



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Scandinavian Forest Economics
No. 44, 2012



Proceedings of the Biennial Meeting of the
Scandinavian Society of Forest Economics
Hyytiälä, Finland, May 2012

Anne Toppinen, Heimo Karppinen & Kati Kleemola (eds.)

Optimal Management of Norway Spruce With Carbon Sequestration

Niinimäki, S¹, Tahvonen, O., Mäkelä, O. and Linkosalo, T.

University of Helsinki, Department of Forest Sciences P.O. Box 27, FI-00014 University of Helsinki, Finland, Phone +358 9 191 57975, Fax +358 9 191 58100, sami.niinimaki@helsinki.fi

In this study a process-based growth model for even-aged Norway Spruce (*Picea abies* [L.] Karst.) is coupled with economics and optimization to analyze optimal management and cost of carbon sequestration. We extend earlier literature by including detailed timber quality features and optimized thinning. Our results show that tree diameter has a major role in defining the optimal timing of harvests especially with higher interest rates. Optimal management with carbon sequestration mainly postpones thinnings, lengthens rotations, and increases sawlog yield. Economic cost of carbon storage is presented for two different sites and two different interest rates. These costs are compared to CO₂ abatement costs in other sectors on a national level. This study suggests it would be economically optimal to use carbon sequestration in order to fulfil national commitment to the EU, i.e. to reduce greenhouse gas emissions by 2020.

Keywords: carbon sequestration, process-based model, optimal thinning, optimal rotation, Norway spruce management