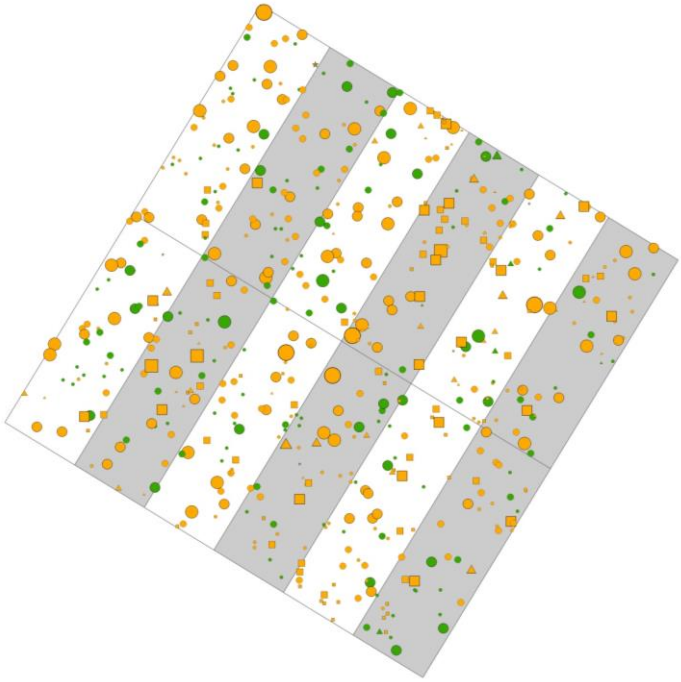
Gounamitz 1 Marteloscope

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 identified, 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.

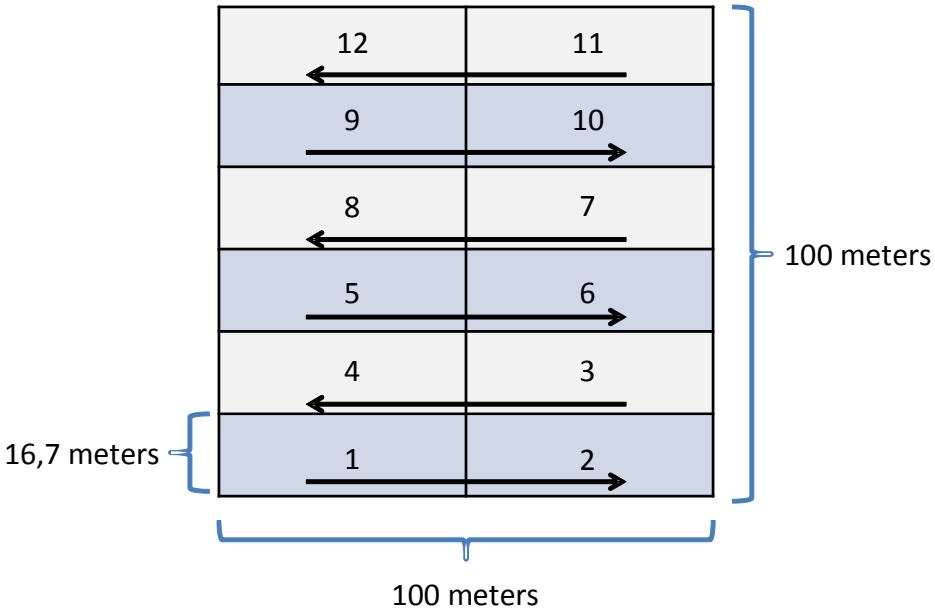


Figure 1. Example of marteloscope design. The arrows indicate the recommended walking direction in order to easily see tree numbers.

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

The latest documented harvesting operation for this stand is dated in 1994. At the time of treatment, the stand presented a basal area of 24 m²/hectare, and the basal area after cutting was 16.5 m²/hectare. Available documentation referred to the use of a cable skidder and present a diameter-limit cutting prescription:

For tolerant hardwoods of « Timber » quality, harvest of:

Yellow birch	42 cm+
Sugar maple	38 cm+
Other tolerant hardwoods	30 cm+

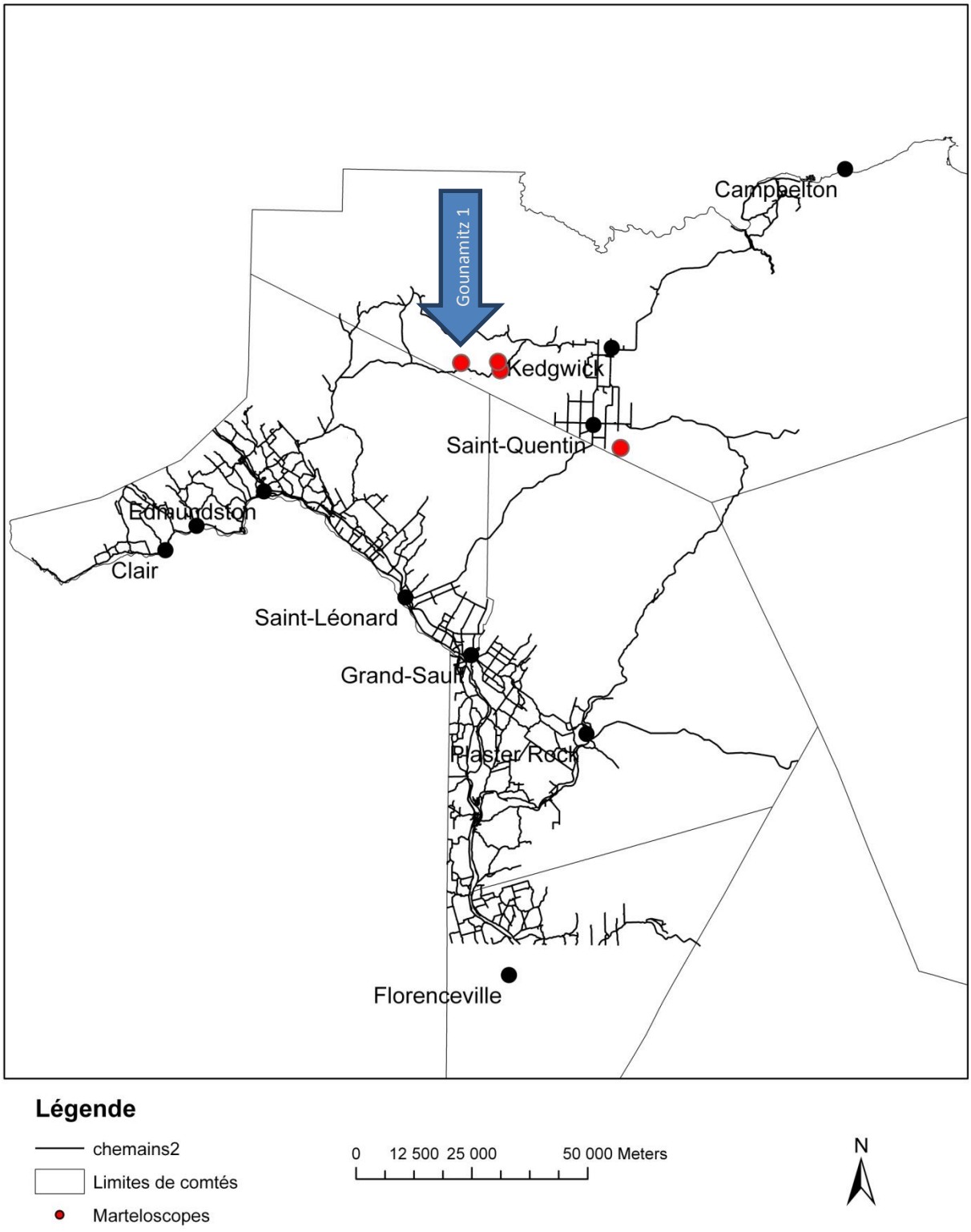
For tolerant hardwoods of « Pulp » quality, harvest of:

Yellow birch	42 – 60 cm
Sugar maple	38 – 60 cm
Other tolerant hardwoods	30 – 60 cm

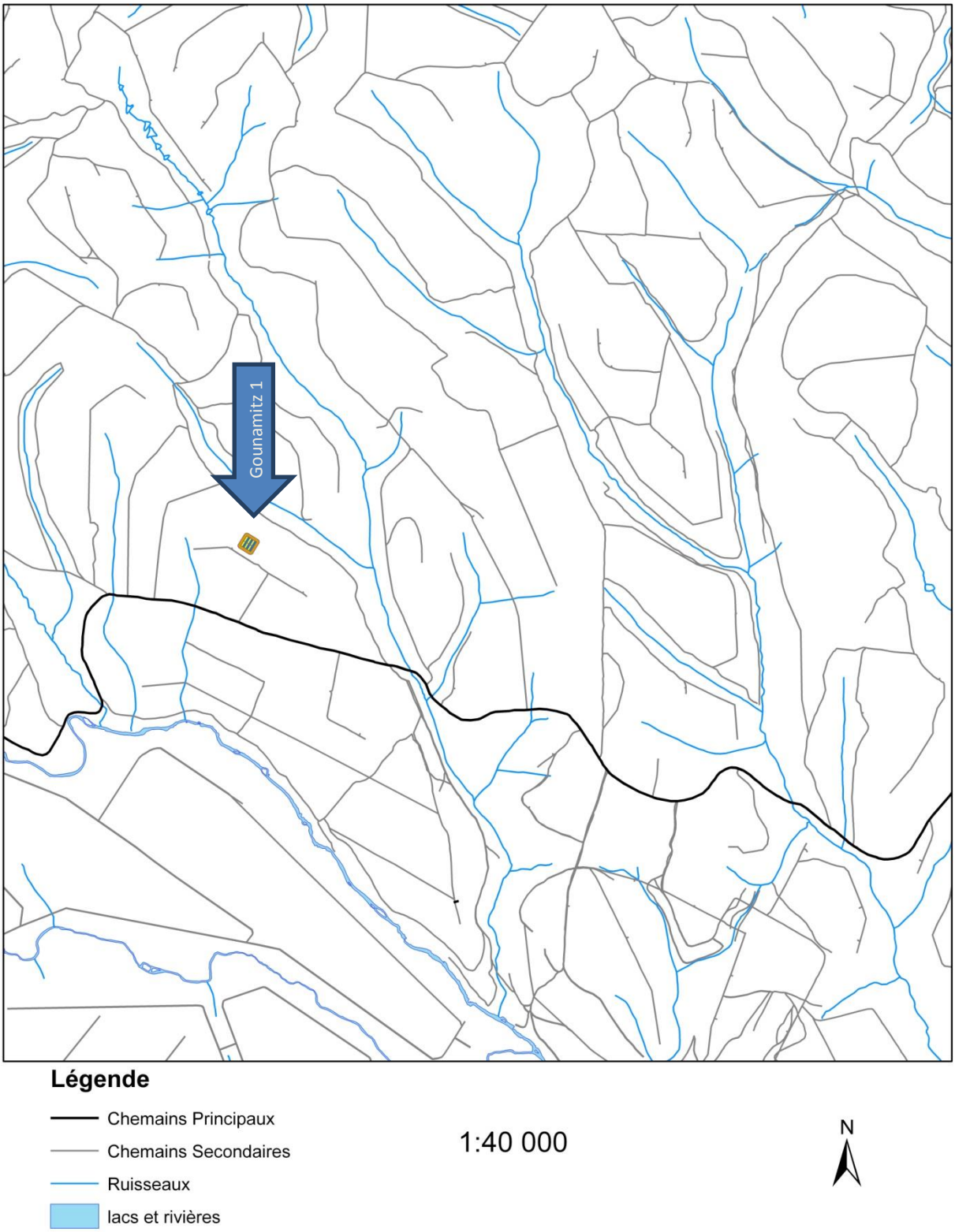
For softwoods, harvest of:

Fir	20 cm+
Spruce	34 cm+

Location of the four marteloscopes installed in 2013



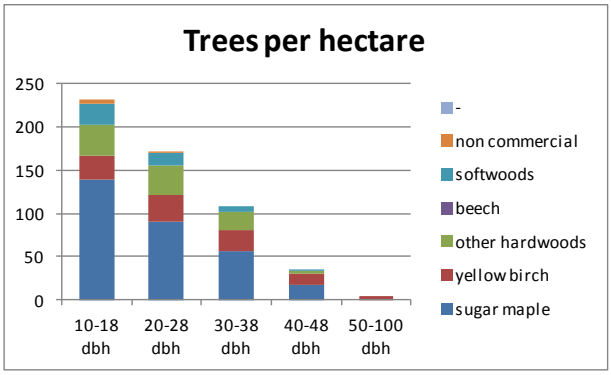
Gounamitz 1 Marteloscope Location

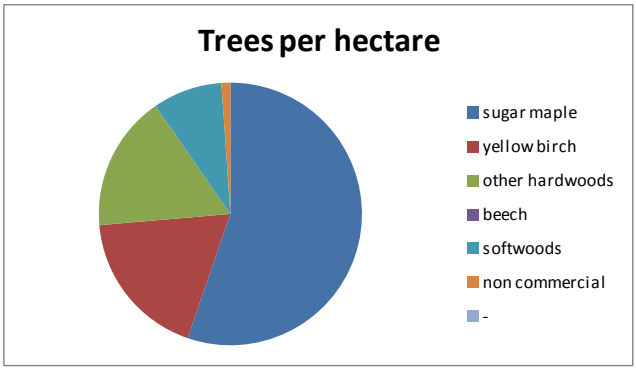


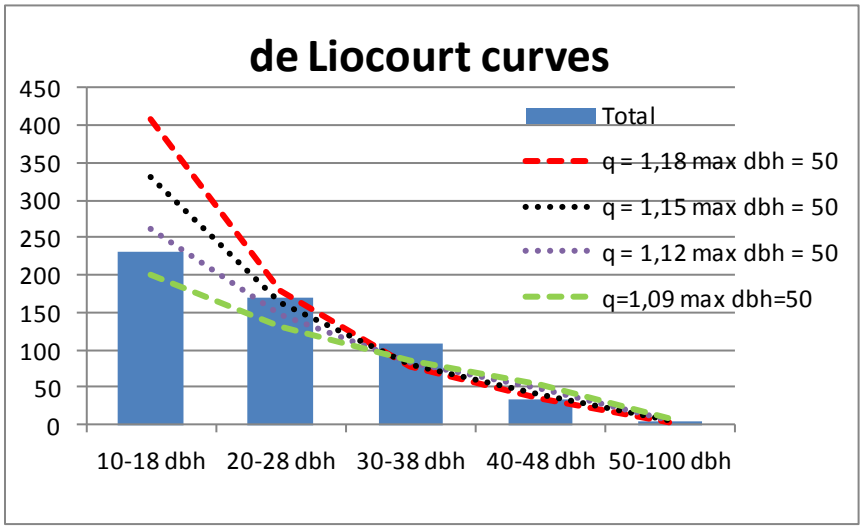
Gounamitz 1 Marteloscope Initial Stand Conditions

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	139	91	57	17	0	**304**	**55%**	**23.8**
yellow birch	28	30	24	14	5	**101**	**18%**	**30.0**
other hardwoods	35	34	20	3	0	**92**	**17%**	**24.1**
beech	0	0	0	0	0	**0**	**0%**	**0.0**
softwoods	24	15	7	1	0	**47**	**9%**	**20.8**
non commercial	5	1	0	0	0	**6**	**1%**	**14.6**
-	0	0	0	0	0	**0**	**0%**	**0.0**
Total	231	171	108	35	5	550		
Proportion	42%	31%	20%	6%	1%			

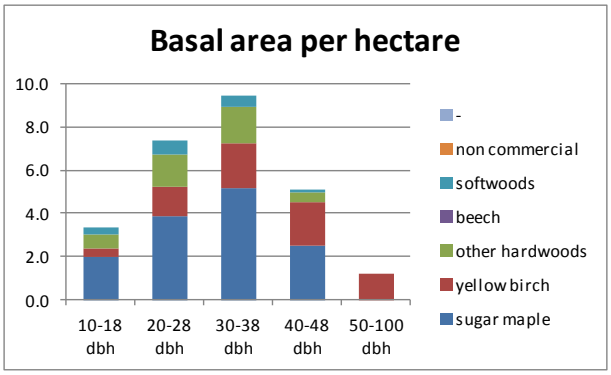


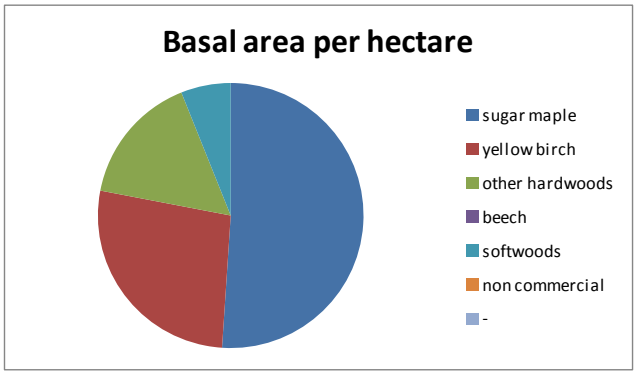




Basal Area per Hectare

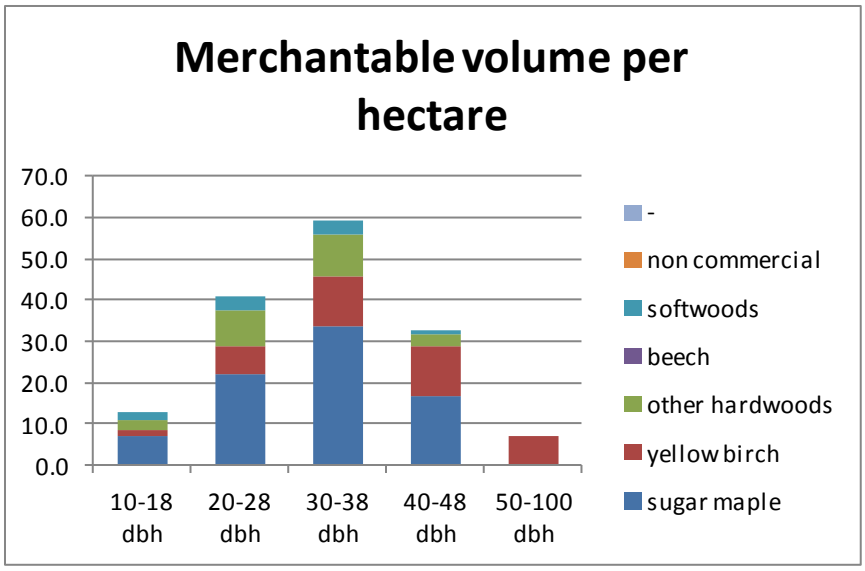
Basal area per hectare							
Species	**10-18 dbh**	**20-28 dbh**	**30-38 dbh**	**40-48 dbh**	**50-100 dbh**	**Total**	**Proportion**
sugar maple	2.0	3.9	5.2	2.5	0.0	**13.5**	**51%**
yellow birch	0.4	1.4	2.1	2.0	1.2	**7.1**	**27%**
other hardwoods	0.6	1.5	1.7	0.4	0.0	**4.2**	**16%**
beech	0.0	0.0	0.0	0.0	0.0	**0.0**	**0%**
softwoods	0.3	0.6	0.5	0.1	0.0	**1.6**	**6%**
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	3.3	7.3	9.4	5.1	1.2	26.4	
Proportion	13%	28%	36%	19%	5%		



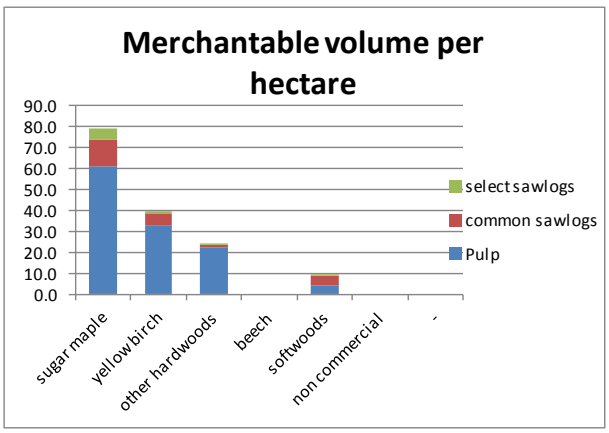


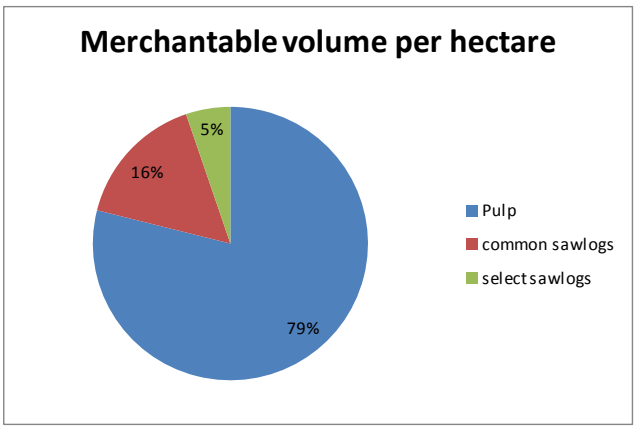
Merchantable Volume per Hectare

Merchantable volume per hectare							
Species	**10-18 dbh**	**20-28 dbh**	**30-38 dbh**	**40-48 dbh**	**50-100 dbh**	**Total**	**Proportion**
sugar maple	7.2	21.8	33.8	16.7	0.0	**79.4**	**52%**
yellow birch	1.4	7.2	12.0	12.1	7.1	**39.8**	**26%**
other hardwoods	2.6	8.3	10.1	2.7	0.0	**23.6**	**16%**
beech	0.0	0.0	0.0	0.0	0.0	**0.0**	**0%**
softwoods	1.5	3.6	3.5	1.0	0.0	**9.6**	**6%**
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	12.6	40.9	59.4	32.5	7.1	152.5	
Proportion	8%	27%	39%	21%	5%		



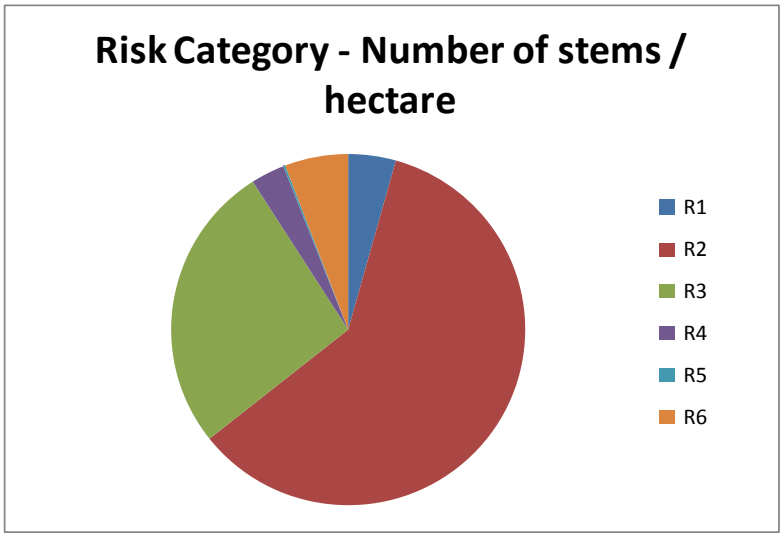
Merchantable volume per hectare					
Species	**Pulp**	**common sawlogs**	**select sawlogs**	**Total**	**Proportion**
sugar maple	61.1	12.6	5.7	**79**	**52%**
yellow birch	33.1	5.1	1.6	**40**	**26%**
other hardwoods	21.9	1.5	0.2	**24**	**16%**
beech	0.0	0.0	0.0	**0**	**0%**
softwoods	4.1	5.0	0.5	**10**	**6%**
non commercial	0.0	0.0	0.0	**0**	**0%**
-	0.0	0.0	0.0	**0**	**0%**
Total	120.3	24.2	8.0	**152**	
Proportion	79%	16%	5%		





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	14	224	60	4	0	2	**304**	**55%**
yellow birch	4	59	27	6	0	5	**101**	**18%**
other hardwoods	0	32	42	4	0	14	**92**	**17%**
beech	0	0	0	0	0	0	**0**	**0%**
softwoods	6	15	15	3	1	7	**47**	**9%**
non commercial	0	0	2	0	0	4	**6**	**1%**
-	0	0	0	0	0	0	**0**	**0%**
Total	24	330	146	17	1	32	**550**	
Proportion	4%	60%	27%	3%	0%	6%		



Risk Category - Volume / hectare								
Species	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**	**Total**	**Proportion**
sugar maple	1.0	57.7	20.3	0.3	0.0	0.1	**79.4**	**52%**
yellow birch	0.9	18.1	13.6	5.1	0.0	2.2	**39.8**	**26%**
other hardwoods	0.0	7.7	13.2	1.3	0.0	1.4	**23.6**	**16%**
beech	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**	**0%**
softwoods	1.8	3.5	2.3	0.3	0.1	1.5	**9.6**	**6%**
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	3.7	87.0	49.5	7.0	0.1	5.2	**152.5**	
Proportion	2%	57%	32%	5%	0%	3%		

[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	80	118	18	1	15	8	34	28	**302**	**56%**
yellow birch	14	34	9	1	14	5	12	11	**100**	**19%**
other hardwoods	4	25	9	0	13	7	10	16	**84**	**16%**
beech	0	0	0	0	0	0	0	0	**0**	**0%**
softwoods	37	4	1	0	0	1	0	1	**44**	**8%**
non commercial	0	3	1	1	0	0	0	0	**5**	**1%**
-	0	0	0	0	0	0	0	0	**0**	**0%**
Total	135	184	38	3	42	21	56	56	535	
Proportion	25%	34%	7%	1%	8%	4%	10%	10%		

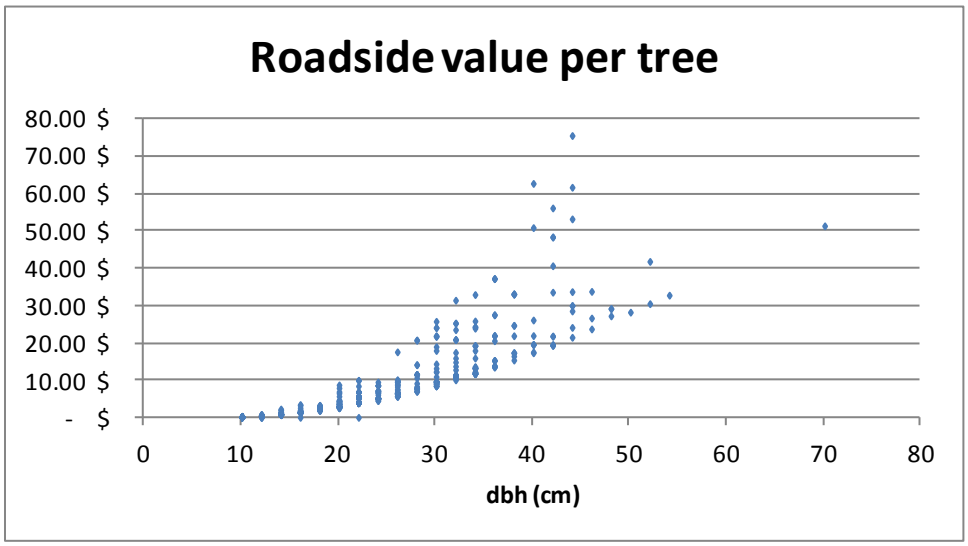
Form Category - Number of stems / hectare										
Risk Category	**F1**	**F2**	**F3**	**F4**	**F5**	**F6**	**F7**	**F8**	**Total**	**Proportion**
R1	12	7	0	0	1	0	0	4	**24**	**4%**
R2	95	117	20	0	26	12	27	33	**330**	**62%**
R3	20	52	16	1	13	8	22	14	**146**	**27%**
R4	3	6	1	1	1	1	2	2	**17**	**3%**
R5	1	0	0	0	0	0	0	0	**1**	**0%**
R6	4	2	1	1	1	0	5	3	**17**	**3%**
Total	135	184	38	3	42	21	56	56	535	
Proportion	25%	34%	7%	1%	8%	4%	10%	10%		

Economic Data

Value			
Species	**Harvest cost**	**Mill price**	**Roadside value**
sugar maple	1 280 $	3 641 $	2 361 $
yellow birch	607 $	1 719 $	1 112 $
other hardwoods	394 $	887 $	494 $
beech	- $	- $	- $
softwoods	164 $	567 $	404 $
non commercial	- $	- $	- $
-	- $	- $	- $
Total	2 444 $	6 815 $	4 371 $

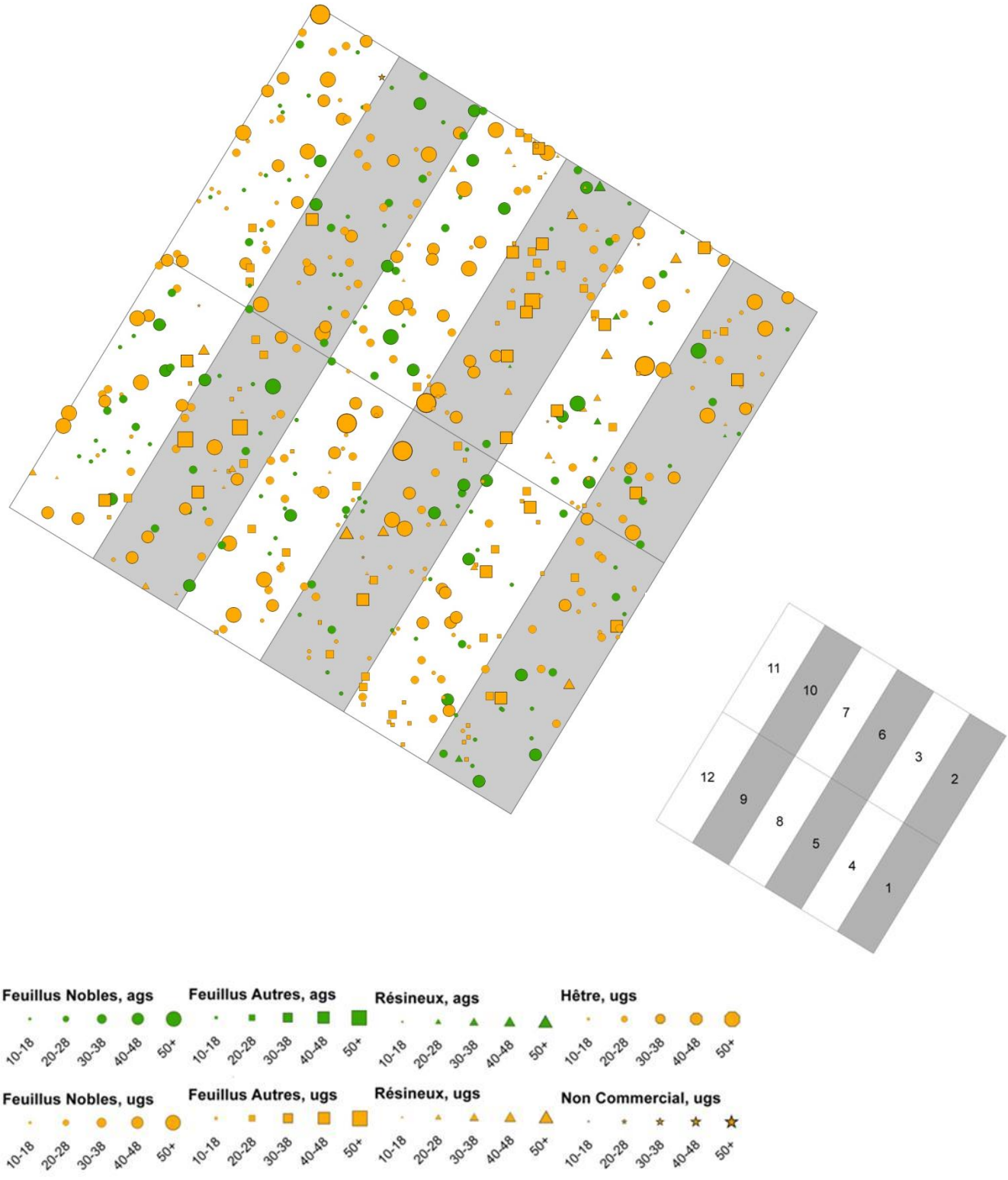
[2] Pelletier, G., D. Landry and M. Girouard (2013). A tree classification system for New Brunswick. Edmundston, New Brunswick, Northern Hardwoods Research Institute.

Net value per hectare							
Species	**10-18 dbh**	**20-28 dbh**	**30-38 dbh**	**40-48 dbh**	**50-100 dbh**	**Total**	**Proportion**
sugar maple	114 $	537 $	1 123 $	588 $	- $	**2 361 $**	**54%**
yellow birch	23 $	174 $	318 $	413 $	184 $	**1 112 $**	**25%**
other hardwoods	41 $	165 $	223 $	64 $	- $	**494 $**	**11%**
beech	- $	- $	- $	- $	- $	**- $**	**0%**
softwoods	34 $	145 $	162 $	62 $	- $	**404 $**	**9%**
non commercial	- $	- $	- $	- $	- $	**- $**	**0%**
-	- $	- $	- $	- $	- $	**- $**	**0%**
Total	211 $	1 022 $	1 827 $	1 127 $	184 $	4 371 $	
Proportion	5%	23%	42%	26%	4%		



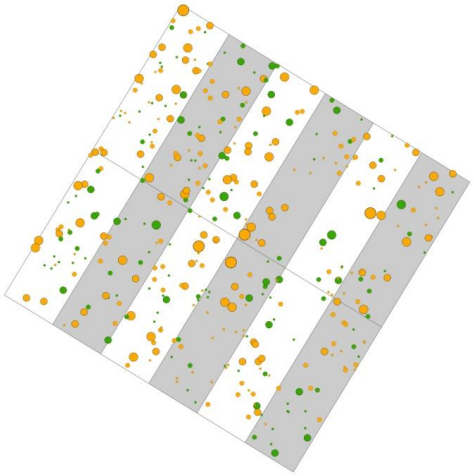
Net value per cubic meter						
Species	**10-18 dbh**	**20-28 dbh**	**30-38 dbh**	**40-48 dbh**	**50-100 dbh**	**Mean**
sugar maple	16 $	25 $	33 $	35 $	- $	**30 $**
yellow birch	16 $	24 $	26 $	34 $	26 $	**28 $**
other hardwoods	16 $	20 $	22 $	24 $	- $	**21 $**
beech	- $	- $	- $	- $	- $	
softwoods	23 $	40 $	46 $	65 $	- $	**42 $**
non commercial	- $	- $	- $	- $	- $	
-	- $	- $	- $	- $	- $	
Mean	17 $	25 $	31 $	35 $	26 $	29 $

Tree Locations in Gounamitz 1 Marteloscope

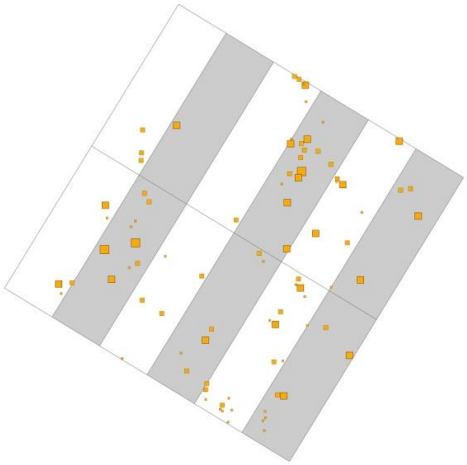


Detailed Cartography per Species Group

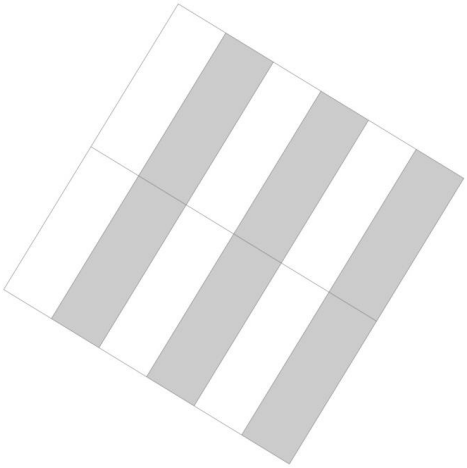
Tolerant Hardwoods



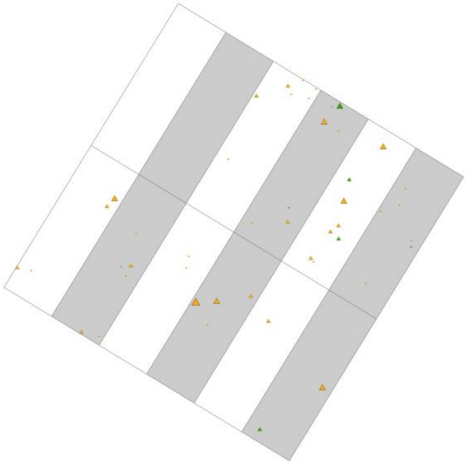
Other Hardwoods



Beech



Softwoods



Aerial Photo