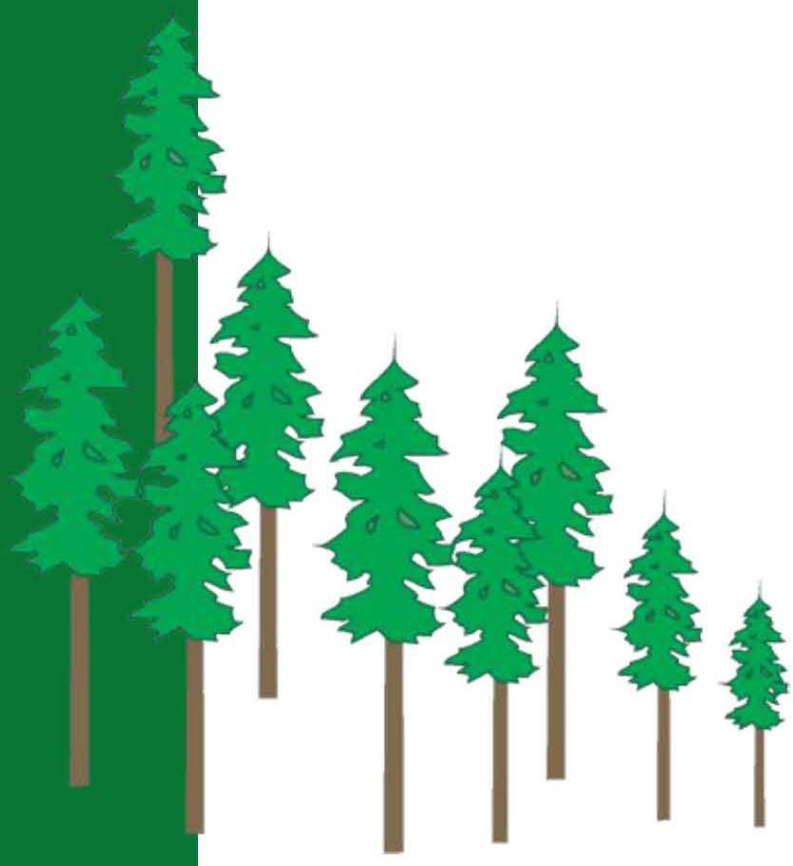
BRITISH COLUMBIA

2016 Specifications: The Interior Market Pricing System



July 1, 2016

Timber Pricing Branch

Specifications: The Interior Market Pricing System

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Disclaimer:

This document is for information only and has no legal authority. It is intended to complement the IAM by providing additional technical details such as rounding rules. If there are any inconsistencies between this document and the IAM then the IAM shall prevail. If there are any rounding or other calculation differences between this document and GAS then GAS shall prevail.

1 SOURCE DATA

Naming conventions for source data used throughout this document are as follows.

PAR	=	3 month average market values and other parameters published quarterly.
IAM	=	*Interior Appraisal Manual*.
Mark	=	refers to values on the corporate data base for each mark.
Mark/IAM		refers to site data for the mark and cost estimates from current *Interior Appraisal Manual*.
APP X	=	refers to an appendix of this document.
S X.X.X	=	refers to steps described in this document.

2 CALCULATING THE MPS STUMPAGE RATE

		Units	Decimal Places	Source/ Value	Rounding
2.1	selling price	$/m³	2		yes
=	stand value			S 2.1.2	
/	CONVOL			S 2.1.1	
2.1.1	CONVOL	m³	0		
=	sum of coniferous species cruise volumes	m³		Mark	
2.1.2	stand value	$	2		
=	sum of species values	$		S 2.1.3	
2.1.3	species value	$	2		
=	species selling price	$/m³		S 2.1.4	
*	species cruise volume	m³	0	Mark	
2.1.4	species selling price	$/m³	2		
=	species appraisal LRF	fbm/m³		S 2.1.5	
*	species lumber AMV	$/fbm		S 2.1.6	
2.1.5	species appraisal LRF	fbm/m³	0		
=	species cruise LRF[1]	fbm/m³	0	Mark	
+	species LRF add-on	fbm/m³	0	IAM	
2.1.6	species lumber AMV (fbm)	$/fbm	3		
=	species lumber AMV (Mbm)	$/Mbm	0	PAR	
/	1000				
2.2	layp fraction	fraction	4		yes
=	layp volume	m³	0	S 2.2.1	
/	CONVOL			S 2.1.1	
2.2.1	layp volume	m³	0		
=	larch cruise volume	m³	0	Mark	
+	yellow pine cruise volume	m³	0	Mark	
2.3	CVPH	m3/ha			no
=	CONVOL			S 2.1.1	
/	net merchantable area	ha	1	Mark	
2.4	hembal fraction	fraction	4		yes
=	hembal volume	m³	0	S 2.4.1	
/	CONVOL			S 2.1.1	

[1] If cruise LRF for lodgepole pine has been reduced for Mountain Pine Beetle volume, the reduction must be added back in as follows (rounded to zero decimal places): final Cruise LRF = Cruise LRF + (green attack volume*3+red attack volume*33+grey attack volume*83)/lodgepole pine net volume

		Units	Decimal Places	Source/ Value	Rounding
2.4.1	hembal volume	m^3	0		
=	hemlock cruise volume	m^3	0	Mark	
+	balsam cruise volume	m^3	0	Mark	
2.5	final cedar fraction	fraction	4		yes
=	intermediate cedar fraction	fraction		S 2.5.2	
*	(1 - Zone6)			S 2.5.1	
2.5.1	Zone6				
=	1 if Zone 6, 0 otherwise		0	Mark	
2.5.2	intermediate cedar fraction	fraction	4		yes
=	preliminary cedar fraction	fraction		S 2.5.3	
*	(1 – cedar decay/100)	fraction	2	Mark	yes
2.5.3	preliminary cedar fraction	fraction	4		yes
=	cedar cruise volume	m^3	0	Mark	
/	CONVOL			S 2.1.1	
2.6	dry firyp fraction	fraction	4		Yes
=	firyp fraction			S 2.6.1	
*	dry fraction			S 2.6.2	
2.6.1	firyp fraction	fraction	4		yes
=	firyp volume	m^3	0	S 2.6.3	
/	CONVOL			S 2.1.1	
2.6.2	dry fraction		2		
=	fraction of top 2 BEC zone/subzone/variant that is dry, if district is DMH or DRM then dry fraction =1	fraction	2	Mark/IAM3.3	yes
2.6.3	firyp volume	m^3	0		
=	Douglas fir cruise volume	m^3	0	Mark	
+	yellow pine volume	m^3	0	Mark	
2.7	LOGVOL		4		yes
=	natural logarithm (EFFVOL/1000)			S 2.7.1	
2.7.1	EFFVOL		0		yes
=	Effective coniferous volume			IAM3.3	
2.8	LOGVPT		4		yes
=	natural logarithm (VPT)		2	Mark	
2.10	decay fraction	fraction	4		yes
=	sum of species decay percent prorates	%		S 2.10.1	
/	100				
2.10.1	species decay percent prorate	%	0		
=	species decay percent	%	0	Mark	
*	species cruise volume		0	Mark	
/	CONVOL			S 2.1.1	

		Units	Decimal Places	Source/ Value	Rounding
2.12	partial cut fraction	fraction	4		
=	1		4		yes
-	(CAPCUT% (no 80% limit)/100)		4	Mark/IAM	
2.13	cable yarding fraction	fraction	4		yes
=	cable yarding volume	m³	0	Mark/IAM3.3	
/	HARVOL			S 2.13.1	
2.13.1	HARVOL	m3	0		yes
=	sum of all harvest method volumes		0	Mark	
2.16	fire damage fraction	fraction	4		yes
=	sum of fire damage fraction prorates	%		S 2.16.1	
2.16.1	species fire damage fraction prorate	%	0		
=	species fire damage percent	%	0	Mark	
*	species cruise volume	m³	0	Mark	
/	CONVOL			S 2.1.1	
/	100				
2.17	effective cycle time	hours	1		
=	cycle time	hours	1	S 2.17.1	yes
+	incremental cycle time	hours	1	S 2.17.2	yes
2.17.1	cycle time	hours	1		yes
=	primary cycle time	hours	1	Mark	
+	secondary cycle time	hours	1	Mark	
2.17.2	incremental cycle time				
=	0.5*(cycle time - 6)	hours	1	S 2.17.1	
note:					
If cycle time < 6, then incremental cycle time = 0					
2.18	deciduous fraction	fraction	4		yes
=	deciduous volume	m³	0	Mark	yes
/	HARVOL	m³	0	S 2.13.1	yes
2.20	Fort Nelson Peace				
=	1 if Zone 9, 0 otherwise		0	Mark	
2.21	2015 Auctions		0		
=	1 for all marks			1	
2.22	DANB		1		
=	DANB (by proxy district as per IAM)			IAM P 3-10	
2.23	decked fraction	ratio	4		yes
=	decked volume		0	Mark	
/	(CONVOL+ decked volume + right of way volume)				

		Units	Decimal Places	Source/ Value	Rounding
2.24	GSS15				**no**
=	(GSS15CC		0	2.24.1	
	*ground skidding clearcut volume		0	Mark	
	+ GSS15PC		0	2.24.2	
	*ground skidding partial cut volume)		0	Mark	
	/(ground skidding clearcut volume		0		
	+ ground skidding partial cut volume)		0		
2.24.1	GSS15CC (minimum value =0)		0		
=	ground skidding clearcut slope		0	Mark	
-	15				
2.24.2	GSS15PC (minimum value =0)		0		
=	ground skidding partial cut slope		0	Mark	
-	15				
2,24,3	GS fraction		4		**yes**
=	(ground skidding clearcut volume			Mark	
+	ground skidding partial cut volume)			Mark	
/	HARVOL			S 2.13.1	
2.25	grey attack fraction	fraction	4		yes
=	lodgepole pine grey attack volume	m^3	0	Mark	
/	CONVOL			S 2.1.1	
2.25.1	lag		0		
=	0 if mark is in zone 5, zone 6 or Cariboo-Chilcotin District or Quesnel District, 2 otherwise.		0	S 2.27.1 0	Mark
2.26	cruise based indicator				
=	1 if cruise based, 0 otherwise				
2.27	RG35				
=	1 if RG35 fraction is greater than or equal to 0.35, 0 otherwise				
2.27.1	RG35 fraction				no
=	RG volume	m^3	0	S 2.27.2	
/	CONVOL			S 2.1.1	
2.27.2	RG volume	m^3	0		
=	MPB red attack volume	m^3	0	Mark	
+	MPB grey attack volume	m^3	0	Mark	
2.28	CPIF	ratio	4		yes
=	current CPI		1	PAR	
/	base CPI			141.7	

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		Units	Decimal Places	Source/ Value	Rounding
3.1	real selling price contribution	$/m³	2		yes
=	real selling price	$/m³		S 3.1.1	
*	selling price coefficient			0.1769	
3.1.1	real selling price		4		Yes
=	selling price	$/m³		S 2.1	
/	CPIF	$/m³		S 2.28	
3.2	layp contribution	$/m³	2		yes
=	layp fraction			S 2.2	
*	layp fraction coefficient			-11.52	
3.3	CVPH contribution	$/m³	2		yes
=	CVPH			S 2.3	
*	CVPH coefficient			0.002137	
3.4	hembal contribution	$/m³	2		yes
=	hembal fraction			S 2.4	
*	hembal fraction coefficient			-19.53	
3.5	cedar contribution	$/m³	2		yes
=	final cedar fraction			S 2.5	
*	cedar fraction coefficient			16.04	
3.6	dry firyp contribution	$/m³	2		yes
=	dry firyp fraction			S 2.6	
*	dry firyp fraction coefficient			-13.32	
3.7	LOGVOL contribution	$/m³	2		yes
=	LOGVOL			S 2.7	
*	LOGVOL coefficient			1.850	
3.8	LOGVPT contribution	$/m³	2		yes
=	LOGVPT			S 2.8	
*	LOGVPT coefficient			9.532	
3.10	decay contribution	$/m³	2		yes
=	decay fraction			S 2.10	
*	decay fraction coefficient			-45.58	
3.11	slope contribution	$/m³	2		yes
=	slope	%	0	Mark	
*	slope coefficient			-0.02717	
3.12	partial cut contribution	$/m³	2		yes
=	partial cut fraction			S 2.12	
*	partial cut coefficient			-5.011	

		Units	Decimal Places	Source/ Value	Rounding
3.13	cable yarding contribution	$/m³	2		yes
=	cable yarding fraction			S 2.13	
*	cable yarding fraction coefficient			-22.08	
3.16	fire damage contribution	$/m³	2		yes
=	fire damage fraction			S 2.16	
*	fire damage fraction coefficient			-6.338	
3.17	cycle time contribution	$/m³	2		yes
=	effective cycle time			S 2.17	
*	cycle time coefficient			-1.992	
3.18	deciduous fraction contribution	$/m³	2		yes
=	deciduous fraction			S 2.18	
*	deciduous fraction coefficient			-17.89	
3.20	Fort Nelson Peace contribution	$/m³	2		yes
=	Fort Nelson Peace			S 2.20	
*	Fort Nelson Peace coefficient			-10.62	
3.21	2015 auctions contribution	$/m³	2		yes
=	2015 auctions			S 2.21	
*	2015 auctions coefficient			11.37	
3.22	DANB contribution	$/m³	2		yes
=	DANB			S 2.22	
*	DANB coefficient			1.150	
3.23	decked contribution	$/m³	2		yes
=	decked fraction			S 2.23	
*	decked coefficient			68.18	
3.24	ground skidding slope contribution	$/m³	2		yes
=	GSS15^2			S 2.24	
*	ground skidding slope coefficient			-0.01099	
*	ground skidding fraction			S 2.24.3	
Note: the value of GSS15 is capped at 35					
3.25	grey attack contribution	$/m³	2		yes
=	grey attack fraction			S 2.25	
*	(2016.5 - 2008 - lag)			S 2.25.1	
*	cruise based indicator			S 2.26	
*	rg35			S 2.27	
*	grey attack coefficient			-2.076	
3.26	cruise based contribution	$/m³	2		yes
=	cruise based indicator			S 2.26	
*	cruise based coefficient			S 3.26.1	
3.26.1	cruise based coefficient	$/m³	2		yes
=	-6.198*(1-rg35) – 5.850*rg35			S 2.27	

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		Units	Decimal Places	Source/ Value	Rounding
4.1	real estimated winning bid	$/m³	2		yes
=	constant contribution			27.54	
+	selling price contribution			S 3.1	
+	layp fraction contribution			S 3.2	
+	CVPH contribution			S 3.3	
+	hembal contribution			S 3.4	
+	cedar contribution			S 3.5	
+	dry firyp contribution			S 3.6	
+	LOGVOL contribution			S 3.7	
+	LOGVPT contribution			S 3.8	
+	decay contribution			S 3.10	
+	slope contribution			S 3.11	
+	partial cut contribution			S 3.12	
+	cable yarding contribution			S 3.13	
+	fire damage contribution			S 3.16	
+	cycle time contribution			S 3.17	
+	deciduous fraction contribution			S 3.18	
+	Fort Nelson Peace contribution			S 3.20	
+	2015 auctions contribution			S 3.21	
+	DANB contribution			S 3.22	
+	decked contribution			S 3.23	
+	ground skidding slope contribution			S 3.24	
+	grey attack contribution			S 3.25	
+	cruise based contribution			S 3.26	
4.2	estimated winning bid	$/m³	2		yes
=	maximum of: 0.25 or				
	real estimated winning bid	$/m³		S 4.1	
*	CPIF			S 2.28	
4.3	final specified operations		2		yes
=	specified operations			S 4.3.1	
*	CBCPIF			S 5.2	
4.3.1	specified operations	$/m³	2		yes
=	water transportation	$/m³	2	Mark/IAM	
+	special transportation systems	$/m³	2	Mark/IAM	
+	camp costs	$/m³	2	Mark/IAM	
+	skyline	$/m³	2	Mark/IAM	
+	heli logging	$/m³	2	Mark IAM	
+	horse logging	$/m³	2	Mark IAM	
+	high development cost (BCTS only)	$/m³	2	Mark IAM	
4.4	final estimated winning bid				
=	maximum of: 0.25 or				
	(estimated winning bid			S 4.2	
-	final specified operations)			S 4.3	

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		Units	Decimal Places	Source/ Value	Rounding
5.1	final TOA	$/m³	2		yes
=	TOA subtotal 2		2	S 5.1.1	
+	return to forest management		2	S 5.1.5	
-	MLRC subtotal 1		2	S 5.1.8	
5.1.1	TOA subtotal 2	$/m³	2		yes
=	total TOA	$/m³	2	S 5.1.2	
/	high grade fraction		4	S 5.1.4	
5.1.2	total TOA	$/m³	2		yes
=	TOA subtotal 1	$/m³	2	S 5.1.3	
*	CBCPIF			S 5.2	
5.1.3	TOA subtotal 1	$/m³	2		yes
=	final forest management administration	$/m³	2	APP2.1	
+	total development	$/m³	2	APP3.1	
+	final road management and road use	$/m³	2	APP2.2	
+	total silviculture	$/m³	2	Mark/IAM	
5.1.4	high grade fraction	fraction	4		yes
=	(1				
-	LG)	$/m³	4	Mark/IAM	yes
5.1.5	return to forest management	$/m³	2		yes
=	TOA subtotal 2		2	S 5.1.1	
*	0.035		3	IAM	
5.1.6	MLRC subtotal 1	$/m³	2		yes
=	MLRC	$/m³	2	1.30	
/	high grade fraction			S 5.1.4	
5.1.7	MLC	$/m³	2		yes
=	MLRC subtotal 1	$/m³	2	S 5.1.6	
+	MLSO	$/m³	2	0.07	
5.1.8	MLC subtotal 1	$/m³	2		yes
=	MLC	$/m³	2	S 5.1.7	
*	CBCPIF			S 5.2	
5.2	CBCPIF		4		yes
=	current CPI		1	PAR	
/	cost base average CPI		1	139.5	
6.1	Reserve Stumpage Rate	$/m³	2		yes
=	maximum of: 0.25 or				
	final estimated winning bid			S 4.4	
-	final TOA			S 5.1	

APPENDIX 1: EXPLANATION OF VARIABLES USED IN THE AUCTION DATASET BUT NOT IN IMPLEMENTATION

Highway Transportation and 1st and 2nd Quarters --- the average values of these variables have been built into the constant.

2012, 2013 and 2014 Annual Dummy Variables --- 1 if the sale was sold during these years, zero otherwise --- These variables do not apply in implementation because MPS applies the dummy variable from the latest year (2015) to all permits.

APPENDIX 2: DECIDUOUS VOLUME AND THE PRORATING OF FOREST MANAGEMENT ADMINISTRATION AND ROAD MANAGEMENT TOAS

		Units	Decimal Places	Source/ Value	Rounding
APP2.1	final forest management admin. (FFMA)	$/m^3	2		yes
=	forest management admin. (FMA)	$/m^3		Mark/IAM4.2.1	
*	HARVOL			S 2.13.1	
/	CONVOL	m^3		S 2.1.1	
APP2.2	final road management and road use (FRM)	$	2		yes
=	final road management	$/m^3		APP2.2.1	
+	final road use	$/m^3		APP2.2.2	
APP2.2.1	final road management	$	2		yes
=	road management (RM)			Mark/IAM4.4.2	
*	HARVOL	m^3		S 2.13.1	
/	CONVOL	m^3		S 2.1.1	
APP2.2.2	final road use	$	2		yes
=	road use (RU)			Mark/IAM4.4.2	
*	HARVOL	m^3		S 2.13.1	
/	CONVOL	m^3		S 2.1.1	

APPENDIX 3: CALCULATION OF DEVELOPMENT AND SILVICULTURE COST ESTIMATES

The calculation of development cost estimates involves a proration with applicable volume as follows:

		Units	Decimal Places	Source/ Value	Rounding
APP3.1	total development cost	$/m^3	2		yes
=	total applicable cost	$		APP3.2	
/	(ADJ_CR_VOL if scale based, or	m^3		APP4.1	
	CONVOL if cruise based)	m^3		S2.1.1	
APP3.2	total applicable cost	$	2		yes
=	sum of applicable type 1 costs and type 2 costs	$	2	APP3.3	
APP3.3	applicable type1 cost	$	2		
=	type1 cost	$	2	Mark/IAM	yes
*	CONVOL	m^3	0	S 2.1.1	
/	project applicable volume	m^3	0	Mark	yes
APP3.4	type2 cost	$	2	Mark/IAM	
APP3.5	total silviculture cost	$/m3	2		Yes
=	total silviculture dollars	$	2	Mark/IAM	
/	(ADJ_CR_VOL if scale based, or	m^3		APP4.1	
	HARVOL if cruise based)	m^3		S2.13.1	

Note: Type 1 costs are tabular roads and tabular culverts and ECE's. Type 2 costs are cattle guards, pipeline crossings and fencing (items without a project applicable cost).

APPENDIX 4: CALCULATION OF ADJUSTED CRUISE VOLUME DENOMINATOR FOR DEVELOPMENT AND SILVICULTURE COST ESTIMATES

		Units	Decimal Places	Source/ Value	Rounding
APP4.1	ADJ_CR_VOL	m^3			No
	If selling price zone =5 then:			Mark/IAM	
	ADJ_CR_VOL	m^3			
=	balsam cruise volume * 0.860	m^3		Mark	No
+	cedar cruise volume * 0.864	m^3		Mark	No
+	fir cruise volume * 1.204	m^3		Mark	No
+	hemlock cruise volume * 0.990	m^3		mark	No
+	larch cruise volume * 0.943	m^3		Mark	No
+	lodgepole pine cruise volume * 1.035	m^3		Mark	No
+	spruce cruise volume * 0.968	m^3		Mark	No
+	white pine cruise volume * 0.481	m^3		Mark	No
+	yellow pine cruise volume * 1.190	m^3		Mark	No
	If selling price zone =6 then:	$		Mark/IAM	
	ADJ_CR_VOL	m^3			
=	balsam cruise volume * 0.662	m^3		Mark	No
+	cedar cruise volume * 0.930	m^3		Mark	No
+	fir cruise volume * 0.998	m^3		Mark	No
+	hemlock cruise volume * 0.988	m^3		mark	No
+	larch cruise volume * 0.943	m^3		Mark	No
+	lodgepole pine cruise volume * 0.744	m^3		Mark	No
+	spruce cruise volume * 0.827	m^3		Mark	No
+	white pine cruise volume * 0.481	m^3		Mark	No
+	yellow pine cruise volume * 1.190	m^3		Mark	No
	If selling price zone =7 then:	$		Mark/IAM	
	ADJ_CR_VOL	m^3			
=	balsam cruise volume * 0.816	m^3		Mark	No
+	cedar cruise volume * 0.859	m^3		Mark	No
+	fir cruise volume * 0.962	m^3		Mark	No
+	hemlock cruise volume * 0.900	m^3		mark	No
+	larch cruise volume * 0.941	m^3		Mark	No
+	lodgepole pine cruise volume * 0.867	m^3		Mark	No
+	spruce cruise volume * 0.975	m^3		Mark	No
+	white pine cruise volume * 0.481	m^3		Mark	No
+	yellow pine cruise volume * 1.190	m^3		Mark	No

Section APP4.1 continued:

If selling price zone =8 then:		$	Mark/IAM	
	ADJ_CR_VOL	m^3		
=	balsam cruise volume * 0.818	m^3	Mark	No
+	cedar cruise volume * 0.864	m^3	Mark	No
+	fir cruise volume * 1.126	m^3	Mark	No
+	hemlock cruise volume * 0.959	m^3	mark	No
+	larch cruise volume * 0.943	m^3	Mark	No
+	lodgepole pine cruise volume * 0.957	m^3	Mark	No
+	spruce cruise volume * 1.074	m^3	Mark	No
+	white pine cruise volume * 0.481	m^3	Mark	No
+	yellow pine cruise volume * 1.190	m^3	Mark	No

If selling price zone =9 then:		$	Mark/IAM	
	ADJ_CR_VOL	m^3		
=	balsam cruise volume * 0.891	m^3	Mark	No
+	cedar cruise volume * 0.864	m^3	Mark	No
+	fir cruise volume * 0.998	m^3	Mark	No
+	hemlock cruise volume * 0.959	m^3	mark	No
+	larch cruise volume * 0.943	m^3	Mark	No
+	lodgepole pine cruise volume * 0.867	m^3	Mark	No
+	spruce cruise volume * 0.984	m^3	Mark	No
+	white pine cruise volume * 0.481	m^3	Mark	No
+	yellow pine cruise volume * 1.190	m^3	Mark	No

Note: The coefficients in this Appendix are updated annually. See the appropriate version of the Interior Appraisal Manual for a stumpage rate calculation effective July 1, 2017 or later.