

PLANSFM

WESTFOREST

A GIS-based multi-objective decision support system for the optimal management of forests on sensitive sites

PROJECT TEAM

Prof. Maarten Nieuwenhuis, University College Dublin*
Dr Dermot Tiernan, Coillte
Stephen Clifford, University College Dublin

* Email: maarten.nieuwenhuis@ucd.ie

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BACKGROUND

Many forests have been planted on the western peatlands of Ireland and their sustainable management is a complex problem. The range of critical environmental and social constraints that needs to be taken into account, as well as the age distribution of the stands, add to the factors to consider in making decisions about the future options for these forests. Decision support tools to facilitate the management of stands, based on, among others, catchment sensitivity, soil type, National Heritage Areas, amenity provision, economic potential and social acceptability merit investigation. This applies particularly to forests established on peatlands and other environmentally sensitive areas, where felling and reforestation decisions need to take into account a wide range of economic, environmental and social factors.

OBJECTIVES

The project aims to develop:

- a GIS system that contains spatial, contextual and qualitative information on restrictions applicable to the western peatland forests (WPFs).
- a matrix of the known impacts and restrictions associated with the range of potential forest management practices and land use changes.
- a decision support system (DSS) for the sustainable management and redesign of WPFs.
- an optimisation module for the DSS, for the production of alternative plans.
- a forest management plan for the WPFs, based on the optimal DSS prescriptions, drawn up in the context of arrangements with the Forest Service, and compatible with an integrated, shared land use policy.

PROGRESS

- Investigated GIS DSSs available within the industry.
- Various topics within forest planning were studied, including forest management and water quality, the biomass market, the forest industry in Ireland, employment within forestry, and the history of the western peatland forests.
- Reviewed the DSS produced by Coillte for the western peatland area as part of a previous project.
- Initial research into restrictions and limitations of forest planning in the western peatlands area.
- Field visits to western Ireland were conducted to look at various issues associated with forestry in the area, such as the general physical conditions on the sites, incentives for conversion from farming to forestry, forest management issues on sensitive sites, and to review Sitka spruce field spacing trials in western Ireland.
- Established contact with researchers in western Canada who are developing forest management models based on Cellular Automata and agent-based modelling.

ACTIVITIES PLANNED

- Compare different decision support systems used in forestry.
- Assess the potential of cellular automata in decision support systems, e.g. Moland.
- Develop methodology for a decision support system. Potential methodologies include Cellular Automata and agent-based modelling.
- Develop and populate the forest management and land use change impact matrix.

OUTPUTS

Nieuwenhuis, M. and Tiernan, D. 2007. WESTFOREST – a GIS-based multi-objective decision support system for the sustainable management of forests on sensitive sites. *Irish Timber and Forestry* 16(6): 20 - 22.

Current Internet Presence

<http://www.ucd.ie/forestry> website describing WESTFOREST in the context of the PLANSFM research programme (due for launch in March 2009).