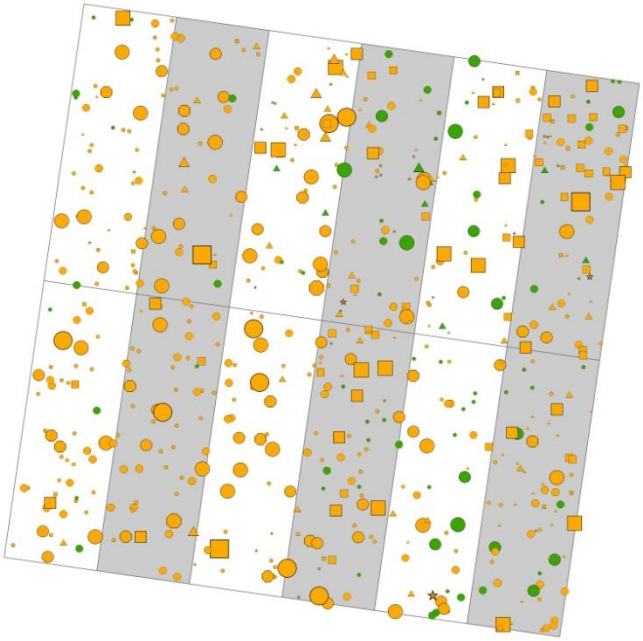
Saint-Quentin Marteloscope

Site Description



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Acknowledgments

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Several persons and companies have provided input in the site design and development of material, including:

- Selection of sites :
  - Gaëtan Pelletier – NHRI
  - Daniel Soucy – NBDNR
  - Yves O'Brien - Groupe Savoie
  - Denis Levesque - Groupe Savoie
  - Michel Caron – Acadian Timber
- Site layout :
  - Yvon Dubé, Civil engineering technologist
- Compiler development :
  - Marie-Pier Arsenault
  - John Leclair
- Tree classification and measurement :
  - Roger Gagné – Canadian Forest Service (training)
  - Sylvain Caron – 4BM
  - Philippe Poitras – 4BM
  - Eric Caron – 4BM
  - Lucien Sirois – 4BM
  - Ted Voisine – 4BM
  - Dominique Frenette – 4BM
- Tree cartography :
  - Marcel Cyr – CFDS
  - Gaëtan Therrien – CFDS
  - Jules Landry – CFDS
- Final report drafting and layout :
  - Caroline Pagé

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Introduction

General Description of a Marteloscope

A marteloscope is a 1 hectare training area for tree marking. It is coupled with a computer "compiler" that allows the analysis of the nature and intensity of each marker's tree selection, following various criteria.

All trees having a diameter at breast height (dbh) greater than 9 cm were measured, numbered and located on a map. These data help characterize initial stand conditions (stand volume, basal area, tree species distribution by form class, vigor, lumber potential, etc.) as well as the exact site design. The associated computer tool provides a summary of harvest choices made by participants (volume selected, categories of wood selected, etc.).

The marteloscopes that are part of this network are subdivided into six corridors 16.7 meters wide to facilitate the complete coverage of the area by the markers (Figure 1). Each tree number has been painted at breast height in order to be clearly visible by markers when moving in the direction indicated by the arrows in each corridor.

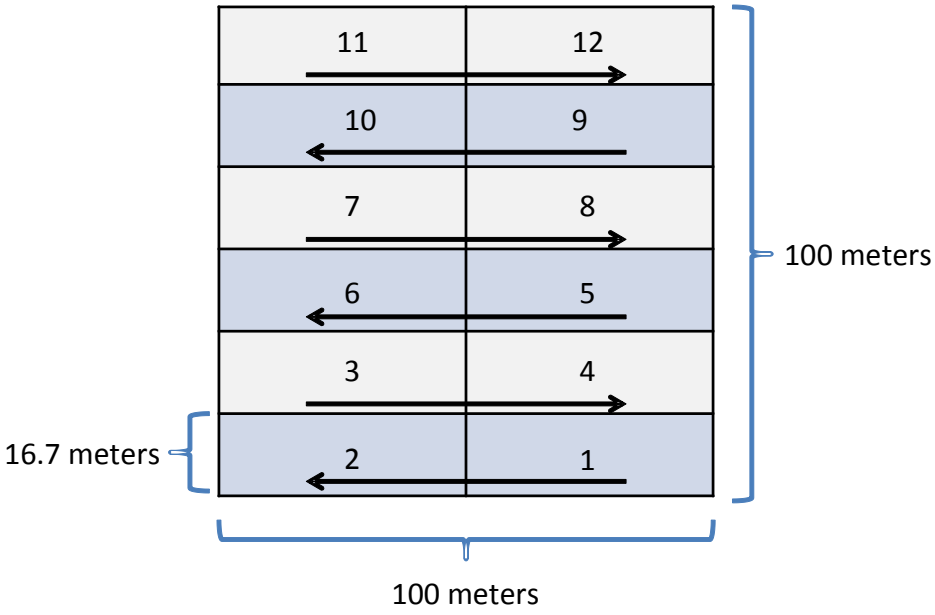


Figure 1. Example of marteloscope design. The arrows indicate the recommended walking direction in order to easily see tree numbers.

Intended Uses of Marteloscopes

Marteloscopes are set up in order to fulfill two particular needs:

1. Training and standardisation:
    a. Students from forestry programs.
    b. Workers conducting tree surveys and classification.
    c. Harvest equipment operators.
    d. Harvest operations supervisors.

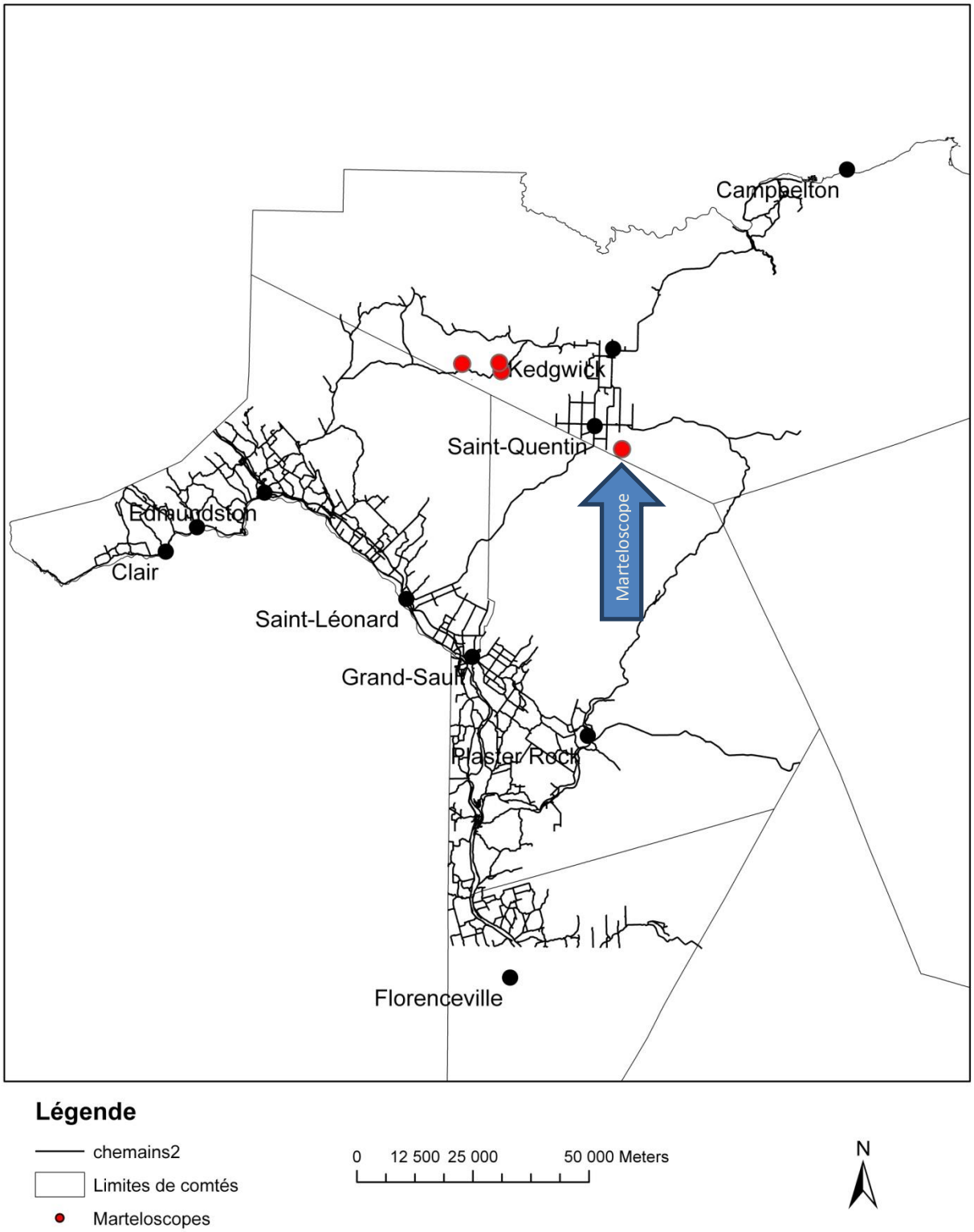
2. Fundamental and applied research:
    a. Discussion basis for various stakeholders in forest management.
    b. Development of decision support tools for uneven-aged stand management.
    c. Evaluate modifications to silviculture prescriptions.
    d. Development of remote sensing tools.

Site History

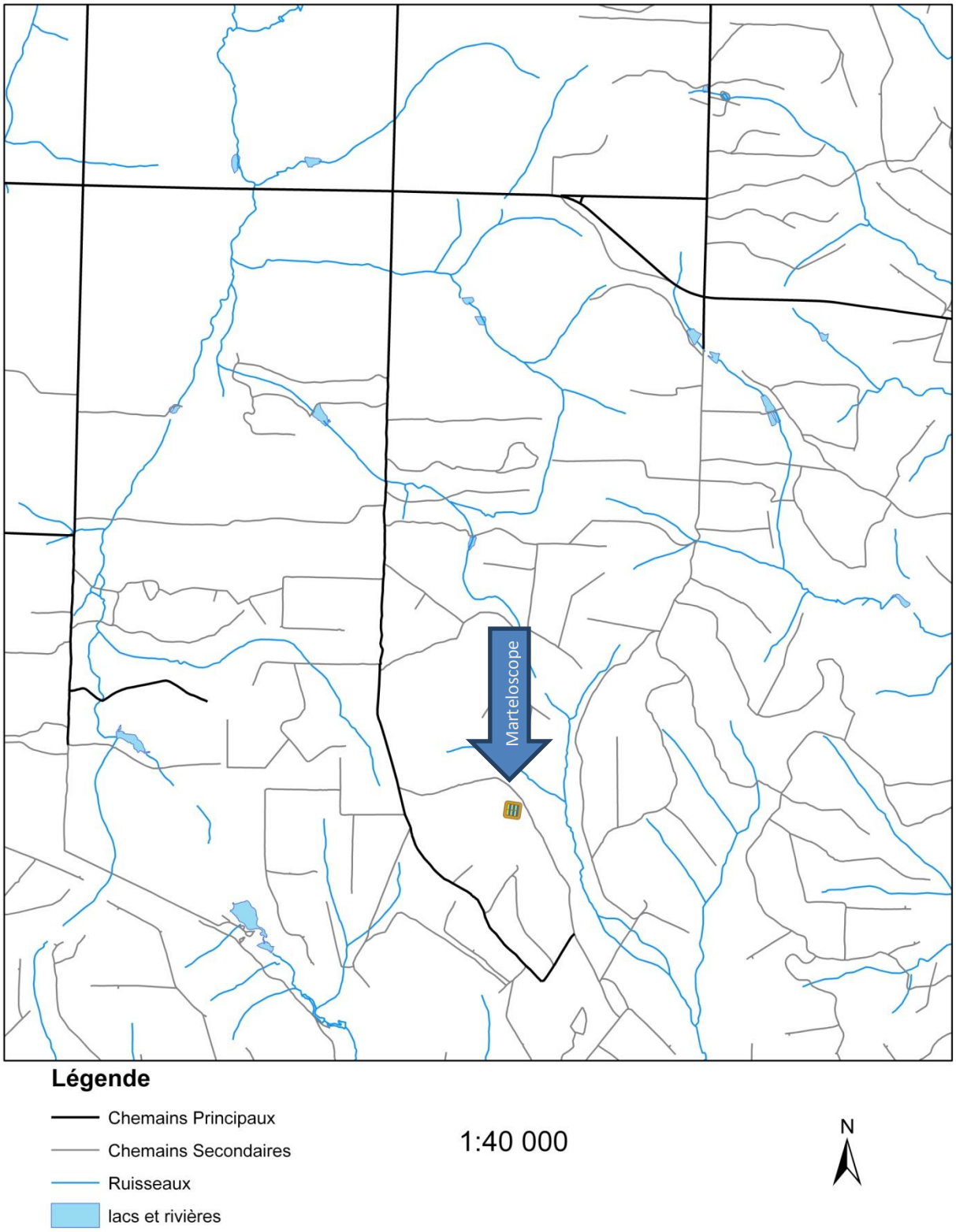
There is no evidence of previous harvesting on this site.

The marteloscope is located in the control area of a selection cutting research site set up in the winter of 2008.

Location of the four marteloscopes installed in 2013



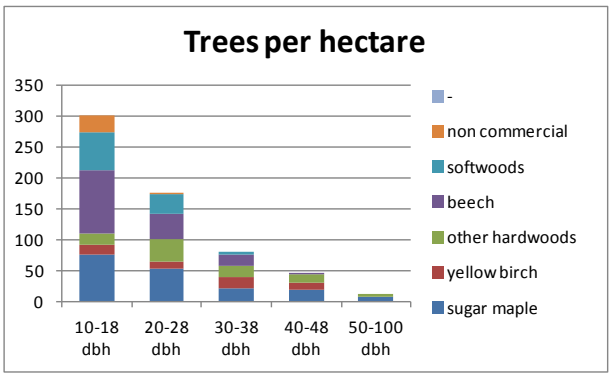
Saint-Quentin Marteloscope Location

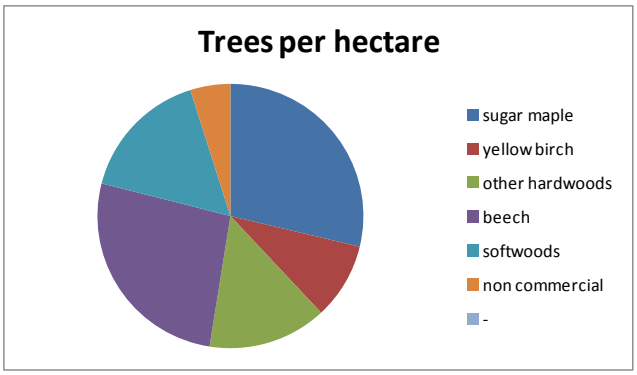


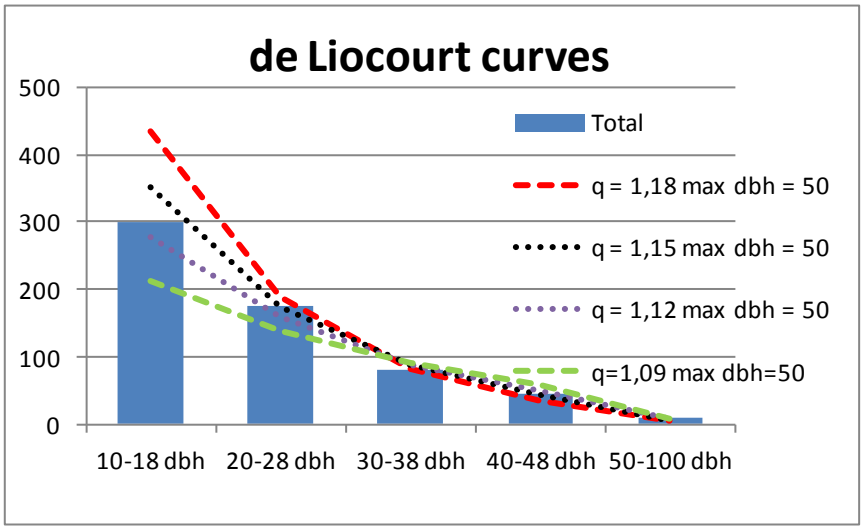
Saint-Quentin Marteloscope Initial Stand Conditions

Trees per Hectare

Trees per hectare								
Species	**10-18 dbh**	**20-28 dbh**	**30-38 dbh**	**40-48 dbh**	**50-100 dbh**	**Total**	**Proportion**	**Qdbh**
sugar maple	75	54	21	18	8	**176**	**29%**	**27,0**
yellow birch	16	10	18	13	0	**57**	**9%**	**31,5**
other hardwoods	19	36	19	12	3	**89**	**15%**	**29,1**
beech	102	41	17	2	0	**162**	**26%**	**19,8**
softwoods	60	33	6	0	0	**99**	**16%**	**18,9**
non commercial	28	2	0	0	0	**30**	**5%**	**14,2**
-	0	0	0	0	0	**0**	**0%**	**0,0**
Total	300	176	81	45	11	613		
Proportion	49%	29%	13%	7%	2%			

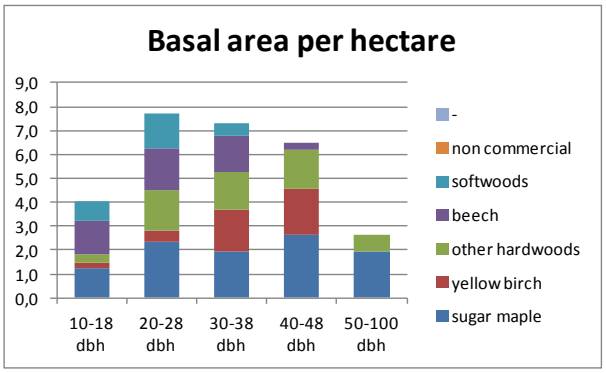


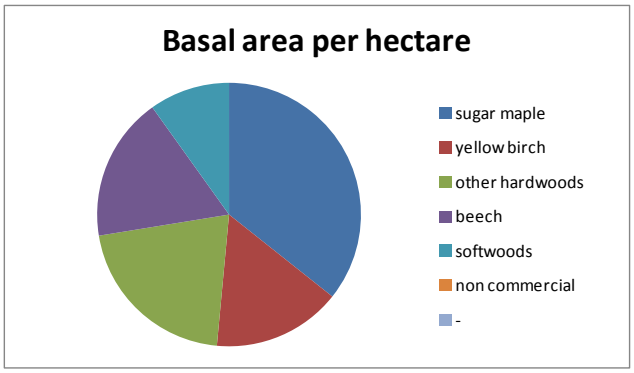




Basal Area per Hectare

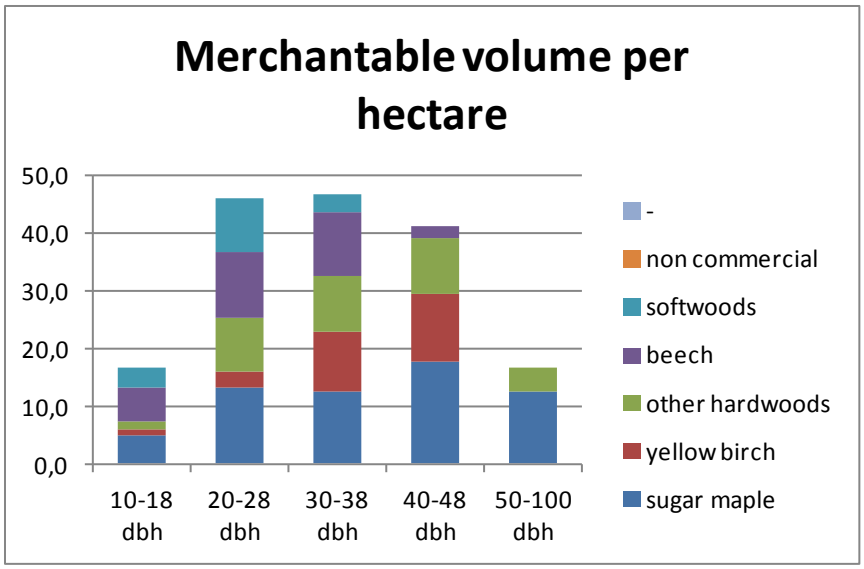
Basal area per hectare							
Species	**10-18 dbh**	**20-28 dbh**	**30-38 dbh**	**40-48 dbh**	**50-100 dbh**	**Total**	**Proportion**
sugar maple	1,2	2,3	1,9	2,7	1,9	**10,1**	**36%**
yellow birch	0,3	0,5	1,8	1,9	0,0	**4,4**	**16%**
other hardwoods	0,3	1,7	1,6	1,6	0,7	**5,9**	**21%**
beech	1,4	1,8	1,5	0,3	0,0	**5,0**	**18%**
softwoods	0,8	1,5	0,5	0,0	0,0	**2,8**	**10%**
non commercial	0,0	0,0	0,0	0,0	0,0	**0,0**	**0%**
-	0,0	0,0	0,0	0,0	0,0	**0,0**	**0%**
Total	4,0	7,7	7,3	6,5	2,7	28,2	
Proportion	14%	27%	26%	23%	9%		



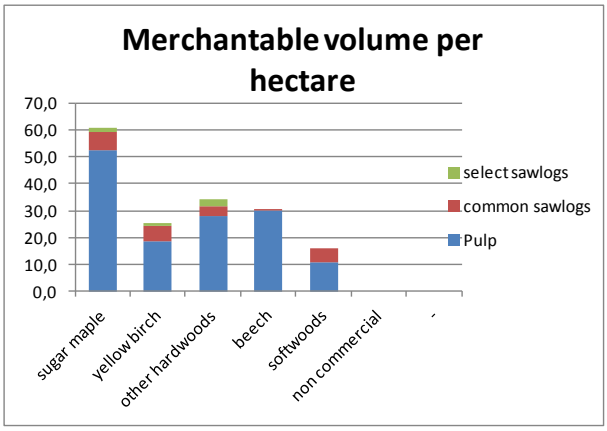


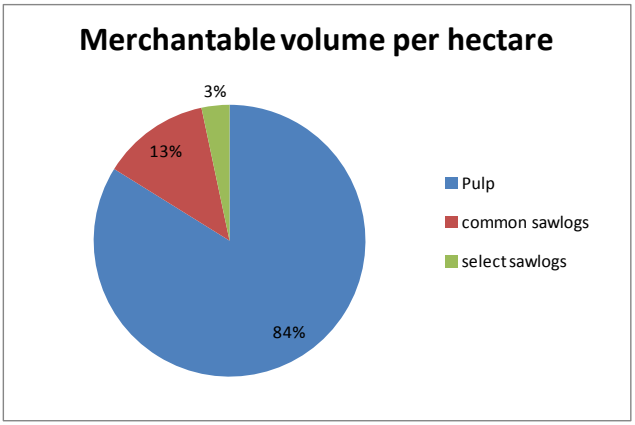
Merchantable Volume per Hectare

Merchantable volume per hectare							
Species	**10-18 dbh**	**20-28 dbh**	**30-38 dbh**	**40-48 dbh**	**50-100 dbh**	**Total**	**Proportion**
sugar maple	4,8	13,3	12,5	17,8	12,5	**60,9**	**36%**
yellow birch	1,0	2,5	10,5	11,5	0,0	**25,6**	**15%**
other hardwoods	1,3	9,4	9,6	9,8	4,2	**34,3**	**21%**
beech	5,9	11,5	11,0	2,1	0,0	**30,6**	**18%**
softwoods	3,5	9,1	3,2	0,0	0,0	**15,8**	**9%**
non commercial	0,0	0,0	0,0	0,0	0,0	**0,0**	**0%**
-	0,0	0,0	0,0	0,0	0,0	**0,0**	**0%**
Total	16,6	45,8	46,8	41,3	16,7	167,2	
Proportion	10%	27%	28%	25%	10%		



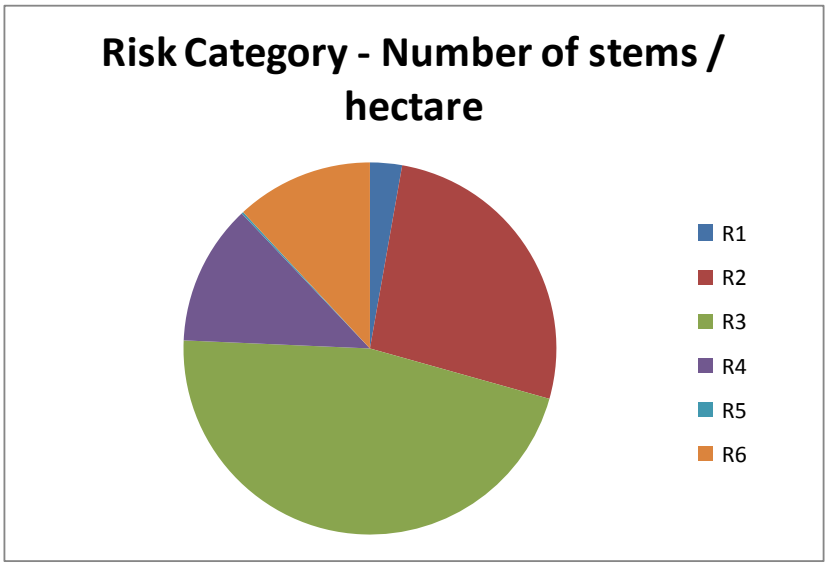
Merchantable volume per hectare					
Species	**Pulp**	**common sawlogs**	**select sawlogs**	**Total**	**Proportion**
sugar maple	52,6	6,5	1,7	**61**	**36%**
yellow birch	18,6	5,8	1,1	**26**	**15%**
other hardwoods	28,1	3,5	2,7	**34**	**21%**
beech	30,2	0,4	0,0	**31**	**18%**
softwoods	10,6	5,1	0,0	**16**	**9%**
non commercial	0,0	0,0	0,0	**0**	**0%**
-	0,0	0,0	0,0	**0**	**0%**
Total	140,2	21,5	5,6	**167**	
Proportion	84%	13%	3%		





Number of Trees and Volume Distribution per Risk Class[1]

Risk Category - Number of stems / hectare								
Species	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**	**Total**	**Proportion**
sugar maple	3	78	81	5	0	9	**176**	**29%**
yellow birch	0	20	35	0	0	2	**57**	**9%**
other hardwoods	1	24	41	9	0	14	**89**	**15%**
beech	0	4	82	60	0	16	**162**	**26%**
softwoods	12	31	34	0	1	21	**99**	**16%**
non commercial	1	6	11	1	0	11	**30**	**5%**
-	0	0	0	0	0	0	**0**	**0%**
Total	17	163	284	75	1	73	**613**	
Proportion	3%	27%	46%	12%	0%	12%		



Risk Category - Volume / hectare								
Species	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**	**Total**	**Proportion**
sugar maple	0.3	15.5	36.0	3.9	0.0	5.1	**60.9**	**36%**
yellow birch	0.0	9.1	16.1	0.0	0.0	0.3	**25.6**	**15%**
other hardwoods	0.1	10.1	18.1	2.7	0.0	3.4	**34.3**	**21%**
beech	0.0	1.0	7.2	17.0	0.0	5.5	**30.6**	**18%**
softwoods	3.0	3.0	4.2	0.0	0.1	5.4	**15.8**	**9%**
non commercial	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**	**0%**
-	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**	**0%**
Total	3.5	38.7	81.6	23.6	0.1	19.8	**167.2**	
Proportion	2%	23%	49%	14%	0%	12%		

[1] Pelletier, G., D. Landry and M. Girouard (2013). A tree classification system for New Brunswick. Edmundston, New Brunswick, Northern Hardwoods Research Institute. « R5 » & « R6 » represent dead trees with or without recoverable products respectively.

Number of Trees and Volume Distribution per Form Class[2]

Form Category - Number of stems / hectare										
Species	**F1**	**F2**	**F3**	**F4**	**F5**	**F6**	**F7**	**F8**	**Total**	**Proportion**
sugar maple	36	100	4	0	8	9	13	5	**175**	**30%**
yellow birch	9	28	2	0	0	4	10	2	**55**	**9%**
other hardwoods	20	37	3	1	6	2	10	6	**85**	**14%**
beech	37	91	0	4	8	5	5	3	**153**	**26%**
softwoods	73	15	0	0	0	6	1	0	**95**	**16%**
non commercial	0	15	0	1	3	3	2	0	**24**	**4%**
-	0	0	0	0	0	0	0	0	**0**	**0%**
Total	175	286	9	6	25	29	41	16	587	
Proportion	30%	49%	2%	1%	4%	5%	7%	3%		

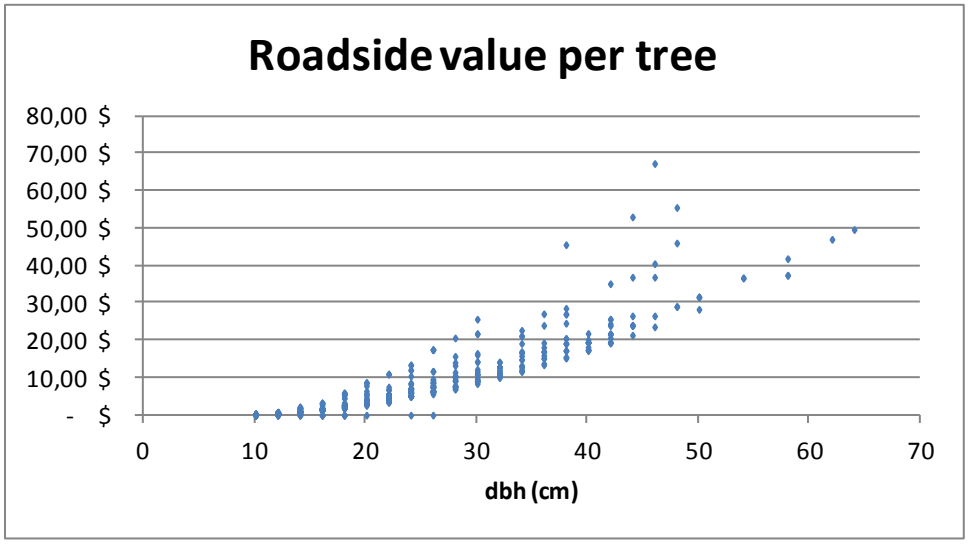
Form Category - Number of stems / hectare										
Risk Category	**F1**	**F2**	**F3**	**F4**	**F5**	**F6**	**F7**	**F8**	**Total**	**Proportion**
R1	12	5	0	0	0	0	0	0	**17**	**3%**
R2	56	84	3	0	6	5	8	1	**163**	**28%**
R3	65	150	6	2	8	15	28	10	**284**	**48%**
R4	18	33	0	4	7	4	4	3	**73**	**12%**
R5	1	0	0	0	0	0	0	0	**1**	**0%**
R6	23	14	0	0	4	5	1	2	**49**	**8%**
Total	175	286	9	6	25	29	41	16	587	
Proportion	30%	49%	2%	1%	4%	5%	7%	3%		

Economic Data

Value			
Species	**Harvest cost**	**Mill price**	**Roadside value**
sugar maple	927 $	2 548 $	1 621 $
yellow birch	386 $	1 177 $	791 $
other hardwoods	534 $	1 305 $	772 $
beech	519 $	1 143 $	624 $
softwoods	281 $	812 $	531 $
non commercial	- $	- $	- $
-	- $	- $	- $
Total	2 647 $	6 984 $	4 337 $

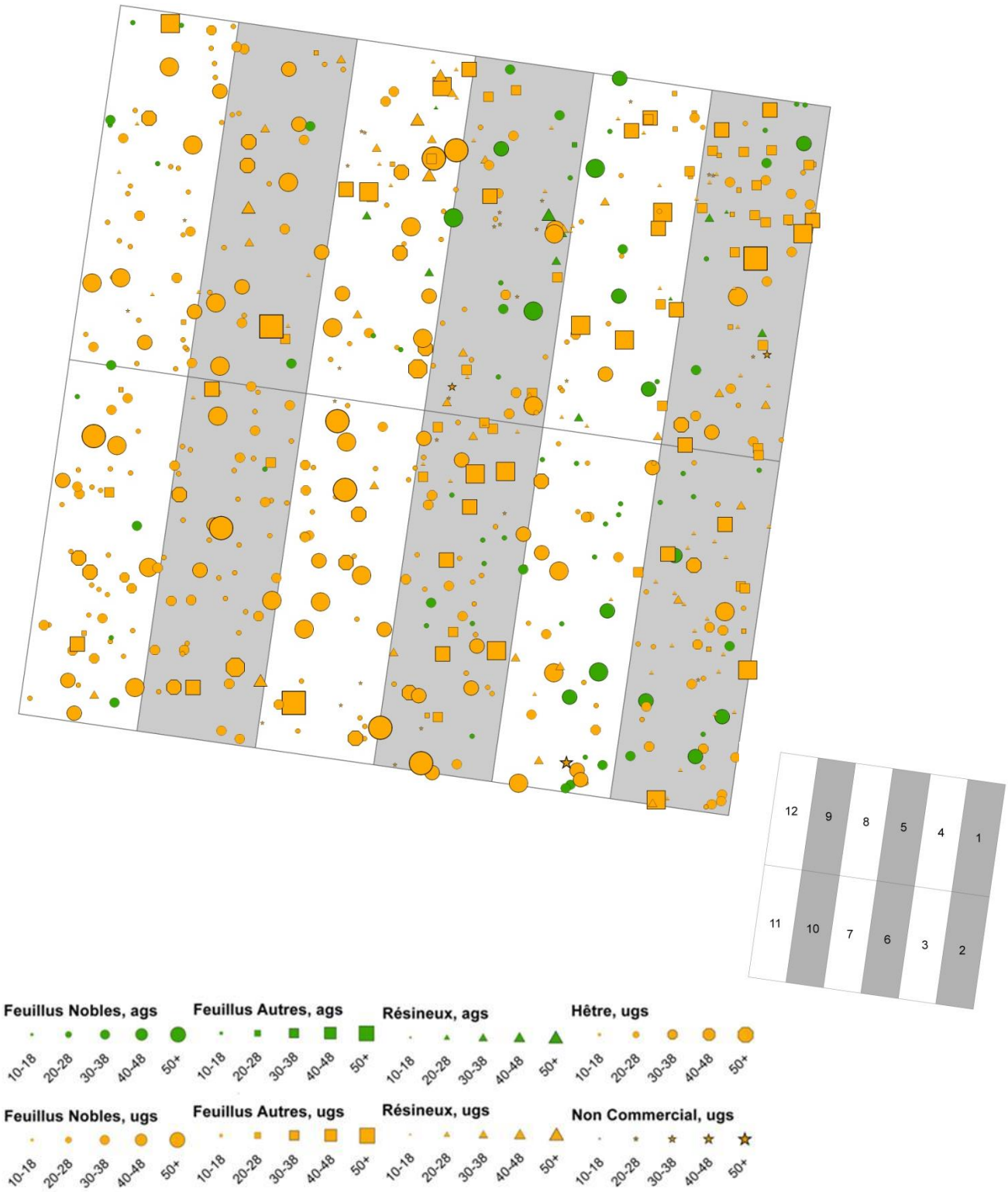
[2] Pelletier, G., D. Landry and M. Girouard (2013). A tree classification system for New Brunswick. Edmundston, New Brunswick, Northern Hardwoods Research Institute.

Net value per hectare							
Species	**10-18 dbh**	**20-28 dbh**	**30-38 dbh**	**40-48 dbh**	**50-100 dbh**	**Total**	**Proportion**
sugar maple	82 $	348 $	389 $	496 $	307 $	**1 621 $**	**37%**
yellow birch	17 $	56 $	327 $	391 $	- $	**791 $**	**18%**
other hardwoods	21 $	192 $	218 $	237 $	103 $	**772 $**	**18%**
beech	91 $	234 $	248 $	50 $	- $	**624 $**	**14%**
softwoods	98 $	330 $	103 $	- $	- $	**531 $**	**12%**
non commercial	- $	- $	- $	- $	- $	**- $**	**0%**
-	- $	- $	- $	- $	- $	**- $**	**0%**
Total	309 $	1 159 $	1 285 $	1 174 $	410 $	4 337 $	
Proportion	7%	27%	30%	27%	9%		



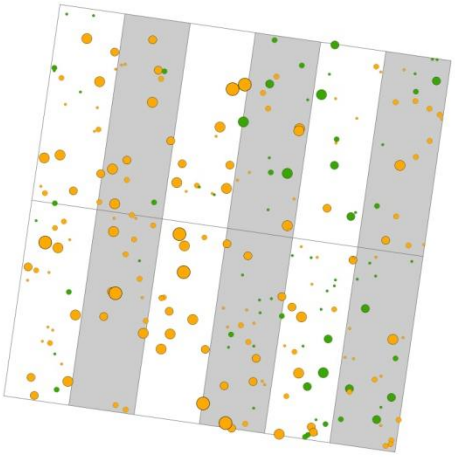
Net value per cubic meter						
Species	**10-18 dbh**	**20-28 dbh**	**30-38 dbh**	**40-48 dbh**	**50-100 dbh**	**Mean**
sugar maple	17 $	26 $	31 $	28 $	25 $	**27 $**
yellow birch	16 $	22 $	31 $	34 $	- $	**31 $**
other hardwoods	16 $	20 $	23 $	24 $	24 $	**22 $**
beech	15 $	20 $	22 $	24 $	- $	**20 $**
softwoods	28 $	36 $	32 $	- $	- $	**34 $**
non commercial	- $	- $	- $	- $	- $	
-	- $	- $	- $	- $	- $	
Mean	19 $	25 $	27 $	28 $	25 $	26 $

Tree Locations in the Saint-Quentin Marteloscope

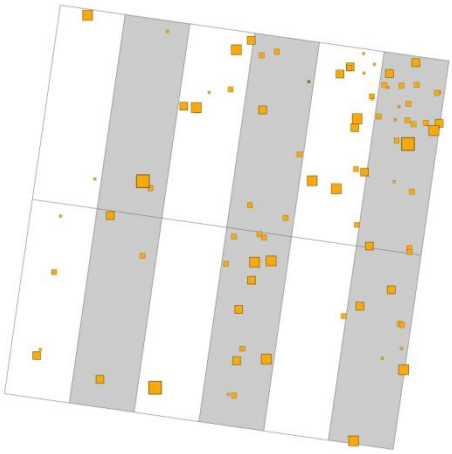


Detailed Cartography per Species Group

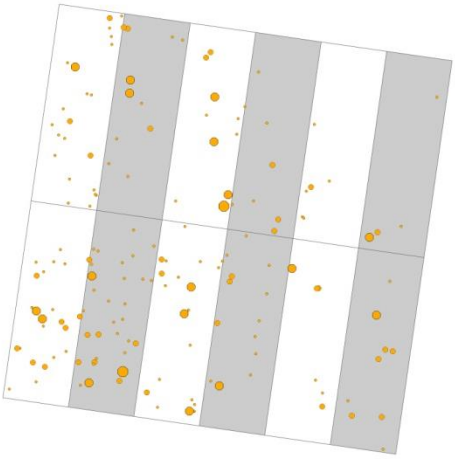
Tolerant Hardwoods



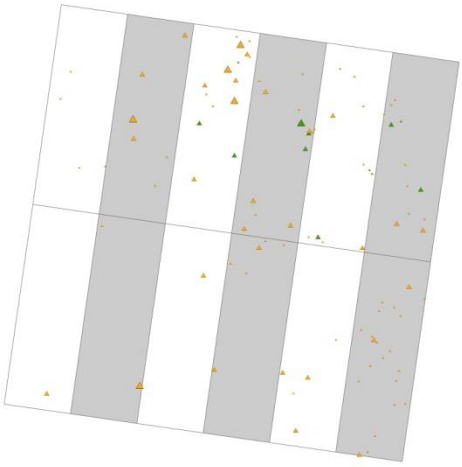
Other Hardwoods



Beech



Softwoods



Aerial Photo