THE SCOTTISH FORESTRY TRUST

ANNUAL REPORT 1998-99

SELECTED ITEMS FROM THIS YEAR'S REPORT

The John Eadie Memorial Fellowship was successfully inaugurated with research foresters from U.S. and N.Z., both working on modelling, being appointed to fellowships.

The Trust for the first time initiated and is directly managing a research project. The project is to identify the locations of natural (autochthonous) populations of the main Scottish native tree species. The existence of these populations is being entered on a database to disseminate information on sources of natural seed or propagation material.

At the beginning of the year the Trust organised a meeting of local authorities, forestry interests and environmental bodies to make them aware of studies, partly financed by the Trust, on comparisons of returns from agriculture and forestry under different subsidy/grant and labour scenarios.

More than £115,000 was provided this year in grant aid to support a range of research and educational projects. This is the largest sum of money ever provided by the Trust in one year and arose in part from the transfer of unspent money from the previous year.

Two very worthwhile educational projects have been supported this year - part financing the publication of a book "for anyone who would like to do more with trees and woodlands" and sponsorship of a trail to the famous plant collector David Douglas at the Royal Botanic Garden, Dawyck .

The Trustees commend the current portfolio of research projects for their quality, relevance and breadth in support of private sector forestry.

During the year a brochure on the Trust was produced to provide information about the Trust, its objectives and achievements. This will be used for general information and to inform organisations or individuals that may wish to contribute financially to the Trust in support of specific projects or the general project portfolio.

The total funds of the Trust at 31st March 1999 were £2,657,589. There was a slight (£120,265) decrease over the year resulting from uncertainties in the stock market and a higher expenditure on projects. The Trustees and Investment Managers agreed not to alter budgets meanwhile.

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THE SCOTTISH FORESTRY TRUST AND ITS OBJECTIVES

The Scottish Forestry Trust is a charitable trust which was established in 1983 to promote education, training and research in forestry and silviculture.

The Trustees have determined that, for the time being, the Trust's major contribution should be towards funding research projects, although, as opportunities arise, educational and training projects are also supported. A small proportion of the budget is set aside for publications and travel.

The Trust's primary objective is to support private sector forestry by contributing to the scientific, technical and economic information it requires to enable it to develop its role in UK forestry. Forestry is defined as the forestry industry as a whole, including its contribution to landscape, recreation, wildlife and the environment.

Projects in all of the sciences which bear upon forestry are supported by the Trust. High priority is given to proposals which address industry needs related to policy formation and execution, and to broad management questions. In general terms, preference is given to studies of a more applied nature where the benefits are more immediately available to the industry. Notwithstanding that, fundamental work, whose potential to resolve outstanding problems, or reveal new opportunities and possibilities is thought to be high, is also supported

TRUSTEES, OFFICIALS and ADVISERS 1998-99

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ACKNOWLEDGEMENTS

The Chairman and Trustees wish to acknowledge with gratitude the generosity of the following donors to the Trust's funds:

£100 to £1,000	Callendar Charitable Trust
	The Duke of Northumberland
	D B Dumughn (2/12/97)
£15,000	Mrs E O Mackie's Executry

The Trustees also wish to thank the Royal Bank of Scotland for assistance in producing a brochure about the Trust.

CHAIRMAN'S FOREWORD

An obvious change this year is in the presentation of the Trust's Annual Report. The Trustees agreed to change the format from A5 to A4. That allows more scope to provide combinations of text and photographs/ diagrams on the same page and I hope you will find this gives a more interesting presentation. As most reports are A4 size, library display and storage are facilitated. As you may see in the contents, fuller accounts of a few current projects or activities are included this year. A complete list of current projects is provided. A full set of audited accounts has been prepared and is available on request to anyone wishing copies. However in this year's report we have extracted salient data regarding the Trust's income and expenditure, balance sheet and financial activities over the year and presenting much of that information in diagrammatic form.

During the year the Trust produced a brochure, which sets out its objectives and achievements together with examples of current and past projects funded. The brochure will be used to provide general information about the Trust for those persons or organisations wishing to know the types of forestry projects supported. Also importantly it will help to inform persons, companies or other Trusts interested in providing funds in general support of the Trust's project portfolio or in supporting a specific project, which the Trust may wish to support but does not have adequate resources. Other initiatives to publicise the existence and role of the Trust in supporting and managing forestry projects are also under consideration.

As agreed by the Trustees and stated in last year's report, the budget for project expenditure has been set at 4% of the market value of the investment portfolio. The market value of the investment portfolio stands at over £2.6 million. Over £115,000 which includes some carry over of underspent funds from the previous year, was provided to support research and education projects. This project budget is significantly more than in any previous year. Two new initiatives were undertaken during the year. The John Eadie Memorial Fellowship was inaugurated. The two visiting research fellows interacted well with their counterparts in Britain to develop further the application of mathematical modelling. The other initiative involved the Trust formulating and managing a project to identify the locations of natural populations of native Scottish tree species. The Trust was seen to be the most appropriate body to carry out this project that entailed gaining access to some unpublished data as well as information of some commercial sensitivity to produce a database of these woods.

As we go into the next millennium, the Trust continues to address the research needs of the private forestry sector by playing an important role as a strong contributor in supporting a diverse and relevant range of projects.

Sir David Landale KCVO

TRUSTEES' REPORT

The objectives of the Scottish Forestry Trust are to support research, education and training in forestry, The Board of Trustees has the sole power to make decisions for the Trust. Trustees are appointed for their experience, expertise and objectivity and cognisance is taken of maintaining a good balance of appropriate skills on the Board. Trustees give freely of their time. In the case of the Chairman and members of the Projects and Research Committee, this for each person is in excess of 10 days per year, whereas other Trustees will spend approximately five days on Trust business. A legal adviser regularly attends the full meetings of the Trustees, held three times per year. The Director is responsible directly to the Chairman for the day-to-day organisation and management of the Trust's business. A professional investment management company, Stewart Ivory & Co. Ltd, advises the Trustees on the investment portfolio. The accounts are audited annually.

A Statement of Trustees' responsibilities for financial statements is presented later in this report and contained in the separate full set of audited accounts, which is available on request. The auditors observe that the financial statements give a true and fair account of the Trust's affairs at 31 March 1999. The financial statements prepared comply with the requirements of the Trust Deed and the Charities Accounts (Scotland) Regulations 1992.

Review of Project Portfolio

The portfolio comprised seventeen individual projects covering biological research, conservation, marketing, land use and sustainability of the environment, as well as including two educational projects. A full list of projects supported is provided under the sections, "Projects Completed This Year" and "Ongoing Projects being Funded".

Since the establishment of the Trust approximately 2% of the projects budget has been allocated to those which could be classified as "educational". This year the Trust supported the publication of a book by Dr Mutch on the establishment, silviculture, valuation and management of woods. People interested in trees and woodlands, especially farmers and conservationists, are the target readership rather than the professional forester. This book has received good reviews as to content and readability and fills a niche in the market. The other educational project supported was the creation of a trail at the Royal Botanic Garden, Dawyck to commemorate the bicentenary of David Douglas who introduced many plants into Britain from North West America. The introductions included such important forestry species as Sitka spruce, Douglas fir, Lodgepole pine and several silver firs. This trail is attracting a lot of interest from general visitors and a special effort has been made to capture the imagination and inform children about David Douglas and the importance of the tree introductions to this country. Educational projects are an important part of the portfolio especially as there is often a lack of awareness and still a lot of misinformation about forestry in the press and on radio. Good quality, well-targeted applications are welcomed.

The John Eadie Memorial Fellowship was established in memory of John Eadie a previous Director of the Trust, who had a profound influence in shaping and consolidating the Scottish Forestry Trust. The aim of the fellowship is the betterment of British forestry by introducing expertise not readily available here. Applicants of high professional standing, enthusiasm and ability to communicate their knowledge were sought. The tenure of the fellowship was for three months and a host organization in Britain had to agree to provide a base and support. The fellowship will be available every second year over the next ten years. Because of the high calibre of applicants and importance of the subject areas, the Trust decided to appoint two fellows. Professor Richard Waring, Oregon State University was hosted by the Institute of Ecology and Resource Management, Edinburgh University and adapted a model of growth and yield based on

stand functional processes to Sitka spruce. Dr Euan Mason, University of Canterbury, N.Z. was hosted by Forest Research, Roslin and helped to develop an Establishment and Early Growth Model and Decision Support System for use in Britain. These two projects are described more fully later in this report.

Earlier in the year the results and demonstration of the methodology of an important study carried out in the Grampian region to indicate which areas of land might transfer from agriculture production to forestry under different levels of returns and with different rates of subsidies or grants were presented at a meeting of local authorities, farming and forestry interests and representatives from environmental organisations.

As mentioned in the Chairman's Foreword another new initiative of the Trust has been to plan and manage a project itself, as the Scottish Forestry Trust appeared to be the most appropriate organisation to undertake the project. A fuller account of that project is given later in the report. Other ongoing projects, which demonstrate the diversity and relevance, are concerned with Predicting Log Quality in Sitka Spruce, Suitability of Birch for Processing, Immuno-Contraception of Grey Squirrels and Carbon Sequestration of Sitka Spruce. Many of these projects have Steering Groups, which may include the Trust's Director, and these Groups periodically oversee the project to help keep the project on track and relevant to forestry industry's needs.

The Accounts for the year show an income of over £118,000. Included in that total is a very generous donation of £15,000 from the estate of the late Mrs Mackie's estate which it has been agreed should be used for publicity about the Trust to encourage contributions to the Trust's Capital Account. The income from investments reflected the more unsettled state of the share market and was down slightly from the previous year, i.e. £83,084 in 1998/99 compared to £85,338 the previous year. Interest on the bank accounts in both years was similar at over £19,000.

Over the year there was a net deficit of income over expenditure of £50,575 compared with a surplus of almost £12,000 the previous year. This deficit arose in part from the decision to increase the projects budget to 4% of the market value of the investment portfolio, which was agreed to by the Trustees last year and discussed in last year's report. It was appreciated that this expenditure would decrease the rate of growth of the capital fund to possibly 2% plus inflation. The income from dividends, bank interest, tax reclaim was not expected to cover this level of expenditure. The administration costs of running the Trust including professional and investment management fees increased only marginally, i.e. less than £400 to £52,410. Expenditure on projects this year amounted to £116,840 compared to £42,167 the previous year.

During the year the Trustees and Investment Managers reviewed the budgets in the light of the unsettled share market and moved to a more defensive position regarding investments. Budgets for projects and administration were included in the review and the decision was made to maintain the agreed levels of expenditure meanwhile.

PROJECTS COMPLETED THIS YEAR

Plantation Establishment Decision Support System

Dr Euan G. Mason
University of Canterbury, Christchurch, N.Z.

Recipient of a John Eadie Memorial Fellowship 1998

Forest plantation establishment is a time of opportunity for forest managers, but to make most of that opportunity they must have access to the right information. Improved survival reduces the need for beating up and the maintenance of regular spacing is important in improving wood quality. Earlier canopy closure due to better site preparation and weed control is also important as it can reduce rotation lengths by four years or more. Improving seedling quality and intensive site management, however, cost money, and managers need to be able to predict the effects of alternative establishment strategies to evaluate their worth. The way forward is to develop appropriate models based on quantitative and qualitative representations of the establishment environment and systems as a decision support system for managers. In future such decision support systems may be integrated into a wider management information system. Models are used extensively for financial planning in forestry, but early growth of tree crops up to age 10 years has not been modelled quantitatively in Britain.

Dr Mason, assisted by staff at Forest Research's Northern Research Station, explored the development of prototype model of crop responses to establishment treatments using data from experiments that had been established by Forest Research staff. A subset of 172 experiments established in the Borders/Kielder region was screened and data processed for development of a model. Results indicated that the equations developed by Dr Mason for the establishment and growth of juvenile *Pinus radiata* in New Zealand fitted surprisingly well to juvenile Sitka spruce in the Borders. This work is now being consolidated by collaborative work between Forest Research and the University of Canterbury.

Dr Mason presented a series of talks to Forest Research staff at the Northern Research Station and Alice Holt, at Aberdeen, Edinburgh and Oxford Universities, as well as several presentations to forest managers. Dr Mason's visit stimulated considerable interest in the need to include initial survival and growth at the juvenile stage of crops in current yield models and the value of decision support systems for forest managers. There exists a large database of field trials investigating the effects of alternative site preparation strategies on survival, growth and in some cases stem form. A summary of that information in the form of models of survival and initial growth with inferences about the likelihood and magnitude of site preparation effects for particular sites would be a valuable decision tool for managers.

The Trustees of the Scottish Forestry Trust wish to record their appreciation to Dr Mason for taking up the fellowship. His experience and expertise in modelling juvenile crops and in developing appropriate decision support systems were particularly appreciated. The Trust would like to thank the Chief Executive and staff of Forest Research for making Dr Mason's stay enjoyable and rewarding.

Environmental Limitations on Growth of Sitka Spruce in Britain

Professor Richard Waring
Oregon State University, Corvallis, USA

Recipient of a John Eadie Memorial Fellowship 1998

Using a general physiologically-based model developed by the author and Dr J. Landsberg, CSIRO, Australia, Professor Waring assessed environmental restrictions on growth of Sitka spruce throughout Britain. Plantation sites encompassing four fold differences in growth rates were selected. Weather data were acquired and, with the assistance of staff at Forest Research, were extrapolated to 27 sites taking account topographic effects on temperature and precipitation. These data were then transformed, with the assistance of Dr Moncreiff at the University of Edinburgh, into units that drive the model: solar radiation, mean temperature, humidity deficits, and number of subfreezing days per month.

The analysis confirmed the importance of the influence of slope in calculating radiation but indicated that local topographic variation in the height of trees may reduce the direct influence of slope by 50%. The modelling exercise indicated that subfreezing temperatures, which occur between 40 to 70 days each year, only modestly constrain photosynthesis because subfreezing temperatures occur when radiation is low and mean daily temperatures are well below optimum. In general, Sitka spruce is planted where water is readily available most months of the year. The model however indicated that on about 20% of the sites investigated, seepage water was required to sustain plantations at measured growth rates. Incident solar radiation and mean monthly temperatures account for nearly half the total variation in productivity; the influence of soil fertility, and, to a lesser extent, high exposure to wind appear to account for further reductions in observed production. In favourable climatic situations, frequent applications of fertiliser should sustain maximum growth rates at age 20 in excess of 40 m^3/ha/yr (yield class of 26 m^3/ha/yr).

Professor Waring presented a series of lectures at Universities in Aberdeen, Bangor, Oxford, Reading and Edinburgh as well as at F.C. Headquarters, Forest Research at the Northern Research Station and Alice Holt and Institute of Terrestrial Ecology, Bush on the modelling approach and the potential for the application of remote sensing in forestry. He claims that remote sensing has progressed to the stage that incident solar radiation, ambient air temperature, humidity deficits, and surface drought can be monitored accurately across broad areas. Recent advances in broad-beam laser technology provide a means of recording tree height growth and the vertical distribution of the leafy canopy with an accuracy of 1 metre. The potential thus exists to scale up the entire modelling approach and to both drive and test it with state of the art remote sensing technology.

The Trustees of the Scottish Forestry Trust wish to record their appreciation to Professor Waring for accepting the fellowship to come to Britain and for his enthusiasm in sharing his knowledge and demonstrating the potential of these newer tools for predicting yield. The Trust would also like to thank the Institute of Ecology and Resource Management, Edinburgh University for hosting Professor Waring's visit.

The Potential for Extending Forest Cover in Grampian

R. Lorrain-Smith, M. Bell, D. Rees and A. Davis.

Study sponsored by the Scottish Forestry Trust, Forestry Industry Council of Great Britain, Grampian Regional Council and Aberdeenshire Council.

This study reports on the potential transfer of land from agriculture to forestry in the Grampian region. If forest cover is to increase substantially, strategies must be based on a true understanding of the agricultural crops, trees and economics that can most effectively be gained through a systematic framework of analysis to allow a range of scenarios to be evaluated. The analytical approach used was based on (1) regional differences in land availability, (2) future agricultural production, (3) timber supplies, and (4) acceptability of forestry. The analyses provide a tool to indicate the regions where encouragement of forestry is required and where controls are desirable. This is also very useful to policy makers to predict the outcome of different policy initiatives, e.g. change in subsidy level.

Three sets of data were required for this analysis. Data on site conditions and land types in Grampian; gross margins for agriculture, calculated for all conditions and sites; and comparable figures for forestry for the main conifer species.

The interface between viable agriculture and forestry under different subsidy/grant and labour scenarios is complex and the results can be unexpected. The analysis indicated that the area closest to being under some degree of economic pressure to change from agriculture to forestry lies mainly to the west and south west of the region, and not in the north east as the area identified for the Grampian Forest. The results highlighted that if the farmer was prepared to do forestry work, rather than hiring contractors, forestry was more attractive.

Further work and testing of this approach is required. For example to include social and environmental factors. However the project demonstrated the potential of this analytical approach and similar studies would be valuable in other parts of the country.

A copy of the report The Potential for Extending Forest Cover In Grampian is available from the Trust priced £5.50.

David Douglas Bi-Centenary Trail at Dawyck Botanic Garden

Although David Douglas is well known to foresters, his achievements are not widely known to the British public. He was the major plant collector of his day introducing over 200 species into Britain from North America. Sitka spruce, Douglas fir, Lodgepole pine, lupin, flowering currant and sunflower were among those introductions. The Trust sponsored a trail to celebrate the bi-centenary of the birth of David Douglas which is aimed at the general public, and children in particular, telling the story of David Douglas, his adventures and achievements.

Selection of Phenotypically Superior Oaks for Use in an Improvement Programme

This project being carried out at the University of Oxford is selecting oak trees throughout Britain and in Europe for future plantations. One hundred phenotypically superior mother trees have been selected on the basis of maximising recoverable timber volume and quality by placing emphasis on improving form and reducing shake. The intention is that this material will now be used to establish breeding seedling orchards and for micropropagation. A manuscript on this project has been submitted for publication.

ONGOING PROJECTS BEING FUNDED

Locating Local Origins of Scottish Native Trees

This project has been developed, directly managed and fully financed by the Trust. Dr Scott Wilson is being employed for 16 months on this work.

This project sought to locate and describe at least 40 natural populations of the following species - Scots pine, silver and downy birches, sessile and pedunculate oaks, ash, alder, aspen, wych elm, wild and bird cherries, rowan, hazel, holly, and juniper. The intention is that these populations would be available for future genetic conservation; they were selected to represent the range of bio-climatic conditions under which the individual native tree species occurs in Scotland. Where possible, populations were identified which contained at least 30 mature, unrelated individuals.

Knowledge about the present distribution of Scottish native tree species in natural stands, has been relatively inaccessible and is not held in a consistent format. Much is unpublished being held in records of statutory bodies [Scottish Natural Heritage and Forestry Commission], non-government organisations, academic research institutions, private companies and many individuals. Also scientific knowledge of the genetic variation within Scottish native tree species, and its distribution within and between geographically localised populations is currently very limited. This needs to be addressed in the light of the importance now being placed on remnant natural woodlands, and the increased establishment of new woodlands composed of native tree species. Many such woodland establishment projects have sought to use local native origins of Scottish native tree species and the Forestry Commission has encouraged the use of such local native sources.

The published literature was reviewed and potential holders of unpublished material were contacted. Existing woodland survey and inventory records were reviewed in detail to identify lists of candidate population locations for each native tree species. These were augmented by locations notified by independent seed collectors and forestry researchers. In addition, areas of non-coniferous woodland were highlighted on the Ordinance Survey maps as potential population search locations.

Regional tours of inspection by road were carried out confined to the mainland and some more accessible islands. This confirmed the existence of many populations and added others. Selection of populations was based on location, condition and ecology, without reference to phenotypic timber form.

The database, compiled in Microsoft Access format, is held solely by the Trust. This contains details of each native tree population covering location, species, size and condition, woodland context, elevation, bio-climate, geology and soils. Over 1,000 individual populations at several hundred locations are included (many locations host several species).

Steps are now being taken to determine the ownership of the population sites in order to seek the owners' views on future dissemination and use of the information contained in the database. The populations identified represent a valuable resource for research and should be encouraged to be made available, under certain conditions, as sources of reproductive material.

Effects of Harvesting Machinery on Soil Physical Properties: This PhD study being carried out at Lancaster University is investigating the impacts to soil physical properties following mechanised forest harvesting at upland sites. The degree and nature of disturbance on selected soils are being examined and efficacy of ground protection measures determined.

Timber Degrade in Sitka Spruce *(Picea sitchensis)* Due to Bark Stripping: Trees which were bark stripped by red deer between 1978 and 1997 were examined and valued in the field prior to felling. Following selected trees being harvested, logs were sawn, examined for stain and timber samples taken for strength tests. An economic assessment of the effects of deer damage is being included in the final report.

Damping Off Pathogens in Natural Regeneration of Scots Pine: This PhD study at the University of Aberdeen is examining the roles of the damping off pathogens, *Pythium* sp., *Phytophthora sp.*, and *Rhizoctonia solani*, on natural regeneration of Scots pine. The susceptibilities of different native Scots pine provenances will be compared.

Environmental Impact Assessment Application in the UK Forest Sector: The aim of this PhD study is to improve the effectiveness of Environmental Impact Assessment in the forest sector as an environmental safeguard and to recommend procedures to aid decision making. With the advent of the UK Forestry Standard and increased uptake of forest certification, environmental impact assessments have acquired additional significance.

Immuno-Contraception of Grey Squirrels: Immuno-contraception is considered a promising option for grey squirrel control in the future. The principle behind this approach is to induce a specific immune response in female grey squirrels. The Trust is included in a partnership of funders who are financing this project with the Forestry Commission taking the lead.

The Role of Winter Desiccation and Frost in Determining Stem Form in Silver Birch Provenances: This PhD study, being carried out at the Northern Research Station, Forest Research and University of Edinburgh, is examining differences among native and selected birch provenances in their abilities to recover stem form after damage. Provenance differences in susceptibility to frost damage to shoots are being quantified. Later studies will examine the responses when seedlings are exposed to desiccating conditions.

Log Quality Assessment: There are concerns among growers and sawmillers that the quality of Sitka spruce logs has decreased in recent years as Sitka will account for over 60% of production in the next 25 years. The objective of this project is to develop an objective method of timber quality assessment in Sitka spruce that can be applied to standing trees at a range of ages and which can be related to the quality of sawlogs and sawn timber that will be produced at the end of a normal rotation.

Management Strategies for Capercaillie in Commercial Forests: In recent years there has been a decline in numbers of capercaillie in Scottish forests. The reasons for its decline are not fully understood. Timber harvesting through its effect on stand structure, food supply and other aspects of habitat quality undoubtedly will have a significant impact. The aim of this project at Aberdeen University is to define the optimal relationship between timber production and capercaillie conservation in commercial forests. Predictive models of timber revenues, habitat quality and population abundance for a range of forest management scenarios will be developed and interlinked.

Broadleaved Timber Forecasting: The Trust is providing financial assistance to have manuscripts prepared for publication from a MSc thesis at Oxford Forestry Institute. The study examined the problems in providing accurate forecasts of broadleaf timber production. A method is proposed to provide accurate five-year forecasts of timber production that would satisfy the immediate requirements of the broadleaf timber processing industry.

A Study into the Suitability of Birch for Processing: The Trust is part funding this project being led by

TRADA. The objective of the project is to determine the suitability of selected birch material for manufacturing specific sawn products (flooring, Glulam and furniture framing). Birch log samples are being obtained from 8 sites across UK. Data are being collected on conversion rates and grade recovery at the sawmill and laboratory tests are determining compliance with existing product standards.

Long-Term CO_2 Sequestration by Sitka Spruce: Detailed measurements of net sequestration of atmospheric CO_2 are being recorded of an 18-year-old stand of Sitka spruce in Perthshire as it enters its first thinning. This study is part of a continuous series of measurements being carried out at the forest by a team from the University of Edinburgh. Thinning is expected to provide a major perturbation in carbon sequestration of the forest and has not been included in previous studies.

A population of birch in Perthshire which is considered of local origin. (Photo. S. Wilson)

COMPLETED PROJECTS

Report Number indicating year, Title, Contractor, Brief Statement and Report Availability

R99/1: Book "Tall Trees and Small Woods" (Dr W E S Mutch). This book addresses the need for more accessible information and better understanding of woodland management for people who are not fully familiar with all the technical aspects of forestry. Available from book shops price £20.

R99/2 Flowering and Seed Production of Aspen in Scotland (Dr R Worrell). Aspen flowers infrequently in Scotland, however in 1996 aspen flowered and set seed profusely. A paper on this study has now been published in Forestry.

R98/1: An Investigation into the Stability of Irregular Forests Using a Wind Tunnel. (Forest Research and Oxford University). Study used a wind tunnel, scaled trees and mathematical modelling. Results indicate that irregular forests are more windfirm than uniform forests. Unpublished report available.

R98/2: Silvicultural Systems of Lower Saxony and the Netherlands. (Ms J. Dunne).The recipient of this award looked at silvicultural systems and techniques employed in Germany and the Netherlands to transform 19th century pine plantations on heathland soils to more diverse forests. Transformation of forests to continuous cover management was seen to be a lengthy process, during which time all the benefits will not occur. A short unpublished report is available, but a manuscript is being prepared for publication in a forestry journal.

R98/3: Ecological Site Classification for British Woodlands. (Forest Research and University of Edinburgh). pH and nutrient-nitrogen availability were identified as the most important components of the soil nutrient regime. Ground flora composition and humus type were particularly valuable in deriving soil nutrient regimes. Short report available, but study has now been published.

R98/4: The Effect of Nursing Mixtures on Stem Form, Crown Size and Wood Quality of Sitka Spruce. (Department of Forestry, University of Aberdeen). Both hybrid and Japanese larch promoted a high rate of growth in Sitka spruce that was equal or greater than that of the annually fertilised pure spruce. By comparison lodgepole pine promoted relatively slow but even growth in the spruce throughout the life of the stand. Lodgepole pine is better able to control growth and branching habit in Sitka spruce, particularly during the critical period immediately following canopy closure with the prospect of better quality sawlogs. An unpublished report is available.

R98/5: Tree Trunk Educational Resources. (Forestry Commission). Programme of educational information related to community woodlands, multipurpose forests, native woodlands and uses of timber was prepared and pilot trials were successfully carried out by formal education and environmental groups.

R98/6: Timber Frame 2000. (Building Research Establishment and TRADA Technology). The Trust provided financial support to supply home grown softwood to construct and test a six storey timber frame building - constructed in a large airship hangar at Cardington to allow a range of tests to be carried out. This project is ongoing. Performance data are being collected as well as the building being used to demonstrate technical aspects to architects and the construction industry.

R98/7: Availability Forecast for the Principal British Hardwoods. (Timber Growers Association). Desk-based project to forecast 20-year availability of the principal British hardwoods. No meaningful and reliable production forecasts by 5 or 10 year periods could be produced for the next 20 years on the information available as broadleaves are subject to widely different management objectives. This report has emphasised the gap in information on the quality of the broadleaved resource. Report is available from the Trust priced £5.50.

R97/1: Fungal Spoilage of Kiln Dried Sitka Spruce at Scottish Sawmills. (Department of Forestry, University of Aberdeen).Disfiguring sapwood stain can be a problem in kiln dried spruce timber. It is caused by the pigmented sporulating structures of the fungus *Ophiostoma piceae*. The study examined the conditions favouring development of the fungus and highlighted improvements in procedures. The results are contained in a PhD thesis. A short report is available from the Trust; papers have been published in forestry journals.

R97/2: Cashel - Forestry for a Thousand Years. (Royal Scottish Forestry Society Forest Trust).The Scottish Forestry Trust made a single payment of £35,000 to help establish a native woodland on the eastern shore of Loch Lomond. This project is attracting considerable attention as access, recreation, education and conservation are encouraged against a background demonstration of best forestry practices.

R96/1: Tolerance of Scots Pine to Low Root Temperatures. (Northern Research Station, Forestry Commission). Differences between provenances (four native, a current commercial seed identity and a Swedish seed origin) were observed in susceptibility to frost damage to roots. No differences in tolerance to waterlogging of native provenances were detected. There were however substantial differences

observed in the basic morphological and physiological attributes between the origins. The main results have been published in a forestry journal. A report is available from the Trust.

R96/2: Socio-EconomicFactors Influencing the Decision to Market Timber in the Private Sector. (John Clegg & Co, and Firn, Crichton Roberts Ltd). This study was part of a multi-sponsored marketing project "A Strategic Review of Private Sector Roundwood Marketing in Britain". Main conclusion was that woodland owners could benefit from being more fully supported in technical and marketing skills. Improvements in marketing structures and services are likely to encourage greater quantities of timber onto the market. A report is available from the Trust.

R96/3: Conservation of Scottish Forestry Soil. (Institute of Freshwater Ecology, NERC).Fourteen soil types grouped within the peat and mineral soil categories were identified as potentially susceptible to erosion if cultivation and drainage are required prior to afforestation. Organic content is the single most important factor controlling the degree of resistance to mineral soil erosion. This study has helped in understanding the mechanics of erodibility of forest soils and in underpinning the theoretical basis of the Forests and Water Guidelines. A report is available from the Trust.

R95/1: Habitat and Diet of Capercaillie in a Commercial Plantation in Central Scotland. (Institute of Terrestrial Ecology, NERC). The role of Sitka spruce in the diet of Capercaillie living in woodland where half of the woodland is Sitka spruce with larch was examined. A report is available from the Trust.

R95/2: Control of Variation in Density in Sitka Spruce. (School of Agricultural and Forest Sciences, University of Wales, Bangor). This study examined the underlying causes of variation in wood density with particular reference to the silvicultural control of critical strength properties. A report is available from the Trust.

R95/3: The Future Location of Forestry in England and Wales, with Especial Attention to the Transfer of Lowland Agricultural Land. (Forestry Industry Council of Great Britain). The work describes a system developed to identify, at a national level, the extent, location and type of land likely to be available for profitable transfer from farming to forestry. A report entitled "The Potential for Extending Forest Cover in the Lowlands of England and Wales" is available from FICGB.

R94/1: An Investigation into the Influence of Site Quality on the Productivity of a Range of Major Tree Species. (Macaulay Land Use Research Institute and Forestry Commission Research Division). This study examined the productivity of Douglas fir, Japanese larch and Scots pine on better quality sites. Site/yield models allowing the prediction of General Yield Class were prepared. A report is available from the Trust.

R94/2: Net CO_2 Uptake of Scottish Forests. (Institute Ecology and Resource Management, University of Edinburgh). The study describes the development and testing of a system for the measurement of CO_2 exchange by forest stands. A report is available from the Trust.

R93/1: Molecular Methods for the Detection and Identification of *Heterobasidion annosum*. (University of Abertay). Study investigated immunology methods in live trees and harvested wood. A report summarising the progress made is available from the Trust.

R93/2: Private Forestry Policy in Western Europe. (Author: A J Grayson). The implementation of policy and the role of financial incentives in Britain, Western Europe and some other countries including Australia and Russia is discussed against the background of descriptions of the historical and social context of forestry, its legislative, policy and administrative framework, and the taxation and grants regimes employed in the individual countries. Book published by CAB International, Wallingford, Oxon, OX10 8DE.

R92/1: The Development of a Transformation from Uniform Plantations to an Irregularly Structured Forest. (Institute of Ecology and Resource Management, University of Edinburgh). An enumeration survey 40 years into a 60-year transformation from uniform plantations to an all-aged forest of mixed species on an upland site at Glentress in the Tweed Valley. A report is available.

R92/2: The Mechanism of Increased Nitrogen Uptake by Spruce in Mixed Species Stands. (Department of Plant and Soil Science, University of Aberdeen). A study of the mechanisms by which the "extra" nitrogen which results in improved growth of spruce when grown in mixture with Scots pine, lodgepole pine or larch on poor peats and heathlands becomes available. A report is available.

R92/3: "Shake" in Oak. (Oxford Forestry Institute, Oxford University). A study of the defect, including the relationships of oak leaf flushing and autumn shedding to early wood vessel size and a predisposition to "shake", the role of mechanical stresses in the condition, and an evaluation of its economic consequences. A report is available.

R92/4: Survey of Squirrels in Britain. (Timber Growers UK). Results of a questionnaire distributed among private woodland owners to determine the current status of both the red and grey squirrels, grey squirrel control, and grey squirrel damage. Designed to be

complementary to the Forestry Commission's Annual Squirrel Survey of its forests, and to be combined with it to obtain a more comprehensive assessment . Report available from TGA.

R91/1: The Commercial Potential of Birch in Scotland. (The Forestry Industry Council of Great Britain). An investigation, made by commissioning a collection of essays, into the potential economic, silvicultural and ecological benefits of native birch in Scotland. A symposium based on the material in the essays was held in May 1991. Copies available, price £5, from the Trust .

R91/2: The Ecology of the Great Spruce Bark Beetle *(Dendroctonus micans)* and its Predator, *Rhizophagus grandis*. (Research Division, Forestry Commission). This work contributed to a wider Forestry Commission programme on the development of a monitoring system for *R. grandis* and on the nature of tree resistance to attack by *D.micans*. A report is available.

R91/3: Development of a Computer Programme for Forecasting Conifer Wood Production in the United Kingdom. (Forestry Industry Council of Great Britain). Computer programme developed to assess impact of different planting rates on future wood supplies, capable of accommodating differences in species growth rates, treatments and rotation lengths, and of differentiating wood production into a range of top end diameter size classes.

R91/4: The Forestry Industry and the Greenhouse Effect. (Department of Economics, University College London). A study of economic aspects of the role of forestry in addressing the greenhouse effect, which looked at policies aimed at reducing carbon emissions, and which developed principles on which carbon taxes and credits might be based. Preliminary estimates are made of both taxes and credits. A published report is available.

R91/5: Designated Areas in Scotland. A publication which includes descriptive accounts of the main designated areas in Scotland together with maps of their locations at a scale of 1:750,000. Published by the Scottish Forestry Trust from material prepared by the Institute of Terrestrial Ecology. Price of publication £7.95 obtainable from the Trust.

R90/1: Yield Class and Windthrow Hazard Characteristics of Forestry in the Grampian Region. (Macaulay Land Use Research Institute). A study of the use of predictive models developed at M.L.U.R.I. on the forestry potential of the region, and presented in the form of maps of yield class and windthrow hazard. A report discusses the methods and provides a commentary on the maps.

R90/2: The Influence of Wide Spacing of Trees on the Interception of Radiation and the Growth of Trees and Pasture. (Department of Forestry and Natural Resources, University of Edinburgh). A study of light interception by the tree canopy and by pasture grasses, and its relationship to the growth of both components when combined in agroforestry (silvopastoral) systems. A short report is available.

R89/1: The Impact of Forestry on Output and Employment in the United Kingdom and its Member Countries. (Fraser of Allander Institute, with additional survey material compiled by the Department of Forestry and Natural Resources, University of Edinburgh). The first comprehensive estimate of the impact of forestry on output and employment on the aggregate UK economy and those of its member countries. A report is available.

R88/1: Production Forecasting for Private Sector Scottish Forestry. (Department of Forestry, University of Aberdeen). A survey of the private sector growing stock in Scotland, for the purpose of exploring the apparent discrepancies between the national production forecast produced by the Forestry Commission and estimated actual production by the private sector. A report is available.

R88/2: Current Knowledge and Perceptions of Forestry. (Valin Pollen Ltd and Consensus Research). Study identified forestry's key audiences, their knowledge and perceptions of the forestry industry, and outlined the way in which the communications chain operated to influence opinion. Recommendations are made on a more effective communications strategy. A report is available.

R87/1: The Economic Effects of the "Guidelines for the Management of Broadleaved Woodland". (Timber Growers UK). The economic impact of the Forestry Commission's Broadleaved Policy, which was introduced in 1985, was examined. An analysis was carried out of the changes in profitability of five major broadleaved species brought about by the guidelines. A report is available.

R87/1: Stirling Forestry Employment Study. (Firn, Crichton Roberts Ltd). Study funded jointly with Stirling District Council and the Scottish Development Agency which analysed employment in the forestry industry in the Stirling District. A report is available.

STATEMENT OF TRUSTEES' RESPONSIBILITIES

Charity law requires the Trustees to prepare financial statements for each financial year which give a true and fair view of the state of affairs of the Scottish Forestry Trust and of its income and expenditure for that period. In preparing those financial statements, the Trustees are required to:

- select suitable accounting policies and then apply them consistently.
- make judgements and estimates that are reasonable and prudent.
- prepare the financial statements on a going concern basis unless it is inappropriate to presume that the Trust will continue in existence.

The Trustees are responsible for keeping proper accounting records, which disclose with reasonable accuracy at any time the financial position of the Trust and to enable them to ensure that the financial statements comply with charities legislation. They are also responsible for safeguarding the assets of the Trust and hence for taking reasonable steps for the prevention and detection of fraud and other irregularities.

ACCOUNTING POLICIES

The financial statements have been prepared in accordance with applicable accounting standards and the Statement of Recommended Practice, Accounting by Charities.

(a) BASIS OF ACCOUNTING

The financial statements have been prepared under the historical cost convention as modified by the revaluation of investment assets.

(b) DEPRECIATION

Depreciation is provided on the cost or valuation of tangible fixed assets over their estimated useful lives to the organisation. The annual depreciation rates and methods are as follow. Office equipment 20% pa straight line

(c) TRUST FUNDS

The Scottish Forestry Trust Funds are held to promote education, training and research in forestry and silviculture.

The Trust has a single General Fund, which is split between capital and revenue. Under the Trust Deed, the Trustees are empowered to use both capital and revenue for any of the purposes of the Trust and to accumulate revenue. This is modified by the Trust rules to require the Trustees not to so deplete capital that the Trust cannot act properly as a charitable organisation.

(d) INVESTMENT INCOME

Investment income is the income received during the year together with the related recoverable tax credits thereon.

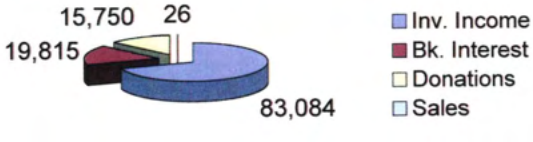
Presentation of Financial Position and Activities

In the following pages the information presented on income, expenditure, and balance sheet has been extracted from the report of the audited accounts prepared by Brown, Campbell and Company for the year ended 31 March 1999.

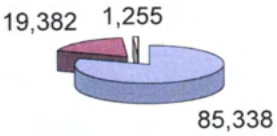
If you wish to receive a copy of the full report of the audited accounts of the Scottish Forestry Trust 1998-99, please contact the Trust's office.

	1999 £	1998 £
Total Income	118,675	105,975

1999 INCOME £

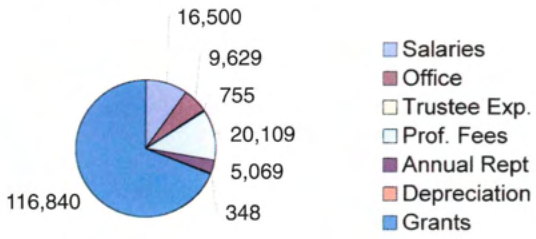


1998 INCOME £

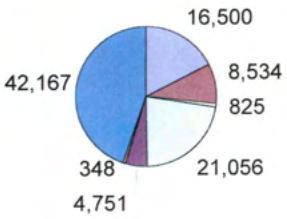


	1999 £	1998 £
Direct Charitable Expenditure	116,840	42,167
Administration & Professional Fees	52,410	52,014

1999 EXPENDITURE £



1998 EXPENDITURE £



	1999 £	1998 £
Net (Deficit)/Surplus	(50,575)	11,794

	1999	1998
	£	£
Total Assets Less Current Liabilities	2,657,589	2,777,854
Funds Unrestricted	2,657,589	2,777,854

Contingent Liabilities

The Trust has made commitments to pay grants, conditional on the research continuing and satisfactory reports being received by the Trutess, as follows

1999-2000 : £90,767
2000-2001 : £77,825
2001-2002 : £34,029

Grant and Other Charitable Expenditure	1999	1998
	£	£
Lower Saxony Sivicultural Systems	-	385
Tall Trees and Small Woods	3,650	2,500
Stability of Irregular Forests	-	4,850
The Potential of Extending Forest Cover in Grampian	5,477	3,000
Nursing Mixtures on Stemform and Wood Quality of Sitka	-	4,805
Timber Frame 2000	-	1,200
Effect of Harvesting Machinery on Soil Properties	4,680	4,680
Ecological Site Classification for British Woodlands	-	5,540
Red Deer and Timber Degrade	12,000	7,000
The Tree Trunk	-	1,650
Availability Forecast of British Hardwoods	-	1,557
Damping Off Pathogens of Scots Pine	-	5,000
Environmental Impact Assessment in UK Forest Sector	2,570	
Selection of Phenotypically Superior Oaks	10,011	
Locations of Local Origins of Scottish Native Trees	17,536	
Flowering and Seeding of Aspen in Scotland	750	
John Eadie Fellowships: Professor R. Waring + Dr E. Mason	12,016	
Immuno-Contraception of Grey Squirrels	5,000	
Stem Form in Silver Birch Provenances	6,000	
Log Quality Assessment	5,000	
Management Strategies for Capercaillie	5,200	
Broadleaved Timber Forecasting	450	
Suitability of Birch for Processing	11,500	
David Douglas Bi-Centenary Trail	5,000	
Long Term CO_2 Sequestration by Sitka Spruce	10,000	

THE SCOTTISH FORESTRY TRUST NEEDS YOUR HELP

Forestry, as a science-based industry must continue to seek new opportunities, resolve emerging problems, and find new ways of tackling longstanding ones. Also, in response to demands and pressures from within and outwith the industry, the wider information needs of forestry have continued to grow.

As a result the Trust is receiving an ever-increasing number of good, relevant applications far beyond the capability of its current resources to fund.

The Trustees believe that it is very much in the interest of a healthy and vital private sector that it should benefit from a financially strengthend Scottish Forestry Trust. **The Trust needs your help** in the form of donations of any size. Since the Trust is a charity, Covenants from donors enable tax to be reclaimed by the Trust, thereby increasing the value of any gifts.

DEED OF COVENANT

(listed companies and other corporate bodies)

This Deed of Covenant is made the..... day of .....

19..... between.....

.....

(hereinafter called "the Donor Company") of the one part and the Scottish Forestry Trust (hereinafter called "the Trust") of the other part WITNESSETH that the Donor Company hereby covenants with the Trust that it will during the term of four years from the ..... day of..... 19..... pay annually to the Trust on the day..... of ..... in each year for the benefit of the work of the Trust such a sum as will after deduction of Income Tax at the rate in force for the time being, leave in the hands of the Trust, the net sum of

..... (.....)

Please return to
The Scottish Forestry Trust
5 Dublin Street Lane South
Edinburgh EH1 3PX

For and on behalf of.....

.....

(Director).....

.....

(Director or Company Secretary).....

.....

DEED OF COVENANT

(Individuals)

I, ...

of .....

hereby bind myself to pay annually to the Scottish Forestry Trust, 5 Dublin Street Lane South, Edinburgh, for the benefit of the general work of the Trust for a period of four years from the

..... day of ..... 19 ..... or during my lifetime whichever shall be the shorter such a sum as will after deduction of Income Tax at the rate for

the time being in force,amount to the sum of ..... per annum,

beginning the firstpayment on the .....19..... in witness

thereof those present are subscribed by me

at .....on the ..... 19 .....

Signature .....

Please return to

The Scottish Forestry Trust
5 Dublin Street Lane South, Edinburgh EH1 3PX

Witness .....

Address .....

.....

Occupation .....

GIFT AID

Gift Aid is a Government tax concession which enables single gifts to be made to charitable organisations like the Scottish Forestry Trust by U.K. residents.

The gift must be accompanied by a certificate obtainable from the
Scottish Forestry Trust
5 Dublin Street Lane South
Edinburgh EH1 3PX.

Causes of poor stem in Birch are being examined in a current project (Photo. D. Malcolm)

One of the French oak genotypes selected for inclusion in the British Hardwoods oak improvement programme. (Photo. J. Hubert)

The Trust funded a study on the Potential for Extending Forest Cover in Grampian. Report is available from the Trust. (Photo. D. Rook)

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0131 557 1800

Chairman, six Trustees and Director of Trust at the launch of the David Douglas Bi-Centenary Trail at Dawyck. (Photo. D. White, RBGE).

Trust Report R98/7 examines the problems of forecasting the availability of British hardwood timber.

The impact of harvesting machinery on soil physical properties is being examined in a PhD study at Lancaster University (Photo. M. Wood)