**The Nova Scotia Primary Forest Products
Marketing Board**

on behalf of the

**New Brunswick Department of Natural Resources,
Nova Scotia Department of Natural Resources, and
Prince Edward Island Department of Environment,
Energy and Forestry**

Survey Results and Prices for
Standing Timber Sales from Maritime Private
Woodlots

for the period

November 1, 2011 to October 31, 2012

FINAL REPORT

Prepared By:

Nortek Resource Solutions Inc.

December 16, 2013

Acknowledgement

The members of the Nova Scotia Primary Forest Products Marketing Board would like to thank the forest industry in the Maritime Provinces for their cooperation and participation in this survey. A special thank you is extended to all those who agreed to contribute to the survey. We appreciate the time given and the fact that you entrusted us with valuable information of a sensitive nature. All identity information will remain confidential.

The Board would also like to acknowledge the New Brunswick and Nova Scotia Departments of Natural Resources that provided the funding for this project.

The Project Team

Nortek Resource Solutions Inc., Market Research Associates Ltd. and New Wave Forestry Ltd. have combined professional resources to jointly prepare this report on prices for Standing Timber from Private Woodlots for the Maritimes. The team consists of two Foresters, two Forest Technicians and one Market Research expert. *Four Best Management Inc.* of Edmunston, New Brunswick also provided French language support for the New Brunswick portion of the project, through translation, telephone contacts and face-to-face surveys.

Kirk Schmidt, the General Manager of *Nortek Resource Solutions Inc.*, holds a Masters of Science in Forestry from the University of New Brunswick and is a Registered Professional Forester in Nova Scotia. Mr. Schmidt has a thorough knowledge of the forest industry in his forestry based professional career which spans more than two decades. Kirk also has a thorough understanding of statistical analysis, spatial analysis and sampling design through his education, work and a number of projects that include his direct involvement with similar stumpage surveys completed for the province of Nova Scotia and the Maritimes.

Éric Caron, Co-Founder and President of *Four Best Management Inc.*, holds a Bachelor of Science in Forestry and a Masters in Business Administration (MBA) from the University of Moncton. Mr. Caron has been directly involved in a number of projects in that include consulting, silviculture, geomatics, training and forest industry specific projects.

George Dempsey is the owner of *New Wave Forestry Ltd.* and is a Certified Forest Technician. George has worked in the Forestry industry in both New Brunswick and Nova Scotia over the past 20 years and brings a wealth of operations knowledge to the project.

Dave Collier graduated from Fleming College in Lindsay Ontario with a diploma in Forest Technology in 2011. Dave is a Certified Forest Technician and currently is employed with *New Wave Forestry Ltd.* in Thorburn, Nova Scotia.

Robin Rodger is the President of *Market Research Associates Ltd.* and has extensive experience as a multi- sector marketing analyst. Mr. Roger has played a key role in a broad range of market and resource based research that has had strong survey design and implementation components.

All of the project team members participated in data compilation and data input quality control. Robin worked with the survey data and ensured the results conformed to proper statistical analysis and market research protocols. Robin also provided the resources needed to contact potential contributors and provide the necessary support to ensure the highest possible participation rate.

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1.0 Introduction

The price and demand for primary forest products tends to be cyclic and over the last decade, this has been the case in the Maritimes. As the prices at the mill gate change in response to demand and supply for milled products, the price paid to individual woodlot owners in the form of stumpage also fluctuates. In this dynamic market, timely data on recent stumpage transactions provide Provincial governments with benchmarks for reviewing and updating internal programs and forest policy.

The Nova Scotia Primary Forest Products Marketing Board (NSPFPMB), New Brunswick Department of Natural Resources (NBDNR), Nova Scotia Department of Natural Resources (NSDNR) and the Prince Edward Island Department of Environment, Energy and Forestry (PEIDEEF) have facilitated the preparation and completion of this report which summarizes private woodlot stumpage information for the Maritime Region. Stumpage is defined as the price per unit measure paid to a landowner for standing merchantable wood.

This project builds upon work that first began in January, 2004 for Nova Scotia and involved developing a sound methodology to accurately collect and analyze private woodlot stumpage data. The primary purpose of this study was to collect and report on stumpage values paid to Maritime private woodlot owners over the period from November 1, 2011 to October 31, 2012.

Completion of this report is in keeping with the intent of the NSPFPMB for the on-going data collection, handling and public distribution of private woodlot stumpage and round wood market information.

This project was managed by a steering committee that was composed of representatives from each of the three provincial departments responsible for forestry, the Vice-Chair and Executive Assistant/Manager of the Nova Scotia Primary Forest Products Marketing Board and legal representation from Cassidy Levy Kent LLP.

2.0 Methodology

2.1 Sampling Process

The sampling methodology and survey instruments were refined during the early stages of this project by the project steering committee. In general, potential contributors were contacted by telephone to recruit them to participate. If potential contributors agreed to participate, an interviewer contacted them to schedule a face-to-face interview. The survey instruments were completed during the face-to-face interviews and the resulting data were input into a database. Face-to-face interviews were completed between April 1, 2013 and July 31, 2013.

All units of measure used by the participants were converted into solid cubic meters to standardize the analysis and results. Conversion factors were derived from values provided by the New Brunswick Department of Natural Resources, Nova Scotia Department of Natural Resources and the Prince Edward Island Department of Environment, Energy and Forestry and are the official conversion rates used within each respective province. (Appendix A).

2.2 Survey Instruments

Stumpage data were obtained through the solicitation/sampling of actual stumpage values paid within the reference period. Survey participants were asked to provide the stumpage prices paid for the last transaction completed within each month of the reporting period, November 1, 2011 to October 31, 2012. Additionally, participants were asked if the interviewer could review their documented records to verify the transaction amounts as a spot check.

Participants completed a survey instrument at the time of the face-to-face interviews for each stumpage transaction throughout the study period.   A stumpage transaction was defined as a verbal or written contract between a woodlot owner and a buyer of standing timber (*e.g.,* contractor). Participants were then asked to provide the county the woodlot was located in and list the stumpage rates paid or offered (payment pending if work is still in progress) for the different products harvested. If participants reported they had completed a transaction that was a lump sum payment, the interviewers asked if the participant could provide their internal product component prices and these data were included in the survey.

The survey concluded by inviting participants to comment on operating conditions that may have influenced the stumpage offered. Participants were asked to rate conditions including job size, partial harvesting, roads, terrain, tree size, the percentage of hardwood and the trucking distance to the receiving mills as being favourable, normal or unfavourable. Reference to these data enabled confirmation that the survey results were not distorted or skewed by reportedly non-normal operating conditions.

2.3 Reporting Period

The survey instrument was designed to capture data over the full 12 month period, with the survey reporting month being defined as the month of the last stumpage payment on a particular job. Participants were asked to report on the last stumpage purchase made in each of the 12 months, if possible.

In some cases, contributors had multiple transactions occurring during the same period, in these cases stumpage rates were recorded on a monthly basis over the time period described by the contributor.   In the majority of these cases, the actual product specific rates did not change over the period however, if there were changes, the interviewers recorded the changes at the nearest month.

2.4 Data Analysis

In a perfect world, it would be ideal to have volumes associated with each reported price point in the survey. As this level of detail is impractical in a survey of this nature, we employed an approach which weighted each price point by dividing the total annual volume by the number of price points reported by each participant. This provided a practical and reasonable solution to weighting individual price points.

The majority of the product specific sample data did not exhibit a definable normal, binomial or other distribution and therefore non-parametric or distribution free techniques were used to determine the benchmark prices presented in this report. In cases where sample populations follow a known distribution, the applied techniques are also applicable in determining benchmark prices.

As illustrated in Appendix B, an Inter-Quartile approach based on Wonnacott and Wonnacott's (1972) *Best, Easy, Systematic* (BES) technique provides an appropriate method for calculating average unit values as well as the respective standard deviation.

3.0 Maritime Results

A potential contributor list that consisted of 1,833 businesses across the Maritimes was developed from a number of data lists including telephone directories, Workman's Compensation Boards and various websites. Each business was contacted by telephone and introduced to the project using a script that was developed for this survey.

A total of 226 potential contributors had purchased stumpage during the survey period and agreed to discuss the survey in more detail with the interview team. Of these, 110 surveys were completed during face-to-face interviews which were conducted between April and July 2013.

3.1 New Brunswick

Table 1 summarizes the number of stumpage survey transactions (purchases from a unique woodlot) and the number of stumpage price points (reported stumpage for a specific product) by county as reported by the participants. A total of 132 transactions composed of 716 price points were recorded.

Table 1: Summary of New Brunswick Stumpage Transactions and Stumpage Price Points (reported stumpage rate/product/month) by County

County	Number of Transactions Reported	% of Total	Number of Price Points	% of Total
Albert	11	7	47	7
Carleton	34	22	172	25
Charlotte	12	8	46	6
Gloucester	≤8	≤5	≤36	≤5
Kent	28	18	138	19
Kings	15	10	63	9
Madawaska	≤8	≤5	≤36	≤5
Northumberland	13	8	≤36	≤5
Queens	8	≤5	≤36	≤5
Restigouche	≤8	≤5	≤36	≤5
Saint John	≤8	≤5	≤36	≤5
Sunbury	≤8	≤5	≤36	≤5
Victoria	≤8	≤5	≤36	≤5
Westmorland	9	6	42	6
York	16	10	90	13
Total	**156**	**100%**	**716**	**100%**

Note: ≤ indicates values withheld to protect confidentiality.

Collectively, the participants reported a total harvest of 407,907 m^3 which represents approximately 34% of the New Brunswick private land harvest of 1,196,760 m^3 for the survey period (harvest data provided by NBDNRE).

3.2 Nova Scotia

The survey recorded a total of 1,565 price points which originated from 245 transactions for Nova Scotia which are reported at a county level in Table 2.

Participants reported a combined annual volume of 701,378 m^3 which is 35% of the Nova Scotia private land harvest of 2,022,716 m^3 for the same period (Nova Scotia Registry of Buyers).

Table 2: Summary of Nova Scotia Stumpage Transactions and Stumpage Price Points (reported stumpage rate/product/month) by County.

County	Number of Transactions Reported	% of Total	Number of Price Points	% of Total
Annapolis	≤12	≤5	≤78	≤5
Antigonish	≤12	≤5	≤78	≤5
Cape Breton	≤12	≤5	≤78	≤5
Colchester	28	11	151	10
Cumberland	61	25	336	25
Digby	≤12	≤5	47	≤5
Guysborough	≤12	≤5	≤78	≤5
Halifax	17	7	116	9
Hants	19	8	105	8
Inverness	≤12	≤5	11	≤5
Kings	35	14	244	17
Lunenburg	23	9	138	10
Pictou	≤12	≤5	≤78	≤5
Queens	≤12	≤5	≤78	≤5
Richmond	≤12	≤5	≤78	≤5
Shelburne	≤12	≤5	≤78	≤5
Victoria	≤12	≤5	≤78	≤5
Yarmouth	≤12	≤5	≤78	≤5
Total	**245**	**100%**	**1,565**	**100%**

Note: ≤ indicates values withheld to protect confidentiality.

3.3 Prince Edward Island

The level of forest harvesting activities on Prince Edward Island is relatively small when compared to neighboring Nova Scotia and New Brunswick. The total number of harvesting contractors is proportionately smaller and as a result, only one face-to-face survey was completed for PEI. This contractor provided data for 5 transactions and 20 price points (Table 3).

Table 3: Summary of Prince Edward Island Stumpage Transactions and Stumpage Price Points (reported stumpage rate/product/month).

County	Number of Transactions	% of Total	Number of Price Points	% of Total
All	5	100%	20	100%

The participant reported an annual harvest that represents 3% of the estimated 386,000 m^3 annual provincial harvest from private woodlots (Canadian Council of Forest Ministers, National Forestry Database).

3.4 Ratings

Each product group was assigned a rating using the Inter-Quartile ratio calculated using:

(Q3 – Q1)/mean

where:

Q3 = Third quartile upper boundary
Q1 = First quartile upper boundary

The Inter-Quartile ratio was used to assign a rating to each product group wherever possible using the matrix shown in Table 4.

Table 4: Inter-Quartile Range/Mean Ranges Used To Estimate the Quality of the Product Specific Results.

Inter-Quartile Range/Mean (IQR)	Estimate of Quality
IQR <=50%	Good
50% < IQR <= 100%	Fair
IQR > 100%	Poor

3.5 Maritime Stumpage Rates

The survey results for Maritime stumpage rates during the period November 1, 2011 through October 31, 2012 are summarized in Table 5.

Table 5: Inter-Quartile Average Stumpage Rates for the Maritimes Weighted by Annual Participant Harvest Levels for the Period November 1, 2011 to October 31, 2012 ($/m3).

Product / Species			Mean	SD	n	Rating
Softwood	Softwood Veneer	White Pine	-	-	-	-
		Spruce-fir-jack pine	-	-	-	-
		Other Softwood	-	-	-	-
	Sawlogs	Spruce-fir-jack pine	$ 22.69	$ 3.24	438	Good
		White Pine	$ 18.49	$ 1.02	124	Good
		Hemlock	$ 13.58	$ 2.44	133	Fair
		Red Pine	$ 12.67	$ 1.00	65	Good
		Other Softwood	$ 4.84	$ 0.00	15	Good
	Studwood & Lathwood	Spruce-fir-jack pine	$ 18.26	$ 2.47	336	Good
		Hemlock	$ 8.20	$ 0.00	2	Good
		Red Pine	-	-	-	-
		Other Softwood	-	-	-	-
	Sawlogs, Studwood & Fencing	Cedar	$ 15.58	$ 2.91	27	Fair
	Poles & Pilings	Red Pine	-	-	-	-
		Jack Pine	-	-	-	-
		Larch	$ 2.26	$ 0.00	1	n/a
		Cedar	-	-	-	-
	Post, Rails & Shingles	Cedar	-	-	-	-
	Pulpwood Grade 1 (sorted)	Spruce-fir-jack pine	$ 8.23	$ 0.82	205	Good
	Pulpwood Grade 2 (sorted)	Spruce-fir-jack pine	$ 2.93	$ 1.10	78	Poor
	Pulpwood (unsorted)	Spruce-fir-jack pine	$ 7.25	$ 1.46	144	Fair
	Pulpwood (unsorted)	Other Softwood	$ 4.28	$ 2.31	6	Poor
	Weir Stakes	Any Softwood species	-	-	-	-
	Stemwood Biomass	Any Softwood species	$ 2.99	$ 0.77	44	Poor
	Forest biomass	Any Softwood species	$ 4.53	$ 0.00	3	Good

Sum =   1621

Product / Species			Mean	SD	n	Rating
Hardwood	Sawlog	Any Hardwood Species (except poplar)	$ 17.57	$ 3.76	19	Fair
	Sawlog and studwood	Poplar	$ 12.78	$ 4.43	11	Fair
	Pallet Logs	Any Hardwood Species	$ 9.13	$ 0.13	19	Good
	Pulpwood	Any Hardwood Species	$ 8.15	$ 1.74	251	Fair
	OSB Fibre	Any Hardwood Species	$ 9.53	$ 2.35	34	Fair
	Fuelwood	Any Hardwood Species	$ 12.42	$ 2.29	87	Fair
	Stemwood Biomass	Any Hardwood Species	$ 7.27	$ 0.00	17	Good
	Top Poles	Any Hardwood Species	-	-	-	-
	Ribbons	Any Hardwood Species	-	-	-	-
	Weir brush	Any Hardwood Species	-	-	-	-
	Other	Any Hardwood Species	25.41	2.48	242	Good

Sum =   680

4.0 Literature Cited

Wonnacott, T.H. and Wonnacott, R.J. 1972 *Introductory Statistics*.
New York, NY, John Wiley & Sons, 510 pp.

APPENDICES

Appendix A: Conversion Factors

All units of measure provided by participants to the surveys were converted to solid cubic meters (m^3) in order to standardize the results. The following Tables summarize the various conversion factors which were provided the respective agencies.

Table A1: New Brunswick Conversion Factors Used in this Study.

Group	Product/Unit	NB Conversion to m^3 (multiply)
General	1 cunit (100 solid cubic ft)	2.832
Softwood	1.22 m cord pulp	2.407
	2.50 m cord pulp	2.115
	2.54 m cord studwood	2.294
	2.84 m cord studwood	2.248
	3.14 m cord studwood	2.211
	1000 bf NB Log Rule	6.1
	1000 bf NB Log Rule (veneer)	5.3
	1000 bf International Rule	5.6
	1000 bf Bangor Rule	5.5
	1 tonne pulp	1.074
	1 tonne studwood	1.163
	1 tonne log	1.251
	1 tonne treelength	1.154
Cedar	1.26 m cord	2.407
	1.92 m cord	2.152
	2.54 m cord	2.039
	1 tonne log / stud / post & rail	1.564
	1 tonne shinglewood	1.408
	1 tonne treelength (non-butted, 25% cull)	1.173
Hardwood	1.22 m cord pulp	1.982
	2.50 m cord pulp	1.841
	1000 bf NB Log Rule	5.6
	1000 bf NB Log Rule (veneer)	5.3
	1000 bf International Rule	5.2
	1 tonne - all products	0.934
	1 ton (2000 lbs) - all products	0.847
Poplar	1.22 m cord pulp	2.407
	2.50 m cord pulp	2.209
	2.54 m cord lathwood	2.294
	1 tonne - all products	1.018
	1 ton (2000 lbs) - all products	0.924

Table A2: Nova Scotia Conversion Factors Used in this Study.

Group	Product/Unit	Desc. or Length (ft)[1]	NS Conversion to m^3 (multiply)
Softwood	Sawlog mbfm	CTL	5.663
	Sawlog fbm	CTL	0.005663
	Sawlog tonne	TL	1.167
	Studwood cord	8	2.322
	Studwood tonne	8	1.167
	Studwood m3(s)	8	0.641
	Studwood cord	10	2.265
	Studwood tonne	1	1.167
	Studwood m3(s)	10	0.625
	Pulp Fuelwood TL tonne	TL	1.167
	Pulp Fuelwood cord	8	2.209
	Pulp Fuelwood tonne	8	1.167
	Pulp Fuelwood m3(s)	8	0.609
	Pulp Fuelwood tonne	RL	1.167
	Pulp tonne	Chips	1.269
	Fuel tonne	Chips	0.817
Softwood Other	Hemlock tonne	All	1.026
	Larch tonne	All	1.033
	White Pine tonne	All	1.11
Hardwood	Sawlogs mfbm	CTL	5.663
	Sawlogs fbm	CTL	0.005663
	Sawlogs m3	CTL	1
	Sawlogs tonne	CTL	0.963
	Pulp/Fuel tonne	TL	0.963
	Pallet mfbm	8	5.663
	Pallet fbm	8	0.005663
	Pallet cords	8	2.209
	Pallet m3(S)	8	0.609
	Pallet tonne	8	0.963
	Pulp/Fuel cord	8	1.926
	Pulp/Fuel m3(S)	8	0.531
	Pulp/Fuel tonne	8	0.963
	Veneer mfbm		5.663
	Veneer fbm		0.005663
	Veneer tonnes		0.963

[1]: CTL = Cut to Length, TL = Tree Length.

Table A3: Prince Edward Island Conversion Factors Used in this Study.

Group	Product/Unit	length Feet	PEI Conversion to m3 (multiply)
Softwood	Pulp cord	All	2.2
	Studwood/Sawlogs cord	All	2.4

Appendix B: Inter-Quartile Weighting Method

An inter-quartile approach based on Wonnacott and Wonnacott's (1972) *Best, Easy, Systematic* (BES) technique provides an appropriate, statistically valid method for dealing with outliers and provides for the calculation of the standard deviation.

The methodology is best described by an example which is shown in the table below.   In this case, 9 ranked price points (Column 2) have been provided by three participants. The annual harvest levels and total number of price points reported by each participant are shown in the Annual Volume column (3) and Number of Price Points Columns (4). By dividing the annual volume by the number of price points, a volume weighting for a price point is determined (5). These are then converted into a percentage which reflects the relative weighting of each price point (6). In the Inner Quartile Column (7), the lower and upper 25% of the Annual Volume Weights are assigned zero weight, or "trimmed." The last column (8) provides the rescaled inter-quartile weights for the dataset. These normalized weights (8) are multiplied by each respective price point (2) and summed to obtain the average. This methodology also permits calculation of the standard deviation.

ID (1)	Stumpage (2)	Annual Volume (3)	# Price Points (4)	Annual Vol/Price Points (5)	Annual Volume Weight (6)	Inner Quartile (Q2 + Q3 = 50%) (7)	Rescale (8)
1	$6.01	11,000	35	314.286	0.1280428	0.0	0.0
1	$6.01	11,000	35	314.286	0.1280428	0.0060855	0.012171
1	$6.01	11,000	35	314.286	0.1280428	0.1280428	0.256086
1	$6.01	11,000	35	314.286	0.1280428	0.1280428	0.256086
1	$6.01	11,000	35	314.286	0.1280428	0.1280428	0.256086
2	$11.32	2,703	6	450.495	0.1835356	0.1097862	0.219572
3	$14.26	3,173	22	144.204	0.0587502	0.0	0.0
3	$15.84	3,173	22	144.204	0.0587502	0.0	0.0
3	$15.84	3,173	22	144.204	0.0587502	0.0	0.0
			Sum	2,454.537	100%	50%	100%
						Mean	**$7.17**
						SD	**$2.20**