RED SPRUCE AND BALSAM FIR GROWTH OVER 50 YEARS FOLLOWING DIAMETER-LIMIT CUTTINGS IN THE PROVINCE OF QUEBEC, CANADA

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During the first half of the 20th century, several observation areas were established in Quebec's commercial forest. The purpose of these areas was to provide long-term monitoring after cutting. The results obtained from two forest types dominated by red spruce and balsam fir and located in the Mauricie National Park and the Mont-Tremblant National Park, Québec, Canada are presented. Pre-harvest compositions and diameter distributions were first compared with post-harvest conditions after 50 years. Basal area growth was modeled using a whole stand approach. Finally, diameter growth of individual stems was analyzed with increment cores. The results were all studied with the assumption that the management objective was to restore some old-growth attributes in post-harvest stands, especially red spruce proportions, which tend to decrease. In the red spruce-balsam fir-yellow birch forest type, it appears clear that red spruce saplings are unable to ensure the resilience of the species because of their low density and inability to successfully compete with balsam fir. Consequently, partial cuttings of low intensity (35% removal) focusing on balsam fir removal should first be used. In the red spruce-balsam fir forest type, red spruce saplings are more abundant and grow faster than balsam fir saplings. Therefore, partial cuttings of higher intensity (50% removal) could meet the management goal.