

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.



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

Amendment No. 1

Effective Date

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:

<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.

Example 5.3

The sample reduction input in [Section 5.5](#) 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:

$$(1) \quad V = \frac{(12 \ 12732.39545) * (3.583566)}{55.6^2}$$

$$= 177.12 \text{ m}^3 \text{ per hectare}$$

The post-reduction estimate for Treatment Unit B is:

$$(2) \quad V = 177.12 (1 - 0.2)$$

$$= 141.69 \text{ m}^3 \text{ per hectare}$$

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

$$(3) \quad V = (2.5 / 5.0) * 177.12 + (2.5 / 5.0) * 141.69$$

$$= 159.40 \text{ m}^3 \text{ per hectare}$$

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:

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

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

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).

*** FOR MPS PURPOSES ***

Average Line Method

BASAL AREA TABLE TEST

Licence Number: A12345 CP: 123

Project: 001

Grades: Cruiser Called Alpha

Cruiser Est Decay

Cruiser Est Waste

CGNF Breakage Table

FIZ: A

PSYU: Skeena (Terrace)

Region: 2 - West Coast

District: 07 - Haida Gwaii

29-Mar-2021 09:07:57AM

Filename: leavetree_compilation_ba.ccp

Compiled by: Test

Cruised by: SMITH BROS CRUISING

Version: 2020.00 IFS build 6318

Type 1 (M):, Plots in Type: 1, TUS: [A : 5.5]

	C	Total	DP	DU	LU
Utilization Limits					
Min DBH cm (M)	17.5	17.5	17.5	17.5	17.5
Stump Ht cm (M)	30.0	30.0	30.0	30.0	30.0
Top Dia cm (M)	15.0	15.0	15.0	15.0	15.0
Log Len m	13.0	13.0	13.0	13.0	13.0
DBH Class					
5					
10					
15					
20					
25					
30					
35					
40					
45					
50					
55					
60					
65	0.3	0.3			
70	0.1	0.1			
75	0.1	0.1			
80	0.5	0.5			
85	0.1	0.1			
90	0.2	0.2			
95					
100	0.6	0.6			
105	0.2	0.2			
110					
115					
120					
125	0.2	0.2			
130	0.2	0.2			
135					
140					
145					
150	0.3	0.3			
175	0.5	0.5			
200					

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.

*** FOR MPS PURPOSES ***

Average Line Method

BASAL AREA TABLE TEST

Licence Number: A12345 CP: TBA

Project: 1

Grades: Cruiser Called Alpha

Cruiser Est Decay

Cruiser Est Waste

CGNF Breakage Table

FIZ: A

PSYU: Skeena (Terrace)

Region: 2 - West Coast

District: 07 - Haida Gwaii

24-Mar-2021 08:51:15AM

Filename: markedtolleave_percentreduction

Compiled by: BA Test

Cruised by: SMITH BROS CRUISING

Version: 2020.00 IFS build 6318

TBASL 1, p11

Type 1 (M): Plots in Type: 7, TUS: [A : 5.5]

	C	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						
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						
75	5.7	5.7	11.4			
80	8.6		8.6			
85	2.9	2.9	5.7			
90	2.9	5.7	8.6			
95						
100	2.9		2.9			
105	5.7		5.7			
110						
115						
120						
125						
130						
135						
140		2.9	2.9			
145						
150						
175	8.6		8.6			
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 m ² /ha	Full Volume m ² /ha	Percent Reduction	Comments
Cw	65	1	A	0.3	5.7	7%	
Cw	70	1	A	0.1	0.0	*	No 70cm DBH class in full volume compilation therefore added to 65cm DBH class
Cw	75	1	A	0.1	5.7	2%	
Cw	80	1	A	0.5	8.6	6%	
Cw	85	1	A	0.1	2.9	3%	
Cw	90	1	A	0.2	2.9	7%	
Cw	100	1	A	0.6	2.9	21%	
Cw	105	1	A	0.2	5.7	11%	
Cw	125	1	A	0.2	0.0	*	No 125cm DBH class in full volume compilation therefore added to 105cm DBH class
Cw	130	1	A	0.2	0.0	*	No 130cm DBH class in full volume compilation therefore added to 105cm DBH class
Cw	150	1	A	0.3	0.0	*	No 150cm DBH class in full volume compilation therefore added to 175cm DBH class
Cw	175	2	A	0.5	8.6	9%	

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

*** FOR MPS PURPOSES ***				PERCENT REDUCTION APPLIED																REDUC 1, p4																			
Average Line Method				Grades: Cruiser Called Alpha																29-Mar-2021 09:41:47AM																			
BASAL AREA TABLE TEST				Cruiser Est Decay																Filename: markedtolleave_percentreductiont																			
Licence Number: A12345 CP: TBA				Cruiser Est Waste																Compiled by: Test																			
Project: 1				CGNF Breakage Table																Cruised by: SMITH BROS CRUISING																			
				District: 07 - Haida Gwaii																Version: 2020.00 IFS build 6318																			
Criteria				DBH Class																																			
Spcs	Type	TU	Class	Block	Damage	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135	140	145	150	175	200	250		
CW	1	A				0	0	0	0	0	0	0	0	0	0	0	0	7	0	2	6	3	7	0	21	11	0	0	0	0	0	0	0	0	0	9	0	0	0

Marked to Leave Percent Reduction - Stock Table Example:

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

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

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

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.

*** FOR APPRAISAL PURPOSES ***

Average Line Method

JOE'S LOGGING

Licence Number: A12345

CP: TBD

Project: 001

Grades: MOF Computerized

Computerized Decay

Computerized Waste

Computerized Breakage

Type Stock Table (m3/ha)

FIZ: D

PSYU: Lac La Hache

Region: 3 - Cariboo

District: 03 - 100 Mile House

15-Mar-2021 03:11:25PM

TSTCK 1, p9

Filename: LeaveTree_Compilation_Volume.

Compiled by: Test

Cruised by: SMITH BROS CRUISING

Version: 2020.00 IFS build 6318

Type 1 (M):, Plots in Type: 1, TUs: [A : 1.0]

	F	Total	DP	DU	LU
Utilization Limits					
Min DBH cm (M)	17.5	17.5	17.5	17.5	17.5
Stump Ht cm (M)	30.0	30.0	30.0	30.0	30.0
Top Dia cm (M)	10.0	10.0	10.0	10.0	10.0
Log Len m	5.0	5.0	5.0	5.0	5.0
DBH					
Class					
5					
10					
15					
20					
25	0.9	0.9			
30	1.2	1.2			
35	3.4	3.4			
40	2.4	2.4			
45	3.8	3.8			
50	6.6	6.6			
55	4.0	4.0			
60	4.8	4.8			
65					
70	3.2	3.2			
75					
80	13.6	13.6			
85					
90					
95					
100	7.9	7.9			
105					
110					
115					
120					

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 PURPOSES ***

Average Line Method

JOB'S LOGGING

License Number: A12345 CP: TBA

Project: 1

Grades: MOF Computerized

Computerized Decay

Computerized Waste

Computerized Breakage

Type Stock Table (m3/ha)

FIZ: D

PSYU: Lac La Hache

Region: 3 - Cariboo

District: 03 - 100 Mile House

23-Mar-2021 03:29:17PM

Filename: markedtolleave_percentreduction

Compiled by: Test

Cruised by: SMITH BROS CRUISING

Version: 2020.00 IFS build 6318

Type 1 (M), Plots in Type: 7, TUS: [A : 8.3]

	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
DBH Class						
5						
10						
15						
20	21.3		28.4			
25	11.3	16.4	27.7			
30	5.9		5.9			
35	13.7		13.7			
40	13.7	15.2	28.9			
45						
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						

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.

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

[illegible]

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