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Forest Employment Survey 1988-1989

Jean Thompson

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FOREST EMPLOYMENT SURVEY (1988-1989)

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Foreword

Forestry is becoming an increasingly important part of the rural economy. The employment it generates is comparatively small in national terms, but is vital to the maintenance of a healthy local infrastructure in many of the more remote parts of Britain.

New planting is continuing and forestry activity in Britain is increasing, especially as the major plantings of the 1950s and '60s begin to yield timber. It is important that planners of future investment, not just in forestry and wood processing but in the wider economy, should be well informed about all relevant factors, not the least of which is employment.

This paper provides an extremely useful snapshot of forestry employment in a single year, 1988/89, dealing comprehensively with the distribution of forestry employment over a range of tasks, and between the five main types of employer. The look ahead, estimating trends over the next 15 years, is based on information about timber which is already growing and will become available for harvesting within that timespan, regardless of any possible changes in land use policy, about which the paper makes no assumptions.

Forestry businesses are often small, employing only a few people. Individual forest owners may not themselves be in a position to influence future investment planning in any substantial way, although collectively their contribution is vital. Their interest in the paper will be mainly in the way labour is allocated across various forest activities throughout the rotation. As well as providing a comparison of their own operations with national averages, the tables of results from the survey will enable them to forecast changes in their labour requirements as their forests expand and mature.

The survey provides useful information for planners and policy-makers, and will be of interest to those within the industry from large companies to small forest owners and contractors alike. The first two surveys provide a sound baseline against which future trends can be measured and it is now planned to continue the survey on a regular basis.

Gwyn Francis
Forestry Commission Director General
May 1990

Abstract

A survey of employment in forestry in Great Britain (excluding Northern Ireland), conducted during 1988 and 1989, shows a total of some 41,000 jobs in forestry and the associated haulage and primary processing of home-grown timber. There has been an overall increase of over 4% since a similar survey in 1986. Numbers involved in the establishment of forests have decreased. Those engaged in the harvesting and processing of timber have gone up, though the rise has been only about half the rate of increase of timber coming onto the market. There has been a small but significant increase in the amount of time spent on the environmental aspects of forestry.

Summary

The survey covers employment in the Forestry Commission, the private sector and primary wood processing. It enumerates both direct labour and contractors, counting part-time and contract employment as the actual time worked and expressing the total as whole-job equivalents. It includes employees and the self-employed, between whom no distinction is made.

Results are tabulated by sector and by forest operation. In most cases, totals are given for England, Wales, Scotland and Great Britain. Northern Ireland is not covered by the survey. Calculations are carried out on the basis of Forestry Commission Conservancy, but variability at this level is such that only the basic table of employment by sector is given for individual Conservancies (see Table 2).

Unit labour requirements calculated from the survey are used, together with forecasts of future levels of forestry activity, to predict probable labour requirements in the industry up to the year 2006.

Summary tables, and other tables and charts illustrating particular points of interest, are incorporated in the text. Detailed tables of results, including comparisons with the earlier 1986 survey and predictions of future labour requirements, are in an appendix.

Forest Employment Survey

1. Introduction

About 10% of the land area of Britain carries woodland cover. The contribution which this important land use makes to the rural economy is considerable. Timber production from British forests provides about 12% of the nation's requirement for wood and wood products, thereby helping to reduce an import bill which in 1989 exceeded £7.3 billion.

Table 1 Self Sufficiency in Timber and Timber products (United Kingdom)

(1987/88)

Product	% Self-Sufficiency	
Sawn softwood	16	
mining		100
pallets and packaging		40
fencing		55
construction		6
Particleboard	40	
Fibreboard	25	
MDF		75
insulating board		30
hardboard		8
Newsprint	12	rising to 25
Coated cartonboard	45	
Chemical pulp	0	
Over all products	12	

Source: *Home Grown Timber Advisory Committee and Department of Trade and Industry Overseas Trade Statistics.*

The creation of stable rural employment has been an important objective of Government forestry policy from the time of the founding of the Forestry Commission in 1919, and before that on the part of individual land owners.

In the mid-1980s the rural economy was changing, with all the uncertainties engendered by the growing problem of agricultural surpluses and the search for alternative land uses. The employment possibilities offered by the various possible land uses became a key factor in rural policy making. However, before 1986 there had been no recent co-ordinated or comprehensive survey of the employment generated by forestry. It was therefore essential that the forestry industry produce reliable statistics on all aspects of forestry employment.

The Commission has been publishing basic statistics on employment annually for many years (Forestry Commission, 1976 *et seq*). The private sector elements of these have been derived in large part as a by-product of small-scale annual surveys of forestry economics carried out by the Forestry Departments of Aberdeen and Oxford Universities, up to forest year 1986 (Todd *et al*, 1988; Dolan and Russell, 1988). Each annual survey report includes one single figure for 'average area per person employed' on private estates. Though these have been very useful over the years in illustrating trends, they do not provide sufficient information on which to base accurate estimates for the industry as a whole.

A separate study of employment on a small sample of private estates in 1984 (Holmes and Todd, 1986) estimated a total of just over 2,000 work-years in this sector of the industry in Scotland, (cf 3,500 in 1988/89 from the present survey and 3,300 from the comparable 1986 survey).

It was against this background that the first full Forest Employment Survey was conducted in 1986 (Grundy *et al*, 1988). The figures obtained have been used by policy makers within and outside the Commission in developing arguments for (and against) the expansion of forestry as a rural land use.

The present survey has been completed following very much the same pattern as the first. This report details the conduct, analysis and results of the 1989 survey, and also draws comparisons with the earlier one. It is the intention to repeat the survey on a three year cycle.

2. Sectors in the Survey

Data were collected separately for each of five main sectors.

Forestry Commission	complete enumeration of all industrial and non-industrial employees, and of directly engaged contractors and those employed by timber merchants on standing sales.
Private estate owners	sample survey, described in more detail in Section 3.1 below.
Forest management companies	complete enumeration of the four largest companies, together with a survey (details in Section 3.2 below) of firms or individuals identified from the Forestry Commission's records of private woodland grant schemes as managing agents or employees of smaller management companies.
Timber merchants and harvesting companies	survey or other methods of data collection carried out with the assistance of organisations representing firms in this sector.
Processing industries	data on the sawmilling industry dealing with British-grown timber, obtained from the Forestry Commission's sawmill survey, and personal communication with firms in the pulp and board sectors.

Sectors not covered include: a majority of the private forest nursery trade; suppliers of materials and machinery; small-scale timber using industries such as turnery and other craft works. The contribution made by forestry to employment in sporting and tourism is not included. Nor does the survey cover process ing of timber beyond the primary stage, or the processing of imported timber.

Primary processing in the sawmilling sector is restricted to the production of basic sawn timber. There is a small but increasing amount of further treatment; pressure treatment, stress grading, kiln-drying and planing, carried out at the sawmill, but in general such operations are carried out by firms which purchase the timber already sawn, so employment on these operations is not included here. Nor is employment generated by users of timber in manufacturing and construction.

The pulp and board mills which process British grown timber usually take their manufacturing processes beyond the stage of wood pulp or wood chips. Their primary products are finished bulk paper and board, including boards laminated with other materials. The further manufacture of these products into packaging, paper products, furniture, etc is outside the scope of the survey.

3. Survey Methodology

3.1. Private Estate Owners

This sector contains a very large number of individuals, so a sample survey was necessary. The ideal structure for such a survey would be to stratify the sample both geographically and by size of forest area managed. Unfortunately there is no recorded information on sizes of individual forest holdings for the whole population of forest owners. Information held by the Forestry Commission (FC) for grant purposes relates only to those areas currently within one of the grant schemes, and there is no other database in existence which would fully meet the requirements of such a stratification.

Timber Growers United Kingdom (TGUK) hold details of the total forest area owned by each of their members, and with their agreement and co-operation a sample was drawn from this. In order to obtain maximum information from the minimum number of respondents, the sample was stratified to select a greater proportion of the largest estates, 100% of all those over 500 hectares, reducing to 10% for those of 20 hectares and under. Sampling was spread over the 12 geographical regions of TGUK in proportion to the number of members in each area. These correspond approximately to FC Conservancies as follows:

FC	TGUK
North England	England North
East England	England East and Home Counties
West England	England South-West South Wales and Three Counties (part) North Wales and West Midlands (part)
Wales	South Wales and Three Counties (part) North Wales and West Midlands (part)
North Scotland	Scotland North and North-East
Mid Scotland	Scotland West and East
South Scotland	Scotland South-West and South-East

To preserve confidentiality, no records were kept of the identities of the TGUK members selected. Nor were details of numbers per region retained once the organisers were satisfied that all parts of the country were fairly represented. In the analysis the Forestry Commission Conservancies were used to represent the geographic distribution of cases. Although the local authority (county in England and Wales, region in Scotland) was recorded on the questionnaire returns, the distribution of these in the sample proved to be so patchy that no use could be made of the information.

It is important to note that the stratification by size cannot be used in the estimation of totals for all forest owners. There is no reason to suppose that the distribution of size-class among TGUK members is a reflection of that for forest owners in general, and indeed every reason to suppose that it is not. TGUK acknowledge that while they certainly have the great majority of large and medium-sized estates in their membership, their coverage falls off sharply among those with very small woodlands. For this reason, the sample drawn from TGUK membership must be regarded as unrepresentative in respect of forest unit area. The calculation of results is therefore based on distribution by Conservancy, without regard to the size stratification.

Questionnaires (see Appendix I) were sent to a total of 1,200 individual owners, and returns were received from almost 400, a 33% response rate. Although this is excellent compared to the national average of 20-25% for postal surveys of all kinds, it is somewhat less than the 50% return from the 1986 survey (Grundy *et al.*, 1988), perhaps because there have been a number of other recent enquiries directed at forest owners by the Forestry Commission and other bodies. The limit of co-operation in some individuals may have been reached. However, it was pleasing to receive back 40% of questionnaires sent to the under-20-hectare group, four times better than for the previous survey. This may have been the result of a special appeal to this group in the questionnaire itself, but may also suggest a heightening interest in forestry matters amongst small-scale owners. There were in all 34 returns for areas of 20 hectares and under, representing 9% of total returns.

Scotland was best represented in the returns, with 184 cases covering 16% by area. England had 170 cases or 8% by area. Wales was rather under-represented with only 27 cases, 4% by area.

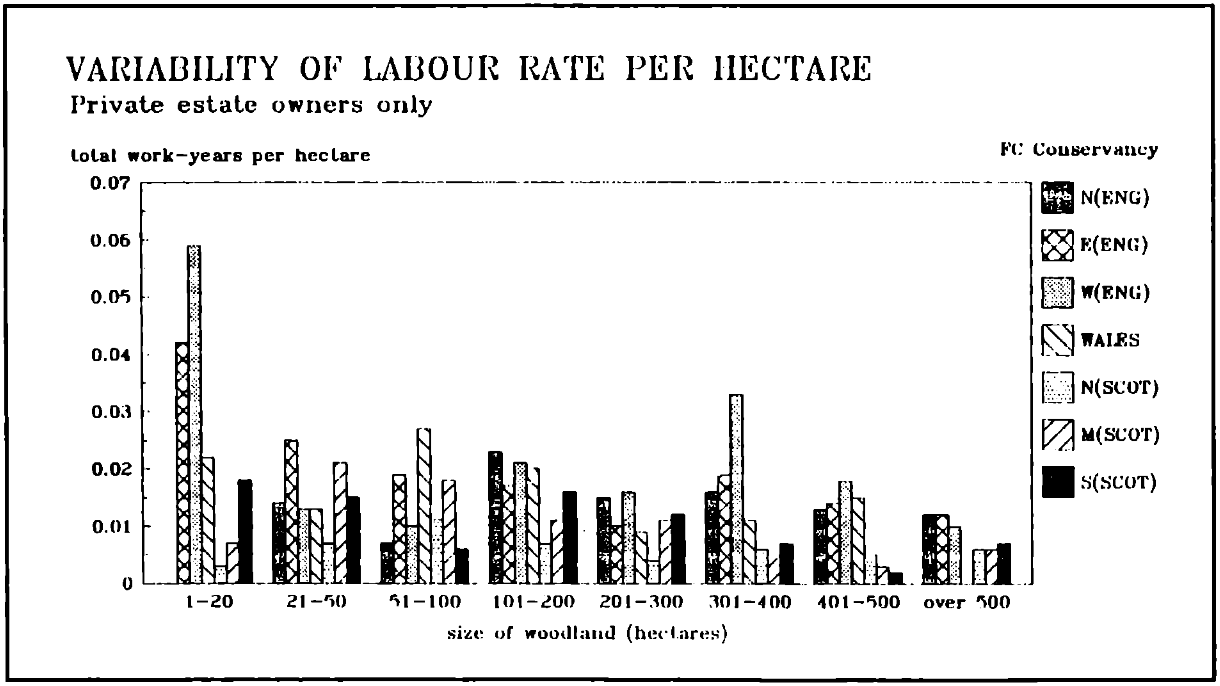
Work-years of employment on each forest and non-forest operation were summed separately for direct labour and contractors. This was done initially by Forestry Commission Conservancy area. Sample results were used to estimate employment for all private estates, multiplying up on the basis of private sector forest area per Conservancy. Note that a work-year is not necessarily equivalent to one job, because of the effects of contract and seasonal employment.

Total work-years per hectare varied surprisingly little either by woodland size-class or geographically, except for owners with under 20 hectares in the south of England, where the labour rate per hectare was found to be significantly higher than in the rest of the survey (see Figure 1). No explanation for this was evident. While it may be reasonable to assume that over-reporting is more likely for very small areas with only fractions of a work-year in total, than for larger estates with full-time labour forces, the same phenomenon was not observed in the rest of the country. A more likely explanation is the preponderance in the south of broadleaved species which require more intensive management both for establishment and maintenance of plantations. In a study covering the south and east of England, Dolan and Russell (1985) found that the establishment of broadleaves was 50% more costly than that for conifers, with mixed plantations showing up as still more expensive. The smaller the area of planting, the more costly the establishment. Their study did not estimate labour requirements, but the differences can be attributed with confidence to the labour-intensive nature of broadleaved plantation establishment.

Because there is no woodland size-class distribution for forest owners as a whole, no adjustment for variability between size-classes can be made. However, it is known that in general the south of England has many more woodlands of under 20 hectares than the rest of the country. If the high work-years per hectare rate is purely a result of over-reporting, then the effect on population estimates will be minimal. If however the effect is real, which seems likely, then the totals for private estates in England are under-estimated.

The questionnaire asked owners to estimate additional labour working in the woodlands, employed not by themselves but by forest management companies

Figure 1



or standing sales timber merchants. The numbers reported were used as a check on these sectors and to assist in estimating totals for the merchants' sector, where sampling was inadequate.

3.2. Forest Management Companies

A slightly different form of the questionnaire was used for this category (see Appendix II).

The four largest forest management companies Economic Forestry Group plc; Fountain Forestry Ltd; Scottish Woodlands Ltd; Tilhill Forestry Ltd) were approached individually in advance. All agreed to distribute the questionnaire and ensure full returns from their local offices. In addition, firms involved with significant numbers of individual woodlands were identified through the Forestry Commission database of current plans of operations under all dedications and grant schemes, and were invited to take part. Most did so (including some who took the trouble to write back explaining that their activities were outside the scope of the survey).

Great care was taken in the phrasing of the questionnaires and covering letters to ensure that potential respondents could readily decide which sector of the survey was appropriate for their operations. There is no indication that respondents found any difficulty with this, and therefore the incidence of double counting in the survey is effectively zero.

The total for the 'big four' management companies covered more than 80% of all management company activity in the survey. Although, inevitably, some small firms are bound to have been excluded, the number of omissions is not thought to be substantial, and the total represented by the 'big four' and the rest has been taken to represent the whole of the management company sector. This has introduced the possibility of some under-estimation for this sector.

Total management company labour in the forest, obtained from this part of the survey, was approximately 12% higher than the estimate derived from the 'additional labour' questions in the forest owners' survey; a difference which is not statistically significant at the 95% probability level. However, the difference is in the expected direction. Two and a half percent of returns in the owners' survey contained notes indicating that the owner did not know how much labour was employed because this came from a company. While this is hardly sufficient to use as an actual measure of the shortfall in reporting, it is enough to indicate that the difference between the owners' survey estimate and the management company survey is of the right order.

3.3. Timber Merchants

This sector of the industry was the most difficult to survey, because there was no comprehensive list of firms operating in the sector. Lists of members were provided by both the British Timber Merchants Association and the Association of Professional Foresters. The United Kingdom Softwood Sawmillers Association made the results of their own recent survey of their membership available. However, these organisations do not cover all firms engaged in the purchase and extraction of timber, many of which are very small. To compound the problem, the response rate was very disappointing. Of over 300 questionnaires sent out only 28 were returned.

Firms may from time to time be harvesting timber on contract for a forest owner, or harvesting standing timber which they have purchased (standing sales). Both of these activities may be further split between the Forestry Commission and the private sector. All work on contract is accounted for by other parts of the survey, with the separate identification by both forest owners and the Forestry Commission of direct labour and contractors. The Commission's figures include those engaged on standing sales in its forests. This leaves only standing sales in the private sector to be counted.

To ask respondents to provide employment figures for this side of their activities only would have been unrealistic. The questionnaire (see Appendix III) therefore asked for all employment to be entered, but also asked for details of the division of timber quantities between contract work, standing sales from the Commission and standing sales from other owners. These were used to apportion employment in harvesting and haulage. It was assumed that employment on other forest operations had already been enumerated under contractors in the other sectors of the survey but that non-forest employment would not have been accounted for elsewhere. Non-forest employment was therefore included in full.

In order to obtain total employment on standing sales in the private sector, various scaling factors based on areas and volumes reported by respondents in the merchants', owners' and companies' sectors of the survey were adopted.

Owners reported quantities of timber harvested by themselves, by forest management companies and by standing sales. These timber quantities were scaled up to produce estimates for the population, using population/sample ratios of the areas from which the timber was harvested (ie areas in the age range from about age 25 to 60 years). The sample distribution of area by age was obtained from the owners' questionnaire and that for the population from the Census of Woodlands, (Locke, 1987). The total volumes for England, Wales and Scotland estimated in this way were 2,250, 250 and 900 thousand cubic metres respectively. These were considered to be sufficiently close to the actual 1988 timber production figures of 2,085, 195 and 785 thousand cubic metres to give confidence in the robustness of the estimates.

Only the standing sales components of these estimates were relevant. From these were subtracted the small amounts of standing sales handled by forest management companies, obtained from the companies' sector of the survey. The remainder were the estimates of standing sales in the private sector handled by timber merchants.

The ratios between these estimates of timber volumes and the timber volumes reported by the sample of merchants provided scaling factors which could then be applied to employment numbers in the sample to obtain employment estimates for the merchants' sector.

Total employment in the merchants' sector was estimated from the sample on this basis to be 5,725 people, of whom 1,670 were in the forest, 2,540 in haulage and processing, and 1,515 in supervisory, managerial and clerical jobs. The apparently high proportion of office employment must be seen in perspective in that about 65% of the forest employment reported by firms in this sector of the survey was not counted here but under contractors' labour in the other sectors.

The Great Britain total of 1,670 work-years of employment by timber merchants in the forest can be compared with the figure of 1,100 given as the estimate of 'extra' labour employed by standing sales merchants, from the owners' survey. Could the actual number really be as much as 50% higher than the estimate made by those on whose land the work took place? The owner often has little control over the time when a merchant enters the forest to extract timber, and may not know the operation is in hand until after it is finished. Many owners in the survey had no idea how many people were involved and accordingly left the question blank. In total, 43 owners reported the extraction of a total of 60,000 cubic metres of timber by standing sales but did not provide any figure for the associated employment. This represented 31% of all standing sales. Assuming the labour actually employed in these cases to be proportional to the rest, the best estimate from the owners' survey of 'extra' employment on standing sales would be 1,600, which is very close to the 1,670 calculated directly from the merchants's sector survey.

The reliability of the information gathered from the disappointingly small sample of operators in the merchants' sector has been demonstrated remarkably well in respect of both timber quantities and alternative estimates of employment in the sector.

3.4 Processing

There are some 700 sawmills in Britain, ranging in annual capacity from under 500 to over 25,000 cubic metres capacity. The Forestry Commission conducts a confidential structured survey of these on a regular basis. The most recent full survey, which included information on employee numbers, was in 1987, and its results have been incorporated in this survey. For the rest of the processing sector, although their individual capacity is often very large, the number of firms processing British timber in the pulp, paper and board industries is very small. All are known to the Forestry Commission, and were approached on a personal basis to supply current employee numbers.

There is additionally a limited amount of local small-scale processing by individual forest owners, companies and timber merchants. An estimate of the employment on such processing was obtained from each of the three surveys, care being taken in the wording of the questionnaires to exclude any labour which was included in the sawmill survey.

4. Results

All results are expressed in terms of work-years of employment. Some of the work, particularly that of contractors, may be part-time or seasonal, so actual numbers of individuals who derive some employment from forestry will be greater than the numbers reported here. Some contractors spend proportions of their working time in forestry, agriculture, horticulture, tree surgery and so on. Seasonal activities such as planting cannot, by themselves, provide year round employment, so may be combined with other forest activities throughout the rest of the year, or with other employment. For example it is common in the north-west of Scotland for forestry and fishing to be combined in this way. The incidence of part-time and seasonal employment has not been measured in this survey.

Respondents were asked to include their own labour on their returns if this was relevant. Since the intention of the survey is to find the total amount of work generated by the forestry and wood processing industries, no distinction has been made between owners' labour, which is self-employment, and that of employees.

4.1. Overall Totals

The total amount of employment in forestry, enumerated or estimated for each of the sectors defined above, is given in Table 2, and illustrated in Figure 2, with the comparable 1986 results.

4.2. Types of Forestry Employer

In England, particularly in the south, traditional private estates predominate as employers. Thus, 75% of all forest labour within the Forestry Commission's East and West England Conservancies is employed, both directly and on contract, by private owners, 20% by the Forestry Commission, and only 5% by forest management companies.

Moving north, the position changes. In Scotland the forest management companies share more than doubles to 11%, though it is still the smallest sector in absolute terms. The other sectors are fairly equally represented, with none dominating.

Wales is different again, with the Forestry Commission accounting for 43% of all employment, the private sector 33%, forest management companies 6% and merchants 18%.

4.3. Employment by Activity

Detailed breakdowns of numbers employed in the various activities of forestry, both forest and non-forest, for each sector, are given in Appendix IV. Summarised for the whole industry, the distribution by activity is shown in Table 3. Figure 3 shows the distribution compared with the position in 1986.

Table 2 Employment in Forestry and Primary Wood Processing in Britain

Work-years — whole job equivalents

	Forestry Commission	Estate Owners	Management Companies	Timber Merchants	Primary Processing	TOTAL
North England	820	2,400	150	—	—	
East England	1,190	4,680	300	—	—	
West England	730	3,610	245	—	—	
Wales	1,455	1,110	185	—	—	
North Scotland	1,310	1,270	460	—	—	
Mid Scotland	1,150	785	365	—	—	
South Scotland	1,065	1,470	515	—	—	
ENGLAND	2,740	10,690	700	1,225	5,670	21,025
WALES	1,455	1,110	195	610	1,410	4,780
SCOTLAND	3,525	3,525	1,345	3,890	2,960	15,245
GREAT BRITAIN	7,720	15,325	2,240	5,725	10,040	41,050

Figure 2

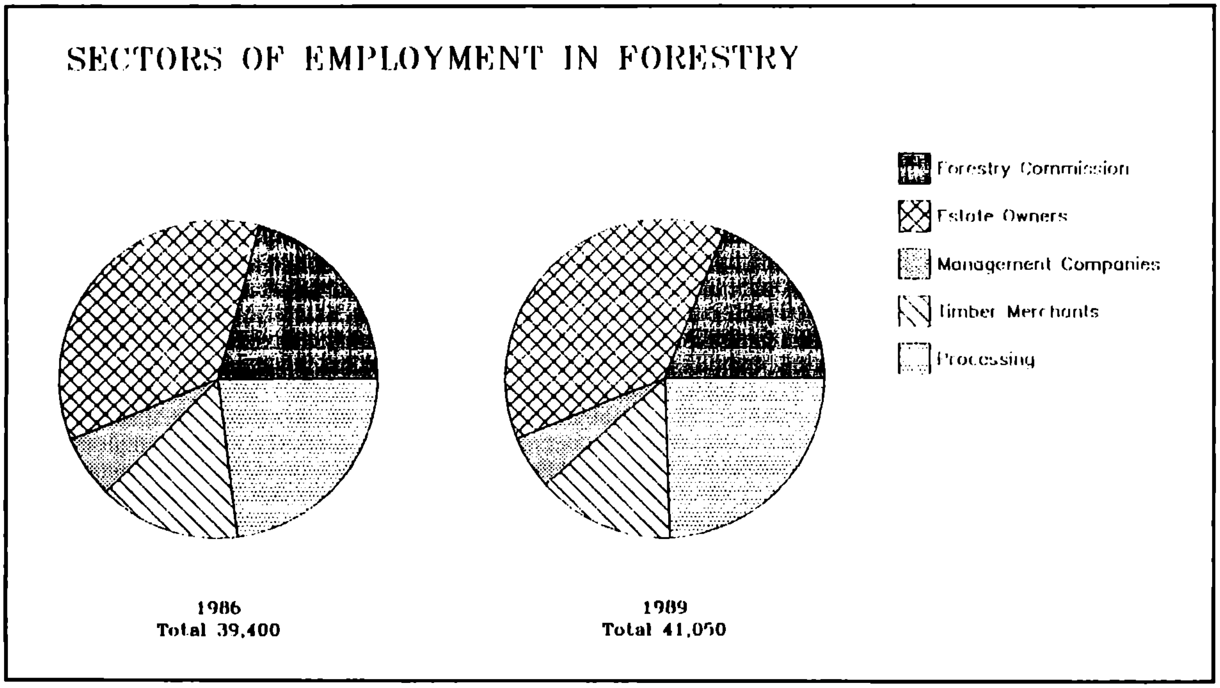


Figure 3

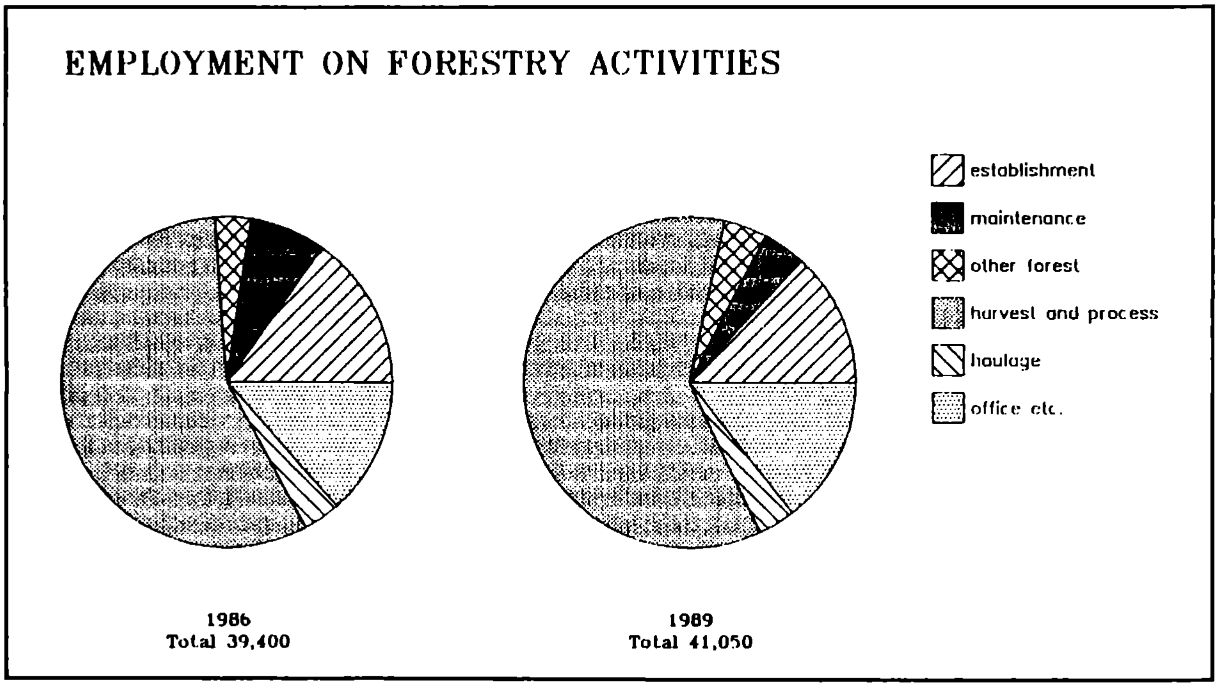


Table 3 Breakdown of Total Forestry Employment by Activity (1988-89)

Work-years — whole job equivalents

	England	Wales	Scotland	GB
Nurseries	250	55	240	545
Establishment	2,352	482	1,487	4,320
Maintenance	1,173	298	773	2,245
Harvesting	5,505	1,585	3,625	10,715
Other forest	1,035	105	585	1,725
FOREST total	10,315	2,525	6,710	19,550
Haulage	640	195	660	1,495
Processing	7,535	1,575	4,990	14,100
Managerial	1,620	280	1,725	3,625
Clerical	735	155	960	1,850
Other non-forest	180	50	200	430
NON-FOREST total	10,710	2,255	8,535	21,500
TOTAL	21,025	4,780	15,245	41,050

The 'nurseries' figures only include forest nursery employment carried out in conjunction with other forestry; firms engaged solely in the provision of plants from nurseries are not included in the survey, as noted in chapter 2.

Most of the 'other forest' employment is on activities connected with the environment. Included in this category are landscape work, nature conservation, the provision of public recreation and sporting.

The total of 14,100 for 'processing' includes 10,040 in the primary wood processing industries. The rest consists of small-scale local forest processing (eg the production of fencing material). There is a suspicion that some respondents may have included some employees here who were engaged on harvesting using 'processors' and should therefore have been classified under 'harvesting'. For this reason, the two categories are amalgamated for purposes of comparison with the previous survey and predictions of trends in future employment.

Managerial and clerical employment in the Forestry Commission includes those (some 25% of the total) who are engaged on Forestry Authority [1] work, for which there is no equivalent in the other sectors. 'Other non-forest' is all Forestry Commission, and is mainly made up of staff in the Research and Development Divisions.

4.4. Direct and Contract Labour

For all except timber merchants and processing, the division between directly employed labour and contractors was obtained (for timber merchants it was included in the questionnaire but results were too sparse to be reported with confidence). Results are shown in Table 4, illustrated in Figure 4.

The percentage of contractors in the work force for the remaining sectors (Forestry Commission, owners and management companies) is 33%. Scotland has most at 40%, Wales 37% and England 28%. Harvesting is by far the most contractor-oriented activity, averaging 60%, with other forest operations 23% and non-forest employment only 8%.

The percentage of contractors is greatest in the management company sector, at 66%. Forestry Commission and private owners have far fewer; 34% and 28% respectively. However, management companies employ fewer contractors in absolute terms than either of the other two sectors, because their overall share of the total employment in forestry is small. Since 1986 both Forestry Commission and private owners have increased their use of contractors by about a fifth, while forest management companies, who were 70% dependent on contractors in the 1986 survey, have slightly increased their proportion of directly employed labour.

[1] The Forestry Authority is that part of the Forestry Commission organisation concerned with the forestry industry as a whole, including the private sector. Its functions cover the administration of grants and felling licences, research and development, training, health and safety, publications, etc. The other part, solely involved in the management of the Commission's own forests, is the Forestry Enterprise.

Figure 4

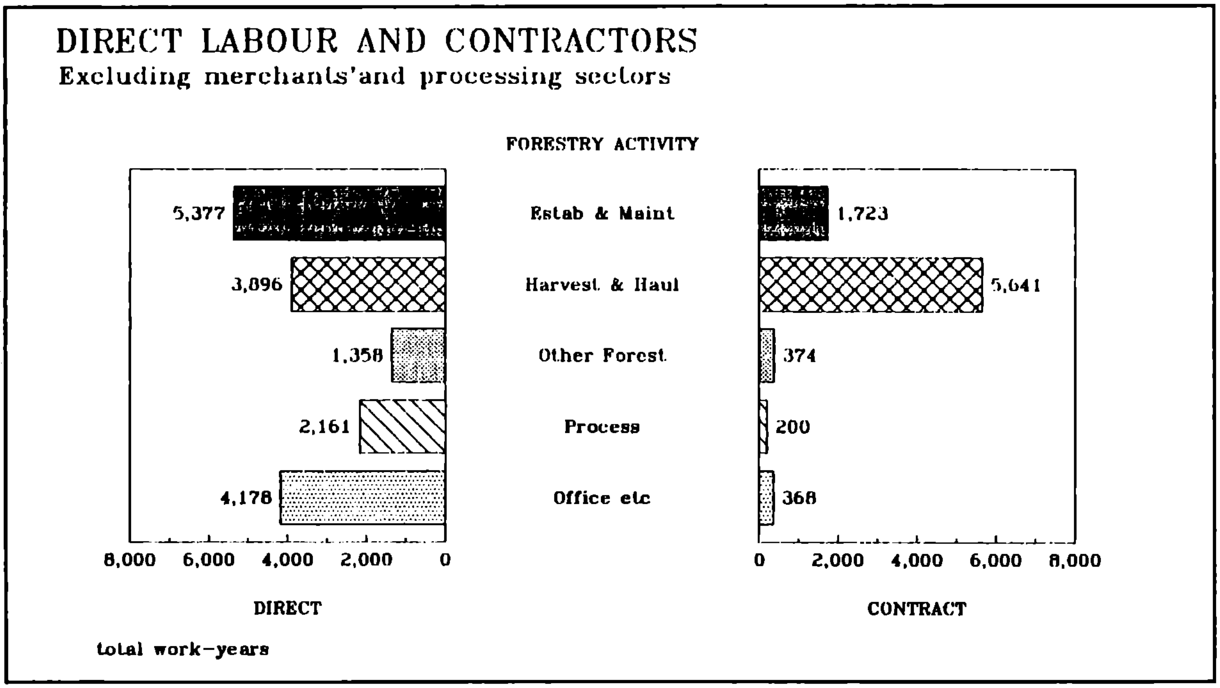


Figure 5

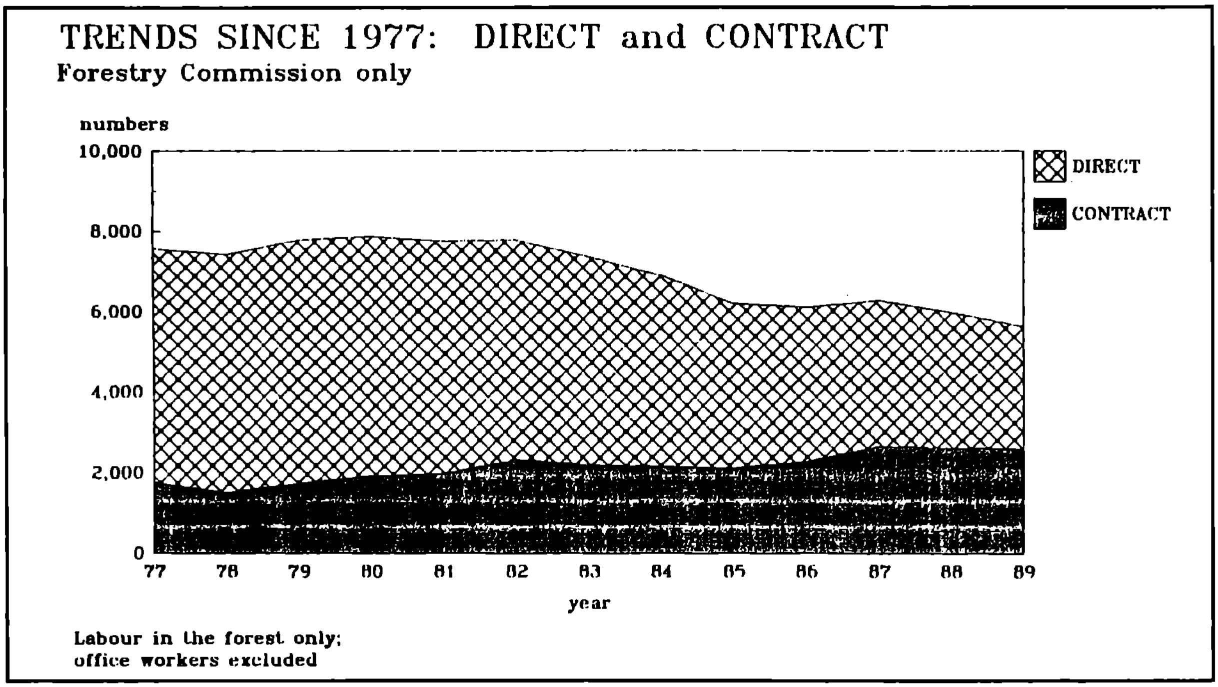


Table 4 Use of Direct Labour and Contractors

	Forestry Commission	Private Owners	Management Companies	Total
TOTAL LABOUR		Numbers		
Establishment and Maintenance	1,505	4,645	960	7,110
Harvesting & Haulage	3,570	5,320	810	9,700
Other Forest	560	1,095	70	1,725
Processing	0	2,355	5	2,360
Office etc	2,085	1,910	395	4,390
TOTAL	7,720	15,325	2,240	25,285
PERCENT CONTRACTORS		Per cent		
Establishment and Maintenance	7	20	70	24
Harvesting & Haulage	65	51	95	60
Other Forest	29	17	21	21
Processing	n/a	8	100	9
Office	0	10	3	5
Overall	34	28	66	33

Table 5 Travel to Work Distances for Forestry Workers

Cumulative percentage of workers living within stated distance of place of employment

	Direct Labour				Contract Labour			
Distance (miles)	5	10	20	50	5	10	20	50
HARVESTING								
Private Owners	85	96	99	100	35	59	84	98
Management Companies	10	19	52	99	2	15	44	91
Timber Merchants	61	82	96	96	1	6	12	89
Over all	83	94	98	99	18	34	53	96
OTHER FOREST OPERATIONS								
Private Owners	86	97	100	100	23	39	70	98
Management Companies	30	57	90	99	3	19	50	93
Timber Merchants	—	—	—	—	—	—	—	—
Over all	82	94	99	100	15	33	64	96
NON-FOREST EMPLOYMENT								
Private Owners	82	96	99	100	13	29	46	84
Management Companies	54	75	94	99	28	54	81	90
Timber Merchants	51	69	78	93	53	65	69	87
Over all	69	85	91	97	38	52	62	86

Only the Forestry Commission has data available for the use of direct labour and contractors over a number of years. These are illustrated in Figure 5.

4.5. Travel to Work

Questions were included in the three questionnaires on the average distances travelled by forest workers between home and place of work. This is defined as the place where the working day begins; it does not include travel within a forest during the working day.

There are, however, problems with the definition of place of work in forestry, where a single forest block can, in some areas of the country, extend over many miles. Practices tend to differ between directly employed labour and contractors, in that the former are usually deemed to start work at some recognised 'signing-on point' such as a forest gate or office. They may then travel considerable distances to reach the actual work site in the forest. Contractors normally include such travel inside the forest in their travel-to-work and are not considered to be working until they reach the actual work site. This results in an unavoidable bias towards longer travel-to-work distances for contractors, which must be borne in mind when looking at the results of the survey.

By no means all respondents were able to complete this question. Results in Table 5 are based only on those who supplied sufficient detail, and are presented as cumulative percentages to avoid having to estimate actual figures from varying numbers of cases.

Direct employees live considerably closer to their place of work than contractors, over 90% within 20 miles compared to around 60%. The employees of private forest owners live very close indeed with over 80% within 5 miles, while those of management companies travel considerably further. No doubt this is partly a reflection of the extent to which workers on private estates still live in tied housing.

There is surprisingly little difference in travel-to-work distances between workers engaged on harvesting and those engaged on other forest operations, but non-forest employees tend to live rather further from the workplace. Overall, contractors on non-forest operations travel furthest, not surprisingly since this is where most of the haulage labour is enumerated.

4.6. Government Training Schemes

There are opportunities in forestry for work experience for Youth Training Scheme (YTS) and other Government assisted trainees for limited periods. The Forestry Training Council reported in 1989 a total of 309 YTS students aged 16-18 in years 1 and 2 of the National Preferred Training Scheme (Forestry), attending one of 7 colleges in Britain. Of these, 37 were employed in Forestry Commission forests. A few additional places were occupied by other Employment Training Agency trainees, mainly older long-term unemployed.

Students spend two years in training, of which more than a year and half is spent as work experience in a forest. Virtually all students who complete the scheme are assured of permanent employment as forest workers. Some continue their studies to qualify as foresters.

Many other YTS trainees spend time working in forests, specialising not in forestry but in countryside conservation, arboriculture, etc. The Forestry Training Council has no actual statistics on such trainees but estimate there to be at least as many as in the forestry scheme. The survey identified over 60 trainees of all kinds in a sample of private woodlands covering only 11% of the private sector area, suggesting something over 500 for the private sector as a whole. Because of the nature of the sample, which over-represents large estates which are more likely to be involved with YTS, the true figure is likely to be less than this, but, in general, information obtained centrally about numbers of trainees agrees well with the findings of the survey.

Table 6 National Preferred Training Scheme — Forestry

College	Enrolled yr 1 1987	Completed yr 1	Enrolled yr 2 1988	Completed yr 2	Percent getting jobs or further education*	Students in scheme in 1989
Riseholm	39	29	20	20	85	54
Dartington	40	34	22	20	85	45
Newton Rigg	15	13	13	9	100	19
Inverness (Scottish School of Forestry)	35	33	22	22	90	32
Barony	45	32	20	20	90	36
Holme Lacy	72	49	42	29	100	108
Glynllifon	8	6	6	6	100	15
Total	254	196	145	126		309

* Figures below 100% indicate that the college lost touch with students, and not necessarily that students failed to find employment.

Source: *Forestry Training Council (unpublished figures)*

5. Comparisons with Previous Survey

The first Forest Employment Survey was conducted in 1986. The present survey covered exactly the same groups and enumerated each in the same way, making comparisons over the three years particularly straightforward.

A summary of the result is in Table 7. Figures 2 and 3 illustrate the comparison in different ways. Detailed comparisons by sector and by country are in Appendix IV. There has been a rise in total numbers employed. In 1986 the total over all sectors was 39,400; it is now 41,050, an increase of 4.2%.

Table 7 Comparisons with 1986 Survey

Work-years: whole job equivalents

	1986	1989
BY SECTOR		
Forestry Commission	8,115	7,720
Estate Owners	13,980	15,325
Management Companies	2,515	2,240
Timber Merchants	5,740	5,725
Processing	9,050	10,040
TOTAL	39,400	41,050
BY ACTIVITY		
estab/maint	8,905	7,110
other forest	1,425	1,725
harvest/process	23,765	26,310
office	5,305	5,905
TOTAL	39,400	41,050

The largest increase in numerical terms has been in harvesting and processing, up 10%, and providing employment for some 2,500 more people than at the last survey. Nine hundred of these additional jobs are in the primary wood processing industries. Although there have undoubtedly been improvements in harvesting productivity and in the technology of processing, these have been more than offset by the rapid rise in the supply of timber reaching the market; 5.2 [2] million cubic metres in 1985/86, 6.5 million in 1988/89. The 25% increase in timber volume has produced a 10% increase in employment in harvesting and processing. The amount of timber harvested by the Forestry Commission has gone up 16% although there has been no increase in the harvesting work force.

Comparisons between the two surveys for the merchants' sector cannot be regarded as definitive. Although, strangely enough, the Great Britain totals for 1986 and 1989 are almost identical, there are huge apparent fluctuations between activities and between countries. These are certainly not real effects, but reflect the failure of both surveys to fully identify the population of firms to be included in this sector, as well as the very low response rates among those firms which were contacted. Apart therefore from including the totals from this sector in Great Britain totals, little or no use has been made of the results. The prediction of future harvesting employment (see chapter 7) is based on unit labour requirements derived from the other sectors of the survey.

Total annual planting increased by 20% between 1985/86 and 1988/89, and the total area of productive forest requiring maintenance increased by 3.5%. Employment on these functions however decreased by 18% overall. Most of the reduction is accounted for by the Forestry Commission, where the loss of over 500 jobs is in line with the much reduced planting programmes and the sale of some plantations to the private sector.

Management companies, who have been carrying out much of the new planting in the private sector, show an increase of 5% in employment on establishment and maintenance, and there is a decrease of almost 8% in these functions among private owners.

It is notable that since the previous survey there has been a considerable increase in employment on 'other forest' activities in all sectors surveyed. This includes all of the 'environmental' activities; landscape, nature conservation, recreation and sport. Actual numbers of jobs are of course small in comparison to the main activities of establishment and harvesting, but the size of the change is very significant. In the Forestry Commission the increase of 150 jobs, up 37% over the three years, is against the trend for the Commission's other activities. Forest manage ment companies have more than doubled their employment in the environmental area. This trend is also evident, though less marked in percentage terms, for private estate owners.

[2] All figures for land areas and timber quantities used in the comparisons are taken from Forestry Facts and Figures (Forestry Commission, 1976 *et seq*).

This is a not unexpected development, given the greatly increased emphasis in recent years on improving the forestry environment, with increased planting of broadleaved species, more concern for the landscaping of plantations, improved consultation on the environmental impact of forestry, and all the general pressure from Government and public opinion. Those engaged in forestry have clearly been responding to these new demands and encouragements by putting more work into activities aimed at improving the forest environment.

Office and supervisory employment has gone up 11% overall, which is rather more than might be expected as a *pro rata* increase based on changes at the forest level. Within the Forestry Commission, numbers in the forest have reduced by 10%, but office and supervisory work has remained virtually unchanged. Exactly the same environmental activities as are described in the previous paragraphs have led to considerable increases in work in the Commission's Headquarters and Conservancy offices and at Forest District offices. Without this there would have been a considerable reduction in the Commission's managerial and clerical employment. No doubt the same influences are at work in all sectors of the industry.

6. Unit Labour Requirements

Labour requirement estimates, measured as work-years per unit quantity, have been calculated for each activity in each sector, and are given in Table 8 and shown in Figure 6. For the merchants' sector the only activity included is harvesting.

Estimates are consistent between sectors for both establishment and harvesting, and for the ratio of office to forest employment. (For the Forestry Commission, Headquarters and Research staff have been excluded from the total of non-forest employees, there being no comparable activities in the other sectors.)

On maintenance operations, private owners appear to use 2 to 4 times as much labour per unit area of woodlands as either the Commission or the companies. This is probably the result, at least in part, of respondents to the private owners' survey recording under 'maintenance' all labour which they could not clearly identify as either 'establishment' or 'harvesting'. Some of this no doubt belongs to the various establishment and harvesting activities, but inevitably there will be some cases where it is impossible to separate forestry and non-forestry operations, where estate workers normally employed on forestry also undertake game management, gardening, and other general estate tasks.

However, privately owned woodlands are on the whole on better quality land, concentrated in lowland areas and with a higher proportion of broadleaves, and therefore requiring a higher level of maintenance.

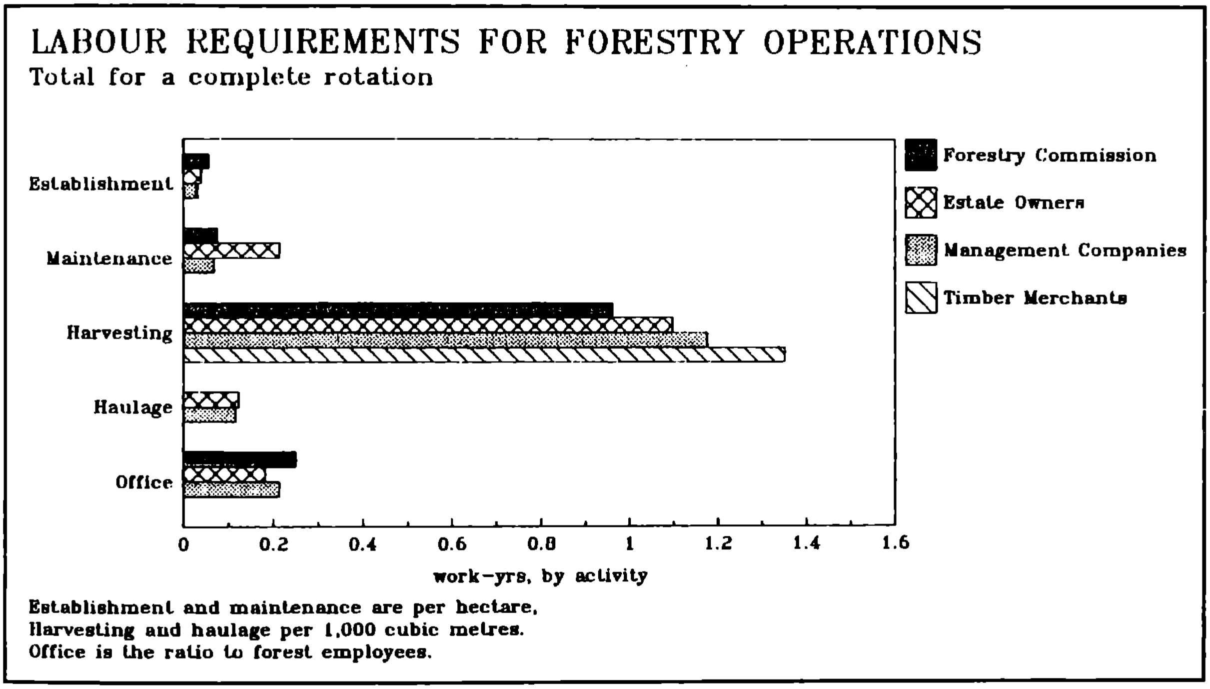
The extent to which an error in the labour rate per hectare for the owners' sector of the survey would affect Great Britain totals is fortunately very small. The total work-years on maintenance for the sector is only 1,245. To reduce this by two-thirds (the average by which it appears to be over-estimated) would result in a change in the overall total of only about 800. However, in the predictions of future labour requirements for the expanding forestry industry, a minimal figure of 1.5 times (instead of 2 to 4 times) the average of the other two sectors has been used, in order to guard against over-estimation.

Table 8 Labour Productivity Estimates per Function

	England	Wales	Scotland	GB
ESTABLISHMENT (work-years per hectare)				
Forestry Commission	0.074	0.075	0.046	0.057
Private owners	0.190	0.186	0.077	0.145
Forest management companies	0.064	0.209	0.027	0.031
MAINTENANCE (work-years per 1,000 hectares)				
Forestry Commission	2.403	1.374	1.143	1.507
Private owners	6.132	3.872	3.082	4.276
Forest management companies	1.680	1.058	1.255	1.331
HARVESTING (work-years per 1,000 cubic metres)				
Forestry Commission	0.809	1.134	1.022	0.961
Private owners	1.230	1.565	0.944	1.098
Forest management companies	1.292	1.831	1.072	1.176
Standing sales merchants	1.211	1.410	1.401	1.351
OFFICE/FOREST EMPLOYEE RATIO				
Forestry Commission*	0.304	0.213	0.221	0.249
Private owners	0.186	0.129	0.189	0.182
Forest management companies	0.275	0.194	0.186	0.213
HAULAGE/HARVESTING EMPLOYEE RATIO				
Private owners	0.114	0.047	0.115	0.112
Forest management companies	0.122	0.102	0.084	0.098

* Excluding FC Headquarters and Research.

Figure 6


LABOUR REQUIREMENTS FOR FORESTRY OPERATIONS
Total for a complete rotation
Establishment
Maintenance
Harvesting
Haulage
Office
Forestry Commission
Estate Owners
Management Companies
Timber Merchants
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
work-yrs, by activity
Establishment and maintenance are per hectare,
Harvesting and haulage per 1,000 cubic metres.
Office is the ratio to forest employees.

7. Predictions

Forestry is an expanding industry. Britain's forests are young, and until recently the amount of timber harvested was low in relation to total forest area. However, the extensive plantations established in the 1950s and 1960s are now reaching maturity and as a result quantities of timber harvested are increasing rapidly and will continue to increase.

Present Government policy is that new planting should increase forest cover by 45,000 hectares per annum, including 12,000 under the Ministry of Agriculture's Set-Aside and Farm Woodland Schemes. In fact less than this has been achieved; in 1988/89 total new planting was just under 30,000 hectares, 25,000 of which was in the private sector. Although the target of 45,000 may not be reached within the next few years, the assumption has been made in the predictions that in the long term it will be achieved. Even if this proves not to be the case, the resulting over-estimation will be very slight, given that most of the employment is on harvesting and processing, which no current planting will reach within the time scale of the predictions.

The forecast of future availability of timber, as well as the planned increases in total forest area, have been used in conjunction with the calculated labour requirements for each type of forestry activity, to calculate the expected numbers of workers required by the forestry and timber processing industries over the next 15-20 years. The current production forecast runs until the period 2002-2006. Virtually all areas clear felled are restocked, and account has been taken in the predictions of the labour required to replant these areas. New planting has been assumed at the rate given above of 45,000 hectares per annum, not only to calculate the labour requirements for planting itself, but also to take account of all the general maintenance, environmental work and the managerial overheads associated with a slowly increasing forest area. The resulting predictions are in Appendix IV, with a summary in Table 10, illustrated in Figure 8.

Table 9 Past and Future Wood Production in Great Britain

Thousands of cubic metres overbark per annum

Calendar Year	Conifers			Broadleaves	Total Conifers and Broadleaves
	FC	PW	Total		
1982	2,690	860	3,550	1,100	4,650
1983	2,770	940	3,710	1,000	4,710
1984	2,890	1,110	4,000	1,000	5,000
1985	2,950	1,220	4,170	1,000	5,170
1986	3,150	1,340	4,490	1,100	5,590
1987	3,340	1,630	4,970	1,000	5,970
1988	3,330	1,920	5,250	1,200	6,450
	(predictions rounded to nearest 100,000 m3)				
1987/1991	3,400	1,700	5,100	900	6,000
1992/1996	3,700	2,300	6,000	900	6,900
1997/2001	4,600	2,800	7,400	900	8,300
2002/2006	5,400	3,400	8,800	900	9,700

Note: One m^3 overbark equals approximately 0.875 m^3 underbark and weighs 0.9 tonnes when freshly felled.

FC: Forestry Commission, PW: Private Woodlands

Source: *Forestry Commission*

Figure 7

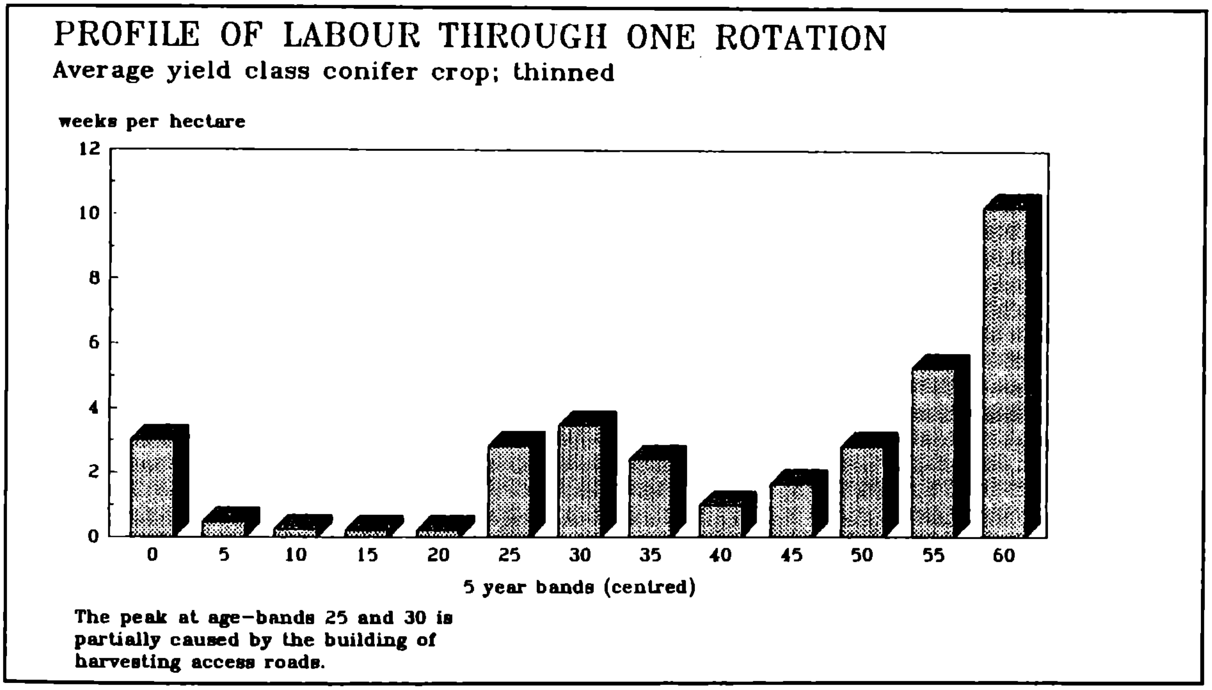


Figure 8

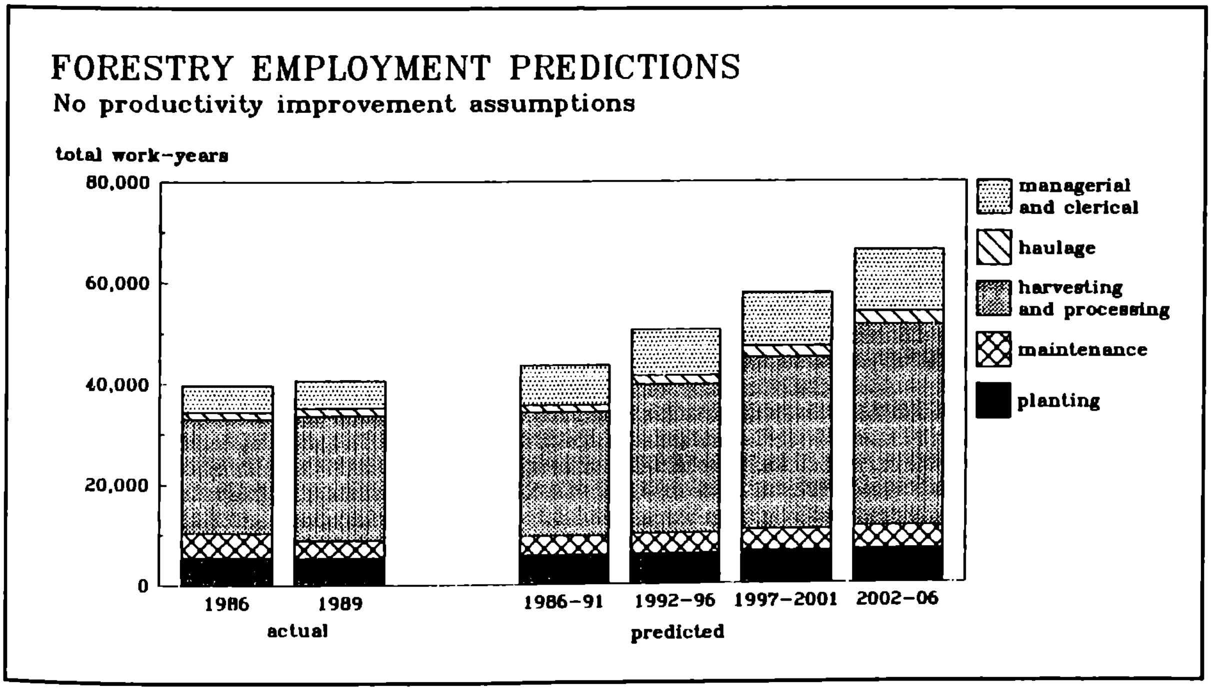


Table 10 Predicted Forestry Employment in Great Britain (No productivity improvements assumed)

Year(s)	Work-years: whole job equivalents
1986	39,400
1989	41,050
1986-91	43,500
1992-96	50,500
1997-2001	57,800
2002-06	66,300

Planting has only a small effect on labour requirements. Harvesting is much the most labour-intensive activity, causing labour profiles to be heavily skewed towards the end of the rotation (see Fig 7). Employment in forestry is expected to continue to increase, because the rate of increase in harvesting is outstripping productivity improvements achieved through new technology and mechanisation.

In making predictions, no account has been taken of the relative shares of the public and private sectors. Trees will be planted and timber will be harvested no matter who owns the forests. A major shift of balance towards the private sector could result in a rather larger work force, depending upon the types of forestry and the efficiency of management practices adopted. Such unknown factors have been ignored, and predictions are for the whole industry, not differentiated by sector.

Improvements in labour productivity will affect the predictions. These have been taken into account in two ways; first by applying general factors based on expectations within the Forestry Commission, and secondly by using the changes between the 1986 and 1989 surveys to derive factors. The generalised expectation is about 2% per annum overall, weighted somewhat towards harvesting and processing since these activities give more scope for mechanisation. Factors used are 2.5% on harvesting and processing and 1.5% on all other activities.

Differences between the two surveys are very variable between activities, between sectors of the survey and between countries. The sampling is barely sufficient at this level to give reliable estimates. Therefore any individual differences which indicate worsening productivity have not been used, since this is unlikely to be a real effect. However the factors used for the 'Totals' lines and for the 'Great Britain totals' columns do take full account of survey variability and are more robust. None of these show declining productivity.

The predictions produced by these two methods are very similar.

8. Forestry in the Context of Rural Employment

The greatest expansion in forestry over the past 20 years has been in the uplands of Scotland, where the relatively poor soils do not support arable crops or rich pasture. Where there has been conversion from agriculture this has usually been from sheep farming. Comparisons of numbers employed in forestry and sheep farming are difficult, because of differences in methods of measuring the areas of ground involved. Sheep are considered to cover an entire hill area, including the barren tops, which leads to very low per-hectare numbers. A forest area is taken as that which is enclosed within fences, omitting the unplantable areas above the timber line. The replacement of sheep by forest therefore changes the number of hectares apparently used.

In general terms forestry employs a small number of workers in the first few years of a crop rotation, very few during the middle years, but many more at the end, (see Figure 7) whereas sheep farming requires a constant workforce. However, over a large enough area, with continuous planting and harvesting programmes, this uneven labour profile can be smoothed, so that a permanent workforce, whether of direct labour or contraction, is sustainable.

Present and future emphasis is on the movement of forestry 'down the hill' onto better agricultural land, with considerable emphasis on broadleaves, and woodlands on existing farms. Although this survey did not address the comparison between conifer and broadleaved forestry, Forestry Commission experience and other work (Dolan and Russell, 1985) show the establishment and maintenance of lowland broadleaves to be at least 50% more labour intensive than even lowland conifers. Comparison with the uplands, where weeding is usually unnecessary or minimal, would show even greater differences. The lower per-hectare labour figures for Scotland in Table 8 reflect the greater preponderance of conifers and larger unit forest areas there.

If the trend towards smaller scale planting and more broadleaves continues, some additional labour will be required for forest establishment and maintenance, although the greatly increased rotation lengths will offset this by delaying the requirement for harvesting workers. In general, therefore, increasing the proportion of broadleaved planting may increase future labour requirements, though not by a great deal within the timescale of predictions in chapter 7.

9. Comparisons with other Published Statistics

Government statistics on numbers of employees in forestry and wood processing are not usually comparable with the results of this survey. For example, the Department of Employment reports 4,700 employees in forestry in Scotland in 1987 (Scottish Economic Bulletin, 1989), compared to some 10,000 found by the survey.

Department of Employment statistics are based on returns from firms with more than 25 employees. In forestry there are very many small businesses with fewer than 25 employees. Additionally, Department of Employment figures are for 'employees in employment', and exclude the self-employed. Self-employment is a very significant feature of forestry work, where the owners of forests, or of forestry contractors' businesses, are often fully or partly engaged in the business themselves.

Statistics for the processing of home-grown timber are not separately identifiable in Government publications. As well as the limitations enumerated above, returns to the Department of Employment do not identify the source of the timber, thereby confounding the processing of British timber with that of imported timber. Categories listed are 'Timber and Wooden Furniture Industries' and 'Manufacture of Paper and Paper Products; Printing and Publishing'. Totals for these categories for Scotland in 1987 are 16,300 and 34,400 respectively (Scottish Economic Bulletin 1989). There are no comparable figures in this survey, as these official statistics cover a great deal of manufacturing activity down-stream from the primary processing stage which is the end point of this survey.

These differences do not imply that either the survey results or the official statistics are 'wrong'. The data collected have different definitions and criteria.

This survey has been done from inside the forestry industry itself. The amount of employment which is created by the expansion of forestry is as important to the industry whether it is self-employment, direct labour or contract working. Therefore the survey includes the work of all the people involved in forestry, regardless of their employment status.

Acknowledgements

The survey would not have been possible without the co-operation of many individuals in the industry; forest owners, managing agents, employees of management companies, contractors and timber merchants, all of whom took the trouble to complete questionnaires in considerable detail. The author wishes to thank them all.

Special thanks are due to representatives of Timber Growers United Kingdom, to the four largest forest management companies (Economic Forestry Group plc; Fountain Forestry Ltd; Scottish Woodlands Ltd; Tilhill Forestry Ltd) and to the British Timber Merchants Association and the Association of Professional Foresters, all of whom made valuable contributions to the design and content of the various questionnaires, and provided not only access to their employees and/or membership lists but also active encouragement to members through internal publications to complete and return the forms. The United Kingdom Softwood Sawmillers Association were kind enough to supply data from a recent internal enquiry among their members. Firms in the pulp and board industries also supplied information through personal contact with the Commission's Harvesting and Marketing Division.

My thanks go also to Catherine Ward, of Napier College, Edinburgh, who gave a great deal of help in questionnaire design and in drawing samples and processing forms, and to Jean Muir who keyed the data into the computer.

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Appendices

PRIVATE FOREST OWNERS QUESTIONNAIRE AND COVERING LETTER

FORESTRY COMMISSION
231 Corstorphine Road, EDINBURGH EH12 7AT
Telephone: 031-334 0303
Telex: 727879 (FORCOM G)

TIMBER GROWERS UNITED KINGDOM
The Organisation representing the interests of Woodland Owners
AGRICULTURE HOUSE,
KNIGHTSBRIDGE, LONDON SW1X 7NJ
Telephone: 01-235 2925

8 November 1988

Dear Woodland Owner

NATIONAL SURVEY OF EMPLOYMENT IN FORESTRY

The Forestry Commission and Timber Growers UK are once again jointly conducting a national survey of employment in forestry and related industries. The first such survey was carried out during 1986, and its results showed that there were considerably more people working in forestry than had previously been estimated. Totals, expressed as full-time man-year equivalents, were as follows:

	England	Wales	Scotland	GB
Forestry Commission	2,900	1,700	3,500	8,100
Private Estates	9,050	1,600	3,300	13,950
Forest Management Companies	550	150	1,800	2,500
Harvesting Companies	4,050	1,450	250	5,750
Wood Processing Industries	5,700	1,100	2,350	9,150
	22,250	6,000	11,200	39,450

The organisers wish to express their most grateful thanks to all those who contributed towards these results.

It is not sufficient, however, to carry out such a survey only once. The postion is constantly changing, with an increasing harvesting programme and improving productivity having conflicting effects on the size of the workforce. It is intended to repeat the survey every 2-3 years.

As part of the survey, all members of TGUK with woodlands of over 500 hectares and a sample of those with smaller holdings are being sent the attached questionnaire. In addition, information is being collected from the Forestry Commission, from the major forest management companies, from timber merchants and from various sectors of the wood processing industry.

Those involved in the first survey will recognise that, apart from a few minor changes, the actual questions and the layout of the form are much as before. The response rate on that occasion was excellent - virtually 100% for those over 500 hectares and a very high percentage of the rest. The lowest response came from those with less than 10 hectares. Many such woodlands may have a workforce so small as to be effectively nil. It is however most important that those with <u>no</u> employees are included in the survey, and their woodland areas counted in the total, together with details of any contract work which may have been carried out.

So please, however large or small your woodland is, help up to obtain reliable information by completing the questionnaire and returning it folded as indicated with the FREEPOST address on the outside, within 2 weeks of receipt. No postage stamp is required.

The survey is completely anonymous. Even the very limited use made of names and addresses in the last survey as a check on response has now been dropped.

With grateful thanks for your co-operation in this important project.

Yours sincerely

R T Bradley
Commissioner Private Forestry & Development
Forestry Commission

A R Williams
Chief Executive
Timber Growers UK

All enquiries to be addressed to:

Mrs J Thompson
Forestry Commission
231 Corstorphine Road
Edinburgh
EH12 7AT

Tel: 031 334 0303

Mr P Wilson
Timber Growers UK
Agriculture House
Knightsbridge
London
SW1X 7NJ

Tel: 01 235 2925

GENERAL NOTES Please read all of the notes before entering answers:

☐ *The survey is anonymous.*

☐ *If an owner holds a number of separate woodlands with separate workforces, a return for each would be appreciated (extra forms can be obtained from the address below, or make photocopies of this one).*

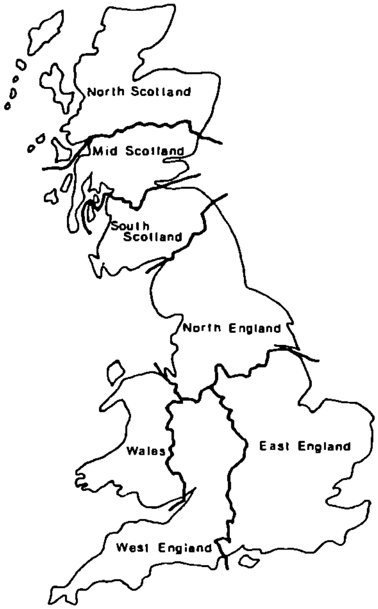
☐ *If a workforce is shared between 2 or more woodlands with different owners, please if possible supply one joint return covering the total enterprise.*

NOTES ON QUESTIONS:

1 *If the return covers more than one county, enter the one in which the major part of the woodland is located. If necessary, enter more than one county.*

2 *The map illustrates Conservancy boundaries.*

3



4 *Area on which the major objective is the production of timber.*

5 *Hectares (should add up to question 4).*

6 *Please supply data for the 12 months ended 30 September 1988 if possible. Alternatively supply data for the most recent complete 12 month period for which you have figures available.*

7 *New planting plus restocking.*

8 **Direct Labour:** *employees whose wages are paid by the owner of the woodland.*

Contractor: *individual or company engaged by the owner to carry out specific tasks.*

Management company: *a company who handles the overall management of a woodland on behalf of the owner, for a fee.*

*(**NB** A firm may operate as a mangement company in one situation and as a contractor in another. If in doubt, please ensure that the TOTAL volume harvested is all recorded, even if the breakdown may be inappropriate.)*

Standing sales: *timber sold standing and then harvested by the purchaser, his employees or his contractors. The woodland owner does not pay for the labour but is paid for the timber.*

9 *Count only directly employed labour and contractors working directly to the owner. The employees of management companies and timber merchants are recorded separately. If employees spend part of their time on forestry and part on other functions (eg farming) count fractions of an employee on each forest related operation.*

If the breakdown between forest operations is not known exactly, please make the best estimate you can.

Please enter in column 3 (Training schemes) any labour supplied through YTS or any other assisted employment or training scheme funded or partly funded by any Government agency. These figures should NOT be included in columns 1 and 2.

All enquiries to be addressed to:-

Mrs J Thompson
Development Division
Forestry Commission
231 Corstorphine Road
Edinburgh
EH12 7AT

PLEASE PASS THIS FORM TO THE MANAGING AGENT FOR COMPLETION IF APPROPRIATE

FOREST EMPLOYMENT SURVEY

A Joint Assessment

by

Forestry Commission

and

TIMBER GROWERS UNITED KINGDOM

1	Local Authority county, (district in Scotland):	1
2	Forestry Commission Conservancy:	2
3	Total area of woodland:	3 ___ *hectares.*
4	Area of managed woodland:	4 ___ *hectares.*
5	Age structure of managed woodland:	5 *up to 10 yrs* / *11-40 yrs* / *over 40 yrs*
6	Period covered by return - 12 months ending:	6 ___ *month* *198* ___
7	Area planted during the period:	7 ___ *hectares.*
8	Volume of timber produced during the period:	8 *by direct labour* / *by contractor* / *by management company* / *by standing sales*
9	Labour employed in the woodland during the period, on forestry and related operations (man-years and fractions of man-years):	9

FOREST BASED	*Direct labour*	*Contractors labour*	*Training schemes*
Forest nurseries			
Ground preparation/fencing/draining			
Planting			
Weeding/beating up/fertilising			
Maintenance			
Road/bridge construction/maintenance			
Landscape/nature conservation			
Recreation/sport			
Harvesting/extraction			
Other forest based			
Total forest based:			
NON-FOREST BASED			
Haulage of timber			
Processing (on the estate)			
Managerial/supervisory			
Clerical			
Other			
Total other			
GRAND TOTAL:			

Continued over

10 Estimated amount of labour, additional to that recorded at question 9, supplied during the period (man-years and fractions of man-years)

by forest management companies	
a. on harvesting operations	
b. on other forest operations	
by standing sales timber merchants	
other	

FOLD

11 Distance travelled to work.

Please enter the number of your direct employees and contractors who live at different distances from their place of work. (Place of work means the point at which they begin the working day; do not count distance travelled to points within the woodland after beginning work.)

Categories of employees are grouped together from the more detailed list in question 9 overleaf.

Direct labour (number)

	0-5 miles	*6-10 miles*	*11-20 miles*	*21-50 miles*	*over 50 miles*
Harvesting: workers					
All other forest based workers					
Non-forest based					

Contract labour (number)

	0-5 miles	*6-10 miles*	*11-20 miles*	*21-50 miles*	*over 50 miles*
Harvesting: workers					
All other forest based workers					
Non-forest based					

FOLD

THANK YOU FOR YOUR ASSISTANCE IN THIS SURVEY

Please return the completed questionnaire within two weeks of receipt, if possible.

The address is printed on the outside. Just fold and tuck in as indicated, and post. Postage is free.

FOREST MANAGEMENT COMPANIES QUESTIONNAIRE AND COVERING LETTER

FORESTRY COMMISSION
231 Corstorphine Road, EDINBURGH EH12 7AT
Telephone: 031-334 0303
Telex: 727879 (FORCOM G)

TIMBER GROWERS UNITED KINGDOM
The Organisation representing the interests of Woodland Owners
AGRICULTURE HOUSE,
KNIGHTSBRIDGE, LONDON SW1X 7NJ
Telephone. 01-235 2925

Dear Sir

The enclosed questionnaire is part of a survey of employment in forestry. It is designed to obtain information from forest management companies. Also included in this sector are consultants, estate agents and investment managers with some involvement in forestry. These were not directly included in the 1986 survey, which merely employed a multiplier on the Forest Management Companies total in respect of such companies. On this occasion better access to records enables us to enumerate this group directly.

Your company has been identified from the Forestry Commission's records of private woodland grant applications as probably falling into one of the above categories and I invite you to complete the questionnaire in respect of any relevant employment generated by your company.

The following points should be noted:

1. Where a company acts purely as an intermediary or legal agent, with actual forest management handled by another company, DO NOT INCLUDE employees of the management company. The only relevant employment in such cases will be in the office and this should be entered unless it is negligible. It will not be necessary on such returns to enter areas or volumes as these will be included by the management company.

2. If you or your company are direct owners of forests rather than agents acting for others, or if you are a full-time managing agent for a single owner, then you have already been included in the Woodland Owners sector of the survey and should not complete the attached. It would be helpful if you would let me know if this is the case. It is, however, possible that different parts of a company could fall into both sectors. If in doubt, please consult the undersigned. (You may or may not have been asked to complete the blue form relevant to that part of the survey, as only a random sample of woodland owners were included. If you did receive a blue form, but did not complete it, please try to find the time to do so now; obtain another blue form from the above address if necessary, as it is slightly different from the attached.)

3. If your company has a number of separate offices throughout the country, this letter is being sent to only one. Since it is not usually apparent which address is that of the head office, will recipients please pass on the correspondence to their company head office if necessary.

4. Where forestry operations are taking place in different parts of the country, separate returns are requested for each separately managed unit. Further copies of the form can be obtained from the above address. (For some companies I have anticipated this requirement and enclose a number of copies.) If the only employment to be entered is managerial or clerical, separate forms are not essential but a list of employee locations would be appreciated.

Accurate figures for the employment generated by forestry are essential for future policy-making for the industry. Both the Forestry Commission and Timber Growers UK representing the private sector strongly support the survey, and I trust you will be able to assist by completing the questionnaire within the requested timescale.

Thank you for your co-operation.

Yours sincerely

Jean Thompson

GENERAL NOTES Please read all of the notes before entering answers:

☐ *The survey is anonymous.*

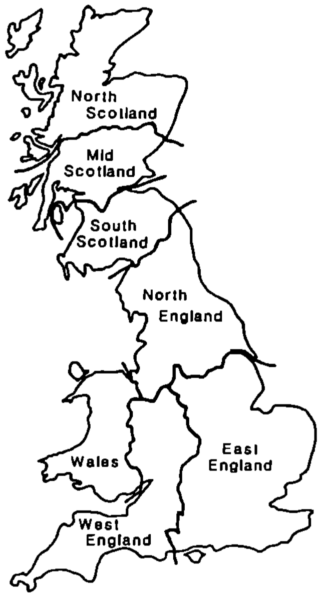
☐ *Please complete a separate return for each locally managed unit of your company. (Preferably by sending copies to all local managers for completion).*

☐ *If a workforce is shared between 2 or more woodlands with different owners, please supply one joint return covering the total enterprise managed as one unit.*

NOTES ON QUESTIONS:

1 *If the return covers more than one county, enter the one in which the major part of the area is located. If necessary, enter more than one county.*

2 *The map illustrates Conservancy boundaries.*



3 *Areas for which your company is paid a management fee and has full direct management control as an agent to the owner, or through an intermediary consultant.*

4 *Additional area not under full management control but covered by specific contracts for the carrying out of forestry operations.*

5 *Harvesting includes felling or extraction or both.*

6 *Please supply data for the 12 months ended 30 September 1988 if possible. Alternatively supply data for the most recent complete 12 month period for which you have figures available.*

7 *New planting plus restocking.*

8 **Company Labour:** *employees whose wages are paid directly by the company.*

Contractor: *individual or company engaged by your company to carry out specific tasks.*

Standing sales: *timber sold standing by you on your own behalf or on behalf of the owner and then harvested by the purchaser, his employees or his contractors. (The woodland owner does not pay for the labour but is paid for the timber).*

9 Count only company employees and contractors engaged by the company.

NB *If your company also purchases timber standing, please complete a GREEN form (designed to collect information from timber merchants) in respect of that aspect of the company's operations. The employees of woodland owners are the subject of a parallel survey.*

If employees spend part of their time on forestry and part on other functions, count fractions of an employee on each forest related operation.

If the breakdown between forest operations is not known exactly, please make the best estimate you can.

Please enter in column 3 (Training schemes) any labour employed by your company but paid for through YTS or any other assisted employment or training scheme funded or partly funded by any Government agency. These figures should NOT be included in columns 1 and 2.

All enquiries to be addressed to:-

Mrs J Thompson
Development Division
Forestry Commission
231 Corstorphine Road
Edinburgh
EH12 7AT

FOR COMPLETION BY FOREST MANAGEMENT COMPANIES IN RESPECT OF THEIR OWN LABOUR AND THE CONTRACTORS WHICH THEY ENGAGE

Before completing questionnaire please read the attached notes

1 Local Authority county (district in Scotland):

2 Forestry Commission Conservancy:

3 Total Area of woodland managed in full: *hectares.*

4 Area of woodland where the company carried out some forestry operations: *hectares.*

5 Area (included in 4 above) where harvesting was the **only** operation: *hectares.*

6 Period covered by return - 12 months ending: *month* 198

7 Area planted during the period: *hectares.*

8 Volume of timber produced by the company during the period:

	by company using own labour or contractors	*by a purchaser (standing sales)*	
Felled only			cubic metres
Extracted only			
Felled and Extracted			

9 Company labour and contractors employed in the woodland during the period, on forestry and related operations (man-years and fractions of man-years):

MAN-YEARS

FOREST BASED	*Company labour*	*Contractors labour*	*Training schemes*
Forest nurseries			
Ground preparation/fencing/draining			
Planting			
Weeding/beating up/fertilising			
Maintenance			
Road/bridge construction/maintenance			
Landscape/nature conservation			
Recreation/sport			
Harvesting/extraction			
Other forest based			
Total forest based			
NON-FOREST BASED			
Haulage			
Processing			
Managerial/supervisory			
Clerical			
Other			
Total other			
GRAND TOTAL			

FOREST EMPLOYMENT SURVEY

A Joint Assessment by

Forestry Commission

and

TIMBER GROWERS UNITED KINGDOM

Continued over

10 Distance travelled to work.

Please **estimate** proportions of the labour force who live within various average distances from their place of work.

Place of work means the point at which they begin the working day; either at a work site within the forest, or at an assembly point elsewhere, as appropriate, ie the point at which you begin paying them for their labour. Travelling time paid for by the company should NOT count.

Categories of employees are grouped together from the more detailed list in question 9 overleaf.

Company labour (percent of direct workforce)

	0-5 miles	*6-10 miles*	*11-20 miles*	*21-50 miles*	*over 50 miles*
Harvesting workers					
All other forest based workers					
Non-forest based					

Contract labour (percent of contractors)

	0-5 miles	*6-10 miles*	*11-20 miles*	*21-50 miles*	*over 50 miles*
Harvesting workers					
All other forest based workers					
Non-forest based					

TIMBER MERCHANTS AND HARVESTING COMPANIES QUESTIONNAIRE AND COVERING LETTER

FORESTRY COMMISSION
231 Corstorphine Road, EDINBURGH EH12 7AT
Telephone: 031-334 0303
Telex: 727879 (FORCOM G)

TIMBER GROWERS UNITED KINGDOM
The Organisation representing the interests of Woodland Owners
AGRICULTURE HOUSE,
KNIGHTSBRIDGE, LONDON SW1X 7NJ
Telephone: 01-235 2925

26 April 1989

NATIONAL SURVEY OF EMPLOYMENT IN FORESTRY

The Forestry Commission and Timber Growers UK are once again jointly conducting a national survey of employment in forestry and related industries. The first such survey was carried out during 1986, and its results showed that there were considerably more people working in forestry than had previously been estimated. Totals, expressed as full-time man-year equivalents, were as follows:

	England	Wales	Scotland	Great Britain
Forestry Commission	2950	1650	3500	8100
Private Estates	9050	1600	3300	13950
Forest Management Companies	550	150	1800	2500
Harvesting Companies	4050	1450	250	5750
Wood Processing Industries	5650	1350	2550	9550
Total	22250	6200	11400	39850

It is intended to repeat the exercise on a 3-year cycle, beginning this year. **The questionnaire overleaf is designed to be completed by timber merchants and harvesting companies in respect of the timber they purchase standing.**

In 1986 some timber merchants and harvesting companies were sent questionnaires and we also obtained information directly from the organisations representing firms in this sector of the forestry industry (BTMA, HTMAS, APF). We have again obtained the co-operation of these organisations and this form is being sent to you as a member.

Slightly different questionnaires have been sent to samples of forest owners and forest management companies. You may also have received one or other of these if your company is involved in more than one aspect of forestry activity.

Please include timber-based or forest-based activities only. The answers should relate to all relevant activities under the control of the local manager, but not those controlled by a separate part of the company.

Thank you for your assistance. Please return the completed schedule to the Forestry Commission by 19 May 1989. Any questions should be addressed to the undersigned.

Yours sincerely

Jean Thompson

GENERAL NOTES Please read all of the notes before entering answers:

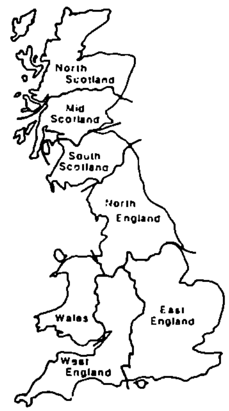
☐ *The survey is anonymous.*

☐ *If your company operates in more than one part of the country please complete a separate return for each locally managed unit. (Preferably by sending copies to all local managers for completion.)*

NOTES ON QUESTIONS:

1 *If the return covers more than one county, enter the one in which most of the company's harvesting activities are located. If necessary, enter more than one county.*

2 *The map illustrates Conservancy boundaries.*



3 *Please supply data for the 12 months ended 30 September 1988 if possible. Alternatively supply data for the most recent complete 12 month period for which you have figures available.*

4 *Total area in which the company carries out forestry operations other than harvesting, if any.*

5 *Harvesting includes felling or extraction or both. Record* **standing sales** where you have purchased the timber in advance of felling, separately from **contract work** undertaken for a woodland owner or management company.

6 a. Count only company employees and contractors engaged by the company.

b. If your company also manages woodlands, please complete a YELLOW form (obtainable from the address below, and designed to collect information from forest management companies) in respect of that aspect of the company's operations. The employees of woodland owners are the subject of a parallel survey.

c. If employees do some work other than harvesting, but not such as to require a yellow form, record the breakdown between forest operations, making the best estimate you can of the split between operations.

d. If employees spend part of their time on forestry and part on other functions, count fractions of an employee on each forest related operation.

e. Please enter in column 3 (Training schemes) any labour employed by your company but paid for through YTS or any other assisted employment or training scheme funded or partly funded by any Government agency. These figures should NOT be included in columns 1 and 2.

f. Include under **processing** only such minor local activities as do not constitute a business in their own right. A processing mill with a permanent workforce will be enumerated separately.

All enquiries to be addressed to:-

Mrs J Thompson
Development Division
Forestry Commission
231 Corstorphine Road
Edinburgh
EH12 7AT

FOR COMPLETION BY TIMBER HARVESTING COMPANIES IN RESPECT OF THEIR OWN LABOUR AND THE CONTRACTORS WHICH THEY ENGAGE

Before completing questionnaire please read the attached notes

1 Local Authority county, (district in Scotland): 1 [ ]

2 Forestry Commission Conservancy: 2 [ ]

3 Period covered by return - 12 months ending: 3 [ ] *month* *198* [ ]

4 Area of woodland where the company carried out some forestry operations other than harvesting: 4 [ ] *hectares*

5 Volume of timber produced by the company during the period:

5

	timber purchased by the company (standing sales) From FC	Other	*harvesting work on contract to a woodland owner*	
Felled only				cubic metres
Extracted only				
Felled and Extracted				

6 Company labour and contractors employed in woodlands during the period, on forestry and related operations (man-years and fractions of man-years):

6 MAN-YEARS

FOREST BASED	*Company labour*	*Contractors labour*	*Training schemes*
Establishment of plantations			
Maintenance of plantations			
Road/bridge construction/maintenance			
Harvesting/extraction			
Other forest based			
Total forest based:			
NON-FOREST BASED			
Haulage			
Processing (see note 6I)			
Managerial/supervisory			
Clerical			
Other			
Total other			
GRAND TOTAL:			

FOREST EMPLOYMENT SURVEY

A Joint Assessment

by

Forestry Commission

and

TIMBER GROWERS UNITED KINGDOM

7 Distance travelled to work.

Please **estimate** proportions of the labour force who live within various average distances from their place of work

Place of work means the point at which they begin the working day; either at a work site within the forest, or at an assembly point elsewhere, as appropriate, ie the point at which you begin paying them for their labour. Travelling time paid for by the company should NOT count.

Categories of employees are grouped together from the more detailed list in question 9 overleaf.

Company labour
(percent of direct workforce)

	0-5 miles	*6-10 miles*	*11-20 miles*	*21-50 miles*	*over 50 miles*
Harvesting: workers					
All other forest based workers					
Non-forest based					

Contract labour
(percent of contractors)

	0-5 miles	*6-10 miles*	*11-20 miles*	*21-50 miles*	*over 50 miles*
Harvesting: workers					
All other forest based workers					
Non-forest based					

DETAILED TABLES OF RESULTS

a. Forestry Commission
   Private Estate Owners

b. Forest Management Companies
   Timber Merchants

c. Comparison with 1986 Survey

d. Predictions

APPENDIX IV(a)

Forestry Commission

Work-years: whole job equivalents

	Direct Labour				Contractors				Total Employment			
	Eng	Wales	Scot	GB	Eng	Wales	Scot	GB	Eng	Wales	Scot	GB
Nurseries	85	0	145	230	0	0	0	0	85	0	145	230
Estab/maint	355	235	580	1,170	25	25	55	105	380	260	635	1,275
Harvesting	455	245	535	1,235	705	590	955	2,250	1,160	835	1,490	3,485
Other	255	50	95	400	70	5	85	160	325	55	180	560
FOREST total	1,150	530	1,355	3,035	800	620	1,095	2,515	1,950	1,150	2,450	5,550
Haulage	(incl in Harvesting)			0	25	30	30	85	25	30	30	85
Processing	0	0	0	0	0	0	0	0	0	0	0	0
Managerial	310	125	410	845	0	0	0	0	310	125	410	845
Clerical	275	100	435	810	0	0	0	0	275	100	435	810
Other*	180	50	200	430	0	0	0	0	180	50	200	430
NON-FOREST total	765	275	1,045	2,085	25	30	30	85	790	305	1,075	2,170
TOTAL	1,915	805	2,400	5,120	825	650	1,125	2,600	2,740	1,455	3,525	7,720

* 'Other' includes scientists, technicians and other professionals, many of them in managerial positions but not managing forests.

Estate Owners

	Direct Labour				Contractors				Total Employment			
	Eng	Wales	Scot	GB	Eng	Wales	Scot	GB	Eng	Wales	Scot	GB
Nurseries	90	5	50	145	15	0	0	15	105	5	50	160
Establishment	1,575	305	540	2,420	510	45	265	820	2,085	350	805	3,240
Maintenance	800	100	230	1,130	85	15	15	115	885	115	245	1,245
Harvesting	1,885	190	380	2,455	1,485	190	690	2,365	3,370	380	1,070	4,820
Other	630	35	240	905	55	15	120	190	685	50	360	1,095
FOREST total	4,980	635	1,440	7,055	2,150	265	1,090	3,505	7,130	900	2,530	10,560
Haulage	130	10	30	170	240	5	85	330	370	15	115	500
Processing	1,640	90	425	2,155	170	0	30	200	1,810	90	455	2,355
Managerial	950	70	260	1,280	100	10	65	175	1,050	80	325	1,455
Clerical	310	25	100	435	20	0	0	20	330	25	100	455
NON-FOREST total	3,030	195	815	4,040	530	15	180	725	3,560	210	995	4,765
TOTAL	8,010	830	2,255	11,095	2,680	280	1,270	4,230	10,690	1,110	3,525	15,325

Forest Management Companies

Work-years: whole job equivalents

	Direct Labour				Contractors				Total Employment			
	Eng	Wales	Scot	GB	Eng	Wales	Scot	GB	Eng	Wales	Scot	GB
Nurseries	60	50	25	135	0	0	20	20	60	50	45	155
Establishment	35	15	55	105	105	30	415	550	140	45	470	655
Maintenance	15	5	30	50	20	5	75	100	35	10	105	150
Harvesting	30	0	10	40	225	55	420	700	255	55	430	740
Other	20	0	35	55	5	0	10	15	25	0	45	70
FOREST total	160	70	155	385	355	90	940	1,385	515	160	1,095	1,770
Haulage	0	0	0	0	30	5	35	70	30	5	35	70
Processing	0	0	0	0	0	0	5	5	0	0	5	5
Managerial	90	20	140	250	5	0	5	10	95	20	145	260
Clerical	60	10	65	135	0	0	0	0	60	10	65	135
NON-FOREST total	150	30	205	385	35	5	45	85	185	35	250	470
TOTAL	310	100	360	770	390	95	985	1,470	700	195	1,345	2,240

Timber Merchants

	Direct Labour				Contractors				Total Employment			
	Eng	Wales	Scot	GB	Eng	Wales	Scot	GB	Eng	Wales	Scot	GB
Nurseries	not separately distinguishable				not separately distinguishable				0	0	0	0
Establishment									0	0	0	0
Maintenance									0	0	0	0
Harvesting									720	315	635	1,670
Other									0	0	0	0
FOREST total									720	315	635	1,670
Haulage									215	145	480	840
Processing									55	75	1,570	1,700
Managerial									165	55	845	1,065
Clerical									70	20	360	450
NON-FOREST total									505	295	3,255	4,055
TOTAL									1,225	610	3,890	5,725

APPENDIX IV(c)

COMPARISONS WITH 1986 SURVEY

Work-years: whole job equivalents

	1986				1989			
	Eng	Wales	Scot	GB	Eng	Wales	Scot	GB
FORESTRY COMMISSION								
Establishment/Maintenance	715	350	990	2,055	465	260	780	1,505
Other forest	255	30	125	410	325	55	180	560
Harvesting/processing	1,215	1,005	1,350	3,570	1,185	865	1,520	3,570
Office	740	285	1,055	2,080	765	275	1,045	2,085
TOTAL	2,925	1,670	3,520	8,115	2 ,740	1,455	3,525	7,720
ESTATE OWNERS								
Establishment/Maintenance	3,910	690	1,345	5,945	3,075	470	1,100	4,645
Other forest	560	100	320	980	685	50	360	1,095
Harvest/process	3,365	595	1,335	5,295	5,550	485	1,640	7,675
Office	1,215	215	330	1,760	1,380	105	425	1,910
TOTAL	9,050	1,600	3,330	13,980	10,690	1,110	3,525	15,325
COMPANIES								
Establishment/Maintenance	205	55	645	905	235	105	620	960
Other forest	10	0	25	35	25	0	45	70
Harvesting/processing	260	55	860	1,175	285	60	470	815
Office	110	30	260	400	155	30	210	395
TOTAL	585	140	1,790	2,515	700	195	1,345	2,240
MERCHANTS								
Establishment/Maintenance	—	—	—	—	0	0	0	0
Other forest	—	—	—	—	0	0	0	0
Harvesting/processing	3,305	1,140	230	4,675	990	535	2,685	4,210
Office	720	290	55	1,065	235	75	1,205	1,515
TOTAL	4,025	1,430	285	5,740	1,225	610	3,890	5,725
PROCESSING SECTOR								
TOTAL	5,600	1,100	2,350	9,050	5,670	1,405	2,965	10,040
TOTALS ALL SECTORS								
Establishment/Maintenance	4,830	1,095	2,980	8,905	3,775	835	2,500	7,110
Other forest	825	130	470	1,425	1,035	105	585	1,725
Harvesting/Processing	13,745	3,895	6,125	23,765	13,680	3,350	9,280	26,310
Office	2,785	820	1,700	5,305	2,535	485	2,885	5,905
TOTAL	22,185	5,940	11,275	39,400	21,025	4,775	15,250	41,050

PREDICTIONS OF FUTURE EMPLOYMENT IN FORESTRY

Work-years: whole job equivalents

	Actual (rounded to 5)		Predicted (rounded to 100)			
Year(s)	1986	1989	1986-91	1992-96	1997-2001	2002-06
NO PRODUCTIVITY IMPROVEMENTS ASSUMED						
Planting	5,330	4,865	5,800	6,000	6,400	6,700
Maintenance	5,000	3,970	3,800	4,000	4,300	4,600
Harvesting	13,270	14,775	14,300	17,400	20,200	23,600
Haulage	1,445	1,495	1,400	1,900	2,200	2,500
Processing						
logs + other	6,154	{10,040	5,800	6,800	8,100	9,800
round	2,896		4,500	5,300	5,900	6,800
Managerial/clerical	5,305	5,905	7,900	9,100	10,700	12,300
TOTAL	39,400	41,050	43,500	50,500	57,800	66,300
PRODUCTIVITY ASSUMPTIONS Harvesting and processing: 2.5% per annum; All other activities: 1.5% per annum						
Planting	5,330	4,865	5,800	5,700	5,500	5,300
Maintenance	5,000	3,970	3,800	3,800	3,800	3,700
Harvesting	13,270	14,775	14,300	15,300	15,700	16,200
Haulage	1,445	1,495	1,400	1,700	1,700	1,800
Processing						
logs + other	6,145	{10,040	5,800	5,900	6,300	6,700
round	2,896		4,500	4,500	4,700	4,700
Managerial/clerical	5,305	5,905	7,900	8,200	8,500	8,700
TOTAL	39,400	41,050	43,500	45,100	46,200	47,100
PRODUCTIVITY ASSUMPTIONS Based on changes between 1986 and 1989						
Planting	5,330	4,865	5,800	5,000	4,400	3,900
Maintenance	5,000	3,970	3,800	3,800	4,100	3,900
Harvesting	13,270	14,775	14,300	15,200	17,500	17,300
Haulage	1,445	1,495	1,400	1,600	1,700	2,000
Processing						
logs + other	6,154	{10,040	5,800	6,500	7,800	9,100
round	2,896		4,500	4,700	5,200	5,700
Managerial/clerical	5,305	5,905	7,900	7,600	6,300	6,200
TOTAL	39,400	41,050	43,500	44,400	47,800	48,100

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