

## **Eskdalemuir**

A comparison of forestry  
and hill farming; productivity  
and economic impact

## Contents

<b>Executive Summary</b>	<b>3</b>
<b>1.0 Introduction and Objectives</b>	<b>4</b>
<b>2.0 Forestry survey and model</b>	<b>6</b>
<b>3.0 Agricultural output estimates</b>	<b>10</b>
<b>4.0 Comparison of forestry and agriculture</b>	<b>12</b>
<b>5.0 Employment</b>	<b>13</b>
Appendix 1: Eskdalemuir forestry expenditure	14
Appendix 2: Agricultural physical output	15
Appendix 3: Agricultural enterprise margins	16
Appendix 4: Equivalent financial input and output of agriculture and forestry at Eskdalemuir	18
Appendix 5: Employment estimates	19

# Executive Summary

## Comparisons

- **This study makes a specific economic comparison between an established productive conifer forest at Eskdalemuir and agriculture on an equivalent area of land. These findings may not necessarily apply to other situations and regions of Scotland.**
- The forest of Eskdalemuir covers 20,000ha of former hill sheep grazing land in the south of Scotland. This study sets out to compare the output and employment achieved on this land as it is now, in forestry, compared to the output of an equivalent area of land remaining in hill sheep farming today.

## Productivity

- **Forestry produces three times the economic output of farming before subsidy**
- **Forestry's spending in the local economy is double that of farming**
- **Forestry trades at a significant surplus, farming at a loss, before subsidy**
- The results of the study indicate that once in a sustainable production cycle, forestry generates around three times the economic output of hill sheep farming before subsidy payment. Forestry also results in almost double the level of spending in the local economy as agriculture.

## Employment

- **Forestry supports the same number of jobs as farming**
- Forestry at Eskdalemuir is currently generating 11% more direct employment and 30% more total employment (direct and indirect) than agricultural use (on an equivalent land area). These results reflect the higher physical and financial output of the forestry activity at present.
- Future modelling shows that timber output and restocking activity will drop to a lower but more sustainable long term level as the forest approaches a 'normalised' 40 year rotation. Employment will also drop to the same level as agricultural use.

## Public subsidy

- **Farming requires a public subsidy of £22,600 per FTE to survive – Forestry receives a modest contribution (one sixth that of farming) towards the provision of public benefits**
- Hill sheep farming requires a direct payment subsidy at ~60% of output before subsidy to survive, whilst forestry currently receives a small (~3% of output) grant contribution towards environmental and forest improvement.
- Once established forestry is also much less dependent on annual subsidy payments to maintain viability. Forestry generates a significant trading surplus before subsidy whilst hill farming trades at a loss.

**Table 1: Estimated costs and returns for different land uses on 20,000ha of land at Eskdalemuir.**

	Forestry - normalised 40yr rotation			Agriculture – specialised sheep SDA		
	£ Total	£ per ha	£ per employee	£ Total	£ per ha	£ per employee
Output	9,902,957	495.15	119,978	3,085,305	154.27	37,110
Less Input costs	6,920,531	346.03	83,845	3,523,651	176.18	42,382
Surplus or (deficit)	<b>2,982,426</b>	<b>149.12</b>	<b>36,133</b>	<b>(438,346)</b>	<b>(21.92)</b>	<b>(5,272)</b>
Grants and subsidies	315,134	15.76	3,818	1,882,001	94.10	22,637

Source: SAC Consulting

# 1.0 Introduction and Objectives

## 1.1 Introduction

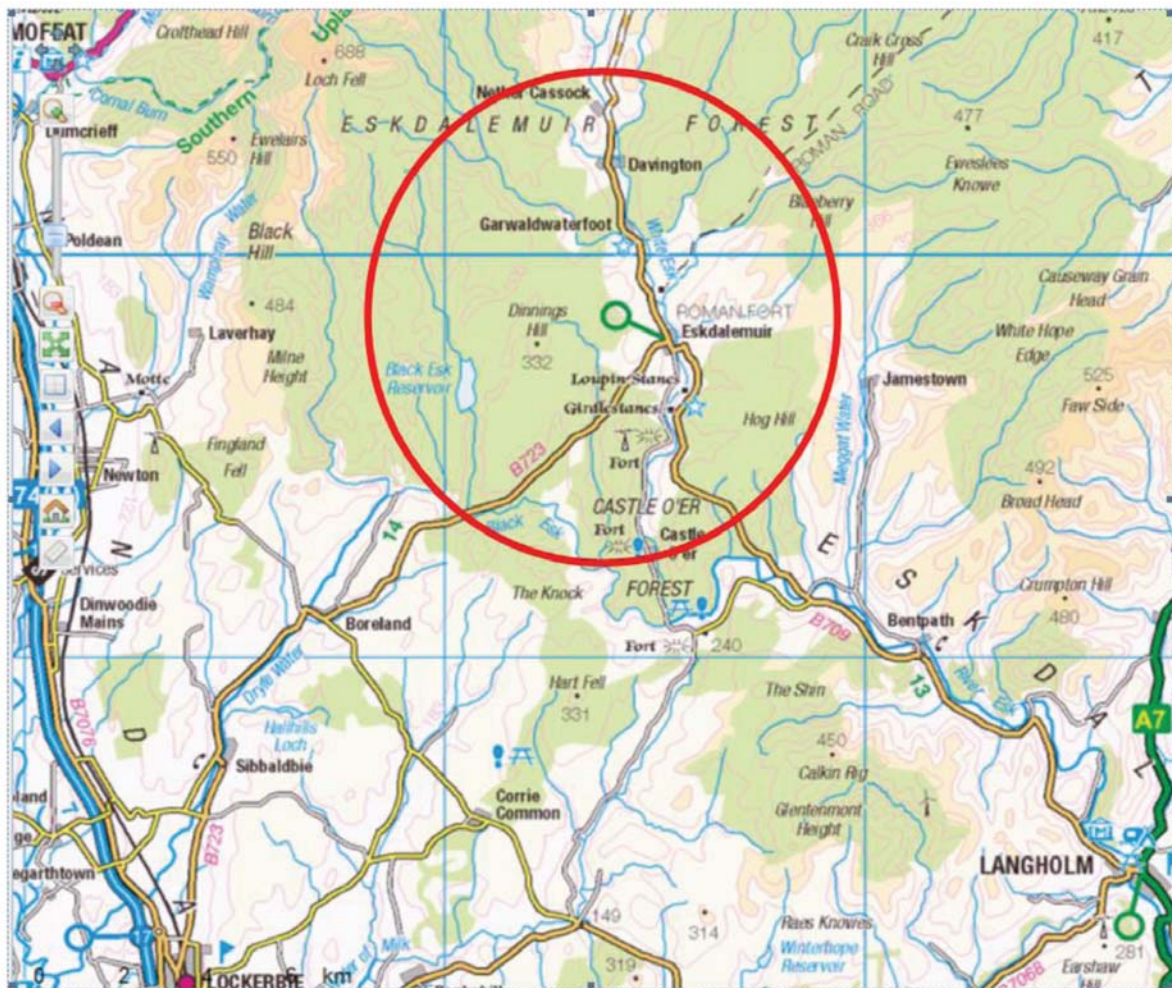
SAC Consulting has been commissioned by Confor to undertake a study comparing the economic and employment effects of different land uses on hill land in the Eskdalemuir area to the north east of Lockerbie in south west Scotland.

Agricultural data on income, subsidy payments and input costs has been obtained from the annual Scottish Government Farm Accounts Scheme for the South of Scotland area based on the Specialist Sheep SDA farm type.

Forestry data on timber sales and prices, management costs and grant income has been obtained from a survey of forest managers at Eskdalemuir.

The forestry figures have then been used to develop a longer run modelling exercise for the 20,000 ha of private forestry at Eskdalemuir. This analysis estimates average annual economic and employment effects over the 40 year forestry production cycle to compare with agricultural production.

Figure 1: Location of Eskdalemuir study area



Source: Ordnance Survey under licence

---

## 1.2 Objectives

1

Identify approximate current (2011 and 2012) annual production from forestry, value at forest gate, value delivered to market, and amount of public subsidy.

3

Provide an easily read comparison of financial and employment outputs from forestry and farming use of the area – i.e. how many jobs is forestry supporting at Eskdalemuir now, and how does this figure compare with how many jobs the same land would support if under agriculture?

5

Assuming farming had continued today at Eskdalemuir over the full 20,000 ha area, identify at today's prices, similar agricultural production and values to (1) and (2) above.

2

Identify approximate current (2011 and 2012) number of jobs in forestry and delivered to market – covering establishment, ongoing management, deer & pest control, harvesting and haulage.

4

Provide a comparison of how much public money went into forestry at Eskdalemuir last year, compared with what would have been paid in agricultural subsidies.

---

# 2.0 Forestry survey and model

## 2.1 Forest survey

The area of private forestry in Eskdalemuir is estimated at around 20,000ha following establishment in the 1970s and 1980s. The area is split into a number of separately owned forests and managed by a number of different forest management companies.

In order to determine current management activity, financial performance and employment effects SAC Consulting prepared a survey and with the assistance of Confor staff sent it to all known forest managers of the constituent forests in the area.

The response from forest managers at Eskdalemuir was extremely good, with all nine managers representing 100% of the forest area responding.

Survey results were then compiled to provide representative figures for the forest as a whole. The key data determined for use in the following forestry model were as follows;

- Average timber yield in tonnes per ha at felling
- Average timber prices in £ per tonne standing and delivered to processor
- Average costs of forest operations in £ per ha including;
  - Restocking
  - Establishment
  - Harvesting
  - Haulage
  - Pest control
  - Management and professional fees
- Average employment levels by activity

## 2.2 Forest modelling assumptions

As a relatively young forest, established over a period of a decade or so, the production profile of the forest at Eskdalemuir has yet to reach a steady state. Currently the harvested area and timber output is at a relatively high level and this will continue for 5 to 10 years before dropping back again for another decade or so while younger restocked forests mature. Within 20 years it is expected the forest will move close to a more stable long term production profile.

In order to present figures more representative of the forest in the medium to longer term, a model has been developed. The assumptions behind this model are as follows;

### Productive forest area

- When established the total forest area of 20,000ha would have comprised 10% bare land and 90% (18,000ha) productive conifer forest. This would have been compliant with the UKFS<sup>1</sup> of the day and the majority of the crops being harvested would be certified under FSC<sup>2</sup>. In future a smaller proportion will be established as productive conifer under today's UKFS. However, total timber volumes produced in the future from the productive conifer crop may not decrease significantly due to the use of significantly improved genetic planting stock, the benefits of localised shelter arising from a more diverse forest structure and improved silvicultural techniques. The forest will also give additional public value for biodiversity, water protection and recreation.

*1 UK Forest Standard*

*2 Forest Stewardship Council*

---

## Timber output

- The forest at Eskdalemuir was mainly established over a relatively short period of around 10 years in the 1970s and early 1980s. The productive lifespan of commercial conifers in the area is typically around 40 years with a range between 30 and 50 years depending on the site. Currently much of the forest is at, or approaching, maturity and felling volumes are elevated as a result. Timber production will be maintained at this level for most of the next decade before levelling out into a more consistent annual felling pattern.
- The average rotation length achieved of 40 years will then result in felling of 1/40th of the productive forest per year which equates to 450 ha per year
- This area of felling will yield an annual timber crop of 428t per ha (the average from the survey) giving a total timber output across the 450ha felled of 192,403t
- The average timber price achieved for this will be the same as averaged from the survey of £27.54/t standing and £51.47/t delivered processor.
- The annual value of timber sales will therefore equate to £5.30m at the forest gate and £9.90m delivered to the processor.

## Subsidy income

- It is assumed that public subsidy to the forest will continue at the same rate per ha as obtained from the survey of £15.76 per ha of total forest estate (including bare land) to give a total annual subsidy income across the 20,000ha of £315,134 pa.
- Subsidy to the forest takes the form of a contribution towards the public benefit of restructuring the forest, whereby at considerable cost to the forest owner, uneven ages of crop are created, with more diverse tree species, and open ground is left for wildlife and biodiversity

## Input costs

- It is assumed that the costs of forest operations will continue at the same rate per ha as obtained from the survey as detailed below. Average costs of forest operations in £ per ha including;
  - Restocking on 450 ha - £1,819 per ha
  - Establishment on 1,350 ha (3yrs) - £170.76 per ha
  - Deer and pest control on 20,000 ha - £5.05 per ha
  - Harvesting on 450 ha - £5,869 per ha
  - Haulage on 450 ha - £4,367 per ha
  - Roading on 20,000 ha - £21.56 per ha
  - Management and professional fees on 20,000 ha - £18 per ha
- Forest managers state that current roading costs appear quite high, but Eskdalemuir is a large complex with some long in-forest haul routes, and as they are dealing with the first harvest interventions they anticipate the need to construct more spur roads to future coupes.
- Outwith the survey of forest managers, additional costs have been added to reflect the notional land rental costs for land at Eskdalemuir. While forestry land is seldom if ever rented, the farming input costs include a cost for rent and borrowings and accordingly for better comparison this notional cost is included against forestry. The figure used has been taken from Scottish Government survey results; Tenanted Agricultural land in Scotland 2012, where the 2011 average rent paid for LFA land was £19 per hectare.

Full details of the results are contained in the following section.

---

## 2.0 Forestry survey and model

### 2.3 Forest modelling results

**Table 2: Eskdalemuir timber output**

Year	Felled (ha)	Yield (t/ha)	Quantity (t)
A) 2011	641	436	279,524
B) 2012	690	419	288,979
C) Annual normalised 40 yr rotation	450	428	192,403

*Note: totals may not tally with stated yield figures due to rounding*

**Table 3: Eskdalemuir timber sales and revenue**

Year	Timber price basis	Value (£)	Price (£/t)
A) 2011	Standing	7,756,800	27.75
	Delivered processor	14,465,384	51.75
B) 2012	Standing	7,897,799	27.33
	Delivered processor	14,795,729	51.20
C) Annual normalised 40 yr. rotation	Standing	5,298,765	27.54
	Delivered processor	9,902,957	51.47

**Table 4: Eskdalemuir grant income**

Year	Total (£)	Total (£/ha)
A) 2011	239,945	12.64
B) 2012	374,190	18.71
C) Annual normalised 40 yr. rotation	315,134	15.76

*Source: SAC Consulting survey of forest managers*



**Table 5 – Eskdalemuir forestry expenditure**

Forest operation	A) 2011	B) 2012	C) Annual normalised 40 year rotation
Restocking	1,093,516	1,000,658	818,605
Establishment	202,621	302,252	231,873
Deer and pest control	96,751	100,184	101,054
Harvesting	3,830,395	3,974,426	2,641,262
Haulage	2,880,634	2,924,139	1,965,208
Roading	379,042	461,139	431,126
Management & professional	328,036	356,780	351,403
Notional land rental*	360,620	379,943	380,000
<b>TOTAL</b>	<b>9,171,614</b>	<b>9,499,521</b>	<b>6,920,531</b>

Source: SAC Consulting survey of forest managers, except \* calculated by SAC Consulting using average rental values from the Scottish Government survey Tenanted Agricultural Land in Scotland, 2012 See Appendix 1 for full details.

## 2.4 Additional costs financing restocking and establishment

The costs and returns detailed in the previous pages do not account for the opportunity cost of forest planting and establishment which must be made up to 40 years in advance of the main income stream from final felling.

In the past the cost of financing the planting of forests at Eskdalemuir was met by a combination of government grants, tax incentives and private capital. Looking ahead to the next 40 years, the cost of restocking of commercial forest areas must now be met by private capital. This carries a financing cost which has been calculated in the following way.

The annual cost of financing restocking and establishment has been calculated on a capital and interest repayments basis over the period; 40 years for restocking and 38 years (for establishment). The interest rate has been taken as the average of the Bank of England base rate over the last 10 years to December 2013 which equals 2.65%. The results are shown in Table 6 which reveals an annual financing cost of £657,798. This cost could be met from the annual surplus expected to be generated by the forestry activity. Alternatively this cost may be met separately by the private forest owners who may benefit from tax benefits on their forest investment.

**Table 6 – financing costs**

Activity	Expenditure (£)	Interest rate (%)	Term of loan (yrs.)	Total Interest cost (£)
Restocking	818,605	2.65	40	518,964
Establishment	231,873	2.65	38	138,834
<b>Total</b>				<b>657,798</b>

Source: SAC Consulting and Bank of England

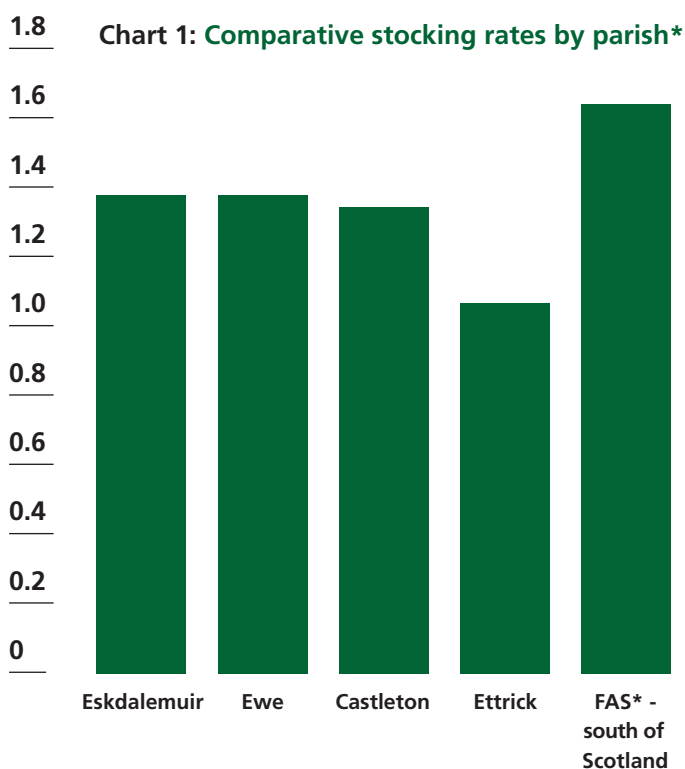
# 3.0 Agricultural output estimates

## 3.1 Farm Accounts Survey background

Physical and financial data for hill farming relevant to the Eskdalemuir area for this study was drawn upon the Scottish Government's annual Farm Accounts Survey (FAS) for Scotland. Annual data collection for the FAS is carried out by Scotland's Rural College (SRUC) on behalf of the Scottish Government (SG). Currently, around 500 fully-reconciled farm accounts are compiled each year, from information supplied by co-operating farmers. Data collected includes financial, economic and some physical information on outputs, inputs, income and balance sheets. The physical data was used to classify the farm according to its type and size. Full details of the survey methodology are given on the Scottish Government's web site<sup>3</sup>.

## 3.2 Farm data used in the study

For the purposes of this study, the most appropriate farm type within the FAS representative of farming in the Eskdalemuir and surrounding hill parishes is the Specialised Sheep SDA. FAS data is collated both nationally and by region. For this study data has been selected from farms in the south of Scotland only (Scottish Borders and Dumfries and Galloway) from the financial year 2010/11.



Source: Scottish Government June Census and Farm Accounts Scheme. Note – \* for specialised sheep SDA farms

<sup>3</sup> <http://www.scotland.gov.uk/Topics/Statistics/Browse/Agriculture-Fisheries/Publications/FASmethod/FASmethod2012>

This data was obtained from a total of 15 farms from across the region which averaged 445ha in size (further details of farm and enterprise physical parameters are given in Appendices 2 and 3). The average labour requirement was 1.2 Full Time Equivalents per farm. Average stocking per farm comprised 736 ewes, 8 suckler cows and 18 other cattle. Average ewe stocking rates were 1.65 ewe per ha from the survey which is considerably higher than the stocking rates seen in the remaining sheep farms in Eskdalemuir and surrounding parishes (Table 6 below). This suggests that the physical and financial performance of agriculture in Eskdalemuir is lower than the average seen across upland units in the south of Scotland.

The financial results from these farms have then been extrapolated to represent the impact of this type of farming on an area of hill land equivalent to the 20,000ha at Eskdalemuir. These results are displayed in Table 7.

### 3.3 Results

**Table 7 – agricultural financial output – specialised sheep (SDA)  
Hill area equivalent to Eskdalemuir 2011/12**

<b>FINANCIAL OUTPUT</b>	<b>£</b>
Total Crops	23,822
Cattle	318,387
Sheep	2,300,120
Other income	-7,666
Non farm income	450,642
<b>Total Output</b>	<b>3,085,305</b>
<b>Total Inputs</b>	<b>3,523,651</b>
<b>Trading surplus (deficit)</b>	<b>(438,346)</b>
<b>Total Grants &amp; Subsidies</b>	<b>1,882,001</b>
Of which:	
LFASS	416,007
Single Farm Payment	1,400,952
Other(£)	65,042
<b>FARM BUSINESS INCOME Published</b>	<b>1,494,732</b>

Source: Scottish Government Farm Accounts Scheme – South of Scotland data set (Scottish Borders and Dumfries and Galloway)

# 4.0 Comparison of forestry and agriculture

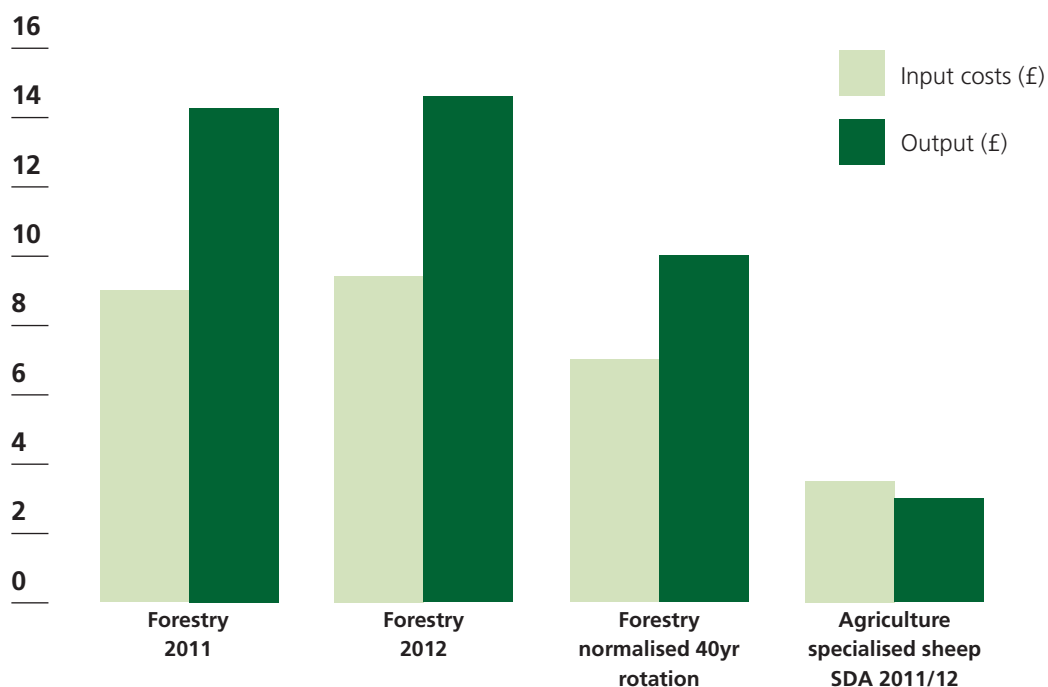
Financial results from the survey of forest managers at Eskdalemuir were then compared with those produced by hill sheep farms as recorded in the Farm Accounts Scheme for the south of Scotland (see chart 2 below).

These results indicate that in 2012 forestry generated output before subsidy of £14.8m which is four and a half times that generated by agriculture of £3.0m in 2011/12. In the future, once timber output settles at a lower and more consistent normalised rotation, forestry is expected to generate just over three times the economic output of hill sheep farming before subsidy payments.

Forestry also currently generates £9m of spending in the local economy; almost three times that of agriculture. Forestry spending will in future settle down under a normalised 40 year rotation at around double that of agriculture.

*For full results see Appendix 4.*

**Chart 2 – Equivalent financial input and output of agriculture and forestry at Eskdalemuir (£m)**



Source: SAC Consulting survey of forest managers and Scottish Government Farm Accounts Scheme for the south of Scotland

# 5.0 Employment

## 5.1 Outline of the employment effects

Estimates of direct employment were obtained from surveys of farming and forestry activities on an area of hill land comparable to that at Eskdalemuir. From this estimates have been generated of the wider employment impacts of the two sectors on the land itself as well as indirectly in the local economy.

## 5.2 Methodology

### Direct employment

Estimates of direct employment in forestry at Eskdalemuir were obtained from the survey of forest managers and broken down by forest activity (restocking, establishment, harvesting etc.).

Estimates of direct employment in agriculture on an area of hill land equivalent to Eskdalemuir were obtained from the Farm Accounts Scheme 2011/12. This survey details the level of direct employment per farm which was aggregated up to represent at area of 20,000ha.

### Indirect employment

Employment multipliers were used to extrapolate the employment effects on the wider economy. These multipliers

give an estimate of how many indirect jobs are generated by the creation of each direct job by sector. Relevant employment multipliers for each sector and activity were taken from the latest Scottish Input-Output tables<sup>4</sup> (Type I). The full details are given in Appendix 5.

## 5.3 Results

This analysis illustrates that forestry (Scenario A) is currently generating 11% more direct employment and 30% more total employment (direct and indirect) than agricultural use (Scenario C) on an equivalent land area. These results reflect the higher physical and financial output of the forestry activity at present given the elevated timber felling and restocking activity occurring at this stage in the life cycle of the forest.

In the future, timber output and restocking activity will drop to lower but more sustainable long term level as the forest approaches a 'normalised' 40 year rotation (Scenario B). Employment will also drop to the same level as that achieved by agricultural land use on an equivalent land area. Forestry employment will be sustainable at a much lower level of public subsidy per employee estimated to be £3,818 per FTE for forestry compared to £22,637 for agriculture.

**Table 8 – Summary of employment effects of land use at Eskdalemuir**

Activity	Area (ha) of activity per FTE	Area (ha) of activity	Direct employment (FTE)	Direct and indirect employment (FTE)
<b>FORESTRY</b>				
(A) Eskdalemuir - average 2011 and 2012	184	20,000	61.79	108.72
(B) Eskdalemuir - normalised 40 yr. rotation	242	20,000	47.37	82.54
<b>AGRICULTURE</b>				
(C) Farm Account Scheme 2011/12 data for Specialised sheep farming	241	20,000	55.43	83.14

Source: SAC Consulting survey of forest managers, employment multipliers from Scottish Government Input-Output tables latest 2009 4 [www.scotland.gov.uk/Topics/Statistics/Browse/Economy/Input-Output/Downloads/IO1998-2009latest](http://www.scotland.gov.uk/Topics/Statistics/Browse/Economy/Input-Output/Downloads/IO1998-2009latest)

# Appendix 1: Eskdalemuir forestry expenditure

YEAR	FOREST OPERATION	TOTAL COST (£)	AREA (HA)	COST (£/HA)	COST £/T
<b>A) 2011</b>	Restocking	1,093,516	552	1,980	
	Establishment	202,621	1,022	198	
	Deer and pest control	96,751	18,980	5	
	Harvesting	3,830,395	641	5,976	13.70
	Haulage	2,880,634	641	4,495	10.31
	Roading	379,042	18,980	20	
	Management & professional	328,036	18,980	17	
	Notional land rental	360,620	18,980	19	
<b>TOTAL</b>		<b>9,171,614</b>			
<b>B) 2012</b>	Restocking	1,000,658	599	1,670	
	Establishment	302,252	1,918	158	
	Deer and pest control	100,184	19,997	5	
	Harvesting	3,974,426	690	5,763	13.75
	Haulage	2,924,139	690	4,240	10.12
	Roading	461,139	19,997	23	
	Management & professional	356,780	19,997	18	
	Notional land rental	379,943	19,997	19	
<b>TOTAL</b>		<b>9,499,521</b>			
<b>C) ANNUAL NORMALISED 40 YR. ROTATION</b>					
	Restocking	818,605	450	1,819	
	Establishment	231,873	1,350	172	
	Deer and pest control	101,054	20,000	5	
	Harvesting	2,641,262	450	5,869	13.73
	Haulage	1,965,208	450	4,367	10.22
	Roading	431,126	20,000	22	
	Management & professional	351,403	20,000	18	
	Notional land rental	380,000	20,000	19	
<b>TOTAL</b>		<b>6,920,531</b>	<b>20,000</b>		

Source: SAC Consulting survey of forest managers

---

## Appendix 2: Agricultural physical output

### Hill area equivalent to Eskdalemuir 2011/12

AGRICULTURAL PHYSICAL DATA	
Area covered (hectares)	20,000
Number of farms	46
Average size of businesses (Standard Labour Requirement)	–
Average size of farm (hectares)	433
Area of Fodder (hectares)	9
Area of Grass (hectares)	3,036
Number of ewes	31,386
Number of suckler cows	421
Number of other cattle	832

PHYSICAL OUTPUT – SAC FMH system (excl cull stock)	
<b>Blackface ewes</b>	<b>31,386</b>
Young weaned (per dam)	–
Young weaned (total nos)	28,875
Live weight lambs (kg per head)	–
Live weight lambs (total kg)	981,764
<b>Hill suckler cows</b>	<b>421</b>
Young weaned (per dam)	–
Young weaned (total nos)	378
Live weight calves (kg per head)	–
Live weight calves (total kg)	132,463

Source: SAC Consulting Farm Management Handbook and Scottish Government Farm Accounts Scheme for south of Scotland

# Appendix 3: Agricultural enterprise margins

## Hill Breeding Ewes – store lamb production (limited inbye) physical data

Breeds	Blackface	Blackface	North C Cheviot	South C Cheviot
Region	NW & W Highlands	Grampian & S Uplands	North	Border
Ewe hogs wintered	Away	Home	Away	Home
Lamb crops per ewe (avg)	5	4	4	5
Ram flock life (seasons)	3	3	3	3
	<b>/100 ewes tupped</b>			
Rams (no.)	3	3	3	3
Lamb numbers:				
marked	70	95	95	95
weaned/disposed	65	92	92	92
sold finished	0	15	7	15
sold store	40	49	57	54
for flock replacement	25	28	28	23
Ewe numbers:				
draft/cast	15	22	21	18
death	10	5	6	4
Wool sales (kg)	160	180	220	260
Ewe feeding:				
concentrates (kg)	1,875	1,875	1,875	1,875
Tup feeding:				
concentrates (kg)	200	200	200	200
Hay reserve (/annum) (kg)	3,000	3,000	3,000	3,000

### Basis of data:

1. Lambs are assumed sold at or by the autumn sales (estimated price).
2. The range of performance levels on hill farms is very wide, and the aim is to try to reflect the average of these.
3. Finished lambs – assume 34 kg liveweight (15 kg carcass weight).
4. North Country Cheviots may be first tupped as 'young ewes' (two shear), or as (one shear) 'Gimmers'.
5. Mortality in ewe hogs is assumed to be 3%.
6. Ewe concentrate feeding – 18% CP, ideally a balanced compound with feeding of ewes selected on the basis of scanning results. Assumes self feed blocks are used on less accessible hills but expensive per unit of energy, ME range 8.5 to 12 MJ/kg DM, total block intake can range from 25-100 blocks/ 100 ewes.
7. Higher performance can result from better winter nutrition and provision of improved summer grazing for selected ewes, particularly those nursing twins.



## Hill Suckler cows physical data

	Calving period	
	Spring (Feb-Apr)	Autumn (Sept-Nov)
Calves weaned	90%	90%
Month of weaning	October	July
Days to weaning	220	270
Month of sale	October	October
Livewt of calves: at weaning (kg)	235	270
Livewt of calves: at sale/transfer (kg)	235	335
Herd life of cows (years)	7	7
Herd life of bulls (years)	4	4
Cow mortality (%)	1	1
Calf mortality (%)	4.5	4.5
Cow:bull ratio (:1)	35	35
<b>Feeding/cow and calf (winter days):</b>	180	200
silage (t)	5.4	7.5
straw (kg)	–	–
creep feed (kg) (incl. pre sale)	–	250
cow concentrates (kg)	50	200
cow cobs (kg)	50	50
grazing (hill/rough pasture)	>0.5	>0.6
Silage fertiliser (kg N/ha)	125	125
<b>Silage:</b>		
yield (t/ha from 1-cut)	20	20
DM quality (g/kg)	220	220
ME quality (MJ/kg DM)	10	10
Rough grazing (ha)	>0.6	>0.5
Silage & aftermath grazing (ha)	0.27	0.375
<b>Housing system: In cubicles*</b>		
Straw for general use incl. calving pens	0.33	0.42
Straw bedding (if in bedded courts) (t)	1.25	1.50

### Assumptions:

1. Grazing is assumed to be hill grazing with some improvements, carrying a maintenance charge of £50/ grazing livestock unit.
2. Approximate value of Scottish Beef Calf Scheme entered. Based on 90 calves for 100 cows to the bull in 2010.

*Farm Management Handbook  
2011/12*

Cost @ £100/t based on bought in straw.

\*Amend bedding costs for cows overwintered or housed on straw.

## Appendix 4: Equivalent financial input and output of agriculture and forestry at Eskdalemuir

	Forestry 2011	Forestry 2012	Forestry - normalised 40yr rotation Av. 2011/12	Agriculture - specialised sheep SDA 2011/12
<b>£ TOTAL</b>				
Timber output	14,465,384	14,795,729	9,902,957	
Agricultural output				3,085,305
Less Input costs	8,810,994	9,119,578	6,920,531	3,523,651
Surplus (deficit) before subsidy	5,654,390	5,676,151	2,982,426	(438,346)
Grants and subsidies	239,945	374,190	315,134	1,882,001
<b>£ PER HA</b>				
Timber output	762.14	739.79	495.15	
Agricultural output				154.27
Less Input costs	464.23	455.98	346.03	176.18
Surplus (deficit) before subsidy	297.91	283.81	149.12	(21.92)
Grants and subsidies	12.64	18.71	15.76	94.10

Source: SAC Consulting survey of forest managers and Scottish Government Farm Accounts Scheme for the south of Scotland

# Appendix 5: Employment estimates

## A) Eskdalemuir forestry - employment - average 2011/12

Activity	Area (ha) of activity per FTE	Area (ha) of activity	Direct employment (FTE)	Employment multiplier*	Direct and indirect employment (FTE)
Restocking	59	576	9.85	1.5	14.77
Establishment	418	1,728	4.13	1.5	6.20
Deer and pest control	8,145	20,000	2.46	1.5	3.68
Harvesting	31	665	21.37	1.9	40.59
Haulage	48	665	13.79	1.9	26.20
Roading	4,054	20,000	4.93	1.9	9.37
Management, professional (FTE)	3,797	20,000	5.27	1.5	7.90
<b>TOTAL (FTE)</b>	<b>422</b>	<b>20,000</b>	<b>61.79</b>		<b>108.72</b>

Source: SAC Consulting - Confor survey

## B) Eskdalemuir forestry - employment - normalised 20,000ha - 40yr rotation

Restocking (FTE)	59	450	7.69	1.5	11.54
Establishment (FTE)	418	1,350	3.23	1.5	4.84
Deer and pest control (FTE)	8,145	20,000	2.46	1.5	3.68
Harvesting (FTE)	31	450	14.46	1.9	27.47
Haulage (FTE)	48	450	9.33	1.9	17.73
Roading (FTE)	4,054	20,000	4.93	1.9	9.37
Management, professional (FTE)	3,797	20,000	5.27	1.5	7.90
<b>TOTAL (FTE)</b>	<b>422</b>	<b>20,000</b>	<b>47.37</b>		<b>82.54</b>

Source: SAC Consulting - Confor survey

## C) Agriculture - employment - 2011/12 Farm Account Scheme data for Specialised sheep farming on 20,000ha of hill land

	Average farm size (ha)	Nos of farms per 20,000 (ha)	Average nos of FTE per farm	Employment multiplier*	Direct and indirect employment (FTE)
Agriculture	433	46	1.20		
Direct (FTE)			55.43	1.5	83.14

Source: Scottish Government Farm Accounts Scheme (FAS)

Notes FTE = Full Time Equivalent; 1,900 hrs pa

\* - Employment multiplier (Type II) from Scottish Government Input-Output tables 2009

**Prepared for:**

Confor: Promoting forestry and wood

**Prepared by:**

Julian Bell,  
SAC Consulting,  
Rural Business Unit,  
2 Technopole Centre,  
Bush Estate, Penicuik,  
Midlothian, EH26 0PJ  
Tel: 0131 603 7524

*February 2014*