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# The economic contribution of forestry and other activities on Scotland's National Forest Estate



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**Final report**

**December 2015**

**CJC**CONSULTING



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## Final report

## CJC Consulting

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December 2015

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Dr Bob Crabtree  
CJC Consulting

# 1 Executive summary

## 1.1 Background

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Scotland's National Forest Estate is managed by Forest Enterprise Scotland (FES), the management agency of Forestry Commission Scotland (FCS), on behalf of Scottish Ministers. It covers approximately 630,000 hectares, is distributed widely across Scotland and supports a range of activities in addition to forestry, including renewable energy, agriculture and tourism. The woodland area within the National Forest Estate is 477,000<sup>1</sup> ha, 31.5% of the 1,419,000 ha of woodland in Scotland.

The National Forest Estate contributes to the economy and employment – a consequence of expenditures on the management of the Estate and the outputs from the Estate. These outputs include providing roundwood for the timber processing industry and deer carcasses for venison processing together with the provision of land for renewable energy developments, both wind and hydro. Continuity of timber production from the National Forest Estate has been instrumental in the development of Scotland's timber processing and wood fuel sectors in the last thirty years, providing the confidence for the significant capital investment in mills and other plant by businesses involved in timber processing and wood fuel production.

The National Forest Estate also provides an important focus for recreation and tourism both directly through its accessible forests, and by contributing to Scottish landscape and wildlife biodiversity.

## 1.2 Objectives

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The aims of this study were to provide:

- A comprehensive assessment of the contribution of the National Forest Estate to Scotland's economy as measured by its expenditures and employment impact within Scotland in 2012/13.
- A baseline and working methods for periodic repeat assessment of the National Forest Estate's economic contribution<sup>2</sup>.

In addition we produced an estimate of Estate-generated employment in 2013/14. Whilst there have been studies on the economic contribution of the forestry sector as a whole in Scotland, no previous studies have dealt specifically with the National Forest Estate.

## 1.3 Economic impacts

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Management of the National Forest Estate generates economic impact through:

- Staff costs incurred by FES, FCS and the Forestry Commission (FC) in the management of the National Forest Estate.
- Expenditures of FES including impacts through the supply chain.
- Harvesting of trees on the National Forest Estate (both directly by FES and by third parties), timber transport associated with this harvest and the provision of roundwood directly or via third parties which supports supporting timber processing (including wood fuel).

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<sup>1</sup> Forestry Statistics 2014

<http://www.forestry.gov.uk/website/forstats2014.nsf/LUContents/061E41873F94CC788025735D0034F33B>

<sup>2</sup> This was provided separately to FES since it contains confidential accounting information.

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- Expenditure associated with visits to the National Forest Estate for leisure and recreational purposes.
- Deer management and shooting which supports the venison processing sector by providing deer carcasses.

Renewable energy. The impacts of wind farm installations and their maintenance on the Estate on land leased to developers.

## 1.4 Expenditure and income

The analysis in this study was based primarily on the 2012/13 FES accounts. In 2012/13 FES made payments of £81.4m<sup>3</sup> with trading receipts of £62.7m (Table 1.1). Each transaction in the cash flow accounts (inflows and outflows) was allocated to one of the categories in Table 1.1 by FES. Most of the revenue (84%) was from timber production, with smaller contributions principally from renewable energy and property sales. Expenditure was mainly related to timber production and forest management, property and civil engineering. FES receives an annual payment from government for the public (non-market) benefits provided by the National Forest Estate, which enables it to broadly balance income and expenditure<sup>4</sup>.

**Table 1.1 Cash flows (ex VAT) by activity (relating to FES accounts 2012/13)**

Category	Inflows	%	Outflows	%
	(£'000)		(£'000)	
Timber production, planting and forest management	52,566	83.8%	27,672	34.0%
Deer management	1,667	2.7%	2,797	3.4%
Environment and heritage	18	0.0%	3,763	4.6%
Communities, recreation and tourism	646	1.0%	6,692	8.2%
Renewable energy	3,456	5.5%	19	0.0%
Property, legal, development, sales and acquisitions	3,676	5.9%	14,623	18.0%
Civil engineering including roads	82	0.1%	13,604	16.7%
Administrative	315	0.5%	3,673	4.5%
Other	37	0.1%	78	0.1%
Planning	1	0.0%	933	1.1%
Non-capital machinery	246	0.4%	3,988	4.9%
Capital machinery	0	0.0%	3,539	4.3%
<b>Total</b>	<b>62,710</b>	<b>100.0%</b>	<b>81,381</b>	<b>100.0%</b>

In addition to £81.4m of payments were £28.2m in FES staff costs, making a total expenditure in 2012/13 of £109.6m.

In order to gain more information on the impact of estate activity on the Scottish economy we undertook a survey of all businesses which had FES transactions

<sup>3</sup> In addition, FES staff costs, including pensions and national insurance, amounted to £28.2m.

<sup>4</sup> Full details of the FES accounts are given in <http://scotland.forestry.gov.uk/images/corporate/pdf/ScotlandAccounts2012-13.pdf>

greater than £10,000 in 2012/13 with SIC codes<sup>5</sup> relating to forestry and primary timber processing. The survey was combined with a wider survey of the forestry and timber processing sector for a parallel study on the economic contribution of the forest industries in Scotland. The questionnaire asked respondents mainly about their employment, turnover, wages and salaries. The response rate to the overall survey was 31%.

For non-respondents and businesses not surveyed we obtained business information from the IDBR<sup>6</sup> as indicated in Section 3.1.

## **1.5 Employment supported**

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The direct employment impact in Scotland in 2012/13 (excluding spending by visitors to the National Forest Estate and renewables) was estimated at 1,770 full time equivalent (FTE) jobs, including 886 FTEs in FES, FC and FCS supporting the operation of the National Forest Estate. Employment supported by non-staff FES expenditure was estimated by linking expenditure to turnover and employment for the individual businesses receiving this income.

Indirect and induced employment impacts were estimated by applying approximate Scottish Type II multipliers from the sectoral Input-Output tables for Scotland to the direct employment. Overall (direct, indirect and induced) employment resulting from FES expenditure and staffing in Scotland was estimated to total 2,515 FTEs (Table 1.2).

Estimates were also made of the employment supported in the wider sector as a result of:

- Harvesting timber on the National Forest Estate and subsequent timber transport and primary processing.
- The provision of deer carcasses from deer culled on the National Forest Estate to the venison processing sector.
- Renewable energy. Making land available on the National Forest Estate to wind farm developers.

Scottish multipliers (both backward and forward) were adjusted to remove double counting and then applied to generate total (direct, indirect and induced) employment impacts.

The timber harvest of the National Forest Estate and the associated harvesting, haulage and processing<sup>7</sup> were major sources of employment (3,994 FTEs) (Table 1.2). Employment supported by the leasing of sites for wind farm developments (turbine erection & access) was estimated through applying ratios from national studies. Applying these ratios to the existing installed capacity, and the additional capacity generation on estate sites in 2012/13, gave an estimate of 681 FTEs. These jobs were mainly associated with wind farm construction. Deer processing supported an estimated 35 FTEs.

Hence, the employment supported in Scotland as a result of activity on the National Forest Estate, excluding recreation and tourism-supported employment, was

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<sup>5</sup> Standard Industrial Classification. Codes for individual businesses were mainly obtained from ONS (see Section 2.5). <https://www.gov.uk/government/publications/standard-industrial-classification-of-economic-activities-sic>

<sup>6</sup> Inter Departmental Business Register. <http://www.ons.gov.uk/ons/about-ons/products-and-services/idbr/index.html>

<sup>7</sup> This refers only to primary processing. Secondary processing was not included in the study.

estimated at 7,225 FTE jobs (Table 1.2). In addition, it was estimated that a further 163 direct jobs were generated by FES spending on supplies from firms located outside Scotland.

Employment (including indirect and induced employment) associated with this visitor expenditure was calculated using a ratio derived from other studies of £43,000 per FTE. On this basis the total estimated employment supported by the National Forest Estate was 3,790 FTE jobs<sup>8</sup>.

Including this recreation and tourism-supported employment gives a total of around 11,000 FTE jobs in Scotland supported by activity on the National Forest Estate.

**Table 1.2 Employment supported as result of activity on the National Forest Estate (Scotland, 2012/13)**

<b>Activity</b>	<b>Total employment Impact (Scotland)(FTEs)</b>
FES/National Forest Estate-related staffing	1,090
FES operational expenditures including direct timber production and haulage	1,425
Timber harvesting and haulage by third parties on the National Forest Estate and primary processing of all timber from the National Forest Estate	3,994
Venison production – provision of deer carcasses culled on the National Forest Estate to the processing sector	35
Renewables – provision of land for wind and hydro developments on the National Forest Estate	681
Expenditure by recreational visitors and tourists to the National Forest Estate	3,790
<b>Total</b>	<b>11,015</b>

## 1.6 Employment supported in 2013/14

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The 2013/14 FES accounts were examined and estimates made of direct and total employment impacts in 2013/14. No additional surveys were undertaken, and the results which are based on derived data are less reliable than those for 2012/13. They should be interpreted as indicative only.

Total employment supported (excluding recreation) was estimated to have increased on 2012/13 by 9% from 7,225 to 7,881 FTEs. This was mainly a reflection of a 15% increase in timber output (with associated employment in harvesting, transport and timber processing) and increased onshore wind capacity (with associated construction and maintenance jobs).

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<sup>8</sup> Not all jobs are additional in the economy since expenditure by Scottish residents would often otherwise have been spent on substitute leisure activities. On the assumption that all spending by visitors to Scotland and 50% of the expenditure of Scottish overnight visitors was additional, the total additional employment supported by the National Forest Estate for the year would be 3,030 FTEs.

Adding in the 2012/13 estimate of employment associated with spending by visitors to the National Forest Estate raises the total 2013/14 employment supported to 11,671 FTE jobs.

## 1.7 Contribution to the Scottish Economy

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As well as generating employment in Scotland, activity on the National Forest Estate generates and supports business and organisation output in Scotland, which is measured as Gross Valued Added (GVA) in the national accounts. This measures the contribution of a business or sector to the economy.

Total GVA generated and supported as result of activity on the National Forest Estate, including the provision of raw material to downstream industries, was £395m.

This figure was derived from the report on the Economic Contribution of the Forestry Sector in Scotland<sup>9</sup> which estimated total employment for the forestry and timber processing sector as 19,555 FTEs<sup>10</sup> and a contribution of £771 million to Scottish GVA. This ratio of £39,400 GVA per FTE employment was also found to apply to the renewables output and was therefore applied to all outputs and services from the Estate. Applying this ratio to the 7,225 FTEs generated and supported by the National Forest Estate gives a GVA impact of around £285m<sup>11</sup>.

The GVA resulting from tourist and visitor expenditure was estimated at £110m<sup>12</sup>. This was based on the visitor expenditures recorded in the All Forests 2 survey<sup>13</sup>.

## 1.8 Conclusions

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The key conclusions are:

- Forest Enterprise Scotland expenditure in 2012/13 was £109.6m, including £28.2m in FES staff costs.
- Total employment (direct, indirect and induced) supported by activity on the National Forest Estate in 2012/13 was estimated at 11,015 FTEs<sup>14</sup> of which:
  - 7,225 FTEs were in the forestry and timber processing sector supported by activity on the National Forest Estate.
  - 3,790 FTEs were supported by tourism spend from visits to the National Forest Estate, of which around 3,030 were additional.
- The Total GVA generated and supported as result of activity on the National Forest Estate, including the provision of raw material to downstream industries, in 2012/13 was £395m, of which:
  - The contribution to Scottish GVA from forestry and timber processing activity was around £285m<sup>15</sup>.
  - The GVA supported by tourism and recreation expenditure

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<sup>9</sup> CJC Consulting (2015). The Economic Contribution of the Forestry Sector in Scotland. Report to Forestry Commission Scotland. <http://scotland.forestry.gov.uk/supporting/forest-industries/economic-contribution-report>

<sup>10</sup> excluding tourism and recreation visitor impacts

<sup>11</sup> However, the contribution of the National Forest Estate to official government GVA statistics is measured by employment costs with an adjustment for government subsidies.

<sup>12</sup> Of which around £85m was additional to the economy.

<sup>13</sup> See Table 6.5

<sup>14</sup> There were an additional 163 direct jobs supported outside Scotland (see Table 3.1).

<sup>15</sup> Unadjusted for subsidy.

associated with visits to the National Forest Estate was estimated at around £110m.

The FTE employment is 0.4% of Scottish workforce jobs<sup>16</sup>, with many jobs in the forestry sector (including primary timber processing and forest related recreation and tourism) located in remote and rural areas of Scotland where employment opportunities are limited.

The study only measured the impact of expenditures by tourists and day trippers who visited the National Forest Estate. Other studies have valued the substantial benefits the public derive from visits to these sites, and also the wider economic contribution of the Estate to tourism through the contribution to wildlife habitats and Scotland's landscape.

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<sup>16</sup> <http://www.ons.gov.uk/ons/guide-method/compendiums/compendium-of-uk-statistics/economy/index.html>

## 2 Background and objectives

### 2.1 Introduction

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Scotland's National Forest Estate is managed by Forest Enterprise Scotland (FES), the management agency of Forestry Commission Scotland (FCS), on behalf of Scottish Ministers. It covers approximately 630,000 hectares, is distributed widely across Scotland and supports a wide range of activities in addition to forestry, including renewable energy, agriculture and tourism. The woodland area within the National Forest Estate is 477,000<sup>17</sup> ha out of a total of 1,419,000 ha of woodland in Scotland (31.5%).

The purpose of the National Forest Estate is described in detail in the 2013-2016 strategic plan<sup>18</sup> as:

- Safeguarding 'national treasures';
- Delivering economic, forestry for people and community benefits;
- Timber production for market stability and development;
- Contributing to the Scottish Government's climate change targets;
- Landscape-scale management for biodiversity and ecosystem services;
- Supporting policy, R&D and exemplars of land use integration and best practice.

The National Forest Estate contributes to Scotland's economy and environment, and provides a range of benefits for Scottish residents and tourists. FES reports on its activities in its annual accounts.

### 2.2 Objectives

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The aims of this study were to provide:

- A comprehensive assessment of the contribution of the National Forest Estate to Scotland's economy as measured by its expenditures and employment impact within Scotland in 2012/13.
- A baseline and working methods for periodic repeat assessment of the National Forest Estate's economic contribution<sup>19</sup>.

In addition we produced an estimate of Estate-generated employment in 2013/14.

### 2.3 Non-market benefits

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Previous studies have indicated that Scotland's National Forest Estate provides substantial benefits to the public which are not recorded through official statistics and are not explicitly valued in the FES annual accounts. These include a wide range of ecosystem services<sup>20</sup>, many of which have been valued though

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<sup>17</sup> Forestry Statistics 2014

<http://www.forestry.gov.uk/website/forstats2014.nsf/LUContents/061E41873F94CC788025735D0034F33B>

<sup>18</sup> <http://scotland.forestry.gov.uk/images/corporate/pdf/FES-strategic-plan.pdf>

<sup>19</sup> This was provided separately to FES since it contains confidential accounting information.

<sup>20</sup> Eftec (2011). Scoping study on valuing ecosystem services of forests across Great Britain. Final report to the Forestry Commission.

contingent valuation and other techniques. Willis et al. (2003)<sup>21</sup> valued the benefits from biodiversity, recreation, landscape, air pollution absorption and carbon sequestration at £104.1m per year for the total forest estate in Scotland. In terms of the National Forest Estate alone, CJC Consulting (2006)<sup>22</sup> derived values for recreation, health and amenity (landscape) at £99-147m per year. The National Forest Estate clearly provides very substantial public benefits which are not quantified in the annual accounts but which would be important in assessing the overall net benefits from the National Forest Estate.

Nevertheless, this project concentrates on the employment and income contribution of the National Forest Estate to the Scottish economy, for which no comprehensive estimates are currently available. The last employment survey undertaken by the Forestry Commission (FC) was in 1998/99<sup>23</sup> but this did not separate out the employment involved in management of the National Forest Estate. In addition, there are no estimates of the up and downstream employment generated by FES activities or for employment associated with recreation and game on the National Forest Estate.

## **2.4 Method and approach**

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FES employs staff, makes expenditures and produces output. We estimated impacts from both backward (suppliers) and forward (purchasers) linkages to FES activity. For suppliers we estimated the direct employment and income effects of FES injections of expenditure and then applied multipliers to estimate indirect and induced impacts. Purchases from FES, e.g. of timber from estate forests, also create impacts, but these added together do not fully capture all the impacts from the planting, felling and use of estate timber. We estimated direct, indirect and induced estate-related impacts by applying ratios derived through our related study of the forestry sector<sup>24</sup> on the simplifying assumption that the National Forest Estate produced approximately 41% of Scotland's timber output in 2012/13 and that the pattern of impacts from this, *pro rata*, will reflect impacts from forestry activity and output in Scotland as a whole.

### **2.4.1 FES transactions**

The accounting system for the annual FES accounts is not designed for the extraction and analysis of information such as that required for the present study, and considerable challenges were encountered in using the accounts for the study.

External transactions were identified and categorised as shown in Table 2.1. This involved removing internal Forestry Commission transactions, salaries and associated costs, including expenses, and VAT. These figures cannot be compared with the published accounts because they are merely receipts and

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<sup>21</sup> Willis, K. G., Garrod, G. Scarpa, R., Powe, N., Lovett, A., Bateman, I. J., Hanley, N. and Macmillan, D. C. (2003). The Social and Environmental Benefits of Forests in Great Britain. Report to Forestry Commission, Edinburgh. Centre for Environmental Appraisal and Management, University of Newcastle upon Tyne [online] available at: [http://www.forestry.gov.uk/pdf/sebreport0703.pdf/\\$FILE/sebreport0703.pdf](http://www.forestry.gov.uk/pdf/sebreport0703.pdf/$FILE/sebreport0703.pdf)

<sup>22</sup> CJC Consulting (2006). Market and non-market benefits of 'Forestry for People' in Scotland. Report to Forest Research, Forestry Commission.

<sup>23</sup> Forest Employment Survey 1998/9. Forestry Commission.

<sup>24</sup> CJC Consulting (2015). The economic contribution of the forestry sector in Scotland. Report to Forestry Commission Scotland.

expenditures without adjustment for depreciation and valuation change. Nor do they include employment costs.

Table 2.1 shows that there were payments of £81.4m and trading receipts of £62.7m in 2012/13. Most of the revenue (84%) was from timber production with smaller contributions from renewable energy, property sales and leases. Expenditure is mainly related to timber production, property and civil engineering. The accounts show expenditure which exceeds earned income, but FES receives an additional payment from government for the public non-market benefits provided by the National Forest Estate.

**Table 2.1 Cash flows (ex VAT) by activity (FES accounts 2012/13)**

Category	Inflows	%	Outflows	%
	(£'000)		(£'000)	
Timber production, planting and forest management	52,566	83.8%	27,672	34.0%
Deer management	1,667	2.7%	2,797	3.4%
Environment and heritage	18	0.0%	3,763	4.6%
Communities, recreation and tourism	646	1.0%	6,692	8.2%
Renewable energy	3,456	5.5%	19	0.0%
Property, legal, development, sales and acquisitions	3,676	5.9%	14,623	18.0%
Civil engineering including roads	82	0.1%	13,604	16.7%
Administrative	315	0.5%	3,673	4.5%
Other	37	0.1%	78	0.1%
Planning	1	0.0%	933	1.1%
Non-capital machinery	246	0.4%	3,988	4.9%
Capital machinery	0	0.0%	3,539	4.3%
<b>Total</b>	<b>62,710</b>	<b>100.0%</b>	<b>81,381</b>	<b>100.0%</b>

Not all of the individual transactions in the accounts were with different organisations, since FES may make payments to different local offices or parts of organisations. We consolidated transactions using postcodes, organisation names, visual inspection and internet searches in order to identify the total payments to, or receipts from, individual businesses.

The classification given in Table 2.1 is used by FES for presentation and internal budgeting purposes. It does not always relate closely to particular businesses involved in each category. For example, a payment to a civil engineering company may be recorded within a category such as 'Communities, recreation and tourism' and not under 'Civil engineering including roads'. Similarly the £6.69m expenditure allocated to 'Communities, recreation and tourism' was largely spent on purchasing a wide range of goods from firms not specialising in recreation or tourism.

We therefore re-classified transactions by business type using Standard Industrial Classification (SIC) codes<sup>25</sup>. We obtained information about as many businesses that traded with FES as possible from the Inter-Departmental Business Register (IDBR)<sup>26</sup> managed by the Office of National Statistical (ONS). The IDBR is a comprehensive list of UK businesses and the main sampling frame for surveys of businesses carried out by the ONS and other government departments. We attempted to match the FES list of businesses with whom it had transactions in 2012/13 with the IDBR list. For those businesses where a match was obtained, we established the IDBR SIC<sup>27</sup> code for the business together with the employment and turnover of that business in 2012/13. We also obtained the mean employment and turnover for each of the SIC codes. Where SIC coding could not be obtained we allocated SICs through investigating the main activity of the business through using internet searches based on business name and postcode.

## **2.5 Survey**

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In order to obtain firm-specific FTE employment data related to FES transactions we undertook a survey of selected businesses. It was not possible to survey all businesses with whom FES dealt in 2012/13, and many of the transactions were very small. We therefore focussed the survey on businesses whose transactions with FES were greater than £10,000 in the year. It was decided to survey 100% of those businesses in the forestry sector as indicated by their SIC code, i.e:

- 02100 Silviculture and other forestry activities
- 02200 Logging
- 02300 Gathering of wild growing non-wood products
- 02400 Support services to forestry
- 16100 Sawmilling and planing of wood
- 16210 Manufacture of veneer sheets and wood-based panels
- 17110 Manufacture of pulp

Other suppliers and purchasers outside the forestry and renewable energy sectors were less likely to have FES as a major client and therefore were expected to be less able and/or willing to respond to a survey. Their estimated contribution to employment impact was based on their SIC code. In total, questionnaires<sup>28</sup> were sent to 407 FES suppliers and customers, comprising 288 that only received payments from FES, those that only made payments to FES (86) and those that both received and made payments (33).

### **2.5.1 Survey questionnaire and management**

The survey was combined with a wider survey of the forestry sector for a parallel study on the forestry sector in Scotland. The questionnaire contained questions to elicit the employment and turnover of businesses in the forestry and renewable energy sectors which traded with FES. It was also designed to separate out employment related to recreation and deer management from more mainstream forestry activities. It was sent out by post with a prepaid reply envelope, although

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<sup>25</sup> <https://www.gov.uk/government/publications/standard-industrial-classification-of-economic-activities-sic>

<sup>26</sup> <http://www.ons.gov.uk/ons/about-ons/products-and-services/idbr/index.html>

<sup>27</sup> Standard Industrial Classification 2007.

<http://www.companieshouse.gov.uk/infoAndGuide/sic/sic2007.shtml>

<sup>28</sup> The questionnaire is in Annex 1

there was an option to download the questionnaire and return by email. A reminder was sent to non-respondents after four weeks and a number of businesses and organisations which were significant trading partners or for whom there was no alternative source of information were phoned to improve the response rate.

### **2.5.2 Survey response and analysis**

The response rate to the survey was 31%, although not all of these were fully useable replies. Given that many businesses suffer from survey fatigue or lack of time, the response rate was considered reasonable. Some non-incorporated businesses may also have been disinclined to divulge details of their activities for reasons of confidentiality. One problem we faced with the FES accounts was that the database recorded contacts and addresses appropriate for paying bills or receiving income. In larger businesses, those receiving the questionnaires may not have been well placed to respond or pass it on to the most relevant staff member, which may well have affected the response rate.

## **3 Expenditure, outputs and employment**

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FES injected £81.4m into the Scottish economy in 2012/13 through purchases from its suppliers. This generates employment and increases the income of the recipient businesses. Payments to staff in FES employment represent further household income which creates additional business income and employment through their spending (the “induced” multiplier). FES also received £62.71m from sales (see Table 1.1), most of which was for timber which also generates employment in timber processing and haulage.

In section 3.1 below, we estimate the direct FES and related Forestry Commission employment in Scotland. In Section 3.2 we estimate the employment effects of FES expenditures, applying multipliers to calculate the indirect and induced effects from this “first round” spending.

### **3.1 FES/FC direct employment**

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We were advised that FES employment averaged 812 FTEs in 2012/13. To this we added staff time in central FC services and FCS that the Human Resources indicated were supporting FES and the National Estate. This gave a total of 886 FTEs of direct staffing. This represents 72% of the 1,224 direct FTEs we were given for total Forestry Commission (including Forest Research) staffing in Scotland in 2012/13<sup>29</sup>.

### **3.2 FES expenditure impacts on employment**

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We estimated direct employment generated by FES payments to suppliers in a series of steps:

- Where there were replies from the survey on business turnover and FTEs, the employment generated by FES expenditure was calculated using the turnover/employment coefficient for the business.
- Where survey data were not available we used the IDBR turnover/employment coefficient for the SIC of the business to generate an employment estimate.
- Where no IDBR employment information was available we used the mean turnover/employment for the SIC of the business to estimate employment.
- For other transactions, including those with no SIC coding, we assumed the 02400 SIC (support service to forestry) turnover/employment coefficient of £57,501 per employee.

Whilst the survey asked for information on FTE jobs, the IDBR only records employment (including part time). Since this employment figure (which includes directors and partners) is higher than FTEs for most businesses because it includes part-time staff, we used a ratio of 0.94 to convert employment into FTEs<sup>30</sup>.

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<sup>29</sup> 1,224 FTEs was the direct employment figure used in the related report on the economic contribution of the forestry sector in Scotland.

<sup>30</sup> FTEs were estimated from employment by regressing FTE on Employment for the survey responses for which both IDBR employment and survey FTEs were available. This gave a conversion ratio of 0.94 (SE 0.09) FTEs per unit of employment.

In Table 3.1 below we first summarise the direct employment estimated to have been supported by FES expenditures in 2012/13 and then adjust this downwards to reflect purchases made outwith Scotland. This adjustment was made using the postcodes for suppliers in the FES accounts.

Following this process, the total direct employment generated by FES expenditure of £81.38m was estimated as 1,047 FTEs (Table 3.1). Adding this to the estimated 886 FTEs employed by FES/FC (see Section 3.1 above) would give a total for direct employment of 1,933 direct FTE jobs. We were able to account for employment associated with 69% of all FES expenditure either through survey responses or IBDR data on individual firms. The remaining 31% were estimated due to a lack of specific information.

**Table 3.1 Estimated direct and total (direct, indirect and induced) employment generated by FES expenditure in Scotland in 2012/13**

Source of information	Expenditure (£m)	All direct employment (FTEs)	Direct employment in Scotland (FTEs)	Total employment in Scotland (FTEs)
Survey responses	11.56	118.8	118.8	211.2
IDBR individual business data	44.37	648.2	507.8	785.7
IDBR SIC mean data (see above)	21.66	218.2	203.3	335.1
Other (imputed)	3.79	62.1	54.4	92.5
<b>Total</b>	<b>81.38</b>	<b>1,047.3</b>	<b>884.3</b>	<b>1,424.5</b>

Note: The large number of 'other' payments are mainly to small businesses, individuals and organisations for which SIC codes were not available or not requested from ONS.

Direct employment in Scotland was estimated using post code information on where payments were made to suppliers. This is not a very reliable indication of where the actual employment takes place but was the best method available. Direct employment in Scotland was 884 FTEs, 84% of the total.

FES expenditure not only supports direct employment but will also generate indirect and induced employment as the initial expenditure triggers further rounds of expenditure (and associated employment) within the economy. This additional employment from backward linkages in the economy is normally calculated using multipliers derived from the Scottish Government's input-output tables.

We multiplied the direct employment estimated for each business supplying goods and services to FES by the 2011 Scottish Type II employment multipliers for the relevant SIC code<sup>31</sup> for each business. Where SIC codes were not available from the ONS we identified the type of businesses and imputed a code. Then each of the supplying businesses was reclassified to the appropriate input-output industry/product group using the 2007 SIC code. Where there was no SIC information<sup>32</sup> a type II multiplier of 1.7 was used. This is an approximate average for the sectors and types of businesses from which the purchases were made. The total employment supported as a result of FES expenditure was 1,425 FTEs

<sup>31</sup> <http://www.gov.scot/Topics/Statistics/Browse/Economy/Input-Output/Downloads>

<sup>32</sup> This only applies to annual expenditures of <£10,000. All other businesses either had an SIC code from ONS or one imputed after identifying the type of business.

(Table 3.1). This does not include FES own employment of 886 direct jobs. This converted to 1,090 total jobs after an application of an induced multiplier.

The total FTEs in Scotland from FES expenditures were then allocated to the categories used by FES in their accounts (Table 3.2). FES expenditure categorised as timber production, planting and forest management accounts for over 500 FTE jobs but (as explained below) this is only part of the impact from these activities attributable to the National Forest Estate. Impacts from capital spending by FES are also relatively high (including capital classified as related to civil engineering). It was not possible to estimate and add impacts from capital investments by businesses such as timber processors who may have invested in new plant and equipment in 2012/13 at least in part due to their throughput of FES timber.

**Table 3.2 Total employment in Scotland in 2012/13 classified by accounting category supported by FES expenditure (excluding FES employment)**

FES Accounting category	Total (direct, indirect and induced) employment (FTEs)
Timber production, planting and forest management	453.2
Deer management	71.2
Environment and heritage	87.1
Communities, recreation and tourism	187.7
Renewable energy	-
Property, legal, development, sales and acquisitions	193.0
Civil engineering including roads	227.2
Administrative	117.6
Other	30.0
Planning	17.2
Non-capital machinery	9.2
Capital machinery	31.1
<b>Total</b>	<b>1,424.5</b>

### 3.3 Impacts from FES outputs

#### 3.3.1 Timber primary processing

The business income related to the outputs from and the services provided by the National Forest Estate (£62.71m in 2012/13) also support employment. Eighty-four per cent of this income was categorised in the accounts (Table 2.1) as associated with timber production, planting and forest management. There were smaller contributions from renewable energy, deer and property sales. Employment in timber harvesting, haulage, primary processing and deer processing (for venison) are also directly linked to the management of the National Forest Estate, and we therefore also include employment supported by these Estate outputs.

In our survey for the forestry sector in Scotland, we asked processors about their employment related to primary processing and the proportion by value of their timber purchases that was from the FES. However, this was not always known with clarity, especially when timber was purchased from intermediaries. We therefore used a *pro rata* estimate based on data from the study on the economic contribution of the forestry sector<sup>33</sup>, attributing 41% of the employment in Scotland in timber processing to the National Forest Estate, reflecting the proportion of FC timber output in 2012<sup>34</sup> (2,627,000 green tonnes) to all Scottish timber output (6,429,000 green tonnes). The total (direct, indirect and induced) employment associated with timber processing in the sector was 5,967 FTEs. Forty-one percent of this is 2,446 FTEs.

Purchasers of timber from the National Forest Estate may transport timber and undertake harvesting (if sold standing). But many will use contractors for harvesting and transport and this employment is not captured in the analysis of FES expenditure. In order to estimate this employment we took the FES element of softwood + hardwood removals in 2012 (41%) and applied this percentage to the sector estimate of employment in harvesting (1,268 direct FTE jobs) and haulage (810 direct FTE jobs). We subtracted an estimate of the employment in harvesting resulting from FES external expenditure to avoid double counting. This gave 488 FTEs (harvesting) and 312 FTEs (haulage). Adding in indirect and induced impacts gives 737 and 499 total jobs respectively (Table 3.3).

**Table 3.3 Total (non-FES) employment in Scotland related to FES timber output**

	<b>Total (direct, indirect and induced) employment (FTEs)</b>
Timber primary processing	2,446
Harvesting of timber	737
Haulage of timber	312
<b>Total</b>	<b>3,994</b>

### 3.3.2 Deer

The Forestry Commission culls around 30,000 deer per year, approximately one third of the annual national cull of a population estimated to number 777,000<sup>35,36</sup>.

FES obtains a small amount of income from permissions for shooting. Data provided for the year ending January 2015<sup>37</sup> showed income from permissions for grouse, pheasant, partridge and rough shooting of £5,676 and for stalking £174,771. Permissions are largely granted to named individuals and associated with strict conditions. The National Forest Estate is not involved with the type of sporting lets used by private estates which generate injections into the Scottish economy from expenditures by visiting recreational shooters.

<sup>33</sup> CJC Consulting (2015). The Economic Contribution of the Forestry Sector in Scotland. Report to the Forestry Commission.

<sup>34</sup> Forestry Statistics 2014. <http://www.forestry.gov.uk/forestry/infd-7aql5b>

<sup>35</sup> <http://www.forestry.gov.uk/news1/C04CD9F3C92EEB1D80257D0400362E1C>

<sup>36</sup> An important element in the Forestry Commission's Deer Management Strategy is the management of deer populations and the protection of forestry from damage.

<sup>37</sup> Income in the 2012/13 year would be very similar.

The employment generated by FES expenditure on deer management and from venison and other game processing was included in Chapter 2. Since expenditures by visiting sport shooters is minimal, (and would theoretically be included under tourism and recreational impacts), no additional employment effects are allowed for.

The £1.667m receipts from deer management in 2012/13 (Table 2.1) largely relate to sales of deer to processors. FES sells around 26,500 deer carcasses annually direct to the venison industry, with a further 3,500 carcasses retained by recreational stalkers<sup>38</sup>. Most of the retained carcasses are understood to be processed commercially, and we therefore added 13% to the FES output to include this additional venison processing. The direct employment in processing (25 FTEs) was derived by telephone interviews with individual processors. Adding an estimated indirect plus induced employment multiplier of 1.4<sup>39</sup> to this gives 35 FTEs.

### **3.3.3 Renewables**

£3.676m of the 2012/13 FES receipts was categorised as renewables, and this income was mainly from leases for wind farms and wind farm access. There were smaller amounts of income in 2012/13 from hydropower, and minerals (quarrying). Here we concentrate on wind turbine sites because employment from other activities is quite small. FES has for many years leased sites for the construction of wind turbines. Under a typical wind farm lease, FES receives a development fee following signing of the lease but only receives rental income once construction is complete. There may also be payments for FES staff time, compensation for loss of timber, and mineral extraction (quarry stone for road building).

The existing installed capacity on FES sites early in 2012 was 363MW, and the *additional* installed capacity commissioned from FES sites in 2012/13 was 217MW, giving a total of 580MW. RenewableUK's State of the Industry Report 2013<sup>40</sup> states that the operating capacity of onshore wind installations in the UK totalled 6,389MW in the UK (3,983MW in Scotland) and that 1,258MW was commissioned in the UK in the year (791MW in Scotland). In its most recent report for RenewableUK, Biggar Economics<sup>41</sup> estimates UK direct plus indirect impacts per MW of installed capacity as follows:

Development stage, i.e. pre-construction (averaging 3-4 years)	0.54 FTEs
Construction stage (averaging 1.5 years)	2.49 FTEs
Operations & maintenance (per annum)	0.43 FTEs

Their report suggests that direct plus indirect impacts in Scotland from wind farms in Scotland will be approximately two thirds of the UK impacts given above.

In 2013/14, the additional installed capacity on FES sites totalled 209MW. This is similar to the 2012/13 total of 217MW, and we thus made the simplifying

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<sup>38</sup> <http://www.forestry.gov.uk/news1/C04CD9F3C92EEB1D80257D0400362E1C>

<sup>39</sup> Not double-counting carcass purchases

<sup>40</sup> RenewableUK: State of the Industry Report 2013.

<http://www.renewableuk.com/en/publications/reports.cfm/state-of-the-industry-report-2012-13>.

<sup>41</sup> RenewableUK (2015). Onshore Wind: Economic impacts in 2014.

assumption that the impact ratios above will apply to the turbine-related activities on the FES sites in 2012/13, i.e.:

Development plus Construction stages	217MW x 3.03 x 0.67 =	440 FTEs
Operations & Maintenance	363MW x 0.43 x 0.67 =	105 FTEs
<b>Total Direct &amp; Indirect Impact</b>		<b>545 FTEs</b>

On average, these 545 FTEs will be relatively well paid and an induced multiplier for Scotland of 0.25 is applied to give an overall estimated impact in 2012/13 of **681 FTEs**.

### 3.4 Total employment impact from Estate outputs and services

The total employment impact of the expenditures and outputs discussed above is 7,225 FTE jobs (Table 3.4). This total does not include those jobs supported by the expenditures of tourists and recreational visitors to the National Forest Estate. These are analysed in Chapter 5 below.

**Table 3.4 Total employment impact in Scotland (excluding visitor impacts)**

	Total employment impact (FTEs)
FES/National estate-related staffing	1,090
FES operational expenditures	1,425
Timber harvesting, haulage and processing	3,994
Deer processing	35
Renewables (Wind turbine related)	681
<b>Total</b>	<b>7,225</b>

### 3.5 Contribution to the economy in Scotland

The National Estate contributes to the economy through spending associated with the management of the National Forest Estate and by providing raw materials and facilities for processing and the production of renewable electricity. The contribution of a business or sector to the economy is measured in government statistics by the business or sector gross value added (GVA).

The report on the Economic Contribution of the Forestry Sector in Scotland<sup>42</sup> estimated a total employment impact of 19,555 FTEs (excluding tourism and recreation visitor impacts) and £771 million GVA, i.e. £39,423 GVA per FTE. Applying this ratio to the 7,225 FTEs generated by the National Forest Estate would give a GVA impact of around £285m.

However, since government departments do not normally produce output, the contribution of the National Forest Estate to official data on GVA is measured more directly by their employment costs. Adjustments are also made for government subsidies.

<sup>42</sup> CJC Consulting (2015). Report to Forestry Commission Scotland.

## 4 Recreation and tourism

### 4.1 Introduction

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This chapter gives a summary of the analysis of employment and GVA impacts of expenditures by visitors to the National Forest Estate. Full details of the analysis can be found in Annex 1 (Chapter 6).

The starting point for estimating the economic contribution of recreation and tourism is the expenditure by visitors attracted to the national estate. FES invested £10.5m on heritage, environment, communities and recreation in 2012/13: 13% of its total expenditure. Much of this is on facilities that make forests an enjoyable experience for tourists and recreational visitors. Since entry to public forests is normally free the only on-site expenditure will be for car parking and the use of facilities (e.g. cafes and bike hire). But the main expenditure associated with visits will generally be on such items as travel, food, drink and accommodation.

However, visits to forests may not be the only source of visitor expenditure associated with the National Forest Estate because the National Forest Estate's contribution to landscape and wildlife may also attract tourists. Hill et al. (2003)<sup>43</sup> surveyed tourists in the Trossachs and Borders and found that 'good scenery' was the most important of five factors for general trip location decisions. As forests are a major part of the 'scenery' in Scotland this might suggest that forests play a key role in trip making decisions. But forests were not ranked highly when tourists were asked why they chose to visit the region.

Unfortunately there are no data that indicate what expenditures can be linked to the landscape and wildlife aspects of the national estate. We therefore focus on visits to the National Forest Estate itself for which data on visitor expenditure are available.

Annex 1 gives a detailed account of the approach used in estimating visitor spend and its impact on employment and GVA. This is summarised below.

### 4.2 Visitor expenditure

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The recent (2012/13) All Forests Survey 2<sup>44</sup> of visits to the national estate was used as the basis for estimating expenditures and economic contribution. The Survey is described in more detail in Section 6.4.1.

There were 9.1m visits of which 77% were by Scottish residents (7.01m), and 23% by 'Other UK and overseas visitors' (£2.09m). Most of the Scottish residents were on day trips with relatively few overnight stays (Table 4.1).

Expenditure totalled £157.8m where the National Forest Estate was the main destination that day. Scottish visitors on day trips were relatively unimportant in economic terms since they only accounted for 12% of expenditure. The expenditure of 'Other UK and overseas' visitors was especially important and contributed 64% of the total.

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<sup>43</sup> Hill, G., Courtney, P., Burton, R. and Potts, J., Shannon, P., Hanley, N., Spash, C., DeGroot, J., Macmillan, D. and Gelan, A. (2003). Forests' Role in Tourism. Main Report Final to the Forestry Commission.

<sup>44</sup> All Forests Survey 2, (2013) Forestry Commission Scotland. Some additional analyses were produced for the current study.

**Table 4.1 Number of visits and expenditure on the day of the forest visit, by category of visitor**

	Other UK and overseas visitors	Scottish visitors on overnight visits	Scottish visitors on a day trip	All visits
<b>Number of visits per year (m)</b>	2.093	0.910	6.097	9.10
<b>Number of visits per year (main destination)(m)</b>	1.088	0.473	3.17	4.73
<b>Expenditure on the day of the visit (£ per visit):</b>				
Food & drink	21.50	17.86	1.82	
Transport	13.44 <sup>45</sup>	11.62	3.78	
Shopping	4.71	3.13	0.25	
Admission fees	1.93	1.80	0.16	
Equipment	0.47	1.22	0.05	
Other	0.93	0.35	0.03	
Accommodation	49.99	42.94	0	
Total expenditure per visit (£)	92.97	78.92	6.09	
Total expenditure (£m)	194.59	71.82	37.13	303.53
<b>Total expenditure (main destination) (£m)</b>	<b>101.18</b>	<b>37.34</b>	<b>19.31</b>	<b>157.84</b>

Expenditures from 'Other UK and overseas' visitors were treated as additional to the economy. Some of the Scottish resident overnight trips would also be additional but it was assumed that the day spend on day trips displaced expenditure that would otherwise have taken place within Scotland<sup>46</sup>. Hence expenditure was classified as either:

- Associated with visits to the national estate: £158m per year (economic contribution)
- Additional injections due to the National Forest Estate: £102-138m per year (economic impact).

### 4.3 Employment

We estimated the total employment impact of the visitor expenditure using a combination of values from the literature and IBDR<sup>47</sup> data. The weighted mean

<sup>45</sup> Only includes transport on the day of the visit.

<sup>46</sup> Whilst some day trip expenditure may have been additional there was no way of measuring this element and given the small proportion of the total spend its exclusion has little impact on the results.

<sup>47</sup> Inter-Departmental Business Register. This gives both turnover and employment data for firms classified according to the Standard Industrial Classification (SIC). <http://www.adls.ac.uk/ons/inter-departmental-business-register/?detail>

was £37,630 per job (£42,330 per FTE) (Table 4.2). This includes the direct, indirect and induced elements in employment.

**Table 4.2 Employment associated with visitor expenditure (National Forest Estate)**

	<b>Expenditure per job (direct+indirect+induced) (£)</b>	<b>Estate employment (FTEs)</b>	<b>Total GVA (£m per year)</b>
Other UK and overseas visitors'	£34,560	2,560	71.6
Scottish visitors on overnight visits	£34,630	943	26.6
Scottish visitors on a day trip	£59,500	284	11.3
<b>All visitors weighted by expenditure</b>	<b>£37,630</b>	<b>3,790</b>	<b>109.6</b>

The total employment (direct, indirect and induced) associated with visitor expenditure on the National Forest Estate was 3,790 FTE jobs. Treating the spend of 'Other UK and overseas' visitors as additional and day trip spend as non-additional results in an additional number of jobs supported between 2,560 and 3,500 FTEs.

#### **4.4 Gross Value Added (GVA)**

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Expenditure by recreational visitors represents normally increases the value added of recipient businesses. Ratios of expenditure to GVA were obtained for different types of business from Scottish Annual Business Statistics (2012) and a GVA multiplier from the Scottish Input-Output Tables<sup>48</sup> was applied to obtain the total (direct+indirect+induced) GVA effects.

The total contribution to national GVA associated with forest visitor expenditure was £109.6m (Table 4.2). As with the employment effects, not all of this GVA represents additional injections into the Scottish economy. The additional impact was in the range £72m to £98m. These estimates should be treated as indicative only because of the aggregated nature of the business statistics for GVA.

#### **4.1 Conclusions**

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A lack of information on decisions to visit the National Forest Estate (and alternative destinations) means that it is difficult to identify the economic contribution of recreation and tourism with much precision. Our estimate of employment contribution of 'main destination' visits to the National Forest Estate is 3,790 FTE jobs. The impact on the Scottish economy is to support between 2,560 and 3,500 FTE additional jobs. Assuming 50% of resident overnight trips are additional<sup>49</sup> gives 3,030 additional FTEs. The GVA associated with tourism and recreation was £109.6m with an impact on the economy of £72-£98m. Assuming 50% of resident overnight trips are additional gives a GVA contribution of £85m.

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<sup>48</sup> <http://www.scotland.gov.uk/topics/statistics/browse/economy/input-output/multipliers>

<sup>49</sup> An assumption made 'Scottish Natural Heritage Scotland's People and Nature Survey 2013/14. [http://www.snh.org.uk/pdfs/publications/commissioned\\_reports/679.pdf](http://www.snh.org.uk/pdfs/publications/commissioned_reports/679.pdf)'

These estimates are likely to be conservative for two reasons. First, the All Forests Survey 2 may underestimate visitor numbers given the difficulty of capturing 100% of visits in any on-site survey. Even so this survey is based on direct on-site recording of visits and incorporates information on expenditure associated with visits. In our opinion this makes it more reliable and useful for economic analysis than the 2012 Scottish Recreation Survey or the 2013/14 SPANS Omnibus surveys<sup>50</sup>. Second, the visitor data do not include the tourist expenditures associated with the National Estate's contribution to landscape and wildlife in Scotland. We could not include this aspect because of a lack of reliable data but it may well make a significant contribution to tourism<sup>51</sup>.

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<sup>50</sup> Scottish Natural Heritage Scotland's People and Nature Survey 2013/14.  
[http://www.snh.org.uk/pdfs/publications/commissioned\\_reports/679.pdf](http://www.snh.org.uk/pdfs/publications/commissioned_reports/679.pdf)

<sup>51</sup> Bryden et al. (2010) found that wildlife watching and scenery accounted for 39% of the employment contribution of nature-based activities in Scotland. SNH Commissioned Report No. 398.

## 5 Conclusions

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The management of the National Forest Estate in Scotland makes a significant contribution to the economy through expenditures and outputs (mainly timber and deer) associated with estate management. It also provides a focus for recreation and tourism both directly through its accessible forests and network of facilities, and also by contributing to Scottish landscape and wildlife biodiversity. Whilst the study only took into account the impact of forest-related expenditures by tourists and visitors the evidence indicates that the wider benefits of the National Forest Estate to the public and environment are very significant.

The key conclusions from the study are:

- Forest Enterprise expenditure: £109.6 including FES staff costs.
- Total employment (direct, indirect and induced) supported by this expenditure and the outputs from the National Forest Estate in Scotland: 7,225 FTEs. This study did not include the employment associated with secondary processing of timber grown on the National Forest Estate, which could be substantial.
- Additional employment supported by the tourism spend is considerable: around 3,790 FTE jobs, of which around 3,030 jobs were additional and dependent on the National Forest Estate.
- Total employment in Scotland supported by the National Forest Estate: 11,015 FTEs<sup>52</sup>.
- The FES contribution to Scottish GVA is assessed in government statistics in terms of employment costs adjusted for government subsidy. A contribution to Scottish GVA of around £285m<sup>53</sup> was estimated on a *pro rata* basis from the forestry sector report.
- In addition, the GVA supported by tourism and recreation expenditure associated with access to the National Forest Estate was estimated at around £110m.

The FTE employment is around 0.4% of Scottish workforce jobs<sup>54</sup> and many of these are located in remote and rural areas of Scotland where employment opportunities are limited.

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<sup>52</sup> There were an additional 163 direct jobs supported outside Scotland (see Table 3.1).

<sup>53</sup> Unadjusted for subsidy.

<sup>54</sup> <http://www.ons.gov.uk/ons/guide-method/compendiums/compendium-of-uk-statistics/economy/index.html>

## 6 Annex 1: Recreation and tourism

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### 6.1 Method and approach

To determine the contribution to the economy of Estate-related recreation first requires an estimate of expenditure associated with visits to the National Forest Estate. This expenditure supports employment in upstream firms and their value added.

Hill et al. (2003)<sup>55</sup>, in their study of Forests' Role in Tourism made a useful distinction between two aspects: 'economic contribution' – which is the importance of an activity to a country's economy and employment; and 'economic impact' which is concerned with the effect of new or external money being injected into the economy. Economic contribution refers to those expenditures that are *associated* with forest visits. Economic impact refers to the *additional injections* of expenditure into the Scottish economy. This is an important distinction which we maintain in the analysis.

Whilst many (and typically site-specific) studies are concerned with the local economy we are concerned here with the Scottish economy at national level. Impacts of expenditure on employment in the local economy will be smaller than those at national level because of leakage to non-local suppliers.

### 6.2 Categories of visitors

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From the perspective of impacts on the Scottish economy, inbound tourists from other parts of the UK and overseas are especially important. These visitors clearly inject additional spending into the economy. Expenditure by Scottish residents is more problematic. This will have an economic impact if the forest visit results in greater expenditure than would otherwise have taken place domestically, and especially if it contributes to displacing a holiday that would otherwise have been taken outside Scotland. But there will be little or no economic impact at national level if expenditure by residents on forest trips would have been spent in Scotland on recreational visits in the absence of forest recreation.

All forest visits have economic significance but in terms of their economic impact it is useful to distinguish three main categories of visitor:

1. Tourists from outside Scotland whose visit is at least partially 'forest-related'.
2. Scottish residents who stay overnight in Scotland<sup>56</sup> and have 'forest-related' expenditures.
3. Scottish residents on trips not involving an overnight stay who have 'forest-related' expenditure.

Expenditure by category 1 tourists is most clearly additional to the Scottish economy. Category 2 expenditure is likely to be in part additional because the trip

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<sup>55</sup> Hill, G., Courtney, P., Burton, R. and Potts, J., Shannon, P., Hanley, N., Spash, C., DeGroot, J., Macmillan, D. and Gelan, A. (2003). Forests' Role in Tourism. Main Report Final to the Forestry Commission.

<sup>56</sup> VisitScotland has a category of 'Tourism Day Visits' (visits not taken on a regular basis and outside the 'usual environment'). These would fit within this second category of visitor. Other 'Leisure Day Visits' fit within category 3. See [http://www.visitscotland.org/pdf/GBDVS Main Annual Report 2011 Final - 26 April 2012.pdf](http://www.visitscotland.org/pdf/GBDVS%20Main%20Annual%20Report%202011%20Final%20-%2026%20April%202012.pdf)

is probably a holiday since it involves an overnight stay. The counterfactual in some cases would be a trip outside Scotland. Expenditure by category 3 visitors is generally assumed to be largely displaced in that, in the absence of forest visits, substitute recreational expenditure would take place within Scotland.

## **6.3 Previous economic studies**

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### **6.3.1 Introduction**

Previous economic studies on the impact of forest recreation have concentrated either on the total forest estate in Scotland or specific forests. We include a brief comment on these studies to provide a context for the current study.

### **6.3.2 Forestry for People (2008)<sup>57</sup> (F4P)**

The F4P study examined the survey evidence available in 2007/08 and concluded that Scottish residents (categories 2 and 3 above) made 34.2m forest visits of which 15m were classified as tourist (mean expenditure £26.89 per visit) and 19.2m as recreation (mean expenditure £5.8 per visit). Total resident tourist expenditure was £403m, and recreation expenditure £111m. Other UK tourists were estimated to spend £25m. No estimate was made for non-UK tourists. These relate to the total forest estate and no separate estimates of expenditure were made for the National Forest Estate.

The study defined forest-related spending as expenditure directly related to recreation at forest sites, and estimated that this was associated with 17,900 direct FTE jobs (13,400 due to tourism and 3,700 to shorter trips). A conversion factor of £31,580 expenditure per FTE was used.

The tourist (UK including Scottish residents) contribution to GVA (direct, indirect and induced) was estimated at £166m. Recreational expenditure by Scottish residents generated £43m GVA.

### **6.3.3 Aberystwyth University; Glentress and Rothiemurchus**

Christie et al. (2006)<sup>58</sup> surveyed visitors to Rothiemurchus and Glentress. Glentress is a specialist mountain biking centre and Rothiemurchus provides opportunities for a wide range of family recreation. The expenditures are unlikely to be typical of the wider estate.

Expenditure at Rothiemurchus averaged £22.29 per person (day visitors) and £39.72 (holiday visitors). At Glentress the corresponding figures were £12.48 and £45.76. However, the survey asked 'How much do you expect to spend today relating to your trip to this forest?' and this form of question is unlikely to pick up all spending on accommodation and travel. The total spend may therefore be underestimated.

Visitor expenditure at Glentress was included in the survey of all Estate forests in the 2013 All Forests Survey 2 (see above).

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<sup>57</sup> Forest Research (2008). A valuation of the economic and social contribution of forestry for people in Scotland. <http://www.forestry.gov.uk/fr/INFD-6S8CSP>

<sup>58</sup> Christie, Mike, Nick Hanley, Brain Garrod, Tony Hyde, Nick Lyons, Ariel Bergman and Stephen Hynes (2006). Valuing Forest Recreation Activities: Final Phase 2 Report. Report to the Forestry Commission, Institute of Rural Sciences, University of Wales, Aberystwyth.

### 6.3.4 CJC Consulting (2006)

CJC Consulting reviewed the available evidence to 2006<sup>59</sup>. Based on the first All forest survey on the national estate they estimated an annual expenditure of £77.6m by UK residents where the Scottish forest was the main destination of the visit. This was associated with employment of 2,484 FTE jobs and £35m in gross value added. However, the estimates were based on limited information because the All-forest survey had not then been completed.

## 6.4 Visitor surveys

### 6.4.1 Scotland's National Forest Estate visitor survey

The recent All Forests Survey 2<sup>60</sup> is an on-site survey using face to face interviews and visitor counters of visits to the National Forest Estate in the period November 2012 to October 2013. The survey is on-site, based on observed and counted visits and has a sound statistical base. Unlike the Scottish Recreation Survey (see below) it only relies on memory recall (the day of the visit) for expenditures.

**Table 6.1 Number of visits and expenditure on the day of the forest visit, by category of visitor**

	Other UK and overseas visitors	Scottish visitors on overnight visits	Scottish visitors on a day trip	All visits
Number of visits per year (m)	2.093	0.910	6.097	9.10
Number of visits per year (main destination)(m)	1.088	0.473	3.17	4.73
Expenditure on the day of the visit (£ per visit):				
Food & drink	21.50	17.86	1.82	
Transport	13.44 <sup>61</sup>	11.62	3.78	
Shopping	4.71	3.13	0.25	
Admission fees	1.93	1.80	0.16	
Equipment	0.47	1.22	0.05	
Other	0.93	0.35	0.03	
Accommodation	49.99	42.94	0	
Total expenditure per visit (£)	92.97	78.92	6.09	
Total expenditure (£m)	194.59	71.82	37.13	303.53
<b>Total expenditure (main destination) (£m)</b>	<b>101.18</b>	<b>37.34</b>	<b>19.31</b>	<b>157.84</b>

<sup>59</sup> CJC Consulting (2006). Market and non-market benefits of Forestry for People in Scotland. Report to Forest Research.

<sup>60</sup> All Forests Survey 2, (2013) Forestry Commission Scotland. Some additional analyses were produced for the current study.

<sup>61</sup> Only includes transport on the day of the visit.

There were 9.1m visits of which 77% were by Scottish residents (7.01m), and 23% by 'Other UK and overseas visitors' (£2.09m). Most of the Scottish residents were on day trips with relatively few overnight stays (Table 6.1).

Expenditure on the day of the visit (and overnight if away from home) varied from £92.97 per day for 'Other UK and overseas' visits to £6.09 for visits by residents on a day trip (Table 6.1). The total expenditure associated with visits is £303.5m. However, not all of this can be allocated to the forest visit since the forest visit may not in all cases have been the factor that determined the decision to spend. Since the forest visit only took around three hours on average, depending on the type of visitor (Table 6.1), the forest visit may not have been the main destination but one coupled with other activities that were predominant in the trip decision. The allocation of expenditure is discussed in Section 6.5.

The total of 9.1m visits per year is very close to the 8.7m visits per year reported in a similar survey undertaken in 2004-2006<sup>62</sup>. This may suggest a slight increase in the number of visits to the National Forest Estate in recent years but it is also possible that the increase could reflect any changes made in survey technique.

#### **6.4.2 Scottish Recreation Survey (SRS) 2012**

This is an Omnibus survey restricted to Scottish households. It does not therefore give any information about visitors from the rest of the UK or overseas. The survey asks about leisure and recreational trips in the last 12 months, with more detailed questions relating to the last visit. It does not differentiate between overnight trips and day visits except by trip duration, and no information on accommodation costs is collected.

Fifteen per cent of respondents who had made a trip in the last four weeks said that woodland/forest was the main destination<sup>63</sup>. Of these, 44% visited Estate forests and 56% other forests or did not know the ownership. The total number of visits to woodlands was 61.9<sup>64</sup>m (Estate woodlands, 27m; other/don't know woodlands, 36.8m). This compares with an observed total for Scottish residents visiting Estate forests of 7.0m (see Table 6.1) in the All Forests 2 survey. Only 4% of SRS recorded trips were 8 hours or more (assumed overnight) whereas in the All Forests 2 survey 13% of Scottish residents were on overnight trips. There is thus a major disparity between the visit numbers and durations from these two surveys.

The reason for this disparity is not known. It could be that the choice of destinations given in the SRS does not relate well to respondents' perceptions of visits which could include numerous types of landscape but be recorded as woodlands in the absence of appropriate alternatives. Whatever the explanation we consider the National Forest Estate on-site survey to be more reliable as regards numbers of visits to forests. But we treat the on-site survey as giving lower bound estimates of visitor numbers given the possibility that visits to smaller woods are underestimated.

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<sup>62</sup> All Forests Visitor Monitoring, Survey of visitors to FCS forests, years 1,2 and 3.  
<http://www.forestry.gov.uk/>

<sup>63</sup> 15% of those making visits said the main destination was woodland/forest.

<sup>64</sup> Single visits where at least one woodland/forest was visited. The sub-categories do not sum to the total because more than one woodland may be visited in a day.

### 6.4.3 Scotland's People and Nature Survey (SPANS) 2013/14<sup>65</sup>

This survey replaced the SRS in 2013. Unfortunately due to changes in the questions asked it does not record the main destination of the most recent trip or collect any information on expenditure. SPANS is therefore not very informative as regards the allocation of recreation expenditure to forestry. However, it does provide some information on the types of destination of the most recent trip.

Where woodlands were visited 39% of visits were to Estate woodlands, 26% to non- Estate and 35% not known. These differ slightly from the SRS 2012 data but the SRS data do indicate the main destination of the trip (on which SPANS is uninformative).

## 6.5 Allocation of expenditure

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The All Forests Survey 2 did not ask about the importance of the visit in planning the trip. Information on this is necessary in order to determine how much expenditure can be associated with forest visits. The Scottish Recreation Survey<sup>66</sup> (SRS) does ask respondents about the main destination of trips and 42% of those visiting woodland/forest stated this to be the main destination<sup>67</sup>. Hill et al. (2003)<sup>68</sup> surveyed visitors at 44 forest sites in GB and found that 62% of visitors to Scottish sites stated that they had specifically set out to visit the forest and not do anything else. The difference in these figures is hard to explain. The relevant questions about motivation differed and this could have been a factor. In addition, the SRS is restricted to a survey of Scottish residents and does not include visitors from outside Scotland whereas Hill et al. would have included all site visitors. But it is not clear how these differences might have affected trip generation. Without further evidence we take a mean 52% of visits having forests as the main purpose of the trip<sup>69</sup>.

Expenditure associated with visits to the National Forest Estate where the forest was the main destination amounted to £157.8m (Table 6.1). This is the expenditure associated with forest visits and is one measure of the economic significance of the forest estate as a recreational resource. But this is not all additional injection of spending into the Scottish economy. Expenditure by 'Other UK and overseas' visitors is clearly an additional injection but some of the domestic spend will also be additional. Where expenditure by residents substitutes for expenditure that would otherwise have flowed outside Scotland (such as non-Scottish holidays or goods and services purchased from the other countries) this would be additional. But we have no evidence on how expenditure patterns would change in the absence of forestry and so take a pragmatic

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<sup>65</sup> Scottish Natural Heritage Scotland's People and Nature Survey 2013/14.  
[http://www.snh.org.uk/pdfs/publications/commissioned\\_reports/679.pdf](http://www.snh.org.uk/pdfs/publications/commissioned_reports/679.pdf)

<sup>66</sup> Scottish Recreation Survey 2012. Scottish Natural Heritage.  
<http://www.snh.gov.uk/docs/A1020956.pdf>

<sup>67</sup> Note that this is not the same metric as the 15% who indicated that woodland was their main destination (see 6.5.2).

<sup>68</sup> Hill, G., Courtney, P., Burton, R. and Potts, J., Shannon, P., Hanley, N., Spash, C., DeGroot, J., Macmillan, D. and Gelan, A. (2003). Forests' Role in Tourism. Main Report Final to the Forestry Commission.

<sup>69</sup> There is no information on the extent to which the existence of the Estate influenced the planning of visits by 'Other UK and overseas' visitors. In principle it is the factors that determine the trip that generate the benefits to the Scottish economy. In the absence of this information we allocate the daily spend to the Estate where this is the main destination on that day.

approach. This is to treat day trip expenditure as displaced but include residents making overnight trips as potentially additional.

Expenditures are thus classified as (data from Table 6.1):

- Associated with Estate visits: £158m per year (economic contribution)
- Additional injections due to Estate £102-138m per year (economic impact).

Bryden et al. (2010)<sup>70</sup> in their study of nature based tourism in Scotland make the point that tourism expenditures recorded on the day of a visit will underestimate the total expenditure related to recreational trips because capital items are excluded unless bought that day. For example, clothing, bikes and other kit are mainly purchased at other times of year but part of this expenditure may be driven by the expectation (in our case) of visits to Scotland's National Forest Estate. To the extent that such capital purchases are unaccounted for, the figures given above are underestimates of spend, and therefore of economic contribution and impact.

## **6.6 Economic contribution and impact**

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Expenditures can be converted into an impact on jobs and incomes. Spending has direct impacts on recipient businesses but also indirect and induced effects. These occur as the initial expenditure translates through backward linkages to create additional employment including spending by employees. None of the recreational surveys tracked the economic impacts. We therefore need evidence from other sources.

Most other studies do not use *de novo* estimates because of the difficulty of tracking beyond the first round impacts. Christie et al. (2006) use a Type II<sup>71</sup> employment multiplier of £34,000 per FTE job to convert forest visitor expenditure to local jobs and incomes. Bryden et al. (2010) used a similar figure of £35,000 spending to 1FTE job for converting visitor spend into FTEs in Scotland. They considered this an appropriate average which took into account the main sectors of spend by visitors. We assume this takes into account both indirect and induced effects.

RSPB (2011)<sup>72</sup> in a study on the economic impact of RSPB reserves assumed that £44,000 of local spend supported 1FTE (taking direct and indirect employment into account). Updating these coefficients to 2014 using the Consumer Prices Index (CPI) gives £41,900 (Christie), £40,700 (Bryden), and £46,400 (RSPB). All these studies apply a Type II employment multiplier and the mean is a spend of £43,000 to support 1 FTE.

We also used a different approach for estimating the impact on direct jobs. This was based on IBDR<sup>73</sup> data which gives the mean ratio of employment to turnover for SIC categories closest to the expenditure types recorded in the All Forests 2

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<sup>70</sup> Scottish Natural Heritage (2010). Assessing the economic impacts of nature based tourism in Scotland. Report 338. <http://www.snh.gov.uk/docs/B726802.pdf>

<sup>71</sup> Type I multipliers sum together direct and indirect effects while Type II multipliers also include induced effects. Direct effects are those within the sector and indirect effects are those in other sectors. As a result of the direct and indirect effects the level of household income throughout the economy will increase and a proportion of this will be spent on final goods and services: this is the induced effect.

<sup>72</sup> RSPB (2011). RSPB Reserves and Local Economies. RSPB. [http://www.rspb.org.uk/Images/reserves\\_localeconomies\\_tcm9-290937.pdf](http://www.rspb.org.uk/Images/reserves_localeconomies_tcm9-290937.pdf)

<sup>73</sup> Inter-Departmental Business Register, Standard Industrial Classification.

survey. Table 6.2 shows the turnover/employment ratios and the direct employment associated with expenditures of the 'Other UK and overseas' category of visits.

**Table 6.2 Employment: Scotland's National Forest Estate 'Other UK and overseas' visitors**

Category of expenditure	Mean daily expenditure per visit (£)	Turnover associated with 1 job (£)	Direct employment (jobs per 1000 visits)	Total employment (jobs per 1000 visits)
Food and Drink	21.50	67,792	0.317	0.412
Transport	13.44	107,212	0.125	0.188
Shopping	4.71	44,612	0.106	0.137
Admission fees	1.93	37,329	0.052	0.067
Equipment/other	0.47	78,003	0.006	0.008
Other	0.93	44,612	0.021	0.027
Accommodation	49.99	35,126	1.423	1.850
<b>TOTAL</b>	<b>92.97</b>		<b>2.05</b>	<b>2.69</b>

### 6.6.1 Employment

Expenditure will also be associated with direct, indirect and induced employment. The Type II employment multiplier<sup>74</sup> is 1.3 for all categories except transport (1.5). Table 6.3 shows the total (direct+indirect+induced) employment generated by each category of visit. A much higher expenditure is required by day trippers because their expenditure is mainly on food and drink and transport for which the turnover per job coefficients are high (see Table 6.3). The overall coefficient for all types of Estate visitor (weighted by expenditure) is £37,630 per job.

The overall figure for all visitors (£37,630, Table 6.3) is lower than used by Bryden, Christie and RSPB. This reflects that the IDBR records employment (including part time employment) rather than FTE jobs and the expenditure required to generate or support an FTE would be higher than £37,630. For comparative purposes it is preferable to work in FTE units so we scale down employment by 12.5%<sup>75</sup> to the £43,000 expenditure per FTE based on the literature reviewed above. The expenditure of £158m associated with visits to the National Forest Estate is thus associated with 3,790 FTEs (Table 6.3).

However, not all visitor expenditure can be treated as an additional injection into the Scottish economy. Excluding Scottish day trippers, and allowing for uncertainty over the extent to which overnight residents inject additional expenditure, gives additional employment of 2,560-3,500 FTEs.

<sup>74</sup><sup>74</sup> <http://www.scotland.gov.uk/Topics/Statistics/Browse/Economy/Input-Output/Downloads/IO1998-2011latest>

<sup>75</sup> 37,630 is 87.5% of 43,000.

**Table 6.3 Employment associated with visitor expenditure (Scotland's National Forest Estate)**

	<b>Expenditure per job (direct+indirect+induced) (£)</b>	<b>Estate employment (jobs)</b>	<b>Estate employment (FTEs)</b>
Other UK and overseas visitors'	£34,560	2,927	2,560
Scottish visitors on overnight visits	£34,630	1078	943
Scottish visitors on a day trip	£59,500	325	284
<b>All visitors weighted by expenditure</b>	<b>£37,630</b>	<b>4,330</b>	<b>3,790</b>

### 6.6.2 Gross Value Added

GVA<sup>76</sup> is, in broad terms, the value of goods and services produced less the cost of inputs and raw materials. Value added can be calculated at business, sector, regional or national level. GVA is used to measure the performance of the national economy. Where expenditure by recreational visitors represents injections into the economy it will normally increase the value added of recipient businesses and contribute to the size of the economy.

**Table 6.4 Gross Value Added: 'Other UK and overseas' visitors**

<b>Category of expenditure</b>	<b>Mean daily expenditure per visit (£)</b>	<b>Direct GVA (£ per £ expenditure)</b>	<b>Direct GVA (£ per visit)</b>	<b>Total GVA (£ per visit)</b>
Food and Drink	21.50	0.239	5.14	8.22
Transport	13.44	0.477	6.41	9.62
Shopping	4.71	0.239	1.13	1.69
Admission fees	1.93	0.239	0.46	0.69
Equipment/other	0.47	0.239	0.11	0.17
Other	0.93	0.239	0.22	0.33
Accommodation	49.99	0.531	26.54	45.13
<b>TOTAL</b>	<b>92.97</b>		<b>40.02</b>	<b>65.85</b>

It was not possible to obtain GVA data for businesses at the SIC code level. Instead aggregated information was used from Scottish Annual Business

<sup>76</sup> The headline measure of economic growth produced by the Scottish Government is GDP at basic prices, also known as total Gross Value Added (GVA), which is based on the output of all industries in the economy. GDP at basic prices does not include the value of taxes (and subsidies) on products (such as VAT and excise duties, which are usually paid by consumers). Product taxes (and subsidies) are measured at UK level but cannot be easily broken down to specific industries or areas of the UK.  
<http://scotland.gov.uk/Topics/Statistics/Browse/Economy/gdp>

Statistics (2012)<sup>77</sup>. We applied the ratio of expenditure to GVA for relevant sectors to obtain the direct GVA impact, and then applied a GVA multiplier from the Scottish Input-Output Tables<sup>78</sup> to obtain the total (direct+indirect+induced) GVA effects. The GVA multipliers vary from 1.5 to 1.7 depending on the category of business. Table 6.4 shows the calculation for 'Other UK and overseas visitors' for which the total GVA per visit is £65.8 per visit. Using only the proportion of visits where forestry was the main designation reduces this to £34.2 per visit.

Visitor expenditure is converted to GVA in recipient businesses at a rate of £1.41-£1.70 per £ expenditure (Table 6.5). Other and overseas visitors contribute most to GVA (£71.6m) and Scottish day trip visitors least (£11.3m). The total GVA associated with forest visitor expenditure of £158m is £109.6m.

**Table 6.5 GVA generation (direct+indirect+ induced)**

	<b>Expenditure (£ per £ GVA)</b>	<b>Total expenditure (£m per year)</b>	<b>Total GVA (£m per year)</b>
Other UK and overseas visitors'	1.41	101.2	71.6
Scottish visitors on overnight visits	1.40	37.3	26.6
Scottish visitors on a day trip	1.71	19.3	11.3
<b>Total</b>		157.8	109.6

As with the employment effects, the GVA contributions in Table 6.5 do not all result in additional impacts in the economy. The total spend translates into an impact in Scottish GVA in the range £72m to £98m. These estimates should be treated as indicative only because of the aggregated nature of the business statistics for GVA.

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<sup>77</sup> <http://www.scotland.gov.uk/Topics/Statistics/Browse/Business/SABS/ScotSection>

<sup>78</sup> <http://www.scotland.gov.uk/topics/statistics/browse/economy/input-output/multipliers>

## 7 Annex 2: Estimate of 2013/14 economic contribution

During the project it was agreed that an attempt would be made to update the 2012/13 analysis to 2013/14 without repeating the survey. The aim was to provide an approximate analysis based on the 2012/13 results and published data. This would give an indication of any major differences in income, expenditure and employment that occurred between 2012/13 and 2013/14. No new analysis of the contribution to recreation and tourism was made.

### 7.1 Expenditure and income

The 2013/14 accounts were downloaded to produce details of all the relevant transactions. These are summarised in Table 7.1. After consolidation there were 4,284 different clients trading with FES. Whilst the majority of the major trading partners were the same as those in the previous year 35% of the clients (1,491)<sup>79</sup> differed from those in 2012/13.

**Table 7.1 Cash flows (ex VAT) by activity (FES accounts 2013/14)**

Category	2012/13				2013/14			
	Inflow	%	Outflow	%	Inflow	%	Outflow	%
	(£'000)		(£'000)		(£'000)		(£'000)	
Timber production, planting and forest management	52,566	84%	27,672	34%	63,203	84%	28,569	36%
Deer management	1,667	3%	2,797	3%	1,709	2%	2,696	3%
Environment and heritage	18	0%	3,763	5%	22	0%	3,388	4%
Communities, recreation and tourism	646	1%	6,692	8%	1,033	1%	6,984	9%
Renewable energy	3,456	6%	19	0%	5,214	7%	43	0%
Property, legal, development, sales and acquisitions	3,676	6%	14,623	18%	2,996	4%	14,310	18%
Civil engineering including roads	82	0%	13,604	17%	116	0%	12,618	16%
Administrative	315	1%	,3673	5%	238	0%	3,798	5%
Other	37	0%	78	0%	1,016	1%	779	1%
Planning	1	0%	933	1%		0%	1,111	1%
Non-capital machinery	246	0%	3,988	5%	59	0%	2,974	4%
Capital machinery	0	0%	3,539	4%		0%	2,348	3%
<b>Total</b>	<b>62,710</b>	<b>100%</b>	<b>81,381</b>	<b>100%</b>	<b>75,607</b>	<b>100%</b>	<b>79,617</b>	<b>100%</b>

<sup>79</sup> However, many of these were small transactions and some may simply reflect changes in name or contact details.

The 2013/14 accounts show a 20% increase in income from timber production, planting and forest management and a 21% increase in overall income. Expenditure in 2013/14 was slightly lower than in 2012/13. The allocation of income and expenditure between the different categories in Table 7.1 while broadly similar between the two years does reveal changes. For example there was a higher expenditure on timber production in 2013/14 but less on civil engineering, environment and heritage.

### 7.1.1 Expenditure-related direct employment

Without new (2013/14) survey information it was decided to use the 2012-13 survey responses for those businesses that responded to the 2012/13 survey. There were fewer clients (65) in the survey returns than in 2012/13 because a number of those responding to the survey did not trade with FES in 2013/14. Hence there is a greater reliance on IDBR data for the 2013/14 estimates.

The assumption in using the survey responses is that the 2012-13 turnover to employment ratio is unchanged. This is a reasonable approximation over a one year time change. Where a business/organisation was not in the survey or did not respond to the questionnaire we use the same process as outlined in Section 3.1 of using IDBR SIC-based information on turnover and employment.

Table 7.2 shows direct employment of 890 FTEs associated with FES expenditure in 2013/14. FES own staff employment is marginally higher in 2013/14 and, when this is added, the total direct employment is 1,713 FTEs. This is slightly lower than in 2012/13 (1,770 FTEs), which may be explained at least in part by the lower expenditure in 2013/14.

**Table 7.2 Estimated direct and total FTE employment from FES expenditure and own employment (Scotland)**

Source of information	Expenditure (£m)	Direct employment (Scotland) (FTEs)	Total (Direct, indirect and induced) employment (Scotland) (FTEs)
Survey responses	12.28	125.9	228.8
IDBR individual business data	39.65	448.4	762.1
IDBR SIC means	25.13	215.2	359.4
Other (imputed)	2.56	33.1	69.0
<b>Total</b>	<b>79.62</b>	<b>822.6</b>	<b>1419.3</b>
FES/National estate staff		890.3	1095.4
<b>Total</b>		<b>1712.9</b>	<b>2514.7</b>

Based on the analysis of postcodes the direct employment from FES expenditure in the rest of the UK was 141 FTEs. This is additional to the 823 direct jobs indicated in Table 7.2.

### **7.1.2 Expenditure-related total employment**

Expenditure by FES will generate additional indirect and induced employment due to backward linkages in the economy. The indirect and induced employment was estimated by applying Scottish Type II 2011 employment multipliers<sup>80</sup> as described in Section 3.2 was used to derive multipliers for all of the individual businesses trading with FES.

Table 7.2 gives the total employment estimate associated with FES expenditure and staff as 2,515 FTEs. This is very similar to the 2012/13 estimate (2,514) (Table 3.1) with the small reduction in expenditure compensated for by slightly higher multiplier effects reflecting changes in the mix of purchases and characteristics of suppliers.

## **7.2 FES outputs and associated employment**

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### **7.2.1 Timber primary processing**

In the 2012/13 analysis we based the employment associated with primary processing of timber on the wider forestry sector report using the proportion of the timber output to *pro rata* the sector results. Since there is no 2013/14 sector analysis this approach cannot be repeated to produce a 2013/14 estimate of employment supported by estate produced timber. Instead we derived employment from the 2012/13 estimates using FES information on timber sales and receipts<sup>81</sup>.

Receipts from 'timber production' were 20.2% higher in 2013/14 (£63.2m) compared with 2012/13 (£52.6m) (Table 7.1). This could be due to higher output, higher prices or a combination of both. Discussion with FES technical staff indicated that the unit price for timber sold by FES was 1% lower in 2013/14 than in 2012/13 whereas volume despatched was higher by 15.9%. The differences between the physical and accounting figures may reflect different timings in the records and the fact that the 'timber production' receipt category in the accounts did not all derive from timber sales. We considered the physical measurements a more reliable indication of timber output and, after adjusting for price changes, assume a 15% increase in volume received by processors.

The question then remains as to how the increased volume impacts on employment. Without a detailed analysis of any change in the type of timber processing (and associated implications for employment) we assume a 15% increase in FTE employment. This is likely to be an upper-end estimate because it does not account for possible improvements in processing technology or labour productivity.

Since total employment associated with timber processing and the associated harvesting and haulage in 2012/13 was 3,994 FTEs, the estimate for 2013/14 is 4,593 FTEs.

### **7.2.2 Deer**

This is a minor output from the National Forest Estate and we assume that deer output and associated employment in processing are unchanged.

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<sup>80</sup> These are the most recent published multipliers.

<sup>81</sup> However, we suggest that in any future economic analysis a survey of timber purchasers is undertaken to obtain more precise information on the purchases of Estate timber by individual firms.

### 7.2.3 Renewables

The *additional* installed capacity commissioned from FES sites in 2013/14 was 209MW giving a total of 789MW at year end. The 209MW capacity increase is almost the same as the capacity added in 2012/13 (217MW). Applying the same RenewableUK employment coefficients as used in Section 3.3.3 gives the following calculation:

Development plus Construction stages	$209\text{MW} \times 3.03 \times 0.67 =$	424 FTEs
Operations & Maintenance	$580\text{MW} \times 0.43 \times 0.67 =$	167 FTEs
<b>Total Direct &amp; Indirect Impact</b>		<b>591 FTEs</b>

We apply the same induced multiplier of 0.25 to give a total estimated impact in 2013/14 of 739 FTEs. This is slightly higher than in 2012/13 because of the maintenance element associated with the increased capacity.

## 7.3 Total employment impact from Estate expenditure, outputs and services

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The total employment impact in Scotland (excluding tourism and visitor effects) is 7,881 FTEs (Table 7.3). This is the summation of the impacts from expenditure on the management of the National Forest Estate together with the impacts from estate outputs and services. The main drivers of employment are FES expenditure to suppliers, FES own employment and employment associated with primary timber processing. Employment associated with managing the National Forest Estate is thus estimated to be about 9% higher in 2013/14 than in the previous year. This is mainly due to a higher timber output and increased installed wind power capacity.

**Table 7.3 Total employment impact in Scotland (excluding visitor impacts)**

	Total employment Impact (FTEs)(2013/14)	Total employment Impact (FTEs)(2012/13)
FES/National estate staff	1,095	1,090
FES operational expenditures	1,419	1,425
Timber harvesting, haulage and processing	4,593	3,994
Deer processing	35	35
Renewables (Wind turbine related)	739	681
<b>Total</b>	<b>7,881</b>	<b>7,225</b>

There was no new survey information on use of the National Forest Estate by visitors and tourists in 2013/14. If we assume broadly the same employment impact as in 2012/13 then 3,790 FTE jobs<sup>82</sup> were supported by visitor and tourist expenditure on visits to the National Forest Estate. The total employment in Scotland supported by the National Forest Estate in 2013/14 is thus estimated at around 11,671 FTEs (compared with 11,015 jobs in 2012/13).

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<sup>82</sup> 3,030 of these jobs were estimated to be additional.

## **7.4 Conclusions**

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The analysis of the 2013/14 accounts is less reliable than that for 2012/13 since the majority of the information was derived and not based on *de novo* surveys. It is therefore best treated as indicative of change rather than as a precise analysis.

With the caveat expressed above, the key conclusions for employment in Scotland in 2013/14

- ❑ Forest Enterprise expenditure, excluding payments to staff: £79.61m.
- ❑ Forest Enterprise/FC staff employment impact: 1,095 FTEs
- ❑ Total employment associated with this expenditure and the outputs from the National Forest Estate: 6,786 FTE jobs. This does not include employment associated with secondary processing of timber which could be substantial.
- ❑ On the assumption that the employment associated with the tourism spend is the same as in 2012/13: 3,790 FTE jobs associated with the National Forest Estate of which 3,030 were additional and dependent on the National Forest Estate.
- ❑ Total employment in Scotland supported by the National Forest Estate: 11,671 FTE jobs. An additional 141 direct jobs were supported in the rest of the UK.

There are two major differences from 2012/13 that impact on employment. First, timber output was substantially higher in 2013/14, and this is associated with increased employment in harvesting and primary processing. Second, there was an increase in installed onshore wind capacity which is associated with higher employment in maintenance and construction.

Future employment supported by management of the Estate will depend primarily on its timber output, the extent of expansion in wind turbine construction and the numbers of visitors to the National Forest Estate and their spending.