Timber Pricing Branch

Ref: 265512

File: 195-30/CRUI

June 29, 2021

BY EMAIL

To: Regional Executive Directors

Re: 2021 Cruising and Compilation Manuals

The purpose of the memo is to inform you that the following manuals become effective July 1, 2021:

- Cruising Manual, Amendment No. 1
- CGNF Standards and Procedures for the Coast Forest Area, Original
- Cruise Compilation Manual, Amendment No. 1
- CGNF Compilation Standards for the Coast Forest Area, Amendment No. 1

The manuals will be available on the internet at the following link:

http://www2.gov.bc.ca/gov/content/industry/forestry/competitive-forest-industry/timber-pricing/timber-cruising

Please find a copy of the highlights for these four manuals attached.

Comments or questions should be referred to Michael Wedel, Cruising Policy Forester, Timber Pricing Branch at (778) 974-2450.

L. La ---

Allan W. Bennett, RPF Director Timber Pricing Branch

Attachments

pc: Melissa Sanderson, Assistant Deputy Minister, Forest Policy and Indigenous Relations Jim Schafthuizen, Executive Director, Forest Policy and Indigenous Relations Lukasz Wichrowski, Cruising Specialist, South Area Greg Jonuk, Cruising Specialist, North Area Martin Plewak, Cruising and Waste Specialist, Coast Area

TIMBER PRICING BRANCH

Cruise Compilation Manual

Effective: July 1, 2020

Includes Amendments

Effective Date

Amendment No. 1

July 1, 2021



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Highlights

2021 Cruise Compilation Manual Changes

This version of the Cruise Compilation Manual is effective July 1, 2021. The *Cruise Compilation Manual* is available on the Internet at:

 $\underline{https://www2.gov.bc.ca/gov/content/industry/forestry/competitive-forest-industry/timber-pricing/timber-cruising/cruise-compilation-manual}$

Section	Description
5.3.4 Marked to Leave Percent Reduction	A description has been added for Marked to Leave Percent Reductions. Example calculations have been added for these.
5.6 Marked to Leave Selective Cutting	A description has been added for Marked to Leave Selective Cutting.
15.9.11 and 15.9.12 Grade Adjustments	The spruce and cedar historic grade percentages are updated for use in grade adjustments.

July 1, 2021 i

Example 5.3

The sample reduction input in <u>Section 5.5</u> indicates a 20 percent reduction in Type 2 - Treatment Unit B for Yellow Cedar with a DBH up to 150 cm. All Tree Classes are included, and no Damage Types are excluded from the reduction.

A Yellow Cedar was tallied in a plot from Type 2 within Block 2. Recall that Type 2/Block 2 has 2 Treatment Units, each having an area of 2.5 ha. Because the Treatment Unit cannot be coded on the Cruise Tally Sheet, the plot determines volume per hectare for both Treatment Units in Type 2 within Block 2.

The Yellow Cedar was tallied using a BAF of 12 in a full plot and the measured DBH was 55.6 cm. The calculated gross merchantable volume was 3.583566 m³. Hence, the pre-reduction estimate for gross volume per hectare for both Treatment Units is:

(1)
$$V = \frac{(12\ 12732.39545)*(3.583566)}{55.6^2}$$
$$= 177.12\ m^3\ per\ hectare$$

The post-reduction estimate for Treatment Unit B is:

(2)
$$V = 177.12 (1-0.2)$$
$$= 141.69 \text{ m}^3 \text{ per hectare}$$

The post-reduction estimate for the two combined Treatment Units is:

(3)
$$V = (2.5/5.0)*177.12 + (2.5/5.0)*141.69$$
$$= 159.40 m3 per hectare$$

5.3.4. Marked to Leave Percent Reduction

A marked to leave percent reduction compilation is used when individual leave trees have been marked in the field and the necessary cruise information collected prior to harvesting so that a specific percent reduction can be calculated using the leave tree volume, basal area or stems per hectare. To determine the appropriate attributes of the leave trees, use a compilation of the leave trees and the corresponding stock table, basal area table or stand table to calculate the percent reduction for each species' DBH class. Below are some examples of different methods compilers

can use to attain the appropriate percent reductions for the cruise compilation.

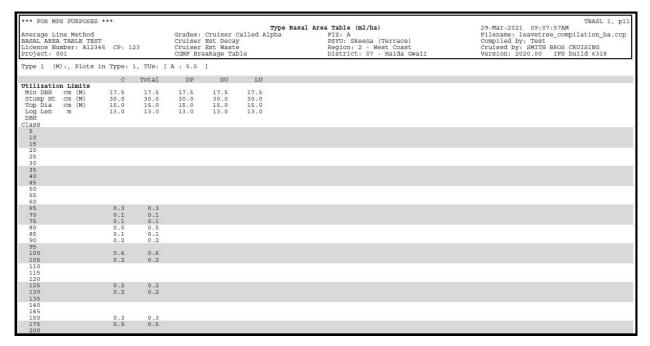
Marked to Leave Percent Reduction – Basal Area Table Example:

The following leave trees were marked and cruised in a cutblock near Kitimat:

				Timber	Treatment
Tree #	Height	Species	DBH	Type #	Unit
1	42.2	Cw	102.0	1	Α
2	36.9	Cw	88.1	1	Α
3	33.3	Cw	68.9	1	Α
4	39.1	Cw	78.2	1	Α
5	30.1	Cw	66.3	1	Α
6	45.2	Cw	155.0	1	Α
7	43.4	Cw	124.7	1	Α
8	39.5	Cw	92.2	1	Α
9	36.5	Cw	100.6	1	Α
10	36.0	Cw	82.0	1	Α
11	34.9	Cw	66.2	1	Α
12	45.1	Cw	179.3	1	Α

				Timber	Treatment
Tree #	Height	Species	DBH	Type #	Unit
13	33.2	Cw	65.0	1	Α
14	39.4	Cw	80.0	1	Α
15	43.1	Cw	132.0	1	Α
16	36.8	Cw	85.4	1	Α
17	34.9	Cw	73.2	1	Α
18	37.9	Cw	77.7	1	Α
19	36.8	Cw	79.6	1	Α
20	40.7	Cw	100.5	1	Α
21	39.2	Cw	101.5	1	Α
22	41.5	Cw	102.9	1	Α
23	31.9	Cw	64.1	1	Α
24	33.3	Cw	67.2	1	Α

The leave trees were compiled below using the same compilation attributes as the associated cutting authority except that it is a 100% compilation and the net area used is the same as the timber type and treatment unit area that the leave trees are located in (5.5ha).



The leave tree basal area table is then compared with the associated DBH class basal area table from the matching species, timber type and treatment unit in the full volume compilation below.

	0.000							80 A C T T T T T T T T T T T T T T T T T T
*** FOR MPS PURPOSES Average Line Method BASAL AREA TABLE TEST Licence Number: A1234 Project: 1	Г	BA	Cruiser	Cruiser (Est Decay Est Waste	Called Al		rea Table (m2/ha) FIZ: A PSYU: Skeena (Terrace) Region: 2 - West Coast District: 07 - Haida Gwaii	TRASL 1, pl1 24-Mar-2021 08:51:15AM Filename: markedtoleave percentreduction Compiled by: BA Test Cruised by: SMITH BROS CRUISING Version: 2020.00 IFS build 6318
Type 1 (M):, Plots i	in Type: 7	, TUS: [A: 5.5	1				
	С	H	Total	DP	DU	LU		
Utilization Limits								
Min DBH cm (M)	17.5	17.5	17.5	17.5	17.5	17.5		
Stump Ht cm (M)	30.0	30.0	30.0	30.0	30.0	30.0		
Top Dia cm (M)	15.0	15.0	15.0	15.0	15.0	15.0		
Log Len m	13.0	13.0	13.0	13.0	13.0	13.0		
DBH								
Class 5								
10								
15								
20	11.4	5.7	17.1					
25	8.6	2.9	11.4					
30		70.00						
35	2.9	2.9	5.7					
40	5.7		5.7					
45								
50	5.7	2.9	8.6					
55	11.4	5.7	17.1					
60								
65	5.7		5.7					
70	1000000	200.20	1000 0					
75	5.7	5.7	11.4					
80	8.6	2.9	8.6					
90	2.9	5.7	8.6					
95	2.5	3.7	0.0					
100	2.9		2.9					
105	5.7		5.7					
110								
115								
120								
125								
130								
135								
140		2.9	2.9					
145 150								
150 175	8.6		8.6					
200	0.0		0.0					
200								

To determine the percent reductions from the full volume compilation, the leave tree basal areas are removed from the corresponding species' DBH class in the full volume compilation.

Species	DBH Class	Timber Type	Treatment Unit	Leave Tree m²/ha	Full Volume m²/ha	Percent Reduction	Comments
Cw	65	1	Α	0.3	5.7	7%	
Cw	70	1	Α	0.1	0.0	*	No 70cm DBH class in full volume compilation therefore added to 65cm DBH class
Cw	75	1	Α	0.1	5.7	2%	
Cw	80	1	Α	0.5	8.6	6%	
Cw	85	1	Α	0.1	2.9	3%	
Cw	90	1	Α	0.2	2.9	7%	
Cw	100	1	Α	0.6	2.9	21%	
Cw	105	1	Α	0.2	5.7	11%	
Cw	125	1	Α	0.2	0.0	*	No 125cm DBH class in full volume compilation therefore added to 105cm DBH class
Cw	130	1	Α	0.2	0.0	*	No 130cm DBH class in full volume compilation therefore added to 105cm DBH class
Cw	150	1	Α	0.3	0.0	*	No 150cm DBH class in full volume compilation therefore added to 175cm DBH class
Cw	175	2	Α	0.5	8.6	9%	

The final percent reduction values applied in the reduced compilation are:

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#** FOR MPS PURPOSES ***

PERCENT REDUCTION APPLIED

Percent Reductions Applied

Percent Reductions Applied

29-Mar-2021 09:41:47AM

Piloname: markedtoleave percentreductions

Project: 1

PERCENT REDUCTION APPLIED

Percent Reductions Applied

Project: APPLIED

Project: APPLIED

Project: 1

PERCENT REDUCTION APPLIED

Percent Reductions Applied

Project: APPLIED

Project:
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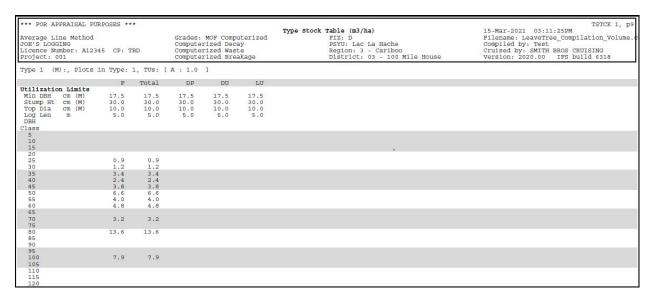
Marked to Leave Percent Reduction - Stock Table Example:

The following leave trees were marked and cruised in a cutblock near 100 Mile House:

				Timber	Treatment
Tree #	Height	Species	DBH	Type #	Unit
1	36.1	Fd	102.0	1	Α
2	29.2	Fd	55.5	1	Α
3	18.5	Fd	25.4	1	Α
4	30.2	Fd	68.9	1	Α
5	31.1	Fd	60.2	1	Α
6	28.7	Fd	52.3	1	Α
7	25.9	Fd	47.0	1	Α
8	33.3	Fd	80.2	1	Α
9	23.9	Fd	30.2	1	Α
10	22.9	Fd	35.1	1	Α
11	36.5	Fd	40.2	1	Α
12	23.0	Fd	34.2	1	Α
13	27.2	Fd	50.0	1	Α
14	30.2	Fd	82.0	1	Α

				Timber	Treatment
Tree #	Height	Species	DBH	Type #	Unit
15	26.5	Fd	60.2	1	Α
16	24.4	Fd	35.6	1	Α
17	26.5	Fd	55.0	1	Α
18	19.4	Fd	24.2	1	Α
19	32.1	Fd	80.0	1	Α
20	24.0	Fd	32.0	1	Α
21	25.3	Fd	48.3	1	Α
22	23.1	Fd	33.2	1	Α
23	20.5	Fd	25.1	1	Α
24	25.0	Fd	39.0	1	Α
25	24.2	Fd	45.5	1	Α
26	25.8	Fd	44.2	1	Α
27	22.1	Fd	33.7	1	Α
28	26.9	Fd	52.1	1	А

The leave trees were compiled below using the same compilation attributes as the associated cutting authority except that it is a 100% compilation. In this example, 1.0ha was used for the initial compilation of the leave trees to ensure that the small individual leave tree volumes were still visible due to the limitation of single decimal places in the stock table. From the compilation the appropriate stock table must be used depending on the timber type, treatment unit, etc. in which the leave trees are located.



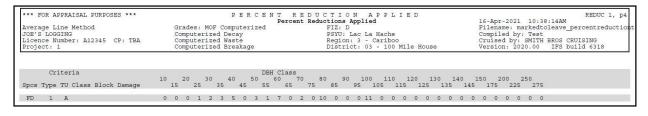
The leave tree volumes are then compared with the associated DBH class stock table volumes from the species, timber type and treatment unit in the full volume compilation below.

*** FOR APPRAISAL PUR	nocpe **							TSTCK 1, pl0
AVERAGE Line Method ODE'S LOGGING Jicence Number: Al2345 CP: TBA Project: 1		Grades: MOF Computerized Computerized Decay Computerized Waste Computerized Breakage			Type Stoc	k Table (m3/ha) FIZ: D PSYU: Lac La Hache Region: 3 - Cariboo District: 03 - 100 Mile House	23-Mar-2021 03:29:17PM Filename: markadtoleave_percentreductio compiled by: Test Cruised by: SMITH BROS CRUISING Version: 2020.00 IFS build 6318	
Type 1 (M):, Plots i	n Type:	7, TUS: [A: 8.3	1				
	F	PL	Total	DP	DU	LU		
Utilization Limits								
Min DBH cm (M)	17.5	12.5	17.5	17.5	17.5	17.5		
Stump Ht cm (M)	30.0	30.0	30.0	30.0	30.0	30.0		
Top Dia cm (M)	10.0	10.0	10.0	10.0	10.0	10.0		
Log Len m	5.0	5.0	5.0	5.0	5.0	5.0		
Class								
5 10 15								
20	21.3	7.0	28.4					
25	11.3	16.4	27.7					
30	5.9		5.9					
35	13.7		13.7					
40 45	13.7	15.2	28.9					
50	27.5	8.1	35.7					
55	36.6		36.6					
60	7.8	16.7	24.5					
65	7.8	8.7	16.5					
70	15.9		15.9					
75	25.6		25.6					
80	16.1	8.5	24.7					
85		8.4	8.4					
90	7.9		7.9					
95								
100	8.5		8.5					
105	8.5		8.5					
110								
115								

To determine the percent reductions from the full volume compilation, the leave tree volumes must be converted from total m³ to m³/ha then applied to the corresponding species' DBH class. For this example, the leave tree volumes were initially compiled using 1.0ha which provided a total m³, but the timber type / treatment unit net area where all the leave trees are located is 8.3ha. The leave tree volumes must be divided by 8.3ha to get the correct m³/ha for comparing with the full volume stock table m³/ha to calculate the percent reduction.

				Total	Leave	Full		
		Timber	Treatment	Leave	Tree	Volume	Percent	
Species	DBH Class	Type	Unit	Tree m ³	m³/ha	m³/ha	Reduction	Comments
Fd	25	1	Α	0.9	0.11	11.3	1%	
Fd	30	1	Α	1.2	0.14	5.9	2%	
Fd	35	1	Α	3.4	0.41	13.7	3%	
Fd	40	1	Α	2.4	0.29	13.7	5%	
Fd	45	1	Α	3.8	0.46	0	*	No 45cm DBH class in full volume compilation therefore added to 40cm DBH class
Fd	50	1	Α	6.6	0.80	27.5	3%	
Fd	55	1	Α	4.0	0.48	36.6	1%	
Fd	60	1	Α	4.8	0.58	7.8	7%	
Fd	70	1	Α	3.2	0.39	15.9	2%	
Fd	80	1	Α	13.6	1.64	16.1	10%	
Fd	100	1	Α	7.9	0.95	8.5	11%	

The final percent reduction values applied in the reduced compilation are reduced from timber type 1, treatment unit A:



Marked to Leave Percent Reduction – Stand Table Example:

The following leave trees were marked and cruised in a cutblock near Sayward:

		# of Leave	Timber	Treatment
Species	DBH Class	Trees	Type#	Unit
Pw	45	5	1	Α
Pw	50	3	1	Α
Pw	55	7	1	Α
Pw	60	5	1	А
Pw	65	4	1	Α

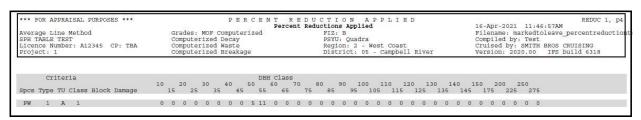
The leave tree stems/ha are then compared with the associated DBH class stand table values from the corresponding species, timber type and treatment unit in the full volume compilation below.

SPH TABLE TEST	*** FOR APPRAISAL PURPOSES *** (Verage Line Method IPH TABLE TEST idence Number: A12345 CP: TBA roject: 1		Grades: MOF Computerized Computerized Decay Computerized Waste Computerized Breakage			Type Star	d Table (stems/ha) FIZ: B PSYU: Quadra Region: 2 - West Co District: 05 - Camp	29-Mar-2021 11:17:54AM Filename: markedtoleave_percentreduction compiled by: Test Cruised by: SMITH BROS CRUISING Version: 2020.00 IFS build 6318	
Type 1 (M):,	Plots :	in Type:	15, TUS:	[A : 15.	8]				
		F	H	PW	Total	DP	DU	LU	
Utilization L	imits								
Min DBH cm	n (M)	17.5	17.5	17.5	17.5	17.5	17.5	17.5	
Stump Ht cm	n (M)	30.0	30.0	30.0	30.0	30.0	30.0	30.0	
Top Dia cm	n (M)	15.0	15.0	15.0	15.0	15.0	15.0	15.0	
Log Len m	n	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Class									
5									
15									
20			264.0		264.0				
25 30		46.2			46.2				
35		74.8	63.5		138.3				
40			44.1		44.1				
45									
50			20.3	11.2	31.5				
55		9.2	56.7	9.6	75.5				
60		7.5			7.5				
65			11.5		11.5				
70			25.0		25.0				
75		5.3	4.5		9.8				
80			3.8		3.8				
85									

For this example, the timber type / treatment unit net area where all the leave trees are located is 15.8ha. The number of leave trees by diameter class must be divided by 15.8ha to get the correct stems/ha for comparing with the full volume stand table stems/ha to calculate the percent reduction for the corresponding species' DBH class.

				# of		Full		
		Timber	Treatment	Leave	Leave Tree	Volume	Percent	
Species	DBH Class	Type	Unit	Trees	Stems/ha	Stems/ha	Reduction	Comments
Pw	45	1	Α	5	0.316	0	*	No 45cm DBH class in full volume compilation therefore added to 50cm DBH class
Pw	50	1	Α	3	0.190	11.2	5%	
Pw	55	1	Α	7	0.443	9.6	11%	
Pw	60	1	Α	5	0.316	0	*	No 60cm DBH class in full volume compilation therefore added to 55cm DBH class
Pw	65	1	Α	4	0.253	0	*	No 65cm DBH class in full volume compilation therefore added to 55cm DBH class

The final percent reduction values applied in the reduced compilation are:



5.6. Marked to Leave Selective Cutting

Another established method to calculate leave tree reductions uses the Selective Cut Indicator. In this method, the percent reduction worksheet is not used. Instead, individual retention trees are marked prior to cruising, and noted with an "L" in Position 59 of the cruise card when they occur within cruise plots. The compilation removes those trees when the selective cut indicator is specified in the Compilation Standards and calculates the partial cut percent accordingly. This method is different from Marked to Leave Percent Reductions, because the leave trees are statistically sampled rather than essentially 100% cruised and removed. If this method is used with only a small number of leave trees, the sampling error of the leave trees is prohibitively high. Therefore, this method is rarely a practical method and its future use is subject to review.

15.9.11. Percentages within Spruce Grades

Natural Resource District	D	E	F	G
Campbell River	8	11	39	42
Chilliwack	0	0	0	100
South Island	27	16	17	40
Coast Mountain	0	22	3	75
North Island - Central Coast	18	18	19	45
Haida Gwaii	11	21	9	59
Sea to Sky	0	0	100	0
Sunshine Coast	0	0	30	70

Source of the table is the Coast Grade Distribution Report 2019-04-01 to 2021-03-31.

Mature spruce logs (greater than 120 years based on the age in 10s and tree class) will be separated into D, E, F and G grades where appropriate.

Example: In the Campbell River District when a log reaches the D/E/F/G decision box 8% of the log net volume will be deemed to be D grade, 11% will be deemed to be E grade, 39% will be deemed to be F grade and 42% will be deemed to be G grade.

15.9.12. Percentages within Cedar Grades

Natural Resource District	D	F	I
Natural Resource District	K	L	M
Campbell River	37	16	66
Campbell Nivel	63	84	34
Chilliwack	24	6	55
Chilliwack	76	94	45
South Island	46	13	64
South Island	54	87	36
Coast Mountain	39	23	76
Coast Mountain	61	77	24
North Island - Central Coast	48	23	71
Notth Island - Central Coast	52	77	29
Haida Gwaii	24	15	63
Tialua Gwali	76	85	37
Sea to Sky	9	2	62
Sea to Sky	91	98	38
Sunshine Coast	35	10	80
Surisifile Coast	65	90	20

Source of the table is the Coast Grade Distribution Report 2019-04-01 to 2021-03-31.

Immature red cedar logs (up to 120 years old based on the age in 10s and tree Classes) flow only into the I-grade where appropriate. Mature red cedar (greater than 120 years based on the age in 10s and tree class) will be separated into I and M grades where appropriate.

Example: In the Campbell River District when a log reaches the D/K decision box, 37% of the log net volume will be deemed to be D grade and 63% will be deemed to be K grade.