



**MEETING
SCOTLAND'S
FOREST
RESEARCH
NEEDS**



Forestry Commission
Scotland

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Section 1 - Introduction

1.1 The Forestry Commission spends £11 million per year on research (this includes surveys and statutory services). The Westminster Government funds this research, on a GB basis. However, following the 2002 Forestry Devolution Review, Ministers agreed that individual countries should play a leading role in determining research priorities. Research is important in providing the knowledge required in meeting the objectives of the Scottish Forestry Strategy and in helping the development of; evidence based policy, best delivery mechanisms, operational efficiency etc. Accordingly, Forestry Commission Scotland (FCS) is issuing this paper on *Meeting Scotland's Forest Research Needs*. This paper, together with comments, will form the basis for identifying and prioritising Scottish forest research needs for incorporation in the revised FC research strategy.

Of course, there are many areas of forest research that will be common to Scotland, England and Wales and it is important to avoid duplication of effort. Once the research priorities have also been developed for England and Wales, the central research purchasing unit in the Forestry Commission will bring the information together to create a coherent FC research strategy that reflects country needs.

1.2 This paper will be placed on the Forestry Commission Scotland (FCS) website for a period of three months. In addition copies will be sent, inviting comments, to all members of the Scottish Forestry Forum Steering Group, to the Regional Advisory Committees, to the Forestry for People Panel and to representative organisations (UKFPA, FIDC, UKWPA, ICF, FTA, FCA, SLF, NFUS, Scottish Environment Link, the Community Woodland network and the Scottish Forest Industries Cluster); potential research providers (Forest Research, Macaulay, TRADA, BRE; relevant departments at Aberdeen, Edinburgh, Abertay and Napier (CTE – Universities) and relevant public bodies (SNH, DCS, Historic Scotland, SEPA).

1.3 The final version of the Forestry Commission Forestry Research Strategy will then be put to the FCS National Committee and subsequently to Scottish Forestry Ministers for endorsement.

Section 2 - Research needs stemming from Scottish Forestry Strategy

2.1 The Scottish Forestry Strategy was published in 2000 and is the Scottish Executive's statement of forestry policy. It is underpinned by five principles: sustainability, integration, achieving positive value, securing community support and reflecting Scotland's diversity and local distinctiveness. It also sets out five strategic directions for forestry in Scotland and, within these, identifies 23 priorities for action. These are listed in Appendix 1. These are policy priorities, not research priorities. While all will require the application of past research results, the requirement for further research differs greatly between them.

2.2 A preliminary analysis suggests broad research requirements that flow from the strategy. They are brigaded in three main categories – natural sciences (biology, ecology, physics, chemistry); social sciences (economics, sociology) and wood products research (engineering).

a. **Natural sciences**

Sustainability. This is the overarching principle in the Strategy. It is difficult to define precisely what this implies in research terms and perhaps does not fit comfortably into a "natural science" category, but it should include:

- reduction in pesticide use through development of effective integrated pest management (IPM) measures;
- avoidance of adverse impacts on the environment (air, soil, water) through understanding of interrelationships and development of practical guidance. This includes acidification (a specific priority in the Strategy).

There are other major and emerging issues (such as awareness of the implications of climate change) of potential significance. Therefore, there is a need to have a "horizon-scanning" capacity so that potential impacts and risks can be assessed in an objective way.

Protection of trees. This is another aspect of sustainability. There are immediate concerns about protection and there is also the need to be able to respond to unexpected threats from pests and diseases.

The immediate concerns include the need for alternatives to deer fencing (so as to protect trees without endangering woodland grouse) and the need to find effective ways of controlling weevils (*Hylobius abietis*) on restock sites.

The need to respond to unexpected threats requires access to scientific expertise, possibly at very short notice.

There is also an obligation to continue the Forest Condition Survey on the minimum basis required by the European Union.

Silviculture. The commitment to diversifying Scotland's forest resource requires silvicultural research aimed at developing cost-effective options for managers in different circumstances.

Specific Strategy priorities are:

- techniques for restoration of native woodlands and prioritisation through development of the Forest Habitat Network concept;
- alternative systems to clear felling;
- establishing woodland on derelict and contaminated land.

Biodiversity The key needs are for measurable and meaningful indicators of biodiversity; and for development of cost-effective management systems to increase biodiversity, which take account of landscape scale ecology as well as local factors.

b. **Social sciences**

Tools for understanding what different communities and social groups want from woodlands. With the policy focus on creating opportunities for all people to enjoy trees, woods and forests, sociological research is needed to clarify the best ways of achieving this. An important aspect is better understanding of how woodlands and their use can contribute to improvement of health, wellbeing and quality of life.

Working with communities. Research is needed to identify and evaluate the best approaches to community consultation, involvement and participation in collaborative forest management across Scotland. Research is needed to guide and evaluate approaches that increase social inclusion and strengthen environmental justice.

Communications and interpretation. A Strategy priority is to "improve availability of information about [recreational] opportunities". Research can help identify the most effective and efficient ways of achieving this.

Economic analysis. The increasing stress that is laid upon evidence-based policy making, demands that efforts continue to be made to value the social and environmental, as well as the monetary, outputs of forestry in the regions of Scotland. Research can help build an objective evidence base of forestry's contribution to rural development as an aid to policy development and resource allocation.

c. Wood products research (engineering)

Product development. As Scotland's forest industries compete through innovation, research is needed in product development – including developing techniques to demonstrate fitness for purpose. Opportunities for Scotland range from better processing, new types of forest product that add more value to our species and the use of wood and forest residues as a fuel or source of new chemicals and fibres.

Timber transport. The problem here is one of cost-effective and socially responsible haulage often from remote areas. Research issues include reduction of the impact of timber lorries on roads and bridges through improved design, transport planning and route management.

2.3 In addition to new research, there is a continuing need for access to existing knowledge, and for this knowledge to be kept up-to-date and effectively communicated. These critical knowledge areas are:

- forest inventory and production forecasting; this includes assessment of timber quality;
- statistical surveys (eg employment, industry and recreational visitors);
- site survey and site classification to aid good design and species choice;
- routine operations (such as cultivation and timber harvesting);
- models to predict the impact of wind and assess alternative ways of managing a forest;
- making full use of outputs from tree breeding programmes.

2.4 Other possible areas for research, not considered above, include:

- management of woodland for production of biofuel;
- utilisation of flood-prone land for woodlands;
- developing woodlands on restored land.

Section 3 - Research environment

3.1 The Forestry Commission spends 90% of its research budget with its research agency, Forest Research. Forest Research is the UK's only multi-disciplinary research agency dedicated to forestry research and is our principal provider of research and scientific advice. The other 10% is spent with external providers in order to:

- promote interest in and knowledge of sustainable forest management in the wider research community;
- engage in partnerships with other funders;
- secure specialist expertise and competencies not available from Forest Research;
- remain open to new or alternative ideas and to test the market.

The funds that the Forestry Commission has available for research are likely to decline by 2.5% per year in real terms. To meet this pressure and to fund new work, it is necessary to recognise the need to end or reduce research on topics that do not reflect policy priorities. There is a need to work to increase partnerships with other potential funders in the public and private sector, including EU sources.

Research commissioning procedures are designed to:

- identify and prioritise the needs of stakeholders;
- obtain research and scientific advice to address the identified needs and problems;
- evaluate and review research programmes;
- advise on scientific issues that need to be built into policy;
- facilitate the transfer of knowledge and technology to the scientific community, practitioners and the public;
- promote effective collaboration with other funders (including both “in cash” and “in kind” supporters of research projects) and between research providers.

3.2 The methods of assessment used by the Forestry Commission research purchasers will be based on ROAME (Rationale, Objectives, Assessment, Monitoring, and Evaluation) procedures. The link between research programmes and forestry policy objectives will be expressed in the ROAME statement for each programme. At programme level and for major individual projects, the ROAME will be expected to cover the benefits of the research to sustainability and to consider its social, environmental and economic relevance.

3.3 The focus of this paper is on the identification and prioritisation of the research needs of forestry in Scotland. The Forestry Commission's central research purchasers will then bring this together with similar information from England and Wales. They will then act as the FC central customer, ensuring that agreed priorities are met and that information from research is effectively communicated.

3.4 The Forestry Research Co-ordination Committee will continue to be used as a mechanism for ensuring that Forestry Commission research funding is integrated with that of other departments and agencies, avoiding duplication of effort.

3.5 There is a particular need to ensure that development of the Scottish Forest Research Strategy is co-ordinated with wider Scottish Executive research strategies. This will be achieved through close liaison between FCS and SEERAD officials.

3.6 Effective technology transfer and advice is vital. Building on its good record in translating the results of research into new policies and practices, the Forestry Commission will continue to support a range of printed scientific and technical publications. The website will increasingly be used as a tool for communication of research. Workshops, seminars and training programmes will also remain an important method for effective research communication. ROAME statements and research purchasing agreements will include suitable provisions for technology transfer, including communication of interim results.

Section 4 - Current research strategy

4.1 The current research strategy was published in August 2001 and covers GB. It argues that public funding for forestry research gives significant support to a sector which provides well recognised social and environmental benefits to the public that frequently outweigh the financial benefits to the owner. The collection of private funds for research in the grower sector has been possible only for exceptional purposes, though private growers often assist research programmes by contributing in kind. Being closer to a commercial market, research into timber and wood processing usually involves more direct financial inputs from the private sector. In order to fulfil the requirement to serve both the policy and the practice of sustainable forestry, the Commission supports research that has immediate benefits to end-users and also strategic research that maintains long-term expertise and capacity in essential areas. Key scientific collections and data banks are maintained where possible to provide the necessary infrastructure for long-term studies. Completely “blue sky” research forms only a minor component of Forestry Commission purchase although some may be funded through partnership with other funders, particularly the Science Research Councils.

4.2 The current research strategy states that the overriding aims of Forestry Commission research are *to inform, support and strengthen the policies by which sustainable forest management can be achieved in Britain and to promote the delivery of their objectives*. It sets out the objectives of research sponsored by the Forestry Commission as:

- to advance scientific knowledge and understanding of sustainable forestry;
- to monitor and improve the effectiveness of the *UK Forestry Standard* in providing the framework for sustainable forest management in Britain;
- to include consideration of social, environmental and economic factors in the planning of all major programmes;
- to facilitate the transfer of knowledge and technology to the scientific community, practitioners and the public;
- to protect woodland from pests, diseases and other threats;
- to increase the contribution woodlands make to the environment and quality of life through:
 - conserving and improving biodiversity;
 - protecting and improving the physical environment;
 - increasing the social and cultural values of woodland;
 - to increase the competitiveness of British-grown forest products;

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- to increase the proportion of research directed towards understanding and enhancing the social and cultural values of woodland.”

4.3 Financial information about the cost of programmes under the current research strategy is set out in Appendix 2.

Section 5 - Questions

Q1 Does this paper provide an adequate basis for assessing Scotland's needs and priorities for forestry research? If not, what else should be taken into account?

Q2 Do paragraphs 2.2 and 2.3 adequately capture the research priorities emerging from the Scottish Forestry Strategy? If not, what else should be included?

Q3 Should the items in paragraph 2.4 be incorporated in the research strategy? Are there any others?

Q4 Are the arrangements set out in Section 3 acceptable?

Q5 Are the general principles, aims and objectives of the current (GB) research strategy – as spelt out in Section 4 – applicable in a Scottish context? If not, what changes should be made?

Q6 What changes of emphasis are required in the current research programmes (see Appendix 2) to meet Scottish needs? Please explain why you think they are necessary and, if the change involves additional expenditure, ideas about potential funding sources?

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**SCOTTISH FORESTRY STRATEGY: STRATEGIC DIRECTIONS (IN ITALICS)
AND PRIORITIES FOR ACTION**

Maximising the value of Scottish wood production

- Improve competitiveness by developing a strong forest industries network.
- Ensure continuing investment in wood processing.
- Develop the timber transport infrastructure.
- Promote more use of timber.
- Develop products that meet market needs.

Developing a diverse forest resource for the future

- Expand the area of well-designed productive forest.
- Improve timber quality through following good forest practice.
- Develop more mixed forests.
- Exploit non-timber outputs and benefits of woods and forests.
- Tackle deer problems. Positive contribution to the environment.

Making a positive contribution to the environment

- Improve management of semi-natural woodlands.
- Extend and enhance native woodlands by developing Forest Habitat Networks.
- Increase the diversity of the farmed landscape.
- Aid recovery of acidified rivers and lochs and improve riparian habitat.
- Encourage alternatives to clear felling.
- Contribute to a radical improvement in the quality and setting of urban areas.

Creating opportunities for more people to enjoy trees, woods and forests

- Provide woodland recreation opportunities near towns.
- Improve availability of information about opportunities.
- Increase forestry's contribution to tourism.

Helping communities benefit from woods and forests

- Create wider employment opportunities.
- Increase opportunities for community consultation.
- Provide opportunities for greater community involvement in forestry.
- Support community ownership where this will bring local benefits.

Appendix 2

The Forestry Commission funds over 60 research programmes that are briefly described on its website (www.forestry.gov.uk). The programmes are organised by topic under five themes and proposed expenditure on each for 2003/04 is given in Table 1 below. To make this more informative, these themes are split into sub-themes and, under each sub-theme, there is a list of programme titles (in italics).

Further information on programme expenditure and copies of the printed research catalogue are available from the Commission.

The expenditures given below include in-house research and research purchased from external providers, the latter being approximately 10% of the whole. A breakdown by theme is given in Table 2.

Table 1
Proposed expenditure for 2003/04 in £000s

| | |
|---|-----|
| Theme – Forests & Society – research in sociology, socio-economics and cultural heritage. | 737 |
| Social sciences and cultural heritage: <i>Forestry and human health; Heritage & archaeology; Social factors in forest design; Social forestry; Veteran trees and woodland history</i> | 615 |
| Socio-economics and statistics: <i>Economic impact and multiplier studies; Forest Industry Surveys; Forest visitor surveys and monitoring; Public attitudes surveys; Social & environmental benefits; The role of forests in tourism</i> | 122 |

| | |
|---|------|
| Theme – Forests & Biodiversity – research into the woodland wildlife. | 1560 |
| Genetic conservation | 245 |
| Species, habitats and indicators: <i>Biodiversity evaluation; Forest habitat management; Lowland native woodlands; Species/Habitat Action Plans; Upland native woodlands</i> | 1050 |
| Modelling & decision support: <i>Decision support for biodiversity; Landscape ecology</i> | 265 |

| | |
|---|------|
| Theme - Forest Protection – research into the threats from pests, diseases and adverse changes in the environment. | 2494 |
| Impact and management of diseases: <i>Dieback of Birch; Disease diagnosis & advice ; New & exotic pathogens; Non-chemical protection; Phytophthora diseases ; Phytophthora ramorum</i> | 670 |
| Impact and management of insect pests: <i>Control of Hylobius; Impact of pests; Integrated forest management (Hylobius); Plant health (exotic pests); Taxonomy & advice (insects)</i> | 1206 |
| Impact and management of vertebrate pests: <i>Deer population ecology; Management of grey squirrels; Tree protection against mammals</i> | 293 |
| Tree Health Monitoring | 225 |

Table 1 cont'd

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| Theme - Forest Operations and Environment – research into the interaction between forests, their management and the physical environment. | 3403 |
| Climate change and carbon dynamics: <i>Carbon dynamics in forests; Climate change</i> | 200 |
| Establishment & species choice: <i>Alternative establishment systems; Biomass crops; Ecological Site Classification (ESC); Seed & seedling biology; Sustainable establishment systems for the uplands</i> | 757 |
| Forests and water | 304 |
| Measuring, monitoring and modelling environmental processes: <i>Environmental Change Network (ECN); Environmental monitoring and evaluation of forest ecosystems; FC core model [model integration programme]; Remote sensing</i> | 583 |
| Safety and efficiency of working practices: <i>Machinery & methods; Safety and ergonomics</i> | 660 |
| Soil sustainability: <i>Reclamation of man-made sites for forestry; Soil sustainability & site studies</i> | 539 |
| Stand management: <i>Alternative silvicultural systems (lowlands); Alternative silvicultural systems (uplands)</i> | 460 |

| | |
|--|--------------|
| Theme - Forest Resources and Industry – research into sustaining and improving the economic resource in the forestry and wood product sector, timber measurement and yield modelling, and the National Inventory of Woodlands and Trees. | 2777 |
| Market Development: <i>Forest stability; Timber quality; Wood products</i> | 670 |
| Resource Assessment: <i>Forest growth sample plots; Measurement; Woodland assessment surveys; Yield modelling & forecasting</i> | 1125 |
| Tree Improvement <i>Breeding & production of conifers; Genetic improvement of broadleaves; Selection & testing of conifers</i> | 982 |
| TOTAL | 10971 |

Table 2**Expenditure (in £000s) by theme with FC Research Agency and external providers**

| Theme | With FC research agency | With external providers | Total |
|-----------------------------------|-------------------------|-------------------------|-------|
| Forests & Society | 435 | 302 | 737 |
| Forests & Biodiversity | 1480 | 80 | 1560 |
| Forest Protection | 2321 | 173 | 2494 |
| Forest Operations and Environment | 3235 | 168 | 3403 |
| Forest Resources and Industry | 2400 | 377 | 2777 |
| TOTAL | 9871 | 1100 | 10971 |