



Forest Research

The Research Agency of the Forestry Commission

TECHNICAL DEVELOPMENT

TIMBER MILES

SURVEY

Work Study 19**57**
20**07** Technical Development

celebrating 50 years of work study in British forestry

Timber Miles Survey

Ref: FR06046 & 1400S/42/06

SUMMARY

Technical Development, commissioned by Forestry Commission Scotland, carried out an initial survey of hauliers moving Scottish round timber, which set out first to define the population of timber hauliers, then to obtain background information for future monitoring of Timber Miles. We also sought indicative gross annual tonnage and mileage data, to provide a baseline approximation of Timber Miles in the wider context of road goods transport.

Eighty seven hauliers were identified and contacted, and complete survey returns were received from 25 hauliers, including three sawmills. It appears from the responses received that many specialist timber hauliers are owner operators or small firms running one or two units, with the majority of hauliers carrying no more than 50,000 tonnes a year of Scottish roundwood.

The ratio of mileage to tonnage was in the range 2:1 to 4:1 in the majority of cases, although the annual mileage reported varied considerably, and was not in proportion to the annual tonnage moved. There does not appear to be any close correlation between the geographical scope and the scale of a haulier's operations, nor between the location of hauliers in relation to processors or forested areas and the scope or scale of their operation.

Most respondents operated only dedicated timber units, but several operated flatbed units and combined timber journeys with return loads of other freight. Estimates of the proportion of unladen miles travelled on timber journeys ranged from 20% to 50% for dedicated timber units, and from 5% to 13% for flatbed units.

The total tonnage reported in this survey amounts to 51% of the Scottish total, based on UK timber statistics. Extrapolating the value obtained for the sample to the whole population gives a very approximate total of 281 million Timber Miles for Scottish roundwood and an average loaded journey of around 51 miles. Statistically, however, there is a margin of error of over 40% with these figures.

The actual figures are likely to be different for several reasons, including the wide variation in average journey length reported. Load sizes given may represent the maximum, and low empty running figures almost certainly include some return loads of other commodities. The use of a trip-by-trip survey method, as in the Department for Transport's *Continuing Survey of Road Goods Transport*, would remove these uncertainties in future monitoring.

INTRODUCTION

Timber Miles may be comparable to the 'food miles' concept proposed as a potential indicator of sustainable development to the Department of Environment, Food and Rural Affairs (DEFRA). Scotland's climate change programme sets out the contribution that forestry can make to carbon savings, including more efficient timber transport (Scottish Executive 2006). The Scottish Forestry Strategy identifies the need to establish a basis for monitoring roundwood road miles as a first step toward this goal (Forestry Commission Scotland 2006).

A scoping study was carried out to identify the issues involved in the calculation of timber miles and several data sources were investigated. This study found that the simplest and most cost effective way to calculate timber miles would be to use estimates of gross total annual mileage and total tonnes transported, both derived from haulier data. This would give an overall figure including laden and unladen travel.

Method

For the purposes of this study, enquiries were first made to establish the context in which haulier data could be used and the level of detail necessary. It was considered that the haulier resource might be stratified in several ways. The size of operation (large, medium, small, owner operator), number of units (vehicles with trailers) and fleet capacity, the quantity and type of material carried and/or the geographical location and extent of operation could all be possible means of dividing the population. Accordingly, a questionnaire was designed to obtain basic qualitative information as well as quantitative estimates.

Once identified, hauliers were first contacted by post with a covering letter setting out the background to the survey and requesting their co-operation. Subsequently, telephone enquiries were made and hauliers were sent questionnaires or, where possible, were interviewed to obtain the data required.

SURVEY RESULTS

A total of 87 operators, believed to be currently hauling Scottish roundwood, were identified from a combination of FC and trade sources. All were approached with a letter requesting their co-operation, and further contact was subsequently made with 46 individual operators.

Survey returns were received from 25 hauliers, including 3 sawmills. Of these, 9 gave telephone interviews and 16 completed questionnaires. In some instances, returned questionnaires were followed up with further enquiries to clarify responses. Partial returns were received from another 2 hauliers.

Of all the operators contacted, only 2 declined to take part, but another 12 were unable to respond. 4 operators stated that they were no longer hauling timber, and one had never been a timber haulier.

Description of operations

Timber hauliers could be described according to the number and type of units they operate. From conversations with both large and small scale operators, it seems that there is a clear distinction to be made between owner operators, which includes small family firms, and larger employers. Respondents from both categories said they believed that the owner operator model was potentially the most efficient for timber haulage, due to low overheads and a flexible, peripatetic pattern of working. By contrast, larger operators, especially those with other business interests, may benefit from economies of scale and may be able to operate all year round, utilising their fleet resource more effectively.

The information received suggests that most timber carrying units have skeletal timber trailers and integral loaders, dedicated full time to round timber. 5 respondents also reported using flatbed trailers to carry round timber. In only one instance were these trailers dedicated full time to round timber transport. Both large and small operators reported combining timber journeys with return loads of other commodities (9 returns). The proportion of loads involved ranged from 5% to 98% in one instance. The majority reported no return loads of other freight, however (16 returns). All timber carrying units, bar one, were reported as being of 44 tonnes gross weight.

Size of operation

It appears from the responses received that most specialist timber hauliers are owner operators or small firms running one or two units (10 returns): Several of the larger operators who responded identified a significant proportion of freight business in other commodities (5 returns).

Operators at all scales expressed the view that the current situation was unsustainable as far as the future of their timber haulage business was concerned. Two hauliers who no longer carry timber cited the burden of increasing costs and regulation, weighed against very slim profit margins, as their reasons for leaving the industry. One of these had recently sold out to a much larger firm.

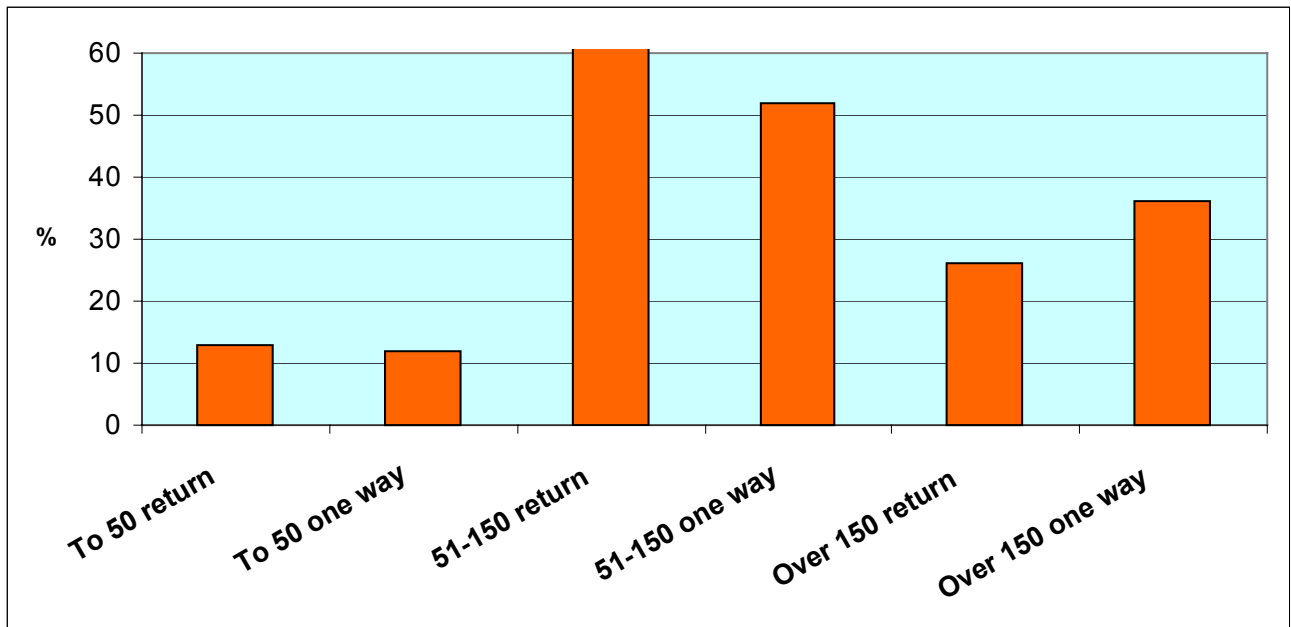
Geographical scope

Returns were received from hauliers operating in all parts of Scotland, and from Northern England. The range of roundwood origins and destinations reported was broadly consistent with hauliers' respective locations, but the operating radius indicated by average journey lengths varied widely.

Average 'round trip' journeys quoted ranged from 30 to 300, and in one case around 450 miles, although most estimates were in the range 50 to 150 miles (14 returns). The furthest most hauliers expected to travel was between 50 and 150 miles one way (13 returns), but 8 hauliers stated that they might travel further than 150 miles with a timber load, in one case over 500 miles.

Figure 1 shows the average round trip and furthest one way journeys reported, grouped into three broad mileage categories and expressed in terms of the percentage of respondents' estimates in each category.

Figure 1 Geographical scope



From the information received, there does not appear to be any close correlation between the geographical scope and the scale of a haulier's operations, nor between the location of hauliers in relation to processors or forested areas and the scope or scale of their operation.

Roundwood products

The proportion of softwood loads carried varied between 95% and 100%, except in one instance where a haulier reported carrying 80% softwood. The relative proportions of small roundwood and log/bar material carried varied much more widely, ranging from 5% to 100% either way, although most respondents quoted proportions of between 30% and 70% either way (14 returns).

In most cases where an estimate was made, the proportion of fencing material carried varied from nil (7 returns) to 5% (9 returns). One sawmill quoted 70%, one haulier 20% and two 10%.

Where known, the proportion of fuelwood loads reported ranged from nil (10 returns) to 5% (12 returns) except in two instances where hauliers reported carrying 10% fuelwood.

Most respondents agreed that average journey length was influenced by the product carried (20 returns), but there was no clear indication as to whether logs/bars or small roundwood travelled further, nor any clear geographical split on this question.

Two hauliers in the West of Scotland who reported long average journey lengths stated that sawlogs travelled further by road, as much small roundwood was now moved by sea.

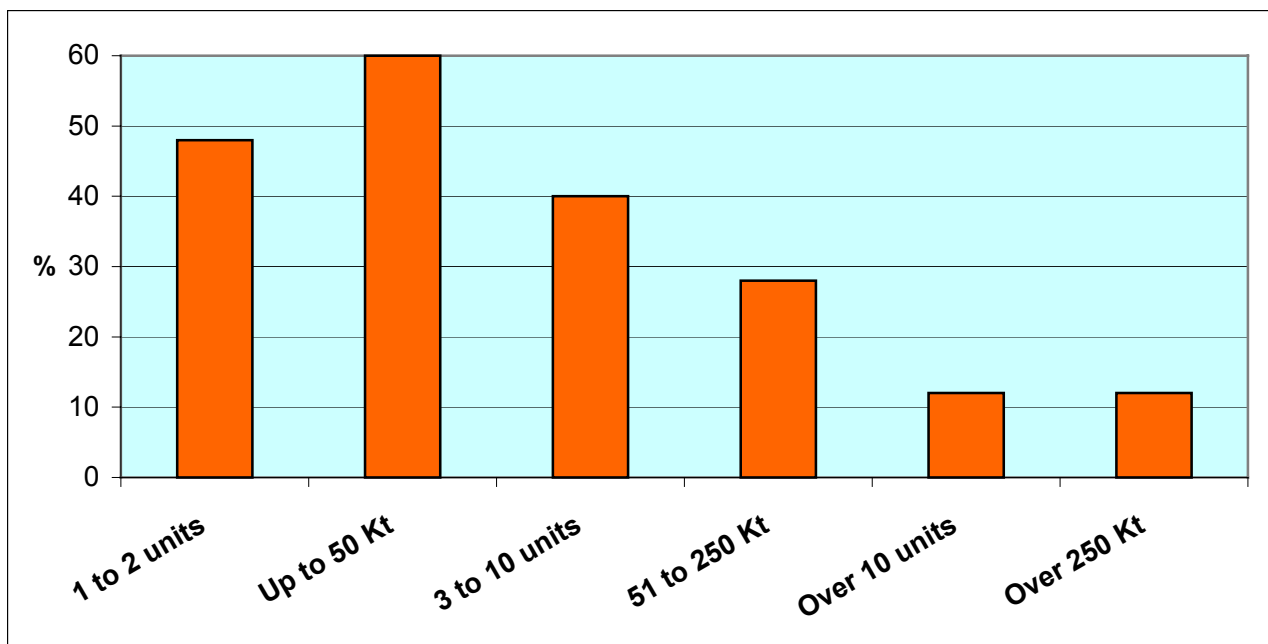
One haulier in the South commented that more small roundwood processing capacity could improve timber transport efficiency, and that woodfuel could have a big part to play. Another haulier, again in the South, cited lack of continuity in deliveries as the biggest obstacle to achieving optimum efficiency. Conversations with both suggested that problems stemmed from a lack of local processing capacity, particularly for small roundwood. Summer mill shutdowns were also identified as a problem, more so where a higher proportion of loads was of small roundwood.

Annual tonnage

Hauliers were first asked to estimate total tonnage moved during the financial year 2005-2006, but it became clear during the survey that such records were not always kept, and many estimates were by calendar year or the preceding twelve months to date. For the purposes of this report, figures are expressed as annual tonnage, regardless of the dates used.

Figure 2 shows those operators who provided complete returns grouped according to the number of timber carrying units they operate and reported tonnes moved.

Figure 2. Size of operation



It can be seen that the majority of hauliers who responded carried no more than 50 000 tonnes a year of Scottish roundwood.

Most units carried 25 000 tonnes or less in a year, with only 4 hauliers reporting higher annual tonnage per unit. The annual tonnage reported moved by each haulier was usually proportional to the number of timber carrying units they operated, as might be expected. 8 hauliers reported a significantly lower annual tonnage per unit, however.

Average load

Some respondents were able to give a figure for the gross weight of their timber carrying units, while others could estimate the average load weight.

These estimates ranged from 24 to 26.5 tonnes for timber trailers with loaders, and from 27 to 30 tonnes for flatbed trailers. It is likely that all estimates represent maximum load capacity, with the variation mainly due to differences in trailer and crane construction.

Annual mileage

As with tonnage estimates, it became clear that hauliers' mileage records were not kept in any consistent way with regard to the period and frequency of recording.

The annual mileage reported varied considerably, and was not in proportion to the annual tonnage moved. The ratio of mileage to tonnage was in the range 2:1 to 4:1 in the majority of cases (15 returns), but three hauliers reported annual mileage of more than 10 times their annual tonnage.

Empty running

Estimates of the proportion of unladen miles travelled on timber journeys, expressed as an average percentage of empty running, ranged from 20% to 50% for dedicated timber units, and from 5% to 13% for flatbed units.

If loaded miles are calculated for each of the hauliers who completed a return, using individual empty running estimates, then the ratio of mileage to tonnage commonly reduces to between 1:1 and 3:1 (17 returns). In two cases these estimates still give an annual loaded mileage more than ten times the annual tonnage, but two give a figure for loaded mileage which is smaller than the tonnage carried.

Fuel

Hauliers were asked to indicate the quantity of fuel used transporting Scottish roundwood. Most expressed this in terms of average fuel consumption, ranging from 4 to 7 miles per gallon.

As might be expected, several hauliers reporting high empty running percentages also reported lower fuel consumption. Conversely, two hauliers made the point that 'circular' patterns of working, transporting a greater number of loads per day over shorter distances, entailed more frequent crane operation and therefore higher fuel consumption.

DISCUSSION

The total estimated tonnage reported here can be compared with the totals reported in UK Timber Statistics (FC Economics and Statistics 2006). The figures given for the calendar year 2005 for softwood roundwood removals from Scotland total some 5.542 million green tonnes. This total is based on estimated percentages of FC and non-FC removals originating from forests in Scotland.

The total tonnage reported in this survey amounts to around 51% of the Scottish total, based on these figures. Although the returns detailed here represent only 29% of the hauliers initially identified, they therefore represent a major proportion of Scottish timber transport activity.

For this initial survey, details of individual timber journeys were not available, therefore precise Timber Miles for the activity represented by the data cannot be calculated. It would be necessary to know the number of journeys undertaken and the load size for each journey to calculate loaded tonne miles.

Nevertheless, it is possible to give an approximate indication of Timber Miles, by using the average loads reported by 21 of these hauliers.

Extrapolating the value obtained for this sample to the whole population gives a very approximate total of 281 million Timber Miles (tonnes x loaded miles) for Scottish roundwood, with a 95% confidence interval of 165-397 million, or $\pm 41\%$. There are several reasons for the large margin of error in this estimate, including the wide variation in average journey length reported.

The figure can be related to the total of 8,096 million tonne miles for goods moved from Scotland by UK registered heavy goods vehicles in 2005, as reported in Scottish transport statistics (Scottish Executive National Statistics 2006). The average journey, calculated by National Statistics by dividing total tonne miles by total tonnes lifted, was around 49 miles for Scottish freight overall. The same calculation applied to the estimated totals reported here gives an average journey for Scottish round timber of around 51 miles.

The actual figures are likely to be different for other reasons; load sizes given are likely to represent maximum load capacity, and low empty running figures almost certainly include some return loads of other commodities. The Scottish timber totals given in UK timber statistics do not include hardwood, but the small quantities of hardwoods harvested, as indicated in the tonnage reported here, mean that this will not influence the total significantly.

The use of a trip-by-trip survey method, as in the Continuing Survey of Road Goods Transport (Transport statistics: DfT 2006), would remove these uncertainties in future monitoring. Hauliers are asked to record details of each journey, including load weight and start and end mileage. This method is used to provide the data for Scottish Transport Statistics, and for DEFRA's Food Miles study (AEA Technology 2005).

With industry support, Timber Miles can be calculated with some confidence in this way. By using methods consistent with those used to monitor the transport of other commodities, it would then be possible to discuss Timber Miles in the wider context of road transport, carbon savings and climate change.

If the timber supply chain is thus proven to be sustainable, then development in the forestry sector can be shown to benefit both industry and environment and will be assured of continuing public support.

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