

2nd Annual Report (2006)

Centre of Advanced Research on Environmental Services (CAR-ES)

Prepared by Per Gundersen (co-ordinator) *Forest & Landscape Denmark* (pgu@life.ku.dk).

In this network, Environmental Services (ES) include i) *C-sequestration*, ii) *water protection* and iii) *biodiversity*.

Objectives (summary from application)

With the general objective to strengthen Nordic collaboration and research innovation the specific objectives of CAR-ES are:

- To strengthen the knowledge base for counting and optimising environmental services in SFM.
- To quantify the environmental impact of different management strategies and practices in operational ways, that can support decision-making.
- To improve the knowledge and visibility of the environmental services provided by forests in the public as well as among forest owners and managers.

The *ambition* is to integrate and synthesise the knowledge base (conceptually, qualitatively and quantitatively) on environmental services to the level needed for developing a decision support system (DSS) for SFM. This knowledge base for a DSS may then be implemented by the partners in their internet based dissemination platforms that may target forest owners, decision-makers as well as the general public.

It is not the aim to perform detailed research with in each of these three vast research topics. The aim is to focus on the interactions and the major gaps in knowledge from *a holistic view* where information can be integrated across the topics.

People in the network

Per Gundersen (co-ordinator) Karin Hansen (replacing Ingeborg Callesen as secretary), *Forest & Landscape Denmark*

Jan Weslien, Eva Ring, Lars Högbom, *Skogforsk*, Sweden

Bjarni D. Sigurdsson, Hreinn Óskarsson, Brynhildur Bjarnadóttir *Icelandic Forest Research*

Magne Sætersdal, Dan Aamlid, *Skog og Landskab*, Norway

Leena Finér, Ari Laurén, Hannu Ilvesniemi Jukka Laine *METLA*, Finland

Iveta Varangiryte, *Lithuanian Forest Research Institute*, Lithuania

Andis Lazdins, *Silava*, Latvia



Current subprojects

Synthesis on environmental services from riparian zones.

Based on a seminar at the 2nd Progress Meeting it was decided to produce a synthesis on the effect of buffer zones on ES. Buffer zones are constructed to protect streams and lakes from effects of an upslope management (typically clear-cut), but they may have positive or negative effects on biodiversity and C-sequestration that are never discussed nor quantified. After review of plans and drafts at the 3rd meeting the scope was broadened to riparian zones, since the ES functions of the land close to streams/lakes/fjords also exist when no management is applied.

Main content will be: Introduction – what is the riparian zone and the issue of buffer zones; Estimate of the forest area that may be ‘riparean’; Impact on water quality; C-storage and possible impact on C-sequestration; Emissions of trace gasses; Role in biodiversity; Current practices and regulation of riparian zone management including creation of buffer zones. Recommendations on management of this zone.

Environmental effects of shorter forest rotations in a landscape perspective.

Discussion at the 2nd Progress Meeting lead to the formulation of a proposal for a SNS pilot project on changes in ES if forest rotations are becoming shorter in the future. The project has received a one year grant for 2007. Jan-Olav Weslien is project leader.

Project abstract: In the future much of the harvested stands will be regenerated with genetically improved plant material which grows faster and allows shorter rotation periods. Shorter rotation periods means also intensified silviculture, since a larger proportion of the landscape is clear cut annually. We foresee that shorter rotation periods with an altered age structure and intensified silviculture in the forest landscape may be beneficial for wood production and carbon sequestration but have negative impacts on biodiversity and water quality. In this project we explore if it is possible to model the effect on all three and balance them against each other and against sustainable profitable wood production. More specifically the aims are 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. Our intention is to follow up this pilot project with larger applications at the national and Nordic levels.

Meetings held during Year 2

18-19 May 2006, Hyytiälä, Finland.

Seminar on ‘Buffer zones and ecosystem services’ and 2nd Progress Meeting.

A guided tour around the intensive forest research facility at *Hyytiälä* (SMEAR-II) was included as well as an excursion to a peatland restoration experiment. 10 scientists from 5 countries participated.

Current Nordic research on buffer zones was presented. A synthesis project on this issue was decided as described above.

The problem of how to structure knowledge, research, resources etc. on ES across all the potential management options were discussed based on questionnaires (matrixes) circulated up to the meeting. This lead to a discussion of the most important research issues and interests.

The issues were prioritized for implementation as proposals, which throughout the summer was realised and granted for the subproject on ‘shorter rotation’ explained above.

Other main issues were: i) National research agendas; ii) Exchange of staff in the form of short term scientific missions; iii) Home page; iv) Planning of the work and meetings.

12-15 October 2006, Haukadalur, Island;

Seminar on 'Effects of afforestation on ecosystem services' and 3rd Progress Meeting

The seminar was attended by 12 scientists from 5 countries and included 6 presentations. The presentations stimulated new bilateral cooperation.

Preliminary draft sections for the buffer zone synthesis was reviewed leading to a broadening of the synthesis to include riparian zones in general as described above.

Other main issues were: i) National research agendas and research ideas; ii) Submitted SNS proposal; iii) Annual reporting and home page; iv) Planning of work and meetings.

Other Year 2 activities in brief

- Proposal on '*Environmental effects of shorter forest rotations*' was submitted to SNS.
- Hierarchy of forest management options produced for structuring information, knowledge, resources etc.
- Exchange of recent relevant papers on the three ES topics among the involved.
- Dr. Karin Hansen, senior scientist at FLD was involved as Secretary for CAR-ES replacing Ingeborg Callesen.
- Web page was improved (www.nordicforestry-cares.org).

Main problems encountered

Environmental Services is a relative new area of research. Trying to bridge the three most important ES's in an integrated and multidisciplinary approach is a challenge because: i) we are not used to work across the three ES's; ii) the Nordic-Baltic region has contrasting geography in terms of natural forest vegetation, land use history, goals in management etc.; iii) management is a very broad term, thus to discuss effects of forest management on ES's we need to structure and clarify the communication with this term in a operational way. We discussed these challenges at our kick-off meeting but had to return to this discussion also at the meeting this year.

The involvement of Baltic colleagues was not optimal due to mistakes at the secretariat with change of staff.

Future activities (2007)

- Finalise work on matrix on forest management option vs level of knowledge on and importance of ES.
- June 7-9, 2007: Project meeting in Bergen, Norway
 - Seminar with emphasis on biodiversity.
 - *Review draft chapters for the synthesis on ES of riparian zones.* Plan for finalising the synthesis paper. Decision on journal.
 - *Presentation of the pilot project Environmental effects of shorter forest rotations (SNS-grant; 1 yr)*
 - How can we use the *management option hierarchy* to organise our information on both knowledge and resources.
- Initiate planning of open international workshops on ES for 2008/9.
- Add more content to web-page at www.nordicforestry-cares.org.
- Autumn, 2007: Topic meeting (content to be planed based on out come of June meeting).

Publications

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