

## ECOWOOD - DEVELOPMENT OF A PROTOCOL FOR ECOEFFICIENT WOOD HARVESTING ON SENSITIVE SITES

EU – funded research project under the Fifth Framework Programme on Quality of Life and Management of Living Resources

It is a 3-year project with 6 partners from 4 EU member states. The total project cost is 1.8 Million Euro, of which the European Commission's contribution is 1.27 Million Euro. The project started in January 1, 2000.

### INTRODUCTION

Forest machinery interact considerably with environment, hence improper selection and operation of harvesters and forwarders can have major negative environmental impacts. Harvesting conditions vary considerably across Europe, from the peat based soils of Ireland, Scotland and Finland, to the steep escarpments of northern Italy and the frozen soils of the Nordic countries. Many of these sites may be classified as 'sensitive' and a need exists to develop appropriate mechanisation systems for them. By selecting and using forestry machinery in an integrated manner, the negative environmental consequences of wood harvesting and extraction/delivery processes can be minimised. Designers and manufacturers of such machinery also need to be fully aware of the potential environmental consequences of inappropriate machine design, selection and operation on such sites.

### THE AIM OF THE PROJECT

The project will develop a protocol for ecoefficient wood harvesting on 'sensitive' sites. The protocol, which will be in the form of guidelines/rules (with appropriate software backup) which will enable the machinery to be matched to the site and ensure that all the stages in the wood chain are integrated. The development of the protocol is of major economic and environmental significance to the European forest industry, particularly at regional levels.

### RESEARCH AREAS

The work within this project has been designed having in mind the following draft definition for a 'sensitive' site:

*"A sensitive forest site is any spatial unit where planned execution of management activities may result in adverse effects to its productivity and/or the environment with respect to its expected ecological, economic and social functions"*

**Work package 1** – Wood cutting and extraction on sensitive sites, machinery selection and operation criteria  
Here the harvesting systems (incl. harvester-forwarders), site classification and modelling, terrain-vehicle interaction, ergonomics, operator selection and training, damage risk, environmental impact and life-cycle-assessment will be looked at.

**Work package 2** – On-board electronics, telemetrics and forwarder routing  
The main topic here is to utilize GIS and GPS in planning and monitoring of the forest operations, creating and utilization of digital data bases for environmentally sound wood harvesting.

**Work package 3** – Development of an operations protocol (OP) for sensitive sites  
This part of work aims at producing the code of practice for ecoefficient wood harvesting on sensitive sites in Europe.

### RESEARCH TOPICS ON TERRAMECHANICS

#### Site classification for forest operations

There are several site classifications in use. For forest operations the classification must be dynamic, since e.g. the weather is continuously changing the trafficability of soils. We want to develop an appropriate database based on criteria useable in the field conditions. A new penetrometer is under development to provide a suitable tool for forest machine operators.

#### Modelling of vehicle/terrain

Partly based on the outcome from the EU-funded project PromotE software packages will be designed to help the planners and executors to make proper decisions concerning the forest operations.

#### Guidelines for matching machines/sites

Field tests will be arranged to collect information on the use of databases in operational conditions. Based on the gained experience guidelines will be produced.

In addition, the matters dealing with off-road vehicles will be touched in several other sub-studies.

### THE PARTNERS AND MAIN EXECUTORS

Prof. Shane Ward, University College Dublin, Ireland, The project leader (Partner 1)

Mr. John Lyons, Coillte Teoranta, Ireland (Partner 2)

Mr. Raffaele Spinelli, National Research Council of Italy (CNR) (Partner 3)

Prof. Rihko Haarlaa, University of Helsinki, Finland (Partner 4)

Mr. Julio Molano, Servicios Forestales SL (SERFO), Spain (Partner 5)

Mr. Antti Peltola, Plustech Ltd. (John Deere), Finland (Partner 6)

### Homepage

<http://www.ucd.ie/~foresteng/>

THE AUTHOR: [Rihko.Haarlaa@Helsinki.fi](mailto:Rihko.Haarlaa@Helsinki.fi)