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The Ministère des Ressources naturelles, de la Faune et des Parcs publishes the quarterly *Newsletter from Québec – Forests* to inform the world community of its achievements in the forestry sector. The publication deals with specific aspects of forest management in Québec, and allows the MRNFP to remain in contact with its partners abroad.

## Summary

### July 2004

- Selection Cutting in Québec's Hardwood Forests – Research Findings Update
- The Québec Tree Marker Certification Program
- The FOR@C Consortium: A Positive Resource for the Québec Forest Products Industry



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## **Selection Cutting in Québec's Hardwood Forests – Research Findings Update**

*(Summary of an article by Steve Bédard, Zoran Majcen and Sébastien Meunier, Direction de la recherche forestière)*

Selection cutting has long been practiced in Central Europe, having come into use in the late 19th century, mainly in uneven-aged forests dominated by silver fir. Closer to home, the United States adopted this European-inspired method around the middle of the 20th century in the uneven-aged hardwood forests of the Northeast.

In Québec, selection cutting was introduced in uneven-aged hardwood forests in the early 1980s, based on the knowledge acquired in Europe and in studies of the structure and growth of natural stands. This method was implemented in order to better adapt silvicultural practices to the characteristics of uneven-aged forests, as well as to improve their quality and promote regeneration.

### **Establishment of an experimental monitoring network**

In the early 1980s, the Direction de la recherche forestière of the Ministère des Ressources naturelles, de la Faune et des Parcs established many sample plots in various regions of southern Québec (see figure). Today there are 36 experimental plots covering a total area of 108 hectares of forest, which were established over a period of some 20 years.

In addition to undertaking research and demonstration projects, the Ministère des Ressources naturelles, de la Faune et des Parcs has a network of plots which have been used to monitor the actual effects of selection cutting since 1995. This network consists of 982 sample plots established in 275 stands (see figure).

This effects monitoring network was set up over a five-year period, from 1995 to 1999. To date, 80% of the plots have been measured five years after selection cutting. The other sample plots will be measured this year, rounding out the first five-year data collection phase.



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## Results

### *Experimental plots*

Since 1992, the Direction de la recherche forestière has published a series of findings on the growth and regeneration of hardwood stands following selection cutting in experimental plots. The results show that selection cutting improves a stand's net production because it encourages the growth of the most vigorous trees left standing and minimizes losses by prioritizing the harvesting of trees that are unlikely to survive until the next cut.

### *Actual effects monitoring study*

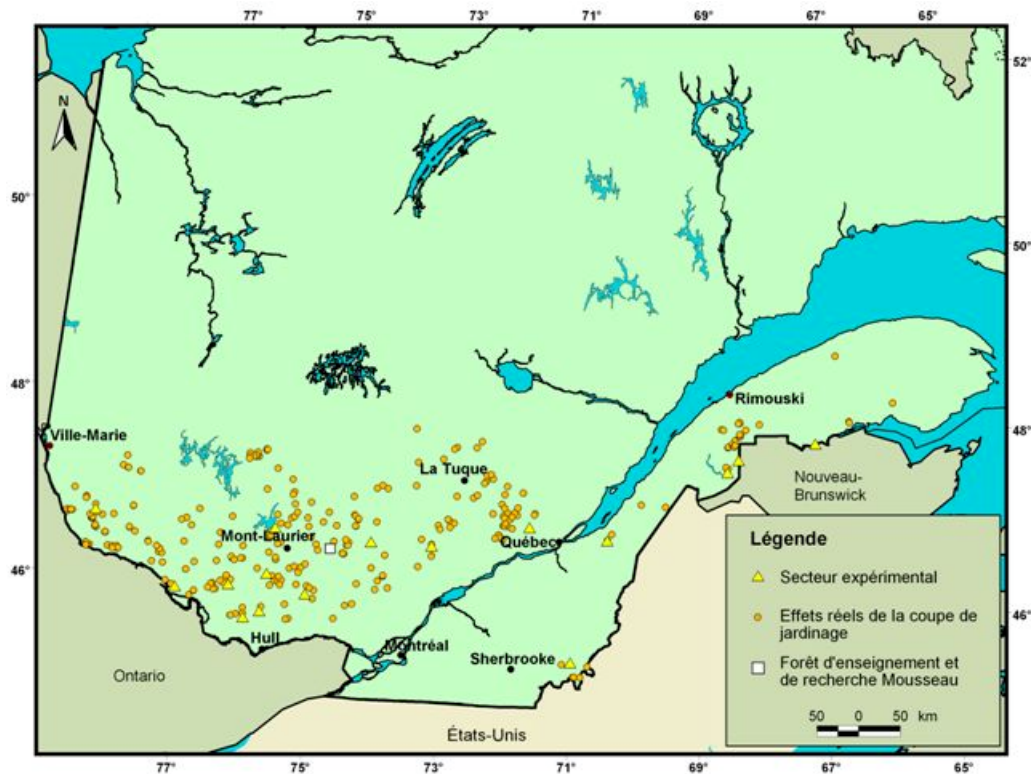
The results obtained five years after selection cutting in the network of monitoring plots show a much lower than expected net increment. In this study, the net periodic annual increment for maple stands was  $0.14 \pm 0.06$  m<sup>2</sup>/ha compared with  $0.32 \pm 0.04$  m<sup>2</sup>/ha in the experimental plots. Furthermore, contrary to the results observed in the experimental plots for the same period, the treatment had no significant effect on the net increment.

The findings from the effects monitoring network indicate a highly variable removal rate. On average, 23% of the basal area removed in all of the maple stands consisted of vigorous crop trees while, on average, 47% of the basal area left standing was made up of declining trees. In selection cutting, when vigorous trees are harvested and a large volume of low-vigour trees are left standing, growth potential is reduced, the risk of mortality is increased, and stand quality is decreased. Consequently, this practice may not assure the possibility of a second cut in some 20 years.

Concerning actual effects, the proportion of declining trees left standing after the cut was higher than that observed in the experimental plots. As a result, even if an increase is noted in the growth of surviving trees over the ensuing years, the mortality rate is likely to be higher than in the experimental plots.

Consequently, the net increment should remain lower than what might otherwise be expected, in order to allow for a second logging operation in about twenty years. The next data collection phase, which will take place ten years following cutting as of 2005, should provide a more accurate picture of the long-term productivity of these stands.

Therefore, if our goal is to have sustained yields, with logging operations every twenty years, as well as to increase the proportion of quality stems available for future harvests, it is essential that the next cuts be limited as much as possible to low-vigour trees. A change in current practices is therefore required in order to ensure the sustainable management of this resource and guarantee quality timber supplies over the long term.





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## Québec Tree Marker Certification Program

*(Summary of an article by Francine Lalonde, Direction de l'assistance technique)*

In December 2002, the Ministère des Ressources naturelles, de la Faune et des Parcs tabled an action plan intended to tighten the oversight and control of hardwood forests on public lands. One of the priorities of the action plan is to make appropriate use of the knowledge required for tree marking.

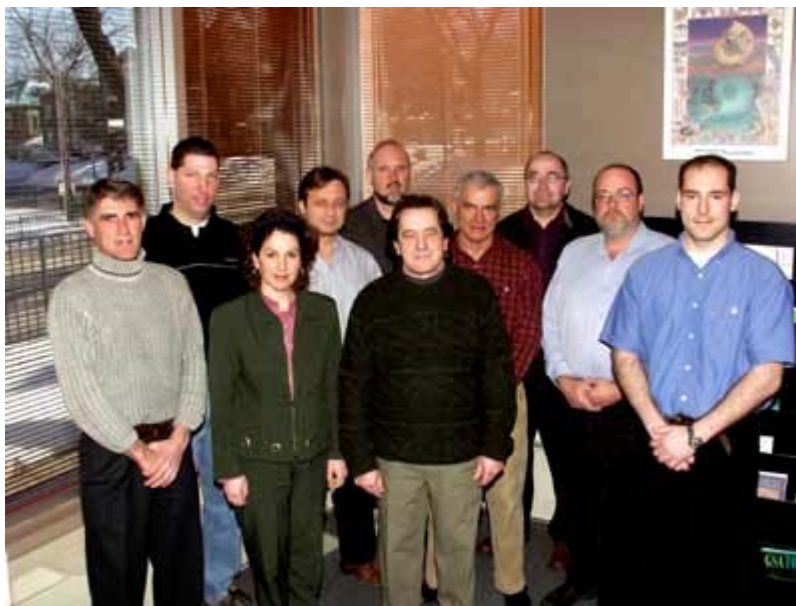
A *Tree Marker Certification Program* has been put in place to achieve this goal. The program is based on a key silvicultural principle: tree selection and marking are key steps in selection cutting and in all forest operations prescribed by a forest engineer that involve partial cuts.

The program also adds value to Québec's current forest management and development system, since training, qualification and competency standards for workers are addressed in the main environmental and forestry certification standards, notably the FSC (Forest Stewardship Council) standard.

The objectives of the *Tree Marker Certification Program* are as follows:

1. To ensure the quality of tree marking operations by implementing high and rigorous standards aimed at tightening the oversight and control of hardwood forest management and development;
2. To monitor and control the competency of persons assigned to carry out tree selection and marking operations in the province through a legislative framework.

The *Tree Marker Certification Program* is part of a comprehensive approach adopted by the Ministry to guarantee the sound management of Québec's hardwood forest resources. It requires all forest stakeholders to apply new knowledge and techniques related to tree marking.



Members of *Groupe de travail en sylviculture et martelage* : 1st row, from left to right : Guy Lesage (Direction régionale de l'Outaouais); Francine Lalande, chargée de projet (Direction de l'assistance technique); Yvan Naud (Direction régionale de Montréal); Étienne Boulay (Direction de la recherche forestière); 2nd row: Jocelyn Hamel (Direction de la recherche forestière); Bruno Boulet (Direction de la conservation des forêts); Mario Blanchette et Conrad Mérette (Direction de l'assistance technique), Michel Huot et Robert Gagnon (Direction des programmes forestiers).



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## The FOR@C Consortium: A Positive Resource for the Québec Forest Products Industry

*(By Réjeanne Pouliot, Direction du développement de l'industrie des produits forestiers, and Mylène Lavoie, FOR@C Research Consortium)*

The *Research Consortium in E-Business in the Forest Products Industry*, located at Laval University in Québec City, better known by the acronym **FOR@C**, is one of the largest research centres of its kind in North America. It started up in January 2002, with a five-year research mandate and a total of \$9.5 million in funding from various private and public sector partners.

The consortium brings together some sixty people, including seventeen permanent employees, associate professors, and more than twenty researchers at the Master's, PhD and post-doctoral levels from around the world. The project has some fifteen partners: Domtar, Bowater, Kruger, Nexfor, Tembec, Shermag, Canadian National, CGI, Forintek Canada Corp., CRIQ, FERIC, NSERC, Canada Economic Development, the Ministère des Ressources naturelles, de la Faune et des Parcs du Québec (MRNFP) and Laval University.

The consortium's research is aimed at managing "value creation in the forest products industry" by harnessing e-business to help manage the flow of information and material between companies. The network brings together all of the companies and business units involved in the supply, processing, production, and distribution of products, right up to the end user. More particularly, this includes forest companies, sawmills, remanufacturers, and pulp and paper mills. The attached figure shows the entire value creation network in the forest products industry.

The new business models and management tools that FOR@C is developing are directed at improving corporate performance through better planning, more effective coordination and increased control of value production activities in the forest products industry.

In accordance with its mandate, which centres on knowledge and skills development through the use of new technologies, the consortium conducts research and supports knowledge-sharing activities. For example, FOR@C has established several technology transfer modules for anyone seeking to learn more about new management concepts and Web-enabled technologies.