

Harvesting Machine Census 2016



Summary

This was the first census carried out by Forestry Commission since 2001. It was based on an online questionnaire service and was designed to report on the state of the forestry harvesting sector across Great Britain. It describes the resource available within countries and regions, including information on the current workforce, turnover and investment plans.

The relatively low number of responses from Scotland, despite its strong harvesting sector, suggest that it is under-represented in results, which to some extent may also apply to Wales.

There was a general trend of increasing availability of machinery from fewest in the remoter parts of Scotland to most in the regions of England and a comparatively good

presence in Wales. As in previous surveys, harvesters and forwarders were the main machine categories reported and there was a notable proportion of skidders.

The survey indicated a significant number of larger purpose-built wheeled harvesters, many of which were nearly new but compared to previous surveys, the number of processing machines continued to decline. It is likely that the majority of the processors recorded, which were almost entirely based in England, were tractor mounted units used for smaller scale operations.

The majority of forwarders were purpose built eight-wheeled models but larger tractor-trailer units were also frequent. There was a reasonable balance across the countries, although the greatest number were reported in England, and some units were decades old.

Whilst a broad range of skidder winch sizes were reported, there was a preponderance of small, single drum winches and machines based in England. Much of the equipment appeared to be decades old.

There would appear to have been a significant decline in the number of skyline/ cable crane operators since the 2001 census. More skylines were reported from England than Wales or Scotland and the limited evidence suggests a broad range of sizes, makes and ages.

The majority of 'other' extraction systems were in the small scale category of less than 6 tonnes load rating, and these are likely to include some small timber trailers.

Although it is not possible to be precise, the responses suggest a combined turnover in the region of approximately £13M to £23M, comprising £8M to £14M in England, £3M to £6M in Scotland and £2M to £3M in Wales. The majority by number was in the lower to mid-range of up to £¹/₄M.

There were a broad range of planned future investment of all main machine types and it appears that grant funding may be an important factor.

Over three hundred people were employed by respondents, with the larger proportion in England and slightly less than half not employed directly in harvesting itself, although the data does not explain why. There appear to be few people in the under 24 age group, which is reflected in comments that it is difficult or very difficult to attract and retain young operators. Otherwise, the harvesting operator age distribution showed a general balance across the range, albeit with fewer in the youngest category in England and Wales. Roughly one-fifth of the workforce will be likely to be approaching, or of, retirement age within ten years. Although there were

few apprentices, there were roughly equal proportions of respondents who would, and would not, consider employing them in the future.

Results suggest that under half of the people working directly on harvesting do not hold NPTC or Lantra qualifications, although at least one person in each team may do so. Of these, approximately three quarters may also hold the additional FMOCS certification. Most operators have attended Emergency First Aid courses at some point in past years.

Comments reveal an industry having difficulty recruiting and retaining new people, in which the work is hard and returns limited, and which has to compete with higher paid alternatives, including arboriculture.

Introduction

Several harvesting machine censuses have been carried out by Technical Development on behalf of the Forestry Commission over the last 25 years. The most recent of these was in 2001¹, since when there is likely to have been a significant change in machine types, numbers, geographic distribution and age. Development of the forest harvesting capability in Great Britain is very much dependent upon the availability of both finance and skilled operators. Consequently, a strategic policy and planning need was identified in each country by Forestry Commission England and Scotland, and the Welsh Government and Natural Resources Wales (the successor to Forestry Commission Wales). This included updated information on machinery holdings, but information was also needed on the age profile and investment aspirations of those working in the harvesting sector.

This census was designed to report on the state and strength of the forestry harvesting sector within Scotland, England and Wales, as far as the response rate would allow conclusions to be drawn individually. However, it was recognised that contractors based in one country frequently operate across national borders within Great Britain, especially those in the English-Scottish and English-Welsh border regions. Therefore, this main report includes the resource *available* within regions, some of which will be based *elsewhere*.

In contrast to past Forestry Commission machinery census exercises, information was also sought on the current workforce, including number of individuals employed, their age profile, training, certification and future trends in the industry: including succession planning and recruitment.

¹ Saunders, C.J. & Jones, W.J. (2002). Harvesting Machine Census 1999 & 2001. Forestry Commission Technical Note FCTN01

With the advent of modern communications technology, the format and distribution of the census was updated to deliver the maximum benefit from the resources available. Where previously there had been a reliance on painstaking compilation of distribution lists and posting of large volumes of printed questionnaires, the 2016 census was constructed around an online questionnaire service. This had the advantage that the link to the survey could readily be publicised and circulated, and used as convenient by respondents through mobile devices and computers. As far as possible the census questions were designed to be readily answered by multiple-choice 'checking', although free text answers were also sought where necessary. It was recognised that fewer people would participate in a longer questionnaire but some would. Therefore the design included a core section of basic facts and multiple-choice that could quickly be answered, and an optional additional section asking for more in-depth feedback.

Articles were placed in leading trade magazines to draw attention to the census, so as to reach as many harvesting machine contractors as possible. The reasons behind the census were explained and an outline given of how the information would be used to inform policy decisions. Additionally, trade associations were involved so as to reach their membership and involve their social media outlets to further engage machine operators. The census was publicised by Forest Research and Forestry Commission operations managers were also asked to promote the census via their staff in the various Forest Districts. Additionally, some larger contractors were contacted directly by individual emails.

Results

Matching the format of the census questionnaire itself, the results are presented largely as graphs showing *numbers* given in response to particular questions. However, attention is drawn to some key conclusions that can reasonably be drawn.

Many of the respondents did not answer all of the questions in the survey, particularly in the longer optional sectional. *As a result it is difficult, and could be misleading, to draw direct comparisons with results from the previous machinery surveys.*

Results show some anomalies that may reflect, amongst others, differences in terminology and interpretation.

The relatively low number of responses from Scotland, despite it's strong harvesting sector, suggest that it is under-represented in results, which to some extent may also apply to Wales.

The first four questions related to contractor / organisation details, the respondent’s agreement to Forestry Commission or Natural Resources Wales use of the information given and whether Forest Research could follow up for further information. Most respondents agreed to follow up contact if desired by the Forestry Commission or Natural Resources Wales.

This report will lay out the questions from the survey in sequence using a mixture of Charts and Tables in answer to the particular question concerned. The response-by-country graphs reflect the *base location* and not necessarily the only working area.

Question 5. Operating area - please tick all the areas where your business currently operates

The results (**Chart 1**) identify all the areas within Great Britain where the respondents are working, with some additional coverage in Northern Ireland.

There was a general trend of increasing availability of machinery from fewest in the remoter parts of Scotland to most in the regions of England, especially the North East, and a comparatively good presence in Wales, especially in the Marches.

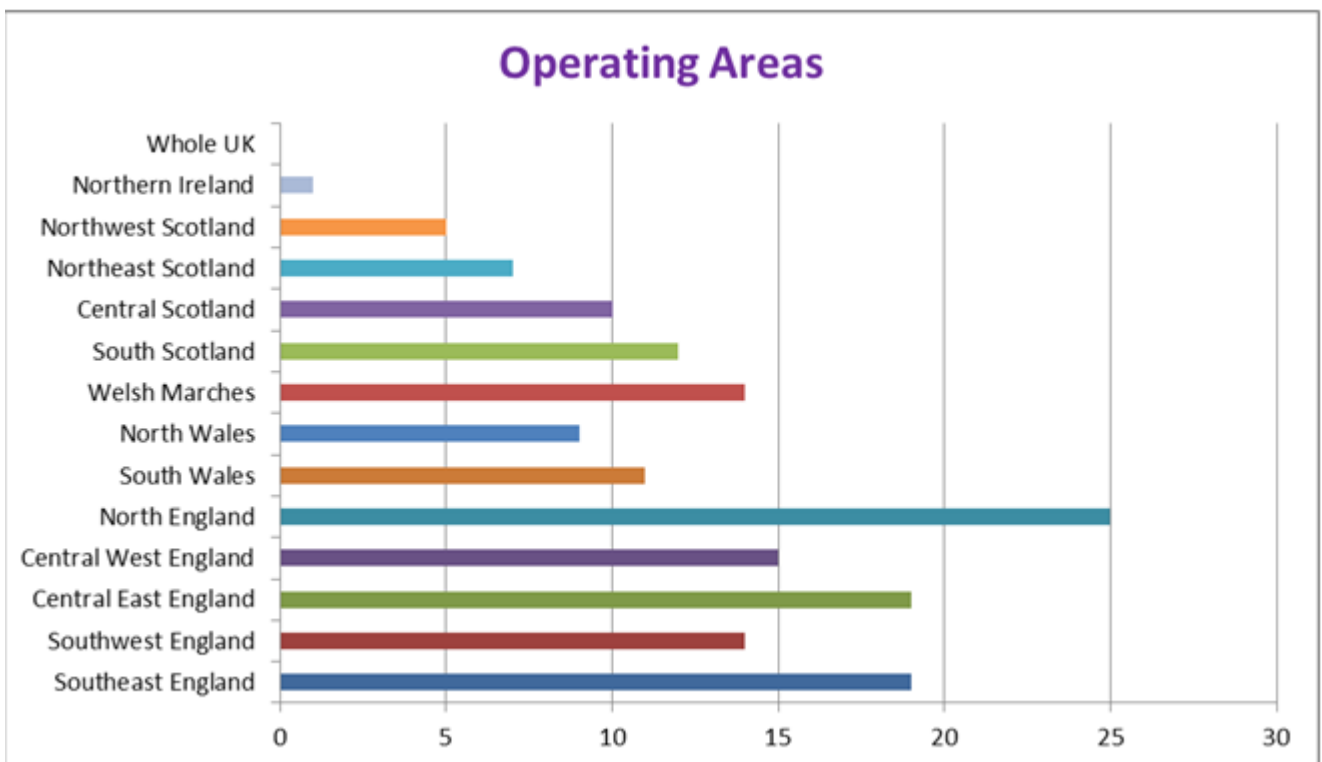


Chart 1. Operating Areas across the United Kingdom

Question 6. Please select which harvesting machine/s your business currently uses

Respondents were asked to describe the machinery they use by selecting from the following categories:

- Harvester/s
- Processor/s
- Forwarder/s
- Skidder/s
- Skyline/s
- Other Extraction System

As with earlier surveys, harvesters and forwarders are the dominant machine type (**Chart 2**) with England having the most machines in all but one of the categories. The other extraction category is led by farm / forestry tractors & trailers, again mostly in England (**Chart 3**).

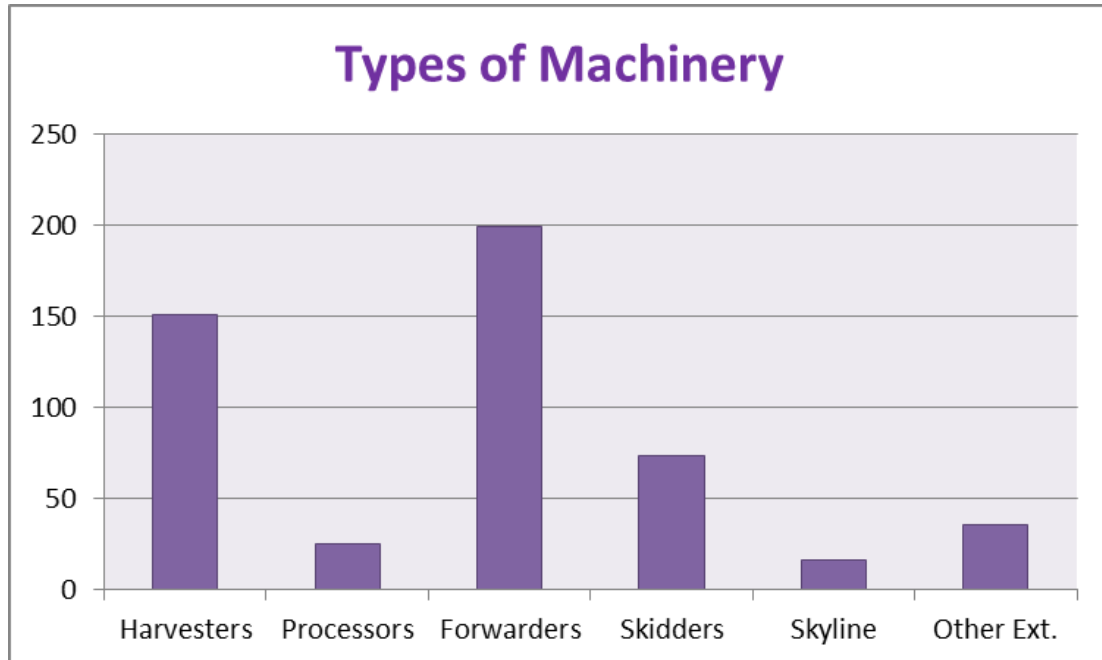


Chart 2. Types of harvesting machinery

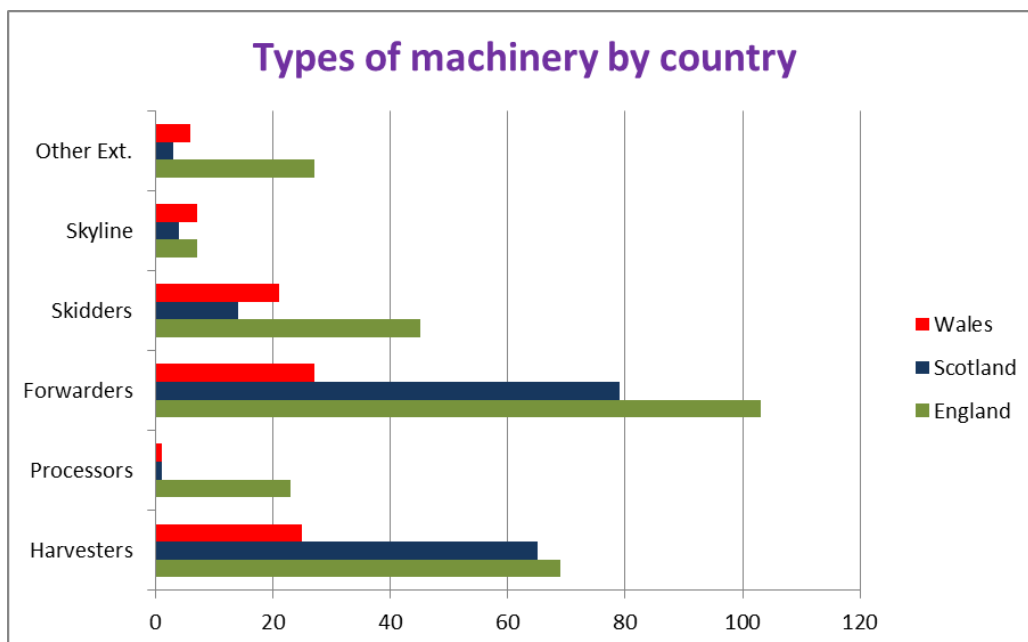


Chart 3. Machinery by country

As in previous surveys, harvesters and forwarders were the main machine categories reported and there was a notable proportion of skidders. The greater number of machines in England compared to Scotland might reflect a higher user response proportion or potentially other more complex factors.

Question 7. Harvester details

The distribution and range of sizes within the harvester category are shown in **Charts 4** and **5**. The survey also asked for additional information relating to machines, including make and model, felling head and size number of wheels and age of the machine. Examples are shown in **Table 1**.

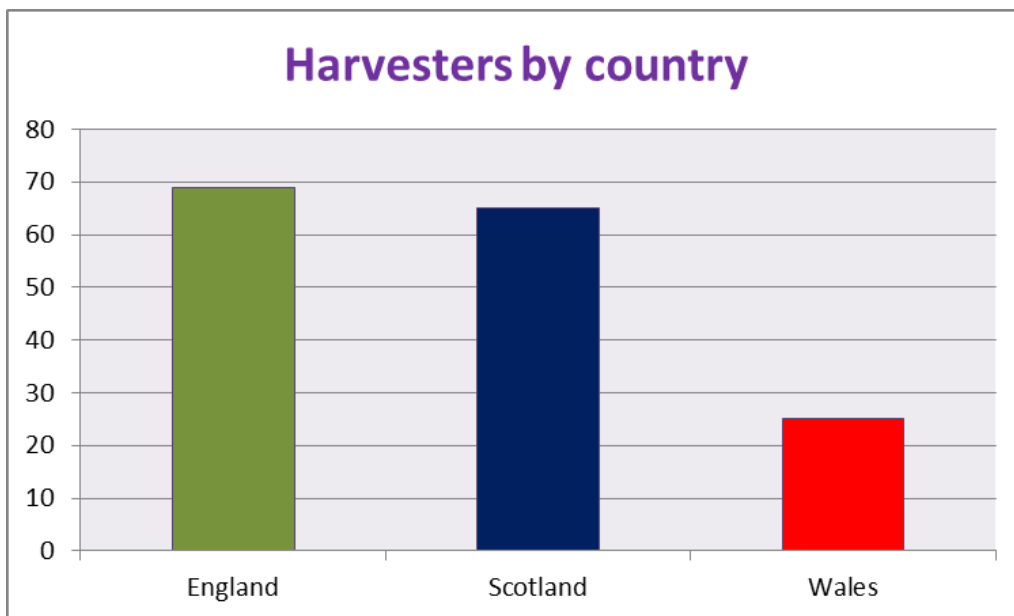


Chart 4. Total Harvesters by country

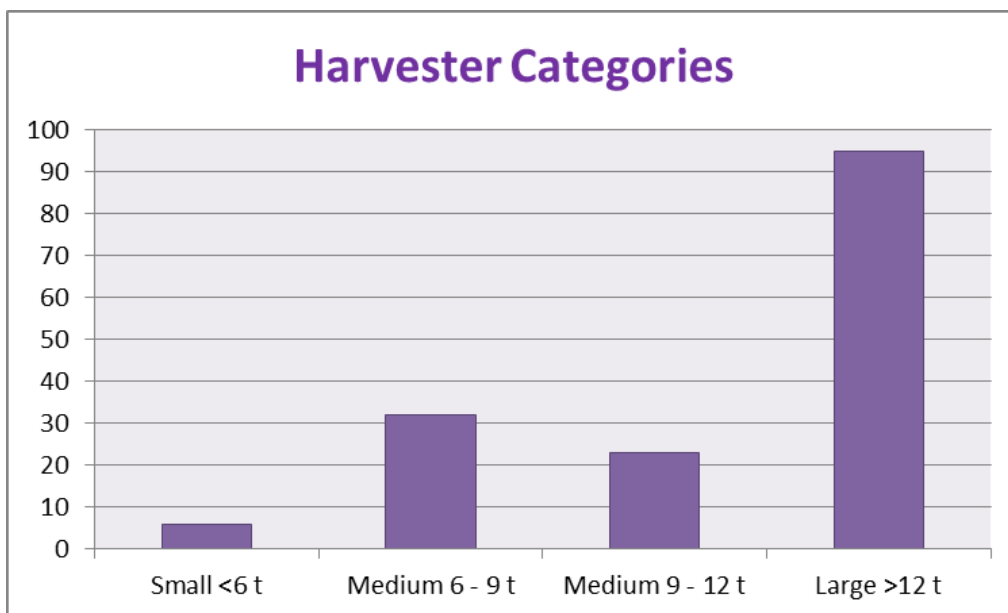


Chart 5. Harvester Sizes

Table 1. Harvesters: additional details

Make & Model	If not purpose built: base unit and ancillary equipment	Head & Max Felling Diameter (cm)	Wheeled / Tracked	Age (years)	
John Deere 1270		480	80	8 wheeled	2
John Deere 1270		480	80	6 wheeled	<1
Komatsu 941		Komatsu 365	70	6 wheeled	5
Tigercat		Logmax 5000 head		Tracked	4
	Komatsu PC88MR6	TMK tree shear	25	Tracked	9
	Kobelco e800	AFM 400s	40	Tracked	12
Timberjack 1070D		H754	55	6 wheeled	12
John Deere 1270e		480c		6 wheeled	3
	Daewoo 130LCV	Kesla 25SH		Tracked	13
John Deere 1270e					
John Deere 1170e					
John Deere 1270e		480c		6 wheeled	5
Komatsu 941		370.1		6 wheeled	
Tigercat 845c		Logmax		Tracked	
ECO LOG 580 E		Logmax 6000	65	6 wheeled	<1
Logset 8HGT			65	6 wheeled	2
Malwa 560C		Biojack energy grapple	20	Wheeled	<1
	Valtra T153	Nisula 425h	40	4 wheeled	2
JD 1270e		H270	65	6 wheeled	3
JD 1270e		H480C	71	8 wheeled	2
Ponsse Scorpion		H7	72	Wheeled	2
JD 1270G		H480C	71	Wheeled	<1
	Neuson 8 ton	keto 51		Tracked	10
Timberjack 1270C		762C	65	Wheeled	15
Valmet 911		Logtech Viking	60	Wheeled	16
Komatsu 931		360.2		Wheeled	4
	Doosan	Keto	70	Tracked	3
	Neuson 8 ton	Keto 51		Tracked	15
Valmet 911		Viking 525	56	6 wheeled	18
	Bobcat E80 8 ton	Arbro 400	40	Tracked	4
JD 1170e			55	Wheeled	1
	Cat 314LCR	Groeneveldt	45	Tracked	<1
Komatsu 911.4		360.2	65	Wheeled	7

The survey indicated a significant number of larger purpose-built wheeled harvesters, many of which were nearly new. Machines were well distributed across the countries, albeit with a slightly higher number based in England.

Question 8. Processor details

The number of processing machines in the countries continues to decline as in previous surveys. Nearly almost all of the processor machines are used in England (**Chart 6**). Unfortunately respondents did not record the make or models of the machines. However, conclusions can tentatively be drawn given the size range (**Chart 7**).

Compared to previous surveys, the number of processing machines continues to decline. It is likely that the majority of the processors recorded, which are almost entirely based in England, are tractor mounted units used for smaller scale operations.

This is in contrast to the much larger dedicated machines prevalent in the industry some twenty to thirty years ago, before harvesting heads became ubiquitous.

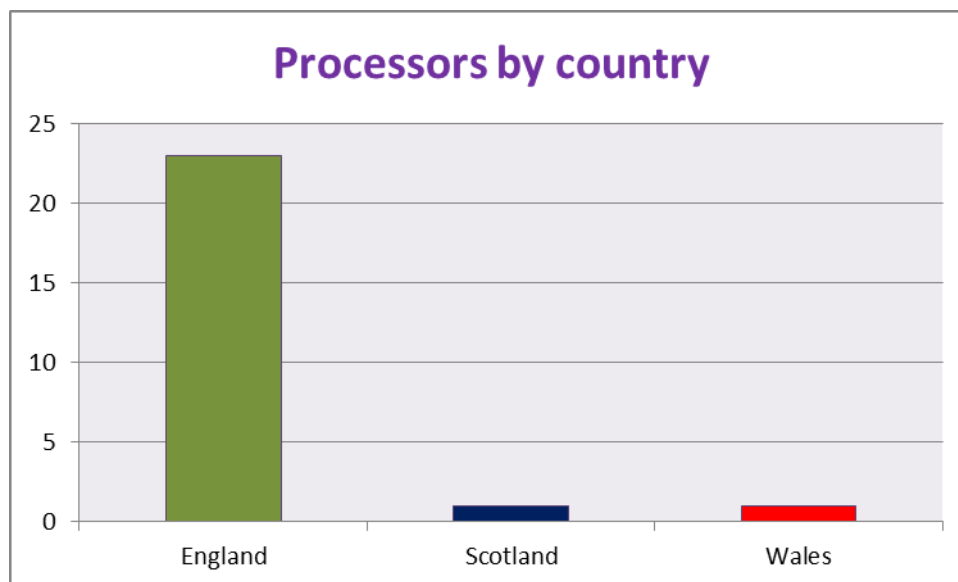


Chart 6. Processor sizes by country

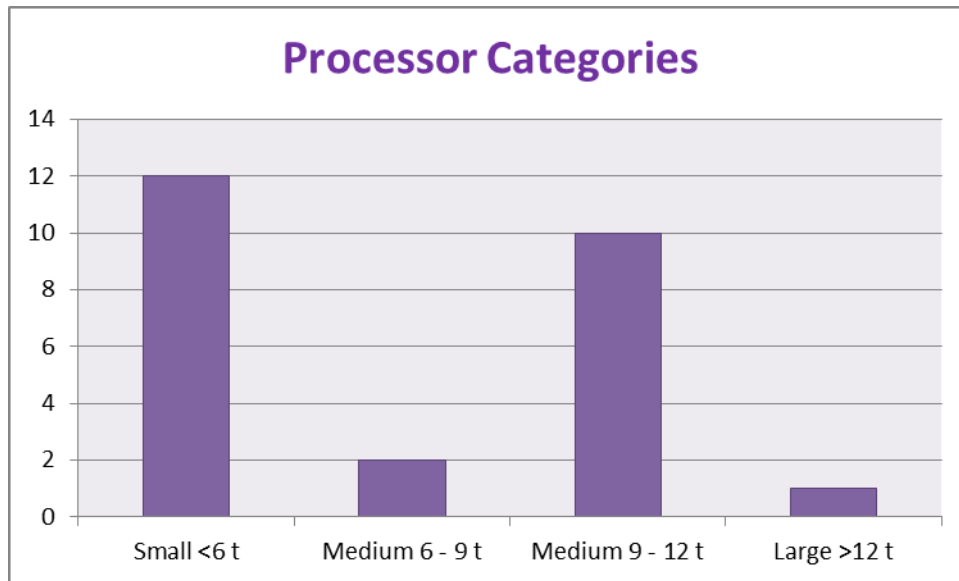


Chart 7. Processor sizes

Question 9. Forwarder details

The majority of machines reported were based in England (**Chart 8**). Respondents were also asked for details of the type, size and ages of their forwarders (**Chart 9**). Some examples of the additional information provided are given in **Table 2**, although this was not always provided.

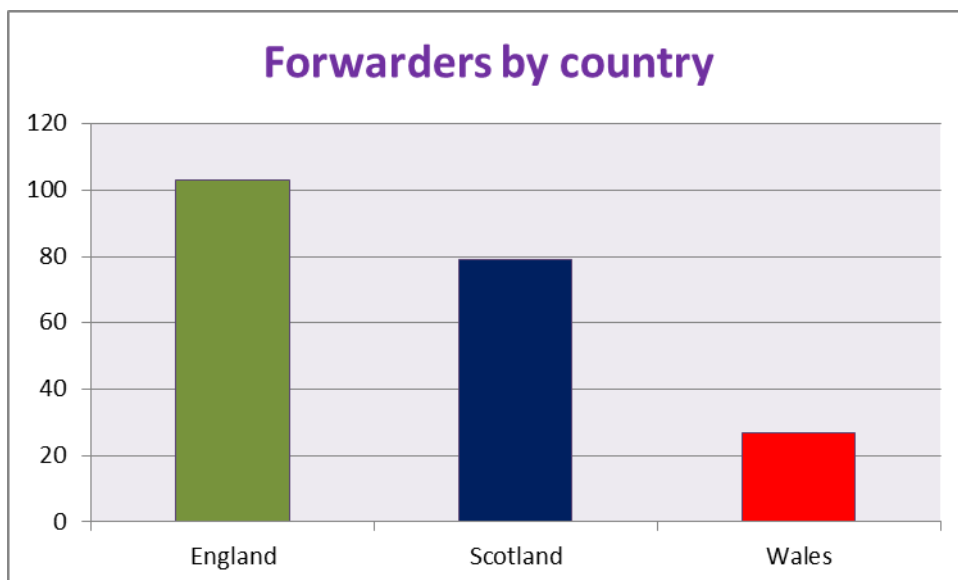


Chart 8. Forwarder sizes by country

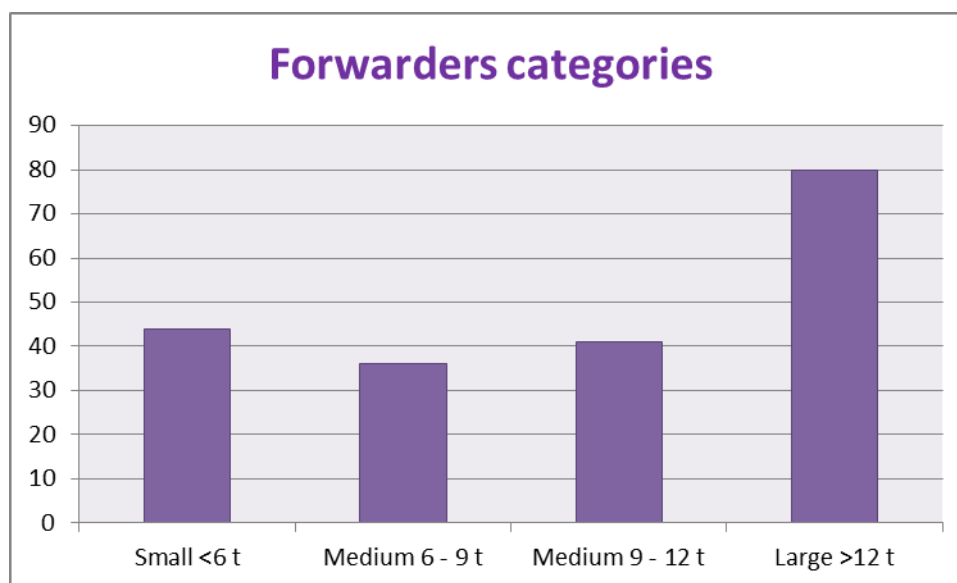


Chart 9. Forwarder sizes

Table 2. Forwarders: additional information

Make & Model	If not purpose built: base unit and ancillary equipment	Load Type & Rating	Wheeled / Tracked	Age (years)
Ponsse Buffalo		15 tonne	8 wheeled	<1
Valmet 828		9 tonne	8 wheeled	25
John Deere 1510e		15 tonne	8 wheeled	1
Bruunett 578F		7.5 tonne	8 wheeled	37
	Valmet 6300 Palms 470 trailer	8 ton	4 wheeled	4
	Kesla 12T trailer with 305 loader	12 tonne	4 wheeled	3
	Valtra 8350 base, Farma 10, 16 trailer	10 ton	8, 4 driven	Base 10 Trailer 2
Weimer		4 tonne	4 wheeled	15
Rottne		Twin bunk	8 wheeled	8
Komatsu 840 TX		12 tonne	8 wheeled	7
	Valtra & Botex			5
Komatsu 855.1		13 tonne	8 wheeled	<1
Ponsee Buffalo		14 tonne	8 wheeled	<1
	Valmet & trailer	10 tonne		5

Returns indicated that the majority of forwarders were purpose built eight-wheeled models but larger tractor-trailer units were also frequent. There was a reasonable balance across the countries, although the greatest number were reported in England, and some units were decades old.

Tractor-trailer units were reported in the Forwarders section, and also occasionally in the 'Other Extraction' category.

Question 10. Skidder details & Question 11. Skidder winching details

The base country and number of skidders are given in **Charts 10** and **11** and information on the make and model, winch rating and the age of the skidder are shown in **Table 3**. The typical use of the machines described in responses is shown in **Chart 12**.

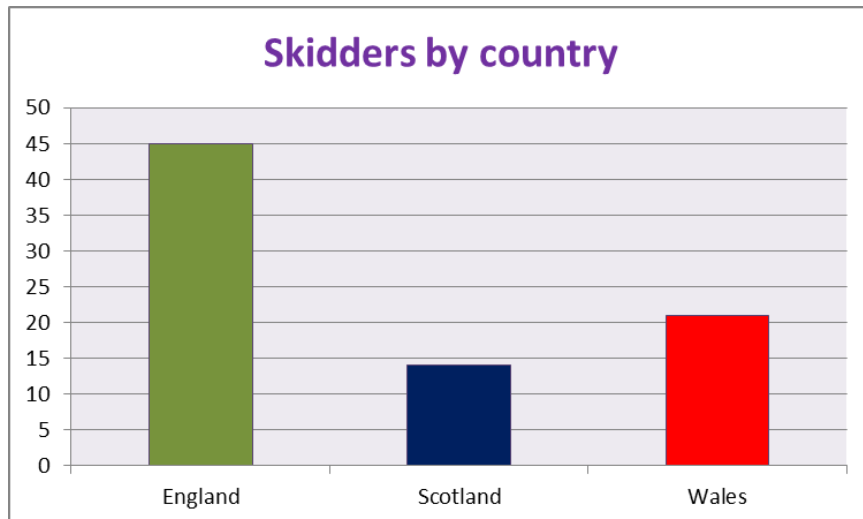


Chart 10. Skidders sizes by country

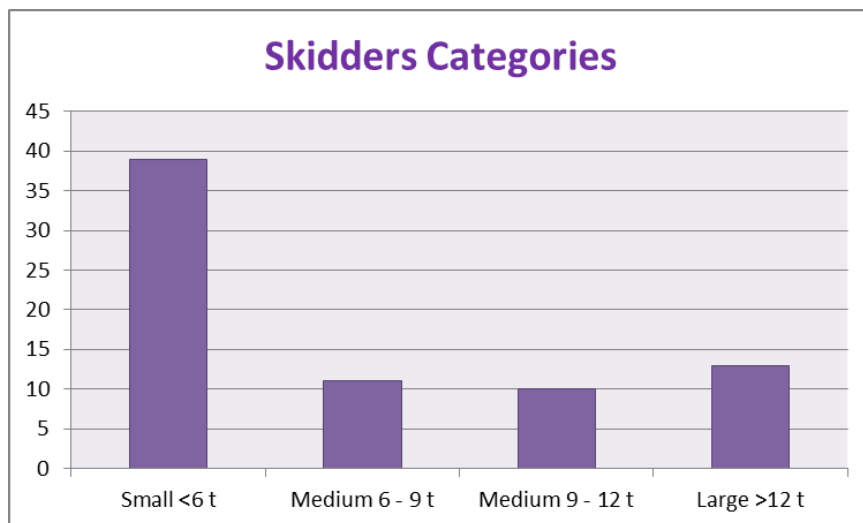
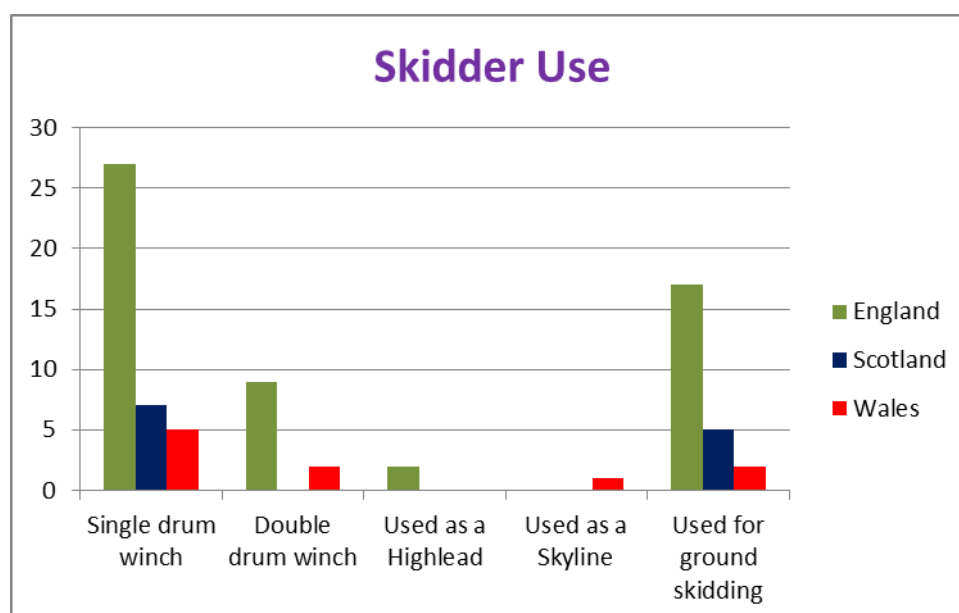


Chart 11. Skidders sizes

Table 3. Additional Skidder information

Purpose Built Make & Model	Winch details	Winch rating (tonnes)	Age (years)
Fransgaard v6500	John Deere	6.5	3
Ford County	Igland 5000 winch double drum	2.5	25
Massey Ferguson 35	Norse 2 tonne winch	2	53
Valtra tractor	Igland 55 winch	5.5	8
Valtra 6400	Farmi winch	6	18
Ford County	Island 5000	2x2	25
Ford	Fransguard	10	30 tractor 10 winch

**Chart 12.** Skidder use

Whilst a broad range of skidder winch sizes were reported, there was a preponderance of small, single drum winches and machines based in England. Much of the equipment appeared to be decades old.

Question 12. Skyline details

The 2016 census returned the use of only fifteen skylines (**Chart 13**), whereas the 2001 census recorded 212 cable-crane / skyline operations. Examples of some of the machinery currently used for skyline operations are given in **Table 4**.

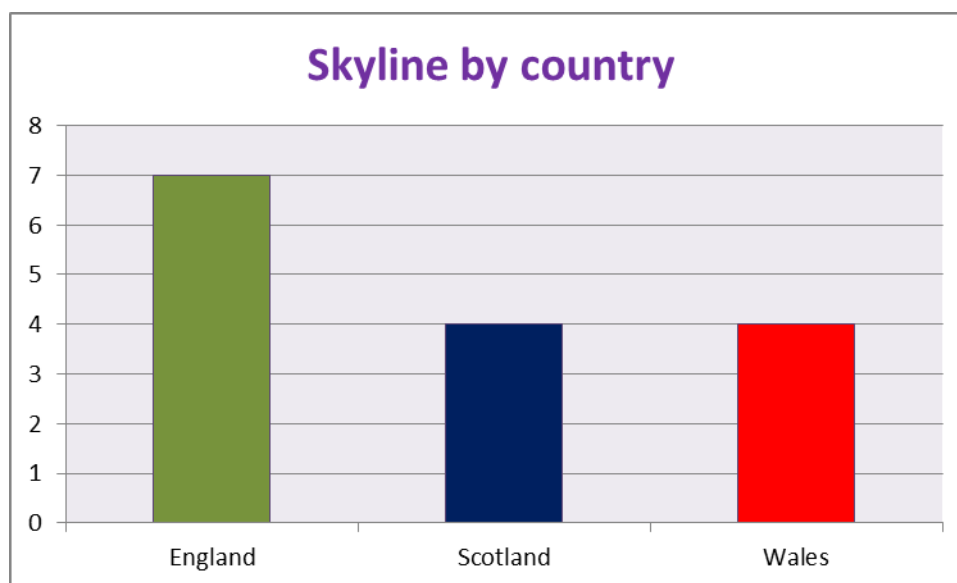


Chart 13. Skyline by country

Table 4. Skyline Information

Make & Model	Prime Mover	Winch	Age (years)
	Fordson Supermajor tractor	Igland 3000	50
Timbermaster	Tractor	Timbermaster	20
	Bedford MJ 4X4 lorry	10 tonne	30
Daewoo 225		Tst carriage	12
Volvo EC240		2 Ton	8
	Volvo 360 blc		4
	Poclain hydraulic		
	Volvo 460 blc		1

More skylines were reported from England than Wales or Scotland and the limited evidence suggests a broad range of sizes, makes and ages. There would appear to have been a significant decline in the number of operators since the 2001 census.

Question 13. Other Extraction Systems

Respondents were asked about other types of machinery currently used for extraction operations. The numbers given by country and size are shown in **Charts 14** and **15**. Some examples of categories, which rely on descriptions given in responses, are shown in **Table 5**. This suggests that some of the 'Other Extraction System' responses could have been given in previous categories instead.

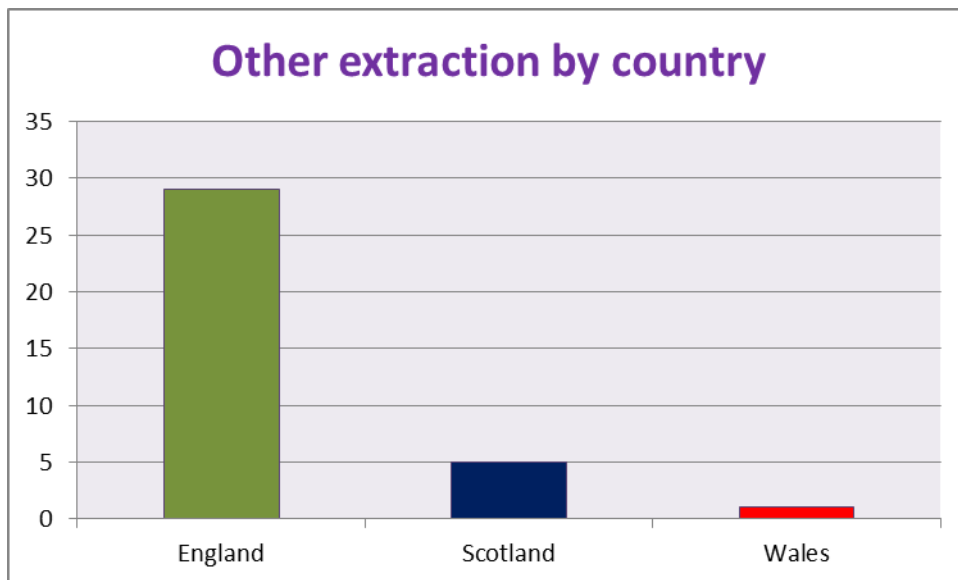


Chart 14. Other types of extraction by country

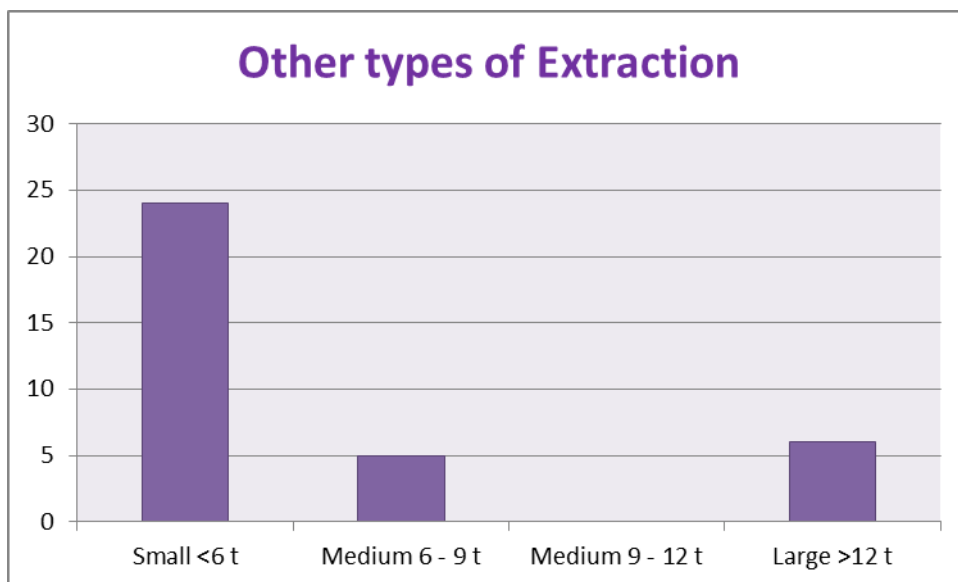


Chart 15. Other types of extraction

Table 5. Other extraction types and additional information

Purpose Built Make and Model	Adapted or Converted	Attachment Winch/Loader/trailer	Age (years)
Iron Horse			
	Case 8 ton steel tracked excavator plus Merlo telehandler	Log grab with rotator on excavator, forks with rotator on telehandler	7 both
	Tractor	3pl Winch	30
BCS valiant 500		Custom built 3t timber trailer + crane	
	Ackerman	Single drum 15 ton	8

The majority of 'other' extraction systems were in the small scale category of less than 6 tonnes load rating, and these are likely to include some small timber trailers.

Question 14. List planned future machine investment

Respondents were asked if they had plans to invest and upgrade any of machinery and if so what equipment (**Table 6**).

Table 6. Types of machine investment

Machine 1	Machine 2	Machine 3	Machine 4
Harvester	Forwarder	New tractor	Bigger winch
Forestry spec tractor			
Forwarder	Harvester		
Logset 8H	Heizohack chipper	Komatsu 845	
Logset forwarder 12F	Logset 8GTE harvester	Logset 12F forwarder	
Ponsse Elk forwarder			
ABS Skyline rebuild			
Purpose built harvester			
Upgrade harvester	Upgrade forwarder		
Skidder	Forwarder		
John Deere 1270g harvester	Tigercat 845c harvester	John Deere 1110g forwarder	
Hyundai Harvester	Doosan Winch		

The responses suggest a broad range of planned future investment of all main machine types.

Question 15. What is the timescale to purchase any planned future machine investment listed above?

As a follow up to Question 14, respondents were asked about the timescales involved in the purchase of new equipment and how they would be made (**Chart 16**).

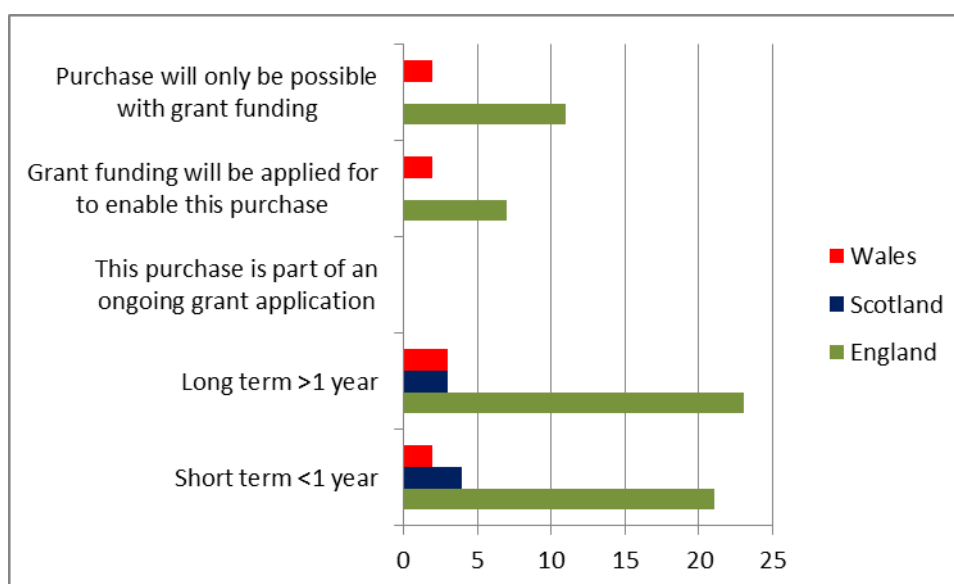


Chart 16. Future investment

Although a limited response, the results suggest that grant funding is an important factor in a significant proportion of future investment aspirations.

Question 16. What is your annual business turnover?

Respondents were asked to provide details of their annual turnover.

Whilst there was a full range of responses, the majority by number was in the lower to mid-range up to £¹/₄M (**Charts 17 and 18**).

Although it is not possible to be precise, the responses suggest a combined turnover in the region of approximately £13M to £23M, comprising £8M to £14M in England, £3M to £6M in Scotland and £2M to £3M in Wales.

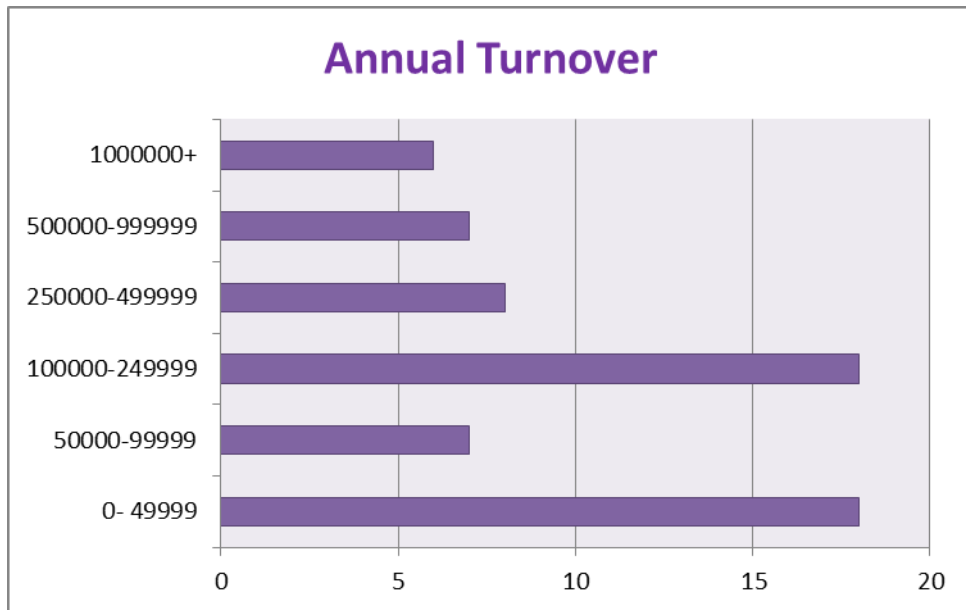


Chart 17. Annual turnover (£)

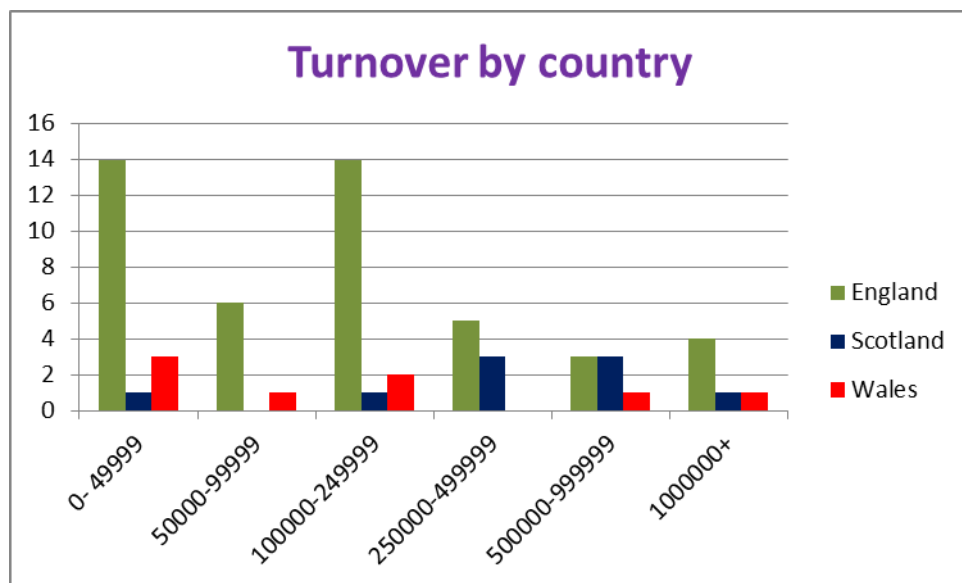


Chart 18. Annual turnover by country (£)

Question 17. How many people does your business employ (full time and part time)?

- Please state total number of employees
- Please state number of employees who work directly on forest harvesting

Results are shown in **Charts 19** and **20**.

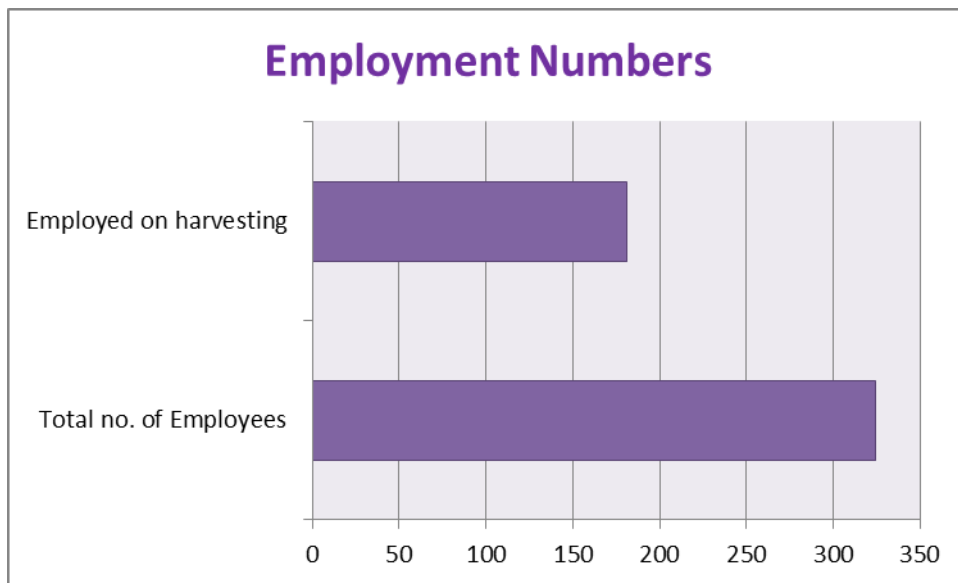


Chart 19. Number of people employed

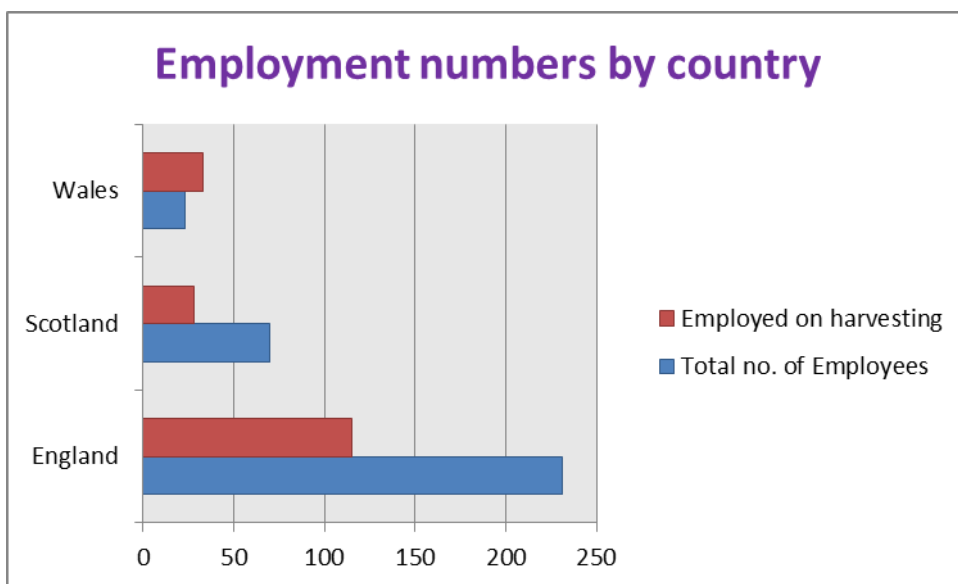


Chart 20. Number of people employed by country

Over three hundred people were employed by respondents, with the larger proportion in England and slightly less than half not employed directly in harvesting itself, although the data does not explain why.

Question 18. Of the employees in your business who work directly on forest harvesting please indicate their age from the following categories

Results are shown in **Charts 21 and 22**.

The harvesting operator age distribution responses show a general balance across the range, albeit with fewer in the youngest category in England and Wales. Roughly one-fifth of the workforce is likely to approaching or of retirement age with ten years.

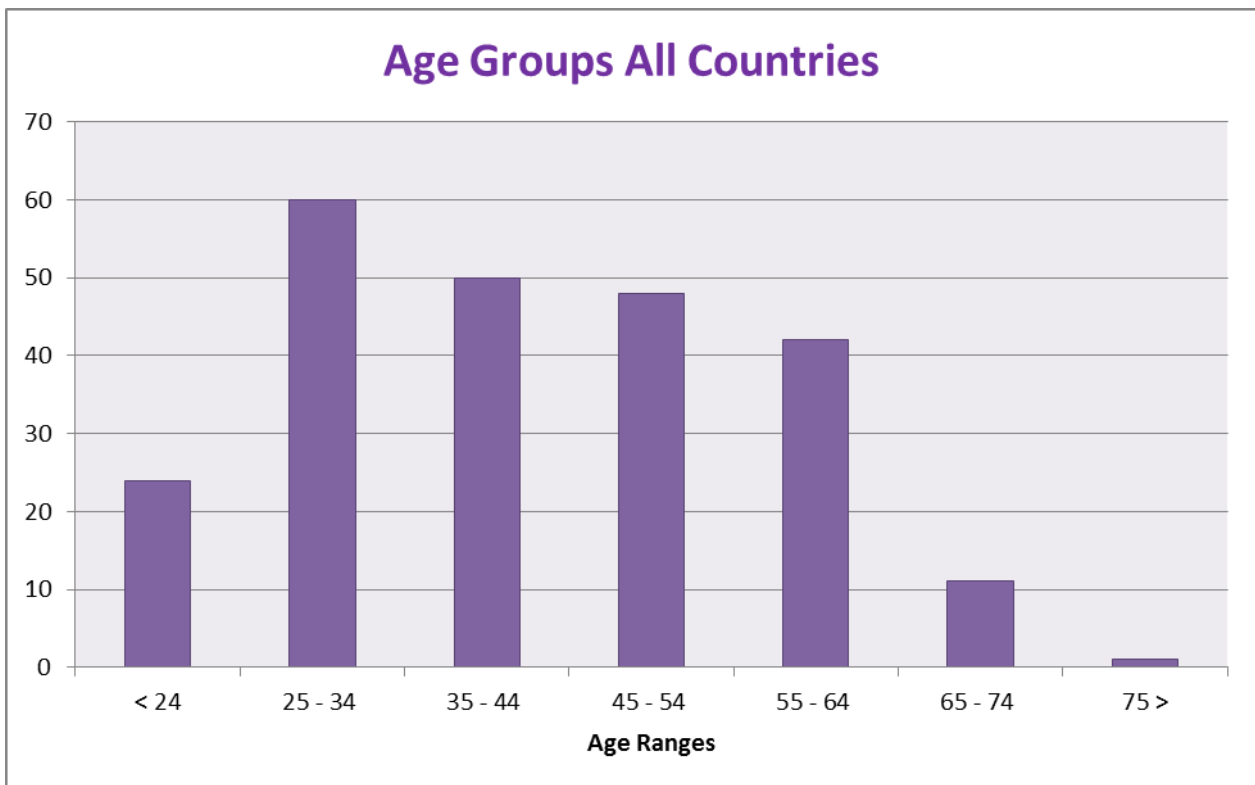


Chart 21. Age Demographics

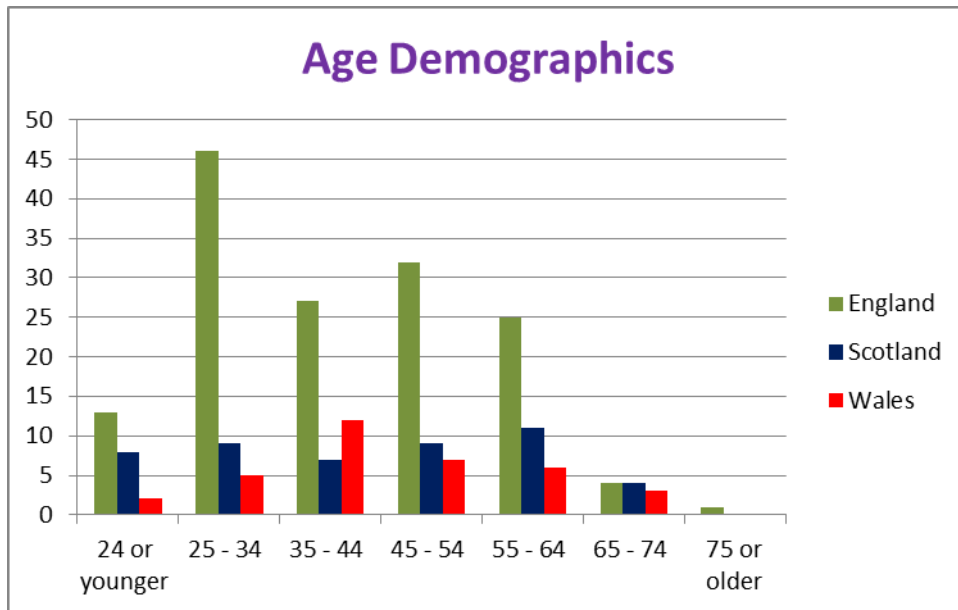


Chart 23. Age Ranges by country

There appear to be few people in the under 24 age group working in the harvesting industry. This is reflected by the comments of many respondents that it is very difficult/ difficult to attract and retain young operators.

Question 19 Do you employ apprentices?

- Currently employ apprentices
- May employ apprentices in the future
- Do not employ apprentices and have no plans to do so in the future

Results are shown in **Charts 23** and **24**.



Chart 23. Do You Employ Apprentices

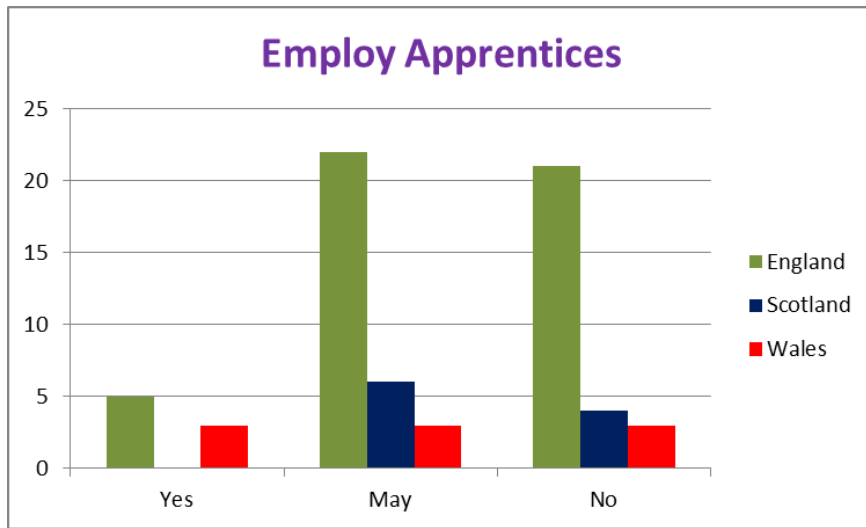


Chart 24. Do You Employ Apprentices by country

Although there were few apprentices, and none reported in Scotland, there were roughly equal proportions of respondents who would, and would not, consider employing them in the future.

Question 20. Workforce Qualification and Certification - which of the following do your machine operators hold for the equipment they use?

- City & Guilds Land Based
- Sector (NPTC)
- Lantra Awards
- Forest Machine Operator
- Training (FMOC)
- Emergency First Aid
- Other

Results are shown in **Chart 25**.

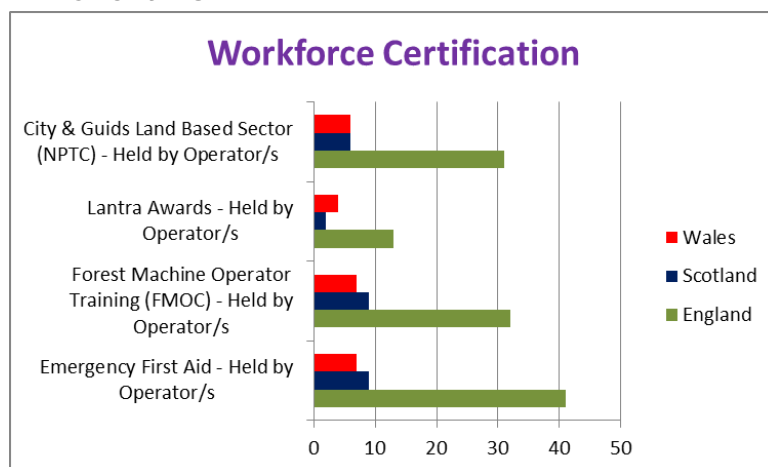


Chart 25. Workforce certification by country

Results suggest that under half of the people working directly on harvesting do not hold NPTC or Lantra qualifications although at least one person in each *team* appears to do so. Of these approximately three quarters may also hold the additional FMOCS certification. Most operators have attended Emergency First Aid courses at some point in past years.

Question 21. In your opinion how difficult is it to attract new people to work in forestry and how is this likely to change in the future?

The final question of the survey drew the following comments, in which we have colour-coded an underlying recruitment message (blue - negative, green - positive):

- It is **hard to attract new people into the industry** as it is **harder work than most expect** this will become more difficult as the workforce gets steadily older and retirements mean there will not be machine owners to allow this
- **Not that hard if we train and pay well**
- **Should not be difficult**
- **Very difficult**, unlikely to improve
- **Lots of interest** from people wanting to help in the woods. Provision of funded-training would help
- **Difficult**. Unlikely to improve whilst the economic aspects of the industry are so heavily stacked against contractors, and forces "race to the bottom" pricing.
- **Attracting is ok but sticking with it poor**, because it is hard work and takes time to get to productive speed. The future is not looking any different as contracts are very short duration so it remains **hard to commit as an employer to an attractive package** to offer to a long term employee. (High seasonal variation in the amount of work available in this area to forestry contractors)
- **Hard to find good cutters and make enough to pay them well**. Hopefully will improve if we can value our woods more
- **Very difficult**
- Seems to be **very difficult**. Cannot see any changes in the medium term
- Expensive to train people and hard to keep them in the job because the money is poor
- **Very difficult. Hard life, very low income**
- **Extremely difficult**
- **Very difficult** - can't see it changing unless there's more money in it
- **Quite difficult** and unlikely to change in my area

- Finding skilled operators/contractors to fell large hardwoods is [very difficult](#)
- It is [impossible to train new starters](#) as machines have to be productive
- [Very difficult](#) as they all want to earn mega wages and it is not in the industry, and with the idea of no more planting of soft wood in the south of England the future down here is very bleak
- [Virtually impossible](#), can't see it changing
- [Easy enough](#)
- Schools don't promote working outdoors as a career, so [young people are not interested](#) in careers in areas such as horticulture, arboriculture or forestry. More emphasis needs to be given to encouraging pupils to consider outdoor working
- Has [proved difficult](#) in the past to attract young people into the trade. We have previously run an apprenticeship scheme and awarded a post through this. Finding training schemes locally prove difficult.
- [Difficult](#) to get skilled labour
- [Very difficult](#)
- [Very difficult](#), I just don't think people interested anymore when you can earn same sort of money doing less stressful jobs
- We operate in the Isle of Man and there is little knowledge of forestry here. If we were able to expand and take on new people there are a number of job fairs that we could attend
- It is [difficult](#). Timber prices need to rise to allow salaries to improve
- I find it [easy as they enjoy the work](#)
- Easy to attract new people, but [difficult to produce the turnover](#)
- [Very difficult](#) in harvesting, lots of men think they would like to do this but many lack the team based skills or be able to work on their own initiative, many just don't get it and solve problems. Many think you just drop trees with no planning or any sequence. It takes a lot of time and training to be able to get cutters and skidder teams to think and use an efficient system
- [Very difficult](#), computers can't dig holes or plant trees.
- [It is not getting any easier](#). The nature of it being hard work puts off a lot of young people we have had coming to us for work experience. They also do not seem to have any patience to work from the bottom up. I think a lot of younger people see the arboricultural side as being more attractive
- [Very difficult](#), it seems [too expensive for any youth to start up](#). PPE and certification
- [Very hard](#)

- **Very difficult** I can't see it changing most young men are too much easy life not the right mind set for forestry.
- It is **difficult to find conscientious people who stick at the job** for more than a year. Investment in modern machinery has had to be made to attract people across from agriculture. I think we will end up with too many forest managers and not enough people doing the jobs. There are exciting blocks of woodland to work in with our smaller scale kit but not enough man power available to get to them or funding to sort uneconomic thinning.
- **Well-nigh impossible as tree surgery is so much more profitable**
- **Not difficult to attract people, very difficult to find suitable candidates**
- **Very difficult** without proper planting and longevity of industry/better opportunities/ better salaries.

The comments reveal an industry having difficulty recruiting and retaining new people, in which the work is hard and returns limited, and which has to compete with higher paid alternatives, including arboriculture.

Conclusions

There was a general **trend of availability of machinery** from fewest in the remoter parts of Scotland to most in the regions of England, especially the North East, and a comparatively good presence in Wales, especially in the Marches.

As in previous surveys, harvesters and forwarders were the **main machine categories** reported and there was a notable proportion of skidders. The greater proportion of machines in England compared to Scotland might reflect a higher user response proportion or potentially other more complex factors.

The survey indicated a significant number of larger **purpose-built wheeled harvesters**, many of which were nearly new. Machines were well distributed across the countries, albeit with a slightly higher number in England.

Compared to previous surveys, the number of **processors** continues to decline. It is likely that the majority recorded, which were almost entirely based in England, were tractor mounted units used for smaller scale operations.

Returns indicated that the majority of **forwarders** were purpose built eight-wheeled models but larger **tractor-trailer units** were also frequent. There was a reasonable

balance across the counties, although the greatest number were reported in England, and some units were decades old.

Whilst a broad range of **skidder winch** sizes were reported there was a preponderance of small, single drum winches and machines based in England. Much of the equipment appeared to be decades old.

There would appear to have been a massive decline in the number of **skyline** / cable-crane operators since the 2001 census. More skylines were reported from England than Wales or Scotland and the limited evidence suggests a broad range of sizes, makes and ages.

The majority of **'other' extraction systems** were in the small scale category of less than 6 tonnes load rating, and these are likely to include some small timber trailers.

The results suggest a broad range of planned **future investment** of all main machine types. Although a limited response, it appears that grant funding is an important factor in a significant proportion of future investment aspirations.

Although it is not possible to be precise, the responses suggest a combined **turnover** in the region of approximately £13M to £23M, comprising £8M to £14M in England, £3M to £6M in Scotland and £2M to £3M in Wales. Whilst there was a full range of responses, the majority by number was in the lower to mid-range up to £¹/₄M.

Over **three hundred people** were employed by respondents, with the larger proportion in England and slightly less than half not employed directly in harvesting itself, although the data does not explain why.

The harvesting **operator age distribution** shows a general balance across the range, albeit with fewer in the youngest category in England and Wales. Roughly one-fifth of the workforce is likely to be approaching, or of, retirement age with ten years. There appear to be few people in the under 24 age group working in the harvesting industry, which is reflected by the comments of many respondents that it is difficult or very difficult to attract and retain young operators.

Although there were few **apprentices**, and none reported in Scotland, there were roughly equal proportions of respondents who would, and would not, consider employing them in the future.

Results suggest that under half, at most, of the people working directly on harvesting do not hold **NPTC or Lantra qualifications** although at least one person in each team appears to do so. Of these approximately three quarters may also hold the additional

FMOCS certification. Most operators have attended Emergency First Aid courses at some point in past years.

The comments reveal an industry having **difficulty recruiting and retaining** new people, in which the work is hard and returns limited, and which has to compete with higher paid alternatives, including arboriculture.

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