

## IMPACTS OF CAREFUL LOGGING ON BLACK SPRUCE FOREST PRODUCTIVITY

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**ABSTRACT.**—Careful logging, also known as CPRS (cutting with protection of regeneration and soils), is widely practiced in northern Quebec. It aims to minimize impacts on soil and to protect advance growth. At the same time, the need for planting is reduced, and crop trees are given an edge over competing vegetation. However, there is concern as to the effects of this form of harvesting on mineral nutrient cycling, and thus, site fertility, in comparison to fire, which is the dominant form of natural disturbance. Furthermore, the practice of CPRS promotes stand dynamics resulting in irregular and uneven-aged stands originating from layering. These stands differ in structure from post-fire stands which tend to be even-aged and regular. The goals of this experiment are to compare general stand characteristics after CPRS and after fire, to compare individual tree diameter, height, and volume growth, to characterize competition in both types of stands, to compare height and volume growth, as well as ANPP at a same level of competition, to explain growth by comparing biomass distribution in trees originating from CPRS and fire, and by examining tree nutrient status. We observe growth differences between trees after logging and fire. Greater ANPP and growth increment in post-fire stands is thought to be due to the accelerated mineral nutrient cycling which occurs after fire, and greater self-thinning efficiency of post-fire trees, resulting in greater carbon allocation to shoot growth and less to root growth.

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