



What Impacts does Integrated Moorland Management, including Grouse Shooting, have on Moorland Communities?

A Comparative Study

A research project carried out for
The Uplands Partnership

By Professor Simon Denny and
Tracey Latham-Green

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The authors of this report are very grateful to the 644 people that helped us to complete this study, either by being interviewed, or by answering our (lengthy) questionnaire. We are conscious that we imposed on both their time and their goodwill. To gain so much co-operation at the height of the coronavirus pandemic, when many respondents were concerned about the future, and some had lost their jobs, was remarkable.

About the Authors

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Simon Denny served in the British Army from 1976 – 1986. He then moved into management training and corporate development in industry. In 1992 he moved into Higher Education and worked at the University of Northampton until 2018, latterly as Executive Dean for Research, Impact and Innovation. At Northampton he initially specialised in designing bespoke development programmes for companies; three of his schemes won National Training Awards. He also designed, won funding for, and managed numerous large-scale projects aimed at helping people develop the confidence and skills necessary for employment, or self-employment. In 2006 Simon was awarded the University's Court Award for services to local enterprise. He became Professor of Entrepreneurship in 2007. In 2010 he was granted The Queen's Award for Enterprise Promotion. Fascinated by the problems involved in measuring the full impact of policies, initiatives and activities he set up the Institute for Social Innovation and Impact in 2013.

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Summary

Upland regions are a nationally significant resource for people in the UK; most have landscape protection status (e.g. Area of Outstanding Natural Beauty), special conservation designations (e.g. Sites of Special Scientific Interest), and separate local governance arrangements. These upland regions are mainly sparsely populated rural areas with Less Favoured Area status. The business impact of the coronavirus pandemic has been identified as being particularly severe in upland areas.

The research project aimed to identify the economic and social circumstances of communities in moorland areas where grouse shooting takes place, and compare them with UK national data sets and other upland areas where grouse shooting is not practiced. Data was collected between April and June 2020 (during the coronavirus pandemic) from 644 people, 61 interviewees and 583 survey respondents, making this one of the larger studies in the field.

The study concluded that integrated moorland management, including grouse shooting, results in a complex web of economic, social and intangible benefits that can have direct and indirect financial benefits, shown in the Grouse Moor Management Impact Systems Map (shown at the end of this Summary).

Key findings

Economic impacts

- Moorland estates do not solely depend on grouse shooting for their income. They are year-round operations and have a number of income-generating activities, integrated with each other and often co-dependent, which combine to produce the classic moorland flora and fauna. Most of these activities attract subsidies, with the exception of grouse shooting.
- Six different types, or 'orders' of economic benefit were identified. Only two of these types of benefit have been clearly described by previous studies. The impact of most of these benefits is felt not only by communities and individuals in areas where grouse shooting takes place, but also more widely throughout the UK.
- Previous studies have shown that communities in grouse shooting areas receive direct financial benefits from expenditure during the shooting season. This study confirmed the importance of expenditure during the shooting season to many businesses and individuals in moorland communities.
- As previous studies have described, the presence of full-time estate staff in communities has an all-year economic impact. The cash and employment generated by these impacts have a great importance to remote communities where there is limited alternative employment. The more remote the area, the greater the economic importance of the estate owners and sporting tenants.
- Agricultural and environmental contractors, builders, carpenters, and other suppliers of professional services, based throughout the UK, are engaged by estate and moor owners and receive economic benefits as a result.
- Integrated moorland management also results in agriculture benefiting from the financial facilitation role played by many estates and sporting tenants in securing Stewardship schemes funding. Without this facilitation role, many moorland farmers would struggle even more than they do at present to remain viable. The work of the farmers and the estates is symbiotic and leads to the maintenance and enhancement of heather moorlands, with good levels of biodiversity and year-round access, which are attractive to tourists and generates very significant income to the local area.
- Estates carry out extensive bracken and tick control on grouse moors, both of which have positive health impacts resulting in an economic impact through reductions in medical costs. The economic importance of this impact is likely to increase as more tick-borne diseases, such as Lyme disease, establish themselves in the UK and tick numbers rise.
- Integrated moorland management results in carbon sequestration, encourages peat formation and reduces the impact of wildfires, the threat and severity of which are increasing each year. In addition, it can help reduce the impact of flooding on communities, both locally and regionally.
- The impacts of integrated moorland management on the agriculture sector through financial facilitation; on tourism through the creation of a unique, accessible and attractive landscape; on human and animal health through tick and bracken control; and on carbon sequestration and flood control through moorland management and restoration practices are immense. Moreover, their long-term financial impact is massive, not only for local communities, but for the wider UK population.
- The practice of integrated moorland management, including grouse shooting, involves significant sums of money (much of it equivalent to export earnings) going into upland areas. This economic model works and should be facilitated rather than hindered.

- The economic impacts of integrated moorland management, including grouse shooting, are delivered in the short, medium, long and very long-term. While acknowledging the impossibility of measuring exact values of longer-term impacts, this study concludes that they are large and deliver long-term benefits, the value of which dwarves the local employment impacts of grouse shooting. The economic impacts of integrated moorland management, including grouse shooting, are very important for moorland communities. They are also important for the wider population of the UK.

Social impacts

- Data was gathered during the height of the coronavirus pandemic. Therefore, we expected to find that communities in areas where integrated moorland management is practiced were characterised by widespread hardship, pessimism about the future, and negative impacts on wellbeing.
- However, compared to national data, respondents that live in moorland communities we surveyed have a stronger sense of belonging, strong social networks, lower levels of loneliness, greater sense of job security, and a strong sense of identity based on a shared heritage and culture, with those involved in grouse shooting in any role having statistically significantly higher levels of wellbeing. All these factors are closely associated with more positive health and well-being outcomes. We think this is an extraordinarily interesting finding that says a great deal about the resilience of the communities we studied. It is also a finding which indicates that people living in moorland communities are annually saving the UK taxpayer very large sums of money through reduced demand for health and wellbeing services.
- Nearly three quarters (74%) of moorland community respondents take part in grouse shooting in some capacity and it is an activity followed by all ages and both genders.
- Individuals who take part in grouse shooting (in various capacities) have statistically significantly higher well-being scores, measured using the short Warwick-Edinburgh mental well-being scale (SWEMWBS), than the national average. Given that the responses to the questions asked by this study were gathered during the pandemic, the authors believe this finding to be very highly significant. Research from 2019 estimated that maintaining well-being can be valued at £10,560 per person, per year. The average unit cost to the NHS of treating someone with depression was estimated at £2,915 in 2019, while the average cost of lost employment related to depression was £13,016.
- Moorland communities in areas where grouse shooting takes place have a high level of 'community' and a greater sense of belonging than the national average. Strong social and community networks are two of the wider determinants of health. Previous research has demonstrated that a strong community and sense of identity positively impacts health and well-being.
- Residents in upland, moorland English communities where grouse moor estates are present were found to have statistically lower levels of loneliness than the national average. The costs of loneliness have been calculated as being over £6,000 per person over a 10-year period. Moreover, loneliness negatively impacts physical health, increasing the increasing the risks of frailty, of developing coronary heart disease, and vulnerability to strokes. Social networks have also been shown to help the management of long-term medical conditions.
- Most estate owners in areas where grouse shooting takes place facilitate access to the public. Access to green spaces has been shown to help increase activity and reduce obesity. In our study, 84% of survey respondents regularly exercised on the moors, with seven out of ten of them doing at least the NHS recommended 150 minutes of moderate exercise a week. Exercise outdoors has been shown to have a greater positive benefit than exercise indoors. A 2014 study indicated that obesity imposes a financial burden of c. £47 billion per year on the UK, and in 2016 Public Health England estimated that a lack of physical activity was costing the UK £7.4 billion per year.

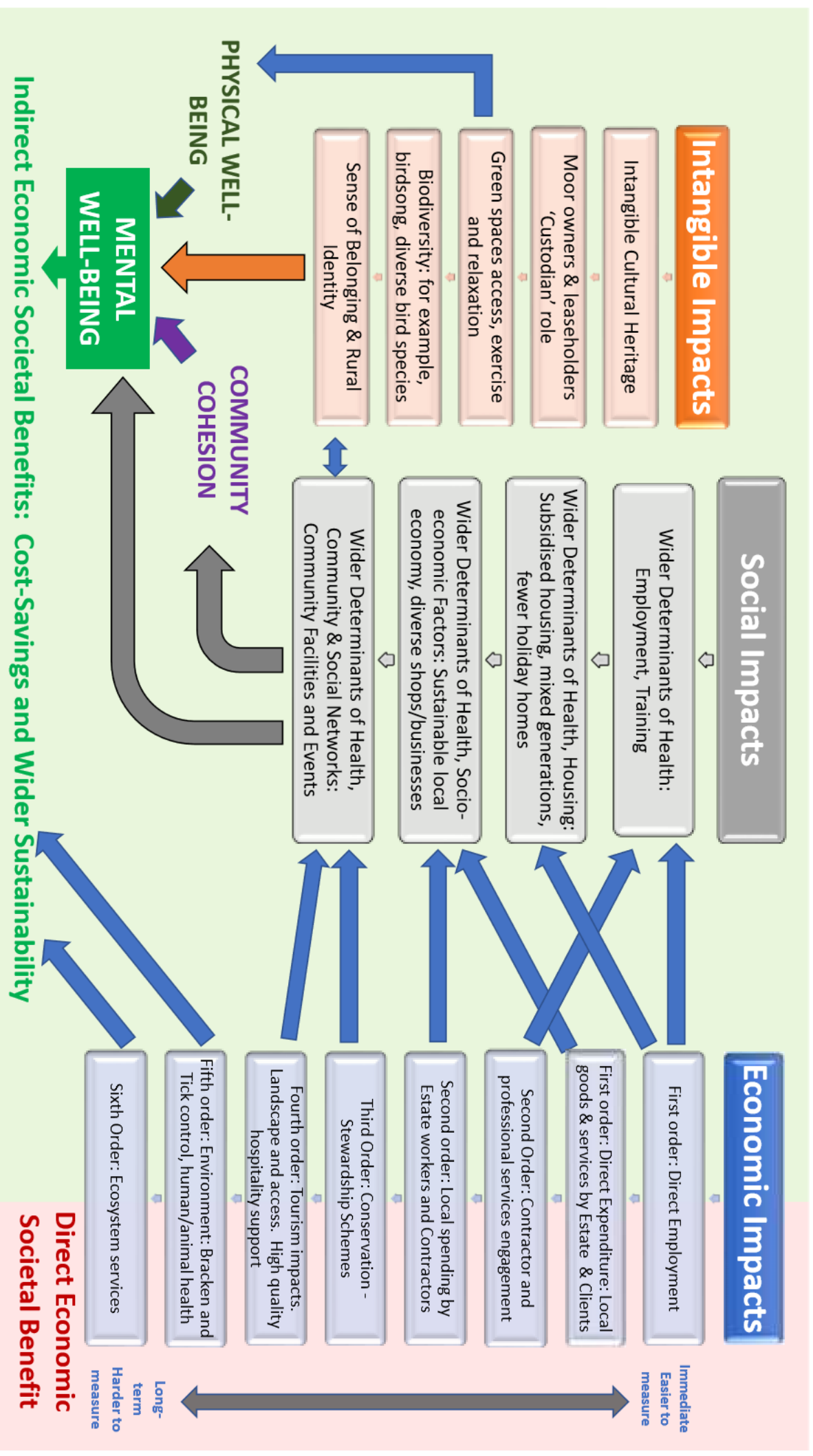
- Individuals that manage or lease grouse moor estates see themselves as custodians of the land. All grouse moor owners and leaseholders surveyed (n=73) believe it is very important that they leave a positive legacy, and an environment better than the one they inherited.
- The majority of grouse moor owners surveyed (47 out of 73) do not require their moor to make a profit in order for them to continue to fund its operations.
- All moor estate owners/leaseholders surveyed (n=73) believe there is an essential and symbiotic relationship between farming and managing land for shooting.
- Communities in areas where integrated moorland management, including grouse shooting, is practiced have a more diverse economy, and are less reliant on tourism than comparable upland areas where land management practices do not include grouse shooting.
- Individuals who participate in grouse shooting in all roles, not just those firing guns, but also those acting as beaters, pickers-up, loaders, drivers, caterers etc. often do so for reasons of intangible cultural heritage (as defined by UNESCO). Individuals participating in grouse shooting feel a strong link to their individual and local heritage. Strong identity has been shown to positively impact mental health and well-being. Previous research has calculated that poor mental health costs the UK £105 billion per annum.
- Birdwatching was the most popular hobby for our moorland community respondents, with 47% of them claiming they followed this pastime. We assume this finding reflects the diversity of bird life found on many grouse moors as a direct result of moorland management undertaken.
- The social impacts of integrated moorland management on the majority of people that live in communities are positive and result in potentially huge financial savings to the NHS and the UK taxpayer. Moreover, communities in areas where integrated moorland management is practiced, both those in National Parks and those outside them, have weathered the coronavirus storm more robustly than those in moorland and upland communities in areas where there is a very high reliance on tourism.

The study concludes that grouse shooting is not practiced in isolation from other activities. Rather, it forms part of a complex web of integrated moorland management practices which have significant economic and social impacts, both on local, often remote, communities and on the wider UK society. The types and value of the economic impacts are more extensive and much higher than previous studies have suggested. The value of the social impacts is huge, and is likely to result in significant savings in the areas of health and wellbeing, especially mental health costs.

Implications for Policy Makers

Grouse shooting is part of a complex web of integrated moorland management practices. However, from the many interviews conducted as part of this research, it is clear that it is the activities associated with grouse shooting that underpins those positive economic and social benefits brought to local upland communities, and the wider UK, by integrated moorland management.

Therefore, it is suggested that any policy that seeks to affect any part of this web should carefully consider what its impacts would be on a wide range of economic and social factors, at the start of the policy formation process. Failure to adhere to this approach would risk causing unintended but irreversible social and economic catastrophe to our upland communities.



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1. Introduction

This is not a research project that takes a position on grouse shooting, or any other type of shooting. Shooting certain breeds of birds and mammals, at certain times of the year, is a lawful activity in the UK that probably involves over 1.5 million people, in some capacity, a year (Latham-Green, 2020). This is a study of the economic and social circumstances of people that live in moorland areas in the north of England.

People inhabiting areas of upland moorland typically live in (a few) small towns or large villages, and (many more) very small villages¹, hamlets, and isolated dwellings. These moorland communities typically have few local amenities and limited economic activity, with very little manufacturing or light industry. Typically, the community economy mainly depends on agriculture and service industries, especially tourism and tourism-related retail. Many inhabitants commute to work in towns and cities away from the moors. Some moorland communities are in danger of becoming dormitory villages. Moorland communities are some of the parts of the UK most severely negatively affected by the impacts of covid-19 (Wallace-Stephens and Lockey, 2020).

The Statistical Digest of the English Uplands² (DEFRA 2011) points out that the upland areas of England are mainly sparsely populated rural areas with Less Favoured Area status. Based on 2010 data, these areas had higher numbers of people aged 65 years old and over (24%) and lower numbers of people aged 16 years old and under (16%). The population of the English uplands have lower accessibility to services. People are less likely to travel by public transport for educational services, health services, employment, and larger shops; only 61.8% of people were able to access employment centres by public transport, compared with 81.3% of the population in urban areas. Although the numbers of people with qualifications in upland areas was slightly higher than in other areas, the level of these qualifications was noticeably lower. The uplands have lower and slower broadband speeds, and limited mobile telephone reception. House prices are significantly above the national average but the uplands have the highest levels of fuel poverty, with 40% of households having to spend more than 40% of their income on fuel. Only just over 30% of households were linked to mains gas. Nearly 30% of the working population is self-employed, compared with 10% in urban areas. Businesses in the English

uplands are overwhelmingly micro³ (40%) or small (30%), and consequently there are more businesses per 10,000 population in the uplands than in other areas. The average turnover per employee is lower than in other areas.

Assessments of the economic and social circumstances of moorland communities are limited. In particular, comprehensive assessments of impact (including wider social and environmental impacts) are few in number, scope and geographical coverage. Challenges in upland areas include the declining availability of support payments and grants for agriculture, forestry and conservation land management, the restrictions placed on designated areas, requirements of planning authorities, a decline in local shops and markets. As such, employment opportunities made available through grouse shooting and moorland management are very welcome – more so than in more economically stable areas of the country.

The impact of the coronavirus has presented upland areas with new and difficult challenges. The RSA's report⁴ into local authority areas most at risk of losing employment due to covid-19 highlights that many of the most vulnerable areas are located in the north and south west of England. Cities and other urban areas tend to be less at risk, particularly local authority areas located in London or in its surrounding commuter belt. The business impact of covid-19 has been particularly severe in upland areas, with Richmondshire District Council area in the Yorkshire Dales being the most vulnerable area, with 35% of jobs at risk from covid-19. This area is 39% more exposed to the negative employment impact of covid-19 than the rest of the UK. Other areas most at risk include upland areas such as parts of the Lake District and Peak District, such as Eden (34% of jobs at risk), South Lakeland (33%) and Derbyshire Dales (33%), see Figure 1.1. The impact of covid-19 on employment has been most marked in the accommodation and foodservice sector where 80% of the workforce has been furloughed. These sectors provide high levels of employment in moorland communities with high tourist profiles, especially in the National Parks.

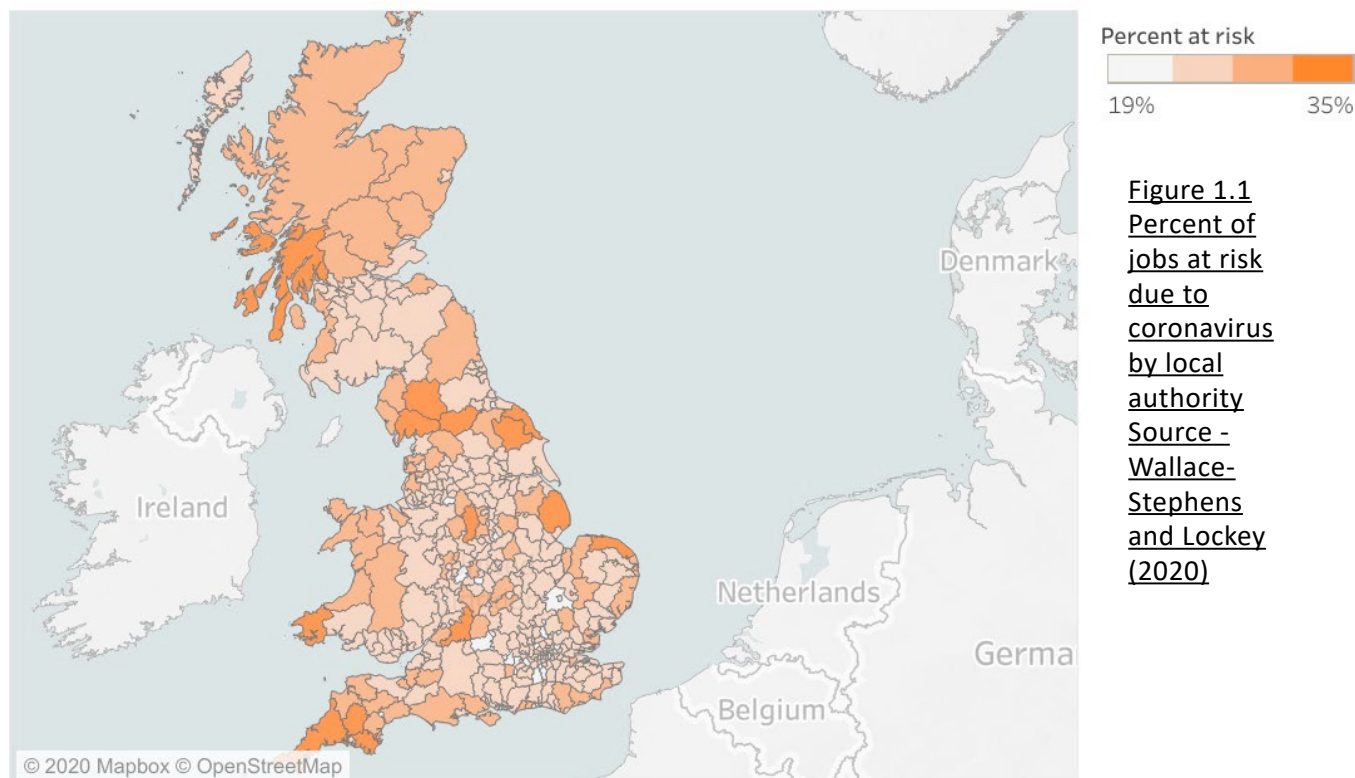


Figure 1.1 shows that the contrast between the moorland communities and parts of the south east is marked: of the top 20 least vulnerable areas, most are in London and its surrounding commuter belt in the south east and east of England. Many of these areas have a more diverse local economy with a high concentration of jobs in 'knowledge economy' industries that allow workers to easily work from home. In Oxford and Cambridge 19% and 20% of jobs are at risk respectively, and these areas are at least 20% less exposed than other parts of the UK.

In some areas of moorland, grouse shooting (and its associated moorland management) is practiced. Therefore, it is possible to compare the social and economic circumstances of moorland communities that are involved, or associated, with grouse shooting, and those that are not. Including social factors in the comparison means the research project is different from most previous studies that have centred around ecological and economic factors. This difference is important as it brings into the scope of the study such aspects as social and community relations, identify, cultural heritage, recreation and well-being.

The Uplands Partnership has commissioned this research project. The remit given to the research team is to examine moorland communities in England⁵ in close proximity to grouse shooting estates and compare them with communities that are not. The research project will identify the social and economic

factors affecting both communities and the impacts that these factors have. By comparing closely matched samples the project will identify whether grouse shooting results in economic and social impacts, and whether these impacts are positive or negative. The study will not look at ecological or environmental impacts associated with moorland management for grouse shooting.

The Uplands Partnership has specified that the research report should be delivered by 1230hrs on Tuesday 4 August 2020.

The research will be carried out by Professor Simon Denny and Mrs Tracey Latham-Green. Professor Denny was the founder, and is now an external associate, of the Institute for Social Innovation and Impact (ISII) at the University of Northampton. Mrs Latham-Green is a post-graduate student of the Institute.

1.1 Moorland in the UK

Moorland is a type of habitat found in some upland areas of the UK. It is characterized by low-growing vegetation on acidic soils. Moorland generally means uncultivated hill land, but also includes some low-lying wetlands such as Sedgemoor in south west England. Generally, moorland refers to highland and high rainfall zones. Moorland and heathland are the most extensive areas of semi-natural vegetation in the UK. A widely used definition for moorland and upland areas is land categorised as 'Less Favoured Areas', an EU classification for socially and economically disadvantaged agricultural areas.

An ageing population is a concern in the UK uplands in general, as many young people tend to leave in favour of lower-cost housing and higher wages elsewhere (Commission for Rural Communities 2010, cited in British Association for Shooting and Conservation (BASC), 2009).

There are 13 areas in England that meet the criteria to be classified as moorland:

- a. Hexhamshire Moors, Northumberland and County Durham
- b. North York Moors, North Yorkshire
- c. Rombalds Moor (including Ilkley Moor), West Yorkshire
- d. Forest of Bowland, Lancashire
- e. West Pennine Moors, including Oswaldtwistle Moor, Haslingden Moor, Rivington Moor and Darwen Moor in Lancashire
- f. Rossendale Valley, Lancashire
- g. Saddleworth Moor, Greater Manchester
- h. Bleaklow, Dark Peak
- i. Dartmoor, Devon
- j. Exmoor, West Somerset & North Devon
- k. Bodmin Moor, Cornwall
- l. Penwith, Cornwall
- m. Shropshire Hills, small pockets of moorland such as the Long Mynd

These areas are shown in the map in Figure 1. The map combines the 13 areas of UK moorland into fewer, larger, areas.

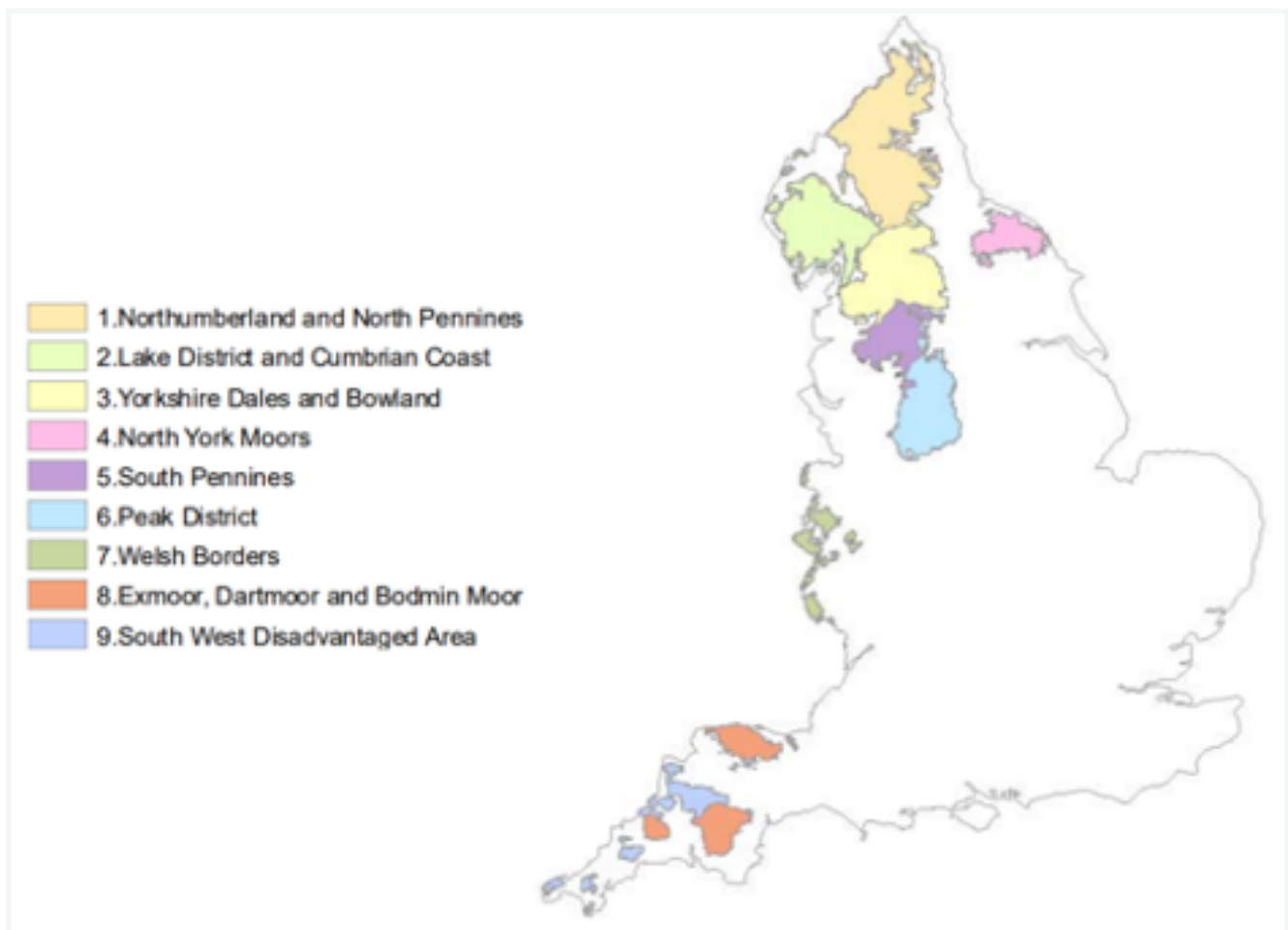


Figure 1.2 Moorland Areas of England (source: Uplands Farm Survey: England (Department of Environment Food and Rural Affairs (DEFRA), 2012))

Upland regions are a nationally significant resource for people in the UK; most have landscape protection status (e.g. Area of Outstanding Natural Beauty), special conservation designations (e.g. Sites of Special Scientific Interest), and separate local governance arrangements (National Parks) (Williams 2011). In addition to game production and shooting, activities which take place in the uplands are wide-ranging: from agriculture to forestry; renewable energy to water catchment management; and quarrying to recreation (Natural England, 2009). Ownership of moorland areas of the uplands is not always straightforward: more than one person may have the right to use the land for different purposes (such as grazing), leading to multiple land uses. Shooting estates and water companies own a great deal of moorland in England and therefore manage it with conservation in mind (Gaskell et al., 2010).

In upland areas, community cohesion is particularly important, as people and services are likely to be spread out. People living in the uplands tend to be connected economically, socially and culturally to not only the land, but also those who manage it. Some have roles as custodians of the land and its natural assets.

1.2 Moorland Communities

Although some cities are relatively close to areas of moorland e.g. Sheffield, there are no English cities located in the moors. The towns that are found in moorland areas are small in terms of population and tend to be sited in valleys along lines of communication e.g. Okehampton in Devon, or are clustered around the fringe of the moors e.g. Pickering in North Yorkshire. People that live on the moors inhabit small villages e.g. Dufton in Cumbria, hamlets, or isolated farms and homesteads. Moorland communities have limited public transport (a 'poverty of access') and travel is mainly by private vehicle. Local amenities are limited and many moorland villages do not have their own schools. Churches share priests with several other parishes⁶. There are few shops, and often there is not a public house or post office. Despite the lack of amenities and limited public transport, about two million people live in moorland communities in England⁷.

2. Scope of the research

There has been much research into the impacts of grouse shooting on the ecology and environment of moorland areas. This project investigates the economic and social circumstances of upland moorland communities and compares those upland, moorland communities where grouse shooting takes place, with relevant UK national datasets and

communities in similar geographic areas that have no involvement with grouse shooting, using both primary and secondary data. Cobham Resource Consultants (1992) produced a schematic way of portraying the economic impacts of country sports, see Figure 2.1. The scheme is a useful reference point for this study. However, the Cobham scheme does not attempt to identify social impacts and the value that some of these might have. In addition, the schematic does not consider all the economic factors that can impact rural communities e.g. the total number of jobs available in communities, the number of equivalent jobs in communities etc. Therefore, this research project will develop wider-ranging criteria for investigation.



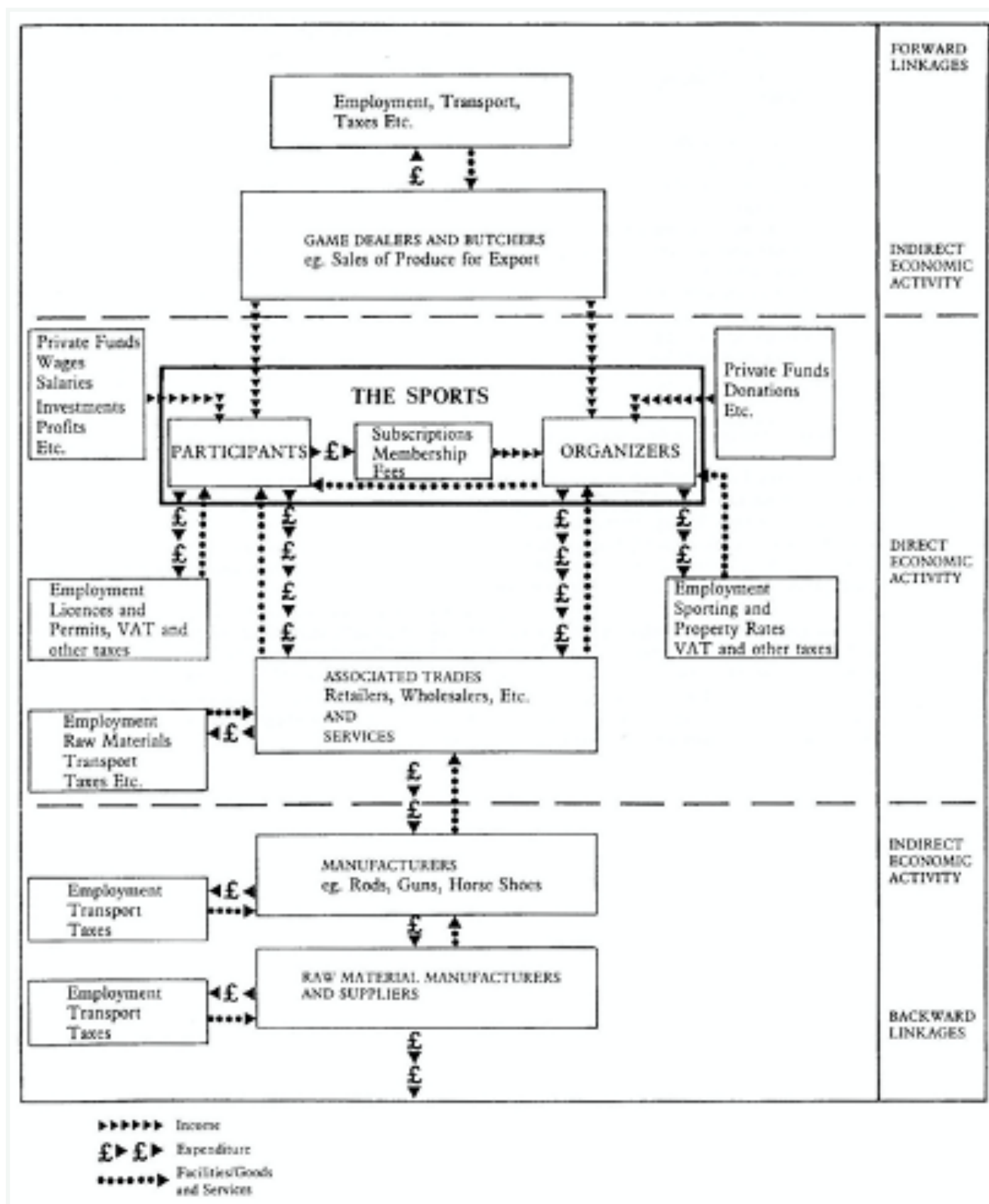


Figure 2.1 Simplified structure of relationships between the interests involved and the provision and pursuit of country sports, illustrating the types of economic activity generated (Cobham Resource Consultants, 1992).

This study has the aim of identifying both economic and social impacts and, where possible, of quantifying the value of these impacts. In order to do this, data gathered by the study will be compared with a number of standard UK databases and tools used to identify

impacts and financial values. The databases and tools that the study refers to are detailed in Table 2.1.

Database/Tool	Reason for inclusion	Source
Unit Cost Database	The unit cost database brings together more than 600 cost estimates in a single place, most of which are national costs derived from government reports and academic studies. The costs cover crime, education & skills, employment & economy, fire, health, housing and social services. The derivation of the costs and the calculations underpinning them have been quality assured by New Economy in co-operation with HM Government.	https://golab.bsg.ox.ac.uk/knowledge-bank/resources/unit-cost-database/
Community Life Survey, 2017-2018	Provides comparative data on levels of loneliness in a nationwide survey that can be used to compare national reported levels of rural loneliness with loneliness reported by those surveyed in this study that live in upland areas.	https://www.ukdataservice.ac.uk/
Understanding Society: Waves 1-8, 2009-2017	Provide comparative data on national mental well-being using a verified, recognized scale that can be used to compare national well-being levels in rural areas with scores for mental well-being of those surveyed in this study that live in upland areas.	https://www.ukdataservice.ac.uk/
Monitor of Engagement with the Natural Environment	Providing comparative data, this national survey looks at people's engagement with the natural environment, in particular, time spent in the natural environment.	http://publications.naturalengland.org.uk/publication/4897139222380544
2011 Census: Key Statistics for national parks in England and Wales	Providing comparative data, published 19 th February 2013, this spreadsheet brings together 35 key statistics from the 13 national parks in England and Wales gathered in the 2011 census.	www.ons.gov.uk
Office for National Statistics Headline Social Capital Indicators	Provides data on sense of belonging to a neighbourhood, one of the indicators with original, latest data from UK Household Panel Survey 2017-18	https://www.ons.gov.uk/peoplepopulationandcommunity/wellbeing/datasets/socialcapitalheadlineindicators

Table 2.1 Databases and tools used to identify impacts and values

3. The economic situation of moorland communities

Rural out-migration of youth and in-migration of retirees and resultant demographic changes represent a potential threat to the sustainability of rural economies in many rural areas across Scotland (Thomson 2012) and moorland areas in England. There is often a shortage in affordable housing to buy, and in some moorland communities landowners provide significant numbers of housing units. Pressures on the land resource and the very wide set of stakeholder interests in land can also lead to conflict, illustrated for example by regular contentious debates around windfarm proposals at local, regional and national levels (Warren et al., 2005).

However, as noted above, comprehensive assessments of the economic and social circumstances of moorland communities are few in number. Although there are some studies that consider the impact of grouse shooting on communities, these do not provide comparisons with communities unaffected by shooting.

A report by the British Association for Shooting and Conservation (2009) into the impact of grouse shooting on the ecosystem reviewed existing research and suggested that there were positive economic and social impacts on communities. However, these impacts were unspecified and unquantified and no attempt was made to compare individual communities. It concluded that landowners and managers of grouse moors investing time and money into their moorland and that this investment 'has many benefits, including socioeconomic support for upland communities, decreasing the likelihood of rural depopulation and helping the UK reach and maintain its conservation objective' (BASC date, p.2). However, BASC has the mission of promoting and protecting sporting shooting and the well-being of the countryside throughout the United Kingdom and overseas. Therefore, its reports are open to allegations of bias by those vehemently opposed to game shooting.

The Moorland Association (2011) attempted to estimate the overall economic value of grouse shooting in England and Wales. It suggested grouse shooting and its associated moorland management practices had a total economic value of approximately £67.7m in England and Wales in 2010. Of this sum, it was calculated that some £15.2m was spent on goods and services such as travel and accommodation, activities which support supply chains, and presumably have economic impacts on

some moorland communities. However, the bulk of the economic value (c. £52.5m) was spent on land management and it was not clear how this expenditure impacted on people living in moorland communities.

McCann (2018) points out that in searching for economically viable alternatives to driven grouse shooting in the UK uplands, results were limited. Suggestions include forestry and ecotourism. When looking into the revenue generated from alternatives such as snow sports, water sports, nature tourism and horse riding, it was found that country sports contributed more to the economy than all of these other uses (Bryden et al., 2010; Public and Corporate Economic Consultants (PACEC), 2015). However, this study did not aim to identify the impacts of country sports at the community level.

There have been several recent reports investigating the overall importance of grouse shooting in Scotland. The Grouse Moor Management Review Group in Scotland, chaired by Professor A. Werritty (2019) identified that the most recent and detailed summary of past research to date is the Scottish Government's report Socioeconomic and biodiversity impacts of driven grouse moors in Scotland (Thomson, McMorran and Glass, 2018). Werritty recorded that, with some qualifications, the report states that, on the basis of the existing database, in 2009 the grouse moor sector supported around 2,640 FTE jobs (both direct and indirect) with £14.5 million spent on wages, grouse moor management and support services. This yields a total Gross Value Added £23 million contribution to the Scottish economy annually, concentrated in rural areas where there are considered to be few other economic opportunities. More recent data collected by the Scottish Moorland Group suggests that more intensively managed estates have an average annual wage bill of £210,000 and support suppliers (often rurally located) with around £515,000 of annual expenditure (Grouse Moor Management Review Group, 2019).

In contrast with the overview, big-picture, reports of Werritty, BASC and the Moorland Association⁸, McMorran has conducted two detailed primary research studies of the benefits and impacts of grouse shooting on community residents.

McMorran (2009) studied in detail a community located in an area of Scotland where grouse shooting is a key local industry, to examine the impacts of grouse shooting on community residents. While the study did not compare the case study community with other communities not involved with grouse shooting, it demonstrated that there were often substantial socioeconomic benefits resulting from grouse shooting at the local community level. McMorran concluded that grouse shooting made a very significant contribution to the local economy, in terms of employment and benefit for local businesses.

McMorran surveyed 252 households, containing c. 560 people. He had 113 responses to his survey, equating to 20% of the total population and 37% of households. As grouse shooting was a major activity in his case study area, 51% of respondents lived on estates involved in shooting, while 49% did not. Of the respondents 10% were employed in the game industry. However, 18% said their livelihood depended on the grouse shooting. The analysis of survey responses enabled him to identify both individual and community impacts of grouse shooting, which can be summarised as follows:

- 40% of respondents said they received positive impacts as individuals such as employment, income for business, rural in-migration, and attractive landscape
- 18% of respondents said they received negative impacts as individuals such as impact on some wildlife, restricted access, noise and smoke at certain times of the year
- 81% of respondents said the community received positive impacts such as employment, income for businesses and the local economy, rural in-migration, and environmental improvements
- 17% of respondents said the community received negative impacts such as impact on some wildlife, risks to public safety, disturbance (when shooting or muirburn was in progress) and an unquantified negative impact of having absentee landowners.

Interestingly, none of the negative impacts claimed for individuals or the community were economic or social (with the possible exception of some aspects of having absentee landowners). However, the positive benefits cited by respondents were heavily weighted on the economic and social impacts of

grouse shooting. All the businesses surveyed by McMorran felt that they benefited in some degree from grouse shooting, with shooting parties being an important seasonal source of revenue. However, more important than the shooting parties were the gamekeepers employed on grouse moors and their families as they were customers of local businesses throughout the year. People living and working in the community spent more money locally than those working outside the community. Grouse shooting was also regarded by respondents as a vehicle to counter the out-migration of young community members and their replacement by older people retiring to the area.

McMorran identified that although other activities such as tenant farming, tourism businesses, forestry, fishing and deer stalking were present on some of the estates in his case study area, on almost all of these estates grouse shooting and grouse moor management constituted the single most important estate activity and management objective.

McMorran et al (2015) studied two areas of northern Scotland where grouse shooting was carried out, the north-eastern Monadhliath mountains and the Angus Glens. As in his 2009 study, the survey used revealed that community respondents perceived individual and community positive and negative impacts resulting from grouse shooting. The employment generated by grouse shooting, and income for local businesses were highly valued. Other direct and indirect impacts of the grouse shooting industry on local businesses were evident in both his study areas, including use of local accommodation. Additional examples included spend by estates, estate staff and/or estate customers in garages, vehicle dealerships, sporting goods suppliers, butchers and on local tradesmen.

The year-round presence of gamekeepers and their families was regarded as economically important to the communities, and had social impacts including the contribution of children to school rolls. The continued presence of workers directly employed in grouse shooting was particularly important in years when grouse numbers were low, and shooting was consequently limited. In addition, many respondents said that that grouse shooting brought about the long-term provision, improvement and maintenance of infrastructure. This included housing, roads, buildings, fences and walls, as well as the development and maintenance of hill track networks which can be used by locals and visitors (McMorran, Bryce and Glass, 2015).

The findings of this 2015 study demonstrate a wide range of direct and indirect socio-economic impacts. Both of the study areas were, like many moorland communities, remote from cities and large towns. The impacts of grouse shooting are likely to be disproportionately significant in such areas. However, in neither the 2009 nor the 2015 study did McMorran and his co-researchers attempt to compare shooting and non-shooting communities.

McMorran et al. (2013) studied the economic activities that landowners in the Cairngorms National Park (Scotland) carried out on their land. Table 3.1 summarizes the economic activities reported, together with details of income and expenditure provided by respondents.

Economic Activity	No. of landholdings involved	Income £	Expenditure £	Remarks
In-hand agriculture	28	6 million +	3.9 million	44% of income from public support payments and grants
Tenanted agriculture	30	1.3 million	1.35 million	1.1 million income from farm rents
Forestry and woodland management	44	2.3 million	2.6 million	39% of income from planting and management grants
Sporting land uses	41	4.4 million +	6 million	No subsidies or grants received
Conservation management	30	1.1 million	1.9 million	£713,250 income sourced from public grants
Residential property	38	1.6 million	2.1 million	Barriers to further development included lack of grants to refurbish properties
Commercial property	11	533,000	137,000	High income to expenditure ratio. 66 business tenants on the 11 landholdings
Tourism or leisure, including retail	32	9 million	5.7 million	Retail income from seven landholdings produced 3.1 million income

Table 3.1 Economic activities, income and expenditure, in Cairngorms National Park

McMorran et al (2013) showed that landowners (individuals rather than communities) can generate profits from commercial property rents, and from some tourism and leisure activities, especially if income from retail units is included. However, other economic activities in the Cairngorms were either carried out at a loss to the landowner or, in the case of in-hand agriculture, only generated a surplus due to public support payments and grants. In-hand agriculture, forestry and woodland management, and conservation management were economic activities that required significant payments of tax payers money. In contrast using land for sporting

purposes did not attract grants but, despite being a loss-making activity, was practiced on 41 landholdings. As Thirgood et al., (2000) pointed out grouse shooting is one of the few uplands land uses which is not directly subsidised by the government.

4. The social situation of moorland communities

As noted above, upland, moorland communities are located in Less Favoured Areas, meaning the geography of the area limits the viability of agricultural production other than livestock production. Figure 4.1 shows the Less Favoured Areas in England. LFAs are classified as either Severely Disadvantaged Areas (SDAs) and Disadvantaged Areas (DAs), with SDAs being areas where other agricultural production is severely restricted, exacerbating the need for alternative income resources and means of providing a sustainable local economy. These areas are rural and predominantly

sparsely populated (Department of Environment Food and Rural Affairs (DEFRA), 2011) and, when this is combined with the limited employment opportunities, the need for strong communities supported by local landowners and businesses, is of great importance. Grouse moor management, both as a stand-alone business and as part of agricultural diversification to ensure farm sustainability, can be of great importance. The overlap of areas managed as grouse moors with these Less Favoured Areas can be seen in Figure 4.1 and 4.2, indicating grouse moor management is seen by landowners as a viable way to utilise less favourable land.

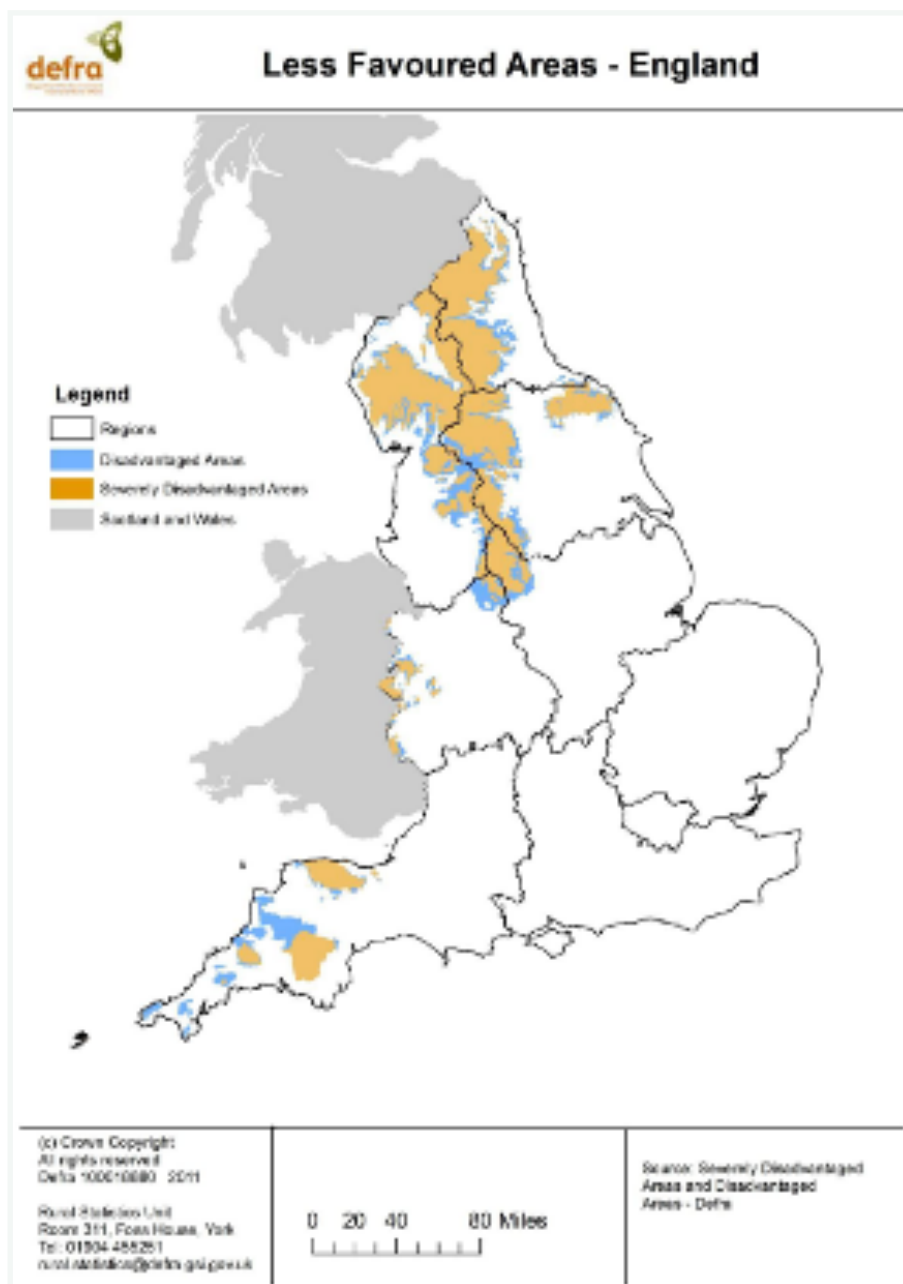


Figure 4.1 Less Favoured Areas in England (DEFRA, 2011)

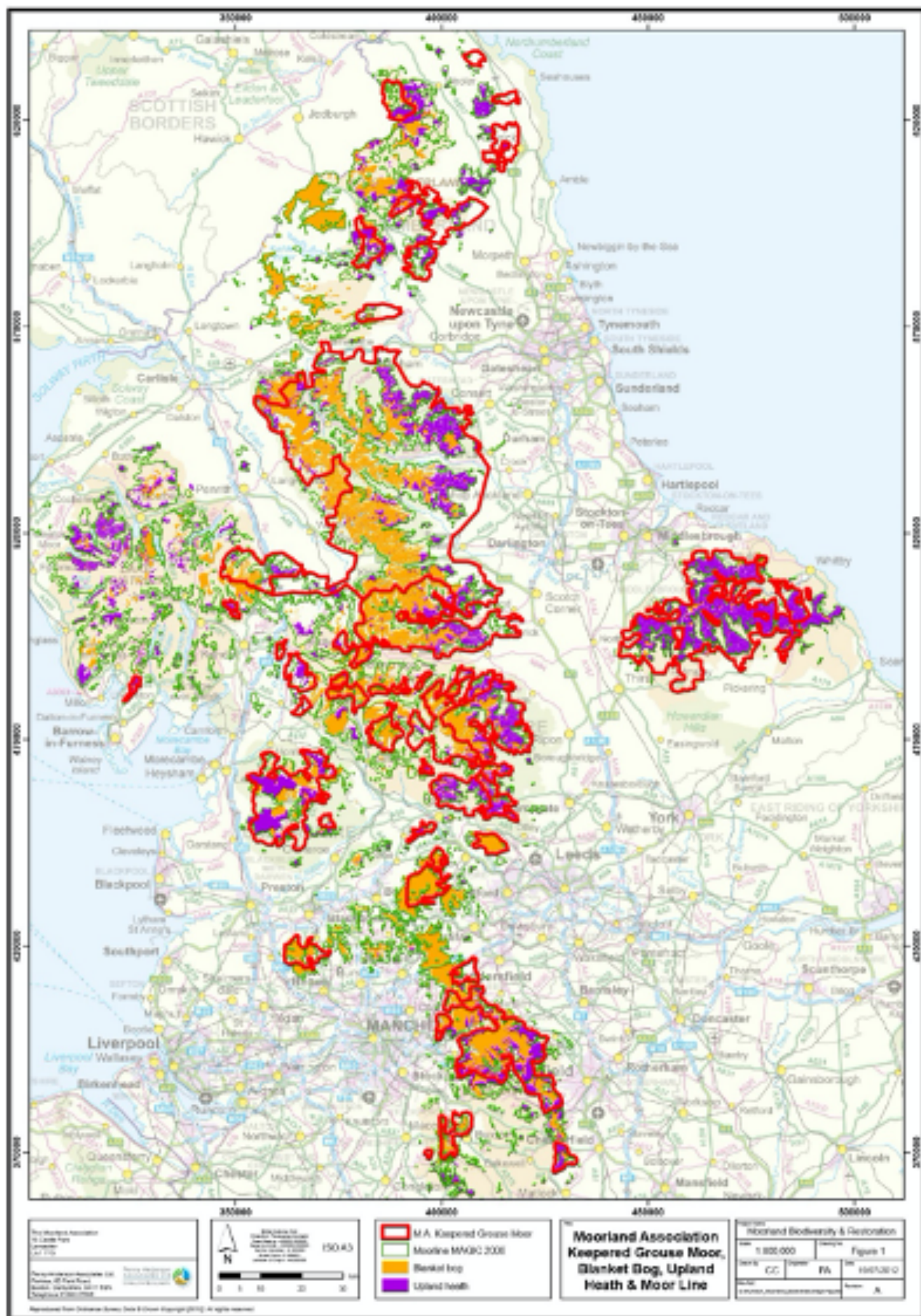


Figure 4.2 Map showing Moorland Association kept grouse moor areas
(Printed with the permission of the Moorland Association)

There is a recognised lack of evidence in relation to the social impacts directly relating to shooting. National Resources Wales (NRW) carried out a consultation on shooting over its land in 2017, which indicated a lack of research in the area of social impact and well-being and highlighted the complexity of assessing well-being in the communities affected (Natural Resources Wales, 2017). The remote nature of the majority of moorland communities means that the value of strong community networks and a vibrant local economy, both subjectively to individuals in terms of their mental health and well-being and to society in terms of potential cost savings to taxpayer in maintaining that well-being and avoiding poor mental health, can be particularly important.

When considering 'social impacts' this review considers what difference the presence of grouse moor management in upland communities makes to people's social and work lives and their health and well-being. These impacts may be on individuals, the people they know, the community or wider society. It considers both social and community cohesion and the social determinants of health as defined by Dahlgren and Whitehead, 1991 shown in Figure 4.3 below.

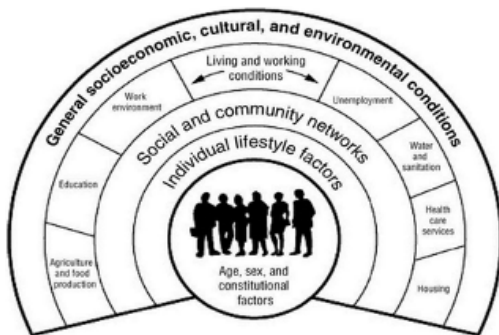


Figure 4.3 Social Determinants of Health (Dahlgren and Whitehead, 1991)

4.1 Green space management, access and health and well-being

The impact of management of uplands for grouse shooting on the environment has been well-researched. Grouse populations have been increased via management of moorland including both predator control and heather burning (Baines et al., 2014; Fletcher, Newborn and Baines, 2014; Ludwig et al., 2017). Heather burning is used to provide improved habitat for grouse breeding and it allows the distinctive purple heather landscape that can be seen in the northern parts of the UK to be maintained. Without burning, the North Yorkshire Moors, for example, would be a very different landscape with far

fewer flowers and more 'woody' heather plants, which would impact a variety of birds, animals and flora (North York Moors National Park, 2018). Managed heather burning (often referred to as muirburn in Scotland) reduces fuel load and creates fire breaks, potentially reducing wildfire risk, which will vary regionally and depend on climate and visitor pressure, both of which are expected to increase the prevalence and intensity of wildfires in future (Fletcher, Newborn and Baines, 2014).

Research has shown that there is high usage of upland moors for birdwatching and walking by both people who live in upland moor areas (McMorran, Bryce and Glass, 2015) and the wider UK population. The RSPB has estimated that upland areas of the UK host 100 million day visits per year (Royal Society for the Protection of Birds (RSPB), no date). Predator control for grouse shooting increases numbers of certain bird species such as Red Grouse, Golden Plover, Curlew and Lapwing (Baines et al., 2014). Raptor numbers can also be positively impacted by management of land for grouse shooting (Ludwig et al., 2017) and whilst alleged hen harrier persecution is often suggested as an issue (Avery, 2016), those managing the uplands are working in partnership with a wide range of relevant organisations to ensure wildlife crime is tackled and that legal measures are used to ensure raptors and grouse can thrive alongside one another in these unique habitats (Uplands Stakeholder Forum, 2016), for the benefit of all. Birdwatching is a pastime enjoyed by many individuals throughout the UK, with 'birdsong' enhancing individuals' experience of the countryside. The RSPB has over 12,000 volunteers and over 1 million members (RSPB, 2017) and these individuals, along with many other people throughout the UK, value birds in the natural environment and gain enjoyment through birdwatching, a positive social impact, when groups of birdwatchers meet up to enjoy their pastime together.

Access to green spaces has been shown to positively impact people's physical and mental well-being. Exercise outdoors has been shown to have a greater positive benefit than exercise indoors (Zhang, 2017; Thompson Coon et al., 2011; Loureiro, Veloso and Veloso, 2014; Frühauf et al., 2016). Access to green spaces has been shown to help increase activity and reduce obesity (Coombes, Jones and Hillsdon, 2010; Countryside Recreation Network, 2006). Physical inactivity and obesity can lead to long term conditions such as diabetes and cardiovascular disease (Leong and Wilding, 1999), which are costly to manage in the NHS. A 2014 study indicated that obesity had a burden of around £47 billion a year on society (circa 3% of GDP), making it the greatest impact after smoking (Dobbs et al., 2014), which is more than the annual cost of armed violence, war and terrorism (Press Association, 2014).

The availability of accessible green spaces to encourage physical activity could reduce this economic burden on society, a wider social impact. The 2014 PACEC study into all types of shooting, found that the majority of the demographic group engaged in shooting (of all types) were male and over 40 (Public and Corporate Economic Consultants (PACEC), 2014). It has been estimated that only 40% of men complete moderate physical exercise (30 minutes a day, five or more days a week) (Pollard, 2010). It has been suggested the best form of exercise for men reluctant to take up physical activity is to find something they enjoy and can easily include in everyday activities, with walking being considered one of the best options (Pollard, 2010). An analysis of 18 best observational studies, from a review of 4,295 studies on walking from 1970, found walking reduced the risk of heart problems by 31% and the risk of death by 32% (during the study period) (Harvard Men's Health Watch, 2009; Pollard, 2010).

Spending time outdoors has been shown to have positive mental well-being benefits (Frühauf et al., 2016; Kerr et al., 2012; Ryan et al., 2010). Additionally, the role of land in human spirituality, connection with a perceived god in a place of 'therapeutic stillness', has been considered in relation to overall human well-being (Winter, 2012). In a comparative study of two upland communities, 69% of respondents agreed that the landscapes resulting from grouse moor management were beautiful (McMorran, 2009). Areas like uplands, even when they are some distance from individuals' homes, have been shown to be areas to which people hold strong attachments (Williams, 2011).

4.2 The importance of identity

Those who live in rural communities such as the uplands often have a strong rural identity and sense of place, which they hold dear (Williams, 2011). An individual strong feeling of identity can have positive impacts on mental well-being. It can "provide individuals with a sense of meaning, purpose, and belonging (i.e. a positive sense of social identity)" (Haslam et al., 2009 p.1), which usually has positive psychological consequences (Haslam et al., 2009). Rural identity has been explored in prior research (Heley, 2010, 2011), with those involved in shooting expressing clear, rural identities (Hillyard and Burridge, 2012; Latham-Green, 2020), (for some respondents) links to their cultural heritage (McMorran et al., 2013), and valuing activities which were grounded in 'rural realities' (McMorran, 2009). UNESCO has identified intangible cultural heritage (ICH), which relates to social practices, knowledge and seasonal events that some individuals and communities recognise to be part of their cultural heritage, as an important factor in the well-being of individuals (United Nations Educational, 2018). In his study into the Economic, Social and Environmental Contribution of Landowners in the Cairngorms National Park, McMorran (2013) found that participants felt grouse moor management contributed to preservation of a 'culturally significant activity and landscape'. In this 2013 study most respondents (75%) 'agreed' or 'strongly agreed' that grouse shooting was an important part of the culture and history of the community (McMorran et al., 2013), findings in line with his earlier work considering 'Red Grouse and the Tomintoul and Strathdon Communities' where 81% of respondents felt that grouse shooting was a strong part of the community's culture and heritage (McMorran, 2009).

A 2020 study looking at the social impact of participation in driven game shooting found that 91.3% of participants surveyed (n=2424) felt a strong countryside identity, which was not dependent on residence in a rural area, as no significant, statistical differences in opinion on rural identity were found when comparing responses from rural and urban dwellers, but was rather connected to the rural activity in which they participated: driven game shooting. Many respondents also felt a strong sense of heritage through their participating in shooting, believing that taking part in shooting represented a link to heritage and returning to their roots, a seasonal ritual which was often shared across generations, a finding that was particularly true for those who grew up in rural areas but now live in urban areas (Latham-Green, 2020). Identity, as explored in Latham-Green's study, is a key element of building strong social networks, one of the wider determinants of health (Dahlgren and Whitehead, 1991).

4.3 Employment, training and local economy- a well-being perspective

The impacts of grouse moor management in uplands in relation to employment and training are covered in section 3. However, it is important to note the wider social impacts of employment and training which, as noted earlier and shown in Figure 4.3, have been identified as social determinants of health by Dahlgren and Whitehead (1991). Employment is recognized as one of the key determinants of both good health and a key means for tackling inequalities (Ellis and Fry, 2010; Bartley, Ferrie and Montgomery, 2005; Dahlgren G and Whitehead, 1991).

Prior research has shown that having a variety of skilled employment opportunities is particularly important in the more remote, rural areas of the UK where alternative employment is often limited and/or seasonal (Monk et al., 1999; Scottish Government, 2012). In his 2009 study of Tomintoul and Strathdon Communities, McMorran found that grouse shooting made a very significant contribution to the local economy, in terms of employment and benefit for local businesses, with 81% of respondents agreeing that the community received benefits from the existence of the grouse shooting industry and 58% feeling that grouse shooting was a major employer in the area. The indirect impacts of this employment on the wider community have also been highlighted in diverse areas from hospitality, with one local garage reporting 80% of its business came from the grouse shooting estates (McMorran, 2009). While this study found that just 10% of respondents were directly

employed by the grouse shooting industry, 18% of respondents said their livelihood was directly dependent on the grouse shooting industry (McMorran, 2009). McMorran's later report which considered the 'Economic, Social and Environmental Contribution of Landowners in the Cairngorms National Park' found that out of season gamekeepers and estate workers using local cafes, shops and restaurants which all provided local employment, helped sustain a local economy and community that would otherwise not be viable (McMorran et al., 2013). A job can enable people to build relationships and a social network and contacts for future opportunities for themselves or their families (Dreiling et al., 2015). Employment can also contribute to an individual's role identity and sense of purpose/belonging (Stets and Burke, 2000; Walsh and Gordon, 2008), which as noted above has been shown to positively impact well-being (Haslam et al., 2009).

A lack of diverse training and skills development opportunities in rural areas has been recognised as an issue due to a number of factors including transport and access to further education (Monk et al., 1999; Scottish Government, 2012; The Commission for Rural Communities, 2012). Development of skills has been shown to potentially positively impact well-being through increasing self-esteem and self-efficacy (Denny et al., 2011; Hazenberg, Seddon and Denny, 2015). Careers directly linked to shooting include game-keeping, gun dog training, gunsmithing, land conservation, ecosystem management and shotgun tuition. Training is currently widely available, with BASC listing 29 colleges offering game-keeping courses (British Association for Shooting and Conservation (BASC), 2018). The 2014 PACEC report into the value of all types of shooting included case studies of colleges providing countryside management and shooting related training in the south west, north west and south east of England (Public and Corporate Economic Consultants (PACEC), 2014).

This PACEC (2014) report also identified a number of personal development and training opportunities, particularly for young people, including gunsmithing apprenticeships, training for specific health maintenance and safety reasons and shooting competitions for scouts, cadets and schools from age fourteen onwards. These educational opportunities help young people develop social skills and health and safety awareness (Public and Corporate Economic Consultants (PACEC), 2014). The wider industries supported by the presence of grouse shooting in remote, upland areas, such as the hospitality and retail industries, provide indirect career opportunities (McMorran, 2009; McMorran et al., 2013; McMorran, Bryce and Glass, 2015).

4.4 Social cohesion - maintaining strong, intergenerationally mixed and engaged communities

The proportion of those aged over 65 in the UK is expected to rise to 26% by 2041, with the greatest number residing in rural and coastal areas (Office for National Statistics (ONS), 2018). This increase is likely partly as a result of the outflow of young people to towns and cities to find employment, as young people in rural areas have been found to be at higher risk of unemployment due to their spatial isolation and to the narrow range of opportunities which are available (Cartmel and Furlong, 2000). Rural out-migration of youth and in-migration of retirees has been recognized as a threat to sustainable, rural communities (Thomson, 2012), indicating the importance of creating a sustainable local economy with diverse work opportunities. Studies considering the impact of grouse moor management have highlighted the positive impact of grouse shooting estates in ensuring communities maintain an intergenerational mix (McMorran, 2009; McMorran et al., 2013; McMorran, Bryce and Glass, 2015).

Inter-generational relationships and the building of intergenerational understanding and respect have been recognised as an important element of social cohesion and social capital (Commission On Integration And Cohesion, 2007; Hatton-Yeo and Batty, 2011). It has been recognised that communities can be strengthened with a positive impact for health and well-being, through intergenerational connection (O'Connor et al., 2019). The presence of gamekeepers with young families getting involved in supporting community activities such as the highland games and regularly using local facilities (McMorran, 2009; McMorran, Bryce and Glass, 2015) contributes to ensuring a vibrant and active community in upland areas throughout the year, not just during the tourist

season. The majority of McMorran's 2015 study respondents believed there were community-level benefits of grouse shooting, with 70% in the Angus Glens and 53% in the Monadhliath noting community-level benefits, with only 8% in Angus Glens and 15% in the Monadhliath not noting any community benefits (McMorran, Bryce and Glass, 2015).

4.5 Social and community networks

People with a shared identity, for example those who take part in driven game shooting of all quarry types (Latham-Green, 2020), or who live in upland communities with a strong cultural and heritage identity (McMorran, 2009; McMorran et al., 2013), have been shown to build strong friendships or 'social and community networks', based on their shared understandings and sense of belonging (Latham-Green, 2020). Social and community networks are another of the social determinants of health identified by Dahlgren and Whitehead, 1991 shown in Figure 4.3. Previous studies into upland communities have identified positive community support either facilitated by or directly provided by estates and ways to further enhance this support (McMorran, 2009; McMorran et al., 2013; McMorran, Bryce and Glass, 2015).

In terms of those who take part in shooting, a 2016 study looking into all types of shooting found that the average number of friends made through involvement in shooting activity was 20. Without shooting, 68% of respondents said meeting new people would be harder, 63% said making new friends would be harder, 62% said maintaining friendships would be harder, and 77% said their social life in general would be poorer. An overwhelming 97% of respondents said they regularly mixed with at least one person due to their shooting activity. Of those who primarily shot driven game, beaters and pickers up mixed with 30 or more people on a regular basis through shooting (British Association for Shooting & Conservation (BASC), 2016).

4.6 Wider social impact: Conflict

Shooting birds for sport is a controversial area, with a number of high profile opponents with expertise in utilising social media and other online platforms to express their views, especially in relation to grouse shooting (Avery, 2016; Knapton, 2017). Negative perceptions of grouse shooting in the media have been raised in previous studies of upland communities (McMorran, Bryce and Glass, 2015) and can cause conflict between those for and against game shooting (Latham-Green, 2020), which can lead to confrontations and negative consequences.

Those taking part in all types of driven game shooting have expressed their concerns at not being able to challenge the negative perceptions of their pastime due to their lack of social media expertise (Latham-Green, 2020). A lack of understanding of grouse moor management has been cited by respondents in earlier studies as a reason for people's opposition to grouse shooting (McMorran, 2009; McMorran et al., 2013). It has been recognized that input from social scientists is needed to help conflicting parties in environmental disputes to identify shared values (Williams, 2011). However, it has also been noted that there are some who are vehemently opposed to shooting birds for sport who cannot be persuaded by balanced and objective evidence and it is unclear whether further knowledge of the social benefits would mediate their views (Latham-Green, 2020).

4.7 The potential value of social impacts

Poor mental health has been estimated to cost the UK approximately £105 billion⁹ a year when the various social and economic factors are taken into account (Centre for Mental Health, 2010; Department of Health Independent Mental Health Taskforce, 2016). For each individual affected, it has been suggested maintaining mental well-being could be valued at £10,560 per person, per annum. (Maccagnan et al., 2019).

In terms of individual direct costs for managing mental health in 2007, the average unit cost to the NHS of treating someone with depression was estimated at £2,085, the equivalent of £2,915 in 2019¹⁰ and the average cost of lost employment related to depression was £9,311, the equivalent of £13,016 in 2019 (Mccrone et al., 2008). There is also evidence that poor mental health can exacerbate

physical symptoms of illness (Barnett et al., 2012), thereby costing the NHS more to treat people; costs that can potentially be avoided if people maintain good mental health and well-being. In 2007, the average service costs for people with anxiety disorders in treatment or where their condition is recognised was £1,104, the equivalent of £1,543 in 2019. Lost employment related to depression was £9,311, the equivalent of £13,016 in 2019 (Mccrone et al., 2008). There is also evidence that poor mental health can exacerbate physical symptoms of illness (Barnett et al., 2012), thereby costing the NHS more to treat people; costs that can potentially be avoided if people maintain good mental health and well-being. In 2007, the average service costs for people with anxiety disorders in treatment or where their condition is recognised was £1,104, the equivalent of £1,543 in 2019. Lost employment costs add an additional £1,298 per person the equivalent of £1,814 in 2019 (Mccrone et al., 2008).

The community and friendship networks facilitated by a strong, sustainable community can help avoid loneliness. The overall costs of loneliness for each individual person can be £6,000 over ten years (Mcdaid, Bauer and Park, 2017). Loneliness has also been shown to negatively impact physical health, increasing the risks of frailty (Gale, Westbury and Cooper, 2018), of developing coronary heart disease, and vulnerability to strokes (Valtorta et al., 2018). Social networks have also been shown to help long-term conditions management (Hinder and Greenhalgh, 2012). In terms of physical fitness, those directly involved in driven grouse shooting as beaters and pickers-up or gamekeepers walk long distances, with one study finding distances walked were between 15-20km on a shoot day for moorland beaters (Latham-Green, 2020) and those who access the uplands outside of the grouse shooting season for walking could be said to benefit indirectly from grouse moor management. It has been estimated avoiding premature death due to physical activity has been valued at £34,818 per person¹¹, equivalent to £55,464 in 2019 (The Scottish Government, 2003).

5. Research Questions and Methodology

This study set out to build on, and add to, the work of previous research by addressing three research questions:

- What are the key economic and social impact factors in upland, moorland areas managed for grouse shooting?
- How economically and socially resilient are communities in areas managed for grouse shooting compared to other UK areas?
- How can the economic value of any social impacts resulting from grouse moor management be assessed?

5.1 Methodology

In line with previous studies considering economic and social impacts, a two-stage, mixed methods approach was adopted, combining a literature review with semi-structured interviews, analysed to find common themes, which were then used to develop a second stage questionnaire for wider distribution to gather quantitative data.

The survey included some questions for which a national comparator dataset existed. The inclusion of these questions allowed comparison to be made between social and economic impacts in upland, moorland areas managed for grouse shooting and the UK as a whole.

5.2 Data Collection

5.2.1 Secondary Data Collection

The literature review provided an overview of the research base into the social and economic impacts of upland, moorland management for grouse shooting.

The area of upland in England that is most similar in terms of geography, access, and infrastructure to areas where grouse moor management is practiced is the Lake District. Although there are some small game bird and clay shoots operating in the Lake District, there is no recent history of sustained upland management that incorporates grouse shooting. Therefore, the authors set out to gather data from inhabitants of communities in the Lake District to enable a comparison to be made between them, and communities in areas where grouse shooting takes place. The survey developed by the study was shared with open groups (with

over 80,000 members between them) in the Lake District using social media (no reference was made to shooting in the promotion of the survey as we did not want to attract responses from people that shoot and might seek to influence the results), as detailed in section 5.3.3.

However, despite a sustained social media campaign, only one response to the survey was received from the Lake District. We have no explanation for this pitifully low response rate. It should be noted that the same survey received 583 responses from people living in other upland areas.

Therefore, the study has used quantitative secondary data to compare the Lake District and other upland National Parks in England, in particular the North York Moors and Northumberland National Parks. These areas are the most similar to the Lake District so some broad comparisons are possible. We did have some interviewees that either lived, or had lived, in the Lake District for many years and, where appropriate, we were able to use their primary data along with secondary information. A number of national datasets, as detailed in Table 2.1 on page 13 were used to compare survey responses to national data.

5.2.2 Primary Data Collection: Qualitative

Interviews are a highly obtrusive form of data collection, defined by Rieger and Wong-Rieger (1995) as "conversations for the purpose of obtaining specific information". They have advantages over other data collection methods used in social science research, including the ability to establish rapport with respondents and thus increase the likelihood of responses, as well as the opportunity for the respondent to clarify and explain their answers to the interviewer's questions. Belson (1981) stresses the importance of testing interview questions before they are used with respondents. Kumar, Stern and Anderson (1993) point out that respondents should be knowledgeable about the issues being researched.

Huber and Power (1985) point out that informants sometimes provide inaccurate or biased data, for four possible reasons: they are motivated to do so; their perceptual and cognitive limitations result in inadvertent errors; they lack crucial information about the topic of interest; or they have been poorly questioned. Dexter (1970) makes the obvious, but important point that the interviewers should have relevant experience of the topic being researched so they can interpret what they hear and ask meaningful supplementary questions.

Research into any activities that are connected, no matter how remotely, with shooting is prone to generate emotional responses. Therefore, although this study is about the economic and social circumstances of moorland communities, the fact that a comparative factor is the existence, or not, of grouse shooting in an area, meant the researchers had to take particular care to ensure they got useful and objective data from the interviews. Interview questions were tested both with people that shoot, or are involved in shooting in some capacity (n=3), and with people that had no knowledge of shooting (n=3). People that piloted the interview questions either lived in moorland communities, or had lived in them in the past. Potential interview respondents were initially identified by personal recommendation from moorland groups regional coordinators, and then by asking interviewees to suggest potential interviewees that lived and worked in their area, both those that had some connection with shooting and, crucially, those that did not. Given that all people that were interviewed (n=61) either lived (or in the case of a retired vicar had lived) in moorland communities or travelled to them for work or leisure, it was reasonable to assume that respondents were knowledgeable about the areas being researched.

Both members of the research team have extensive experience in interviewing people about the impacts of participation in driven game shooting, the topic of Latham-Green's 2020 study. Latham-Green has worked for the NHS and has carried out previous studies into wellbeing. Denny set up the Institute for Social Innovation and Impact at the University of Northampton and has carried out detailed work into economic and social impacts of activities, for clients including the Ministry of Defence and the Royal College of Nursing. Latham-Green does not shoot and, apart from her PhD study, has had no involvement in shooting. Denny has shot for many years, as well as being a keen birdwatcher and a member of two county wildlife groups. Therefore, the researchers were confident they had relevant

experience of the topic being researched. Additionally, both researchers reviewed each other's interview notes to guard against unconscious bias.

To mitigate against respondents providing inaccurate or biased data, interview data was triangulated with data from the literature review and the survey. In addition, confirmation of data provided by some interviewees was provided by asking other informed interviewees for their understanding of a topic. In addition, the researchers (appropriately) challenged some statements by respondents (e.g. by saying things such as 'surely, that cannot be correct') to give respondents the opportunity to reflect on what they had said. Finally, the researchers would occasionally ask closed questions (e.g. by asking questions such as 'surely there cannot be much going on in (name of community)?' or 'so moorland management is just for profit?') to generate an immediate response that could be followed up with supplementary questions. It should be noted that the latter tactics were only used in interviews where a rapport between interviewer and respondent had been established.

A total of 61 individuals with relevant connections to upland, moorland communities were interviewed using a semi-structured questionnaire. Interviewees included moor owners, shooting tenants, land agents, gamekeepers, people that go beating, publicans, vicars, shop owners, upland contractors, moorland trust coordinators, local residents, police officers and teachers.

The interviews were spread across the UK with specific individuals living in Cumbria (4), County Durham (3), North Yorkshire Moors (13), Yorkshire Dales (3), Northumberland and North Pennines (8), the Peak District (3), Wales (6), Scotland (3) and 18 individuals with knowledge, experience or involvement spanning one or more of the areas stated in relation to grouse moor management. Due to the restrictions imposed by covid-19, interviews were conducted by telephone or using the Zoom platform, and great efforts were made to establish a rapport using these communication methods. All interviewees had the aims of the study explained, and the ethical processes the research followed were discussed. Interviewees were assured that their responses would be anonymous and that it would not be possible to identify them from their responses. Detailed notes were taken during each interview, and written up within two working days. As noted above, the researchers exchanged the notes they made from their interviews so they could be reviewed for unconscious bias.

5.2.3 Primary Data Collection: Quantitative

A survey which developed out of the themes identified from the qualitative interviews and literature review was distributed from 18th June 2020 to 3rd July via email to those who either lived in an upland, moorland community or had a strong connection to it in terms of either land management and/or their work. The survey included demographic data, area of residence and a number of questions relating to economic and social impact factors in moorland communities.

As noted above in section 5.2.1, upland, moorland areas in England were of particular interest in this study. In order to try and gain responses from both those involved in grouse shooting and moor management and residents with no formal or direct connection to shooting, the sharing of the questionnaire was encouraged and it was distributed using social media in 11 generic upland, moorland groups with a total of circa 81,000 members and five country sports related groups, with a total of circa 6,700 members. The post encouraged people to share the survey with others who lived in upland, moorland communities and utilising the canva photograph to draw attention to the posting in individuals' newsfeeds, as shown in Figure 5.1.



Figure 5.1 'Canva' used to promote the survey on Facebook

The survey was open from 17th June to 3rd July 2020 and received 583 responses from upland moorland owners, residents and others with a connection to upland moorland management. Of these respondents, 396 were identified as living in upland, moorland areas of England managed for grouse shooting and 73 were identified as owning or leasing moors. The survey was shared in open groups in the upland, moorland areas using social media, including groups specifically located in the Lake District area alone with over 11,000 members, with no reference made to shooting in the social media post. Unfortunately, only one survey respondent lived within the moorland area of England where land is not managed for grouse, therefore desk research and national statistical data was used for comparator purposes.

A summary of the demographic breakdown of respondent data is shown in Table 5.1

	Upland, English grouse managed moorland residents	All survey respondents	Grouse Moor Owners/ Leaseholders
No of Responses	396	583	73
Gender – Male	73.5%	78.2%	93.2%
Gender – Female	26.5%	21.8%	6.8%
Age			
Mean	48.3	50.5	56.3
Median	49.5	51	55
Range	15 to 85	15 to 89	22 to 85

Table 5.1 Survey respondents' demographic data

Figure 5.2 and Figure 5.3 show the broad range of educational and occupational levels of individuals answering the survey, illustrating the diversity of survey respondents.

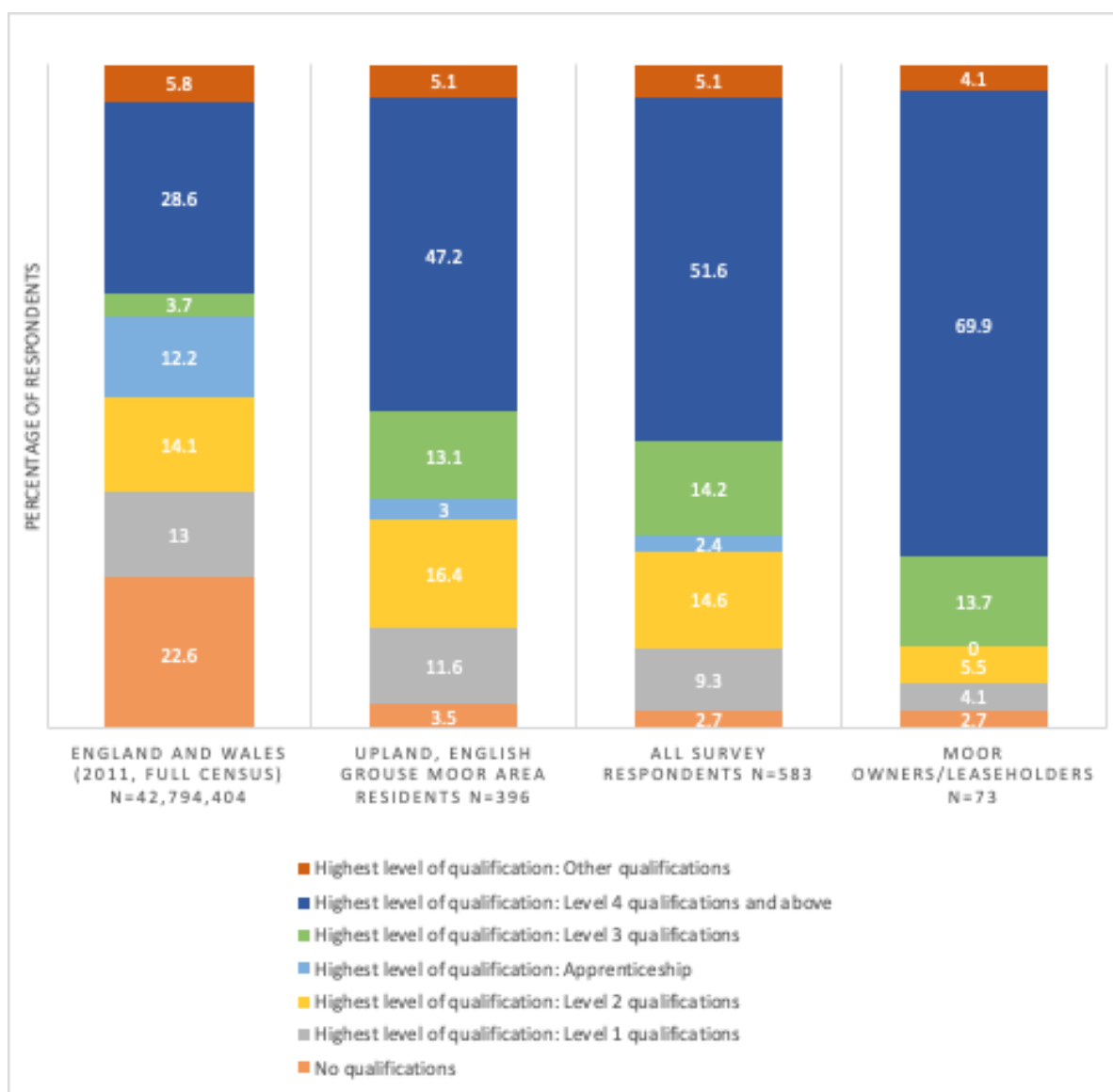


Figure 5.2 Respondents' qualification levels, compared to the national average

The respondents came from a wide range of educational backgrounds, although the residents of upland moorland communities, all survey respondents and moor owners and leaseholders were more likely to have a qualification at level 4 or above compared to the national average and a lot less likely to have no qualifications at all, indicating

perhaps a wide range of educational opportunities on offer within these communities. Education is one of the wider determinants of health (Dahlgren and Whitehead, 1991) and can positively impact health and well-being.

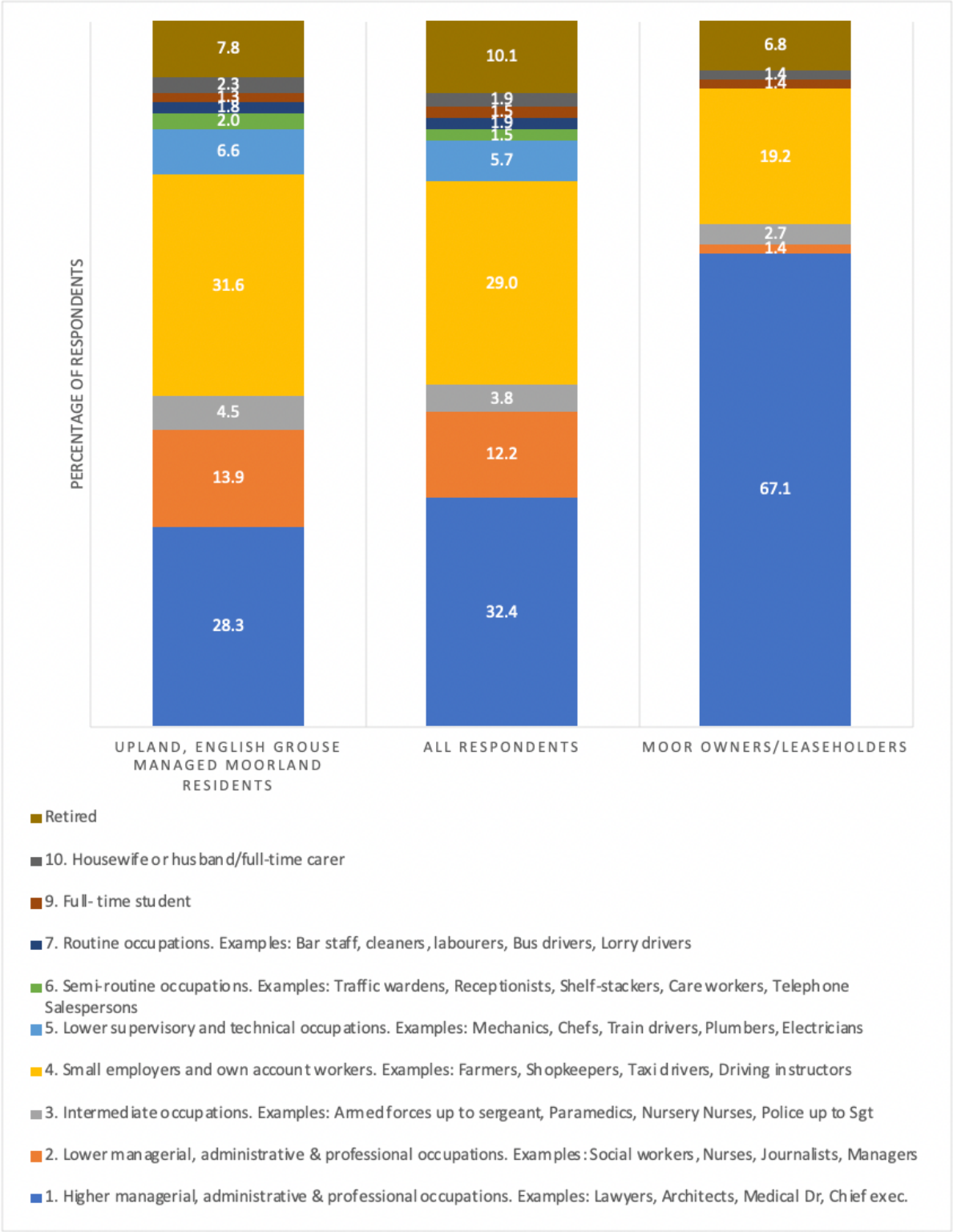


Figure 5.3 Respondents' occupation levels

Whilst moor owners work in predominantly higher-level occupations (as would be expected because of the amount of resource required to own or manage a grouse moor) the other respondents were spread across a wide range of occupational backgrounds.

5.3 Data Analysis

5.3.1 Qualitative Data Analysis

A total of 61 interviews (see Appendix 1) were completed and analysed using an inductive method to identify the emerging themes of economic, intangible and social impacts. The results of the analysis of qualitative data are shown in section 6.

5.3.2 Quantitative Data Analysis

The responses were checked for outliers and normality of distribution where required for statistical testing. Normal distribution of data allowed the use of the independent t-test for statistical comparison with national datasets where possible. The data was analysed using Microsoft Excel 2016 and SPSS version 22, using national datasets as comparators where appropriate.

5.3.3. Triangulation

Mixed methods studies such as this one enable triangulation of results to improve validity, if the results show mutual confirmation (Bryman, 1988). The data from the quantitative and qualitative analysis was brought together with the findings of the literature review to further validate the results shown in section 6.

6. Findings

6.1 Economic Impacts

"Grouse moor owners put a lot of money into their estates, and most don't run at a profit. There is a well-known phrase, 'how do you get £1 million by running a grouse moor? Start with £2 million'!! That sums it up" (Andrew Green, Managing Director, Green's of Haddington, 25 May 2020¹²).

A number of claims are made about the economic impact of grouse moors. The GWCT¹³ cites the report 'The Value of Grouse Moor Management' (commissioned in 2015 by the Countryside Alliance and the National Gamekeepers' Organisation) which indicated that grouse moor owners in England spend £52.5 million every year on grouse moor management. The report also indicated that businesses associated with grouse

shooting benefit by £15.2 million every year. These include game dealers, accommodation providers, equipment suppliers, catering establishments and transport operators. The GWCT points out that many of these businesses are in economically Less Favoured Areas in remote rural locations which depend on grouse shooting as the main economic driver outside the tourist season. It is claimed that grouse moors in England support 1,520 full time equivalent jobs. 700 of these are directly involved in grouse moor management, and a further 820 jobs are in related services and industries. The Moorland Association's website, citing the same report, suggests that the owners and sporting tenants of its 175 member grouse moors in England and Wales spend a combined total of £52.5 million on land management a year, of which 90% is privately invested¹⁴. All of these organisations are, of course, regarded as supporters of well-managed and legal shooting.

As part of the analysis of the data gathered from interviewees (n = 61) for this report, we isolated examples of economic impact that were described to us. It is fair to say we were surprised by the range and depth of these economic impacts described. The economic impacts identified are, inevitably, linked and part of a holistic whole. However, we were able to identify six different economic impacts, only two of which are cited by the GWCT and the Moorland Association. Therefore, we believe our economic impact model is more complete than that developed by previous studies.

To illustrate the range of economic impacts described, they were divided into a number of levels, or orders, based on how immediately they were delivered, and how easy they were to measure. The schematic shown at Fig. 6.1 was developed to display the impacts. The lower order (fourth, fifth and sixth level) are not simple to measure, but they need to be included to reflect the symbiotic and integrated nature of the economic effects of managing a moor for grouse.

Integrated Moorland Management Economic Impacts

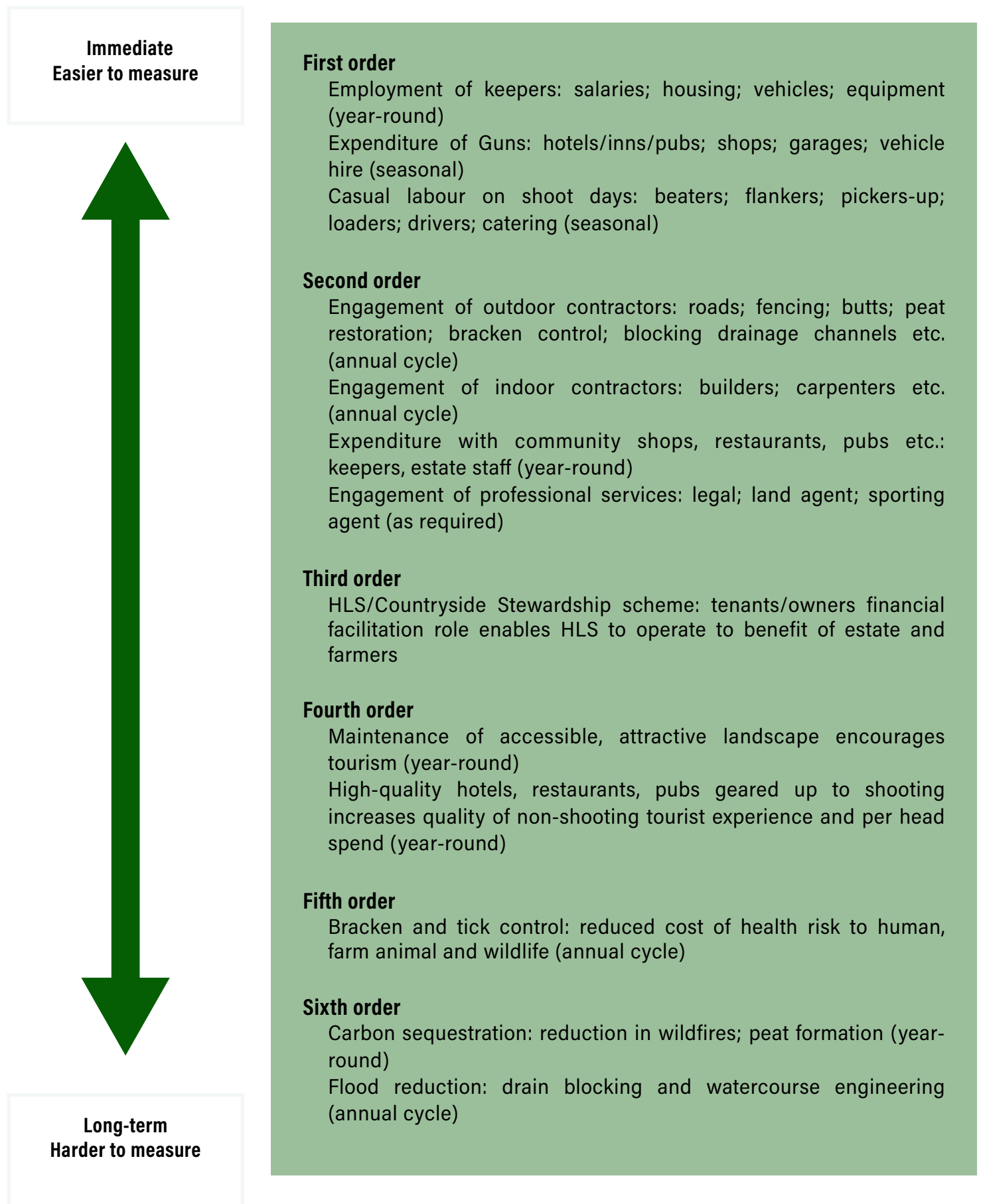


Figure 6.1: Schematic showing economic impacts of integrated moorland management, including grouse shooting.

6.1.1 First Order

"I cannot think of any activity that could take place on the moors that generates anything like the income that grouse shooting does. Walkers, bird-watchers, cyclists are welcome to use the moor, but they all do so for free. When they go into the local villages, they buy some meals and normal tourist stuff, but don't spend heavily like the shooting parties."

P4, Land Agent

The first order economic impacts are those directly resulting from the activities involved in the shooting of grouse; the employment of keepers (the great majority of which are employed full time) and the engagement of casual labour in the form of beaters, loaders, pickers up, drivers, caterers etc. Included in this first order impact is the money spent by people shooting (the Guns), both the money they pay to the estate, and the money spent with local hotels and businesses during the season. This report does not set out to estimate the total value of this first order economic impact in the UK; we do not intend to replicate the work of earlier studies. However, we will examine a few case studies that illustrate the scale and importance of first order economic impacts to remote moorland communities.

As noted elsewhere in this report, estates do not solely depend on grouse shooting for their income. They have a number of income-generating activities, integrated with each other and often co-dependent, which combine to produce the classic moorland flora and fauna. Most of these activities attract subsidies, with the exception of grouse shooting, and the income from grouse shooting is vital to many estates. A farming estate owner in North Yorkshire provides an interesting case study.

"If we look at the economics of my moorland, each ewe will have on average 1.5 lambs, worth £40.00 each in the market. So, each ewe can produce £60.00 income. You can have one sheep on four acres of moor without doing damage to the land. You can have a pair of grouse on four acres, and they average six or seven young. Their value is £80 – 100 a bird each. For a thousand acres of moorland you can earn c. £15,000 from sheep, or c. £120,000 from grouse. On a well farmed moor grouse provide a much better return. In addition, whereas for every 1,000 ewes you need one full-time worker; you need a full-time worker for every 500 brace of grouse. Because grouse produce a good return, you

employ more staff, and they have families and live locally. Cattle are less profitable than sheep due to overheads such as silage, sheds, machinery etc. However, cattle improve the land for ground-nesting birds including curlew, lapwing, woodcock. Cattle work brilliantly as part of an integrated system."

P2, Farmer and estate owner, North Yorkshire

The amount of money estates earn from grouse depends on the numbers of grouse available to shoot (and in some years there may not be any), and how much they charge the Guns. Most of the money charged for shooting goes to pay the wages of the gamekeepers and the costs of their housing, vehicles and equipment. As we have described elsewhere in this report, most estates do not set out to make a profit from shooting grouse and the owners or tenants are investing their own capital into the activity.

People that want to shoot grouse spend money not only with estates, but also with local businesses. In many cases their expenditure is vital to the local community. A moor owner in Northumberland described how on a shooting day he has nine Guns, who come from throughout the UK as well as the USA, Germany and Italy. The guns typically stay in six or seven local hotels.

"The (Name of Hotel) in (Name of village) is a key local hotel for shooting. it is owned by a charity which lets it to a firm that runs a number of hotels aimed at shooting parties."

P3

This hotel is also used by Guns shooting with another estate owner who said,

"Guns stay in local hotels, such as the (Name of Hotel). Without shooting the local hotels would struggle. They are normally completely booked by shooting parties from 11 August to October. (Name of village) is small and quiet. It is a much more social place during the season. Shooting is a key part of social life for many locals. There is no local hostility to shooting, it is absolutely integral to the area."

P8

Other hotels and inns earn substantial income from shooting. A farmer in North Yorkshire said,

"There are nine guns shooting on a day on my moor. One or two teams come from abroad each year. The guns stay in the local pub, the (Name of Pub) at (Name of village), which is a big shooting pub."

P2

When interviewed, the landlord of this pub explained how important shooting parties were to his business.

"I set out to run the inn so it would be used by the shooting community. When I took the pub over there were six bedrooms, there are now 15. The cost is £90.00 per night, plus food. There is an extensive evening menu designed for parties of 10 – 12. As well as me and my wife, I employ six chefs and up to 30 other staff at the height of the shooting season. I try to employ locals wherever possible. In a typical year 30% of my business from August to September is shooting parties, and it is at least 20% of his business from October to January. Keepers use the pub all year round. I am the biggest employer in (Name of village) and the biggest hotel or inn for 10 miles in any direction. (Name of village) has about 500 people; apart from the (Name of pub), there is a shop/Post Office, but it is only open part time. He works with a number of shoots. The (Name of pub) is a destination inn for shooters, and is geared to up help people have a great time shooting. The staff understand the needs of teams of guns, it gets them away in the morning, half the rooms allow dogs and I liaise with team organisers. If there was no shooting, life would be tough. There are walkers and tourists, but they don't spend as much as shooting people. Without shooting or tourism,

there is no point in (Name of village), 2018 was a tough year because of the low grouse numbers, I took on many fewer staff."

P25

Grouse shooting is expensive. Many people that want to shoot grouse also want to indulge themselves by booking luxury accommodation. Two owners of luxury- country house hotels in North Yorkshire gain significant income from shooting parties. One owner explained,

"I have six or seven let days on the moor a year, and typically for each of these days nine guns will stay in the hotel for two to three nights. Shooting accounts for c. 140 bed nights a year¹⁵ in the castle, and another 50 – 60 room nights in other hotels and inns. I also provide catering on the moor for the guns and beaters. The overseas grouse teams are especially big spenders. It is very high-end tourism". The other country house-hotel owner remarked, "I am in the sales and marketing profession. I charge a team of guns (normally eight people) a price for the house of £3,500 + VAT per day. Many teams also bring wives, partners etc. In a good year I will sell 35 – 40 days, in a moderate year perhaps only 32. In 2018, a bad year for grouse, I only sold 25 days."

P12

To operate these two enterprises, over 150 full time staff are employed in a normal year. Both of these houses are in locations that have no major industry or employers and are thus very important to the economy of their moorland area.

Grouse shooting attracts many Guns from overseas whose expenditure is, in effect, export earnings. The second of the country house-hotel owners cited in the previous paragraph points out,

"Overseas guests account for about 60% of my business in August, and at least 50% of it in September. They bring big money into the UK as they also spend lots of money locally. In the North York Moors and the North Pennines, foreign clients account for about 80% of the Guns in August and about 70% in September. They bring big money into the UK as they also spend lots of money locally. The amount of tourist dollars spent is massive. Teeside Airport is probably only open because of private jets coming in for the shooting season".

P20

A moor owner in Northumberland also mentioned Teeside Airport,

"Guns fly into Teeside Airport in private jets, they hire vehicles and drivers, they stay at local inns and hotels for two or three nights. Many of them bring wives or partners who go spend money locally in Durham or places like Bowes Museum. A vast amount of money is spent."

P3

The owner of a very large estate in Scotland agreed that overseas clients are important,

"a lot of teams of guns come to Inverness Airport each season. They spend money with taxi firms, car hire firms, caterers, laundries and contractors. The Guns are international." He made the point that, "the Red Grouse is one of the few animals that is indigenous to the UK and the UK alone. We need to look after them. The UK is unique for the volume and quality of its gamebird shooting. We do it in a much more professional and smarter way than the USA, Spain, France or Germany. They don't have the tradition of gamebird shooting we do. It is a great story and it is undersold. We are the Rolls Royce of game shooting. The Americans are over-awed by the formality and professionalism of our moors. Of course, there are some poor shoots, but good ones are excellent and it is not found anywhere else. We have something here that is not replicable."

P18

A sporting agent described the impact made by one US citizen that rented the shooting on a North York Moor for 20 years.

"Each year the client and his invited Guns stayed in (Name of village), in the (Name of hotel). The hotel provides top class service. Earlier in the season the Guns would be mainly US citizens, and UK teams would be on the moor in September and October. The client took over the (Name of hotel), he had a suite there for his personal use for much of the year. There would typically be nine guns staying for six days at a time, then another team would come in the next week. Guns would be collected from airports in locally-hired Range Rovers driven by people from the village. (Name of the shop) a sporting clothing and tailors in (Name of village) did very well from the invited guns. Many of them got very enthusiastic about the grouse shooting experience. They would not dream of appearing on the moor without appropriate clothing. Many of them ordered bespoke tweed shooting suits from (Name of shop). They spent vast amounts of money in (Name of shop)."

P24

The estimated spend on hotel accommodation alone each year, in one hotel, was over £75,000.

Some overseas nationals do not lease moors, but own them. A land agent gave the example of a moor that was bought over 35 years ago by an international buyer. He said,

"he employs over 20 full-time staff, mainly keepers. He also employs lots of staff in the shooting lodge. It is only the family that shoot, there are no let days. On a shoot day there will be over 50 local staff beating, loading, picking up, driving etc. There are normally 10 to 12 shoot days a year. He pays for 600 - 700 man-days employment a year, as well as the 20 full-time keepers and the house staff."

P13

The moor is in a remote area of Northumberland.

A day's driven grouse shooting involves more people than the Guns. On a typical driven day there will be people employed as beaters, flankers, pickers-up, loaders, drivers, and caterers. The numbers of these casually employed staff varies by estate and by the time of year. A moor needs more beaters in August when it is warmer and the birds have not been shot at, so do not fly so keenly. As the season progresses, fewer beaters are required. The amount of money spent over a season on casually employed staff varies; we were given examples ranging from £60,000 to over £100,000. The ages of those involved in a day's shooting ranges from teenagers to (very) old-age pensioners. Most casually employed staff are local (within an hours' drive, which in moorland areas is less than 30 miles) although people from some urban areas such as Middlesbrough, Tyneside and Ashington in Northumberland (which was mentioned by several interviewees as town with a long tradition of supplying beaters to estates up to 60 miles away). A sporting agent gave an account of the numbers of casually employed staff on one moor in the North York Moors National Park,

"during the grouse season the number of people out on a shooting day, excluding the Guns, was 60 to 70. There were about 20 days shooting a year if grouse numbers permitted. There would be about 50 beaters, each getting £50 a day and 10 pickers up each getting £100 a day. Lunches were done by a local farmer's wife who charged £500 a day. The Guns had their personal loaders who would stay in a local pub for six to eight weeks during the season. The client paid for everything, apart from beer. The bill for loaders was another £8 - 9,000 a year."

P24

A hotel owner described the impact that the grouse shooting season has on the Yorkshire Dales,

"Tourism in the Dales is seasonal. Out of season there is a very slow pace of life. All the estates have keepers and they are up and about all year on the moors, it is an isolated life. Prior to the season the entire community gets excited; young lads look forward to going beating; pubs, hotels and shops are all gearing up for business; the whole place looks forward to getting involved with and benefiting from shooting."

P20 Hotel Owner

The money earned from casual employment on the moors can be very important to local residents. A chartered surveyor¹⁶ described how he met a man working his dogs on the moor and recognized him as the person who had run the outdoor clothing shop in Appleby¹⁷ for years. The man said how his shop closed due to online competition. He now works his dogs and gets the same income (c. £20k p.a.) as he had when he was running the shop as he now has no overheads. The ex-shopkeeper claimed that without his income from working his dogs on shoots, he would either have to take a job in a supermarket or move for work. The chartered surveyor then observed,

"if you think about it, golf gives nothing to the community. You go to the course, play a round, drink in the bar and go home. It doesn't involve lots of locals, it doesn't spend big money in the local shops. Shooting is different, it gives a lot to communities."

P21

It is very obvious that the first order economic impacts are considerable. Moreover, the cash and employment generated by these impacts have a very great importance to remote communities where there is limited alternative employment.

6.1.2 Second Order

"If there was no grouse shooting lots of local businesses would go bust; contractors, carpenters, caterers and garages for a start. There would be a very big impact on the rural economy".

P17 Managing Director, bracken control business

The grouse shooting season normally lasts no more than two and a half months. However, maintaining a moor so that shooting can take place is a year-round activity. Estates are significant economic entities that do not only run grouse moors. They also generate income from other activities including agriculture, forestry, alternative energy, property and land rental. An owner of an estate in North Yorkshire has installed a small hydro-electric power (HEP) plant on one of his water courses which generates electricity sold for c. £40,000 p.a. Interestingly, this sum is almost exactly the same as the income he gets from 1,200 sheep. However, the forestry on the estate generates no profit. He points out that,

"Like all farmers, I can get subsidies for most of my activities, farming, HEP, and so on, but there are no subsidies or grants for shooting, which is the only income-generating activity in moorlands that is not subsidised. Shooting is 'one of the legs on the chair' that keep this estate going and allows me to employ local contractors."

P2

Similar to the farmer quoted in the preceding paragraph, most estates employ local contractors, for both outdoors and indoors work. An estate owner in North Yorkshire said,

"The estate is a big user of local contractors, for both inside and outdoors tasks, so indirectly it is a big employer", P16, and a Scottish land owner added, "The (name of) estate is a big local purchaser from contractors and suppliers of all sorts."

P18

The money spent on contractors can be considerable. The owner of a moor in Scotland, that has been in his family since 1919, said;

"I do my accounts each year. My estimate is that I put about £800,000 p.a. into the local economy because of the estate. This sum includes money spent on moorland roads, the keepers, their houses, vehicles, the sheep (which have to be wintered on low land in

Fife, miles away from the moor), contractors and so on. The money paid to beaters etc. would only be about £80,000 of the total investment, about 10%. Money is spent throughout the year, not just in the shooting season."

P23

The CEO of an estate in Durham commented,

"The family, and the tenant, put a lot of money into the management of the moor. The tenant has just spent hundreds of thousands of pounds to renovate properties for the keepers. The owners/sporting tenants are very high net worth people. The moors are their passion, they invest and local people benefit."

P32

Grouse moors also attract significant annual investment from rich foreigners¹⁸. An agent that had managed an estate on the North York Moors for 20 years, on behalf of an American tenant pointed out,

"The client was very wealthy and he wanted the moor to be right. I reckon he spent £40,000 p.a. on road building, and £50,000 p.a. on casual labour for the other tasks, excluding beaters. In addition, vehicles were hired from local companies all year round."

P24

The work done by agricultural and moorland contractors is extensive. In spring and early summer, roads are upgraded. The North York Moors estate this agent managed was on sandstone and needed to be continually resurfaced at a rate of about 25% p.a. The work would normally be done by local farmers, and would involve four or five people, five days a week, for about six weeks. Interestingly, much of the work done was carried out by local farmers after the lambing season, providing important extra income to the farmers.

In early summer the butts have to be maintained or built. Modern wooden butts are made in sections off-site by a carpenter, and then assembled in place on the moor by a construction team consisting of a carpenter, driver, fork-lift driver and two others. They would work under the guidance of four keepers. To complete the annual outdoor cycle, from October to April, three or four farmers would be employed (when conditions were right for controlled burning) to work with the keepers to burn the heather to ensure it could regenerate for both sheep and grouse. As health and safety has become more important, more people are required to manage the burning, and more machinery is used.

The operations manager of an agricultural contractor described her company's work.

"The company's customers are North Pennines AONB, Natural England (there is a National Nature Reserve at Moorhouse), and estates. The estates are by far the biggest customers. Shooting estates are essential clients, they are a huge part of the company's revenue. The work the company does includes: access track maintenance, stone butt repairs and building, wooden butt repairs and building, fencing, bracken control, heather maintenance, moorland restoration, drainage, spring-head clearance. The main income generator is bare peat restoration."

P28

Nearly all estates use health and safety advisers to ensure the work carried out through the year complies with relevant legislations. The managing director of a health and safety advisory business which works with shooting estates from the North of Scotland to East Anglia, as well as hundreds of non-shooting businesses, stated

"on a grouse moor we will look at all land management practices, including road maintenance and condition, butt construction and use, burning, fencing, bracken control, management of wildlife, worming and gritting of birds, personal safety for staff with ticks, sheep dipping, forestry and so on."

P31

There is a strong market for grouse. Whereas some pheasant and partridge shoots struggle to find a market for the birds, grouse command a premium price. To meet the demand for grouse, game dealers operate substantial businesses, normally in remote areas.

A dealer from North Yorkshire explained,

"I employ eight staff from August to March; some are local but three Poles have been coming over for years. They live in static caravans on the site and can earn £15,000 over six months, much more than they can earn in Poland. I collect birds from over 60 moors, on the day they are shot. I have four vans and each one will do over 30,000 miles over the six months of the shooting season. My waste disposal bill alone is £1,000 a week during the season and I buy in over 10,000 plastic boxes each year for packaging the birds. In a good grouse season, I spend over £100,000 on couriers to get birds to UK customers. In addition, grouse are exported to France where there is a strong demand. (Name of company) is one of only two businesses in this Dale. If I closed, people would be able to find work, but they would have to travel a lot further. The money generated by grouse shooting is important. Most owners do a lot to maintain their property, the moor and the houses etc. for the keepers. The money pumped into estate infrastructure is huge, and lots of people in the community are employed."

P36

An important element of the second order economic impact results from the staff that estates employ. The 15 estate owners based in North Yorkshire, Northumberland and Scotland that were interviewed for this study employ between them c. 80 keepers and c. 175 other full-time staff. All of these people live, many with their families, in remote (in some cases very remote) areas.

A land agent pointed out,

"the keepers are in the community all year round. They spend money there, their children go to school locally. In an estate I know well the keepers run charity events, cut the grass in the public areas of the village, and organise social gatherings before and after the shooting season. The shoot Christmas dinner is the biggest social event the village has with over 80 people attending. The estate employees keep this village going."

P4

A retired vicar also highlighted the importance of the year-round presence of estate staff to the community in Northumberland that he had just (in May 2020) retired from.

"The parish has a charity shoot every year that raises between £40 – 65,000. A lot of the money goes to local causes like the maintenance of the village hall and the church. (Name of village) is quite feudal, it is an estate village so the doors and window frames are the same colour. Rents are very low so it still has affordable homes. Therefore, young people can stay in the village. The (estate owning) family take their responsibilities very seriously. The village school is kept going because estate staff and young people can afford to live there and their children go to the school."

P15

The vicar commented on how the economic and social impacts of the estate were inter-twined,

"everybody in village knows everybody else. When coronavirus started, I set up a 'buddy system' through the church. In the village everybody was included, whether they went to church or not. It is paternalistic, but it works. It is a fantastic community. People are resilient and resourceful. Because it is remote, people just cope with problems; if you lose your job, you get another, people help each other. If you can't get food, somebody will deliver it. There are lots of upland farms but these are small and are really only run by the families that live in them. The major economic activity in the area is estate farming, including shooting, forestry and so on."

Estates are also purchasers of professional services. As well as employing land and sporting agents, many of them use lawyers. Although professional service providers are seldom local, they are an

element of the economic impact of grouse moorlands. A lawyer (who does not shoot) specialising in land disputes said,

"my clients range from large estates, to family farms, trust funds, institutional landowners such as the National Trust, and tenant farmers. Common areas of dispute are where parties have competing interests on the land. I have not come across disputes between communities and shoots, it tends to be specific groups that take action against shoots."

P53

Pointing out the economic impact of grouse shooting to remote communities he observed,

"if there was no grouse shooting, the impact would depend on the location. In many places, if there was no shooting, the land would not or could not be used for anything else as it is so poor. The North Pennines is pretty desolate, if there was no shooting, nothing would happen."

The data gathered by this study supports the contention of the GWCT and the Moorland Association that the economic impact of grouse shooting results not only direct (first order) effects, but in indirect (second order) impacts. A rule of thumb might be the more remote the area, the greater the economic importance of the estate owners and sporting tenants. The first and second order economic impacts are important if moorland communities are to thrive, and not simply survive.

6.1.3 Third Order

"It is the sporting tenant that puts the money into the initial phases of the Higher Level Stewardship scheme that makes it viable, and enables farms to keep going."

P60 Visiting Professor

Third order economic impacts result from the part that some sporting tenants and estate owners play in enabling Higher Level Stewardship and Countryside Stewardship schemes to operate. Examples taken from interviews with respondents in the North Yorkshire Moors serve to illustrate this level of economic impact.

There are about 27 shooting estates, with at least one full-time gamekeeper, on in the North York Moors National Park area. Interview data suggests that perhaps half a dozen of these estates cover their costs, while the rest run at a loss and are subsidized either by their owner or the sporting tenant. One example of the level of subsidy involved was provided by an interviewee¹⁹ who acted as agent for an estate in the North York Moors that was leased by a US citizen from 1997 – 2017. The agent estimates that, over the 20-year tenancy, the moor had cost the US citizen an average of £600,000 a year.

An interviewee²⁰ that works in a Further Education College (and who does not shoot) described how he had been heavily involved in a Higher Level Stewardship scheme operated by an estate and local farmers,

"the Scheme was interesting as very little money went into the estate. The funding went to around a dozen or so individual shepherds and graziers who had their flocks on the moor...the landowners were very much adding value to the landscape as a whole, not just their estates...they had the attitude that they wanted to put something in place that was better than when they started."

P39

Another interviewee pointed out that the ability to enter the Higher Level and Countryside Stewardship schemes in many upland areas depends on grouse shooting as it would not be possible to deliver a scheme where any capital works are involved without an active sporting manager. He gave a detailed account of how the post-Brexit Stewardship scheme would work. The interviewee has been working on the application for the Stewardship

scheme for Barnsdale on behalf of the estate owner, the sporting tenant and graziers. The new scheme starts in 2021 and will be worth £6 – 8 million over 10 years. The scheme includes capital and revenue grants in return for specified outcomes. The capital grant is paid in full (100%) after the work has been done²¹, so without significant investment up-front of c £450,000, the Stewardship scheme cannot operate. Moreover, until the capital work has been done, no revenue payments are made. The capital work is for renovation of buildings and roads etc. and is used to employ mainly local contractors. In Barnsdale it is only the sporting tenant that has the cash available to finance the capital work, so the whole Stewardship scheme depends on the shooting interest.

While the capital projects mainly benefit the estate, the revenue payments are essential to the farmers and graziers. It is accurate to say there would be no farming on the North York Moors without the Stewardship revenue payments. While farmers can get a lot of money from moorland Stewardship schemes (one farm in Barnsdale gets 22% of its total income from Stewardship, another gets 33%), there is a time-lag between claiming a revenue grant (normally claims are made in the spring) and the receipt of the payment (payments are normally made in the winter). This gap between the spring claim and the winter payment means farmers have to have part-time or second jobs, and many of the farmers and their families earn additional income as beaters, caterers etc. on shooting days²². The Barnsdale estate operates as a partnership: the estate owns the land, the sporting tenant has the shooting, the graziers put sheep and cattle on the land. All three parties work together and all benefit from the Stewardship scheme, as do contractors and, as a result of shooting, the casual labour. The Barnsdale case is far from unique; a similar situation exists on many other estates in the North York Moors. The shooting interest plays a key role in financial facilitation.

6.1.4 Fourth Order

"Over a five-year period, you might not get any shooting on two years, but the expenditure is constant. You spend a lot of money for something that might not happen and, as a result, you get a landscape that people value, the heather moorland. Tourists come to see the heather moorland and bring money into the communities. Grouse shooting makes communities sustainable."

P6, Assistant Land Manager

As noted above, the grouse shooting season normally lasts no more than two and a half months. However, maintaining a moor so that shooting can take place is a year-round activity. An operations manager of an agricultural and moorland contractor explained that outside the shooting season her company works on,

"access track maintenance, stone butt repairs and building, wooden butt repairs and building, fencing, bracken control, heather maintenance, moorland restoration (including restoring the vegetation on areas of bare peat), drainage (both blocking and clearing drains), and spring-head clearance"

P28

These activities result in an accessible landscape that many people find attractive, resulting in year-round tourism and leisure activities. A retired local government official observed,

"people do use the moors for other leisure activities such as mountain biking, walking, bird watching etc. However, they don't pay anything to the estates when they do these activities and if the estates did not manage the moors, there would be no paths and very few birds."

P1

A qualified ecologist that has managed nature reserves in the past and now works for a shooting and conservation organisation, observed that,

"the North York Moors National Park has to be managed to remain moorland, or it will revert to woodland". The great majority (80 – 85%) of the North York Moors National Park is managed because the estates have grouse shooting as part of their integrated economic activities."

P5

He claimed,

"tourism in the N York Moors is largely dependent on the heather landscape so, without management for shooting there would be less tourism. For example, in the Tour of Yorkshire the cyclists ride through the iconic moorland, it has a real quality to it. People go to the N York Moors in July and August to look at the heather on the hills. The keepers and the way they manage the heather are key to the appearance of the heather."

As a director of a charity points out,

"(apart from shooting), the only other economic games in town are agriculture and tourism, and agriculture depends on subsidies. Tourists like heather moors, and they exist largely because of management for grouse. I am not sure the alternative landscape would be as attractive."

P22

A gamekeeper in the North York Moors pointed out that,

"the shoot maintains lanes and tracks (at a cost of £30,000 – £50,000 p.a.), which provide access for the public all year round at no cost. All the keepers enjoy engaging with walkers on the moors. People can learn about the moors when they come here walking"

P46

It is not only in the North York Moors that tourists make use of the landscape created by moorland management. A game keeper in the North Pennines observed that,

"people come to see the fells and walk on them all the time"

P26

An estate owner in the Peak District agreed saying,

"heather moorland is very valuable to the Peak District, people come to look at it" (P34), while the chief executive of an estate in Durham believes that, "moors are beautiful and emotive places, people relate to them." (P32) The managing director of a bracken control business observed, "I didn't know about grouse moors before I started bracken spraying. I was a farmer in lowland Scotland and did not understand what estates did. I've learned that estates have a 90% positive impact on their areas and communities. In Scotland you can walk where you want and owners have spent huge money creating an environment that everybody can enjoy, for free."

P17

People that are not involved in shooting also described how they liked visiting the moors. A lecturer in a FE College in Yorkshire said he visits the moorlands a couple of times a month as he likes birdwatching, a hobby shared with a retired policeman from North Yorkshire who pointed out "there are lots of species on the moors", (P45) while a Headteacher of a primary school in Northumberland said,

"I enjoy the moorland landscape and the vastness of it. It's good to get away to some peace and tranquillity and admire nature. It's also good to take children there and teach them about the environment and the importance of caring for it for future generations as well as appreciate how lucky they are to have this on their doorstep."

P43

A Parish Councillor (and retired truck driver) from the North York Moors area told us,

"I visit the moorland daily. I like to see the little grouse chicks being raised, the variety of species including buzzards and kites. There is a balance and variety here, lots of small birds, skylarks, wheatears, various other larks, as well as buzzards and kites."

P48

As well as encouraging and enabling year-round tourism, it is suggested that grouse shooting can increase the expenditure of the non-shooting tourist. The Managing Director of a shooting business used the example of the village of Reeth, in the Yorkshire Dales, to illustrate this point,

"Reeth has been greatly influenced by shooting. It has a high-end restaurant, two pubs and a hotel.

The restaurants, pubs and hotels in the area are high-quality because they want to appeal to shooting people. As a result, other tourists can go to great pubs and restaurants etc. all year round. They are smart and high quality because of the money going into the area from shooting. The high-quality facilities increase tourist spend. In addition, because of the way they are managed and the wildlife they contain, the moors are attractive to tourists and birdwatchers etc."

P38

The evidence, both from people that are involved in shooting and those that are not, indicates that the existence of heather moorlands, with good levels of biodiversity and year-round access, is attractive to tourists. Moreover, the presence of some high-quality facilities (hotels, restaurants etc.) means that many levels of tourists can be catered for, from the day-trippers going walking or birdwatching and taking their own sandwiches, to those wanting a holiday in a privately run, luxury hotel. Moreover, an area with integrated moorland management, including grouse shooting, results in a year-round living landscape with economically resilient communities. Urquhart and Acott (2014) in their study of the social identity of Cornish fishing communities illustrate the importance of 'real' communities with a quote from a Visit Cornwall tourism manager,

"being in a place where there are real live people that you can talk to in the pub or on the harbour-side does bring things to life, I think again it adds another dimension to people's holiday the fact that they're not living in some museum."

The exact value of this fourth order economic impact is not possible to estimate, let alone calculate. However, given that the North York Moors claims that c. 7.93 million people visit the National Park each year²³, the value is likely to be extremely high for this area of moorland alone.

6.1.5 Fifth Order

"You really don't want to get Lyme Disease. I caught it from a tick in 2017 and I was really unwell. I don't think I have fully recovered yet to be honest."

P61, Ecologist

The fifth order economic impact is derived from the land management practices employed on grouse moors. Game keeping practices reduce bracken coverage and tick numbers, both through direct bracken control and through use of sheep to act as tick 'mops'. Controlling bracken and ticks is important for human and animal health, both of which have economic impacts²⁴.

Dense bracken covers about 900,000 hectares in the UK and is increasing by between 1 – 2% p.a. Bracken is present and increasing on a further 700,000 hectares. The four main health impacts caused by bracken are:

- Direct toxicity to animals and humans due to a number of poisoning and growth impacting chemical groups within the spores, frond, rhizome and true root systems.
- Impacts through the action of the living plant and litter on the soil and water systems in the habitat, including direct toxicity in drinking water.
- Creation of an environment which encourages the concentration of some of the animal hosts, such as deer, sheep and microtine rodents on which the four stages of the tick life cycle depend. The hosts are frequently the 'carriers' of pathogens which have the potential to cause Tick Borne Diseases (TBDs) in other animals (and people) which have no immune tolerance to them.
- Related to the point above, the encouragement of disease spreading parasites through the creation of favourable conditions to complete life cycles and sustain high populations. Dense bracken and the litter it creates provide ideal 'questing' conditions for ticks and the environment for the different tick life stages to rest and metamorphose

(ecdysis) between blood feeds. It also encourages hosts which are the source of the TBD pathogens.

A bracken control company director pointed out that bracken, "holds c. 70% of the tick load on a moor". P17 Moreover, in the UK changes in land use policy and the climatic gradient have encouraged bracken growth over the last 30 years and not only does the plant hold the majority of the ticks on a moor, but tick numbers are increasing rapidly. Moor owners and gamekeepers in England and, especially, North Wales and Scotland reported ticks as being a 'massive problem'. In Scotland ticks were described by one moor owner as endemic.

The risks to health from tick-borne diseases are serious, and under-estimated²⁵. Professor Roy Brown writes,

*"the number of tick-borne diseases is increasing dramatically (seven diseases currently pose serious health risks to birds, mammals and people in the UK). The rates of infection in ticks and multiple pathogen loads are also increasing. New pathogen strains (e.g. the Flavivirus causing Tick Borne Encephalitis [TBE]) have become 'native' in the UK in the very recent past. " It was estimated at an internal NIHR (National Institute for Health Research) working meeting in February 2020 that there could be as many as 18,000 new cases of Lyme Disease confirmed in the UK in 2020, against about 4,000 in 2015. Lyme Disease is a 'headline' problem but there are several other chronic (as well as acute) tick transmitted infections affecting a much larger number of people, as well as companion animals, stock and wild mammals and birds."*²⁶

On estates where grouse shooting occurs, landowners, gamekeepers and farmers/graziers combine activities to control both bracken and tick numbers. The reduction in tick burden on managed moors means that they are more healthy places for both wild and domesticated animals, and humans. The impact of ticks on wildlife can be very serious. As one keeper reported,

*"I've seen curlew chicks completely covered in them."*²⁷

While it is not possible to put an economic value on the impact of tick control on wildlife, the economic impact of poor sheep health is more obvious. Sheep can be badly affected by louping ill virus, as a moorland owner reports,

*"our shepherd began to notice symptoms in some of the lambs and at that point we had sheep and grouse tested for the louping ill virus. The tests proved 84% positive and the vet said it was the worst case he had seen. After better treatment, there was a great improvement in the flock's general condition."*²⁸

The costs to human health of contracting a tick-borne disease vary with severity: a visit to a General Practitioner resulting in a prescription is estimated to cost £68, whereas a hospital day-case costs £742, and admission to hospital £1,864 per episode (all costs 2019)²⁹. It is obviously not possible to estimate how many people do not acquire a tick-borne disease as a result of land management practices common on grouse moors. However, it is possible to assert that bracken and tick control on grouse moors have a positive economic impact, which is likely to increase as more tick-borne diseases establish themselves in the UK and tick numbers rise, as a result of reduced risk of disease to both animals and humans.

6.1.6 Sixth Order

"Carbon capture is a big thing for us."

(P16 Moor owner, North Yorkshire)

In our schematic illustrating the economic impacts of grouse moors (Figure 6.1), the impacts that are delivered over the longest term and, consequently, are the hardest to measure are the land management practices aimed at sequestration of carbon, encouraging peat formation, reducing wildfires, and reducing risk of flooding.

As noted earlier, this project is not examining the environmental and ecological impacts of grouse moor management, nor do the authors purport to be experts in ecosystems services. We do not propose to examine the claimed advantages and disadvantages of heather burning³⁰. However, the potential impacts of the sixth order economic factors that have been identified from the analysis of interview data do need to be considered as part of a symbiotic and integrated economic and social model.

Of the 17 moor or estate owners interviewed, 13(76%) stressed the importance they attached to carbon sequestration and peat formation and restoration³¹. The owner of an estate in North Yorkshire highlights this point,

"Carbon capture is a big thing for us. Peat is a major sequester of carbon and, when conditions are right, peat is being formed all the time from sphagnum moss. We have to look after the moors to maintain the peat. This means we have to keep the heather short and new. If it gets old and woody you get wildfires and they will damage or destroy peat that has taken hundreds of years to deposit. Sphagnum moss is key for peat and it will not grow if the heather is too long and the moss doesn't get enough light."

P16

A Scottish estate owner echoed this theme,

"Our moor has deep peat, over 10 metres deep in places. It is a designated site for blanket bog. If you don't manage the heather it gets too long and the sphagnum moss can't form, so there is less peat formation. Managing the heather with controlled burning reduces the risk of wildfire, if it is done on a seven-year rotation."

P18

A moor owner and farmer stressed the importance of Stewardship schemes to carbon sequestration, saying,

"all the (local) farmers have joined into the Higher-Level Stewardship environmental scheme (which is due to be replaced post-Brexit). The scheme provides payments for producing environmental outcomes. These outcomes are hard for us individual farmers but if a group of farmers work together, they can succeed. The outcomes include things such as biodiversity, carbon capture, maintenance of habitats such as blanket bog. I am very keen on integrated moorland management."

P7

The impact of moorland restoration work is also claimed to impact on biodiversity (illustrating the holistic nature of the moorlands). The operations manager of the agricultural and moorlands contractor (cited earlier) remarked that a significant proportion of her firm's income comes from peat restoration. She contrasted restoration projects for different clients,

"In 2019 the company did two projects at the same time, one on the National Nature Reserve and one on an estate. On the estate there were lots of waders and other wildlife. On the Nature Reserve the staff saw very few birds. The Nature Reserve does not manage the heather like the estates do, so it gets long and you get trees sprouting. The lack of light reduces sphagnum moss formation and you don't get new peat forming. If you don't manage a moor, you get a wood. If you have shorter vegetation, the ground nesting birds can see predators and they feel safe. They love it."

P28

Nearly all moor and estate owners commented on the importance of managing the drainage on their land. They were struck by the irony that they can now access government funding to undo what their predecessors were paid by the government to do! An estate owner in North Yorkshire summed the situation up well,

"the estate is in the new Countryside Stewardship scheme which, apart from other things, provides payments for blocking up the moor drains that were put into the moor between the 1940s and the 1970s as part of earlier government environmental schemes"

P16

Another North Yorkshire moor owner said his aim was to manage the land,

"...so the activities are carbon neutral, and to sort out the water issues so there is no pollution or flooding etc. I am now being rewarded for undoing what the government paid moorland owners to do post-WW2. I am blocking moor drains etc. to control flooding downstream."

P2

This owner pointed out that water from his land drains into the River Ouse, which flows through York. He has put meanders into streams on his land (which had been straightened by government-funded drainage schemes in the 1960s) to lengthen the water course, reduce peak flows, and improve aquatic life, as a contribution to try to reduce flooding downstream.

The economic impact of carbon sequestration and flood reduction work carried out on grouse moors are impossible to accurately measure. The costs of the flooding that hit the UK (including York, which experienced 'nightmare' floods in December 2015³²) were estimated by the Environment Agency³³ but it is clearly not feasible to try to calculate the economic effect of blocking moor drains, or increasing the length of streams. Similarly, work done to encourage peat formation and reduce wildfires cannot be accurately economically valued.

However, the value of this work is likely to be significant. A qualified ecologist pointed out that,

"until coronavirus hit us, all political parties were being affected by the impact of climate change. They have now realized that climate change is expensive. The moors hold the biggest carbon store in the UK, and have done for hundreds of years. If you have too much old heather, it becomes a major fire risk and when it burns in a wildfire you get a deep fire which can burn underlying peat. This is disastrous for the moor and for carbon release. But controlled burning of short heather does not burn the underlying peat. Effective moorland management, for grouse and other animals protects the biggest carbon store in the UK. It protects against climate change."

P5

6.1.7 Economic impacts: conclusions

This study's schematic showing the different orders of economic impact resulting from integrated moorland management, including grouse shooting, represents a holistic approach to identifying impact. It demonstrates the complex integration of actions that are involved in integrated moorland management, and the depth and breadth of the impacts of these actions. Short term impacts (orders one and two in the schematic) are relatively short-term in effect and are fairly simple to measure (which is presumably why previous studies have focused on them). Long-term, and very-long term, impacts result in effects over years, in some cases over decades. Consequently, measuring them accurately is not possible. However, the fact that it is not possible to measure an effect (for example, as noted above, it is not possible to say how many people and animals have not acquired a tick-borne disease as a result of moorland management practices³⁴) does not mean that it is not present, and that it is not important. The impacts of integrated moorland management on the agriculture sector through financial facilitation; on tourism through the creation of a unique, accessible and attractive landscape; on human and animal health through tick and bracken control; and on carbon sequestration and flood control through moorland management and restoration practices are immense.

Moreover, their long-term financial impact is massive, not only for local communities, but for the wider UK population.

6.2 Social Impacts

To identify social impacts on communities located in areas where moorland is managed for grouse shooting a number of factors were considered. These factors included the strength of community identity, belonging and friendships, the range of community shops and services, and the variety of clubs, groups and societies available in the areas. Some of these factors are, of course, integrated with the economic order model described in in section 6.1. In many cases we were able to gather data that was valid to compare with national data.

6.2.1 Community and Sense of Belonging

"The community spirit in the moorland communities with shooting is strong, if you go into a shop more than twice, they recognise you. They are good at coping. They all have friends that can help them or take over jobs on estates."

P21 Chartered Surveyor

Strong social networks have been recognised as one of the wider determinants of health (Dahlgren and Whitehead, 1991). Respondents in our survey were asked three questions designed to rate the strength of social networks in their area, as shown in Table 6.1. Figure 6.2 shows the results.

	Strongly Disagree	Disagree	Neither agree or disagree	Agree	Strongly Agree
If I needed help, I can rely on my friends from within the local community	☐	☐	☐	☐	☐
I have made some close, long-term friends in my local community	☐	☐	☐	☐	☐
I feel like I belong to the neighbourhood I live in.	☐	☐	☐	☐	☐

Table 6.1 Questions about social networks, community and sense of belonging.

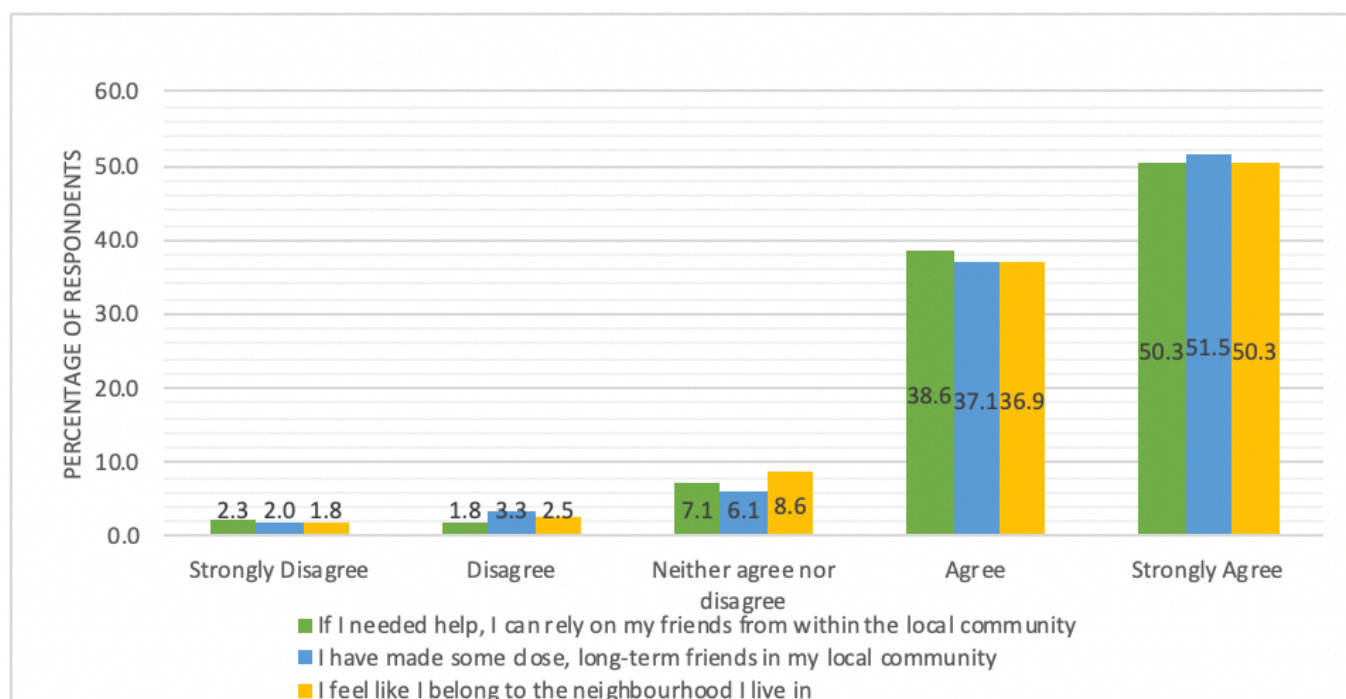


Figure 6.2 Strength of social and community networks and sense of belonging in upland, English grouse moor areas

The very high levels of 'agree' and 'strongly agree' responses to the questions about friends and community (shown in Figure 6.2) indicate a strong community in the areas concerned. For the third question asked, there is a similar national dataset relating to 'belonging to your community'. In the national survey, adults aged 16 and over are asked how strongly they agree with the statement "I feel

like I belong to this neighbourhood", with the five possible responses being "Strongly agree", "Agree", "Neither agree nor disagree", "Disagree" and "Strongly disagree". Those who answered "Strongly agree" or "Agree" were used as the indicator. This study worded the equivalent question in a way that was more suited to rural environments.

If we compare national and this survey's moorland resident responses (see Figure 6.3), we see clear evidence that moorland community residents in England feel a very much stronger sense of belonging to their community than the national average.

A statistical analysis was completed using an independent t-test with this study's full survey dataset and the Community Life Survey 2017-18 full dataset.

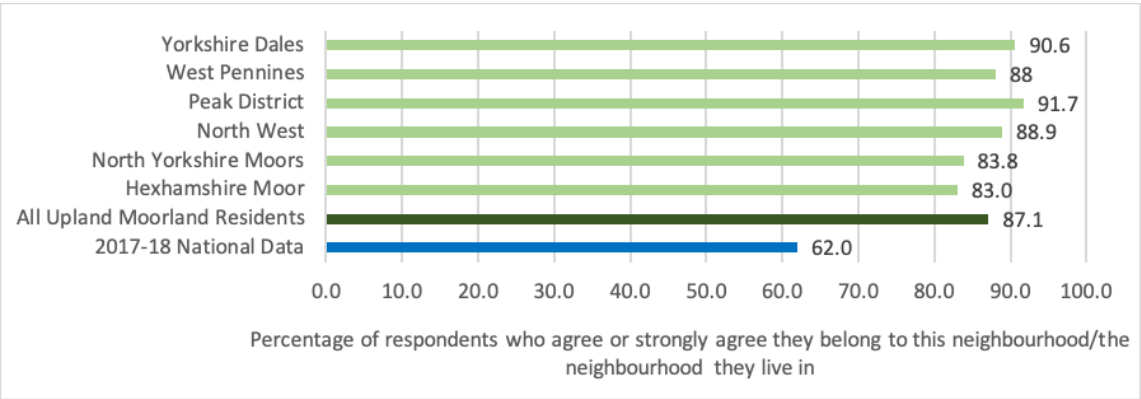


Figure 6.3 Respondents 'sense of belonging' compared to national dataset

Whilst we cannot complete statistical testing, as the questions are not exactly the same as the national dataset, the sense of belonging to neighbourhood indicated by the survey respondents compares very favourably with national data in this area. As noted above, strong social networks are one of the determinants of health.

Community and social networks are one of the key wider determinants of health as identified by Dahlgren and Whitehead (1991). The impact of a strong community on levels of loneliness in people who live in moorland areas of England was considered. To explore this, the data collected in the study was compared to national data. The comparator dataset used was the Community Life Survey 2017-2018. Respondents to both our survey and the national survey were asked the question shown in Table 6.2.

How often do you feel lonely?				
Often, always	Some of the time	Occasionally	Hardly ever	Never
1	2	3	4	5

Table 6.2 Question about loneliness

The use of a five-point Likert scale for both datasets allowed a comparison to be made between the responses from moorland community residents and the national dataset.

Community Life Survey 2017-18 Dataset			Moorland Community Residents Dataset					
N	Mean	SD	N	Mean	SD	t	Df	Cohen's effect size d
10046	3.48	1.169	396	3.75	1.065	4.906***	433.360	0.24

Table 6.3 Independent t-test results comparing loneliness levels in upland, English, grouse moorland communities with national data

The results of the t-test in Table 6.3 revealed a statistically significant difference ($p < .001$) with a small effect size ($d = .24$), indicating that individuals who live in upland, moorland communities managed for grouse shooting surveyed in this study have a statistically lower level of loneliness than the national average, an indicator of a strong community support networks for individuals living in these areas.

Combatting loneliness is a key element of the government's health and well-being report (ONS, 2017a). Loneliness can impact both mental and physical health, increasing the risk of depression, particularly in older adults (Ge et al., 2017) and increasing the risks of frailty (Gale, Westbury and Cooper, 2018), of developing coronary heart disease, and vulnerability to strokes (Valtorta et al., 2018). The overall costs of loneliness for each individual person can be £6,000 over ten years (McDaid, Bauer and Park, 2017).

6.2.2 Community facilities and groups in upland, grouse managed moorland areas

"(Name of village) has won village of the year twice in the past. The main reason it won is that it has so many clubs and societies; sports, drama, religion, cultural etc. There are something like 70 local groups in all. People have to make their own entertainment in remote areas like (Name of village), and they do. There is a big summer fair, a panto etc. It is not a dormitory town but a real community with an economy of its own."

P15, retired vicar

The data we have gathered and analysed in this study illustrate the thriving communities in moorland grouse moor areas. To give just two examples, at the interview stage, those who lived in communities such as Allendale and areas of the North Yorkshire Moors all said there were a large number of facilities and clubs available, noting that there were lots of different age groups living in the areas.

The interviewees described village fairs, local cricket and football teams that have matches between other local teams, and between the estates in the areas. The presence of younger gamekeepers and their families in the area, often with their families, and a thriving local economy ensuring employment for a diverse range of age groups means these facilities can continue. A Parish Councillor in a North Yorkshire Moors village spoke of a choir that has several bases in the area and had been asked to perform nationally and internationally. One village has

an annual quoits tournament and another area hosts the local agricultural show.

Additionally, the Rosedale and Rydale shows are both long established country events attracting both community residents and visitors from many miles around. There are sports and social facilities, village halls, regular events like village fairs and several active Methodist, Catholic and Anglican churches. There are still primary schools in the villages. An interviewee in rural Yorkshire noted that, in September 2020, 25% of the children in the local primary school would be from the estate employees and contractors and their families. Another interviewee said of an area in Northumberland:

"There is a very vibrant community. Lots of clubs and events going on, we have a sports club as well as a golf, tennis, bowls and cricket club. We have a well-used community sports hall which local residents can hire for sports clubs and parties. Very sociable, the area has three pubs, tearooms, arts café, village hall. These all attract tourists especially cyclists and ramblers. There is a communal park which leads down to the river and designated walking trails. We have a Methodist chapel and Anglican church, both of which the children at school visit for curriculum work and events like the Harvest Festival. It has a May Fair each year which is well attended; a Festival at New Year attracts tourists from all over. There is an annual folk festival – again well attended from all over the North east and beyond.; the local village pantomime is always eagerly anticipated."

P43

We are not, of course, claiming that this wealth of community facilities and activities are unique to upland communities where integrated moorland management is practiced. However, the authors were struck by the number of clubs and activities that nearly all interviewees described, and compared them favourably with the situation in their (separate) lowland communities.

Survey respondents living in moorland communities managed for grouse were frequently members of community clubs, groups and associations, with 51% of 388 individuals who responded to the question saying they were a member of a community group. The variety of groups is shown in Table. 6.4, noting that individuals can be members of more than one group.

	Number of Respondents	Percentage of overall survey respondents
Choir	9	2%
Church Group	40	10%
Social Club	14	4%
Pub quiz team	13	3%
Rural Sports Association or Group	67	17%
School PTA	8	2%
Sports Club or Team	60	15%
Village show committee	31	8%
Other	66	17%

Table 6.4 Range of Community Groups Memberships reported by survey respondents

	Number of Respondents	Percentage of overall survey respondents
Astronomy	27	7%
Birdwatching	187	47%
Baking and/or cooking	123	31%
Crochet	15	4%
Drawing and/or painting	36	9%
Genealogy	19	5%
Knitting	17	4%
Sewing	25	6%
Wood-working	74	19%
Other	101	26%

Table 6.5 Upland, English grouse managed moorland residents' hobbies'

Respondents were asked directly about hobbies (results shown in table 6.5), noting again that individuals may have indicated more than one hobby. Under the 'Other hobbies' category, various pastimes were noted including reading, local history, dancing, crafts such as metal working and leather working, falconry, dog training, gardening, photography, and choral singing. Interestingly, birdwatching was the most popular hobby, with 47% of respondents noting it as one of their interests. This finding gives some weight to interviewee statements such as "you would lose the birdlife without shooting" (P15, retired vicar), and "grouse moors teem with birds; curlew, golden plover, lapwing. It is not just grouse" (P28, agricultural contractor).

Table 6.6 shows the range of sports individuals take part in, again remembering individuals may take part in more than one sport. 'Other' sports included tennis, hunting, horse riding, quoits, rugby and yoga. Shooting (in some capacity) and walking were by far the most popular sports selected. We had 396 survey responses from people that lived in moorland communities. We were surprised by the high percentage of these respondents that take part in shooting in some capacity (74%).

This finding supports interviewee statements such as, "teenagers will wait in the village centre on shoot days to be collected by the local estates to go beating" (P29, sporting agent) and, "culturally, grouse shooting is an important part of the community" (P32, estate manager).

Tables 6.4, 6.5 and 6.6 indicate the wide range of sports, community groups and hobbies that are available for individuals living in grouse moorland communities. Walking and birdwatching are both facilitated and improved by the management of moors by local estate owners and leaseholders.

The presence of strong community and facilities can create strong community networks and also form part of the wider socio-economic conditions identified by Dahlgren and Whitehead (1991) as wider determinants of health, which can have financial benefits to society described in in section 6.4.

	Number of Respondents	Percentage of overall survey respondents
Cricket	45	11%
Cycling (any type)	93	23%
Fishing	133	34%
Football	27	7%
Golf	49	12%
Martial Arts	1	0%
Netball	4	1%
Running	64	16%
Sailing	15	4%
Shooting (any role incl. beaters, pickers-up)	295	74%
Walking	265	67%
Other	73	18%

Table 6.6 Sports participation of survey respondents

6.2.3 Wider determinants of health: Employment, Housing & Intergenerational Communities

"(Village name) is a vibrant local community with few holiday homes. It has a railway station and regular bus services. There are several shops/facilities including a Bakery, Pub, School, Bank, three Churches, a Plant Nursery, a Restaurant/Tea Shop, a Local Garage and Service Station, a Village Shop, a Post Office and Petrol Station and a Pottery/Arts gallery. Lots of local people are employed in these shops and other businesses and in agriculture, contracting, catering services for estates, service industries, there is very little unemployment."

P51, Builder and Bakery owner

Section 6.1 described the role of integrated moorland management in providing direct, indirect and casual employment. This section looks at two key related areas considered in this study.

Housing was a key issue mentioned by interview participants, with many concerned that the increase in the numbers of people buying second homes in moorland communities meant there was insufficient local housing for young people, resulting in younger people with families moving away. The estate workers we interviewed lived in subsidised housing, allowing them to live and work in the local community, while some estate owners ensured that a range of affordable housing is available to enable young people, with families, to live in the communities.

"(Village name) is quite feudal, it is an estate villageRents are very low so it still has affordable homes. Therefore, young people can stay in the village"

P15, Retired Vicar

One respondent noted the impact of young families being able to stay in the area on primary school sustainability,

"Everyone who lives in (village name) either farms or works at the shoot. Gamekeepers, farmers or handymen; four Gamekeeper families have nine children (between them); two farming families have four children. The local primary is (school name). Next school year, seven of the 30 or 40 pupils will be Gamekeepers' children"

P46, Gamekeeper

Whilst not all interview participants took part in grouse shooting, some noted that taking part in shooting is a pastime that crosses the generations.

"It has a wider impact as all ages go beating including children and older generations Shooting is a very social thing and all the farmers go who wouldn't usually see many other people - it is something they do together."

P47, Caterer

The resilience of upland, moorland communities has been tested in 2020 with the coronavirus pandemic and subsequent lockdown. However, the gamekeepers and other estate staff surveyed said their work had not changed and they felt confident their jobs were secure.

"the estate will still employ the same number of people. The owner uses it for leisure time and business clients whilst also selling a few commercial days. There will definitely be less foreign visitors but the staff employed will not be affected as they will retain their jobs and the shoot will still be using local services and buying local goods."

P46, Gamekeeper

As noted previously, 396 survey respondents lived in moorland communities around the northern moorland areas shown in Figure 4.2 in section 4 (Hexhamshire Moors and the North Pennines, the Yorkshire Dales, the North Yorkshire Moors, the North West and the West Pennines, the Eastern part of Cumbria (where moorland is managed for grouse shooting) and the Peak District). Of these 74% indicated that they took part in shooting in some capacity, while the remaining 26% did not list shooting as a pastime. Of our interviewees, 20 out of 61 did not take part in shooting. In the wider survey those living in upland, moorland communities were asked the question shown in Table 6.7.

	Very worried	Fairly worried	Not very worried	Not worried at all	I've already lost my job because of coronavirus	N/A I don't work	Don't know
How worried are you for your job as a result of Coronavirus?							

A comparison with national data is below in Figure 6.4. Far fewer upland, moorland residents expressed concern about losing their jobs as a result of coronavirus than respondents in a national YouGov poll. This finding strongly indicates that moorland communities in areas where grouse moor

management is practiced have stronger perceptions of job security than the national average. Unsurprisingly, job security is positively associated with good health and wellbeing.

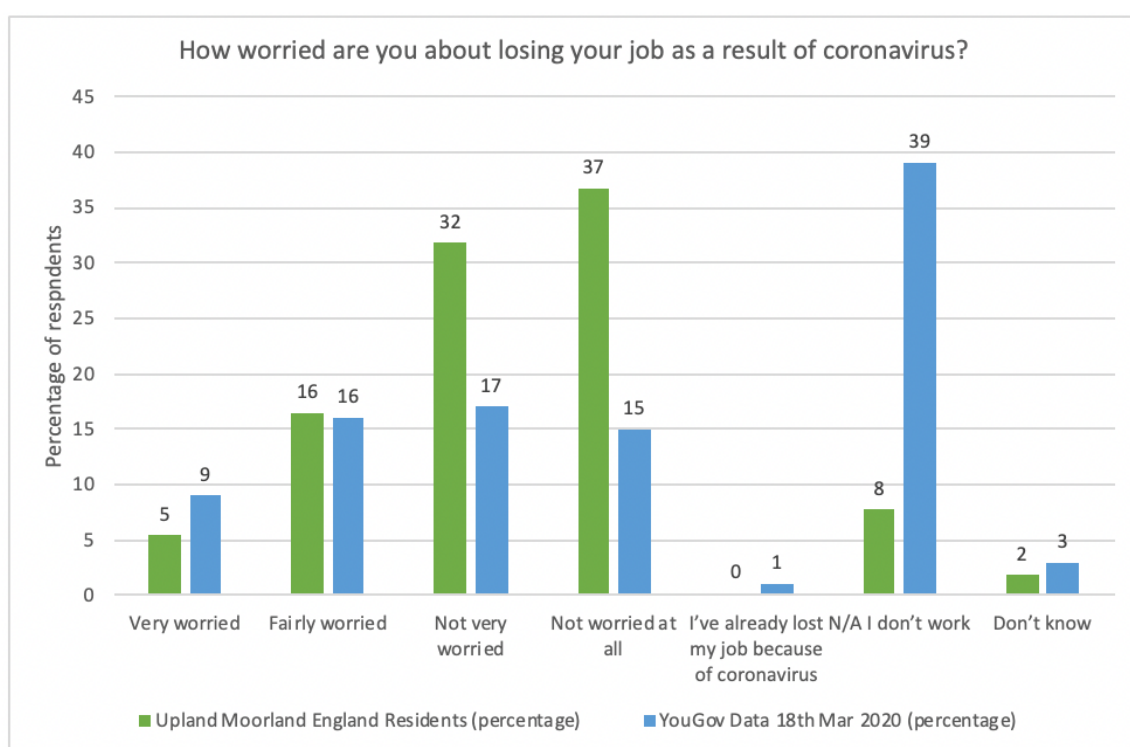


Figure 6.4 Levels of concern around impact of coronavirus on employment status, nationally and in upland, moorland areas managed for grouse shooting

	Very difficult	Fairly difficult	Fairly easy	Very easy	Don't know	n/a
How easy or difficult do you think it currently is for people looking for a job in your LOCAL area to find work at the moment with additional Covid-19 virus impact?						

Table 6.8 Survey question around finding work during the coronavirus pandemic with comparative national data available

Participants in the survey were also asked the question in Table 6.8.

The responses to this question indicate that respondents felt that it would be more difficult to find work locally due to the pandemic than the national figures (see Figure 6.5). It is interesting that moorland community residents felt more secure in their jobs than the national dataset, but believed it would be harder for them to find new work due to the pandemic. The researchers conclude that, during the pandemic, jobs in communities where integrated moorland management is practiced are relatively secure, apart from those in the tourism and hospitality

sectors. However, were estates to cease integrated moorland management, then the economic and social impact would be severe as the communities would become over-reliant on tourism and hospitality. Thriving communities seem to depend on integrated moorland management for both economic and social reasons. Employment, is one of the wider determinants of health (Dahlgren and Whitehead, 1991) and therefore this confidence in job safety would likely positively impact mental health and well-being, the value of which is discussed further below, in section 6.4.

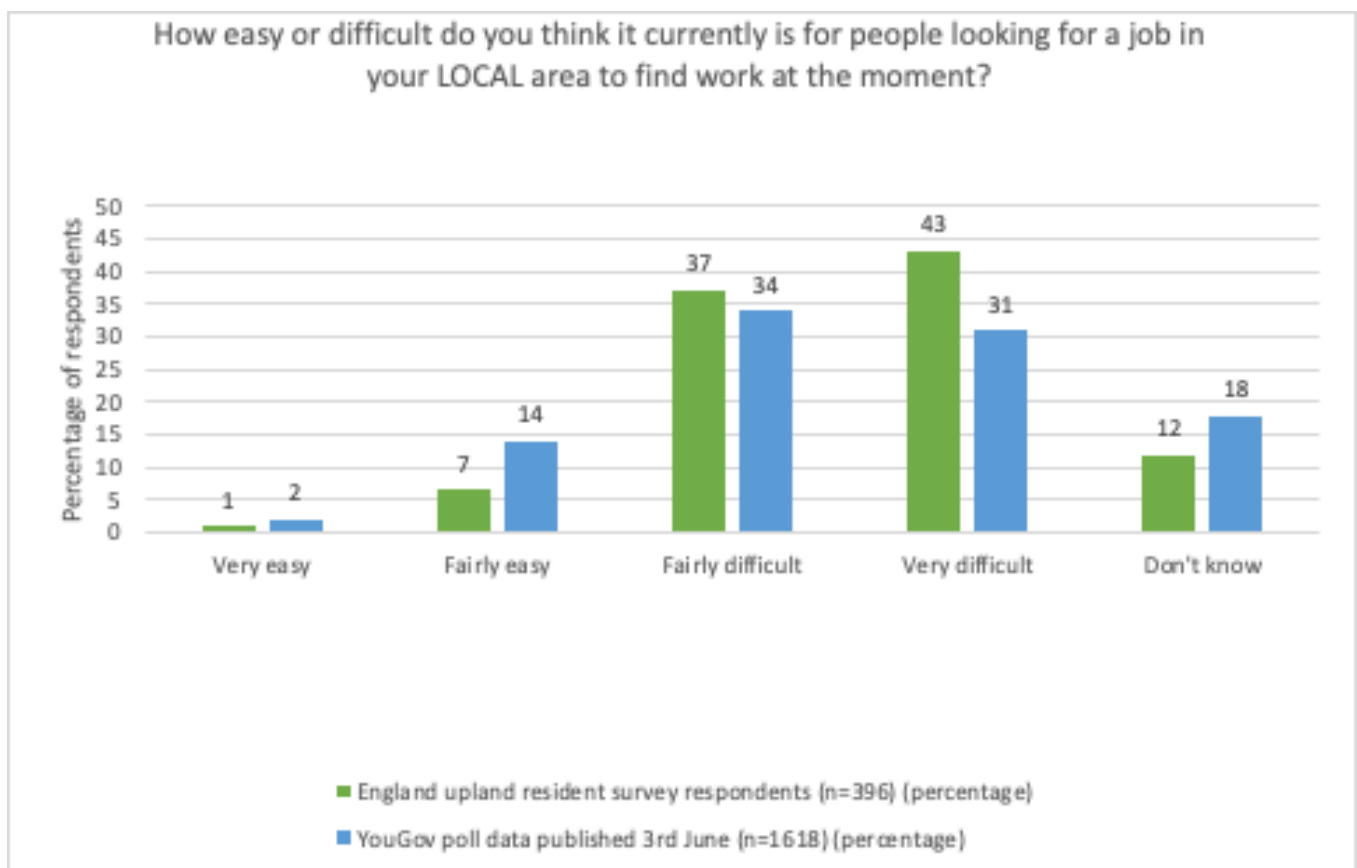


Figure 6.5 Finding work during the coronavirus pandemic, comparison of responses from English, upland moorland residents in grouse moor managed areas with national data

6.3 Intangible factors

6.3.1 Intangible benefits: Intangible Cultural Heritage & Identity.

"Having watched from the side-lines and listened at various meetings, what I got out of it was a group of individuals who were very committed not just to improving upland management practice in their area but with a very strong belief that they wanted to pass something on to the future, so that really old fashioned idea that you don't inherit a landscape from your ancestors you hold it in trust for your children. They had the attitude they wanted to put something in place that was better than when they started. I have sat in similar meetings where the general impression of the meeting is how much can I get out of it and these guys didn't generally think like that"

P39 FE College Lecturer

Of the 396 respondents that lived in moorland communities, 74% of them (295 individuals) took part in shooting in some capacity either as a gun, picker-up, gamekeeper, driver, caterer, or in another role; many respondents being involved in more than one capacity. The survey was shared in many open groups that were not directly linked to shooting. Therefore, we conclude that shooting is a popular pastime in moorland communities.

Latham-Green (2020) found that people who took part in driven game shooting felt a strong sense of rural identity, whether they resided in the countryside or in an urban environment. Having a strong identity is a key part of building and maintaining social networks, which Latham-Green found is an important wider determinant of health, positively impacting particularly on mental well-being. Many of Latham-Green's respondents also felt a strong sense of heritage through their participating in shooting, with links to their ancestors. They believed that taking part in shooting represented returning to their roots, a seasonal ritual which they often shared with their family members across generations. The United Nations Educational, Social and Cultural Organisation (UNESCO) has identified intangible cultural heritage (ICH) as an important factor in the well-being of individuals. A 2003 treaty, signed by many European countries including France, Spain and Italy, defines ICH as:

"the practices, representations, expressions, knowledge, skills – as well as the instruments, objects, artefacts and cultural spaces associated therewith – that communities, groups and, in some cases, individuals recognise as part of their cultural heritage. This intangible cultural heritage, transmitted from generation to generation, is constantly recreated by communities and groups in response to their environment, their interaction with nature and their history, and provides them with a sense of identity and continuity, thus promoting respect for cultural diversity and human creativity"

(United Nations Educational Scientific and Cultural Organisation (UNESCO), 2003)

Cultural heritage does not begin and end with monuments. It also includes "living expressions ... such as oral traditions, performing arts, social practices, rituals, festive events, knowledge and practices concerning nature and the universe or the knowledge and skills to produce traditional crafts" (UNESCO 2003).

The importance of ICH to individual and community well-being is highlighted by UNESCO, which notes that social practices, which may be regular, seasonal events, often see the return of young people, who may have moved away from their homes to find work for example, to their ancestral communities to engage with these activities. . These activities are valued by the communities as they are linked to their perception of their history and worldview, and engaging with traditional activities keep community traditions alive, reaffirming the identity of community members (UNESCO), 2018).

Whilst the UK is not yet a signatory to the UNESCO ICH treaty, there has been research into its relevance in areas such as the importance of safeguarding traditional craft and skills in the Midlands (Harrison, 2019) and the social and cultural wellbeing of Cornish coastal communities (Urquhart and Acott, 2014).

In this study, respondents that own, manage, work on and take part in shooting on grouse moors expressed a strong sense of identity with their home area as a reason for taking part in shooting. The role of grouse moor management and shooting in moorland areas in the UK as a focus for shared cultural identity within moorland communities, shares many similarities with the cultural identity cited by Cornish fisherman in the south west of the UK. Those who shoot, and those who are involved in coastal fishing, both feel a strong sense of identity and belonging, there is a heritage and cultural perspective to the activities and the activities' existence shapes the 'place' in which they live (Urquhart and Acott, 2011, 2014; Latham-Green, 2020)

Both coastal fishing and moorland management impact the environment which tourists experience and clearly value. In turn, tourism makes positive economic contributions to each of the communities, although there can be negative impacts in terms of the number of holiday homes (as mentioned particularly by interview respondents near to the Lake District and in parts of the Yorkshire Dales). Integrated moorland management practices result in a landscape with a unique sight, sound and smell. An equivalent sense of uniqueness is created by the sights of small fishing boats and the smell of the sea in Cornish fishing villages. The heritage 'places' created by traditional Cornish fishing and traditional grouse moor management in the uplands of the UK are, in many ways, similar.

Survey responses were received from 73 estate owners, moor owners and leaseholders across the UK. All 73 respondents in this category 'agree' or 'strongly agree' that 'It is important to me that I leave a better environment on the moor for future generations than when I arrived'. In addition, all these respondents 'agree' or 'strongly agree' that 'there is an essential, symbiotic relationship between farming and shooting land management'. The strong sense of being the current custodians of the land was identified from both moor owners ("I am the custodian of the moor" P18 estate owner),

and those who had worked with them on the HLS environmental management scheme ("the tenant is embedded in the community. The events he organises (and discretely funds) bring together the 40 - 50 people in the Dale. It is not charity, or bribery, but because the tenant feels he belongs and that his duty is to do things that others cannot" P60, Visiting Professor). Respondents clearly believe their role is to focus on the long-term sustainability of the environment for future generations, rather than simply maximising profits.

Survey data also shows that moor ownership (or leasing) is not intended to be a profitable activity for most respondents. As Figure 6.6 shows, while 35.6% of moor owners/leaseholders said that their moor needed to make a profit in order for them to continue funding its maintenance, the great majority of moor owners and lease holders were not driven by commercial considerations. For most moor owners and lease holders their sense of custodianship outweighs commercial considerations.

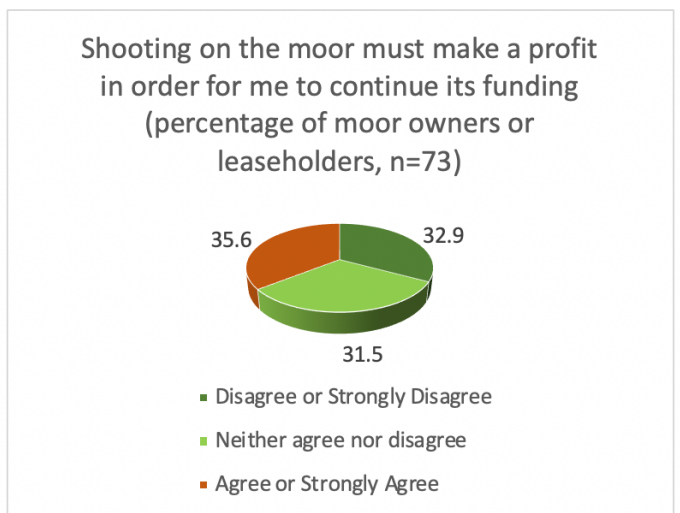


Figure 6.6 Moor owner/leaseholder responses to the statement 'Shooting on the moor must make a profit

The data further reveals that a sense of identity may play a key role in this desire to maintain the natural habitat and protect the traditional pastimes in upland, moorland areas. Intangible cultural heritage, as discussed above, is a way that individuals maintain a connection to their past through activities that link back to their heritage or the heritage of a particular area and, as noted earlier, this strong identity has been shown to have a positive impact on health and well-being. A total of 50 of the 73 moor owners/leaseholders (68.5%) indicated that they participate in shooting because their family did so in the past and maintaining a link to family heritage is important to them. An even greater percentage of these individuals, 57 out of 73 (78.0%), indicated that they participate in shooting because maintaining a link to local heritage is important to them.

Overwhelmingly, these people participate in shooting because they feel a strong, rural identity and connection to the countryside, with 67 out of 73

respondents (91.8%) noting they participate in shooting for this reason. Intangible Cultural Heritage is an important and recognisable phenomenon that this study clearly identifies is a key part of the social (and economic) aspect of moorland ownership and communities.

Not all moor owners/leaseholders live near to their moor. However, 71.2% of moor owners or leaseholders noted that they participated in shooting because it was a pastime regularly practised in the area in which they now live, indicating that absentee landowners do not dominate grouse moor ownership.

The study gathered survey data from 583 people, 377 of whom took part in grouse shooting in some capacity. As noted previously, people may take part in grouse shooting in one or more roles, as shown in Figure 6.8.

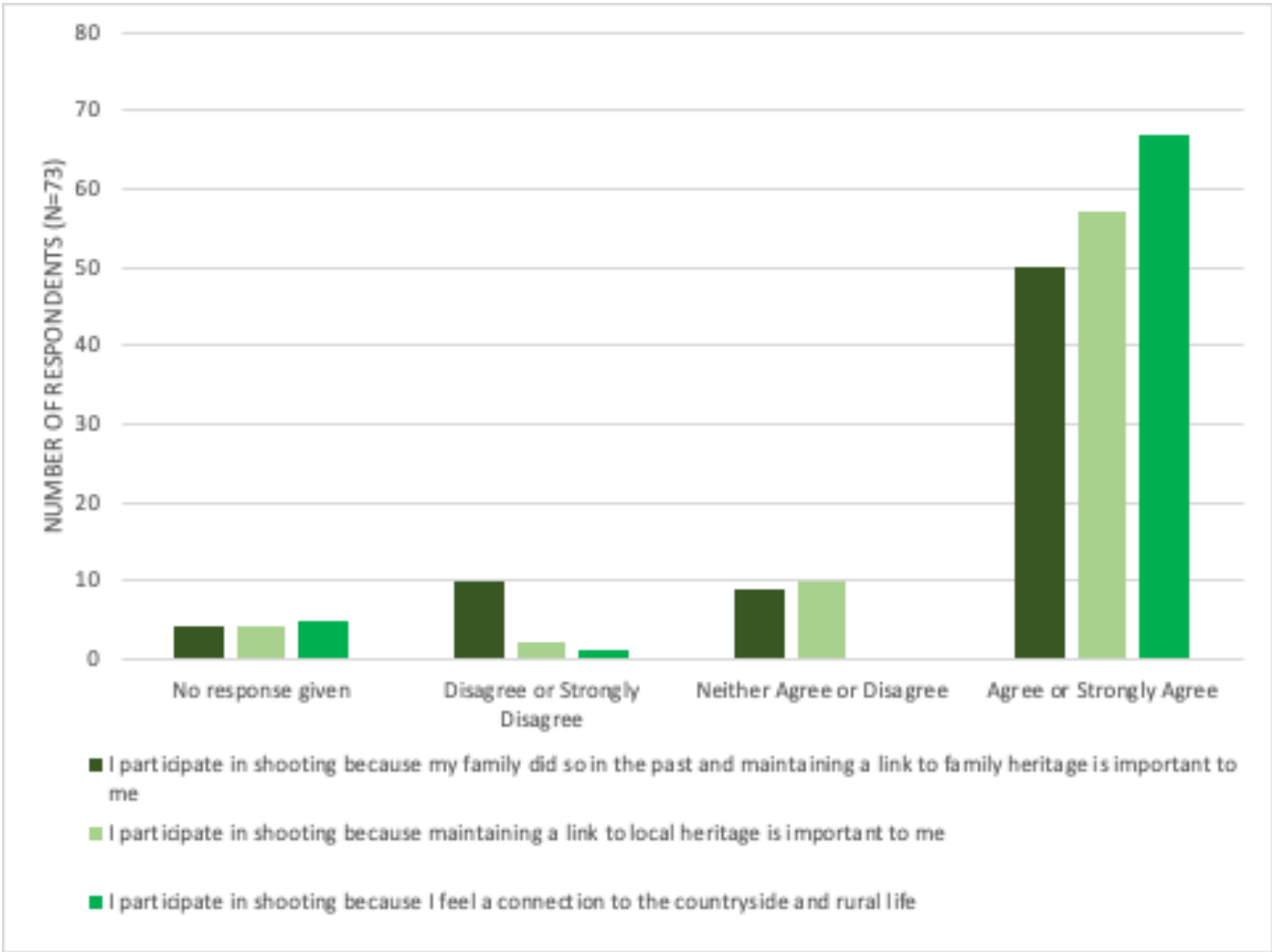


Figure 6.7 Number of moor owner/leaseholders participating in shooting for identity and heritage reasons

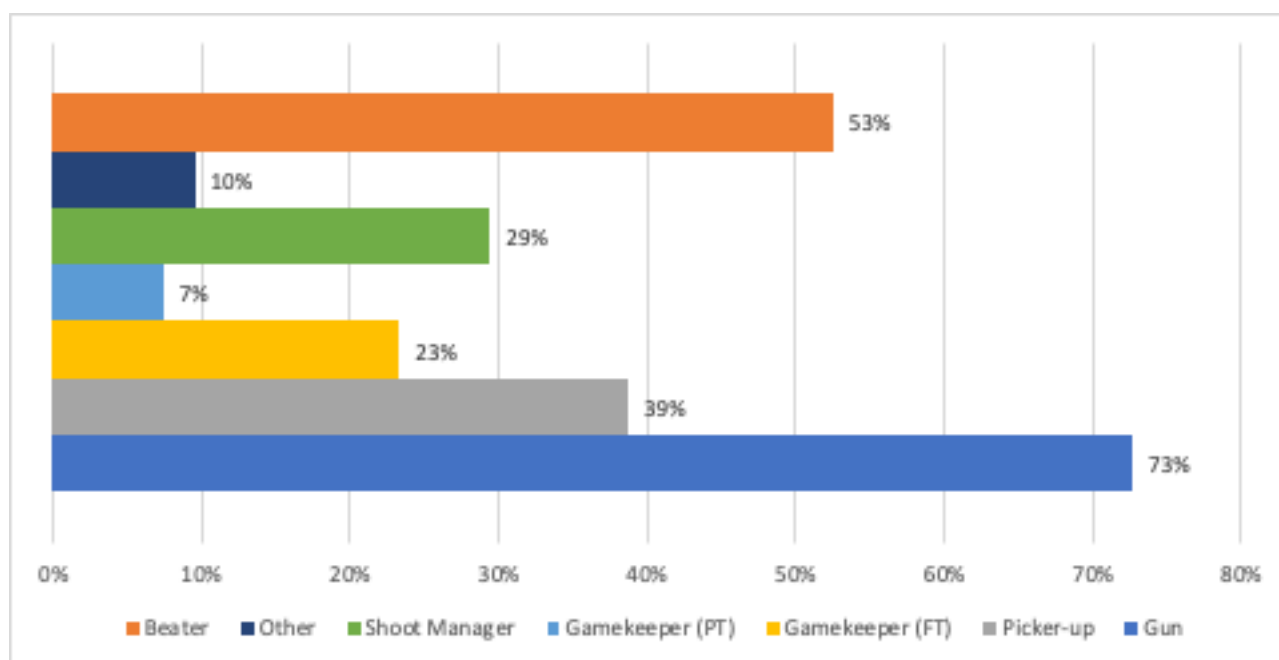


Figure 6.8 Percentage of 377 surveyed individuals taking part in grouse shooting by role (note, individuals may take part in more than one role)

Taking part in an activity that confirms the individual's sense of identity, and their sense of belonging and/or heritage is positively associated with a positive impact on mental well-being. The UK Government measures well-being using the 'short Warwick-Edinburgh well-being scale,' which asks respondent seven questions relating to well-being, with responses being given on a five-point Likert scale, giving a total response out of 35. To provide a comparison between national and survey data, the

seven questions were used (unaltered) in our survey. It should be noted that the national dataset was not compiled in the middle of a national pandemic emergency, unlike the survey dataset. It is very possible that the pandemic, and the national response to it, could have negatively influenced the responses from some participants, particularly given the wording of some of the Warwick-Edinburgh scale's questions. The questions asked in the SWEMWBS are shown in table 6.9.

	None of the time	Rarely	Some of the time	Often	All of the time
I've been feeling optimistic about the future	☐	☐	☐	☐	☐
I've been feeling useful	☐	☐	☐	☐	☐
I've been feeling relaxed	☐	☐	☐	☐	☐
I've been dealing with problems well	☐	☐	☐	☐	☐
I've been thinking clearly	☐	☐	☐	☐	☐
I've been feeling close to other people	☐	☐	☐	☐	☐
I've been able to make up my own mind about things	☐	☐	☐	☐	☐

Table 6.9 Questions asked in short Warwick-Edinburgh mental well-being scale (SWEMWBS)

Understanding Society Wave 7 2015-16 National Dataset			Grouse Shooting Participants dataset, 2019					
N	Mean	SD	N	Mean	SD	t	Df	Cohen's effect size d
37469	25.38	4.91	370	26.41	3.76	-5.220***	381.523	0.24

Table 6.10 Results of independent t-test SWEMWBS of grouse shooting participants compared to national data.

An independent t-test was carried out to see if there was any difference in the well-being of those who participated in grouse shooting in some capacity, and the national average. The results of the t-test are shown in table 6.10. The results of the t-test revealed a statistically significant difference ($p < .001$) with a small effect size ($d = .22$), indicating that individuals who take part in grouse shooting across a range of roles have statistically significantly higher well-being scores, measured using the short Warwick-Edinburgh mental well-being scale (SWEMWBS), than the national average. Given that the responses to the questions asked by this study were gathered during the pandemic, the authors believe this finding to be very highly significant.

There are few studies that attempt to value subjective well-being (Maccagnan et al., 2019). However, a 2019 study suggested that maintaining well-being could be valued at £10,560 per person, per year (Cox, Bowen and Kempton, 2012 in Maccagnan et al., 2019). Maintaining well-being saves the UK a very large sum of money, each year. Communities in areas where integrated moorland management is practiced have significantly higher well-being than the national average, even during an unprecedented international pandemic. We believe that this is a very interesting finding.

6.3.2 Green Spaces, well-being and exercise

Green Spaces, well-being and exercise

"I enjoy the moorland landscape and the vastness of it. It's good to get away to some peace and tranquility and admire nature. It's also good to take children there and teach them about the environment and the importance of caring for it for future generations as well as appreciate how lucky they are to have this on their doorstep."

P43, Headteacher, Primary School

The contribution of local landowners to shaping the landscape is described earlier in this report. The great majority of survey respondents living in moorland areas communities agreed (76.7%) that local landowners make a positive contribution to the local area.

Having green spaces close to home is important to 93% of the UK population (Natural England and the Office for National Statistics, 2018) and exactly the same percentage, 93% of our survey respondents, felt the same way. As noted in the literature review, section 3, access to green spaces has been shown to positively impact well-being.

Additionally, exercise in green spaces has been found to be more beneficial than indoor exercise. Respondents in the interviews reflected this positive, impact on their mental well-being:

"I visit the moors daily in all weathers. I like big open spaces. Where else would I see a huge amount of open space? I am an active person. I walk an average 10 miles a day. The views are one of the reasons I love it here. If you have a problem no matter how big it is, it's always halved when you come up on the moors (and see the view and wide-open spaces)."

P48

Most estate owners in areas where grouse shooting takes place provide, indeed facilitate, access to the public. In our study 84% of moorland community residents surveyed (334) regularly exercised on the moors. Of these individuals, 69% completed 150 minutes a week or more of exercise on the moors. The NHS recommends that adults should take part in at least 150 minutes of moderate exercise, such as brisk walking, or 75 minutes of vigorous activity, such as running, per week (National Health Service (NHS), 2020). Nationally, only 66% of men and 58% of women aged 16 and over met these aerobic guidelines according to the last national survey (Office of National Statistics (ONS), 2017), compared with 69% in our sample. As noted above, regular physical exercise can also positively impact mental health, making access to the managed moorland and important resource for rural populations, where alternative facilities for exercise may not be present.

Physical inactivity and obesity can lead to long-term conditions such as diabetes and cardiovascular disease (Leong and Wilding, 1999), which are costly to manage in the NHS. Public Health England estimate that lack of physical activity costs the UK £7.4 billion per annum (Public Health England (PHE), 2016).

Having a sense of a rural or countryside identity appears to be linked to spending time outdoors. In the national MENE survey (data collected 2018 – 2019) 38% of adults strongly agreed that ‘spending time out of doors is an important part of my life’. In comparison

84% of this study’s respondents that lived in moorland communities (n=396) said spending time out of doors was very important. Moreover, 74% of this study’s respondents said that they spent time out of doors away from their home areas at least once a week. For comparison, the national figure is 65%. Table 6.11 summarises comparative data from the national MENE survey and from this study. It shows that rural, upland community residents make use of their local, natural resources far more frequently than the national average.

A positive reason for being outdoors that was mentioned by many interview respondents was the great diversity of bird species that could be seen on managed moorland.

"I visit the moor every day in all weathers. I like well-managed, well-burnt (in a controlled way) moorland as it provides many different species such as curlew, grouse and lapwing. The RSPB managed moor has much fewer species than we have here"

P48 Parish Councillor/ Retired Truck Driver

	National MENE Survey Data 2018/19	Percentage of Survey Respondents (Survey respondents who live near to upland, moorland in England)
More than once per day	3%	15%
Every day	13%	25%
Several times a week	26%	24%
Once a week	23%	10%
Once or twice a month	19%	12%
Once every 2-3 months	5%	7%
Once or twice	5%	6%
Never	6%	1%
At least once a week	65%	74%
Less than once a month	16%	13%
Never	6%	1%

Table 6.1 Time spent outdoors, away from home, English upland, grouse managed moorland residents survey respondents and national dataset

The majority of all this survey's respondents (n=583), 64.5%, listed birdwatching as an activity they took part in; and 47% of residents in communities in grouse moor areas said birdwatching was one of their hobbies (see Table 6.5). The management of land for game shooting can support increased biodiversity, in particular the numbers of waders, which seems to positively impact the experiences of birdwatchers.

"Grouse moors teem with birds; curlew, golden plover, lapwing, it is not just grouse"

P 28

"I love (the moorland landscape). It has such biodiversity and wild life, I could name ten species of bird around me now. It could be improved with more money but if it wasn't for shooting, I don't know where the money would come from"

P44, Gamekeeper

Responsible grouse moor management, integrated with other economic activities, appears to result in increased biodiversity. A more diversity, wildlife rich, accessible landscape encourages local residents to go outdoors as part of their leisure activities. The high levels of outdoor activity can have benefits in terms of maintaining good health and well-being which can be expressed in financial terms, as described in section 6.4.

6.4 Social and intangible impacts: conclusions

We did not expect, especially as we gathered data during the pandemic, to find that communities in areas where integrated moorland management is practiced were in a good state. On the contrary, we expected to be told about widespread hardship, pessimism about the future, and negative impacts on wellbeing. In contrast, despite the national context, the majority of our respondents that live in moorland communities said that, compared to the national average, they have a stronger sense of belonging, strong social networks, lower levels of loneliness, thriving and busy communities, affordable housing, secure jobs, and a strong sense of identity based on a shared heritage and culture, with those involved grouse shooting in any role having statistically significantly higher well-being scores. All these factors are closely associated with more positive health and well-being outcomes. We think this is an extraordinarily interesting finding that says a great deal about the resilience of the communities we studied.

We did not set out to calculate the exact value of social impacts that are gained by people in communities where integrated moorland management is practiced. However, we note that the overall cost-savings that accrue to society from maintaining good health and well-being are substantial. Poor mental health costs the UK £105 billion per annum, when the various social and economic factors are taken into account (Department of Health Independent Mental Health Taskforce, 2016). Subjective well-being valuation is in its infancy, however, it has been suggested that maintaining well-being could be valued at £10,560 per person, per year (Cox, Bowen and Kempton, 2012 in Maccagnan et al., 2019). Access to green spaces not only positively impacts mental health and well-being but can also facilitate increased activity and reduce obesity (Countryside Recreation Network, 2006; Coombes, Jones and Hillsdon, 2010). Exercise outdoors has been shown to have a greater impact than exercise indoors (Thompson Coon et al., 2011; Loureiro, Veloso and Veloso, 2014; Frühauf et al., 2016; Zhang, 2017). Physical inactivity and obesity can lead to long-term conditions such as diabetes and cardiovascular disease (Leong and Wilding, 1999), which are costly to manage in the NHS. A 2014 study indicated that obesity had a burden of around £47 billion a year on society (circa 3% of GDP), making it the greatest impact after smoking (Dobbs et al., 2014). Avoiding premature death due to physical activity has been valued at £34,818 per person (The Scottish Government, 2003) and overall, Public Health England estimate that lack of physical activity costs the UK £7.4 billion per annum (Public Health England (PHE), 2016). We suggest that, given the results of our survey, and the factors it identifies that are closely associated with more positive health and well-being outcomes, the social circumstances of the majority of people that live in communities where integrated moorland management is practiced result in potentially huge financial savings to the NHS and the UK taxpayer. This is a new, and important conclusion.

6.5 More comparisons

"The moorland has to be used for something. If no shooting took place, I suppose alternative uses would be forestry and tourism, but the area is an AONB so there are planning restrictions. You would lose the birdlife without shooting, people would be surprised how major the changes would be. The money coming into the area would be much less"

P15, retired vicar

The vast majority of northern moorland areas in England and Scotland have been managed for grouse shooting for over 100 years (Jones, 2015) ("I ask, what is the intrinsic nature of the place, it is a grouse moor and has been since at least 1870, it's a long tradition" P18 estate owner, "the land has been in the family for over 150 years and I have game books dating back to the 1880s which show that grouse shooting has been practiced for a very long time" P3, moor owner). As a consequence of this long-term phenomenon, it is difficult to find moorland communities, in comparable areas, that are not impacted in some way by integrated moorland management, including grouse shooting. Moors in more southern areas of the country, such as Exmoor and Dartmoor, are heavily supported by other forms of shooting such as pheasant, partridge and clay shooting. This study was particularly focused on studying the economic and social circumstances of communities in moorland areas, and seeks to compare those in areas where there is, and is not, integrated management of the moors, including grouse shooting. The only comparable area that has not been managed for grouse, or other, shooting in England is found in the Lake District, particularly in the area to the north west of the National Park (see Figure 4.2 on page 19).

Frustratingly, the data available on National Parks is not comparable. For example, a report produced by the National Parks authority stated that,

"The Lake District economy is very dependent on tourism, with 53% of jobs in the National Park in the tourism industry"

(English National Parks Authority Association (ENPAA), 2010, p. 3)

However, the same report does not provide comparable percentage figures for the other moorland English National Parks (English National Parks Authority Association (ENPAA), 2010). In addition, as the management of land for grouse is an integrated part of the local economy in some of the other National Parks (providing year-round diverse

employment and input into the tourist sector, as well as other sectors) it is difficult to disentangle the figures.

However, there is some useful and comparable census data (from 2011) available for the National Parks. For example, if we look at the number of second homes in the area, the Lake District has the largest number of second homes, as shown in Figure 6.9 overleaf.

In our survey, 60.3% of respondents from the North York Moors and 70% of respondents from Northumberland said they did not believe there were too many second homes in the area. The existence of affordable (subsidised) housing for people that work on estates may contribute to the responses from the North York Moors and Northumberland.

Figure 6.10 and Table 6.12 show that the percentages of the population employed in accommodation and food services activities is highest across the five moorland National Parks in the UK in the Lake District at 22.0%, a further indicator of the high reliance on tourism of the Lake District.

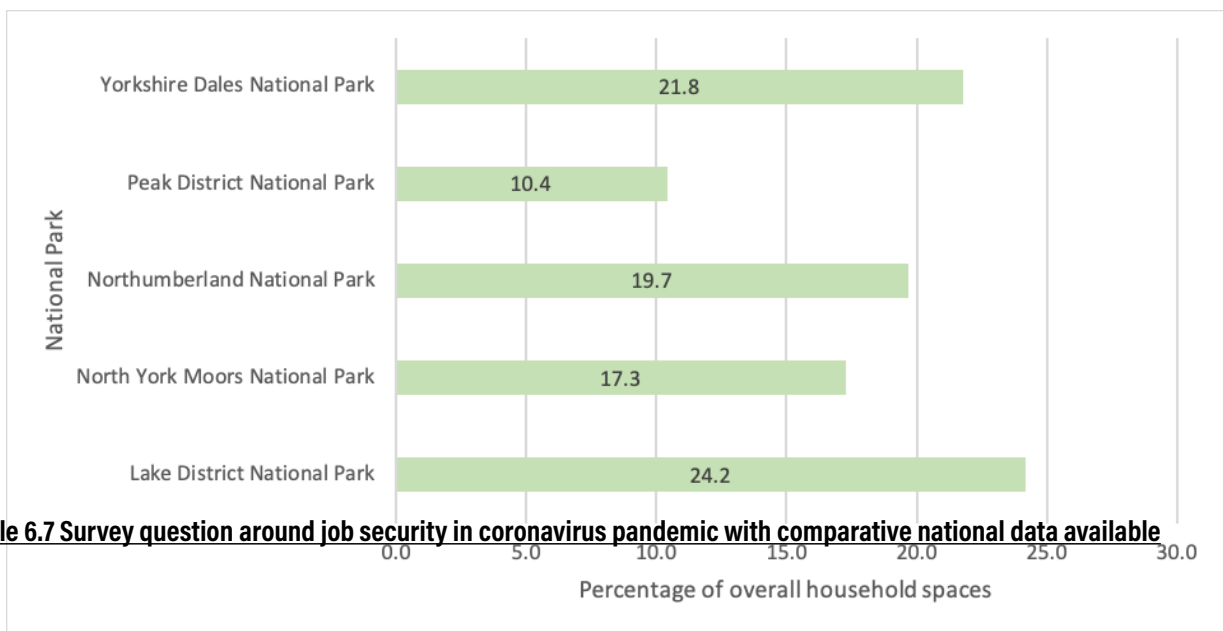


Table 6.7 Survey question around job security in coronavirus pandemic with comparative national data available

Figure 6.9 Percentage of all household spaces with no usual residents in 2011 census (Office for National Statistics (ONS), 2013)

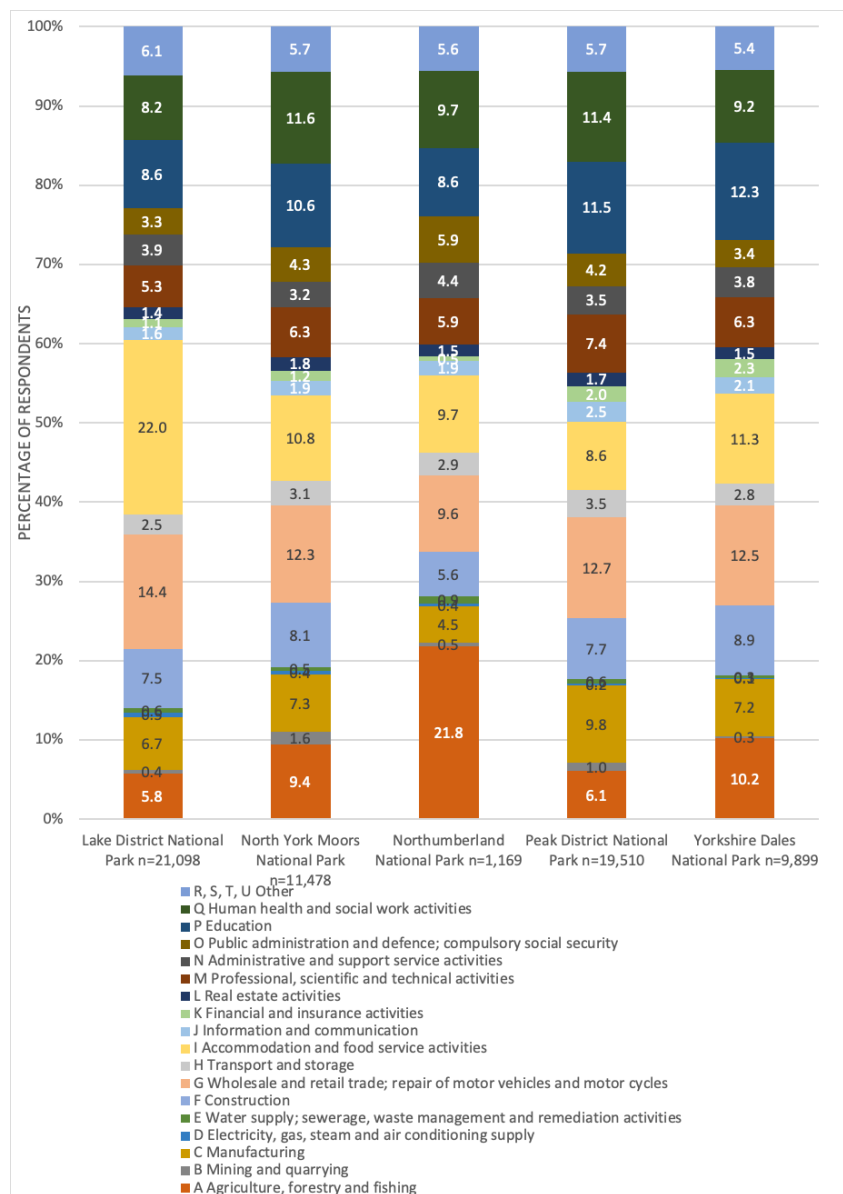


Figure 6.10 Industry of employment: All usual residents aged 16 to 74 in employment the week before the 2011 UK census (Office for National Statistics (ONS), 2013)

	Percentage of census respondents employed in specified industry				
	Lake District National Park n=21,098	North York Moors National Park n=11,478	Northumberland National Park n=1,169	Peak District National Park n=19,510	Yorkshire Dales National Park n=9,899
A Agriculture, forestry & fishing	5.8	9.4	21.8	6.1	10.2
B Mining and quarrying	0.4	1.6	0.5	1.0	0.3
C Manufacturing	6.7	7.3	4.5	9.8	7.2
D Electricity, gas, steam and air conditioning supply	0.5	0.4	0.4	0.2	0.1
E Water supply; sewerage, waste management and remediation activities	0.6	0.5	0.9	0.6	0.3
F Construction	7.5	8.1	5.6	7.7	8.9
G Wholesale and retail trade; repair of motor vehicles and motor cycles	14.4	12.3	9.6	12.7	12.5
H Transport and storage	2.5	3.1	2.9	3.5	2.8
I Accommodation and food service activities	22.0	10.8	9.7	8.6	11.3
J Information and communication	1.6	1.9	1.9	2.5	2.1
K Financial and insurance activities	1.1	1.2	0.5	2.0	2.3
L Real estate activities	1.4	1.8	1.5	1.7	1.5
M Professional, scientific and technical activities	5.3	6.3	5.9	7.4	6.3
N Administrative and support service activities	3.9	3.2	4.4	3.5	3.8
O Public administration and defence; compulsory social security	3.3	4.3	5.9	4.2	3.4
P Education	8.6	10.6	8.6	11.5	12.3
Q Human health and social work activities	8.2	11.6	9.7	11.4	9.2
R, S, T, U Other	6.1	5.7	5.6	5.7	5.4

Table 6.12 Industry of employment: All usual residents aged 16 to 74 in employment the week before the 2011 UK census (Office for National Statistics (ONS), 2013)

The comparable census data and the national parks report cited highlight the dependency of the Lake District on tourism compared to the other areas of English, upland moorland where a more mixed economy is apparent, balancing agriculture, grouse moor management and tourism, as detailed in this report. Having an economy that is heavily reliant on tourism makes an area vulnerable to disruption³⁵. Whereas some disruption is 'normal', for example bad weather can affect tourism in the short term, catastrophic disruption such as that caused by the coronavirus pandemic has a devastating impact on local communities. In contrast, our study shows that moorland communities where there is a more diverse economy, such as those where integrated moorland management includes grouse shooting, are economically and socially resilient due to the year-round activities that take place, even in years when there is little or no shooting. As this study shows, the six orders of economic impact are important. Moorland areas where integrated management including grouse is not practiced do not benefit from these economic impacts.

The impacts of the coronavirus pandemic have been severe on all hospitality, accommodation and leisure sectors in the UK's National Parks. We believe that our study shows that communities in areas where integrated moorland management is practiced, both those in National Parks and those outside the parks, have weathered the coronavirus storm more robustly than those in areas where there is a very high reliance on tourism.

7. Conclusions

7.1 Summary of Impacts

This study sought to answer the following questions:

- What are the key economic and social impact factors effecting communities in moorland areas where grouse shooting takes place?
- How economically and socially resilient are communities in areas managed for grouse shooting, compared to other UK areas?
- Can the economic value of any social impacts resulting from grouse moor management be assessed?

Previous reports into the economic impact grouse shooting have only focused on the first two economic orders that this study has identified. This focus is perhaps understandable, but it takes a simplistic approach and has resulted in only a partial

understanding of the full impacts. The question should not be 'how much money does grouse shooting generate for people,' rather it should be 'what are the economic impacts of integrated moorland management, including for grouse shooting'. As this study has identified by taking a holistic and detailed view, estates and moor owners manage their moor to get a return from a number of different activities, one of which are grouse. Agriculture and shooting have a symbiotic relationship, not only are sheep a source of income, but they also help control ticks. Estates may have income from forestry, energy production, and renting properties. All these activities are in some way subsidized, with the exception of grouse and grouse shooting. Moreover, they take place throughout the year, not just during a short shooting season, and carry on irrespective of whether grouse numbers enable shooting to take place. Previous studies have grossly underestimated the economic impacts.

If we examine our economic impact schematic, it is very obvious that the first order economic impacts are considerable. Importantly, the cash and employment generated by these impacts have a very great importance to remote communities where there is limited alternative employment, a key point for decision makers to consider. The data gathered by this study supports the contention of the GWCT and the Moorland Association that the economic impact of grouse shooting results not only direct (first order) effects, but in indirect (second order) impacts. A rule of thumb might be the more remote the area, the greater the economic importance of the estate owners and sporting tenants. The first and second order economic impacts are important if moorland communities are to thrive, and not simply survive.

It was not in the remit of this study to calculate the amount of money involved in the first and second order economic impacts, this work has been done before. Although the expenditure involved in the first and second order impacts will vary year by year (for example, in 2018 many moors had no shooting due to a lack of a harvestable surplus of grouse), it is relatively easy (albeit time consuming) to measure. The other orders of economic impact are harder to calculate. In theory a survey of the applications and delivery of Higher Level and Countryside Stewardship schemes would reveal the extent and value of the financial facilitation role played by the shooting interest. However, such a survey would take significant resource and time. The value of the fourth, fifth and six economic orders are impossible to calculate with any degree of accuracy. It is not possible to say how many people would visit the North York Moors if the landscape, vegetation, and animal life (both domesticated and wild) were different. Similarly, it is obviously not possible to estimate how many people do not acquire a tick-borne disease as a result of land management practices common on grouse moors, although it is reasonable to assert that bracken and tick control on grouse moors have a positive economic impact as a result of reduced risk of disease to both animals and humans. Finally, the economic impact of carbon sequestration and flood reduction work carried out on grouse moors are impossible to accurately measure.

The economic impacts of integrated moorland management, including grouse shooting, are delivered in the short, medium, long and very long-term. While acknowledging the impossibility of measuring exact values of lower order impacts, this study concludes that they are large and deliver long-term benefits the value of which dwarves the extent of first two orders. The economic impacts of integrated moorland management, including grouse shooting, are very important for moorland communities. They are also very important for the wider population of the UK.

The social impacts of integrated moorland management, including for grouse shooting, are more marked than we thought they would be. Many of the social impacts identified have been shown in previous studies to have a significant and positive effect on health and wellbeing. This observation is important; as the UK Government recognises, the costs of negative health and wellbeing outcomes are huge, and growing.

Moorland community residents responding to our survey felt a very much stronger sense of belonging to their community than the national average. While the questions used in our survey are (deliberately) not exactly the same as the national dataset, the sense of belonging to neighbourhood indicated by the survey respondents compares very favourably with national data in this area. Strong social networks are one of the determinants of health. In addition, individuals who live in upland, moorland communities managed for grouse shooting surveyed in this study have a statistically lower level of loneliness than the national average, an indicator of a strong community support networks for individuals living in these areas. The negative well-being costs of feeling lonely are high; up to £6,000 per head over a 10-year period (Mcdaid, Bauer and Park, 2017).



Data from both interviews and the survey indicated that communities in areas where integrated moorland management is practiced have a wealth of facilities, amenities, clubs and societies. The authors were struck by the number of clubs and activities that nearly all interviewees described, and compared them favourably with the situation in their (separate) lowland communities. Many inhabitants take part in the same hobbies and sports. Birdwatching was the most popular hobby, with 47% of respondents noting it as one of their interests. Shooting is a popular pastime in moorland communities with 74% respondents saying that they take part in shooting in some capacity or capacities. One finding about participation in shooting is very interesting. The study demonstrated that individuals who take part in grouse shooting (in various capacities) have statistically significantly higher well-being scores, measured using the short Warwick-Edinburgh mental well-being scale (SWEMWBS), than the national average. Given that the responses to the questions asked by this study were gathered during the pandemic, the authors believe this finding to be very highly significant.



Having an affordable home and a secure job are positively associated with good health and well-being. Some interview respondents said they were concerned that the numbers of people buying second homes in moorland communities meant there was insufficient local housing for young people, resulting in younger people with families moving away. However, other interviewees cited the presence of estates that normally provide housing as part of the employment package as being a key factor in maintaining age-diverse and thriving communities. Bearing in mind the findings of the RSA report cited in the Introduction we were very interested to note that in our study moorland community residents felt more secure in their jobs than the national dataset, but believed it would be

harder for them to find new work due to the pandemic. We conclude that, during the pandemic, jobs in communities where integrated moorland management is practiced are relatively secure, apart from those in the tourism and hospitality sectors. However, were estates to cease integrated moorland management, then the economic and social impact would be severe as the communities would become over-reliant on tourism and hospitality. Thriving communities seem to depend on integrated moorland management for both economic and social reasons.

A strong sense of identity based on factors linked to heritage and culture is an important phenomenon in remote areas. There are interesting similarities between people in moorland communities and those which are involved in coastal fishing, both feel a strong sense of identity and belonging, there is a heritage and cultural perspective to the activities and the activities' existence shapes the 'place' in which they live. In our study, respondents that own, manage, work on and take part in shooting on grouse moors expressed a strong sense identity to their home area as a reason for taking part in shooting. The belief that land owners are custodians for the future is a clear part of this identity of 'place'. All our respondents that own or lease moorland 'agree' or 'strongly agree' that 'It is important to me that I leave a better environment on the moor for future generations than when I arrived'. In addition, all these respondents 'agree' or 'strongly agree' that 'there is an essential, symbiotic relationship between farming and shooting land management'. Moreover, the great majority of moor owners and lease holders were not driven by commercial considerations. For most moor owners and lease holders, their sense of custodianship outweighs commercial considerations. The sense of identity may play a key role in the desire to maintain the natural habitat and protect the traditional pastimes in upland, moorland areas. Intangible cultural heritage means that individuals maintain a connection to their past through activities that link back to their heritage or the heritage of a particular area. This strong identity has been shown to have a positive impact on health and well-being.

Traditionally, reports into the impact of grouse shooting have directed their focus on specific environmental or economic factors and their impacts. These reports may have met their terms of reference, but they give only a partial picture of the full economic and social impacts of integrated moorland management. We set out to identify and consider the impact of a full range of economic and social factors, and we used the data we gathered to enable us to achieve this goal. We acknowledge that the grouse shooting industry does provide direct and indirect, tangible, economic impacts as detailed in section 6.1, but there are very wider impacts to be considered if the full, holistic and integrated picture is to be seen. Figure 7.1 shows the interconnectedness of social, intangible and economic impacts. It highlights that and that the main positive impacts resulting from integrated moorland management do not lie in the traditional economic impacts, but rather in other orders of economic impact and in social and intangible benefits and their potential 'economic proxy values'.

In the Lake District, integrated moorland management, including grouse shooting is not practiced. The predominant industry in the Lake

District is tourism. This can have both positive and negative impacts. Whilst tourism provides a very good income for many people, it can also increase the amount of second home ownership and reduce the number of permanent, full-time residents (especially younger residents) in an area.

The coronavirus pandemic has had a devastating impact on tourism, whereas those employed directly in the grouse estate management industry, and those that provide services to the industry, feel secure in their employment. The RSA report (see page 11) found that those living in remote rural and coastal communities where hospitality and retail are key employers, were at highest risk of losing their jobs as a result of the Covid-19 outbreak, including areas such as the Peak District and Lake District National Parks. Comparisons are invidious. However, we conclude that the practice of integrated moorland management, including grouse shooting, is very strongly associated with communities that are economically diverse and resilient, and socially rich and activity.

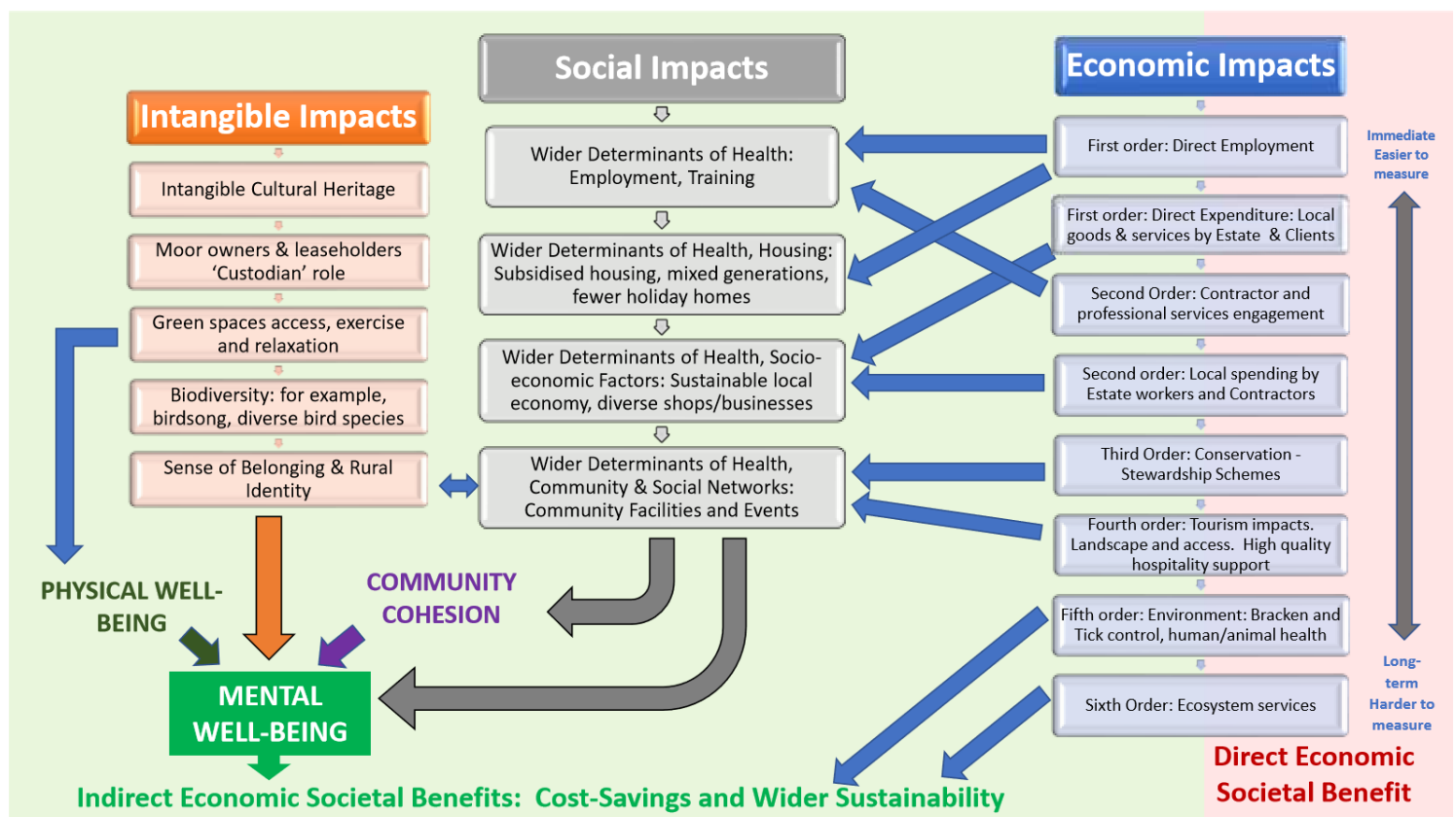


Figure 7.1 Grouse Moor Management Impact Systems Map

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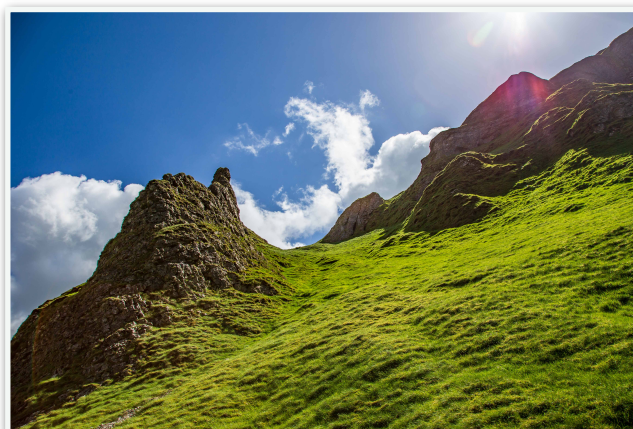
7.2 Considerations for policymakers

This study has shown that grouse shooting is not practiced in isolation from other activities, rather it is a part of a complex web of integrated moorland

management practices which have economic and social impacts on local communities. These economic and social impacts result in both individual (strong sense of identity and cultural heritage, high rates of well-being and low rates of loneliness, job security) and community (rich and diverse range of amenities, facilities and activities, affordable housing for many younger people) benefits that deliver positive social outcomes.

Because grouse shooting is part of this complex web of integrated moorland management practices, it is suggested that any policy that seeks to affect this web should carefully consider what its impacts would be on a wide range of economic and social factors, at the start of the policy formation process. Communities in areas where integrated moorland management is practiced (and, in many cases, other people in the UK, including taxpayers) receive a number of economic and social benefits, all of which are underpinned by grouse shooting.

Changing the web could be likened to removing a leg from a chair: a community might be able to balance in the short-term, but it would cause irreversible damage to its long-term future.



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P number	Gender	Age	Occupation/Status
1	M	70s	Retired local government official
2	M	50s	Farmer
3	M	40s	Moor owner
4	M	40s	Land agent
5	M	40s	Ecologist*
6	F	30s	Assistant land manager
7	M	60s	Moor owner
8	M	50s	Estate owner
9	M	50s	Estate manager
10	M	40s	Solicitor
11	M	60s	Sporting agent
12	M	50s	Estate owner
13	M	40s	Land agent
14	M	60s	Chartered surveyor
15	M	60s	Retired vicar*
16	M	50s	Estate owner
17	M	50s	Managing Director, Bracken control business*
18	M	50s	Estate owner
19	F	50s	Health and safety officer*
20	M	40s	Hotel owner*
21	M	50	Chartered surveyor
22	F	50s	Charity director*
23	M	70s	Estate owner
24	M	40s	Sporting agent
25	M	50s	Publican*
26	M	40s	Gamekeeper
27	M	70s	Land agent
28	F	50s	Agricultural contractor*
29	M	30s	Sporting agent
30	M	40s	Gamekeeper
31	M	50s	Director, Health and safety business*

*= not involved in grouse shooting

32	M	40s	Estate manager
33	M	40s	Estate manager
34	M	60s	Estate owner
35	M	40s	Estate owner/farmer
36	M	50s	Game dealer
37	M	70s	Agricultural merchant
38	M	40s	Director, Shooting business
39	M	50s	FE College lecturer*
40	M	60s	Hotel owner*
41	M	30s	Game farm owner
42	M	50s	Gamekeeper
43	F	50	Headteacher, Primary School*
44	M	40s	Gamekeeper
45	M	60	Retired police officer*
46	M	50s	Gamekeeper
47	F	50s	Caterer*
48	M	60s	Retired lorry driver/Parish Councillor/farmer*
49	M	60s	Retired moorland manager
50	M	40s	Gamekeeper
51	M	60s	Builder/bakery owner
52	M	30s	Insurance broker*
53	M	40s	Lawyer*
54	M	50s	Moor owner
55	M	40s	Moor owner
56	M	50s	Farmer
57	M	40s	Moor owner
58	M	70s	Moor owner
59	F	50s	Charity co-ordinator*
60	M	70s	Visiting Professor/specialist researcher and consultant *
61	F	60s	Ecologist*

Footnotes

¹ Small villages often have populations of fewer than 350 people e.g. Low Roth and Rosedale in North Yorkshire, and Blanchland in Northumberland, which have populations of 273, 318 and 135 respectively.

² The data contained in the Digest is mainly shown at local authority levels, which means it does not apply to individual moorland communities. However, the Digest gives clear indications of the economic and social circumstances that apply in moorland communities.

³ Micro businesses employ 1 – 9 people, Small businesses employ 10 – 49 people.

⁴ The report is based on the Office of National Statistics (ONS) Survey of the Business Impact of Coronavirus (Covid-19) Survey (BICS), published 23 April 2020 (Royal Society for the encouragement of Arts Manufactures and Commerce (RSA), 2020).

⁵ The focus of the research is on moorland communities in England. Where relevant, examples of moorland communities in Wales and Scotland are cited.

⁶ A phenomenon not limited to villages in upland areas

⁷ Source: Moorland Communities Trust website accessed 2 May 2020

⁸ The Grouse Moor Management Review Report, BASC and the Moorland Association reports are all summaries of existing research. They did not involve primary research.

⁹ Figure is made up of intangible costs to quality of life (£53.6bn), direct costs to health and social care services (£21.3bn), and loss of output to economy (£30.3bn)

¹⁰ Equivalent 2019 value figures are calculated using the Bank of England's online inflation calculator, rounded to the nearest whole pound, a link to which can be found here <https://www.bankofengland.co.uk/monetary-policy/inflation/inflation-calculator>

¹¹ <https://www2.gov.scot/Resource/Doc/47032/0017726.pdf>

¹² Name of interviewee given with his permission.

¹³ See p.42 in 'Moorland Conservationists: The Untold Story' GWCT (2020)

¹⁴ <https://www.moorlandassociation.org/grouse-shooting-economics/>

¹⁵ At a cost of c. £250 per head per night, plus food

¹⁶ Interviewed on 21 May 2020

¹⁷ A town in Cumbria

¹⁸ Money spent by foreign tenants is the same as export earnings.

¹⁹ Interviewed on 22 May 2020

²⁰ Interviewed 22 May 2020

²¹ <https://www.gov.uk/government/collections/countryside-stewardship-information-for-agreement-holders>

²² A shooting day on Barnsdale involves about 45 people employed as casual labour i.e. not the Guns, Keepers or FT employed estate staff

²³ [https://www.northyorkmoors.org.uk/about-us/press-office/facts-and-figures#:~:text=Around%207.93%20million%20people%20visit%20year%20\(2016%20STEAM%20Report\).](https://www.northyorkmoors.org.uk/about-us/press-office/facts-and-figures#:~:text=Around%207.93%20million%20people%20visit%20year%20(2016%20STEAM%20Report).)

²⁴ We are not, of course, suggesting that only moors managed for grouse shooting control bracken and ticks.

²⁵ Tick-borne diseases include arbovirus (which includes Tick-Borne Encephalitis and the Flavivirus group. Ebola and Zika are members of this group); protists; bacteria (including Lyme Disease); tick paralysis; and alpha gal syndrome.

²⁶ Professor R Brown, 29 May 2020. Professor Brown is Visiting Professor in Epidemiology and Invasive Species Control at the University of Lincoln and a specialist researcher/consultant working in the environmental control of hard bodied ticks and Tick-Borne Diseases in the Northern Hemisphere at the habitat/landscape scale through the research company 'R & D Applied Biology' in North Yorkshire.

²⁷ A. Jenkins, cited in Moorland Conservationists: The Untold Story, GWCT, 2020

²⁸ J Kemp-Welsch cited in *ibid*.

²⁹ Source: Unit Cost Database <https://www.greatermanchester-ca.gov.uk/what-we-do/research/research-cost-benefit-analysis/>

³⁰ The Moorland Association has recently published a dossier comprising four reports from university researchers and scientists which examines the evidence surrounding the use of controlled burning to help restore, maintain and improve peatlands, see <https://www.moorlandassociation.org/2020/07/key-scientific-reports-shine-new-light-on-value-of-heather-burning/>. More recent work suggesting that controlled burning could stabilize carbon storage includes [Flanagan, NE, Wang, H, Winton, S, Richardson, CJ. Low-severity fire as a mechanism of organic matter protection in global peatlands: Thermal alteration slows decomposition. Glob Change Biol. 2020; 00: 1-17.](#)

³¹ The interview schedule did not have a question that mentioned carbon sequestration or peat restoration. However, the majority of estate or moor owners spoke about these issues, often with real passion. We are not, of course, suggesting that only owners of moors where grouse shooting takes place are concerned with carbon sequestration, peat formation and restoration.

³² See <https://www.bbc.co.uk/news/uk-england-35186241>

³³ See https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/672087/Estimating_the_economic_costs_of_the_winter_floods_2015_to_2016.pdf

³⁴ Unless, of course, a controlled experiment was done by getting matched samples of people and animals to spend time on moors where tick numbers were, and were not, controlled. There would be some interesting ethical obstacles to overcome before such a study could be conducted!

³⁵ The Lake District usually expects around two million visitors in May, which contribute heavily to the National Parks authority's £10m annual budget with 53% coming from revenue including car parking. Richard Leafe, chief executive of the Lake District National Park, said the current situation has left them "exceedingly exposed to a severe financial impact" Source: In Cumbria website, 10 June 2020 <https://www.in-cumbria.com/news/18507538.coronavirus-leaves-lake-district-exposed-says-boss/>



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