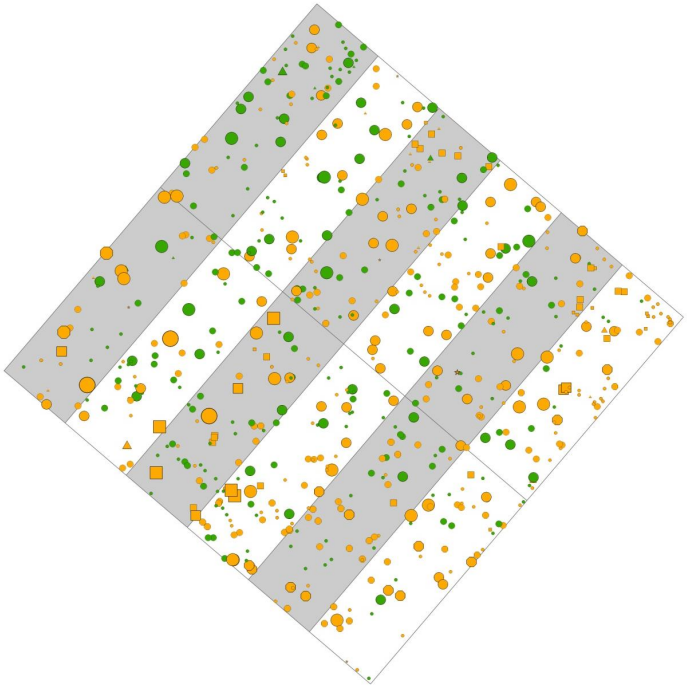
Gounamitz 2 Marteloscope

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
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  - Denis Levesque - Groupe Savoie
  - Michel Caron – Acadian Timber
- Site layout :
  - Yvon Dubé, Civil engineering technologist
- Compiler development :
  - Marie-Pier Arsenault
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- Tree classification and measurement :
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  - Sylvain Caron – 4BM
  - Philippe Poitras – 4BM
  - Eric Caron – 4BM
  - Lucien Sirois – 4BM
  - Ted Voisine – 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.

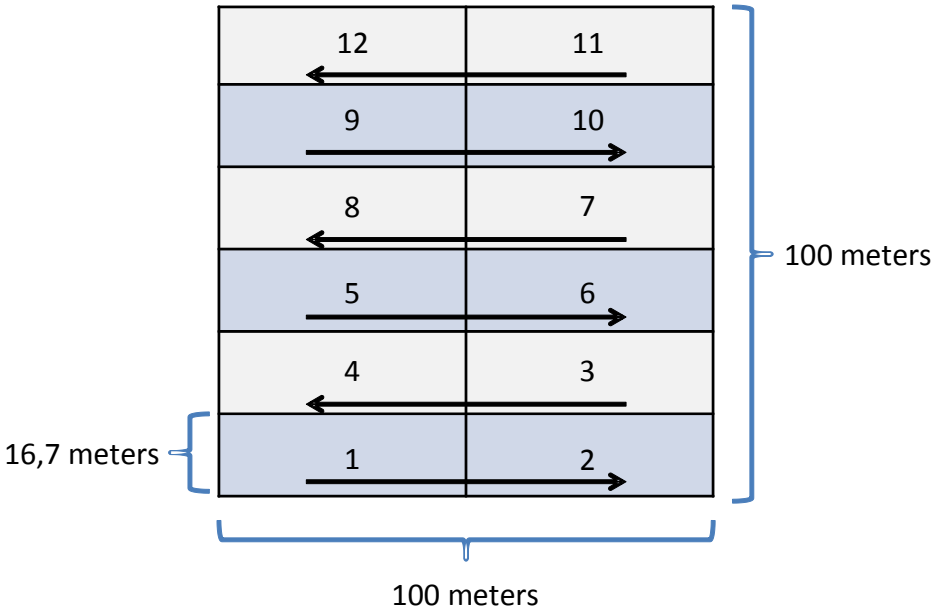


Figure 1. Example of marteloscope design. The arrows indicate the recommended walking direction in order to easily see tree numbers.

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 1993. At the time of treatment, the stand presented a basal area of 22 m^2/hectare, and the basal area after cutting is unknown. Available documentation referred to a diameter-limit cutting prescription:

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

Yellow birch	46 cm+
Sugar maple	40 cm+
Other tolerant hardwoods	30 cm+

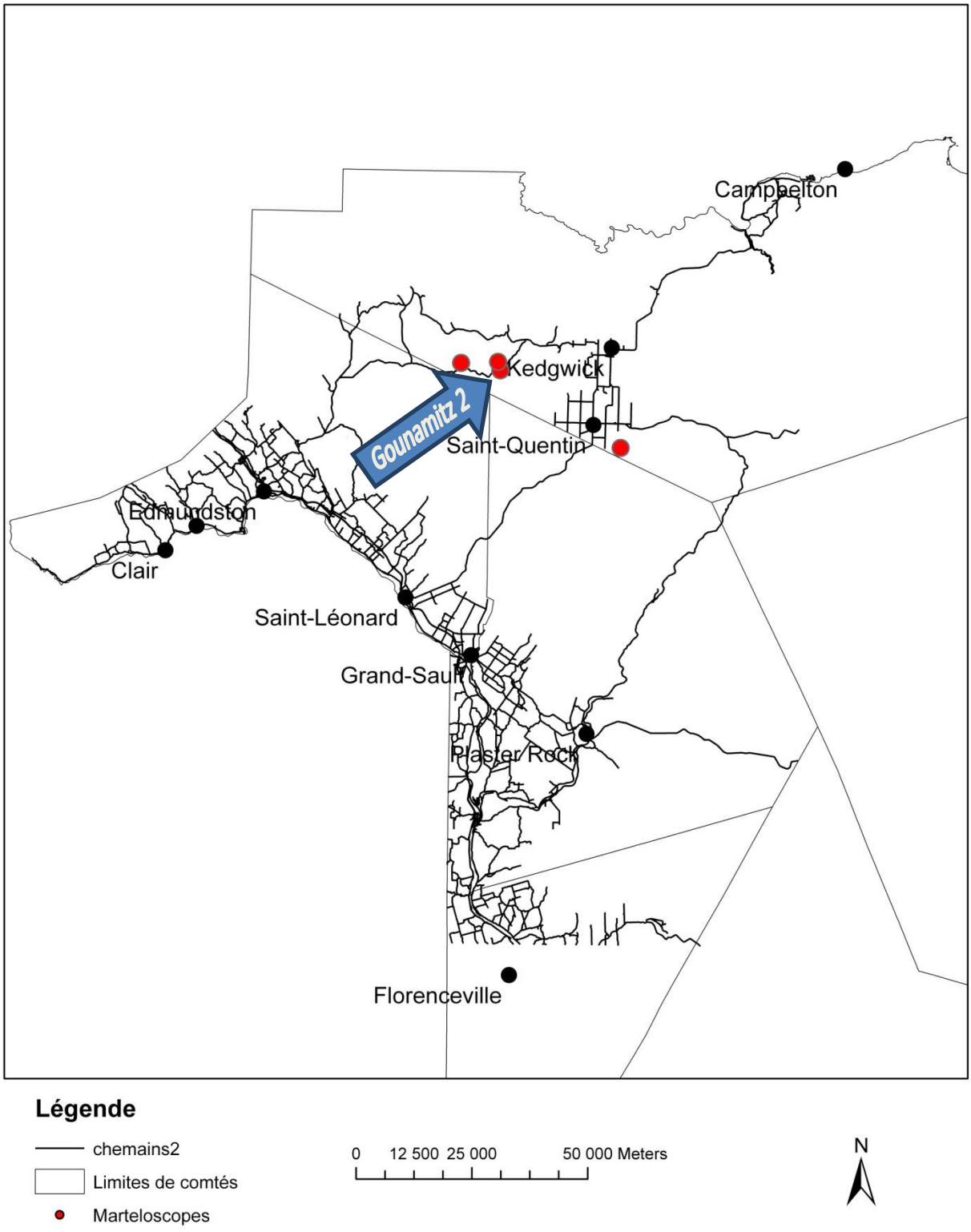
For tolerant hardwoods of « Pulp » quality, harvest of:

Yellow birch	46 – 60 cm
Sugar maple	40 – 60 cm
Other tolerant hardwoods	30 – 60 cm

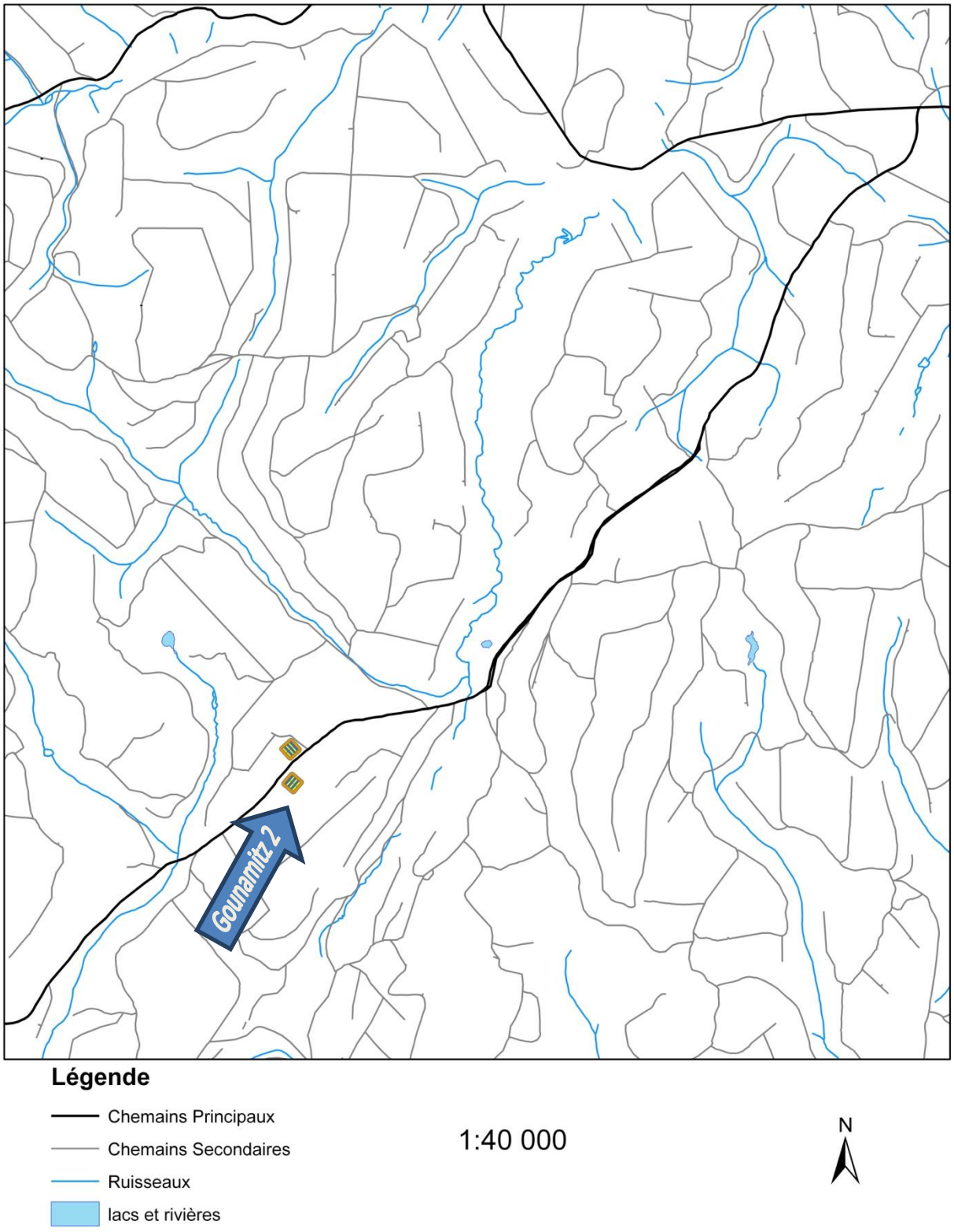
For softwoods, harvest of:

Fir	20 cm+
Spruce	34 cm+

Location of the four marteloscopes installed in 2013



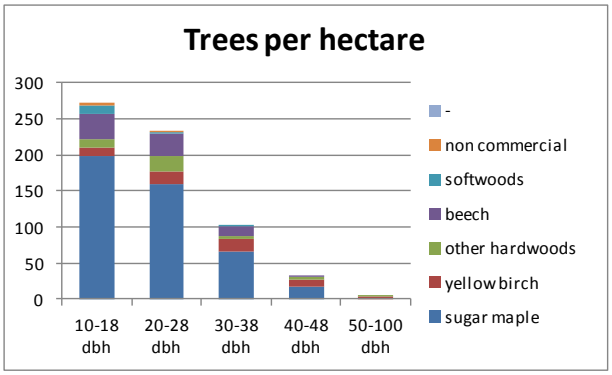
Gounamitz 2 Marteloscope Location

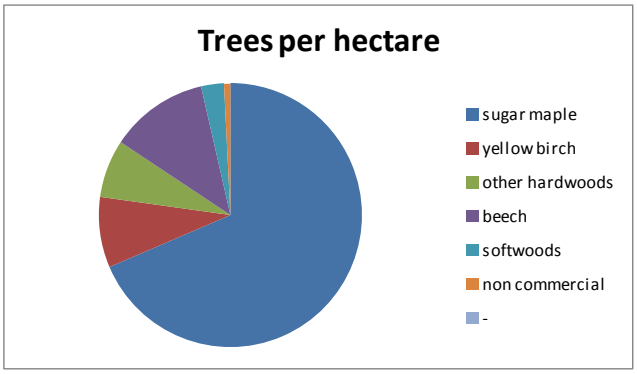


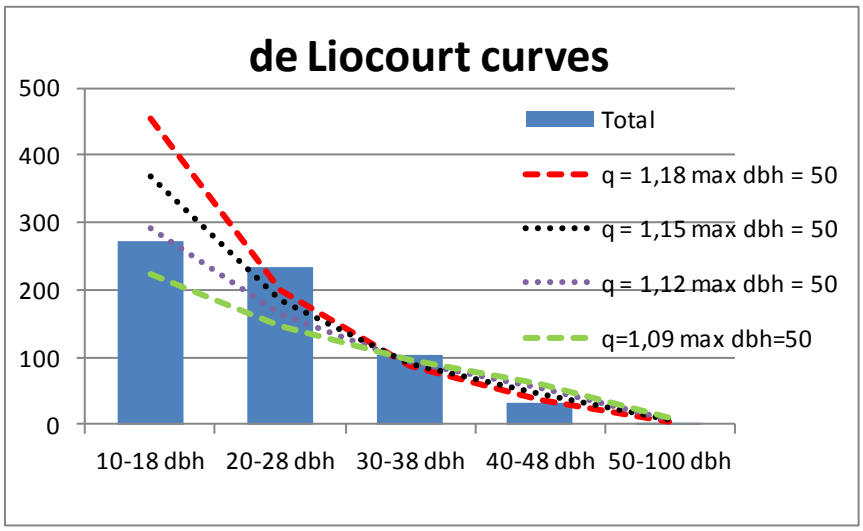
Gounamitz 2 Marteloscope Initial Stand Conditions

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	199	160	66	17	0	**442**	**69%**	**23.1**
yellow birch	10	16	17	10	3	**56**	**9%**	**32.8**
other hardwoods	13	23	5	4	1	**46**	**7%**	**26.4**
beech	34	30	12	2	0	**78**	**12%**	**23.2**
softwoods	13	3	2	0	0	**18**	**3%**	**18.2**
non commercial	4	1	0	0	0	**5**	**1%**	**13.4**
-	0	0	0	0	0	**0**	**0%**	**0.0**
Total	273	233	102	33	4	645		
Proportion	42%	36%	16%	5%	1%			

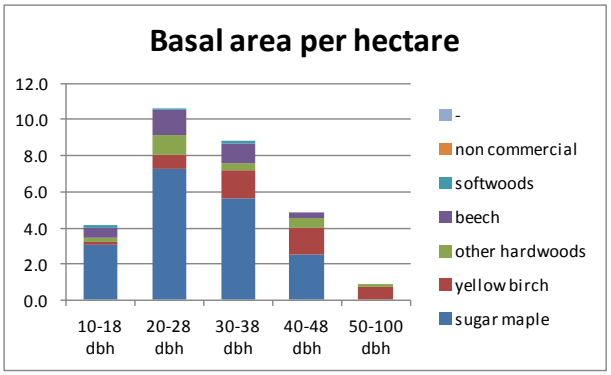


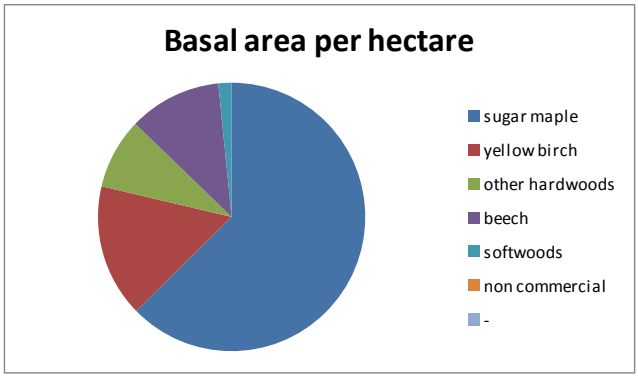




Basal Area per Hectare

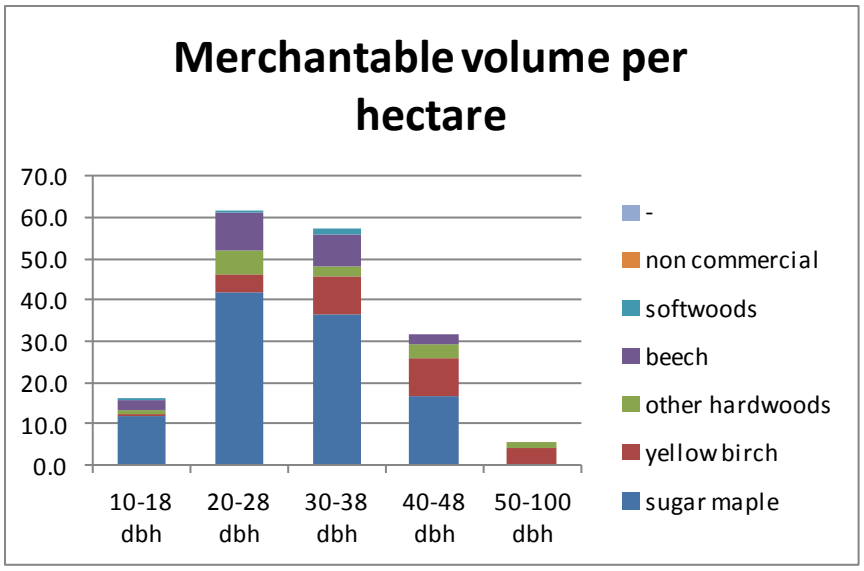
Basal area per hectare							
Species	**10-18 dbh**	**20-28 dbh**	**30-38 dbh**	**40-48 dbh**	**50-100 dbh**	**Total**	**Proportion**
sugar maple	3.1	7.2	5.6	2.5	0.0	**18.4**	**63%**
yellow birch	0.2	0.8	1.5	1.5	0.7	**4.7**	**16%**
other hardwoods	0.3	1.1	0.4	0.6	0.2	**2.5**	**9%**
beech	0.5	1.4	1.1	0.3	0.0	**3.3**	**11%**
softwoods	0.1	0.1	0.2	0.0	0.0	**0.5**	**2%**
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	4.2	10.6	8.9	4.9	0.9	29.5	
Proportion	14%	36%	30%	17%	3%		



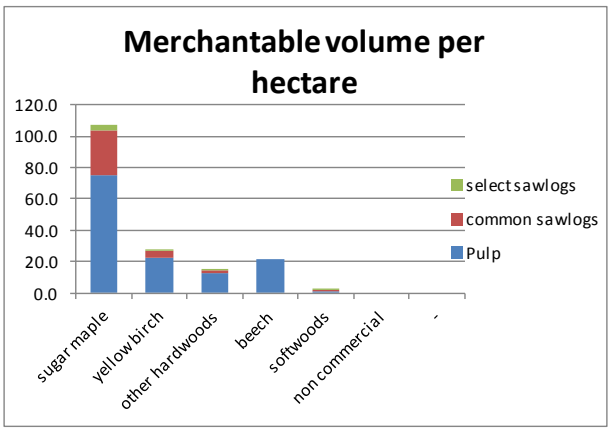


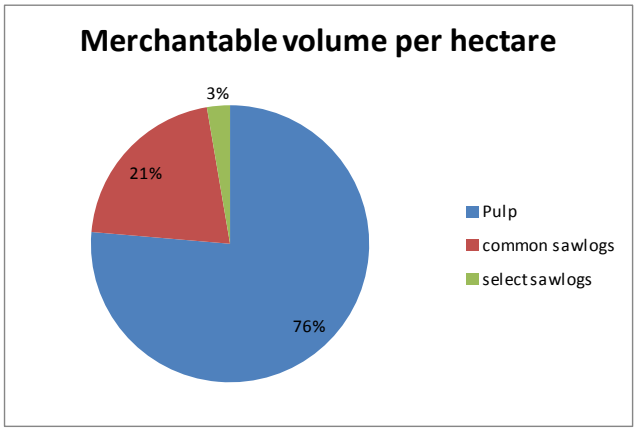
Merchantable Volume per Hectare

Merchantable volume per hectare							
Species	**10-18 dbh**	**20-28 dbh**	**30-38 dbh**	**40-48 dbh**	**50-100 dbh**	**Total**	**Proportion**
sugar maple	11.8	41.6	36.5	16.9	0.0	**106.8**	**62%**
yellow birch	0.6	4.4	9.0	8.9	4.2	**27.1**	**16%**
other hardwoods	1.1	6.0	2.6	3.5	1.2	**14.4**	**8%**
beech	2.4	9.2	7.6	2.4	0.0	**21.6**	**13%**
softwoods	0.5	0.7	1.4	0.0	0.0	**2.6**	**2%**
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	16.4	61.8	57.3	31.6	5.4	172.6	
Proportion	10%	36%	33%	18%	3%		



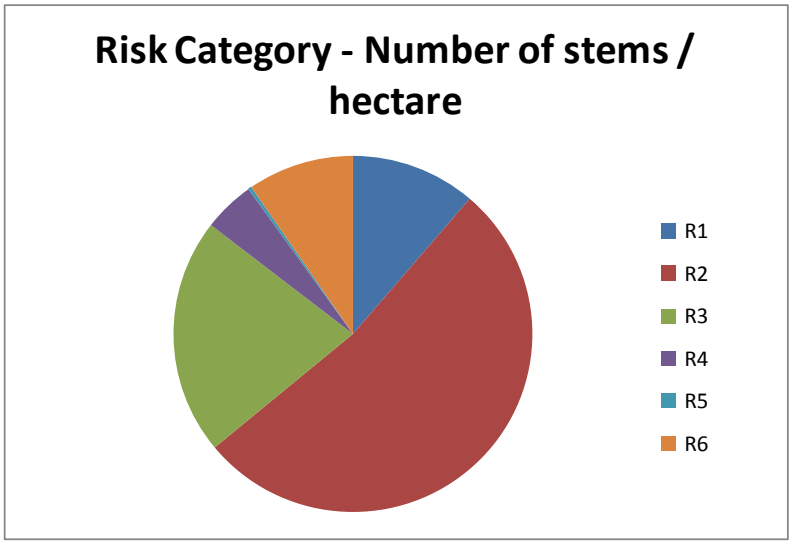
Merchantable volume per hectare					
Species	**Pulp**	**common sawlogs**	**select sawlogs**	**Total**	**Proportion**
sugar maple	74.8	28.6	3.4	**107**	**62%**
yellow birch	22.0	4.4	0.7	**27**	**16%**
other hardwoods	12.6	1.7	0.2	**14**	**8%**
beech	21.6	0.0	0.0	**22**	**13%**
softwoods	0.8	1.5	0.3	**3**	**2%**
non commercial	0.0	0.0	0.0	**0**	**0%**
-	0.0	0.0	0.0	**0**	**0%**
Total	131.8	36.2	4.6	**173**	
Proportion	76%	21%	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	65	281	86	4	0	6	**442**	**69%**
yellow birch	2	29	22	0	0	3	**56**	**9%**
other hardwoods	0	23	18	2	0	3	**46**	**7%**
beech	0	1	8	23	2	44	**78**	**12%**
softwoods	6	6	1	1	0	4	**18**	**3%**
non commercial	0	0	3	0	0	2	**5**	**1%**
-	0	0	0	0	0	0	**0**	**0%**
Total	73	340	138	30	2	62	**645**	
Proportion	11%	53%	21%	5%	0%	10%		



Risk Category - Volume / hectare								
Species	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**	**Total**	**Proportion**
sugar maple	10.2	71.8	23.2	0.2	0.0	1.5	**106.8**	**62%**
yellow birch	0.2	12.2	13.9	0.0	0.0	0.8	**27.1**	**16%**
other hardwoods	0.0	7.1	5.7	1.1	0.0	0.5	**14.4**	**8%**
beech	0.0	0.0	0.7	5.2	0.2	15.4	**21.6**	**13%**
softwoods	1.3	1.0	0.1	0.0	0.0	0.2	**2.6**	**2%**
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	11.7	92.1	43.7	6.5	0.2	18.4	**172.6**	
Proportion	7%	53%	25%	4%	0%	11%		

[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	119	229	14	2	12	12	37	14	**439**	**70%**
yellow birch	10	22	6	0	6	0	8	2	**54**	**9%**
other hardwoods	2	23	2	0	8	1	3	6	**45**	**7%**
beech	8	33	3	1	6	3	9	6	**69**	**11%**
softwoods	18	0	0	0	0	0	0	0	**18**	**3%**
non commercial	0	1	1	0	0	2	0	0	**4**	**1%**
-	0	0	0	0	0	0	0	0	**0**	**0%**
Total	157	308	26	3	32	18	57	28	629	
Proportion	25%	49%	4%	0%	5%	3%	9%	4%		

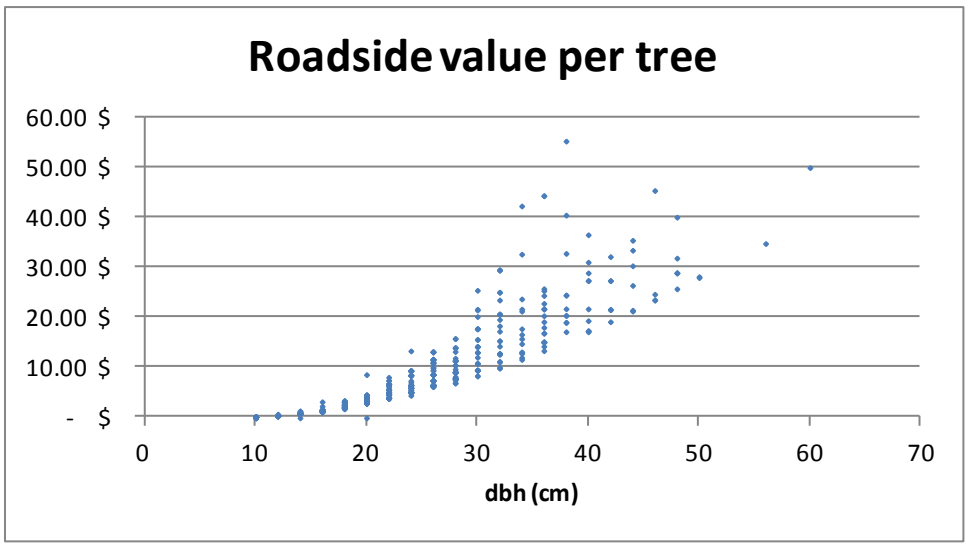
Form Category - Number of stems / hectare										
Risk Category	**F1**	**F2**	**F3**	**F4**	**F5**	**F6**	**F7**	**F8**	**Total**	**Proportion**
R1	37	36	0	0	0	0	0	0	**73**	**12%**
R2	93	172	11	0	16	6	28	13	**339**	**54%**
R3	13	69	12	0	10	5	20	9	**138**	**22%**
R4	5	15	1	3	2	0	0	4	**30**	**5%**
R5	0	1	0	0	0	0	0	1	**2**	**0%**
R6	9	15	2	0	4	7	9	1	**47**	**7%**
Total	157	308	26	3	32	18	57	28	629	
Proportion	25%	49%	4%	0%	5%	3%	9%	4%		

Economic Data

Value			
Species	**Harvest cost**	**Mill price**	**Roadside value**
sugar maple	1 765 $	4 938 $	3 173 $
yellow birch	407 $	1 170 $	764 $
other hardwoods	233 $	544 $	312 $
beech	350 $	805 $	455 $
softwoods	45 $	170 $	125 $
non commercial	- $	- $	- $
-	- $	- $	- $
Total	2 799 $	7 628 $	4 829 $

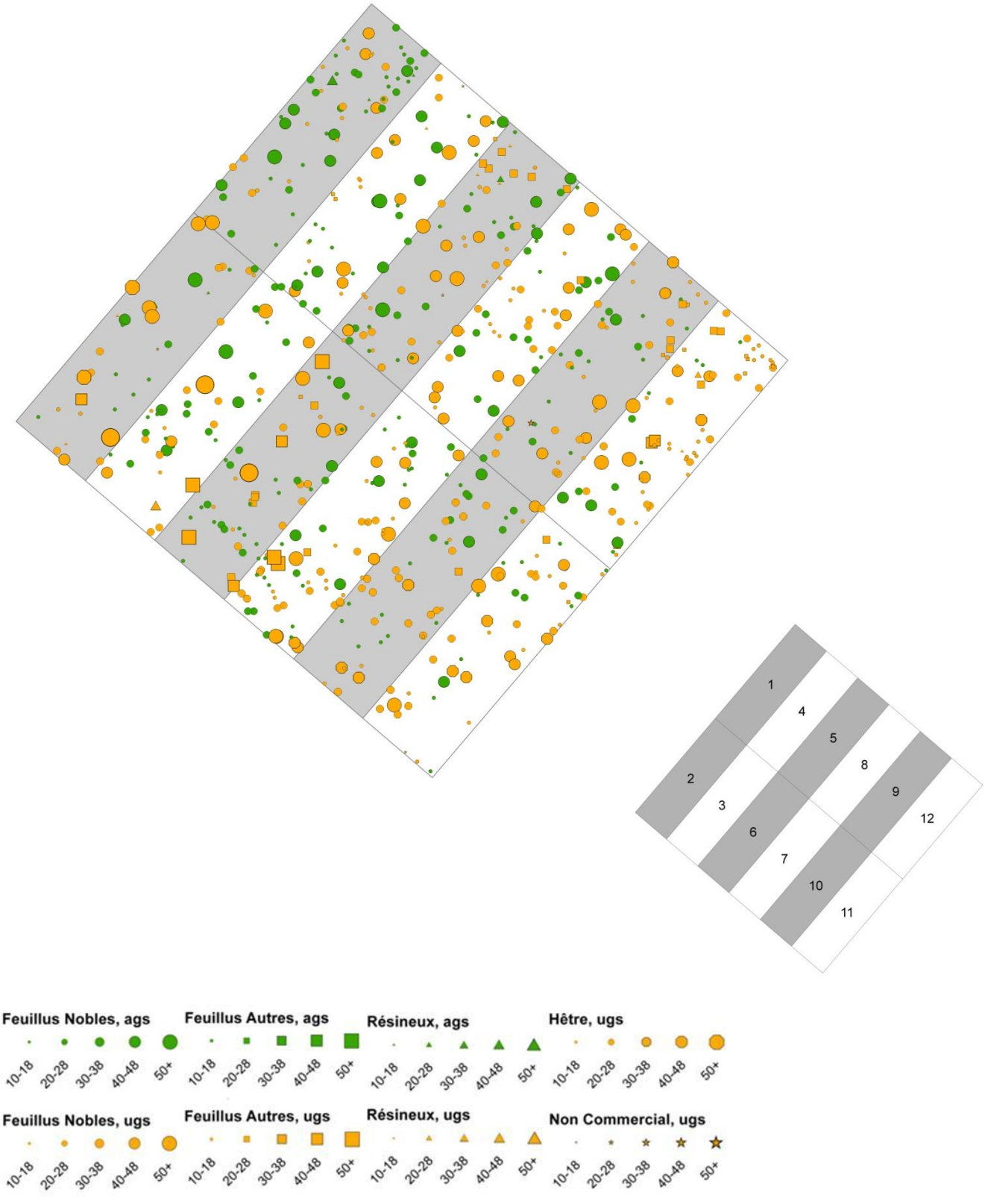
[2] Pelletier, G., D. Landry and M. Girouard (2013). A tree classification system for New Brunswick. Edmundston, New Brunswick, Northern Hardwoods Research Institute.

Net value per hectare							
Species	**10-18 dbh**	**20-28 dbh**	**30-38 dbh**	**40-48 dbh**	**50-100 dbh**	**Total**	**Proportion**
sugar maple	202 $	1 162 $	1 310 $	499 $	- $	**3 173 $**	**66%**
yellow birch	9 $	119 $	273 $	250 $	113 $	**764 $**	**16%**
other hardwoods	19 $	123 $	60 $	81 $	28 $	**312 $**	**6%**
beech	38 $	187 $	171 $	59 $	- $	**455 $**	**9%**
softwoods	12 $	30 $	83 $	- $	- $	**125 $**	**3%**
non commercial	- $	- $	- $	- $	- $	**- $**	**0%**
-	- $	- $	- $	- $	- $	**- $**	**0%**
Total	280 $	1 621 $	1 897 $	889 $	141 $	4 829 $	
Proportion	6%	34%	39%	18%	3%		



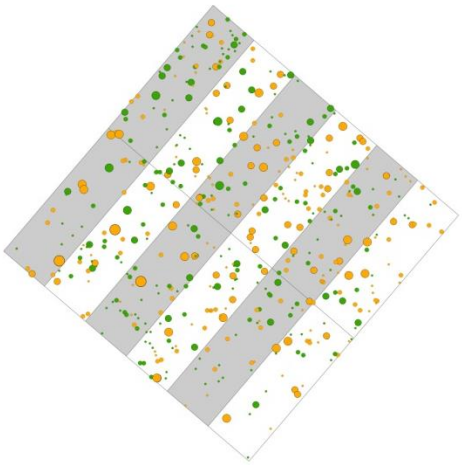
Net value per cubic meter						
Species	**10-18 dbh**	**20-28 dbh**	**30-38 dbh**	**40-48 dbh**	**50-100 dbh**	**Mean**
sugar maple	17 $	28 $	36 $	30 $	- $	**30 $**
yellow birch	15 $	27 $	30 $	28 $	27 $	**28 $**
other hardwoods	17 $	20 $	23 $	23 $	24 $	**22 $**
beech	16 $	20 $	22 $	24 $	- $	**21 $**
softwoods	22 $	44 $	59 $	- $	- $	**48 $**
non commercial	- $	- $	- $	- $	- $	
-	- $	- $	- $	- $	- $	
Mean	17 $	26 $	33 $	28 $	26 $	28 $

Tree Locations in Gounamitz 2 Marteloscope

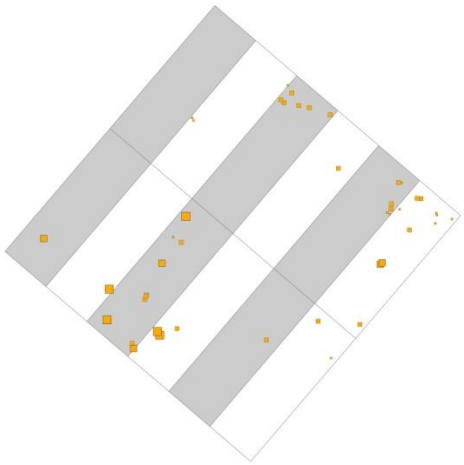


Detailed Cartography per Species Group

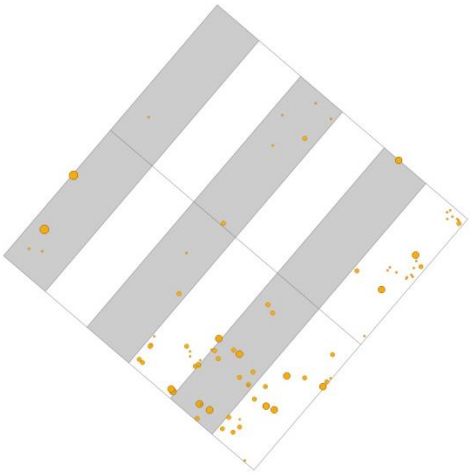
Tolerant Hardwoods



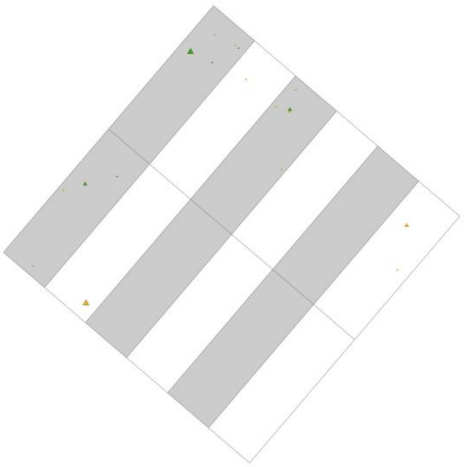
Other Hardwoods



Beech



Softwoods



Aerial Photo