

Coarse Woody Debris Backgrounder

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Introduction

This document shows by Biogeoclimatic (BEC) subzones the average densities of big CWD pieces, defined as larger than 20 cm diameter and 10 m length, found on harvested sites compared to those within retention patches. In general the density of big CWD is much lower on harvested areas compared to natural areas within retention patches. Large logs last longer than smaller pieces, hold more moisture, contribute more organic material to the soil, and provide habitat for a greater number of species. The data is from the Forest and Range Evaluation Program resource stewardship monitoring, sampled during the years 2005 to 2007. The sampled blocks were harvested under the *Forest Practices Code*. This is background information pertinent to the *Chief Forester Guidance on Coarse Woody Debris Management* (http://www.for.gov.bc.ca/hfp/frep/publications/extension_notes.htm). Suggested improvements in CWD quality as indicated by the density of big CWD pieces are provided.

Data Presentation

Below is an example of monitoring data for big CWD pieces in the IDFdk BEC subzone. This example shows data from 81 harvested cutblocks. Fifty-six of these blocks also contained patch retention.

**Density of Big CWD pieces¹ in the IDFdk
(≥20 cm diameter and ≥10 m long).**

Type	Mean pieces/ha	Median pieces/ha	Sample Size
Harvest	7	0	81
Patch	23	23	56

FREP

Extension Note

#8

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¹ Diameter measured at the line transect crossing

Figure 1: Example cumulative distribution frequency chart showing median number of big CWD in patch areas.

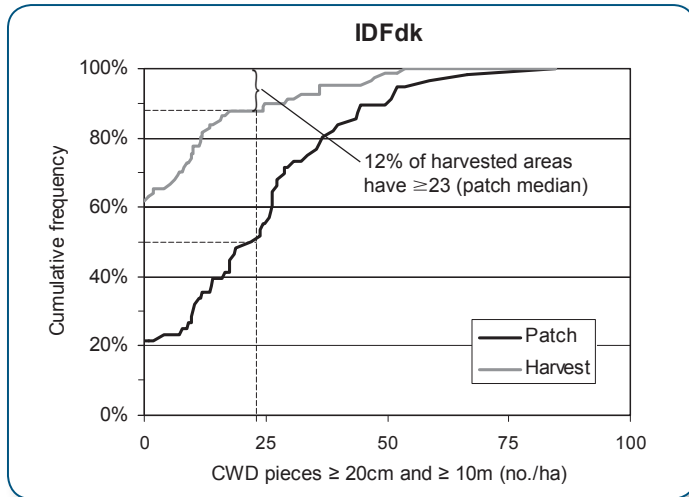


Figure 1 is an example cumulative distribution chart. In general, a retention curve equal to, or further to the right than the baseline curve is good for biodiversity. For further explanation of cumulative distribution charts please see the appendix.

The example chart shows that higher densities of large CWD are typically found in the retention patches compared to the harvested areas. It would be preferable for the grey line (representing the big CWD in harvested areas) to be further to the right – closer to the black line (representing the big CWD in the retention patches). The median density of large pieces of CWD

per hectare gives the same conclusion. This median is 0 for the harvested areas (indicating that more than ½ of the harvest blocks had no large pieces found during sampling), and 23 for the retention patches. For example, in the IDFdk data (Figure 1) only 12% of the sampled cutblocks contain the median (or higher) density of 23 large pieces CWD/ha as seen in the patch retention. The median is an important number. An increase in the median number of big CWD on harvested areas will likely translate into a complete shifting of the harvested curve, taking it closer to the patch retention curve. A good outcome for biodiversity would be to have these two curves equal – meaning that over many blocks in an ecosystem the density of large CWD is equal, comparing the harvest areas and similar un-harvested areas. This is a long-term goal.

Opportunity for Improvement: As government goes forward with monitoring of forest practices under FRPA, along with an increase in the average density of large CWD, a goal of 20% improvement is suggested for the median density of large pieces of CWD on harvested areas. For the IDFdk example shown above, this will mean the median increases from 0, to at least 4.6 pieces per hectare of large CWD in harvested areas. (Calculation is $0.2 \times (\text{patch median} - \text{harvest median}) + \text{harvest median}$, or for the IDFdk: $0.2 \times (23 - 0) + 0 = 4.6$). The appendix presents data for other ecosystems.



Photo Central Cariboo Forest District: Wildlife Tree Patch showing long, large diameter CWD with some elevation and criss-crossing of pieces.

Appendix

Cumulative Distribution Charts by BEC Subzones

The following data is from the Forest and Range Evaluation Program (FREP). Sampling occurred during the 2005, 2006 and 2007 field seasons. The blocks sampled are randomly chosen from a potential population of cutblocks harvested from 1997 to 2005. The blocks sampled are therefore representative of where harvest occurred during that time frame. Data from retained patches with 15% or more windthrow was not used to avoid undue influence of the harvesting on the CWD in the retention patches.

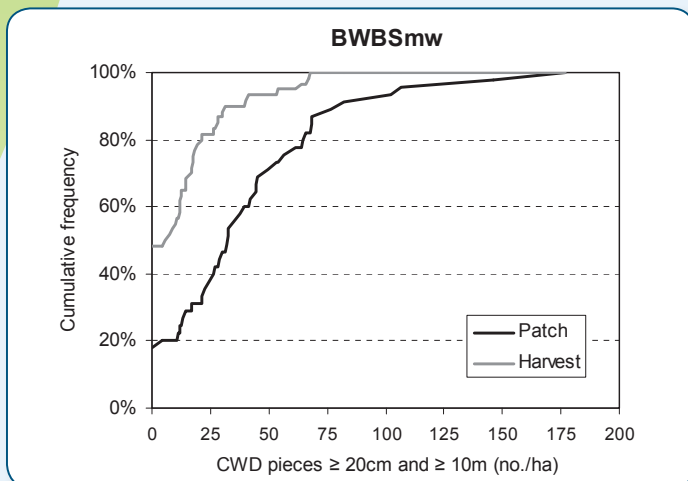
Cumulative distribution charts are used to display data. Indicator values are ranked from lowest to highest and graphed as percentages. Cumulative distributions for the baseline data (density of big CWD as sampled in retention patches) and the harvest area density of large CWD, are presented separately (i.e., as two curves in each chart). Looking at the XY coordinate for any point in the curve you can see the percentage of the sample (Y coordinate) that has a certain density of big CWD (X coordinate) or less. For example for the BWBSmw 60% of the sampled cutblocks have 12 or fewer pieces of big CWD per hectare found in their harvest areas.

In general, a harvest area curve equal to, or further to the right than the patch (baseline) curve is good for biodiversity. Such a curve shows that the full population of harvest areas has equal or higher densities of large CWD compared to that found in the retention patches.



Photo Haida Gwaii Forest District coastal harvest area CWD

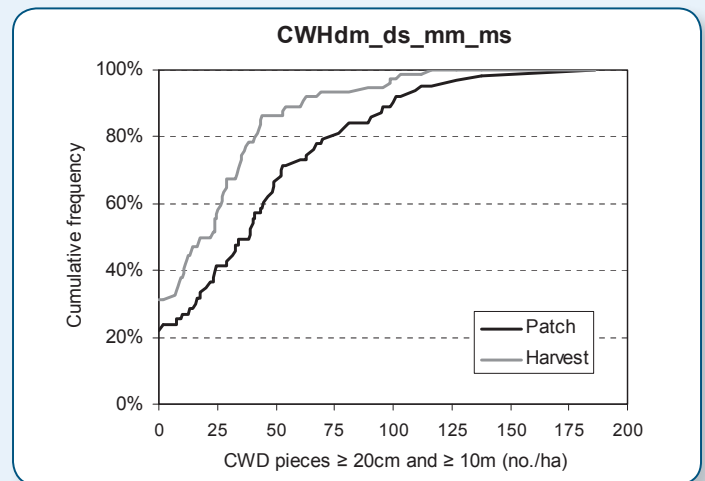
Figure 1: BWBSmw



BWBSmw	Mean	Median	Sample Size
Harvest	13	6	68
Patch	40	33	45

Monitoring for Improvement in BWBSmw: Harvest median increases to 11.

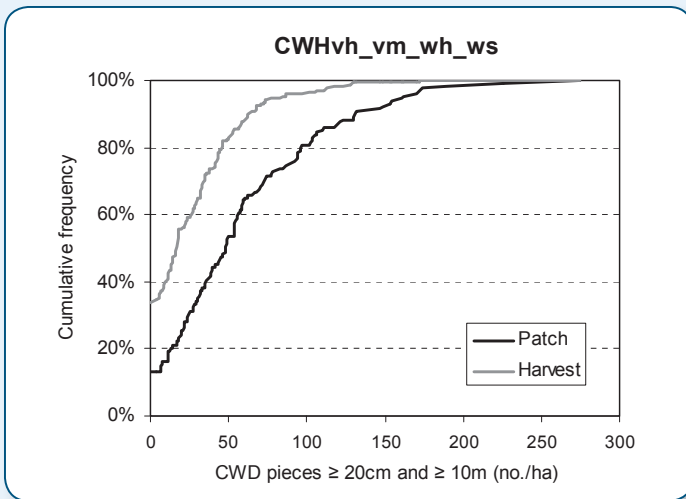
Figure 2: CWHdm_ds_mm_ms



CWHdm ds mm ms	Mean	Median	Sample Size
Harvest	25	20	74
Patch	43	39	63

Monitoring for Improvement in CWHdm_ds_mm_ms: Harvest median increases to 23.

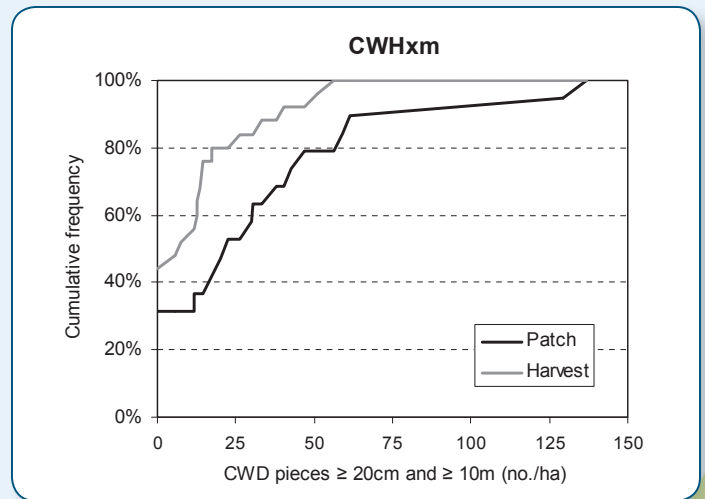
Figure 3: CWHvh_vm_wh_ws



CWHvh_vm_wh_ws	Mean	Median	Sample Size
Harvest	26	17	171
Patch	59	48	129

Monitoring for Improvement in CWHvh_vm_wh_ws: Harvest median increases to 23.

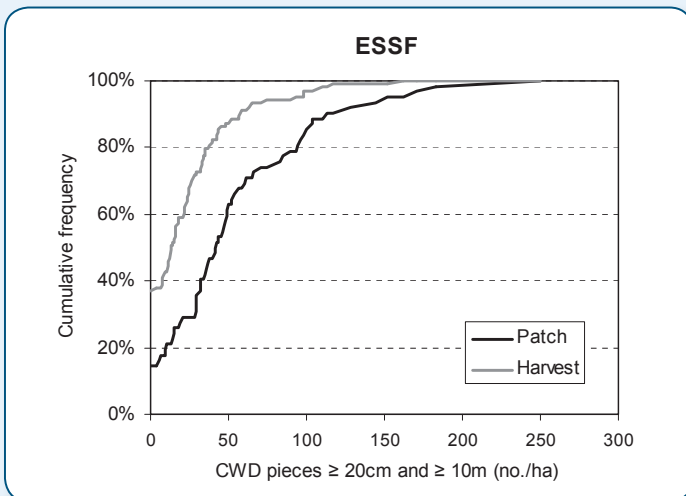
Figure 4: CWHxm



CWHxm	Mean	Median	Sample Size
Harvest	13	8	25
Patch	34	23	19

Monitoring for Improvement in CWHxm: Harvest median increases to 11.

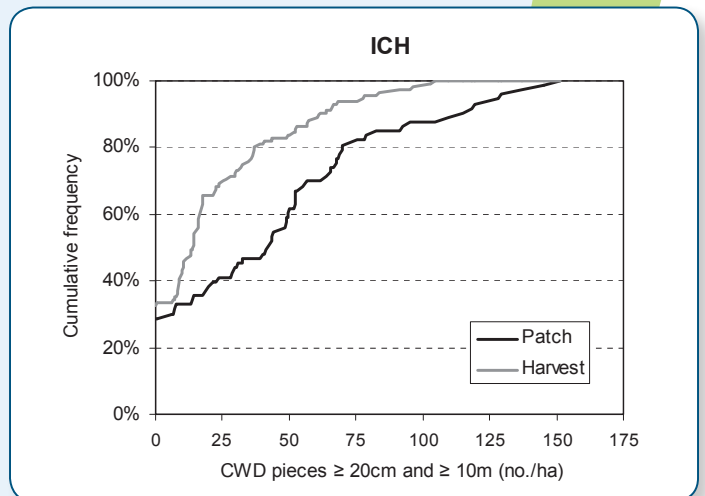
Figure 5: ESSF



ESSF	Mean	Median	Sample Size
Harvest	23	13	103
Patch	54	42	62

Monitoring for Improvement in ESSF: Harvest median increases to 18.

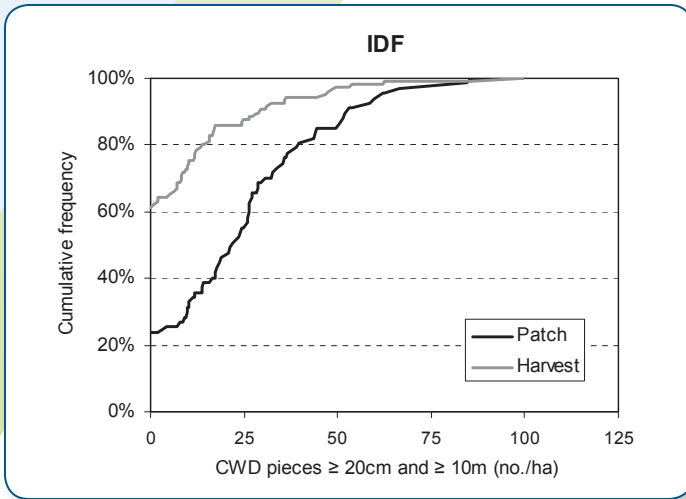
Figure 6: ICH



ICH	Mean	Median	Sample Size
Harvest	22	14	116
Patch	44	43	73

Monitoring for Improvement in ICH: Harvest median increases to 19.

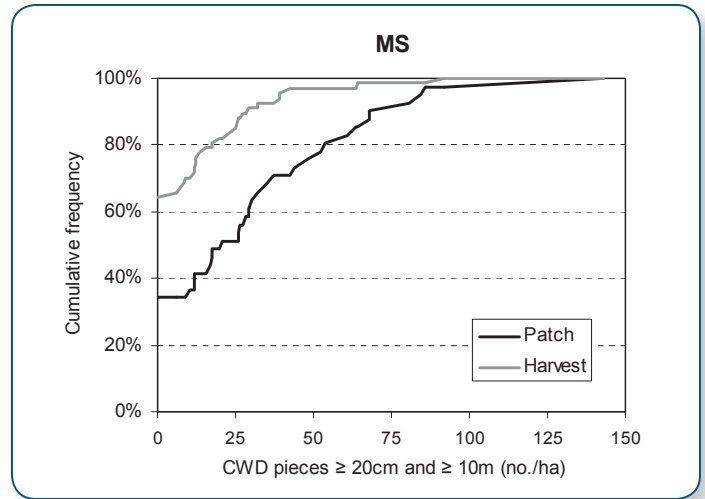
Figure 7: IDF



IDF	Mean	Median	Sample Size
Harvest	8	0	106
Patch	24	22	67

Monitoring for Improvement in IDF: Harvest median increases to 4.

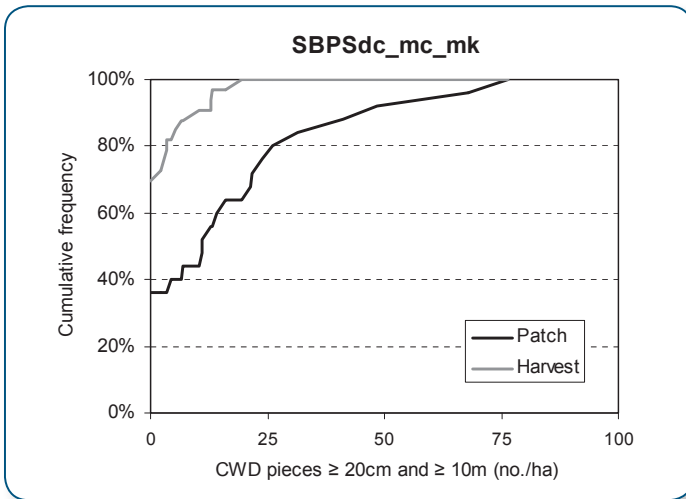
MSCWHxm



MS	Mean	Median	Sample Size
Harvest	9	0	67
Patch	29	21	41

Monitoring for Improvement in MS: Harvest median increases to 4.

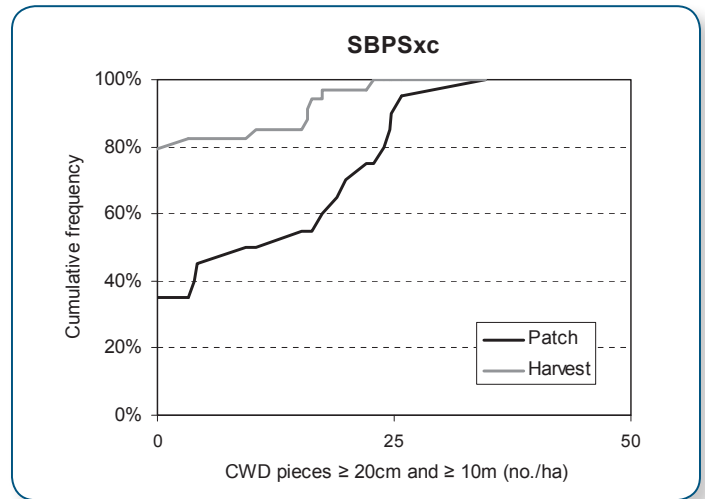
Figure 9: SBPSdc_mc_mk



SBPSdc_mc_mk	Mean	Median	Sample Size
Harvest	2	0	33
Patch	17	11	25

Monitoring for Improvement in SBPSdc_mc_mk: Harvest median increases to 2.

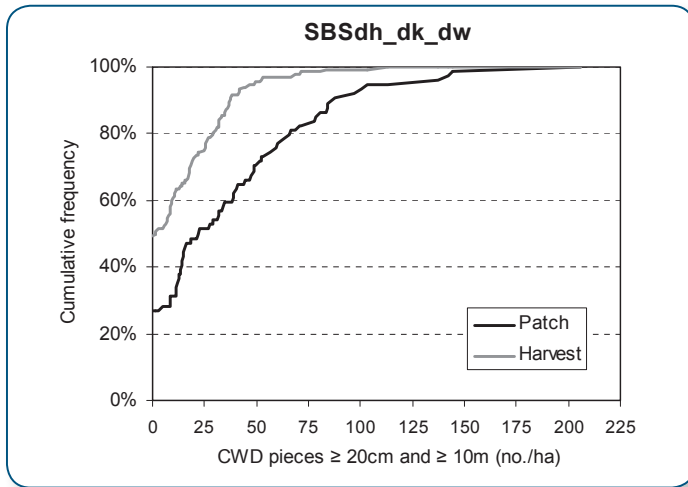
Figure 10: SBPSxc



SBPSxc	Mean	Median	Sample Size
Harvest	3	0	34
Patch	12	12	20

Monitoring for Improvement in SBPSxc: Harvest median increases to 2.

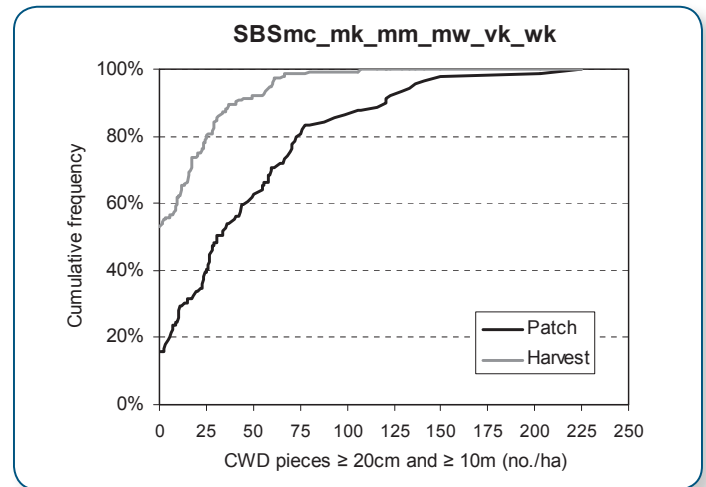
Figure 11: SBSdh_dk_dw



SBSdh_dk_dw	Mean	Median	Sample Size
Harvest	14	1	132
Patch	37	22	74

Monitoring for Improvement in SBSdh_dk_dw: Harvest median increases to 5.

Figure 12: SBSmc_mk_mm_mw_vk



SBSmc_mk_mm_mw_vk	Mean	Median	Sample Size
Harvest	13	0	152
Patch	47	31	89

Monitoring for Improvement in SBSmc_mk_mm_mw_vk: Harvest median increases to 6.

FREP Data used:

Zone	Group	Subzone	Number of blocks		
			Harvest	Patch	Total
BWBS	BWBS	mw	60	45	105
CWH	CWHdm_ds_mm_ms	dm	23	21	44
		ds	18	14	32
		mm	6	5	11
		ms	27	23	50
		Total	74	63	137
	CWHvh_vm_wh_ws	vh	21	22	43
		vm	90	64	154
		wh	32	28	60
		ws	28	15	43
		Total	171	129	300
	CWHxm	xm	25	19	44
		Total	25	19	44
	ESSF	dc	7	4	11
		dk	4	0	4
		dv	2	0	2
		mc	10	10	20

FREP Data used: *(continued)*

Zone	Group	Subzone	Number of blocks		
			Harvest	Patch	Total
		mm	3	1	4
		mv	34	21	55
		mw	3	3	6
		vc	5	5	10
		vv	1	0	1
		wc	18	9	27
		wk	7	3	10
		wm	7	4	11
		xc	1	1	2
		xv	1	1	2
		Total	103	62	165
ICH	ICH	dk	2	1	3
		dw	9	5	14
		mc	18	11	29
		mca	1	1	2
		mk	20	13	33
		mm	2	1	3
		mw	43	27	70
		vk	10	7	17
		wk	11	7	18
		Total	116	73	189
IDF	IDF	dk	81	56	137
		dm	12	4	16
		mw	5	3	8
		ww	5	3	8
		xh	2	0	2
		xm	1	1	2
		Total	106	67	173
MS	MS	dc	1	1	2
		dk	16	4	20
		dm	24	16	40
		xk	16	12	28
		xv	10	8	18
		Total	67	41	108
SBPS	SBPSdc_mc_mk	dc	8	7	15
		mc	4	2	6

FREP Data used: *(continued)*

Zone	Group	Subzone	Number of blocks		
			Harvest	Patch	Total
		mk	21	16	37
		Total	33	25	58
	SBPSxc	xc	34	20	54
		Total	34	20	54
SBS	SBSdh_dk_dw	dh	2	1	3
		dk	39	12	51
		dw	91	61	152
		Total	132	74	206
	SBSmc_mk_mm_mw_vk_wk	mc	61	38	99
		mk	31	15	46
		mm	1	1	2
		mw	23	15	38
		vk	5	4	9
		wk	31	16	47