

## Existing Forest Management Software Search and Evaluation

### Applications Identified

Following a search of the World Wide Web and a publication review, a large number of forestry software applications were identified. Although the search was worldwide, language barriers directed the search towards English speaking nations with developed forestry industries such as the United States, Canada, Australia, New Zealand and Britain. Over sixty forestry applications were identified and thirty one were selected for review on the basis of relevance to this project. Of these, approximately half are commercial, while the other half are the products of research projects carried out by universities and forest authorities.

### Suitability of the software in an Irish context

A small number of the applications came close to providing the functionality required for particular areas of forest management as carried out by forestry professionals in Ireland. However, none succeeded in meeting these requirements without some modification. Those packages that were considered most suitable for Irish requirements are summarised below and are discussed in greater detail in the main report.

#### Woodplan Software for Forestry and Estate Management

<http://www.woodplan.co.uk>

This package offers a full suite of forest management software.

#### Remsoft – Woodstock –Forest Modelling System

<http://www.remsoft.com/index.html>

Forest modelling system that can be used in harvest scheduling and wood supply analysis, wildlife management and simulation of forest ecosystems.

#### Remsoft – Stanley – Spatial harvesting block scheduling

<http://www.remsoft.com/index.html>

Automates the process of developing a spatial harvest plan.

#### Assisi Forest™ 98 / Assisi Forest™ 2000

<http://www.assisisoft.com>

Forestry simulation program can be used to design harvesting plans.

#### Assisi Inventory™ 2000

<http://www.assisisoft.com>

Forest inventory. Used to store raw inventory data and compile volume and value estimates.

#### NED Software products

<http://www.fs.fed.us/ne/burlington/ned/indexb.htm>

NED is a collection of software products being developed

by the USDA Forest Service. The software is intended to aid resource managers, develop goals, assess current and future conditions and produce sustainable management plans for forest properties. Three modules available.

#### FORVAL – Timberland Investment Appraisal

<http://www.cfr.msstate.edu/fwrc/products/software/forval.htm>

Forestry evaluation software.

#### SVS – Stand Visualisation System

<http://faculty.washington.edu/mcgoy/svs.html>

Software generates graphics to depict various stand conditions.

#### Softree – Natural Resource Software – Terrain Tools

<http://www.softree.com/products/products.htm>

A mapping package.

#### Fors/map for Windows – Desktop Mapping System

<http://www.forsonline.org/mapfor.htm>

Mapping facility customised with enhancements for forestry and natural resources.

#### Forestry Compendium

<http://tree.cabweb.org/efctext.htm>

A silvicultural reference tool to assist in selection of species for trials in plantation, agro-forestry and natural forest systems.

#### Woods of the World CD

[http://www.forestworld.com/wow/wow\\_cd/wowcd\\_description.html](http://www.forestworld.com/wow/wow_cd/wowcd_description.html)

Multimedia database of detailed information on up to 910 wood species and products, covering 95% of the wood types in trade. Educational/extension use.

## Conclusions

To conclude, having a forest management software package available for the forest sector would benefit the entire industry through better, more informed management and coordination of effort. The elimination of waste in the supply chain could reduce time and costs spent on forest management and improve the overall efficiency and professionalism of the forestry sector.

The logistics of the development of such a package might well prove difficult and demand that separate modules be designed. It would be preferable, that such modules have the capacity to be integrated. This would enable a specific mix of functions, to be selected by each purchaser. Such an option would make the software desirable to both the farm forester and professional forest management sector, thus increasing the marketability of the software while enhancing forest management efficiency across the industry.



Silviculture / Management No. 1

**The steadily increasing number of private growers will soon be faced with long-term management decisions regarding their plantations. In addition, the approved forester scheme has resulted in a number of independent assessors managing large and variable portfolios, which place high demands on time and skills management. Both of these sectors are potential beneficiaries from the introduction of forest management software into the industry.**

**In 1999 a research project funded by COFORD was initiated examining these issues.**

**The objectives of the project were twofold:**

- (1) To determine the perceived value and potential market for forest management software in Ireland. In addition, information was obtained as to the functions that forest management software would be expected to fulfil;**
- (2) To identify what forest management software was available globally and to establish the suitability of such software for Irish forestry.**

COFORD,  
Agriculture Building, UCD,  
Belfield, Dublin 4, Ireland.  
Telephone: +353 1 716 7700  
Email: info@coford.ie  
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## Computer Software Requirements in Forest Management

Nik Hennessy and Damien Lawlor

### Background

The main barriers to many private growers and foresters using computers and information technology as decision support tools in forestry are believed to be cost and lack of computer literacy. Such problems need to be addressed if forest management software is to prove useful. Intuitive software can help to address these problems by providing management support in an efficient and easy-to-use manner. While specialised software for forest management is available from a host of companies throughout the world, it is apparently scarce in Ireland.

Unfortunately, as development costs are sizeable and the number of potential customers relatively low, the unit cost of specially developed forest management software would be high. Most growers and foresters in Ireland would therefore find it difficult to justify the cost of expensive customised software.

In the absence of international standards and codes of practice, software is often developed on a project specific basis, or is designed to cater exclusively for specific data or region specific data models. These may be offered locally or advertised internationally on small-scale websites, but are generally not released into the public domain as off-the-shelf software.

There was, therefore, a need to identify forest management software available internationally and to evaluate this software in the context of Irish forestry.

### Methodology

Surveying was deemed the most appropriate method to determine the potential market for forest software in Ireland. Due to the diversity of those responsible for forest management, different sectors of the forest management community were surveyed using various survey techniques<sup>1</sup>. The three sectors analysed were (1) prominent farm foresters, (2) approved foresters and (3) the farm forestry community in general.

The second objective of this study was to identify forest management software available globally. The sources of information accessed included Irish and British forestry publications as well as the World Wide Web. The World Wide Web search concentrated primarily on information sources based in Britain, the United States, Canada and New Zealand.

<sup>1</sup> The full methodology employed is presented in the COFORD publication 'Computer software requirements in Forest Management'.

## Results

The surveys are reported in more detail in the main report, however, some key results have been extracted and are presented here. Only survey results from approved foresters and the farm forestry community are discussed. Responses from the prominent farm forester group are not reported on, but rather they were used to refine the questionnaires and methods used in the surveying of the other two groups.

## Computer Ownership and Usage

The difference in computer knowledge between the two groups was considerable, with 42% of the farm forester group claiming to have no computer knowledge versus 16% in the approved forester group (see table 1).

**Table 1: Computer knowledge, ownership and usage for Farm forester and Approved Forester groups.**

		%Farm forester group	%Approved forester group
Computer knowledge	None	42	16
	Beginner	33	17
	Intermediate		
	/advanced	25	67
Received training		N/A	57
Ownership	Owns	39	77
	Has access	14	16
Usage	Daily	48	47
	Weekly	28	27

A similarly large difference is evident between the two groups for those who considered their computer knowledge as intermediate/advanced. Computer knowledge, training and ownership all rate higher for the approved forester group. However, usage of computers, be that daily or weekly, is almost identical for both groups.

For both groups the computers being used are mostly modern, with 52% of farm forester and 70% of approved forester respondents using Pentium™ PCs. Almost half of the approved foresters who already own computers intend to upgrade within the next twelve months. Among the farm forester group, 31% of those not yet owning a computer expressed the intention to purchase one within the year.

For both groups the most popular operating systems were MS Windows™ 95 and 98.

## Farm Foresters Survey

### Computers and farming

Only 17% of respondents use a computer for farm management. Interestingly, half of the respondents who use their computers for business, state that they do not use their computers for the management of their farm.

In terms of software used, the most popular application used by farm foresters is Microsoft Word™ (a word processing application). Microsoft Excel™ (a spreadsheet application) is also very popular, with some farmers also using Microsoft Access™ (a database application). The Microsoft Office suite of applications is by far the most popular package used. Twenty nine percent of respondents who own computers use a software package to keep farm accounts.

### Details of forest plantations

Among respondents, the mean plantation size was 22 ha. This is considerably larger than the national average of approximately 8 ha and is due to the heavier weighting of a couple of very large forest areas (> 400 ha) that were included in the survey. An interesting finding is the relationship between computer ownership and size of plantation, with the mean plantation size for those farmers who are also computer owners increasing to 36 ha. Conifers were the most popular species in plantations, with 66% of respondents' plantations consisting of at least 60% conifers. Knowledge of the proportion of broadleaves to conifers in plantations is important when designing forest management software (e.g. for yield models).

### Age-Class Distribution

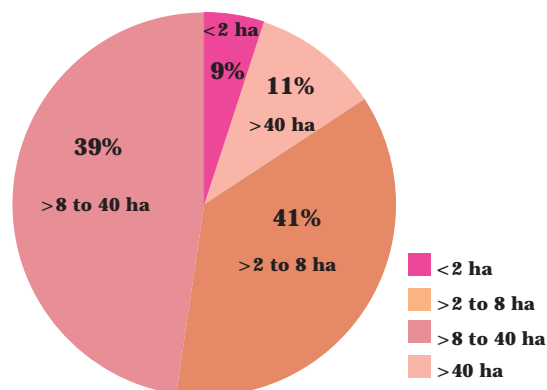
Almost two-thirds of the respondents' total forest area is between 4-12 years old. As first thinning approaches for these plantations, there will be increasing pressure for management plans and consultancy.

### Profile of forest areas

The distribution of forest sizes is presented in figure 1. The majority of farm forests were either between 2 ha and 8 ha (41%) or between 8 ha and 40 ha (39%).

### Use of computers in forest management

At the time of this survey, only 5% of all farm forester respondents used a computer for any aspect of the management of their forest. Even among the group who owned computers, only 12% were using their computer



**Figure 1. Distribution of forest sizes among the farm forestry group.**

for forest management. Participants were queried as to the aspects of forest management that could be most usefully included in a software package. Results suggest that farm foresters' requirements are greatest in the financial aspect of forest management, with investment appraisal and cash-flow analysis scoring highest. However, the other aspects of forest management also score quite high, suggesting that a broad software package would find most favour with farm foresters.

### Interest in specialised forest management software

In total, 44% of farm foresters indicated that they would use specialised software for forest management if it was available. However, among those who own their computer, interest in specialised software was even greater at 63%. This shows a strong relationship between computer ownership and stated willingness to use forest management software. Reasons for not using forest management software included (in order of frequency): lack of interest in computers; difficulty; holdings too small to justify use of software; insufficient knowledge of forestry and/or computers; inconvenience and lack of time.

## Approved Forester Survey

### Forest management

The mean size of the forests being managed by each approved forester was 400 ha. In total, 81% of the forest area being managed by approved foresters consisted of conifers. In addition, almost 60% of the total forest area under management was under 4 years old as outlined in figure 2. This suggests that approved foresters are predominately involved in forest establishment.

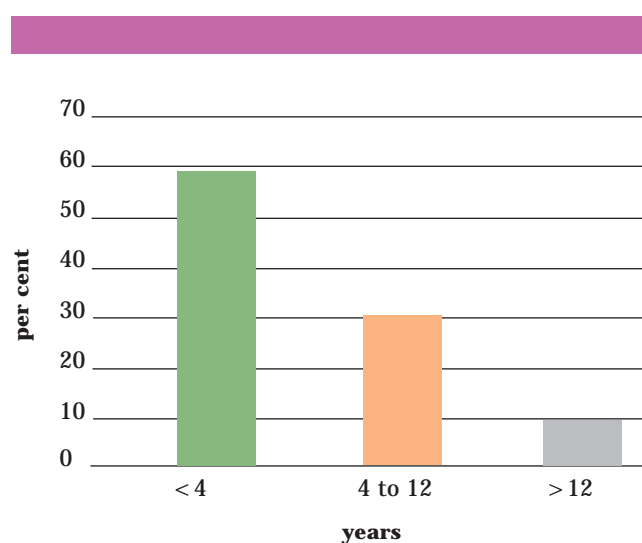
### Required functionality from forest management software

Participants were queried as to the aspects of forest management that could be most usefully included in a software package. Results suggest that approved foresters have most interest in the planning aspects of forest management, with mapping, investment appraisal and operations planning scoring highest.

Relatively low interest was shown in timber forecasting, which may have been due to the fact that the majority of forests that respondents were dealing with had yet to reach the timber yielding stages of their rotation.

### Use of computers in forest management

Over 85% of respondents regarded geographical information systems (GIS) as being essential to forest management. Most are familiar with GIS concepts and have seen a GIS in operation. However, only one third have ever used a GIS and only 13% own a GIS package. Despite the perceived importance of GIS, two thirds of respondents are still calculating figures for their forest operations by hand. Only one third use a computer for calculations (mainly using MS Excel™ spreadsheets), while 64% do not perform any checks on their calculations (mainly citing lack of time). Only 10% ever derive statistics from their figures. Nonetheless, 93% of approved foresters indicated that they would use specialised software for forest management if it were available.



**Figure 2. Age profile of forest plantations managed by approved foresters**