THE SCOTTISH FORESTRY TRUST

ANNUAL REPORT 2000 - 2001

SELECTED ITEMS FROM THIS YEAR'S REPORT

£99,873 was provided as grant aid supporting a wide subject range of research and educational projects.

Two new studies on public involvement in forests were initiated.

The Trust assisted with funding an authoritative and objective review of risks and benefits of genetically modified trees for industrial plantations. This review is being published in International Forestry Review.

The total assets of the Trust at 31st March 2001 were £2,548,315. This represents a decrease in assets of £330,197 over the past twelve months.

£918 was gained from sales of reports and royalty payments. This sum, although relatively minor, does represent a significant increase on any previous year.

The full report of the audited accounts is published separately; copies are available from the Trust on request.

The Trustees reviewed the investment portfolio with the Investment Manager and agreed to maintain the levels of expenditure agreed meanwhile.

Stephen Webster nominated the Trust as his sponsor in the London marathon in May and raised £851 for next financial year.

A web site is being designed to provide information about the Trust, application forms, information about grant aid, and reports available. It is anticipated that this web site will on line in the autumn.

CONTENTS

	page
Selected Items from This Year's Report	Inside front cover
The Objectives of The Scottish Forestry Trust	3
Trustees, Officials and Advisers 2000-2001	4
Acknowledgements	4
Chairman's Foreword	5
Trustees' Report	6
Projects Completed This Year	9
Ongoing Projects	11
Completed Projects	13
Statement of Trustees' Responsibilities	19
Presentation of Financial Position and Activities	20
Gift Aid	23

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.

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 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 in the widest sense, and includes production and use of all forest products and its contribution to landscape, recreation, wildlife and the environment.

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

TRUSTEES, OFFICIALS and ADVISERS 2000-2001

TRUSTEES

Chairman Sir D W N Landale KCVO

Dr C M Cahalan* (from 31/12/00)
J R Firn*
A Hart (from 31/12/00)
J Kissock
Dr D C Malcolm OBE** (to 31/12/00)
W L Mason*
S A Neustein*
Dr J A Petty **
N D H Sanders (to 31/12/00)
Sir F M Strang Steel Bt, CBE
L L Yull

* Member,Projects and Research Committee
**Chairman, Projects and Research Committee

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ACKNOWLEDGEMENTS

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

£100 to £1,000 Callendar Charitable Trust

CHAIRMAN'S FOREWORD

As this is the final full year in which I shall be Chairman of the Trust, it is opportune to review the performance of the Trust over the past 6.5 years of my chairmanship.
The Trust was established in 1983 and has established a sound reputation for objectivity, high standards and far-sightedness. The Trust's reputation has depended on the quality of projects selected and their impact on British forestry. In the last six years the Trustees have tried to consolidate that reputation, continued to manage the Trust's financial resources judiciously, and increasingly publicised its achievements to encourage the highest quality of relevant applications for grant aid.

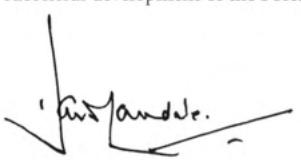
In 1998, the budget for project expenditure was agreed at 4% of the total return of the investment portfolio. Administration, including investment management, auditing and legal advice, should not exceed 2%. The market value of the investment portfolio was over £2.7 million at that time. Allowing for inflation, the portfolio was anticipated to continue to grow at a modest rate. The volatility of the share market however over the past year has resulted in a fall in the portfolio value to about £2.5 million.

The Trust has taken a more directive role over the last three years in funding specific projects. For example, the project *Locations of Populations of Native Scottish Trees* was initiated, carried out and published by the Trust. Another initiative that has been very successful has been the inauguration of the *John Eadie Fellowship*. The aim of the fellowship is to provide British forestry with expertise not readily available here. In 1998, two forest scientists with expertise in forest growth modelling from the U.S.A. and N.Z. spent three months in Britain. In 2000/01, Professor Burch from Yale University has been here looking at social and community forestry.

The Trustees are aware that there continues to be a need to publicise the achievements and role of the Trust to a greater extent and to a wider audience. A leaflet was produced three years ago and has been widely distributed. The format of the Annual Report was changed to make it more interesting. A web site is also now being designed.

I wish to acknowledge the time and professional commitments of my fellow Trustees. The Trust's credibility depends on their objectivity, expertise and judgement. I would also like to take this opportunity of thanking all those who have supported the Trust over its relatively short time.

Obviously anything involved with forestry is a long-term affair but I believe that over the 18 years of the Trust's life it has made a significant contribution to the forestry scene in Britain. It is unfortunate to be handing over at a time when not only the Stock Market, but the whole of the forestry scene is somewhat in the doldrums. The role of the Scottish Forestry Trust has to a large extent been reactive, i.e. responding to the requests of others. It may be that we will have to adopt a more proactive approach and be the catalyst for some future programmes. In this regard I wish my successor Sir Michael Strang Steel and all Trustees best wishes for the future, as I am sure they have an important role to play in the successful development of the Forestry Industry in Britain



Sir David Landale KCVO

TRUSTEES' REPORT

The primary objective of the Scottish Forestry Trust is to support research, education and training in forestry, and the Board of Trustees has the sole power to make decisions for the Trust. Trustees are appointed for their experience, expertise and objectivity and provide a good balance of appropriate skills on the Board. Full meetings of the Trustees are held three times per year and the Projects and Research Committee, which evaluates applications for grant aid, meets a month before each full Trustees' meeting. Trustees give freely of their time. In the case of the Chairman and members of the Projects and Research Committee, this is in excess of 10 days per person each 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, Colonial First State Investments, advises the Trustees on the investment portfolio. The accounts are audited annually. A legal adviser regularly attends the Trustees' meetings.

A Statement of Trustees' responsibilities for financial statements is presented later in this report and in the separate printed set of the audited accounts, copies of which are available on request. The financial statements prepared comply with the requirements of the Trust Deed and the Charities Accounts (Scotland) Regulations 1992. The auditors observe that the financial statements give a true and fair account of the Trust's affairs at 31 March 2001.

Review of Projects Portfolio

The current range of projects represents a very diverse and relevant mix of subjects, which require to be addressed in forestry today. Twenty projects were funded, listed in a table of "Grant Aid Expenditure" on page 22.

The Trust this year has supported work looking at public involvement in forests and woodlands in Britain. Mark Twery, U.S.D.A. Forest Service and Max Hislop, Northern Research Station, Forest Research were very successful in developed a decision framework for public involvement in forest planning, This is being used by Forestry Commission staff as well as other organisations. There is a worldwide trend towards greater participation and more diverse services from forestry at local levels. Professor Burch from Yale University, who is recognised internationally for his research on public involvement in forestry, is spreading his three month tenure of a *John Eadie Fellowship* over two years. Professor Burch has been brought to Britain to suggest possible directions for future research, training and education.

A significant proportion of funding has supported work in the general area of genetics and conservation of native trees. The project on *Locations of Populations of Native Trees* was completed last year and report has now been published. This work, which was initiated and carried out by the Trust, has been well received. CD–ROMs, which include fuller ecological details of the sites, have been given to the Forestry Commission, Scottish Natural Heritage, and Royal Botanic Garden, Edinburgh. A PhD study at Edinburgh University is examining the genetic quality of native tree seed being collected from highly fragmented populations as such seed collections are being used in large reforestation programmes. New plantings are often based on the indiscriminate use of planting stock without consideration of potential maladaptation to its new environment. A study on birch is looking at adaptive variation through a series of provenance trials. In addition the Trust funded an authoritative review of certification of plantations of genetically modified trees and a fuller account of that important study is provided later in this Annual Report.

The Trustees have re-iterated the need to encourage good, relevant projects on wood utilisation and marketing. The projects on *Suitability of Birch for Processing, The Role of Winter Desiccation and Frost in Determining Stem Form in Silver Birch Provenances,* and *Wood Properties of Genetically Improved Sitka Spruce with Special Reference to Juvenile Core* are continuing. The project on *C:N Ratios of Kiln Dried Timber* was completed and is reported on later in this Annual Report.

Environmental concerns are being studied in two of the projects being funded as PhD studies - *Environmental Impact Assessment: Practice in the UK Forest Sector* and *Effect of Harvesting Machinery on Soil Physical Properties.* Both PhD theses are nearing completion and will be reported on next year. The Trust continues to be a joint funder of a project to explore use of immuno-contraception to control grey squirrel populations. A study at Aberdeen University on the pathogen *Peridermium pini* will continue for a further year.

The Trust supported an officer from Timber Growers Association to investigate forest roads in Sweden, an issue of increasing concern in Scotland. An International Student Symposium organised by students at Edinburgh University to discuss ecological concerns attracted students from many countries and was very successful.

Last year's Annual Report noted that the Trust was exploring the interest of the main forest industry organisations in the concept of coming together into a new forest industries building, which would demonstrate home-grown timber and wood products. This year that concept has been taken further by the Trust funding an independent consultant to evaluate the support for, and feasibility of, a UK Forest Industries Centre. A report is expected in the summer of 2001.

Financial Review

The full report of the audited accounts prepared by the Trust's Accountants and Auditors, Brown Campbell & Company, has been printed separately and copies are available on request. In the latter part of this report some information has been extracted from that report.

Over the year, the total assets of the Trust decreased by £330,197 to £2,548,315. The Accounts show an income of approximately £100,000. Expenditure on Projects and Research accounted for most of that income and in addition there was an expenditure of £54,592 on management and administration. The deficit was increased further by a substantial fall in the market value of the investment portfolio to account for the £330,197 decrease in value of assets.

This year has been characterised by a volatile stock market and although the Trust's portfolio was well placed with only minor holdings in technology shares, nevertheless substantial falls in shares occurred. The Trustees in agreeing to budgets of 4 and 2% respectively of the market value of the investment portfolio for project and administration expenditures respectively in 1998 anticipated that these budgets would still allow some limited capital growth and include inflation. The budgets were based on a portfolio valuation of £2.5 million, which is the current market value, to provide £100,000 for grant aid expenditure. It should be emphasised that these budgets were based on total returns on the investments and not income from dividends, interest and sales of reports. Budgets were reviewed regularly through the year and the decision made to continue with those levels of expenditure at the present time. The Trustees with the Investment Manager will continue to monitor the financial situation closely and adjust budgets if considered necessary.

The income from dividends, bank interest, and tax reclaims is similar to that of last year. It is pleasing

to note that this includes £599 from a royalty payment from Dr Mutch's book, *Tall Trees and Small Woods,* and about £320 from sales of the report *Locations of Populations of Scottish Trees.* This sum far exceeds book/report income from any previous year.

The administration costs of running the Trust, including professional and investment management fees, of £54,592 compares well with the overall five year average of £52,000, especially considering the increases in office rental, annual report production and investment management over the last five years. Expenditure on projects this year amounted to £99,873 thus almost fully accounting for the budget of £100,000.

Stephen Webster successfully completing the London Marathon.
His nomination of the Trust as sponsor raised £851.

PROJECTS COMPLETED THIS YEAR

A Decision Framework for Public Involvement in Forest Design Planning

Max Hislop, Forest Research and Mark Twery, U.S.D.A. Forest Service

Funding was provided by the Trust to support U.S. forest scientist, Mark Twery to work with Max Hislop at the Northern Research Station, Forest Research to develop a prototype decision framework for involvement of the public in forest planning processes in an objective and logical way. The work carried out over the three month period included reviewing literature, and consulting with Forest Enterprise headquarters and district staff. A decision framework was developed, tested, refined and then a series of workshops and seminars were held. Three elements of the framework are a preliminary assessment system, flow chart and tool sheets. The preliminary assessment system allows consideration of level and method of stakeholder involvement. The flow chart provides the manager with the information necessary to involve stakeholders. Most stakeholders are likely to be involved in the early stages rather than in the late stages. The tool sheets provide a set of reference materials for the manager to use when making final selections of which methods to implement as well as providing information on skills, time and equipment needed. This approach allows the manager to evaluate options. Inclusion of the framework into management memoranda and training for forest managers are recommended. This should improve the consistency of public involvement efforts and enhance the likelihood of success. Training in the use of the various tools available and related skills should also be provided for staff involved in all stages of planning and public involvement with the districts.

Certification of Genetically Modified Forest Plantations

Steven Strauss, Oregon State University

Professor Strauss spent three months at the Oxford Forestry Institute reviewing risks and benefits of using genetically modified trees for industrial plantations. During this period he collaborated with staff at the Oxford Forestry Institute and a co-authored manuscript on "Certification of Genetically Modified Forest Plantations" has been submitted for publication in the *International Forestry Review.*

Genetically modified (GM) refers to the use of recombinant DNA and asexual gene transfer methods to isolate, modify, and reintroduce genes into organisms. The value of GM crops varies greatly depending on where and how they are used. The main benefits in agricultural crops to date are reduced management costs, improved yields, and reduced insecticide or herbicide use. The demand for wood continues to grow in proportion to rising population and standard of living. It is expected that plantations will be required to meet a large proportion of future industrial wood demand and that it can be done from a relatively minor land area. It is widely recognised that highly productive plantations can reduce pressures on natural forests. GM forest trees are expected to have their major benefits in intensively managed forest plantations and GM can add to current tree breeding by providing specific traits with improved efficiencies not available by conventional breeding. GM can now be applied to a wide variety of tree species, although the efficiencies vary. In recent years forest and forest product certification systems have developed with the intent of defining and promoting responsible forest practices and sustainable forest management. The certification provided by the Forest Stewardship Council (FSC) is widely adopted internationally and it bans all uses, including contained field research, on GM material. The authors note that FSC allows other practices of intensive plantation management that may have complex or irreversible ecological consequences, e.g. biological control organisms, uses of exotic species, hybrids or clones. The ban by FSC makes it very difficult for certified companies to participate in the research

required to solve the concerns over the use of GM trees. Several means for conducting field trials with a high degree of environmental safety are described. The authors argue that the ability to use knowledge of genomes would provide major environmental benefits, such as wood that results in less pollution during pulping or energy generation, reduced use of undesirable pesticides and herbicides

Public Roading in Sweden – The Use of Gravel Roads

Joint Visit by Forestry Commission, Forest Industry and Local Authority Representatives.

The Trust's support allowed Michael Alexander, T.G.A. to be included in a party investigating the use of gravel roads in Sweden. A possible solution to the problem in Scotland of maintaining an adequate rural road network with declining Local Authority budgets might be to convert some minor roads from the standard bituminous construction to the type of waterbound gravel roads commonly used in Scandinavia. This visit looked at the use of low cost public road options in south-west Sweden and to assess their potential for use in Scotland. It was observed that if properly constructed, waterbound gravel highways can offer a viable alternative to bituminous roads and may be suitable in remote areas with low levels of traffic. In addition timber bridges may present a viable low cost option. It is recommended that both the gravel roads and timber bridges should be designed to be "Fit for Purpose" and small-scale trials should be undertaken to assess their suitability for application in Scotland.

Modification of Nitrogen Content and C:N Ratio of Sitka Spruce Timber by Kiln and Air Drying

Chris Payne, University of Abertay-Dundee

Kiln drying reduced the total nitrogen content of the sapwood and heartwood by about 30% within the first 24 hours of the drying schedule. Air drying also reduced nitrogen content but to a lesser extent than kiln drying. Loss of nitrogen from the wood appears to be in gaseous form which is suggested to be through deamination of amino acids producing ammonia. While the overall effect of kiln drying was to increase the C:N ratio of timber, the process decreased the wood surface C:N ratio with respect to the cross-section value possibly due to an accumulation of non-volatile nitrogen. The nitrogen redistribution observed was not of sufficient magnitude to cause an increase in susceptibility to fungal degrade.

International Student Symposium on "Forest Ecology: A Move Towards Sustainability and Community Involvement"

Students of the Institute of Ecology and Resource Management, University of Edinburgh

Students from 27 countries met in Scotland in September 2000 to discuss the challenges posed by sustainable forest management practices, the demands of society, and environmental constraints in forestry. This symposium also allowed the students to study and compare their environments, courses, and practical experiences. Proceedings have been published and if copies are desired please contact IERM, Edinburgh University.

IPD Forestry Index

Investment Property Databank, 7/8 Greenland Place, London

The index is calculated from a sample of private sector coniferous plantations in Britain for the period ending 1999. The average return of –3% per year over the last three years compares with 19.9% per year reduction in timber prices since 1996. Copies of the IPD Forestry Index can be obtained from the address above.

ONGOING PROJECTS

Environmental Impact Assessment Application in the UK Forest Sector: This PhD study is examining environmental impact assessments in the forest sector. The aim is to recommend procedures to aid decision making. Almost all environmental statements lack sufficient baseline data, clear predictions of the future effect of the proposal and a mechanism through which the significance of impacts can be determined. This study should be completed in August 2001.

Effects of Mechanised Forest Harvesting on Soil Physical Properties: Field measurements have now been completed and the PhD is being written up. Throughout 1998 and 1999, field trials were undertaken at upland forest harvesting sites in north-east England and south-west Scotland to investigate the degree and nature of disturbance on selected forest soils and to examine the efficacy of ground protection measures.

Immuno-Contraception of Grey Squirrels: The Trust is included in a partnership of funders who are financing this project with the Forestry Commission and Joint Nature Conservation Committee taking the lead. An oral contraceptive vaccine is considered a humane method for grey squirrel control. Research has shown that a vaccine against a specific sperm antigen did induce antibodies that inhibit fertility. A trial conducted on a small number of squirrels in 1999 produced encouraging results, but is being repeated with larger numbers of animals. Included in the project is the development of methods of incorporation of the vaccine into bait and provision of bait. A fuller report on this project is planned for next year's Annual Report

Suitability of Birch for Processing: The Trust is part funding this project being led by TRADA. This project is looking at the suitability of birch for manufacturing specific sawn products (flooring, glulam and furniture framing). Birch logs have been harvested from sites throughout Britain. Preliminary results on conversion rates and grade recovery at the sawmill and laboratory tests indicate that home grown birch has a quality not dissimilar from what is available in other countries. For Scottish sites a conversion yield of approximately 42% was recorded with no effect of dbh, but that will vary with source material and product. Preliminary results indicate that birch glulam is suitable for construction purposes with regard to strength and stiffness. As this project is now almost completed, final results will be reported next year.

The Role of Winter Desiccation and Frost in Determining Stem Form in Silver Birch Provenances: The principle hypothesis being addressed in this part of the study is whether loss of the dominant leader in silver birch is a result of xylem dysfunction. This might be caused by frost inducing vaporisation of water inside the xylem conduits with subsequent dehydration of the living cells upon thawing. Work is proceeding to demonstrate that freezing temperatures during winter do cause sap freezing in birch provenances and further to demonstrate that the frosts do affect xylem functionality by reducing the hydraulic supply capacity of the shoots.

Management Strategies for Capercaillie in Commercial Forests: This project has now reached the stage of integrating the major components of the model, developing the model further and testing. A procedure has been developed that combines the habitat suitability index with forestry data in a geographical information system. Some database manipulation is required so that the habitat suitability scores relate to the actual habitat areas. The volumes of timber that may potentially be felled in each habitat area will be estimated from general yield models and inventory data. Field work to be carried out in Glenmore/Inshriach will test the habitat suitability model against other methodologies.

Effect of Growth Rate on Wood Properties of Genetically Improved Sitka Spruce with Special Reference to the Juvenile Core: There is insufficient knowledge of how Sitka spruce genetic improvement, particularly in terms of growth potential, is influencing wood properties. This PhD study at the University of Aberdeen will compare wood properties of "fast growing" and "slow growing" progenies and with "unimproved" genotypes. The main progress over the last year has been completion of stem analyses and preliminary work on spiral grain. Statistical analyses have still to be completed.

***Peridermium pini* in North East Scotland:** *P.* pini causes a stem rust in Scots pine leading to losses in timber quality and yield. A survey of semi-native, mature Scots pine forests was undertaken to ascertain whether these forests may act as a reservoir for this pathogen. Statistical analyses of disease incidence at plantation forests is being examined in relation to age-class, time since last thinning, and soil type. This project at Aberdeen University plans to map the distribution of *P. pini* in Scots pine in that region and apply Geographical Information Systems to analyse its distribution in relation to site factors and current management practices.

Genetics of Fragmented Populations: This project has the objective of assessing the genetic quality of seed derived from fragmented populations of rowan (*Sorbus aucuparia)* and ash (*Fraxinus excelsior)* in Moffat Dale, Dumfries-shire. The study will compare the genetic variation in remnant stands with genetic variation in the seeds produced. The number of adults contributing to the production of seed in remnant stands will be examined. Gene exchange through pollen and seed will be measured.

Birch Seed Collection: There is no definitive information on the adaptive variation of any native broadleaved species of potential forestry importance in Britain. New plantings have often been based on the indiscriminate use of native or imported origins. The objective of these seed collections is to establish a comprehensive provenance trial of silver birch (*Betula pendula)* from populations throughout England and Wales. These collections will compliment collections made in Scotland in 1995 which have already been used to establish provenance trials.

Forest Industries Building: Consultants Ballantyne Mackay were contracted to examine the potential for a Forest Industries Centre that would be a visionary statement building demonstrating the efficient and effective use of UK grown timber and manufactured processed products. The intention was that this building would provide office accommodation for organisations and companies in the sector, alongside meeting space and event facilities. There was insufficient interest in, or demand for, such a building. There was however some interest expressed in the concept of a dynamic demonstration project that would have a strong focus on research and development, with wood having a high profile place working alongside other sustainable construction materials. The building would be expected to demonstrate renewable energy, high levels of insulation, adaptability and flexibility. The Trustees in accepting this report, then authorised a further examination by the consultants to determine the level of support for this revised concept and to try to identify a prime user around which the project could be structured.

***John Eadie* Memorial Fellowship:** The aim of the fellowship is to provide British forestry with expertise not readily available here. Professor William Burch, Professor of Natural Resource Management, School of Forestry and Environmental Studies, Yale University is the current recipient of the *John Eadie Fellowship.* The Trust is very fortunate to have someone of Professor Burch's eminence, experience and commitment to take up this fellowship. Professor Burch will provide an informed critique of current British practice in social and community forestry and its future direction. He will see examples of community involvement in the management of British forests. It is anticipated that this research will also provide insights for future policy formulation in the field and to the development of sound practice. Professor Burch will report on his findings in autumn 2001.

COMPLETED PROJECTS

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

R01/1: Locations of Populations of Scottish Native Trees. (Scottish Forestry Trust). This project describes some 40 natural populations of fifteen Scottish native trees. A database of approximately 1,100 populations has been prepared which identifies populations by site numbers and grid references, but no information on ownership is provided. Where the owner's permission has not been obtained, specific references to those sites have been omitted. The published literature was reviewed; potential holders of unpublished records or knowledge of such populations were contacted and regional tours of inspection made. Selection of populations was based on location, condition and ecology, without reference to phenotypic timber form. To our knowledge there is no other comparable "register" of native reproductive material sources available. A published report is available from the Trust price £12.50. Several shorter reports on this project have also been published.

R01/2: Damping-Off Oomycetes in Natural Regeneration of Scots Pine. (University of Aberdeen). This study demonstrated the presence and pathogenicity of fine root pathogens in soils of Scots pine forests. No severe disease symptoms were observed thus suggesting that the environmental conditions are not conducive to pathogen attack. University of Aberdeen PhD Thesis. Short final report only is available from the Trust.

R01/3: Log Quality Assessment in Sitka Spruce in South Scotland. (Forest Research). Objective of study was to assess log quality in standing trees. Method based on estimate of straight log lengths available in bottom 6m. Factors associated with decreasing straightness scores were greater spacing, higher yield class, increase in elevation, windiness of the site, and propinquity to planting year. Thinning increased straightness score. Detailed stem analysis indicated that straightness scores assigned in mid-rotation should be similar to those of trees at harvest age. Workshops have been held at different locations and publications include an article on *Changes in* Stem *Straightness* in "Scottish Forestry".

R01/4: Timber Degrade in Sitka Spruce (*Picea sitchensis)* due to Bark Stripping. (Centre for Ecology and Hydrology, Banchory). The impact of bark stripping recorded over a 20-year period in stands of Sitka spruce in Glenbranter Forest was assessed from its effects on economic value and timber quality. The reduction in net value due to perceived bark-stripping was of the order of 10% of the net value of the crops. However Sitka spruce demonstrated that it is able to recover from bark wounds, although at the better sites producing potentially more green logs the effect on timber quality could be more important. Article in *Forestry & British Timber,* September 2001.

R01/5: Broadleaved Timber Production Forecasting in Britain. (Oxford Forestry Institute). Production forecasts and predictions of felling rates are needed to promote investment in hardwood processing industry. Factors affecting production are reviewed. The preparation of short-term forecasts using the Forestry Commission's Woodland Grant Scheme database to predict felling areas is suggested. Further suggestions for supplementing the inventory data to improve predictions are also included in the report. An article has been published in *Timber Grower* and another has been submitted to another forestry journal.

R01/6: Using Scottish Hardwoods: Design Competition and Conference. (Forestry Commission) The Scottish Forestry Trust supported a design competition for students and a conference on use of Scottish hardwood timber in construction and joinery. Both events were successful in providing information and generating greater interest in our hardwoods. Publication "Designing with Timber"

is available from the Forestry Commission.

R01/7: Long Term CO_2 Sequestration by Sitka Spruce. (IERM, University of Edinburgh). Carbon flux measurements were recorded at Griffin Forest near Aberfeldy, Perthshire for three years; the Sitka spruce crop, established in 1981 to 1983, is yield class 16. The net annual sequestration of carbon in 1999 was 5.7 t C ha^{-1}. Differences in the inter-annual amounts over three years appear to be due to different weather patterns in September and October. The annual net CO_2 exchange of *ca* 6 t C ha^{-1} is at the top end of fluxes measured over 15 sites in Europe. This three-year study has provided a sound base line for carbon sequestration by a typical Sitka spruce stand in central Scotland. Further information can be obtained from the University of Edinburgh.

R00/1: A Process Model Analysis of Environmental Limitations on the Growth of Sitka Spruce Plantations in Great Britain. (Professor R H Waring, 1998 *John Eadie Fellow)* A simplified physiologically-based model was used to assess growth limitations imposed by various site factors across Britain. Variation in solar radiation associated with topography accounted for nearly half the differences observed in growth. Soil fertility significantly limited growth on a number of sites. This modelling analysis suggests that improved forecasts of Sitka spruce plantation growth throughout Britain could be obtained with better estimates of solar radiation and canopy nitrogen content than with more conventional sets of measurements. Manuscript published in *Forestry*.

R00/2: Creation of Decision-Support Tools for Plantation Establishment. (Dr E G Mason, 1998 *John Eadie Fellow*). During Dr Mason's tenure of the Fellowship at Forest Research, he adapted a model for *Pinus radiata* in NZ to examine responses of Sitka spruce to establishment treatments using data from experiments in the Borders/Kielder region. Initial results are encouraging but further work is required. Dr Mason also advised Forestry Commission staff on the potential of an establishment decision-support system to assist forester managers to access the best information before deciding on how to establish crops.

R00/3: The Potential for Extending Forest Cover in Grampian. (R Lorrain-Smith, M Bell, D Rees and A Davis). This study examined the potential transfer of land from agriculture to forestry in the Grampian Region. Removing all grants and subsidies favours forestry sometimes very substantially. Reducing forestry costs, e.g. by farmers doing their own work, appeared to make a big difference to the area of land under pressure to change to forestry. Including final felling seems to favour forestry, but this would depend on the strength of the desire for early returns. Published in *Scottish Forestry* 52. Fuller report available from the Trust priced £5.50.

R00/4: David Douglas Bi-Centenary Trail at Dawyck Botanic Garden. (Royal Botanic Garden, Edinburgh). To commemorate the legacy of David Douglas in introducing so many important forest species into this country, the Scottish Forestry Trust helped to sponsor a trail at Dawyck, Peeblesshire.

R00/5: Selection of Phenotypically Superior Oaks for Use in an Improvement Programme. (Oxford Forestry Institute) Trees have been selected for an oak genetic improvement programme (*Quercus robur* and *Q. petraea*) based on criteria to maximise recoverable timber volume and quality. Manuscript published in *Quarterly Journal of Forestry.*

R00/6: Forestry: An Economic Development Opportunity for North Scotland. (Timber Growers Association and Forestry Contracting Association). A one day seminar and workshop was held at Nairn on 30th September 1999. The main topics discussed were roundwood marketing, economic development and transport development.

R00/7: Control of *Heterobasidion annosum* in Sitka Spruce. (A Brown, Forest Research). Ms Brown was partially funded by the Trust to assist in a forest pathology experiment on "Rotstop" to control *H. annosum* at the Danish Forest and Landscape Research Institute in May 1999.

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. Results 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.

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. Results of study have been published in *Scottish Forestry* 52 and *Forest Ecology and Management* 140.

R98/4: The Effect of Nursing Mixtures on Stem Form, Crown Size and Wood Quality of Sitka Spruce. (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. 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. Main results published in *Forest Ecology and Resource Management* 122.

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. Performance data have been collected and the building is 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. This report has emphasised the gap in information on the quality of the broadleaved resource. Report available from the Trust priced £5.50.

R97/1: Fungal Spoilage of Kiln Dried Sitka Spruce at Scottish Sawmills. (University of Aberdeen).Disfiguring sapwood stain can be a problem in kiln dried spruce timber. The study examined the conditions favouring development of the *Ophiostoma piceae* and highlighted improvements in procedures. Results have been published in *Forestry & British Timber May.1997*, and *Material und Organismen 33*

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.

R96/1: Tolerance of Scots Pine to Low Root Temperatures. (Forest Research). Differences between provenances (four native, a current commercial seed identity and a Swedish seed origin) were observed in susceptibility to frost damage to roots. The main results have been published in forestry journals.

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. 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. 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. Main results published in *Hydrological Processes* 11 and *The Science of the Total Environment* 265

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. Main results published in *Forestry* 69.

R95/2: Control of Variation in Density in Sitka Spruce. (School of Agricultural and Forest Sciences, University of Wales). This study examined the underlying causes of variation in wood density with particular reference to the silvicultural control of critical Main results published in *Forestry* 70

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. Brief report published in *Quarterly Journal of Forestry.*

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. 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.

R93/1: Molecular Methods for the Detection and Identification of *Heterobasidion annosum*. (University of Abertay-Dundee). Study investigated immunology methods in live trees and harvested wood.

R93/2: Private Forestry Policy in Western Europe. (Author: A.J. Grayson). Policy implementation and role of financial incentives in Britain, Western Europe and some other countries including Australia and Russia are 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.

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 peat soils and heathlands, becomes 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. Published in *Timber Grower* 128, *Commonwealth Forestry Review* 65.

R92/4: Survey of Squirrels in Britain. (Timber Growers Association). 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. 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*. (Forest Research) 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*. Published in *Chemoecology* 2

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. in the production of information on the forestry potential of the region, and presented in the form of maps of yield class and windthrow hazard.

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.

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 from the 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. Some results published in *Regional Studies 26.*

R88/1: Production Forecasting for Private Sector Scottish Forestry. (University of Aberdeen). A survey of the private sector growing stock in Scotland, was carried out toinvestigate the apparent discrepancies between the national production forecast produced by the Forestry Commission and estimated actual production by the private sector.

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. A report is available.

R87/1: The Economic Effects of the "Guidelines for the Management of Broadleaved Woodland". (Timber Growers Association).

R87/2: Stirling Forestry Employment Study. (Firn, Crichton Roberts Ltd).

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% straight line
Computer equipment	33% straight line.

(c) TRUST FUNDS

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

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.

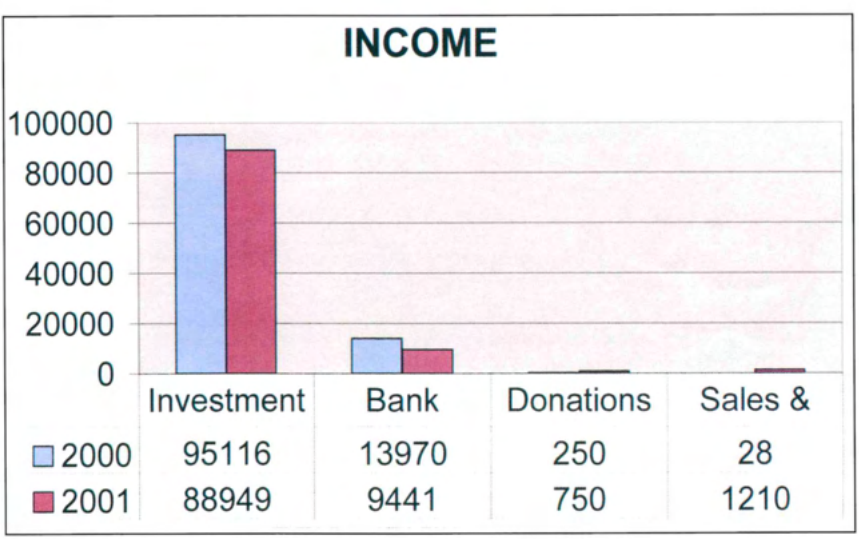
Presentation of Financial Position and Activities

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 2001.

If you wish to receive a copy of the full report of the audited accounts of the Scottish Forestry Trust 2000-2001, please contact the Trust's office.

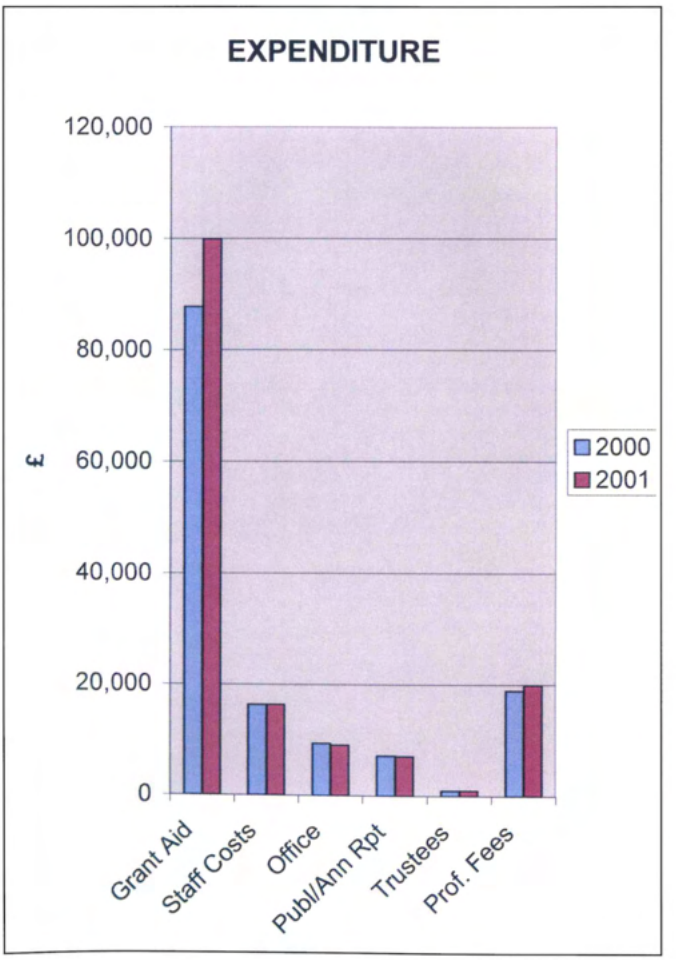
INCOME

	2001 £	2000 £
Total Income from investment income and recoverable tax credits, bank interest gross, donations, sales of reports and royalties.	100,350	109,364



EXPENDITURE

	2001 £	2000 £
Direct Charitable Expenditure	99,873	87,737
Administration & Professional Fees comprising employment costs, trustee expenses, office costs, annual report and publicity, professional fees for investment management, auditing and legal services	54,592	54,552



	2001 £	2000 £
Net Deficit	(54,115)	(32,925)
Total Assets Less Current Liabilities	2,548,315	2,878,512
Funds Unrestricted	2,548,315	2,878,512

Contingent Liabilities

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

2001-2002: £93,063
2002-2003: £33,031
2003-2004: £19,471

GRANTS AND OTHER CHARITABLE EXPENDITURE	2001 £	2000 £
Locations of Local Origins of Scottish Native Trees	2,822	8,774
Damping Off Pathogens in Scots Pine	5,000	-
Environmental Impact Assessment Applications	-	1,800
Effects of Harvesting Machinery on Soil Physical Properties	4,390	9,070
Timber Degrade due to Bark Stripping	-	5,000
Log Quality Assessment in Sitka Spruce	-	5,000
Immuno-Contraception of Grey Squirrels	11,095	10,000
Suitability of Birch for Processing	1,000	7,500
Winter Desiccation of Silver Birch Provenances	11,600	6,800
Selection of Phenotypically Superior Oaks	-	3,753
Management Strategies for Capercaillie in Commercial Forests	9,100	5,200
Wood Properties of Genetically Improved Sitka Spruce	12,803	6,295
Broadleaved Timber Production Forecasting	450	-
David Douglas Bi-Centenary Trail	-	5,000
Long-Term Carbon Dioxide Sequestration by Sitka Spruce	2,000	-
Peridermium pini in North East Scotland	12,290	6,050
Control of *Heterobasidion annosum* in Sitka Spruce	-	350
Scottish Hardwood Design Project	-	5,090
Conference: Economic Development for N. Scotland	-	500
C:N Ratio of Kiln Dried Sitka Spruce Timber	1,500	1,475
International Student Symposium	1,500	-
Use of Genetically Modified Trees	4,000	-
Decision Framework for Public Involvement		2,400 -
Genetics of Fragmented Populations	4,735	-
Forest Roads in Sweden	600	-
IPD Forestry Index	588	-
Birch Seed Collections	3,000	-
Forest Building Centre	6,225	-
John Eadie Fellowship: Professor W Burch	2,775	-
John Eadie Fellowship: other	-	80
	99,873	87,737

The Scottish Forestry Trust's financial resources are able to support only some of the very worthwhile applications it receives. The demands for funding are intense. The Trustees would be grateful to receive any contributions in the form of donations or legacies to enhance British forestry through supporting the Trust's activities.

GIFT AID DECLARATION

The Scottish Forestry Trust

Donor's details

Title Mr/Mrs/Miss/Rev/Prof/Dr/Other .....

Full name (in CAPITALS) .....

Address (in CAPITALS) .....

.....

Postcode .....

I want The Scottish Forestry Trust to treat:

- the enclosed donation of £.....
- the donation(s) of £..... which I made on . ..../...../.....
- all donations I make from the date of this declaration until I notify you otherwise.
- all donations I have made since 6 April 2000, and all donations I make from the date of this declaration until I notify you otherwise.

as Gift Aid declarations

delete as applicable

Donor's signature ..... Date .....

Notes:
1. You can cancel this declaration at any time by notifying The Scottish Forestry Trust.
2. You must pay an amount of income tax and/or gains tax at least equal to the tax that The Scottish Forestry Trust reclaims on your donations in the tax year (currently 28p for each £1 you give).
3. If in future your circumstances change and you no longer pay tax, and capital gains equal the tax The Scottish Forestry Trust reclaims, you can cancel your declaration (see note 1).
4. If you pay tax at the higher rate you can claim further tax relief in your Self Assessment tax return.
5. If you are unsure whether your donations qualify for Gift Aid tax relief, ask The Scottish Forestry Trust. Or ask your local tax office for leaflet IR113 Gift Aid.
6. Please notify The Scottish Forestry Trust if you change your name or address.

A possible solution to the problem of maintaining adequate rural roads? Timber bridge and gravel road in Sweden. (Photo. Courtesy of Svenska Trabroar AB)

Published report on "Locations of Populations of Scottish Native Trees" is available from the Trust, price £12.50. (Photo. Scots pine by Scott Wilson)

Two projects are being funded this year on community involvement in forestry. (Photo. Courtesy of Forestry Commission).