead)



— Cruise
— Retention

Discussion: The first 45% of the sampled FREP blocks and the baseline cruise blocks have no trees larger than 50 cm DBH, however, for the remaining sampled blocks, the retention have higher density of large trees than the baseline. Looks good! The overall mean for the large trees found in the cruise blocks is lower than the mean from the retention in the FREP sampled blocks.

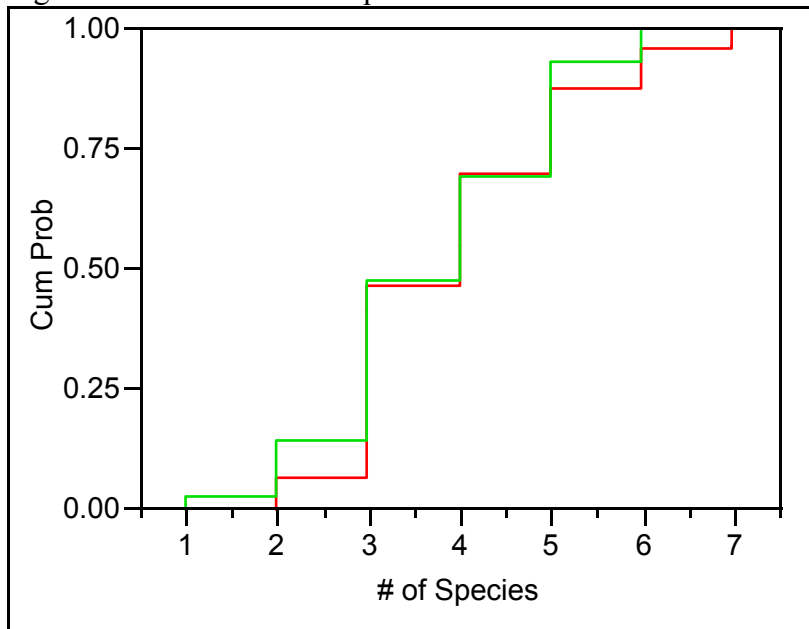
Tree Species on a Block all zones

The Biodiversity Guidebook 1995 states that “The maintenance of the diversity of naturally occurring plant species is key to the maintenance of biological diversity within landscape units”. This indicator looks at the number of unique tree species found on sampled cutblocks in the RSM plots, compared to that found in timber cruise. The number of species found on site is highly dependent on the sampling effort, particularly in areas with rarely occurring species (sampling intensity for stand-level biodiversity surveys, Densmore and Nemec 2008 in draft). Future work is planned for this indicator to get better comparability between the sampling intensity from the FREP samples and the cruise.

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Cruise	182	3.94505	1.25141	0.09276	3.7620	4.1281
Retention	42	3.73810	1.23089	0.18993	3.3545	4.1217

Figure 3: Number of Tree Species Found in Block



— Cruise
— Retention

Discussion: The number of tree species sampled are very close between the retention in the sampled blocks and the cruise baseline. The means of number of tree species found in the cruise blocks versus the retention areas of the FREP sampled blocks are similar.

Coarse Woody Debris

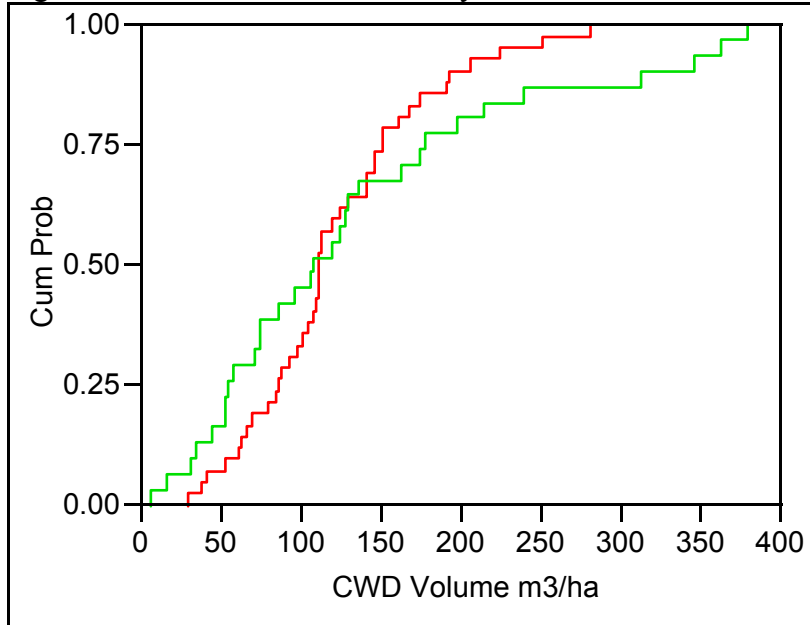
The CWD indicators are volume and number of long pieces of coarse woody debris. These indicators are compared in the retention patches (more natural) versus the harvest area (less natural, particularly if no planning for coarse woody debris retention). Long pieces of coarse woody debris are more valuable than short pieces of similar diameter. They last longer (Stone et al. 1998) before they have decayed into soil, and during that time can better perform their habitat and soil stability functions compared with smaller pieces (Harmon et al. 1986).

CWD Volume

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Harvest	42	123.805	55.851	8.618	106.40	141.21
Patch	31	135.952	102.674	18.441	98.29	173.61

Figure 4: Volume of Coarse Woody Debris



— Harvest
— Patch

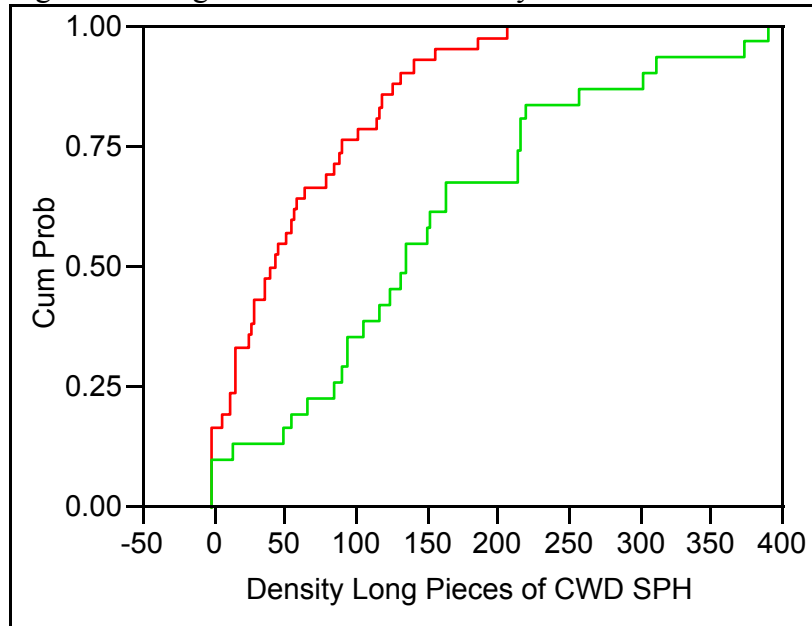
Discussion: The patch line above represents data from the 31 RSM blocks that had data on CWD in patch retention. The CWD volume seems to be similar in the patch areas compared to the harvest areas, though considering only the higher CWD volume areas (patch and harvest), there is higher CWD volume in the patches. The mean CWD volume from all the patch retention areas in the FREP sampled blocks, is similar to the mean from the harvest areas.

CWD Density of long pieces (>10m)

Means and Std Deviations

Level	Number	Mean	Std Dev	Std Err Mean	Lower 95%	Upper 95%
Harvest	42	58.643	55.035	8.492	41.49	75.79
Patch	31	150.806	103.704	18.626	112.77	188.85

Figure 5: Long Pieces of Coarse Woody Debris



— Harvest
— Patch

Discussion: The patch line above represents data from the 31 sampled RSM blocks that had patch retention. This is a usual pattern of lower density of long CWD pieces in the harvest area versus the patch. The mean density of long pieces of CWD found in the sampled FREP retention patches is higher than the mean from the harvest area.

Summary:

- 97 patches either internal or on the edge of the cutblocks, 2 were external and non-contiguous with the block.
- Total weighted retention 16.1%, about half of that is considered constrained for reasons such as riparian reserves, low timber volume, or wet areas.
- Dispersed retention is equivalent to 3.7% retention
- 40 blocks have retention, while 2 blocks have zero (or minimal, less than 0.0%) retention
- Functional snag density is comparable between the retention areas of the sampled cutblocks and the cruise baseline.
- Large tree density is higher in the retention areas compared to the baseline.
- Number of tree species found on a block is comparable between the FREP sampled retention and the cruise.
- CWD volume is overall comparable between patch and harvest areas.

- There is lower density of long pieces of CWD in the harvest areas versus the patches.

References

B.C. Ministry of Forests, 1995. Biodiversity Guidebook

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

B.C. Ministry of Forests and Range, 2006. Wildlife Tree Retention: Management

Guidance. <http://www.for.gov.bc.ca/hfp/values/wildlife/WLT/index.htm>

B.C. Ministry of Forests and Range. 2005. Preliminary assessment of the effectiveness of wildlife tree retention on cutblocks harvested between 1999 and 2001 under the Forest Practices Code. Victoria, BC. <http://www.for.gov.bc.ca/hfp/frep/publications/reports.htm>

Densmore, N and Amanda Nemec, Draft, Sampling Intensity for Stand-level Biodiversity Surveys

Harris, B. 2001. Observations on the use of stubs by wild birds: A10-year update. BC Journal of Ecosystems and Management 1(1):19–23.

<http://www.forrex.org/publications/jem/jem.asp?issue=1>