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FINAL PROJECT REPORT

Please notice that the size of text sections in the form can be adjusted if needed.

The length of the final report should not exceed 5 pages.

1. Projekt titel	Miljöeffekter av kortare skoglig omloppstid i ett landskapsperspektiv
2. Title of project	Environmental effects of shorter forest rotation in a landscape perspective
3. Project leader /coordinator (name, address, telephone, telefax. e- mail)	Prof. Jan Weslien The Forestry Research Institute of Sweden (Skogforsk), SE 75183 Uppsala phone +46 18188500 fax+46 18188600 jan.weslien@skogforsk.se
4. Time schedule	The project started 1 / 1 2007 and ended 31/12 2007
5. Project cost	SNS-grant: 24 000 € Total project cost:
6. The purpose of the project/main problems/hypotheses addressed	Forest productivity is estimated to increase in the future due to genetically improved plant material and warmer climate. As a result economically optimal rotation periods will be shorter and annual cuts larger. This may have effects on the environment. In addition there may also be direct effects of climate warming. In this study we explore the environmental effects of increased forest production and warmer climate from three aspects: water quality (proxy: dissolved total nitrogen, DTN), carbon sequestration (carbon stocks above and below ground) and biodiversity (proxy: coarse woody debris, CWD) All three aspects are modelled in common scenarios in a fictive managed forest landscape in central Fennoscandia.

<p>7. Brief description of the research plan and of possible larger deviations from the plan</p>	<p>The aims of the project were to 1) identify existing models for water quality, carbon sequestration, biodiversity and wood production 2) modify existing models for our purposes 3) make initial model runs and 4) report net effects and identify missing information. The project has fulfilled these goals to a high extent. For biodiversity we planned to model plant diversity and dead wood dynamics. In the end we found that it was only possible to model the latter. Plant diversity could not be modeled due to lacking knowledge on how climate will affect plant distribution and abundance.</p>
<p>8. Results (max 2 pages)</p>	<p>See appendix</p>
<p>9. What advantages has been gained by the Nordic collaboration (i.e. by the cooperating partners, use of the project results)</p>	<p>Models for wood production, water quality, carbon sequestration and biodiversity exist in varying frequency and quality within the Nordic countries. Substantial benefits were gained through cooperation since the most adequate models for our purpose could be used. The project can also be seen as a deliverable from the CAR-ES project, since the initial research plan was sketched during the CAR-ES meeting in Finland May 2006. Modeling experts were recruited by members in the CAR-ES core group.</p>
<p>10. Publications and other communication activities (please list scientific reports, more popular reports and other communication activities)</p>	<p>Manuscript for publication in scientific journal, to be submitted 2008. Main results communicated during Skogforsks national conference "Utvecklingskonferensen 2008" which reached an audience of almost 1000 practitioners in the Swedish forestry sector.</p>

<p>11. Project summary (about 1/3 page) with main emphasis on results for possible use in the News & Views section of Scandinavian Journal of Forest Research</p>	<p>Forest productivity is estimated to increase in the future due to genetically improved plant material and warmer climate. As a result economically optimal rotation periods will be shorter and annual cuts larger. This may have effects on the environment. In addition there may also be direct effects of climate warming.</p> <p>In this study we explored the environmental effects of increased forest production and warmer climate from three aspects: water quality (proxy: dissolved total nitrogen, DTN), carbon sequestration (carbon stocks above and below ground) and biodiversity (proxy: coarse woody debris, CWD) All three aspects were modelled in common scenarios in a fictive managed forest landscape in central Fennoscandia. Our results indicate that carbon sequestration will increase with increased productivity but to some extent decrease due to climate warming. DTN in runoff water was virtually unaffected by productivity but increased strongly with warmer climate. CWD amounts decreased with productivity due to shorter forest rotations and by climate warming due to increased decomposition rates.</p> <p>The study can be seen as a novel approach in estimating effects of increased forest productivity and changed climate on three different environmental aspects in the forest ecosystem. The outcome was not clear to us before the study due to the complexity of the modeled systems. Our model landscape is simplified and has no equivalent in the real world. Nevertheless, the study helps us understand how the environment might change in future due to faster growing, genetically improved trees and warmer climate.</p>
<p>12. Date and signature</p>	<p>Date: 2008-05-01</p> <p>Signature of project leader/coordinator</p> <p><i>Jan Weslien</i></p>