

1st Annual Report

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

By prepared by Per Gundersen (co-ordinator) *Forest & Landscape Denmark* (pgu@kvl.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.

Partners in the network

Per Gundersen (co-ordinator) *Forest & Landscape Denmark* (core-group)

Jan Weslien, *Skogforsk*, Sweden (core-group)

Bjarni D. Sigurdsson, *Icelandic Forest Research* (core-group)

Magne Sætersdal, *SkogForsk* Norway

Leena Finér, *METLA*, Finland

Iveta Varangiryte, *Lithuanian Forest Research Institute*, Lithuania

Andis Lazdins, *Silava*, Latvia

Ingeborg Callesen, *Forest & Landscape Denmark* (secretary)

Meetings held during Year 1

28 January 2005, Uppsala, Sweden.

Subject co-ordinators Per Gundersen, Jan Weslien, and Bjarni Sigurdsson (at the first workshop defined as the core-group) met to discuss how to start the network and to set up the first year program and kick-off meeting. A limitation to issues related to 'a piece of land' and things

measured on a per hectare basis was decided, meaning that C-sequestration later in the wood-chain is not considered. Discussions on how to structure information on forest management practices in an operational way was initiated.

29-30 September 2005, Hørsholm, Denmark; Kick-off meeting.

Held in connection to a WOOD-EN-MAN project meeting to reduce the travel cost of Baltic participants; 11 scientists from 7 countries participated.

The network is new and the concept as well as the whole idea of the CAR was not settled in the group. The persons involved do not know each other and are specialist in one of the three ES's. Much of the meeting was thus dedicated to *discuss the basic idea* of the CAR and reach a common understanding of the project. We had general presentation on the three ES's as well as on our personal topics and current projects.

Other main activities were: i) Excursion to Vestskoven, an afforestation area where effects on the three ES's have been quantified; ii) Country overviews on current research activities on ES; iii) Structuring of management options in a hierarchy; iv) Home page; v) Planning of the work; vi) Organisational aspects.

Other Year 1 activities in brief

- A press release describing this and other Nordic networks were cited reasonably well in DK newspapers in January
- Dr. Ingeborg Callesen, postdoc at FLD was involved as Secretary for CAR-ES.
- Set-up of a preliminary 'flat' web page.
- Poster presentation at the AFFORNORD conference in Iceland
- Exchange of recent relevant papers on the three ES topics among the involved.
- Work on structuring information in matrixes and hierarchies.

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 used quite some time on these challenges on our first meeting and will use more time also in future meetings.

Having our meeting in connection to the WOOD-EN-MAN meeting had some practical advantages, but the Baltic representatives could only participate in part of the meeting. There also seems to be other Baltic colleagues central to get involved along with those that participated.

Future activities (2006)

- Produce a more user-friendly web-page at www.nordicforestry-cares.org.
- Prepare matrixes/tables over persons, projects and literature on ES at the participating organisations and in the Nordic-Baltic countries in general
- May 18-19, 2006: Project meeting in Finland.
 - *Pilot review on the effect of buffer zones on ES.* What data do we have in the Nordic-Baltic countries? Can we produce a synthesis paper?

- Finish the work on a *management option hierarchy* to be used in organising our information on both knowledge and resources.
 - Detail the work programme for the coming years based on the information gathered and the pilot review on buffer zones.
 - Plan topic meeting and workshops.
- October 5-6, 2006: Topic meeting (content to be planned based on outcome of May meeting).

Publications

Gundersen, P.; J. Weslien, B.D. Sigurdsson, M. Sætersdal and L. Finér (2005). The objectives of the research network Centre of Advanced Research on Environmental Services (CAR-ES). Proceedings from "Effects of Afforestation on Ecosystems, Landscape & Rural Development" June 18-22, 2005 Island, in press, 4 pp.

Publications from activities linked to CAR-ES

Gundersen, P., Schmidt, I.K. and Raulund-Rasmussen, K., 2006. Leaching of nitrate from temperate forests - effects of air pollution and forest management. *Environmental Reviews* 14: 1-57.

Jónsson, Jón Ágúst, Guðmundur Halldórsson & Bjarni D. Sigurdsson (2006). Changes in bird life, surface fauna and ground vegetation following afforestation. *Icelandic Agricultural Sciences* 19: xx-xx (submitted).

Sigurdsson, Bjarni D., Borgthor Magnusson, Asrun Elmarsdóttir & Brynhildur Bjarnadóttir (2005). Biomass and composition of understory vegetation and the forest floor carbon stock across Siberian larch and mountain birch chronosequences in Iceland. *Annals of Forest Science* 62 (8): 881-888.

Poster and abstract. Bjarni D. Sigurdsson, Borgthor Magnusson, Asrun Elmarsdóttir and Brynhildur Bjarnadóttir. 2005. Effects of afforestation on understory biomass, carbon stock and vegetation composition: a chronosequence study in Iceland. Given at AFFORNORD Conference on Effects of Afforestation on Ecosystems, Landscape & Rural Development, June 18th - 22nd, 2005 Reykholt, Iceland.

Poster and abstract. Brynhildur Bjarnadóttir, Bjarni D. Sigurdsson & Anders Lindroth. 2005. Eddy flux measurements over a young *Larix sibirica* stand in eastern Iceland. Given at AFFORNORD Conference on Effects of Afforestation on Ecosystems, Landscape & Rural Development, June 18th - 22nd, 2005 Reykholt, Iceland.

Poster and abstract. Guðmundur Halldórsson, Edda S. Oddsdóttir, Bjarni Didrik Sigurdsson, Anna Arneberg (2005). The effects of afforestation on abundance of soil fauna. Given at AFFORNORD Conference on Effects of Afforestation on Ecosystems, Landscape & Rural Development, June 18th - 22nd, 2005 Reykholt, Iceland.