BiGGAR Economics

Scottish Land&Estates

The Contribution of Rural Estates to Scotland's Wellbeing Economy

February 2023

BiGGAR Economics

Contents

1. Executive Summary

Rural estates make a substantial contribution to building Scotland's wellbeing economy. They have a significant impact on seven of Scotland's National Outcomes and add substantial value to economic, human, social and (especially) natural capital stocks.

Scotland's 1,125 rural estates cover a combined area of approximately 4.1 million hectares, around 57% of Scotland's rural land. Those familiar with the sector are well aware of the contribution it makes to the Scottish economy and society, but outwith the sector this contribution is not well recognised or widely understood. This report was commissioned to help address this.

To do this it adopted a holistic wellbeing approach that considers the contribution estates make to achieving Scotland's 11 National Outcomes and the value they add to national capital stocks. In so doing it provides a comprehensive assessment of the contribution rural estates make to building a wellbeing economy in Scotland.

1.1 Contribution to National Outcomes

Scotland's 11 National Outcomes are statements of the kind of nation Scotland wants to be. They reflect what a wellbeing economy should deliver.

Rural estates make a significant contribution to at least seven of these outcomes. Their contribution to the environmental, economic and community outcomes is particularly large, but they also make a smaller (but still significant) contribution to the outcomes relating to fair work and business, poverty, health and education.

1.1.1 Stewards of the Natural Environment

Land management is at the heart of rural estate operations. For many estates efforts to protect and enhance Scotland's natural environment are a core part of what they do. Evidence gathered to support this research suggests that four out of five estates and around 12% of estate staff are actively engaged in conservation work.

This activity makes a major contribution to protecting and enhancing Scotland's biodiversity and natural capital, both important indicators of progress toward the national outcome relating to the environment.

It was estimated that visitors make 5.4 million day trips/year to rural estates to enjoy the natural environment. These visits increase levels of physical activity within the population, an important determinant of health outcomes.

Rural estates also play an important role in supporting Scotland's transition to net-zero by enabling the roll out of renewable energy. It was estimated that estates account for 7,540 MW installed renewable energy capacity, 57% of Scotland's total.

Estates account for 57% of Scotland's renewable energy generating capacity and enable 5.4 million visits/year to the natural environment

1.1.2 Engines of Rural Growth

Rural estates generate an estimated £2.4 billion GVA/year for the Scottish economy and support around 56,310 jobs. This makes a significant contribution to Scotland's economic growth, an important indicator of economic progress, but an even more important contribution to Scotland's rural communities.

It is estimated that around 80% of the jobs supported by rural estates are in rural Scotland. This equates to around 1 in 10 of all rural jobs. Rural estates therefore play an important role in driving inclusive growth by ensuring the benefits of economic activity in Scotland are distributed across the country.

Rural estates generate around £2.4 billion GVA support around 1 in 10 rural jobs.

1.1.3 Anchors for Thriving Communities

The jobs supported by rural estates play an important role in sustaining populations in some of Scotland's most fragile rural communities but the contribution estates make to rural communities is much wider than this.

One of the most ways estates support rural life in Scotland is by providing homes for people to live in. Evidence presented in this report shows that rural estates provide homes for around 8,250 private tenants and around 4,700 agricultural tenants across Scotland. These homes underpin many rural communities, enabling people to live in parts of Scotland where housing options would otherwise be limited.

Rural estates also lease land to around 14,000 crofters and farmers. These enterprises form the backbone of many Scottish communities and therefore play an important role in creating the "thriving, resilient communities" envisaged in Scotland's national outcomes.

Rural estates provide homes for nearly 13,000 families and land for around 14,000 rural enterprises

1.2 Contribution to National Capital Stocks

Healthy stocks of human, social, natural and economic capital provide the foundations for a sustainable wellbeing economy. They enable high standards of wellbeing to be maintained for future generations.

Rural estates add significant value to all four stocks of national capital but the contribution they make to the value of Scotland's natural capital is particularly significant, accounting for around **17% of Scotland's natural capital asset base**.

The contribution that rural estates make to Scotland's natural capital asset base arises from estates' agricultural, forestry and renewable energy operations and the contribution they make to Scotland's carbon sequestration potential and nature-based tourism economy. **The total value of the assets underpinning this contribution was estimated to amount to £35.1 billion.**

Rural estates also make an important contribution to Scotland's stock of economic capital, both through their own capital investment and investment leveraged from renewable energy developers. Taken together it was estimated that this investment adds around **£88.7 million/year to Scotland's economic capital asset base**.

The contribution estates make to human capital arises from the educational benefits children experience from participating in school visits and the additional life time earnings of apprentices who work for estates. These contributions were estimated to add £**25.5 million to the value of Scotland's human capital stocks each year.**

Finally, rural estates also make an important contribution to community life by supporting local projects, participating in local development groups, and providing small acts of services for the local community. It was estimated that these activities add **£1.2 million/year to the value of Scotland's social capital stocks.**

1.3 Future Role of Rural Estates

This report shows that rural estates make an important contribution to building a wellbeing economy in Scotland. However, it has also identified areas where there is scope to increase this contribution. These areas are explored in a separate improvement framework that has been produced to complement this research. Its existence is a testament to the sector's commitment to the wellbeing agenda.

Rural estates have huge potential to help drive efforts to establish a wellbeing economy in Scotland and could be key delivery partners for a variety of related policy priorities. Realising these opportunities will require a supportive policy environment; constructive dialogue with policy makers and effective partnerships with public agencies. By articulating the sector's contribution to Scotland's wellbeing economy and highlighting the potential to increase this in the future, it is hoped this report will support efforts to achieve this.

Rural Estates Contribution to Scotland's Wellbeing Economy

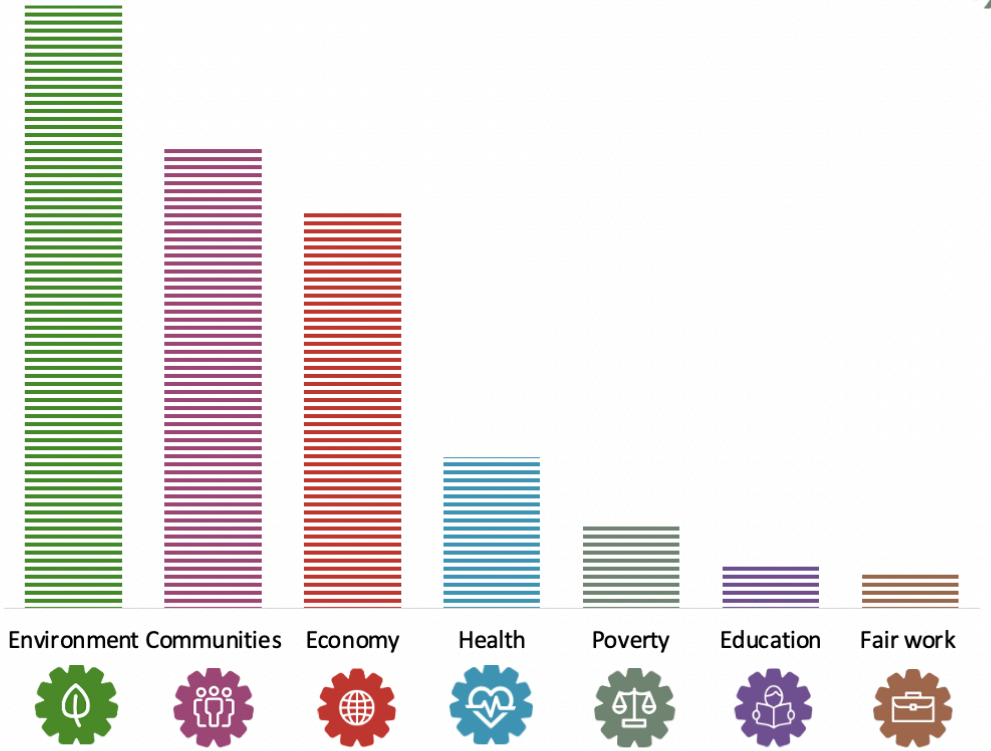
Natural Capital

£35.1 billion

Economic Capital

£88.7 million

Stewards of the Natural Environment…Place Makers…Engines of the Rural Economy……Gateways to Nature…Community Anchors…



Human Capital

£25.5 million

Social Capital

£1.2 million

2. Introduction

In early 2022, Scottish Land and Estates (SLE) commissioned research to assesses how rural Scottish estates contribute to the development of a wellbeing economy. This report presents the findings of that research. It is hoped that it will provide the basis for a constructive discussion with policy makers about the role and potential of rural estates.

In 2014, SLE commissioned research to investigate the economic contribution of rural estates in Scotland[1]. The study found that Scotland's rural estates made an annual contribution of £760 million to Scotland's economic output.

However, the contribution that rural estates make to Scotland goes well beyond jobs and wealth creation. They also create significant environmental and social value in a variety of different ways. Increasingly, within the political context of global environmental crises and a growing land reform agenda, estates are investing in their environmental resilience and social infrastructure, protecting the natural environment, and supporting local communities. These actions, and their impacts, speak coherently to the concept of a Wellbeing Economy, and rural businesses have an important role to play within this emerging agenda.

There is, however, a research gap in assessing and demonstrating the contribution that rural estates in Scotland are already making, and can make in the future, to the Wellbeing Economy. This research was commissioned to fill that gap. It helps to set the rural estates contribution in a wider policy context and stimulate a constructive discussion with policy makers.

There are three outputs from the research:

- this report, which explains the contribution that rural estates makes to Scotland's wellbeing economy and how this has been measured;
- a technical appendix that describes the approach to the economic impact and capital valuations; and
- a guidance note that provides practical steps that rural estates could take to increase the contribution they make to Scotland's wellbeing economy.

[1] Hindle R et al. (2014), Economic Contribution of Estates in Scotland: An Economic Assessment for Scottish Land & Estates

2.1 Report Structure

The remainder of the report is structured as follows:

- chapter 3 explains what a wellbeing economy is, why this matters to rural estates and how this assessment was undertaken; and
- chapter 4 provides an overview of the rural estates sector in Scotland, summarising the available evidence about the size, scale and nature of the sector and its operations.
- Chapter 5 describes how rural estates drive **local economic development** through the various activities they support, including agricultural activity, forestry operations, tourism, sporting and recreational activity, commercial and residential property and renewable energy generation;
- Chapter 6 describes how rural estates act as **stewards of the natural environment**, protecting and enhancing biodiversity, and supporting the transition to net-zero;
- Chapter 7 describes rural estates role in **providing homes, creating sustainable new communities** and the importance of this to population retention and economic progress in rural Scotland;
- Chapter 8 describes how rural estates are a **gateway to nature**, supporting healthy active lives and providing opportunities for education and learning;
- Chapter 9 explains the role rural estates play as **community anchors** by supporting traditional ways of life, supporting community led projects and helping to build social capital; and
- Chapter 10 summarises the contribution that rural estates make to Scotland's wellbeing economy and presents the conclusions of the analysis.

- The technical appendix describes how the economic impacts quantified in chapter 5 and the capital value described throughout the report were calculated..

2.1.1 Acknowledgements

BiGGAR Economics would like to thank those who contributed their time to this study. Their input has helped to inform the analysis of the contribution rural estates make to Scotland's wellbeing economy. The following groups deserve particular thanks:

- the estates who completed survey, participated in workshops and gave their time for consultations;
- the stakeholders who participated in the consultation programme; and
- the staff at SLE.

3. Evidence and Approach

The approach used in this report is based on Scotland's National Performance Framework and wellbeing economy monitor. It considers how rural estates help to realise Scotland's vision of a thriving wellbeing economy. It draws on a wide variety of sources and is underpinned by a bespoke modelling and assessment framework.

3.1 What is Wellbeing?

Wellbeing is about more than simply being well. While health and happiness are important they are not, in themselves, sufficient.

Writing nearly 2,500 years ago, Aristotle argued that the ultimate goal of society should be to promote "eudaimonia", a concept that can be roughly translated as a combination of human flourishing, happiness and wellbeing. This belief was shared by Tomas Jefferson, for whom human life and happiness were the *"only legitimate object[s] of good government"* and Adam Smith, who thought the most important measure of a society is the degree to which it promotes people's happiness.

These ideas continue to underpin ideas about wellbeing today and their echoes can be found in contemporary politics. The defining vision of the Scottish Government is to establish a "wellbeing economy". This is embedded at the heart of Scotland's plan for National Strategy for Economic Transformation (see below), but the ideas underpinning it are not exclusive to the current administration.

For example, "Smart Successful Scotland", Scotland's first post-devolution economic strategy, was published by a Labour-led administration in 2001 and identified sustainable development and closing the opportunity gap as top priorities. More recently, the Levelling Up white paper, which sets out the flagship policy agenda of the UK Conservative Government[2], explains that levelling-up means: *"giving everyone the opportunity to flourish* [and] *people everywhere living longer and more fulfilling lives and benefitting from sustained rises in living standards and wellbeing."*

The similarity of the language used in the statements points to the existence of a broad-based political consensus about the primacy of wellbeing within public policy.

[2] Department for Levelling Up, Housing and Communities (February 2022), Levelling Up policy paper

3.1.1 Scotland's National Strategy for Economic Transformation[3]

The National Strategy for Economic Transformation (NSET) sets out the Scottish Government's ambition for Scotland's economy over the next 10 years. At its heart is a vision of creating a wellbeing economy where society thrives across economic, social and environmental dimensions.

> **"Our vision for 2032 is to create a wellbeing economy: a society that is thriving across economic, social and environmental dimensions, one that delivers prosperity for all Scotland's people and places."[4]**

To deliver this a wellbeing economy must do two things. It must provide the conditions people need to flourish today and sustain those conditions for tomorrow.

3.2 Why Wellbeing Matters

Focusing on wellbeing is intrinsically beneficial: it feels good to do good. It can also bring more tangible benefits.

Setting out a positive vision of how rural estates contribute to Scotland's wellbeing economy can provide a constructive basis for discussions with policy makers, making it easier to get things done. Enhancing this contribution will also help improve economic performance, benefiting estates and those who depends on them.

Two key factors link wellbeing to economic performance: social inequality and environmental sustainability.

The causal links between inequality and sub-optimal economic performance are well established. Research by the OECD[5] has shown that UK GDP is already at least 9% lower than it should be because of rising inequality. Links between climate change and declining economic performance are also well evidenced. Research[6] by the Grantham Institute, for example, shows that the cost of climate change could increase from 1.1% of UK GDP in 2022 to 3.3% by 2050

Focusing on wellbeing will help Scotland become fairer and more environmentally sustainable. In the long run this will benefit everyone.

---

[4] Scottish Government (March 2022), Delivering Economic Prosperity, Scotland's National Strategy for Economic Transformation

[5] Quoted in address to UK parliament by OECD Secretary General in 2015

[6] Rising J et al. (2022), What Will Climate Change Cost the UK?, LSE: Grantham Institute

3.3 Measuring Wellbeing

While the ideas underpinning a wellbeing economy are not new, important progress has been made in recent years on how progress is measured. International best practice [7] favours the use of plural systems that encompass a range of different measures relating to both long-term sustainability and current performance.

This best practice is reflected in Scotland's National Performance Framework (NPF) and wellbeing economy monitor. The former is used to assess societal progress and the latter is used to monitor the sustainability of the economy.

3.3.1 Scotland's National Outcomes and Wellbeing Economy Monitor

Rather than measuring societal wellbeing directly, the NPF monitors progress towards 11 "national outcomes" that are directly linked to wellbeing. These relate to:

- childhood experience
- community empowerment
- culture and creativity
- the economy
- skills and education
- the environment
- fair work
- health
- human rights
- international connections
- poverty and inequality

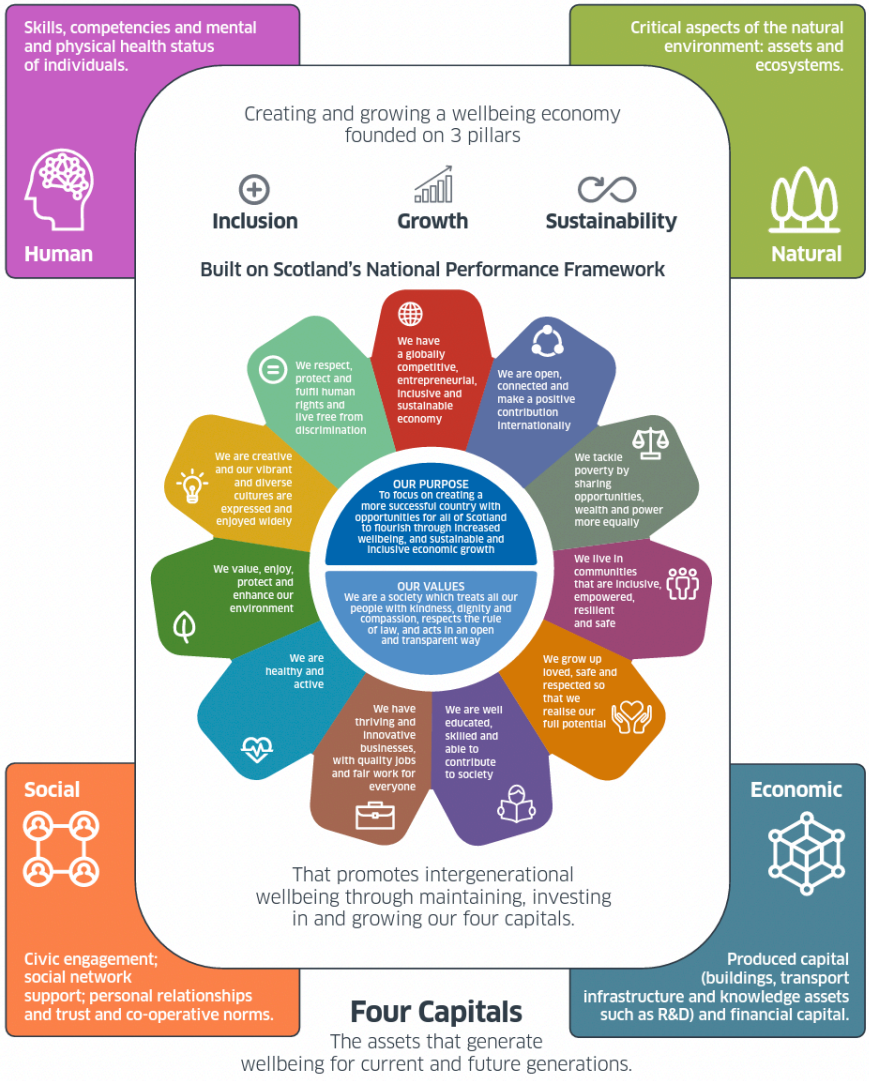
To monitor the long-term sustainability of the economy, the Scottish Government monitors the health of four important capital stocks:

- **economic capital** – financial, intellectual and physical assets;
- **human capital** – the knowledge, skills and health accumulated by individuals;
- **social capital** – the networks, shared norms, values and understanding that facilitate co-operation within and among groups; and
- **natural capital** – natural assets including soil, air, water and all living things.

An overview of this approach is provided in Figure 3-1.

[7] See for example recommendations from the Commission on the Measurement of Economic Performance

Figure 3-1: Wellbeing Economy Monitor and National Performance Framework



Source: Scottish Government

Taken together, these approaches provide a comprehensive framework for assessing progress toward the creation of a "wellbeing economy" in Scotland and have therefore been used as the foundation for this assessment. In keeping with this approach the assessment considers two main types of contribution:

- contributions to Scotland's national outcomes; and
- contributions to Scotland's capital stocks.

The approach used to assess each type of contribution is described below in sections 3.4 and 3.5.

3.4 Gathering the Evidence

The evidence required to assess rural estates' contribution to Scotland's wellbeing economy was gathered from a wide variety of sources including:

- an on-line survey of SLE members;
- one-to-one interviews with 10 rural estate owners/managers;
- four workshops/consultation events with rural estates;
- a modelling exercise to assess the current economic impact of rural estates;
- analysis of 62 “Helping it Happen” case studies;
- interviews with eight sectoral specialists with expertise on one or more of the indicators; and
- a desk-based review of publicly available data sets, research reports and other sector specific evidence.

The on-line survey undertaken to support this exercise received 76 completed responses which represented approximately 15% of the total land area covered by rural estates. This was supplemented by evidence gathered during one-to-one interviews and through four workshops/consultation events with estates.

The responses provided a rich source of qualitative and quantitative evidence covering all aspects of estate operations. The data was used to inform the assumptions used in the economic impact assessment and as one of the sources of evidence considered in assessing the estates’ contribution to the National Outcomes.

Interviews with sectoral specialists were used to provide additional insight into specific contributions and to help test some of the preliminary conclusions emerging from the analysis.

To supplement the primary research, a desk-based review of 62 case studies compiled by SLE as part of its annual awards, was also undertaken. These provided illustrative examples of the different types of contributions and are used to help validate conclusions drawn in the assessment.

Underpinning the Scottish Government’s conception of a wellbeing economy is an explicit commitment to inclusive and sustainable growth. This is reflected by the inclusion of a specific national outcome relating to economic performance. To help assess the contribution rural estates make to this outcome, a bespoke model was developed to quantify the economic impact of rural estates.

In addition, the research also drew on a wide range of publicly available research and data-sets. This evidence was used to inform the assumptions used to extrapolate the emerging findings for the sector as a whole. The sources used are referenced at appropriate points throughout the report.

3.5 Assessing Contributions to National Outcomes

The contribution of rural estates to Scotland’s national outcomes was undertaken using a three step process:

- firstly, the estates were engaged with to understand more about their activities and how they relate to Scotland's national outcomes;
- next these activities were mapped against the indicators used by the Government to monitor progress toward the outcomes; and
- the evidence for each contribution was then assessed using a bespoke matrix which allows contributions to different outcomes to be assessed consistently.

3.5.1 Identifying What Matters

The first step in applying the approach was to identify what the estates themselves consider their most important contributions to be. This was done through a series of workshops and discussions during with estate representatives who were asked to think how their estates might contribute to the national outcomes. Four important themes emerged from these discussions:

- **approach to business** – estate businesses typically do not generate high returns to capital and often exhibit longer time-horizons than other types of businesses. This can encourage a more sustainable approach to business characterised by long-term decision making, reinvestment of profits and a deeply held sense of responsibility toward the local community;
- **rural estates as key drivers of local economic activity** – rural estates play an important role in sustaining some of Scotland's most fragile rural economies with the diversity of estate activity providing an important source of local economic resilience. This extends beyond the wealth created and employment directly supported by estate businesses themselves to include the effects of estate expenditure in the local supply chain and the provision of essential services, like housing and commercial space for local businesses;
- **rural estates as an intrinsic part of the communities in which they operate** - many rural estates enjoy symbiotic relationships with the communities of which they are a part, with the success of one reliant on the success of the other. Mutual co-dependence, long-established social networks, and a strong sense of "their success is our success" are hallmarks of these relationships. Many estates provide jobs and housing in parts of the country where both are in short supply, helping to sustain the viability of otherwise fragile communities;
- **rural estates as stewards of Scotland's natural environment –** environmental management is at the heart of rural estate operations and many are passionate about their role as custodians of Scotland's natural environment. Estates are a major repository of land management expertise and can play a central role in helping Scotland transition to a net-zero environment.

3.5.2 Progress Indicators and Measures

The next step was to map estate operations against the 81 "national indicators" the Scottish Government uses to monitor progress toward the national outcomes. This exercise identified 13 indicators that are particularly relevant for rural estates:

- economic growth
- employees on living wage
- entrepreneurial activity
- social capital
- natural capital
- condition of protected nature sites
- perception of local area
- relative poverty after housing costs
- biodiversity
- energy from renewable sources
- visits to the outdoors
- engagement in extra-circular activities
- physical activity

There are however some areas of activity that are likely to contribute to the national outcomes but which are not well captured by any of the existing national indicators.

The national indicators monitored by the Scottish Government are not intended to be comprehensive, but rather to provide an indication of whether society is moving in the right direction. As such, if there is a clear connection between a particular activity and one of the national outcomes that is not captured by an existing indicator, it may be appropriate to construct a new indicator. On this basis, three additional indicators were constructed as part of this assessment:

- **rural population** – rural homes provided and rural enterprises supported;
- **rural jobs** – jobs supported in rural Scotland; and
- **community empowerment** – rural estates approach to community engagement.

3.5.3 Contribution to National Outcomes

Once the evidence relating to each indicator had been assembled the extent of the contribution to national outcomes was assessed by considering two questions:

- how substantial it is? i.e. how big is the effect?
- how compelling it is? i.e. how good is the evidence to support the impact?

The first question was answered by considering the evidence for each impact in relation to an appropriate comparator or reference point. This varied depending on the indicator in question. For some indicators it was appropriate to consider the proportion of estates engaging in a particular activity, while for others it was more appropriate to compare the scale of the impact to a national reference point.

So, for example, it was found that just 23% of rural estates reported their approach to community engagement was empowering, therefore this effect was assessed as “small”. It was also found that 95% of estates pay at least the living wage compared to 86% of employers nationally so this effect was assessed as “large”.

To answer the second question the quality of the evidence base underpinning each contribution was considered. This was, by necessity, a subjective process but the main factors taken into account were the variety and quality of evidence available.

So, for example, the evidence relating to estates’ contribution to social capital was drawn almost exclusively from the survey undertaken to support the research. As this is not a representative sample the evidence was assessed as “plausible”. However, the evidence of the contribution estates make to national housing supply

was drawn from two surveys, case studies, press releases, independent experts and government reports and was therefore assessed as "compelling".

The overall impact was then assessed using the matrix presented in Figure 3-2.

Figure 3-2: Wellbeing Impact Matrix

		How substantial is the impact?				
		Trivial	**Small**	**Moderate**	**Large**	**Very large**
How compelling is the evidence	**Unconvincing**	Minor	Minor	Minor - Medium	Minor - Medium	Medium
	Plausible	Minor	Minor	Minor - Medium	Medium	Medium-Major
	Persuasive	Minor - Medium	Minor - Medium	Medium	Medium-Major	Medium-Major
	Compelling	Minor - Medium	Medium	Medium-Major	Major	Major
	Conclusive	Medium	Medium-Major	Medium-Major	Major	Major

Source: BiGGAR Economics

3.6 Assessing Capital Formation

To monitor the estates' contribution to the long-term sustainability of the economy, the value of their contribution to four important capital stocks was assessed:

- **economic capital** – financial, intellectual and physical assets;
- **human capital** – the knowledge, skills and health accumulated by individuals;
- **social capital** – the networks, shared norms, values and understanding that facilitate co-operation within and among groups; and
- **natural capital** – natural assets including soil, air, water and all living things.

Contributions to economic capital stocks were assessed based on data provided by estates on annual capital investment.

Estates' contribution to Scotland's natural capital was based on data from the Natural Capital Accounts produced by the Office for National Statistics (ONS).

Contributions to human and social capital were assessed using a bespoke methodology based on willingness to pay data and proxy market valuations. This is consistent with guidance from HM Treasury on wellbeing benefits[8].

Further detail on this methodology is provided in the Technical Appendix.

[8] HM Treasury (July 2021), Green Book Supplementary Guidance: Wellbeing

4. Scotland's Rural Estates

There are around 1,125 rural estates in Scotland which cover 4.1 million hectares of land. Their operations include a variety of activities including agriculture, tourism, forestry and residential property.

While there is no precise definition of a 'rural estate', there is widespread agreement on their key characteristics. Typically, these include:

- a contiguous area of land managed under a single set of overarching organisational objectives;
- involvement in a variety of activities, of which agriculture is traditionally the most important; and
- continuity of ownership, with academic research indicating that on average privately owned estates have been in the same ownership for 122 years[9].

The ownership of Scotland's rural estates has attracted considerable attention in recent years, helping to fuel public perceptions which are often based more on emotion than reality. By reviewing the available evidence about rural estates, this section presents a balanced picture to underpin the subsequent analysis.

4.1 Scale of Land Holdings

The total area of Scotland is 7.71 million hectares, with rural land covering 94% of the total (7.43 million hectares).[10] It has four main types of ownership:

- privately owned 'estates' – estates owned by individuals, families or businesses;
- publicly owned – land owned by public bodies such as Forestry and Land Scotland (the National Forest Estate), Scottish Water, the Crown Estate;
- community owned – land under community ownership through organisations such as Knoydart Foundation, Assynt Foundation;
- environmental organisations – such as the National Trust for Scotland (NTS), John Muir Trust and Royal Society for the Protection of Birds (RSPB).

[9] Hindle, R., Thomson, S., Skerratt, S., McMorran, R. and Onea, P. 2014. Economic Contribution of Estates in Scotland: An Economic Assessment for Scottish Land & Estates.
[10] Ibid.

Table 4-1: Rural Landholdings in Scotland by Ownership

Type of Owner	Area (ha)	Percentage of rural land
Private 'estates'	4,140,460	57.1%
Public bodies	914,000	12.6%
Community	227,526	3.1%
Environmental organisations	182,438	2.5%
Total	**5,464,424**	**75.4%**

Source: Glass et al (2019), The Effects Associated with Concentrated and Large-scale Land Ownership in Scotland: A Research Review.

The estimate for privately owned estates provided in the table above comes from a study commissioned by Scottish Land and Estates in 2014[11]. Supplementing this with data from other sources, the authors estimated there were 1,125 privately owned estates across Scotland covering an area of 4.1 hectares. A breakdown of these landholdings by size is provided in Table 4-2.

Table 4-2: Private Landholdings by Size

	Number of Estates	Area (ha)
Small (<1,000 ha)	371	232,587
Medium (1,000 – 10,000 ha)	667	2,236,075
Large (10,000+ ha)	87	1,671,798
Total	**1,125**	**4,140,460**

Source: Hindle et al. (2014)

The figures presented in Table 4-1 and Table 4-2 have been used throughout this report to help scale up impacts for the sector as a whole.

Scotland's main public and environmental landowners include the Crown Estate, Forest and Land Scotland, the National Trust and the John Muir Trust. A breakdown of the landholdings of these organisations is provided in Table 4-3.

[11] Hindle et al (2014), Economic Contribution of Estates in Scotland: An Economic Assessment for Scottish Land & Estates

Table 4-3: Public Bodies and Environmental Organisations

	Land Area Covered (ha)
Crown Estate (4 estates)	37,000
Forestry & Land Scotland	640,000
John Muir Trust (5 estates)	22,500
NTS (7 estates)	50,900
Total	**750,400**

Source: BiGGAR Economics based on data published by the Scottish Government, Crown Estate Scotland, the John Muir Trust, the National Trust for Scotland and the 'Who Owns Scotland' database.

4.2 Geographic Distribution

Table 4-4 provides a break-down of Scotland's privately owned rural estates by location. It shows that, while there are rural estates in every region of Scotland, the majority, in terms of both numbers and area, are located in the Highlands.

Table 4-4: Estimated No. & Area of Privately Owned Estates in Rural Scotland

Region		Small	Medium	Large	Total
Central	No. of Estates	70	140	5	215
	Size (ha)	42,344	447,299	128,266	617,910
Highland	No. of Estates	122	366	64	552
	Size (ha)	88,211	1,356,411	1,129,938	2,574,561
North East	No. of Estates	21	34	7	62
	Size (ha)	11,796	105,673	146,224	263,693
South East	No. of Estates	81	64	5	150
	Size (ha)	45,443	159,256	174,793	379,492
South West	No. of Estates	77	63	6	146
	Size (ha)	44,792	167,436	92,576	304,804
Scotland	**No. of Estates**	**371**	**667**	**87**	**1,125**
	Size (ha)	**232,587**	**2,236,075**	**1,671,798**	**4,140,460**

Source: Hindle et al (2014), Economic Contribution of Estates in Scotland: An Economic Assessment for Scottish Land & Estates, Table 5

4.3 Land-Use

In mid 2022, SLE had 1,058 landowner members, around 65% of whom have provided information about land use. To enable the economic analysis to be scaled up for the sector, the self-reported land-use estimates were applied to the total area of rural

estates given above, though an adjustment was required to account for larger estates being less likely to report all of their holdings. The estimates produced are summarised in Table 4-5.

Table 4-5: SLE Members Landholdings by Land Use

Land Use	Self-reported land-use	Estimated land area
Hill ground	48%	1,995,100
Arable ground	7%	296,500
Commercial forestry	8%	339,900
Other	36%	1,508,900
Total		**4,140,500**

Source: SLE Membership Database, Hindle et al (2014), and BiGGAR Economics. Numbers are rounded.

4.4 Activities

Survey evidence shows rural estates are engaged in a broad range of activity. This is presented in Table 4-6 alongside comparable data from the 2014 survey. The largest area of activity for the sector is, therefore, agriculture with 92% of estates reporting some level of engagement. However, this was very nearly matched by the proportion (89%) reporting an involvement in providing residential property, suggesting estates may play a wider role in rural communities than is sometimes assumed.

Comparing data from the two surveys suggests that renewable energy has become a much more important area of activity for rural estates in recent years, with reported engagement levels more than doubling in the space of eight years. An even larger increase was recorded for conservation activity, with the proportion of estates reporting involvement increasing from 32% in 2014 to 79% in 2022.

Table 4-6: Land Use of Rural Estates

Land Use	2022	2014
Agriculture	92%	n/a*
Residential property	89%	79%
Conservation	79%	32%
Sports and recreation	78%	78%
Forestry	72%	65%
Renewables	70%	32%
Tourism (inc. retail, heritage, food and drink).	62%	66%
Commercial property	72%	30%

Source: BiGGAR Economic survey and Hindle et al (2014), *Data not comparable across surveys.

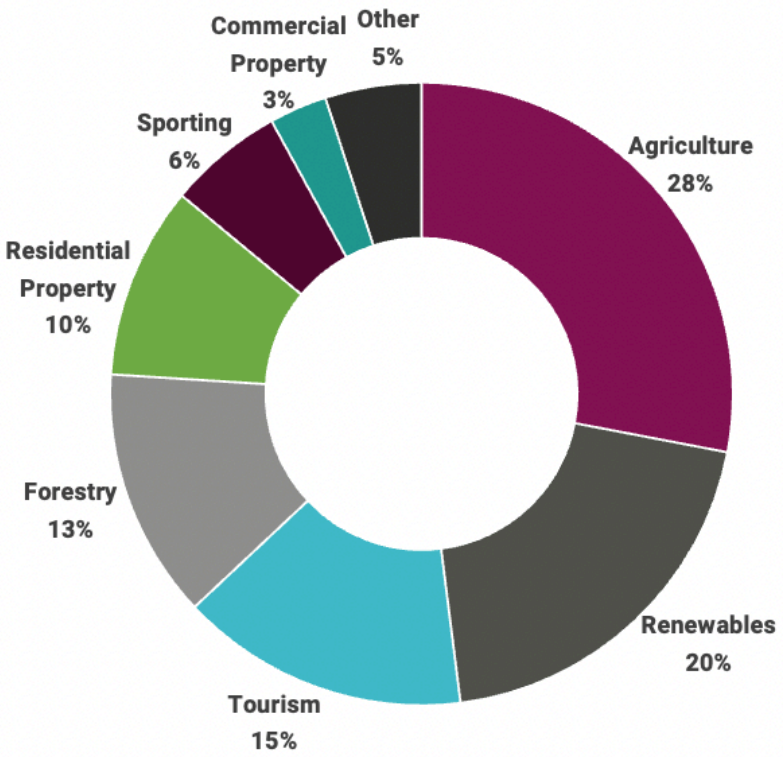
4.5 Income

Evidence gathered for the survey which underpins this research suggests that agriculture is the most important source of income for rural estates (Figure 4-1). However, comparison with equivalent data from the 2014 study suggests the share of income from this activity has declined significantly from around 44% in 2014 to under 30% in 2022. This shift has been due largely to a significant increase in the proportion of income attributable to renewables (from 3% to around 20%) and is consistent with the finding reported in the previous section, which identified renewables as important part of the estates' business models.

Another notable finding is the relatively low proportion of income generated from sport and recreation (stalking, shooting, fishing etc.) Despite their traditional association with rural estates, these activities account for only 6% of total income.

Also of note is the very small proportion of income (0.6%) attributable to carbon trading (incorporated within the "other" category). This is particularly significant given the ongoing debate around the potential effect of demand for carbon credits on land values and suggests this is (as yet) unlikely to be a significant influence on landowner behaviour.

Figure 4-1: Estate Income by Source, 2021



Source: BiGGAR Economics survey

5. Rural Economic Engines

Rural estates account for around 1 in 10 rural Scottish jobs making them important drivers of economic growth in areas where opportunities are often limited.

Rural estates make a significant contribution to economic prosperity in Scotland through their direct operations, their expenditure on supplies and the activity they support elsewhere in the economy.

A thriving economy is essential to the foundations of a wellbeing economy. It provides opportunities for meaningful employment and the ability to earn an income, both of which are important to individual wellbeing. It also generates the wealth needed to pay for public services, like health, education and environmental protection, that enable other important national outcomes to be delivered.

The importance of economic prosperity to establishing a wellbeing economy is reflected in two of the outcomes in Scotland's NPF, one relating to economic performance and one relating to fair work and business. The contribution rural estates make to the first of these outcomes was assessed by quantifying their contribution to **economic growth**. Their contribution to the second outcome was assessed by considering their role in supporting **entrepreneurial activity**.

However economic growth is not sufficient for a wellbeing economy. The nature and location of this growth also matters. To support the delivery of a wellbeing economy it is important that growth is both sustainable and inclusive.

To achieve inclusive growth, economic activity should be spread equitably across the country and provide opportunities for everyone. Rural estates' contribution to this was assessed based on the **number of rural jobs** they support and by considering the **quality of the jobs** they provide.

To achieve sustainable growth it is important that economic activity occurs within planetary constraints. The estates' contribution to this is considered in chapter 6. Sustainable growth also requires an adequate stock of economic capital to be maintained. The estates' contribution to this is considered by assessing the level of **capital investment** undertaken by the sector.

5.1 Economic Impact of Estates

Rural estates contribute to Scotland's economic prosperity in three main ways:

- through their core commercial operations, which generate wealth and support jobs throughout rural Scotland;
- supporting other businesses elsewhere in Scotland by buying goods and through the expenditure of their staff;
- enabling other rural enterprises by providing commercial premises and land to enable businesses to operate and by attracting visitors who spend money in the local economy.

A summary of each of these impacts is provided below. The details of the approach used to assess them and the assumptions underpinning them are described in the Technical Appendix.

5.2 Core Commercial Operations

Rural estates are complex businesses which typically encompass a wide variety of different operations. While agriculture is by far the most common activity, most estates also rely on a mixture of commercial forestry, tourism, country sports and/or renewable energy. Many also generate income from renting premises or land to commercial and/or agricultural tenants and infrastructure providers, like electricity and communications companies.

The economic impact of each of these activities was estimated separately using a bespoke economic model which was constructed using the survey evidence and relevant national data sets. The approach and assumptions used is summarised below and described in further detail in the Technical Appendix.

Core operational impacts include all economic activity (jobs and GVA) supported by each area of operation. This includes the jobs directly involved in delivering the operation in question as well as any administrative support required to deliver them and any other activity they might be cross-subsidising.

5.2.1 In-hand Agriculture

Rural estates in Scotland own 4.1 million hectares of land, of which approximately 9% is arable and 50% is hill ground. Using evidence from the survey on the land-use profiles of estates of different sizes, it was estimated that approximately 60% of this was managed in-hand and the remaining 40% was tenanted.

To estimate the value of economic activity this supports, it was necessary to make assumptions about the type of agriculture it is used for. Most agricultural land on rural estates is uncultivated hill ground in the Scottish Highlands, which is primarily used for sheep and cattle grazing (typically the least valuable agricultural activity). It was assumed that the remaining arable land is used for a mixture of mixture of cereals, horticulture and livestock.

The Scottish Government publishes statistics on the employment, income and GVA from different types of agriculture in an annual report on Scottish Agriculture. By applying appropriate ratios and multipliers from this report to the area of land farmed by rural estates it was estimated that in-hand agriculture by rural estates directly supports around 6,400 jobs across Scotland and around £79 million GVA/year.

5.2.2 Commercial Forestry

Official statistics show there are nearly 1.0 million hectares of privately owned forest and woodland in Scotland. Publicly available research[12] suggests almost half of this is part of a rural estate.

The economic impact of estates' forestry operations was estimated using figures published by the forestry sector on the economic impact of forest operations. Using these figures it was estimated that estate forestry operations generate around £20 million GVA/year for the Scottish economy and directly support around 490 jobs.

However, this impact only relates to activity directly supported within rural estates. It does not take account of related activity such as planting, harvesting, haulage and processing, much of which is undertaken by independent contractors. These activities are a mainstay of many rural communities, providing secure and relatively well-paid employment. This activity is captured as part of the supply chain impact described in 5.3.

5.2.3 Tourism

Rural estates' tourism operations involve two main types of tourism asset:

- short-term tourist accommodation such as self-catering properties, caravan parks and campsites that cater to overnight visitors; and
- visitor attractions such as stately homes, farm shops, distilleries and adventure centres that cater primarily to day visitors.

The first of these impacts was estimated based on evidence provided in the survey about the amount and type of accommodation provided by estates of different sizes. This suggests that 64% of estates have visitor accommodation. The survey also provided information about the density of visitor accommodation in estates of different size. By combining this with data from national surveys on the average income generated by different types of tourist accommodation it was estimated that rural estates generate around £23 million income every year from short-term visitor accommodation.

Responses to the survey also suggest that around 61% of rural estates operate tourist attractions. The economic impact from this was estimated based on the average number of visitors per hectare reported in the survey and data provided by estates on the income received from these visitors. In this way it was estimated that

[12] Whightman A (February 2012), Forest Ownership in Scotland: a scoping study

around 5.7 million visitors/year visit attractions on rural estates, generating around £20 million income for the estates involved.

By applying GVA and employment multipliers for this visitor accommodation sector to this income it was estimated that the direct impact of estate owned tourism accommodation amounts to around £23 million GVA/year and 960 jobs.

5.2.4 Country Sports

Country sports is an area of activity traditionally closely associated with rural estates. The economic impact of this was estimated based on data provided by estates on the number of people directly employed in sporting and outdoor recreational roles and the average number of hectares/job for these types of roles.

By applying these estimates to the land area known to be used for this purpose it was estimated that the direct impact of country sports amounted to around £26 million GVA/year and supported around 1,060 jobs.

5.2.5 Estate Operations

Estates receive income from a variety of other sources which are not captured in the core operational impacts described above. The delivery of these activities is generally not labour intensive and estates will employ very few people to deliver the associated tasks. However, the income derived from them can be important for cross-subsidising other activities. The main sources of income considered here are:

- residential tenants who lease property from estates;
- businesses that lease commercial premises from estates;
- income received from infrastructure providers with assets on estate land;
- income from renewable energy assets located on the estates (including rent from renewable energy companies); and
- agricultural and crofting tenants who lease land from estates.

Where appropriate, the wider economic impact these activities have elsewhere in the economy is described in section 5.4. This section quantifies only the impact supported by these activities within estates themselves.

The starting point for estimating this impact was to estimate the total rental income received by estates from each source. This was done using information provided by estates in the survey undertaken to support this research and supplemented by appropriate sources of third party evidence. The rental income received was then converted into GVA and employment estimates using ratios derived from the information provided by estates in the survey. In this way, it was estimated that core estate operations support around 590 jobs in rural estates and that these jobs generate around £147 million GVA/year for the Scottish economy.

5.2.6 Summary Core Operational Impact

Taken together, the core operations of rural estates described in this section generate £294 million GVA for the Scottish economy each year and support around 9,500 jobs. A summary of these impacts is provided in Table 5-1.

Table 5-1: Core Operational Impacts

Asset class	Jobs	GVA £M
In-hand agriculture	6,400	79
Forestry	490	20
Tourism (accommodation and attractions)	960	23
Country sports	1,060	26
Estate operations	590	147
Total Impact	**9,500**	**294**

Source: BiGGAR Economics analysis

5.3 Supply Chain and Staff Spending Effects

The direct effects associated with core estate operations is only part of the contribution estates make to economic growth in Scotland. They also make an important contribution to rural economies through their supply chains and the spending of staff.

Many estates report a strong sense of responsibility to support local businesses and go out of their way to buy local. Some report a mutual dependency on local suppliers and the existence of a virtuous circle of support in the local community. In the survey undertaken to support this research, 95% of respondents said it was either "important" (30%) or "very important" (60%) to source goods and services from the local area. Overall, respondents estimated around 72% of their expenditure on supplies was with businesses from the local area.

The most commonly used suppliers tend to be trades contractors for repair and maintenance work, vehicle maintenance, agricultural suppliers, farm and forestry contractors, butchers, caterers, food and beverage suppliers. Another important category of expenditure is professional services such as accountancy, legal advice and property management. This expenditure can be particularly important for supporting professional level jobs in places like Perth and Inverness.

In addition, staff employed by estates are an important part of the community and make an contribution through their spending in the local economy.

The supply chain and staff spending impact of rural estates was estimated by applying economic multipliers appropriate to each area of activity to each of the core operational impacts described in the previous section. In this way, it was estimated that rural estates generate a further £193 million GVA and support a further 6,600 jobs in the Scottish economy through their spending (and the spending of their staff) elsewhere in the economy. A break-down of this impact is provided in Table 5-2.

Table 5-2: Supply Chain Impacts

Asset class	Jobs	GVA £M
Total impact	**6,600**	**193**

Source: BiGGAR Economics analysis

5.4 Enabling Local Enterprise

The third way rural estates drive economic activity in rural Scotland is by supporting local businesses to become established and grow. They do this by:

- providing land to enable agricultural enterprises to operate;
- leasing land to renewable energy providers;
- attracting visitors who spend money in other local tourism businesses;
- creating a market for the forest industries supply chain; and
- providing commercial premises for local businesses.

These impacts are considered below.

5.4.1 Economic Impact of Agricultural Tenants

The starting point for estimating this impact was the total land area devoted to tenanted agriculture. This was derived from the survey undertaken to support this report. Official statistics were then used to derive appropriate estimates for the farm business income associated with this land area. These estimates were informed by available information from the survey about the land-uses within rural estates. Using this approach it was estimated that tenant farms leased by rural estates generate around £80 million GVA/year for the Scottish economy and support around 6,340 jobs.

The impact of tenanted crofts on rural estates was estimated based on data published by the Crofting Commission on the number of active tenanted crofts in Scotland and research evidence published by the Scottish Government[13] on average crofting incomes. Using this data it was estimated that crofts rented from rural estates generate around £23 million GVA/year for the Scottish economy and provide employment for around 1,560 people.

5.4.2 Renewables

Evidence published by the Scottish Government[14] shows there was 731 MW of locally owned renewable energy capacity in Scotland in 2019, around a third of which was owned by rural estates. This represented just over 5% of all renewable capacity in Scotland in that year.

In addition, a very significant proportion of Scotland's corporately owned on-shore wind farms are also located on rural estates. While these are generally not directly

[13] Scottish Government (2021), Economic Report on Scottish Agriculture

[14] Energy Saving Trust (2020), Community and locally owned renewable energy in Scotland 2019.

funded by rural estates, they could not have been developed without their active support and, as such, it is appropriate to include their impact.

The Scottish Government study quoted above suggests around 1.4% of Scotland's on-shore wind generating capacity is owned by other locally-based organisations, including community groups, local authorities and housing associations. Data published by Forest and Land Scotland (FLS)[15] shows a further 13% of Scotland's on-shore wind capacity is located on FLS land. It was assumed that the remaining on-shore wind capacity was located on rural estates.

The economic impact of these assets was estimated using evidence from a 2021 study on the economic impact of Scotland renewable energy sector by the Fraser of Allander Institute at the University of Strathclyde. In this way it was estimated that estate owned and enabled renewable energy assets generated £819 million GVA/year for the Scottish economy and supported 7,480 jobs.

5.4.3 Forest Industries

Estates' forestry operations also create significant demand for related forest industries. This includes activity associated with harvesting, hauling and processing timber. While this cannot be fully attributed to estates, without the timber provided by estates, a significant proportion would not take place.

The impacts of this activity were based on data from a study commissioned by the Scottish Government on the economic impact of the forestry industry. Using this data it was estimated that the economic impact supported by estate forests was £143 million GVA and 3,630 jobs.

5.4.4 Nature-Based Tourism Contribution

Scotland's natural heritage is a key factor in attracting people to visit and explore Scotland. VisitScotland's market research indicates that 50% of visitors to Scotland report its scenery and landscape as the motivating factor for travelling to the country. Given that 57% of rural land in Scotland is owned by private estates, rural estates clearly play an important role in attracting these visitors.

To estimate the economic contribution of this activity, it was necessary to consider the number of day visitors, domestic and overseas visitors who come to Scotland primarily for the scenery and landscape and to visit rural areas. Using evidence published by Visit Scotland and the GB Tourism Survey published by Visit Britain, this was estimated to be around 9.0 million visitors with a combined spend of £752 million.

The economic impact this creates was estimated by considering the main sectors of tourism spend and applying sector-appropriate economic ratios and multipliers. Tourism spending at rural estates, such as on visitor attractions at rural estates,

[15] FLS database of currently operating renewable schemes, accessed via https://forestryandland.gov.scot/what-we-do/renewables on 3/8/22

tourism accommodation and sporting activities, was excluded here to avoid double counting.

In this way it was estimated that nature-based tourism attributable to rural estates contributes £492 million GVA and 11,210 jobs in Scotland.

5.4.5 Commercial Premises

Around half the estates that responded to the survey reported they provided commercial premises for local businesses. Together they accommodate 378 business tenants, which are estimated to employ a total of around 1,500 people.

The type of businesses accommodated were varied and wide ranging, including contractors, tradesmen, tourism businesses and retail outlets as well as distilleries, garden centres and professional services.

The economic impact of these businesses was estimated based on the proportion of estates providing commercial space, the size of the space available, the type of business occupying the space and typical employment densities for those types of businesses. In this way, it was estimated that the commercial tenants accommodated by rural estates generate £334 million GVA/year for the Scottish economy and support 9,980 jobs.

5.4.6 Quantifying the Contribution to Economic Growth and Jobs

The economic impact of the business enterprises supported by rural estates are summarised in Table 5-3.

Table 5-3: Enterprise Support Impact of Rural Estates, GVA (£m)

	Impact	Jobs	GVA
Business support impacts			
	Agricultural tenants	7,910	103
	Forestry	3,630	143
	Renewable energy operations	7,480	819
	Nature based tourism	11,210	492
	Commercial property tenants	9,980	334
	Total	**40,210**	**1,892**

Source: BiGGAR Economics Analysis. Note: totals may not sum due to rounding.

5.5 Total Economic Impact of Rural Estates

Combined with the economic impact of estates' core operations and supply chain expenditure, this implies that rural estates generate around £2.4 billion GVA for Scotland's economy each year and support more than 56,000 jobs.

Table 5-4: Core Operational Impacts

Asset class	Jobs	GVA £M
Core operations	9,500	294
Supply chain	6,600	193
Enterprise support	40,210	1,892
Total Impact	**56,310**	**2,379**

Source: BiGGAR Economics analysis

5.6 Contribution to National Indicators

5.6.1 Economic Growth

The evidence used to estimate this impact was drawn from a range of sources including primary research with rural estates and high quality third party evidence from a number of different public data sets and published research. The method used to estimate the impact (see Technical Appendix) is consistent with best practice guidance contained in the Green Book published by HM treasury. As such the evidence base underpinning this contribution was assessed as "compelling".

In terms of the Scottish economy as a whole this size of this contribution is relatively trivial, accounting for a little under 2% of the total value of the Scottish economy and a little over 2% of total employment. On this basis the scale of the contribution to economic growth was assessed as "trivial". This implies that the overall contribution rural estates make to Scotland's economic growth should be considered "minor-medium".

However, the economic outcome within the NPF makes it clear that economic growth alone is not sufficient for wellbeing: growth must also be inclusive and to achieve this, it is important that the benefits of economic growth are spread equitably across the country.

Using data from the survey undertaken to support this research it was possible to estimate that approximately 80% of the impact summarised above occurs in rural Scotland. This equates to approximately 45,000 jobs.

Data published by the Scottish Government[16] shows that in 2021 there were a total of 439,500 jobs in rural Scotland. This implies that rural estates account for around 10% of employment in rural Scotland. The scale of this effect was assessed as "moderate" implying that the overall impact in terms of **rural employment** should be considered "medium-major".

5.6.2 Secure and Satisfying Work

Job quality is an important determinant of individual wellbeing and there is good evidence to suggest that jobs on rural estates are above average in quality.

[16] Scottish Government (2021), Rural Scotland Key Facts 2021

Anecdotal evidence provided by estates suggests many relate to niche roles which tend to be relatively highly paid and secure.

Job quality is part of the "fair work and business" outcome within the NPF and is monitored through two indicators: contractually secure work and employees receiving the living wage. The evidence gathered to support this research suggests that rural estates make a significant contribution to the second of these measures. It is therefore appropriate to assess their contribution to this outcome on this basis.

The survey of SLE members undertaken to support this research found that 95% of rural estate staff were earning at least the Living Wage. This compares to nearly 86% of workers across Scotland as a whole in 2021[17].

The survey also showed that the average length of service of estate staff is around 15 years, suggesting that rural estates provide stable employment which is especially important in rural and remote areas. As a group, they compare well with the wider economy where only around one-third of all workers in the UK have been in their jobs for more than 10 years[18].

The average length of service for estate staff is 15 years and 95% earn at least the Living Wage

However, evidence gathered in the survey also suggested that around 86% of rural estate employees are on permanent contracts. This compares to nearly 95% across Scotland. Security of employment is an important determinant of individual wellbeing so there is room for rural estates to improve performance in this regard.

Based on the evidence above, the scale of this contribution was assessed as "moderate". However, as it was drawn from a small sample size and could not be corroborated it was assessed as "plausible" rather than "persuasive". Overall this implies that the impact can be considered "minor-medium".

It is worth noting that the survey also indicated that the average salary of full-time estate workers may be significantly higher than the average salary for workers elsewhere in the economy and that the gap between the highest and lowest paid members of staff may be significantly smaller. However, the response rate to these questions was very low so this evidence was not considered when assessing this contribution, but it suggests that the conclusion above could be conservative.

[17] Scottish Government, National Performance Indicators, Employees on the living wage
[18] OECD.Stat, August 2022, Employment by Job Tenure Intervals

5.7 Entrepreneurial Activity

A healthy stream of business start-ups is an important component of a thriving economy. Entrepreneurial activity is one of the indicators used to monitor progress toward the economic outcome in the NPF, so it is appropriate to use this to assess the contribution rural estates make to this outcome.

Rural estates support entrepreneurial activity directly, by starting new businesses, and indirectly by enabling others to do the same. An example of an estate that does both is Charlesfield Farms in the Borders (described below).

Charlesfield Industrial Estate

Charlesfield Farms in the Scottish Borders hosts an industrial estate which grew out of an old munitions factory built during the Second World War. The industrial estate, which has expanded significantly over the years, is now an important regional employment hub that is home to around 70 local businesses.

In 2009, the estate expanded the site and subsequently secured planning permission to develop an anaerobic digestion plant, which became operational in 2015. The facility runs on feedstock sourced from nearby farms, which is used to produce gas that is then fed back into the local district heating network. This has facilitated new housing delivery in the local area while simultaneously providing local farmers with a stable alternative market for their output.

Building on the success of the plant, Charlesfield Farms has embarked on a further new venture. In 2021, the estate secured planning permission to develop a £50 million distillery on site. The vision behind the new facility, which is expected to create 20 permanent high-value jobs in the local area, is to become the most resource-efficient producer of grain spirit in Scotland.

A small selection of further examples of estates that have launched new businesses in recent years is provided below:

- Inchyra House in Perthshire has launched three new enterprises in recent years: a wedding venue, a performance venue and a fabric design business;
- JAHAMMA Estates near Fort William launched a new wild venison enterprise in 2020 at the height of the pandemic, helping local game dealers to cope with the loss of demand from the hospitality sector; and
- Douglas & Angus Estates has established Hudson Hirsel, a public interest led property development company responsible for delivering multiple high-quality developments across Scotland (see also section 7.2.1).

In addition to the new businesses established by estates, one in five estates that responded to the survey reported providing space for businesses started by others. At the time of the survey, these employed around 50 people.

The total number of people employed in estate-supported start-ups is likely to be small so the scale of this contribution was assessed as “small”. However the evidence is drawn from multiple independently verified sources, so can be considered “compelling”. This implies the overall impact on this outcome should be considered “medium”.

5.8 Capital Investment

In addition to supporting current economic activity, most estates contribute to Scotland's stock of economic capital through the investment they make in long-term assets such as agricultural equipment, property and infrastructure.

Although only a small number of estates provided information about their recent capital investment, for those that did, expenditure was substantial amounting to £11.5 million each year. Based on this data it was estimated that rural estates contribute around £72 million to Scotland's stock of economic capital each year.

5.9 Contribution to National Wellbeing

This section has presented evidence that suggests rural estates make a substantial contribution to the prosperity of Scotland's rural economy, providing jobs and generating wealth in areas where alternative opportunities are scarce. While relatively insignificant in terms of the Scottish economy, the sector is vital to the prosperity of rural Scotland, accounting for around one in ten rural jobs and making an important contribution to entrepreneurial activity. There is also good evidence to suggest that the jobs provided by rural estates are relatively high quality.

Taken together, this evidence suggests that rural estates play an important role in delivering the inclusive growth envisaged in the National Performance Framework.

Table 5-5: Summary Wellbeing Contribution

Contribution to…	
National Outcomes: indicators (impact)	**Capital Stocks**
Economy: economic growth (minor-medium) **Economy:** rural employment (medium-major) **Fair work and business:** Employees on living wage (minor-medium) **Economy:** Entrepreneurial activity (medium)	£72.1 million contribution to economic capital stocks.

6. Stewards of the Natural Environment

Rural estates account for around 17% of Scotland's natural capital asset base and play an important role in protecting and enhancing Scotland's biodiversity. The sector also plays a vital role in the transition to net zero by enabling the rollout of renewables. The scale of this impact is likely to increase significantly in the future.

One of the defining features of a wellbeing economy is the ability to continue to grow within planetary boundaries without compromising the ability of future generations to live well. Failure to achieve this will harm wellbeing directly through the negative effects of climate change and indirectly by reducing material prosperity, now and in the future.

This is why Scotland's NPF includes a national outcome specifically focused on the environment. It is also the reason why natural capital is one of the four capital stocks measured by the wellbeing economy monitor. Evidence gathered as part of this research suggests that rural estates make a substantial contribution to both.

One of the main ways they do this is by implementing sustainable land management practices and engaging in efforts to protect and enhance Scotland's natural environment. Another important part of this contribution is the support they provide for the transition to net-zero by enabling the roll out of renewable energy.

These activities contribute directly to four of the national indicators used to monitor progress toward Scotland's national outcomes:

- biodiversity;
- natural capital;
- the condition of protected nature sites; and
- energy from renewables.

These contributions are assessed in turn below.

6.1 Biodiversity and Natural Capital

The survey undertaken to support this research suggests that most rural estates are engaged in some way in protecting and enhancing Scotland's rural environment.

Those who responded to the survey also reported that 12% of estate staff were employed in conservation and land management.

Four out of every five estates are actively engaged in conserving the natural environment and 12% of staff are involved with conservation and land management.

Estates contribute to Scotland's biodiversity and natural capital in a wide variety of ways including:

- implementing sustainable agricultural and land management practices;
- responsibly managing ancient woodlands and environmental sites;
- restoring peatland and other habitats;
- supporting wildlife conservation;
- implementing sustainable deer management practices; and
- supporting sustainable visitor management.

A summary of some key highlights of this activity is presented below.

6.1.1 Sustainable Agricultural and Land Management Practices

The survey undertaken to support this work suggests that 92% of SLE members were engaged in farming activity on their estates. Agriculture policy and, in particular, agriculture reform is therefore vitally important to them. The UK is in the process of designing a replacement for the EU's Common Agricultural Policy (CAP) which, in 2018, was worth around £18.5 billion to the farming sector. The Scottish replacement scheme is expected to be similar to the new proposal for England and will be developed through a process of co-design with farmers, land managers and other interested parties working in partnership with relevant government departments.

It is expected that the new plan will follow the principle of public money for public goods whereby farmers and other land managers will be paid for delivering (primarily) environmental benefits rather than the amount of land they farm. In its plan for agricultural transition[19], DEFRA sets out a range of schemes including initiatives to increase biodiversity, restore landscapes, promote animal welfare and increase productivity through investment in new equipment and technology. Within this, the Environmental Land Management Scheme will guide the delivery of improvements to water quality and biodiversity which are key elements of the government's 25-year Environment Plan. It also supports the government's net zero ambitions by helping to reduce agricultural greenhouse gas emissions, protecting and increasing carbon stores and supporting ecosystem resilience.

[19] Defra, 2021, The Path to Sustainable Farming: An Agricultural Transition Plan 2021 to 2024

To help assess the extent to which rural estates engage in sustainable agricultural practices, the survey undertaken to support this work asked about involvement in various practices included in the DRFRA scheme. The responses to these questions are presented below.

- 43% reported they had made improvements to agricultural land;
- 43% reported they had implemented natural solutions to manage floodwater or reduce runoff;
- 41% reported they maintained low input grassland;
- 37% reported improving grassland; and
- 36% reported managing water bodies.

Estates were also asked about their engagement in sustainable land management practices. The responses to this question are presented below:

- 74% reported managing feeding, shelter and breeding areas for wildlife;
- 53% reported creating or maintaining farm woodland;
- 46% reported restoring rivers, flood plains and riparian habitats;
- 46% reported taking steps to improve soil quality;
- 43% reported planting and maintaining hedges for wildlife;
- 42% reported undertaking targeted measures to support species reintroduction;
- 34% reported that they were involved in managing or creating woodland;
- 30% reported they were involved in restoration or creation of grassland, wetland, heathland and/ or coastal habitats; and
- 29% reported they were engaged in peatland or moorland restoration.

6.1.2 Ancient Woodland and Environmental Designation

Scotland's ancient woodlands (defined as land that has been continuously wooded since at least 1750) are an important component of the nation's natural capital. In the survey of estates undertaken to support this research, 25 reported that a total of 9,368 hectares of land within their estates was listed within the ancient woodland inventory. This represents around 6% of the estimated 148,000 hectares of ancient woodland in Scotland[20]. Some 28 estates also reported that 83,487 hectares of land within their boundaries was covered by an environmental designation.

Recent notable projects among SLE members which highlight where estates have invested in species reintroduction, wildlife conservation and control of invasive species are:

[20] Woodland Trust (2018), The Current State of Ancient Woodland Restoration

- planting 30 young oak trees at Scone Estate as part of a programme to restore the historic landscape of the area;
- protecting the Scottish Wildcat population at Aigas Estate through the conservation breeding programme;
- installing 5,000 metres of deer fencing around 1,660 hectares of land, mitigating against capercaillie strike risk, managing herbivore impacts and seeking natural regeneration of native tree species to increase woodland edge habitat for priority species including grouse, capercaillie and red squirrel;
- sustainable forest planning and management at Cardney Estate to fell 13 hectares of mature conifers and replant young oak trees with a further proposal to replant 184 hectares of new native woodland; and
- regenerating and planting 5,000 acres of new trees to enhance biodiversity at Ardtornish Estate.

6.1.3 Peatland Restoration

Peatland restoration has drawn particular attention at a UK and wider level in recent years due to the ability of peat soil to store greenhouse gases in the long-term if it remains waterlogged. However, an estimated 5% of global greenhouse gas emissions are released from peat soils due to human activity. Under the Peatland Action Plan, the Scottish Government has committed to restoring 250,000 hectares of degraded peatland by 2030 as part of the 2020 Climate Change Plan, with 25,000 hectares already under restoration and 6,000 hectares having being restored in 2021 alone.

The **Lochrosque Estate** in Wester Ross is one example of where peatland restoration is well underway. Initially, activity was driven by the potential for more efficient green energy production. However, 5 years on, the benefits are manyfold and Lochrosque is working on 9 different restoration sites across the estate. By 2022, 1,000 hectares had already been restored and a further 2,000 hectares were in the pipeline. By restoring peatlands at scale, and sensitively planting native woodland across the estate, it has witnessed a multitude of benefits for people, the environment, the climate and the local economy. The estate hosted an event for SLE members in June 2022 that looked at the key elements of their restoration work.

A further example of peatland conservation is given by the estates which are within the **Flow Country** in Caithness and Sutherland. They are actively working to protect and restore this major natural asset which is one of the largest areas of blanket bog in the world and is seeking World Heritage Site status for its globally rare habitat. The site passed the Technical Evaluation stage with UNESCO in 2020 and will submit a full nomination package in late 2022.

In the Cairngorms, the **Peatland ACTION Programme** provides funding and technical support for peatland restoration projects that deliver quality outcomes and provide multiple benefits at a scale that make a difference.

Further recent examples of investment in maintaining ecologically valuable habitats and sustainable land management practices at SLE member estates are:

- restoring three lowland raised bog sites, an SSSI and a Special Area of Conservation at Rosebery Estate to attract greater diversity of insects which will benefit the red grouse population;
- ongoing moorland restoration to conserve the Scottish wild landscape at Farr Estate;
- environmentally focused land management, peatland restoration, tree planting, regenerative agriculture on upland livestock and river management to support freshwater and wetland species at Wemyss and March Estate; and
- environmental protection at Hopetoun Estate which will lead to 20% of its farmland managed under environmental measures.

The **East Cairngorms Moorland Partnership** reported a successful season in 2021 with the hatching of a sea eagle chick on the Balmoral estate which was the first time the species had successfully bred there. The Partnership has also reported recent success for golden eagles, hen harriers, red kite, osprey, peregrine and merlin as well as short-eared owls across various land holdings.

6.1.4 Deer Management

Deer present a significant threat to woodlands, agriculture and peatlands and deer management is considered to be essential in tackling climate change. The British Deer Society estimate that 100 uncontrolled roe deer can grow to 1,000 in just 10 years without management measures in place. Throughout Scotland there are 45 deer management groups, which include many rural estates, that are working to achieve similar goals.

One example of how rural estates are addressing this issue is the **Monadhliath Deer Management Group** (MDMG). With 40 estate members and covering an area of around 150,000 hectares, it is the largest Group in the country and has formed a Strategic Deer Management Plan in partnership with NatureScot (formerly Scottish Natural Heritage). It works to find a balance between private and public interests on this complex and challenging task.

6.1.5 Visitor Management

In both Loch Lomond and the Cairngorms several larger estates actively work alongside the National Park Authorities to manage visitors and improve ranger services, infrastructure, car parking, and facilities at key locations. For example, the **Managing for Visitors** group in the Cairngorms helped to address the challenge of increased visitor numbers to the area following the pandemic and the growth in domestic tourism which it created. This led to facilities improvements in Deeside, Glen Shee and to the West of the Cairngorms with many funded by the Rural Tourism Infrastructure Fund. In Loch Lomond there are examples of similar improvements in visitor management around Luss and to the south of the Loch.

6.1.6 Wildlife Estates Scotland (WES)

The Wildlife Estates Scotland (WES) initiative promotes best practice in habitat and wildlife management through an internationally recognised accreditation scheme.

Rural land managers play a vital role in delivering government priorities for biodiversity. Through the WES initiative, Scottish Land and Estates have collectively set a high standard for landowners to balance their social, economic and environmental responsibilities and take an active role in managing their business model. The scheme has its origins in the Wildlife Estate Europe initiative which was set up by the European Landowners Organisation.

The key aims of WES[21] are to be: trusted by Government to deliver the national climate and biodiversity challenge targets, trusted by NatureScot and non-governmental organisations to deliver best practice in environmental land management, and trusted by the public as custodians of the countryside.

A further description of the WES initiative is presented in the case study panel below.

Wildlife Estates Scotland

Over 511,000 hectares of land across 64 properties became accredited within the first 10 years of WES

The Wildlife Estates Scotland (WES) initiative was introduced in 2010 and over time it has become a highly regarded brand which is recognised in 19 countries. It highlights the positive contribution rural estates make to government targets on biodiversity and is supported by stakeholders such as the RSPB, NatureScot, the Cairngorms National Park Authority and others. The initiative has evolved from a self-regulation tool to aiming to be the gold standard certification in best practice in land management across Scotland.

There are two levels of WES membership, Level 1 (supporter level, with 283 members) and Level 2 (full accreditation, with 64 members), and there is a busy pipeline for involvement in both. Several estates have also undergone a re-accreditation process. The aim is to have 2.5 million acres (around 1,012,000 hectares) of land accredited at Level 2 by 2023. WES Level 2 members are

[21] Wildlife Estates Scotland Annual Conference, 2021, Chief Executive's address

encouraged to invite MSPs onto their estates to make them aware of the work they do to support biodiversity. Across the WES membership, the estates:

- manage 97 SSSIs and 79 internationally designated sites;
- protect 830 known breeding raptor territories;
- planted 132 km of new hedgerow over 5 years; and
- provide work for 680 full-time employees as well as part-time and seasonal jobs.

By Spring 2022, around 12% of WES members had undertaken a carbon audit, 23% had undertaken peatland restoration and 23% were undertaking conservation grazing. Around one-third of WES members participate in the Agri-Environment Climate Scheme.

6.1.7 Contribution to Biodiversity and Natural Capital

This section has presented evidence of a wide range of different ways in which rural estates protect and enhance Scotland's biodiversity and natural capital. The survey undertaken to support the research reported that 79% of estates were involved in conserving the natural environment and 29% were involved in restoring peatland, in addition, 53% were involved in maintaining woodland. Significantly, the survey had a high proportion of large estates of more than 10,000 hectares: 21% of survey respondents had estates of more than 10,000 hectares compared with 8% of all rural estates in Scotland which are within this category. This suggests that the scale of this contribution can be considered "large".

Estates contribution to biodiversity and natural capital is evidenced by their active participation in sustainable land management practices and through the Wildlife Estates Programme described earlier in this chapter. Strong examples exist of active groups being formed to restore peatland and to manage deer numbers, which are two key areas of current policy focus in support of climate change management.

Estates contribution to natural capital and biodiversity is also evidenced through the amount of ancient woodland they manage and through their participation in natural capital audits. In particular, the 64 members of SLE who have signed up to the Wildlife Estates Scotland scheme are demonstrating a level of commitment to habitat and wildlife management that is recognised at an international level.

Overall this evidence was assessed as "persuasive", which implies that the overall impact that estates have on this outcome is "medium-major".

6.2 Sites of Special Scientific Interest (SSSIs)

NatureScot is the public body responsible for Scotland's natural heritage and included among its responsibilities is monitoring the condition of protected nature sites across Scotland, many of which fall within rural estate boundaries. Sites of Special Scientific Interest (SSSI's) are identified as "special" for plants, animals or habitats, rocks, landforms or a combination of these features. This is one of the 81 indicators used in the National Performance Framework to report on the achievement of the environmental outcome.

The survey of SLE members found there were 96 SSSI's across 34 member estates. Terrestrially across Scotland, 78% of protected nature sites were assessed by NatureScot as being in a favourable or recovering condition in 2022[22] which is testament to landowners taking their responsibilities seriously in this area.

The 96 protected nature sites on the estates that responded to the survey represent around 7% of Scotland's 1,440 designated SSSIs. Although many more will be located on estates that did not take part in the survey it was not possible to estimate this number therefore the scale of this contribution was assessed as "small". Across Scotland, NatureScot reported four out of five SSSIs are in a favourable or recovering condition. As this evidence is high-quality and independent it was assessed as "compelling", implying the overall impact on this outcome can be considered "medium".

6.3 Renewable Energy

Most rural estates are engaged in renewable energy activities which further contribute towards the country's net zero targets. The survey of SLE members undertaken to support this research found that 70% of members' estates were involved in renewable energy production.

Historically, many rural estates installed small, run-of-the river hydro schemes supported by the feed-in tariff which applied at the time. These have made the estates more self-sufficient in their energy needs and reduced their reliance on energy from traditional sources. As well as supporting sustainability goals, they have also helped to meet the energy needs of the wider community.

Looking to the future, rural estates could play an important role in facilitating the much-needed upgrade of the electricity transmission network. The current system was designed in the 1950s when energy was produced in power stations near towns. At present, renewable energy is produced elsewhere, often in rural areas, and needs to be transported on upgraded infrastructure.

[22] NatureScot, May 2022, The Proportion of Scotland's Protected Nature Sites in Favourable Condition 2022, An Official Statistics Publication for Scotland

Research published by Scottish Energy Saving shows that rural estates directly own wind farms with an installed capacity of 214 MW, hydro schemes with a further 23 MW of installed capacity and solar schemes with an installed capacity of 6MW. Estates also play an important role in the renewable energy market by leasing land to energy companies. It was estimated that the wind farms enabled by this have an installed generation capacity of 7,293 MW (see section 11.4.2).

Taken together this implies that rural estates account for 7,540 MW of installed renewable energy capacity, or 57% of Scotland's total, a "large" contribution. The data used to estimate this figure was drawn from multiple sources, including government reports and industry data and can therefore be considered as "compelling". This implies that the overall impact estates have on this outcome should be considered "major".

6.4 Valuing Estates' Contribution to Natural Capital

Natural assets – like water, soil and plants – underpin every aspect of the economy so ensuring stocks are maintained at healthy levels is critical for long-term prosperity. This chapter has illustrated some of the ways in which rural estates help to achieve this. The value of this activity can be quantified by considering the contribution it makes to Scotland's stock of natural capital.

Scotland's Natural Capital Accounts show that in 2018 (the latest year for which complete figures are available), the total value of Scotland's natural capital assets was around £206 billion. This includes estimates for 13 different classes of asset, of which five are particularly relevant to rural estates.

The value of each asset is driven by an underlying annual physical flow. For example, the value of Scotland's renewable energy resources can be measured in terms of the number of gigawatt hours (GW) it produces each year.

The first step in estimating the contribution that rural estates make to Scotland's natural capital resource was to estimate how much of these annual flows take place on rural estates. This was then applied to the total asset value for each class of asset to derive an estimate of the total natural capital contribution made by estates. The core assumptions used to do this are presented in Table 6-1 and further detail on the method is provided in the Technical Appendix.

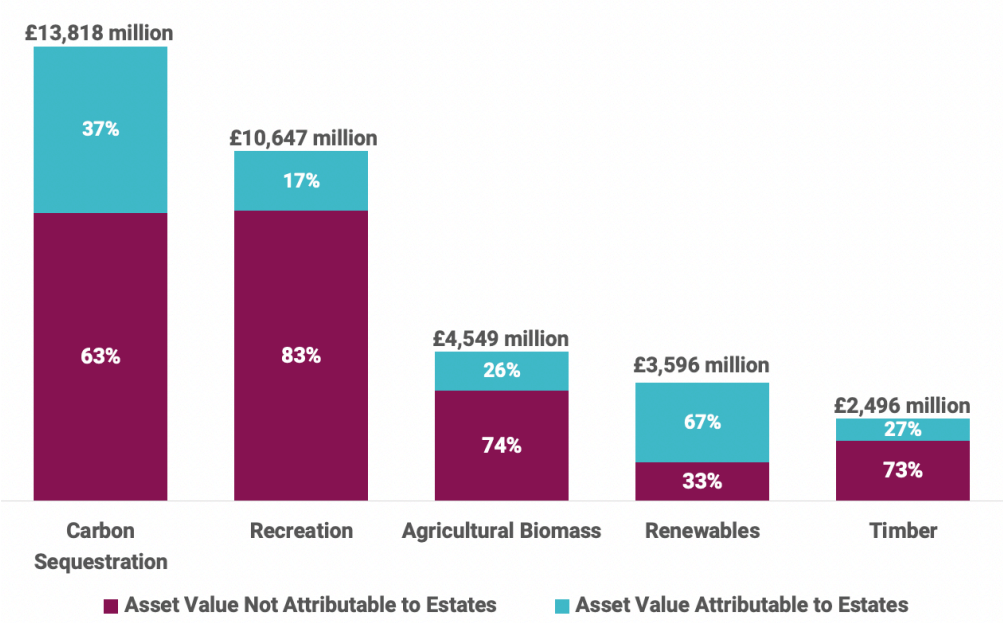
Table 6-1: Rural Estates Contribution to Natural Capital

Asset class	% Attributable to Rural Estates	Value £m
Agriculture	26%	£4,549
Renewables	67%	£3,596
Timber production	27%	£2,496
Carbon sequestration	37%	£13,818
Outdoor recreation	17%	£10,647
Total	17%	£35,106

Source: BiGGAR Economics analysis

Using this approach it was estimated that, in 2018, rural estates accounted for £35.1 billion of natural capital value which represented 17% of the Scottish total.

Figure 6-1: Rural Estates Contribution to Natural Capital by Asset Class (£ million)



Source: BiGGAR Economics analysis

The largest component of this, by some margin, is the estates contribution to Scotland's renewable energy asset base, followed by carbon sequestration. The former contribution is based on the scale of renewable energy generation while a significant proportion of the latter relates to new forest plantation. Given the significant policy support that currently exists for these activities it would not be unreasonable to expect substantial growth in both areas in the coming years.

In the past, fossil fuels were by far the most significant component of Scotland's natural capital asset base. At their peak in 2012 they accounted for 61% of the total

stock, but by 2018 this had fallen to just 26%. In the same year, renewables and carbon sequestration accounted for 22% of Scotland's natural capital asset base.

As Scotland continues to transition to net-zero the relative importance of these assets will continue to evolve. If this follows the current trajectory, which current public policy emphasis suggests it will, the role of Scotland's rural estates will become increasingly important.

6.5 Contribution to National Wellbeing

Taken together, the evidence presented in this section suggests that rural estates make a substantial contribution to the national outcome relating to the environment. They do this both through active efforts to protect and enhance the natural environment and by supporting the roll out of renewable energy infrastructure.

This section has also presented evidence to suggest that rural estates contribute significantly to Scotland's stocks of natural capital. The total value of this contribution was valued at £35 billion, or 17% of the nation's natural capital assets.

As the roll out of renewable energy infrastructure continues, rural estates will be well placed to play a key role in supporting Scotland's continued transition to net-zero. Therefore it is not unreasonable to expect the scale of this contribution to increase significantly in the future.

Table 6-2: Summary contribution to national wellbeing

National Outcomes: Indicators (effect)	National Capital Stocks
Environment: Biodiversity (medium-major) **Environment:** Protected nature sites (medium) **Economy:** Natural capital (medium) **Economy:** Energy from renewables (major)	£35.1 billion of Scotland's natural capital stocks (17% of total).

7. Place Makers

Rural estates are major contributors to Scotland's private rental market, providing homes for nearly 13,000 families across the country. They are also leading the way in public interest-led development. Over the past 10 years these developments have delivered around 760 high-quality new homes, including 210 affordable homes across Scotland.

One of the most important and direct ways rural estates contribute to wellbeing is by providing homes for people to live in.

By providing homes in parts of rural Scotland where there are often few alternatives rural estates help to support population retention in some of Scotland's most fragile rural communities. Supporting **rural population** retention in this way makes an important contribution to the national outcome relating to resilient communities.

By increasing the overall supply of housing, rural estates make a positive contribution to **housing affordability** in rural Scotland, which is an important indicator of progress toward the national outcome relating to poverty.

By delivering high-quality, public interest-led housing developments they improve how residents feel about where they live and their **perceptions of the local area**, both important elements of the national outcome related to communities.

Investments made by rural estates in their housing stock, together with the investment facilitated in new housing development, also make an important contribution to Scotland's stock of **economic capital**.

This section presents the evidence of these activities and assesses their impact.

7.1 Maintaining a Healthy Rural Population

One of the most important ways in which rural estates help to sustain rural communities is by providing homes for people to live in. The availability of an adequate supply of housing is fundamental to achieving the "resilient communities" envisaged in the communities outcome within Scotland's NPF so this contribution was assessed based on the number of homes provided for rent.

The evidence used to do this was drawn from the survey undertaken to inform this study, an earlier survey commissioned by SLE and Scottish Government data.

The SLE survey in 2014 related to 159 estates, which reported they provided homes for 4,900 households. This included 10 estates with very large property portfolios of more than 130 homes. Excluding these properties suggests that, on average, a rural estates' active property portfolio is likely to be around 5 homes.

The SLE survey also suggested that around 75% of members are involved in the private residential rental market. The evidence gathered in the survey undertaken to support this research suggests this figure could now be closer to 89%. To avoid overestimating the impact the lower value was used to scale up the contribution.

By applying the average size of a typical property portfolio to the total number of estates involved in supplying residential accommodation it was estimated that rural estates provide rented and tied homes for around 8,250 Scottish households.

In addition, research commissioned by the Scottish Government[23] suggests there are around 4,800 agricultural tenancies across Scotland with housing attached. The majority of these homes will be located on rural estates[24].

Taken together this suggests that rural estates provide homes for nearly 13,000 households across Scotland. A breakdown of these figures is provided in Table 7-1.

Table 7-1: Private Rental Provision by Rural Estates

Survey source	Rented properties (of which affordable)	Staff & former staff	Total
BiGGAR Economics	2,166 (688)	367	2,533
SLE survey	1,979 (unknown)	369	2,348
Total rented and staff	4,145 (688)	736	4,881
Scaled up for sector as a whole @ average of 5 homes/estate*			8,250
Homes tied to agricultural tenancies*			4,700
Total rented and tied homes provided by rural estates in Scotland*			**12,950**

Source: BiGGAR Economics and SLE survey evidence *These estimates are rounded.

To help put these figures in context, the Scottish Government estimates[25] thar around 340,000 Scottish households live in privately rented accommodation. Provision by rural estates is equivalent to around 4% of this total. In absolute terms this is a small contribution, however this overlooks the context within which it occurs.

Scotland's rural estates operate in Scotland's smallest and most remote communities where housing options can be very limited. In recent years this

[23] Scottish Government (2018), Agricultural Tenancy House Condition Survey

[24] The Crown Estate Scotland owns approximately 30,000 ha of tenanted land. The estimate of the number of tied farm houses included in the table has been adjusted to account for this.

[25] Scottish Government (2021), Private Sector Rent Statistics for Scotland 2010-2021

challenge has intensified as changes in working practices have made it easier for people to relocate to rural areas. The effect of this on rural house prices and the consequences for community life has been well documented.

The availability of a secure supply of rental accommodation is vital in this context because it can enable people who may not be able to afford to buy their own home to stay in the local area. This is particularly important for retaining young people in an area, which is vital for long term community resilience.

However, this is not the only reason why a stable private rental market is important. Not everyone living in a rural area intends to remain in the area for a long time and many will need time to get used to the lifestyle before deciding. Having a stable supply of privately rented accommodation is therefore crucial for enabling rural areas to maintain a flexible labour market and a healthy population turnover. It is crucial for enabling local businesses and public organisations to fill skills gaps and attract key workers like teachers and doctors, both of which underpin the resilience of small rural communities.

Set in this context it is reasonable to assess this contribution as "large". The evidence upon which it is based is drawn from three surveys of rural estates and so can therefore be considered "compelling". This implies that the overall significance of the contribution should be assessed as "major".

7.2 New housing Development

In rural communities, many estates take an active role in facilitating new build homes.

In 2020/21 almost 15,000 new build houses were completed in Scotland[26]. Official statistics on previous land use and ownership are not readily available, but major residential development on brownfield sites is uncommon so other than rural estates, there are few other sources of new development land. This implies that most new homes delivered in Scotland each year can ultimately be traced back to a land sale by a rural landowner.

This is often where the role of rural estates in housing delivery stops but some estates take a much more proactive role, adding significant value in the process. They can do this because they tend to have a long-term interest in the land, which means they may be prepared to accept lower returns or wait longer for returns to materialise than commercial housing developers.

There are two main ways in which this approach translates into improved wellbeing: by enabling higher quality place-making and by improving housing affordability, particularly in remote, rural parts of Scotland.

[26] Scottish Government (May 2022), Housing Statistics 2020-2021.

7.2.1 Place Making

The quality of the physical environment is an important factor in determining individual wellbeing. A significant body of research exists showing the positive impact of factors like urban green space and the negative effects of factors like dereliction and housing disrepair.

These links are reflected in the significant emphasis now put on "place-making" within public policy, but research shows Scotland's market-based model of housing delivery is ill-equipped to deliver this and calls have been made for Scotland to shift to a more proactive model of "public interest-led development"[27].

A core characteristic of this approach is a patient approach to capital returns and a focus on place quality rather than housing numbers. This underpinned the delivery of Scotland's New Towns in the 1950s and 1960s, enabling thriving new communities complete with municipal parks, shopping precincts and other facilities to be developed. While it has long since fallen out of favour with public agencies, a small number of rural estates are leading the way in resurrecting this approach.

The best-known example of this is perhaps Moray Estates' Tornagrain Development (see below). A summary of the number of homes expected to be delivered by this and similar developments elsewhere in Scotland is provided in Table 7-2.

Table 7-2: Public Interest-Led Development by Rural Estates

Estate	Development	Location	Homes planned and delivered
Moray Estates	Tornagrain	Near Inverness	5,000 planned over 50 years, c.250 delivered to date.
Wemyss and March Estates	Longniddry Village	East Lothian	450 planned including 98 in phase one.
Southesk Estates	Chapelton of Elsick	Near Aberdeen	4,000 planned by 2023 with detailed permission granted for first phase of 800.
Douglas and Angus Estates	Various	Borders and Lanarkshire	Approximately 200 homes planned across 3 sites.

Source: BiGGAR Economics research based on public sources

[27] Scottish Land Commission (2021), Toward a Public Interest Led Approach to Development

Tornagrain

Tornagrain is a planned new settlement near Inverness airport built on land owned by Moray Estates. It was designed in response to rapid expansion of Inverness and recognised the need to protect neighbouring communities by planning future housing growth.

The town's architecture has been inspired by popular Scottish market towns such as Cromarty, Nairn and Grantown-on-Spey and has flowed from extensive consultation into what people wanted. Rather than being a commuter town, it aims to be a place where people can live, work and find the services they need in their daily lives.

The plan is based around a High Street, which is the focus for commercial activity, and four neighbourhood centres with no more than a 5 minute walk to basic services. Houses are distinct and have been built using high quality materials. They incorporate period features such as timber sash and case windows, high ceilings and chimneys, which gives an overall look that is very different to a typical housing development. As well as a nursery, shop, cafe and pharmacy, Tornagrain currently has community allotments, a play park, tennis courts and green spaces. Existing landscape features such as forests and burns have also been incorporated into the design. A network of pathways connects everything together and walking and cycling is encouraged around the town.

Initial planning permission was granted to Moray Estates in 2012 with a long-term vision of creating 5,000 homes, 3 primary schools, a secondary school, shops, employment space, parks and other services over a 620 acre site which is expected to take 50 years to complete. Around a quarter of the properties within the development will be classed as affordable homes and these will be interspersed throughout the community. By June 2022, 250 homes had been built and the town had around 600 residents. A key access road connecting the site to the A96 trunk road was also under construction.

The Tornagrain Community Association was officially founded in 2021 to support community building by organising events such as picnics, walks and community gardening and by developing community groups.

The design approach taken by Moray Estates to the development and on-going management of Tornagrain is highly innovative and contrasts strongly with many other modern property developments.

The importance of physical environment to wellbeing is reflected in the communities outcome of the NPF through the inclusion of an indicator relating to the perception of the local area. It is reasonable to assume that the kind of high quality, public interest-led developments described in this section would have a positive effect on

the residents perception of their local area, therefore it is appropriate to use the number of homes delivered in such developments as a measure of this contribution.

The public sector is now largely absent from the large-scale delivery of new development in Scotland, implying that the scale of this contribution should be considered as "large". The evidence used to assess it was drawn from multiple independent sources and is therefore "persuasive", implying that the overall impact should be considered "medium-major".

7.3 Affordable Rural Housing

The affordability of housing in rural Scotland has been a hugely contentious issue in recent years. The difficulties faced by young people have been particularly well documented and emotive stories about young families being forced to leave their communities in search of a home are commonplace. The consequences of this for rural communities can be severe and although addressing it has been identified as a priority by Government, so far the policy response has not met the challenge.

Research commissioned by the Scottish Land Commission[28] shows that a major driver behind this is the high cost of building homes in rural areas, concluding that: *"Even if there was a plentiful supply of low-cost land in our rural towns and villages, the majority of speculative volume housebuilders would still not engage in this market".* To overcome this, the Land Commission has called for *"new models of development"* to support the delivery of affordable housing in rural Scotland.

Evidence gathered as for this study shows some rural estates are already trying this. A good example is the Old Sawmill development at Rothiemurchus (see overleaf).

Ten of the estates that responded to the survey reported they had delivered a total of 100 new affordable homes within the past five years. Supplementing this data with data from a previous survey by SLE and published information on the Rural and Islands Housing Fund it was estimated that over the past 10 years, rural estates in Scotland have delivered at least 210 new affordable homes across Scotland.

One of these developments was at Stracathro Estate near Brechin where a family housing development of six, three-bedroomed affordable homes was completed in 2021. The Estate took the decision to build the homes following concerns that the local school was threatened with closure. They were built at a cost of £1.15 million and were part-funded by a £530,000 Rural Housing Fund grant. With an advertised rent of £475 per month, they compare favourably with the £700 per month average for commercial rents in the area for a similar property.

[28] Savills (May 2020), The Role of Land in Enabling New Housing Supply in Rural Scotland, published by the Scottish Land Commission.

Old Sawmill, Rothiemurchus

An innovative delivery model used to deliver six affordable homes near Aviemore.

The Old Sawmill development at Rothiemurchus was developed as a collaboration with the local community, the Rothiemurchus Estate and the Communities Housing Trust. It provided six self-build homes: four affordable plots for the local community and two open-market plots within the Cairngorms National Park.

Aviemore is a desirable area with challenges around land availability, planning, limited housing stock and housing affordability. Faced with these challenges, several local families formed a co-operative and approached the Rothiemurchus Estate to tackle the issue. The Communities Housing Trust brokered the unique cross-subsidy model to provide the plots.

The homes used local and sustainable materials, where possible, and are highly energy efficient. The affordable self-build homes all have the Rural Housing Burden attached, a legal condition which protects the property's affordability in perpetuity and prioritises the local community in future sales, helping to prevent holiday and second home ownership.

The Sawmill development could form a template for a further development and Cairngorms Business Partnership are working with the Communities Housing Trust to bring the plan together.

7.3.1 Contribution to Housing Affordability

Relative poverty after housing costs is one of the indicators used by the Scottish Government to assess progress toward the national outcome relating to poverty. Rural estates contribute to this both directly, by enabling the development of new affordable homes, and indirectly by increasing the supply of market housing, which puts downward pressure on prices. The number of homes delivered is therefore an appropriate measure to assess rural estates contribution to this outcome.

While the numbers presented in this section are relatively small in relation to overall housing delivery across Scotland it is important to consider the effect in context. All of the projects described in this section have been delivered in rural Scotland where housing delivery is more challenging than in urban areas. Many of the projects have also been delivered in very small, remote communities where even one additional household can significantly increase community viability.

In this context the scale of the impact was assessed as "moderate". As the evidence for the contribution was drawn from

multiple sources it can be considered “persuasive”, which implies that the impact should be assessed as “medium”.

7.4 Capital Contribution

New housing development enabled by rural estates is an important addition to national capital stocks. Although this investment is not generally funded directly by rural estates, the type of development described in this chapter would not happen without their proactive support and active engagement. It is therefore appropriate to include this investment as part of the assessment.

Based on the evidence presented above it was estimated that rural estates build an average of around 60 new homes each year. To estimate the contribution this makes to national stocks of economic capital this was multiplied by the average value of a new build house in Scotland.

In this way it was estimated that new housing development delivered by rural estates adds around £16.6 million to the value of Scotland’s economic capital asset base each year. Further details about the approach used to estimate this value and the assumptions underpinning it are provided in the Technical Appendix.

7.5 Contribution to National Wellbeing

The evidence presented in this chapter shows that rural estates make an important contribution to Scotland’s rural communities by providing homes for people to live in. It also shows how some rural estates have been very active in public interest led development, delivering around 760 high quality new homes over the past 10 years and making an important contribution to resident’s perception of where they live. Rural estates also make a significant contribution to improving housing affordability in rural areas both directly and indirectly by increasing overall housing supply.

Table 7-3 – Summary Wellbeing Contribution of Housing & Place-making

Contribution to…	
National Outcomes: indicators (impact)	**National Capital Stocks**
Communities: Rural population (major) **Poverty:** Relative poverty after housing costs (medium) **Communities:** Perceptions of local area (medium-major)	760 new homes built over the past 15 years, adding c.£16.6m to national stock of economic capital.

Source: BiGGAR Economics Analysis

8. Gateways to Nature

Every year around 5.4 million day trips are made to rural estates, directly improving the physical and mental wellbeing of Scotland's population. Rural estates also facilitate school visits for around 16,500 children each year and provide more than 300 apprenticeships, contributing significantly to Scotland's stock of human capital.

There is a strong body of evidence linking exposure to the natural environment with improved physical and mental wellbeing. By providing access to Scotland's natural environment, rural estates play an important role in supporting individual wellbeing.

Access to nature is so important to wellbeing that it is reflected in two of Scotland's national outcomes. **Visits to nature** is one of the indicators used to measure progress toward the environmental outcome while **physical activity** is one of the indicators used to measure progress toward the health outcome. This chapter considers the contribution rural estates make to both outcomes.

Many estates also use their natural assets to provide opportunities for children and young people to participate in educational visits. These **extra-curricular activities** help to improve the educational outcomes of young people, enhancing the value of Scotland's stock of human capital. Rural estates play a further role in enhancing human capital by providing opportunities for staff to engage in **workplace learning.**

This section considers all four of these contributions to the National Outcomes and quantifies the value estates add to Scotland's stock of **human capital**.

8.1 Learning from Nature

Rural estates help to build the knowledge and skills people need to manage and care for the natural environment, which is increasingly important for the environment and the economy. They do this by providing education opportunities starting from childhood through to adulthood. Rural estates provide space for outdoor nurseries or forest schools, they deliver school educational visits and create apprenticeships.

8.1.1 Outdoor Nurseries

Outdoor learning is recognised as being of vital importance for children's physical, mental, social and emotional wellbeing[29] and rural estates play a vital role in this. The survey undertaken to support this research indicates that a third of the estates

[29] Scottish Government (2020), Scotland's National Position Statement on Outdoor Play and Learning.

responding to this question hosted outdoor nurseries. In practice, these are a combination of outdoor nurseries, where children spend their time playing and learning in the outdoors all day, every day, and forest schools, which are session-based programmes as part of a wider nursery or primary school experience.

For example, Duffus Estate hosts a Forest School Nursery which aims to have children outside for at least 80% of the time. The Estate provides office space for the nursery as well as the necessary grounds maintenance to ensure the safety of children and staff. Other estates facilitate outdoor learning 'classrooms', such as Dunecht Estate, which has been involved in the establishment of three forest school areas for local primary schools. Staff of the Estate also visit the forest schools to pass on their knowledge and experience to pupils.

8.1.2 Educational Field Trips

As well as hosting outdoor nurseries or forest schools, rural estates deliver educational field trips, primarily aimed at school pupils. These are often developed in conjunction with local schools and cover a wide range of topics linked with the Curriculum for Excellence.

The survey undertaken to support this research indicates that across 32 estates, 225 educational field trips took place. Based on an average class size of 23 pupils[30], this equates to around 5,200 children. Analysis of the Helping it Happen case studies by BiGGAR Economics showed a further 10,500 children participating in educational workshops organised by rural estates (these estates did not respond to the survey, so there is no double counting).

Estates that Educate is an initiative involving six Scottish estates and educating school pupils about rural conservation and land management job opportunities. Over 5 consecutive weeks, students experience real life on a working Scottish estate through first hand practical demonstrations by the people who carry out these skills on a day to day basis. A wide variety of areas are covered, including tick awareness, sheep management practices, deer and larder skills, renewable energy, fishing, different land management practices and biodiversity.

The programme allows pupils to engage in activities they will never have experienced before, improving their understanding of the countryside, the role of local sporting estates as well as raising awareness of the different career opportunities within the rural economy. Overall 94 gamekeepers, shepherds, ghillies, estate staff and volunteers spent 3,340 hours with over 800 children from 15 schools.

Many estates also work with the Royal Highland Education Trust (RHET) which aims to provide learning opportunities for 3-18 year olds about food, farming and the countryside and to create a wider understanding of the environmental, economic and social realities of rural Scotland. Every academic year, around 21,000 children have the opportunity to go onto farms and estates throughout Scotland through RHET.

[30] Scottish Government (2020), Schools in Scotland - Summary Statistics: 2020

This evidence indicates 16,500 children participate in educational field trips at rural estates across Scotland. This figure excludes the children participating through RHET as it was not possible to take account of double counting with other visits.

8.1.3 Apprenticeships

Beyond preschool and school education opportunities, estates support work based learning. Information provided in survey undertaken to support this research indicates that 41% of estates created apprenticeships and on average each estate created 1.2 apprenticeships. In total 87% of these apprenticeships were with medium, large or very large estates. By assuming that 41% of all medium, large and very large estates across Scotland create similar numbers of apprenticeships, it was estimated that rural estates create around 310 apprenticeships each year.

These apprenticeships cover a wide range of areas, including management, hospitality and rural skills. Apprenticeships combine on-the job training with studying, enabling apprentices to earn while studying and helping employers benefit from skilled employees who are familiar with their business.

8.1.4 Contribution to National Wellbeing

Rural estates contribute to the education outcome within the NPF by providing opportunities for workplace learning through the apprenticeships they create. As the evidence for the scale of this activity is drawn from one source with a relatively small sample, the evidence was assessed as "plausible". Scaling the data to all rural estates in Scotland, would suggest around 300 apprenticeships are created by rural estates each year. This is equivalent to around 1% of apprenticeships started in 2018/19 in Scotland, which can be considered "small". This implies that the overall significance of the contribution would be "Minor".

Rural estates also contribute to the education outcome through the extra-curricular activities they support, such as educational visits from schools. The evidence for the scale of this activity is drawn from multiple sources (BiGGAR Economics survey, analysis of Helping it Happen case studies and information from Estates that Educate) and therefore can be considered "persuasive". The 16,500 school pupils participating in educational visits to rural estates, represent 2% of all primary and secondary school pupils in Scotland, which can be considered "small", implying that the overall the impact should be assessed as "Minor-Medium".

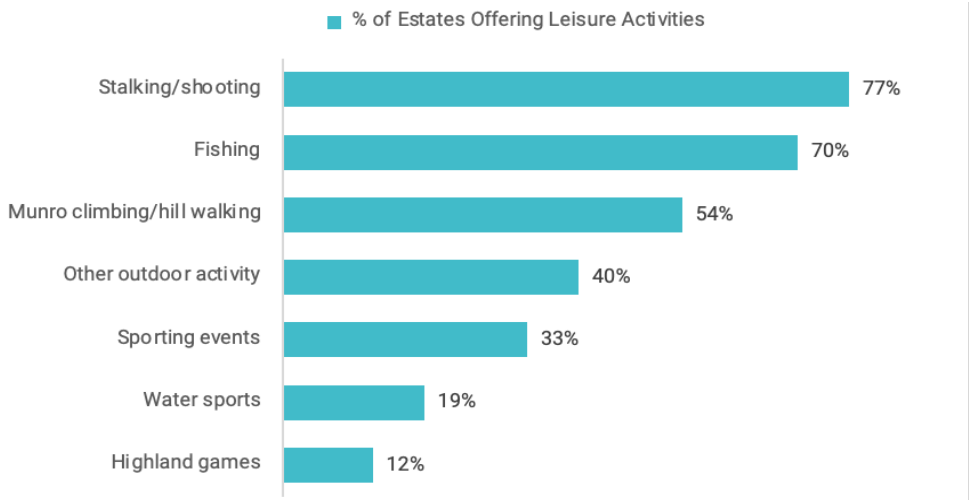
The impact of outdoor nurseries was not assessed as the survey indicated only a third of estates are involved in this. However, engagement with estates during the field work for this research suggests that this is a growing area of activity that at least some estates have an appetite to support. As such it could be an area where rural estates have the potential to increase their impact in the future.

8.2 Healthy and Active Lives

Rural estates provide opportunities for people to engage in a wide range of paid and free outdoor physical pursuits. In so doing, they support the physical and mental health of the population. This is extremely important but also has an economic dimension in supporting human capital.

The survey provides information on the outdoor leisure pursuits offered by estates. Three quarters of the estates that responded offered at least one leisure pursuit. Stalking/shooting was the most commonly offered activity with 77% of estates providing it, followed by fishing (70% of estates) and hill walking (54% of estates). This is summarised in Figure 8-1.

Figure 8-1 Leisure Pursuits Offered by Estates



Source: Survey of SLE membership

The survey indicated that 1.2 million people/year participate in these leisure pursuits. However, this will be an underestimate because not all estates responded to the survey and not all survey respondents who offer leisure pursuits provided information on the number of people participating. In addition, as exact numbers of participants are often not counted, the figures provided by survey respondents are only an estimate and may not capture the full scale of activity.

A more robust estimate of the number of visitors to rural estates was therefore estimated by looking at national statistics on visitor numbers and activities. The first step in doing this was to consider the total number of day trips to rural areas in Scotland[31]. The next step was to establish how many of these trips might be attributable to rural estates. This was done based on the proportion of rural land located within rural estates (57%). However, not all these visitors will participate in active leisure pursuits.

[31] TNS (2020), The GB Day Visitor Survey 2019,

National visitor survey data indicates that 22% of day visitors participate in outdoor leisure activities such as walking. By applying this proportion to the total number of rural visits attributable to estates it was estimated that around 5.4 million visitors a year undertake leisure activities at rural estates in Scotland.

Rural estates also invest significant time and resources in maintaining access to nature by maintaining paths, tracks and parking spaces. Data from the SLE survey indicates that 1,880 km of paths and 1,195 parking spaces are maintained by the rural estates in the sample. Around £1.0 million is spent annually by rural estates on maintaining access infrastructure.

8.2.1 Contribution to National Wellbeing

Rural estates contribute to the health outcome of the NPF by supporting physical activity and the environment outcome by supporting visits to the outdoors. The number of estates offering leisure pursuits and the variety of activities offered are all "compelling" evidence. In terms of the scale of impact, the number of participants indicates the impact is "Moderate". The overall significance would therefore be "Medium-Major".

8.3 Valuing The Contribution to Human Capital

The quantifiable contribution to human capital from educational field trips, apprenticeships and exposure to nature is discussed below, with further detail of the method in the Technical Appendix.

8.3.1 Educational Field Trips

The value of educational field trips was assessed by considering parents' willingness to pay for these trips. The amount that parents are willing to pay provides a measure of the value that parents place on these trips. For parents the value of these trips lies in the benefits for children such as the knowledge they acquire as well as the skills they develop. Research by Oxford Home Schooling[32] indicates that parents would be willing to pay £25 for each child attending a school trip. Applying this to the 16,500 children who participate in educational activities at rural estates gives an estimated value of £0.4 million/year.

8.3.2 Apprenticeships

The net average lifetime earnings premium associated with a Level 2 apprenticeship is estimated to be £69,300[33]. By applying the average lifetime earnings premium associated with an apprenticeship to the estimated number of apprenticeships created by rural estates (310), it was estimated that apprenticeships with rural estates contribute £25 million in lifetime earnings.

[32] Oxford Home Schooling, Parents' opinions on school trips

[33] CEBR 2016), Productivity and Lifetime Earnings of Apprentices and Graduates

8.3.3 Exposure to Nature

Research indicates that exposure to nature can have important health and wellbeing benefits. A recent study[34] examined relationships between recreational time spent in nature and self-reported health and well-being. It showed that the likelihood of reporting good health or high well-being increased significantly for those who spent at least 120 minutes in nature, compared with those who had no contact with nature.

The ONS[35] builds on this study and estimates the self-reported health benefits from exposure to nature. The evidence is not sufficiently robust to quantify these effects, however the impact is likely to be very substantial. This is particularly important for rural estates given the important role they play in facilitating access to nature.

8.4 Contribution to National Wellbeing

By providing opportunities for people to engage in a wide range of outdoor physical pursuits rural estates support the physical and mental health of the population. This is important in its own right but also has an important economic dimension through the role it plays in supporting human capital.

While the wellbeing benefits from spending time in nature cannot be quantified, they are likely to be a significant given the number of people that access nature through rural estates and the evidence relating to quality of life benefits from exposure to nature. Rural estates also support the formation of human capital by providing opportunities for work based learning, apprenticeships and educational visits.

Rural estates form part of Scotland's landscape and scenery and are therefore an important component of Scotland's natural heritage, which is a key factor in attracting people to visit and explore Scotland (the economic impact of this was considered in section 5.4.4).

Table 8-1: Summary Wellbeing Contribution of Enabling Access to Nature

Contribution to…	
National Outcomes: indicators (impact)	**National Capital Stocks**
Education: Workplace learning (Minor) **Education:** Extra-curricular activities (Minor-Medium) **Health:** Physical activity (Medium-Major) **Environment:** Visits to the Outdoors (Medium-Major)	£25.5 million contribution to national stock of human capital.

[34] White, Alcock, Grellier et al (2019), Spending at least 120 minutes a week in nature is associated with good health and wellbeing.
[35] ONS (2022), Health benefits from recreation methodology, natural capital, UK

9. Community Anchors

Rural estates play a vital role in maintaining the social fabric of rural communities. They provide land for around 14,000 agricultural enterprises and add around £1.2 million/year to Scotland's stock of social capital.

There is a strong body of evidence to show that one of the most important determinants of individual wellbeing is the strength of relationships with others. Another important determinant is as sense of agency, of having meaningful control over one's own life. Rural estates cannot control either of these factors directly but they can and do play an important role in creating the conditions necessary for people in rural areas to form relationships and exercise control over decisions that affect their lives.

They do this by helping to sustain viable and thriving **rural populations** and by **empowering local communities** by engaging with them on decisions about land use. One of the ways rural estates help to sustain viable populations in rural areas is by providing land for agricultural tenancies (their role in providing jobs and homes is explored elsewhere in this report).

A defining feature of a wellbeing economy is a healthy stock of what social scientists refer to as "social capital". **Social capital** has been variously defined but can be broadly understood as *"the networks, norms and social trust that facilitate coordination and cooperation for mutual benefit*[36]*"*. It matters because it enables people to work together effectively, a cornerstone of any successful human society.

Evidence gathered as part of this research suggests that rural estates make an important contribution to building and maintaining social capital in rural Scotland through the voluntary activities they undertake to support local communities.

These contributions all help to realise the national outcome relating to resilient communities. This chapter considers each of them in turn.

9.1 Agricultural Enterprises

Agriculture is an important cornerstone of community life across rural Scotland that plays an important role in maintaining rural populations and sustaining a meaningful connection between the population and the land. The role of tenanted agriculture

[36] Putnam (2000), Bowling Alone: the Collapse and Revival of American Community, Simon and Schuster.

and crofts is particularly important in this respect because these tenures are relatively affordable, which can make the sector more accessible for new entrants.

Both tenures play an important role in achieving the "resilient communities" envisaged in the communities outcome of the NPF. It is therefore appropriate to use the number of agricultural enterprises supported by rural estates as a measure of their contribution to this outcome.

The importance of tenant farms and crofting goes beyond the jobs and wealth they create. These operations support important and traditional ways of life in remote and rural parts of Scotland, enabling families to continue living and working in the areas they think of as home, and supporting the Country's cultural heritage.

Crofting is a system that is unique to Scotland and a part of life in the Highlands and Islands especially. Originally conceived as a means of supplementing meagre rural incomes, crofting continues to provide an important source of income for crofting families, helping to sustain the population of many otherwise marginal rural areas.

In rural communities, family farming and crofting requires skills such as entrepreneurialism, business ownership and management, risk management and resilience. By diversifying activities they can spread risk and adapt to new and changing circumstances. They can also help to:

- promote the environmental sustainability of agriculture;
- bring an added vitality of the rural economy; and
- help to mitigate against poverty by ensuring food security.

9.1.1 Quantifying Support for Agricultural Enterprises

Quantifying this measure is not straight forward because it is common practice for individual farms to incorporate both tenanted and owned land and for multiple tenancies to be worked as part of a single holding. This makes it difficult to provide a precise estimate of the number of tenant farming and crofting families working land owned by rural estates.

Official statistics do however provide some insight. In 2020/21 there were 21,186 crofts on the Crofting Register, of which 15,137 were tenanted[37]. Government statistics show that 1,556 of the tenanted crofts were owned by the Government while data published by the Crofter's Commission suggests there are around 1,100 unworked crofts in Scotland. A web-based review suggests Scotland's main community owned estates, the National Trust for Scotland and the John Muir Trust own approximately 3,500 crofts, implying that privately owned rural estates rent land to approximately 8,950 crofting enterprises across Scotland.

[37] Crofter's Commission website accessed August 2022 https://www.crofting.scotland.gov.uk/facts-and-figures

A report published by the Scottish Government[38] shows that there are also around 5,000 tenant farms in Scotland. The majority of which will be owned by rural estates[39].

Taken together this implies that rural estates provide land for nearly 14,000 agricultural enterprises across Scotland. In relation to the overall scale of tenant agriculture and crofting in Scotland the scale of this contribution is "large". The evidence used to quantify this contribution was drawn from multiple sources, including independent public data-sets so can therefore be considered "compelling", implying that the overall significance of this contribution should be considered "major".

9.2 Building Social Capital

Social scientists differentiate between three distinct types of social capital: bonding capital, which draws together groups of people; bridging capital, which supports collaboration among diverse social groups; and linking capital, which makes it easier for people to connect with institutions and influence decisions that affect their lives.

Evidence gathered for this report suggests that rural estates play an important role in building all three types of social capital.

9.2.1 Social Bonds

Estates contribution to social bonding is most apparent in the time and resources many devote to small acts of service for members of the community. This takes many forms, from clearing access roads and pulling vehicles out of ditches to delivering mail to outlying areas in winter. Many rural estates are also a valuable source of social support for older members of the community, often continuing to provide low-cost housing for employees and their families long past retirement.

Overall 93% of survey respondents reported having provided some form of unpaid service to the community in the past year. Within this:

- 83% had provided practical support like clearing snow or fallen trees;
- 52% had provided free or low cost produce like wood or game;
- 9% had helped with transport by providing lifts; and
- 27% had provided administrative support to fill in forms or deal with officials.

9.2.2 Community Collaboration

Many estates also play an important role in helping to build community cohesion by supporting local projects and initiatives. Three quarters of survey respondents reported providing this kind of support, within this:

[38] Scottish Government (2021), Tenant Farming Rent Review Survey: Final Report

[39] This figure will include farms on estates owned by the Crown Estate, which at the time of writing accounted for around 2% of Scotland's tenanted agricultural land.

- 90% had provided space for local groups to pursue hobbies and 65% had provided space for local community events (for free or a nominal charge);
- 50% had sponsored a local event;
- 73% had made a financial contribution to a local good cause;
- 29% had provided organisational or project management support for community projects; and
- 21% were subsidising the operation of a local shop or other facility.

Within this list, the project management and organisational support provided by rural estates merits special mention. Delivering effective community development projects requires specialist skills and resources that are almost invariably in short supply within what are usually volunteer-led groups. By providing professional project management and organisational support, estates can significantly enhance the capacity of these groups, helping to address a widely recognised gap in support.

9.2.3 Building Networks

A final way that estates contribute to social capital is by participating in groups that exist to promote the interests of the community. Nearly half of those who responded to the survey reported involvement in one or more local groups. This included:

- 52% who were involved in a community council or local project;
- 36% who contributed to a local economic development group;
- 30% who reported being involve in a local development trust; and
- 24% who were involved in a local land management group.

This level of participation is significantly higher than the 26% of the population who report having volunteered in the past year[40] and suggests that commitment to local community development may be particularly high amongst rural estates.

9.2.4 Quantifying the Value of Social Capital Formation

The value of human relationships, social norms and networks is not something that can be adequately expressed in numbers or readily monetised. However, it is possible to derive an indicative value based on the imputed costs to estates.

This can be obtained by multiplying the amount of time estates spend on these of activities by the market value of that time. Using this approach it was estimated that each year rural estates contribute around £1.2 million to Scotland's stock of social capital. This estimate is based on conservative assumptions about the average amount of time estates spend on these kinds of activities and may therefore underestimate the true value of this impact. Further detail on the method used and the assumptions underpinning it are provided in the Technical Appendix.

This result is based on a small sample and is not supported by any third-party sources, which suggests that the evidence is "plausible" rather than persuasive.

[40] Scottish Government (2020), Scottish Household Survey 2019

However, the scale of the contribution in terms of the proportion of estates participating in comparison to national volunteering rates can be considered “large”. This implies the overall impact rural estates have on social capital formation is “medium”.

9.3 Empowering Communities

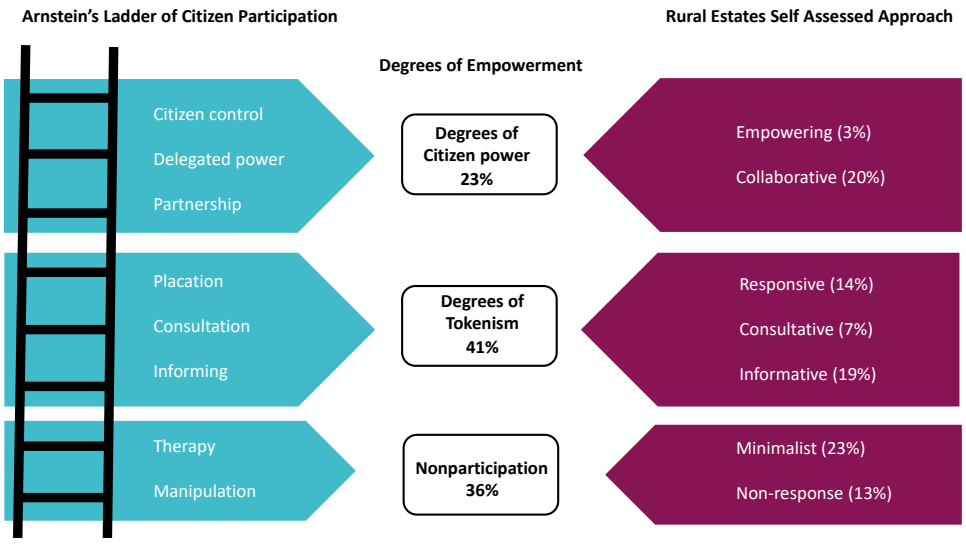
At the heart of Scotland’s national outcome relating to communities is the idea of empowerment. The indicator in the NPF that most closely corresponds to this relates to community ownership, however the ability of communities to take an active role in shaping their future does not depend on the acquisition of legal title.

There are many states short of outright ownership that could enable the *“inclusive, empowered, resilient and safe”* communities envisaged by the NPF. This analysis therefore focuses on the contribution estates make to community *empowerment*.

The first source of evidence considered in relation to this contribution was estates own perceptions about their approach to community engagement. This was assessed by presenting estates with six statements and asking them to select the one that best described their approach. The statements provided broadly correspond to the increments identified in “Arnstein’s Ladder of Participation”, a well-known model of community empowerment.

The responses, which are depicted in Figure 9-1, suggest that 23% of rural estates believe that their approaches to community engagement are either “empowering” or “collaborative”. These descriptors correspond to the top levels of Arnstein’s Ladder, suggesting that these estates are actively contributing to community empowerment.

Figure 9-1: Rural Estates Contribution to Community Empowerment



Source: Adapted from Arnstein’s Ladder of Participation

However, this evidence is subjective and based on a small sample so other sources of evidence are required for a robust conclusion.

Arnstein's hierarchy suggests that the highest level of community participation is citizen control, which would be consistent with outright community ownership. Arguably therefore the ultimate expression of an empowered approach to community engagement would be the voluntary transfer of land to communities.

Public records show that this is, in fact, exactly what has happened on many occasions. As the Chief Executive of the Scottish Land Commission has noted[41]:

"Most recent community buy-outs in Scotland have not been adversarial and reliant on legislation but negotiated between communities and landowners."

This tends to support landowners self-reported perception of their approach to community engagement, however the figures are based on a self-selecting sample so may not be representative.

If this was the case then we would expect to find evidence of discord between the less empowering landowners (who did not respond to the survey) and communities with an unsatisfied desire for greater influence over local decision making.

The most likely way for such evidence to emerge would be in the form of investigations by the Scottish Land Commission into alleged breaches of its community engagement protocol, which was published in early 2019 to moderate relations between rural communities and landowners.

At the time of writing no breaches of the protocol had been investigated. That no investigations have taken place in nearly three years tends to support landowners self-assessment and implies that existing approaches to community engagement are largely in line with community expectations.

At 23%, the proportion of estates playing an active role in community empowerment can be considered "small", however the third-party evidence cited above suggests that it can also be considered "persuasive". Overall this implies that rural estates make a "minor" contribution to realising the national outcome relating to communities through their efforts to engage communities in decision making.

[41] RICS (2021), Community Ownership Land Deals in Scotland

9.4 Contribution to the Wellbeing Economy

This chapter has shown that rural estates play a key role in maintaining the social fabric that underpins thriving rural communities.

They do this by providing homes for people to live in and land for rural enterprises, by supporting community projects and engaging communities in decision making. Perhaps most importantly, rural estates also contribute to the formation of social capital in rural areas. This is intrinsically important because good relationships are fundamental to wellbeing, but also has important economic implications.

Economists have only recently started to understand the vital role that social capital plays in supporting economic performance but there is now mounting evidence that it is an important factor in explaining differences in economic performance among regions[42]. Part of the reason for this is that in regions where skills levels are relatively low (as they are in many parts of rural Scotland) high levels of social capital can compensate to some degree as a stimulus for economic growth.

Despite the growing recognition of the importance of social capital, evidence published by the Scottish Government[43] shows that Scottish levels are declining. The evidence presented in this chapter suggests that rural estates and the communities of which they are a part could provide insight into how this could be addressed.

A summary of the impacts considered in this chapter is presented in Table 9-1.

Table 9-1: Summary contribution to national wellbeing

Contribution to…	
National Outcomes: indicators (impact)	**National Capital Stocks**
Communities: Agricultural enterprises (major) **Communities:** Social capital (medium) **Communities:** Community empowerment (minor)	£1.2 million based on imputed value of voluntary activity undertaken in service of communities.

[42] Muringani J (March 2021), Social Capital and Economic Growth in the Regions of Europe, Environment and Planning A: Economy and Space.
[43] Scottish Government (2020), Social Capital in Scotland Report

10. Summary and Conclusions

Rural estates make a substantial contribution to building a wellbeing economy in Scotland. They contribute most to national outcomes relating to the environment, communities and the economy. Estates also contribute to the sustainability of Scotland's economy, adding substantial value to national stocks of economic, human, social and (particularly) natural capital.

The aim of this analysis was to assess the contribution that rural estates make to building a wellbeing economy in Scotland. To do this it has focused on two key components of the wellbeing economy:

- social progress – measured in terms of contributions to Scotland's national outcomes; and
- national capital stocks – measured in terms of additions to national stocks of social, natural, human and economic capital.

The report has presented evidence that rural estates make a substantial contribution to both elements. These contributions are summarised below.

10.1 Contribution to National Outcomes

Rural estates contribute in some way to most if not all of Scotland's national outcomes, however the analysis suggests that they make a particularly important contribution to the outcomes relating to Scotland's environment, communities and economy. The analysis has also identified evidence of smaller (but still significant) contributions to the national outcomes relating to fair work and business, poverty, health and education.

A summary of the contributions made to each outcome is provided in Table 10-1. To enable these contributions to be compared across outcomes an overall score was calculated for each impact.

This was done by translating each individual contribution into a numerical value using a scale of 1 – 5 (where 1 corresponded to a minor effect and 5 corresponded to a major effect). An average and a total score was then calculated for each contribution and multiplied together to provide an overall score for each outcome.

The main advantage in this approach is that it enables contributions to be compared using a single numerical scale.

The rationale for multiplying the average and total scores for each outcome together is twofold. First it ensures that all the outcomes are weighted equally (using only a total score would give disproportionate weight to outcomes with more indicators). Secondly it ensures that the analysis remains focused on the most important contributions (because including multiple trivial contributions would reduce the average score and therefore the overall impact).

Table 10-1 Rural Estates Contribution to National Outcomes

Outcome	Indicators	Impact	Overall score
Environment 	Biodiversity Visits to the outdoors Energy from renewables Protected nature sites	Med-Major Med-Major Major Medium	64
Communities 	Rural population Social capital Community empowerment Perceptions of local area	Major Medium Minor Med-Major	49
Economy 	Entrepreneurial activity Rural employment Natural capital Economic growth	Medium Med-Major Med-Major Min-Medium	42
Health 	Physical activity	Med-Major	16
Poverty 	Relative poverty after housing costs	Medium	9
Education 	Engagement in extra-curricular activity	Moderate	5
Fair work & business 	Employees on living wage	Min-Medium	4

Source: BiGGAR Economics Analysis.

10.2 Contribution to National Capital Stocks

This analysis has also quantified the contribution that rural estates makes to four important capital stocks: economic, natural, social and human. These contributions have been assessed using different approaches and as such are not directly comparable and should not be summed together. A summary of these contributions is presented in Table 10-2.

By far the largest contribution is estates' contribution to Scotland's natural capital asset base. This contribution arises primarily because of the land resource encompassed within rural estates but also reflects the significant efforts of rural estates to protect and enhance natural assets.

Table 10-2 Capital Impacts Summary

	Economic	Natural	Human	Social
Source	Annual capital investment undertaken and enabled by estates.	Proportion of Scotland's natural capital asset base attributable to rural estates	Value of educational field trips and additional life time earnings of apprentices	Imputed value of voluntary activity and non-commercial services
Value (£m)	88.7	35,106	25.5	1.2

Source: BiGGAR Economics analysis

Both types of contribution are summarised in the schematic overleaf.

10.3 Conclusion

The contribution that Scotland's rural estates make to building a wellbeing economy in Scotland arises principally from the role estates play in protecting, enhancing and providing access to Scotland's natural environment. Other particularly important contributions arise from the role estates play in sustaining viable rural communities and driving local economic activity.

10.3.1 Scotland's Natural Environment

From the summaries presented above it is clear that the most significant contribution rural estates make to building a wellbeing economy in Scotland is in relation to the natural environment. This contribution can be understood at two levels: one global and one individual.

At the global level environmental sustainability is fundamental to the concept of a wellbeing economy because it ensures that economic activity is undertaken within planetary constraints and does not compromise the wellbeing of future generations.

In this respect rural estates make a very substantial contribution accounting for approximately 17% of Scotland's natural capital asset base, and 57% of installed renewable generating capacity. It is clear from the evidence gathered that estates' contribution to this agenda is not passive and is at least in part attributable to the proactive efforts estates take to manage their assets it in an environmentally responsible way.

The scale of these impacts is likely to increase significantly in the future as the roll out of renewables continues and oil and gas reserves diminish, making the sector a key partner in Scotland's transition to net-zero.

The environmental contribution of Scotland's rural estates can also be understood at a more individual level. This report has estimated that each year estates facilitate around 5.4 million visits to Scotland's natural environment and around 16,500 school visits. Access to nature is fundamental to individual wellbeing. By facilitating this access rural estates therefore make an important contribution to the physical and mental health of the population and the educational outcomes of children.

Once again, this contribution is not passive.

Many estates provide opportunities to engage in a wide variety of outdoor pursuits ranging from mountain biking to fishing. Many more take proactive steps to facilitate access to nature for no financial gain. Evidence presented in this report shows estates maintain at least 1,880 km of outdoor paths and tracks and 2,000 car parking spaces, enabling people to access parts of Scotland that would otherwise be largely inaccessible.

10.3.2 Supporting Thriving Rural Communities

The second major contribution rural estates make to establishing a wellbeing economy in Scotland is by supporting thriving rural communities. This contribution is both practical and more abstract.

At a very practical level rural estates play a crucial role in sustaining the population of large parts of rural Scotland by providing jobs and homes that enable people to remain in or relocate to rural communities. It is estimated that rural estates rent nearly 13,000 homes families in rural areas and provide land for around 14,400 agricultural enterprises. These homes and enterprises play a vital role in sustaining the population of some of Scotland's smallest and most fragile rural communities.

At a more abstract level rural estates also play an important role in underpinning the social fabric of Scotland's rural communities. They do this in a wide variety of ways – from supporting community projects to keeping rural roads clear through the winter. While this support normally goes unrecorded it plays an important role in maintaining the social capital. This matters because it enables people to work together effectively, a cornerstone of any successful human society.

10.3.3 Driving Rural Economic Progress

The commercial operations of rural estates are a major component of Scotland's rural economy, generating wealth and employment in parts of the country where opportunities are often scarce. Evidence presented in this report suggests that the jobs provided by rural estates are relatively high quality, which directly supports individual wellbeing.

However, the economic contribution of rural estates extends far beyond core operations because of the role they play in enabling the activity of other businesses. They do this by buying goods and services from local businesses, by attracting visitors to rural areas who spend money in local tourism businesses and by providing commercial premises and land to support the operations of other businesses.

Taken together the economic activity undertaken and enabled by rural estates was estimated to account for around one in ten of all jobs in rural Scotland.

Future Role for Rural Estates

The evidence presented in this report suggests that rural estates are making an important contribution to building a wellbeing economy in Scotland. However, it has also identified areas where there is scope for the sector to increase its contribution. These areas are explored in a separate improvement framework that has been produced to complement this research. Its existence is a testament to the sector's continuing commitment to this agenda.

Scotland's rural estates have huge potential to help drive efforts to establish a wellbeing economy in Scotland. They could be key delivery partners for a wide variety of related policy priorities. Realising these opportunities will require effective partnerships; a supportive policy environment; and constructive dialogue with policy makers. By articulating how the sector contributes to Scotland's wellbeing economy and highlighting the potential to increase this impact in the future, it is hoped that this report will support efforts to achieve that.

A summary of the contribution rural estates make to Scotland's wellbeing economy is provided overleaf.

Rural Estates Contribution to Scotland's Wellbeing Economy

11. Technical Appendix

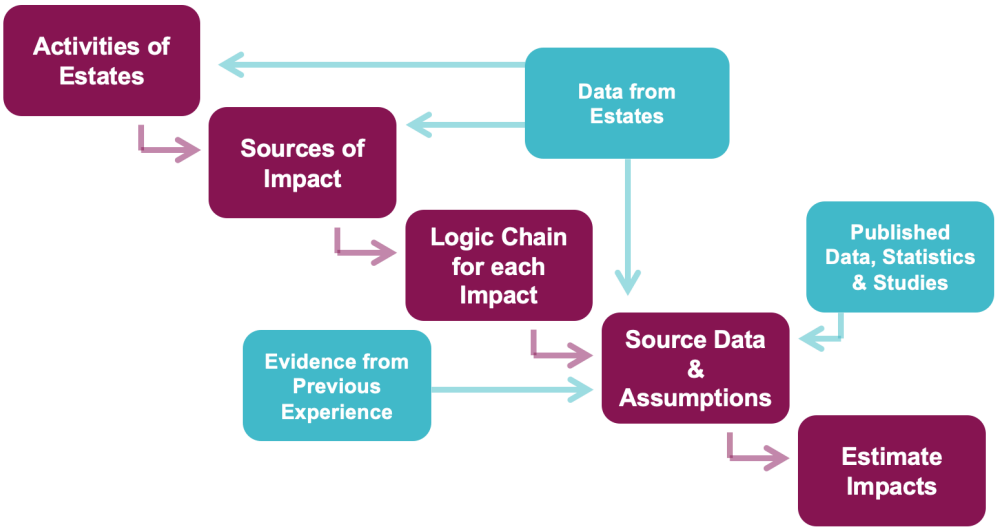
This section outlines the methodology used to estimate the economic impacts considered in this report and the key assumptions and sources underpinning them. It also describes the approach and assumptions used to quantify the contribution that rural estates make to national capital stocks.

11.1 Economic Impacts

11.1.1 Approach

The first step in estimating the economic impact that estates make in Scotland was to consider the different types of impacts generated by rural estates. This task was informed by previously published studies of the sector, BiGGAR Economics own experience and consultations with landowners (Figure 11-1).

Figure 11-1 Approach for Estimating Impacts



Source: BiGGAR Economics

On this basis, a list of economic impacts was identified and a bespoke economic model was developed to capture the contribution that estates' activities make to the economy. Depending on the type of impact, two general approaches were used: building a picture of the sector based on survey data (a bottom-up approach) or considering published data sources and estimating the share associated with estates (a top-down approach). In some instances, a combination of the two.

Data from a range of sources was used in the economic model, which are referenced throughout the appendix, including:

- BiGGAR Economics survey of landowners;
- information provided by SLE, including surveys of its own members;
- data published the Scottish Government, including on agriculture;
- the Scottish Annual Business Statistics and UK Annual Business Survey, which contain data related to turnover, Gross Value Added and employment in different sectors of the economy;
- the Scottish Input Output Tables, which contain data on economic multipliers, which can be used to estimate the indirect and induced impacts; and
- a previous study of the sector undertaken in 2014, particularly in relation to the overall size of the sector.

11.1.2 Methodology

The primary metrics used to assess the economic impact of Scotland's rural estates are:

- Gross Value Added (GVA) – this is a measure of the economic value added by an organisation or industry. It is typically estimated by subtracting non-staff operational costs from the revenues of an organisation; and
- jobs – this is a measure of employment which considers the headcount employment in an organisation or industry;

There are three types of economic impact associated with the activities of Scotland's rural estates:

- direct impact – this is the direct impact associated with the activities of Scotland's land and estates, which will including employing and paying staff and generating income;
- indirect impact – this is the impact associated with spending in the supply chain; and
- induced impact – this is the impact associated with staff spending their wages in the wider economy.

Direct impact were estimated based on economic ratios (for example, the turnover to GVA ratio, and the turnover per employee ratio), using the Scottish Annual Business Statistics. Indirect and induced impacts were then estimated using multipliers from the Scottish input output tables.

For some elements of estates' impacts (for example rents) the turnover per employee ratio is likely to be very high because few people are involved in delivering these activities. However, they will support estate administration and may subsidise other elements of the business. To take account of this, an estimate of turnover per employee for land-based businesses (rents from agricultural tenants, renewable energy companies, residential tenants and commercial tenants) was taken from a small subset of respondents to the survey. This suggested that the average turnover/employee would be approximately £350,000.

In addition to impacts associated with the direct activities of estates, there is also an impact associated with the activity that they support, for example by users of the land such as agricultural tenants and onshore renewables. While these impacts cannot be attributed fully to estates, they are supported by them. Where applicable these impacts have been highlighted as supported impacts.

11.1.3 In-hand Agriculture

Estates are substantial landowners in Scotland, and a significant share of this land is managed in-hand, generating income and employment.

The starting point for the analysis was the share of land of different types that are owned by estates and this was applied to the total hectares of land managed by estates. It was then necessary to account for land managed in-hand by estates (excluding tenanted land, which is considered elsewhere). The income, employment and GVA associated with estates was then estimated using official data.

The main input for estimating the economic impact associated with agriculture was the type of land being farmed, and data provided by SLE on their members. This data suggested that 9% of total land owned by estates was arable farm land, 50% was hill ground and the remainder was composed of commercial forestry or land that could not be farmed (such as moorland).

As this was based on 2.2 million hectares, while a study undertaken in 2014 suggested that estates own land amounting to 4.1 million hectares and therefore it was necessary to gross up to this figure. Discussions undertaken with SLE suggest that the largest estates are likely to be excluded from the total provided by their members and therefore it was assumed that the remaining land was composed similarly to large estates, which was estimated based on the survey undertaken by BiGGAR Economics.

On this basis it was assumed that:

- around 7% of land owned by estates is arable (0.3 million hectares); and
- around 48% of land owned by estates is hill ground (2.0 million hectares).

It was then necessary to estimate the share of land that was managed by estates, using the survey undertaken by BiGGAR Economics. This found that there were differences depending on the size of estate, with 91% of agricultural land on small estates managed in-hand, while on large estates it was estimated that 43% of agricultural land was managed in-hand, reflecting the size and productivity of different farms.

Table 11-1 Share of Agricultural Land Managed In-hand, hectares

	Small	Medium	Large	Total
Managed in-hand	91%	70%	43%	60%
Tenanted	9%	30%	57%	40%

Source: BiGGAR Economics Survey/BiGGAR Economics Calculations

As with the share of land managed in-hand, small estates have a different profile to larger ones, with a higher share of agricultural land associated with arable land and lower share associated with hill ground. Using findings from the survey, an adjustment was made to account for these differences. This is shown in Table 11-2.

Table 11-2 Share of Agricultural Land Type by Size of Estate

	Small	Medium	Large
Arable	77%	14%	5%
Hill ground	23%	86%	95%

Source: BiGGAR Economics Survey/BiGGAR Economics Calculations

Data from the Economic Report on Scottish Agriculture[44] was then used to estimate the economic impact associated with agriculture on estates. As detailed data on the types of agriculture undertaken by estates was not available, it was assumed that hill ground managed by estates would be comparable with cattle and sheep farmed in Less Favoured Areas (the designation used by the Scottish Government). Arable land would be comparable with mixed holdings (e.g. farms that undertake different types of agriculture such as cereals, horticulture and livestock).

Using this data, the level of employment, income and farm business income (FBI)[45] associated with each hectare of land was then estimated for arable land and hill ground. As can be seen in Table 11-3, mixed holdings/arable land is more productive on each of these measures.

Table 11-3 Measures of Economic Impact (per hectare)

	FTEs	Income	Farm Business Income/GVA
Arable/Mixed Holding	0.012	1,193	202
Hill ground/LFA Sheep and Cattle	0.003	225	31

Source: BiGGAR Economics Calculations based on Scottish Government (2020), Economic Report on Scottish Agriculture, Table B.3 & Table C23.* Full-time Equivalent

[44] Scottish Government (2020), Economic Report on Scottish Agriculture
[45] It has been assumed that Farm Business Income corresponds to GVA

Based on the share of arable land and hill ground managed by estates and the economic impact associated with each hectare, it was estimated that Scottish estates employed 6,400 people and had an income of £513 million. This was associated with FBI of £79 million. Therefore, the direct economic impact of in-hand agriculture would be £79 million GVA and 6,400 jobs.

Table 11-4 Direct Economic Impact of In-hand Agriculture

	Employment	Income (£m)	FBI/GVA (£m)
Arable	2,450	254	43
Hill ground	3,950	258	36
Total	**10,270**	**513**	**79**

Source: BiGGAR Economics Calculations

It was then necessary to estimate the indirect and induced impacts associated with in-hand agriculture, using multipliers for the crop and animal production sector. On this basis, it was estimated that the total economic impact would be £147 million GVA and 10,510 jobs.

Table 11-5 Total Economic Impact of In-hand Agriculture

	Scotland
GVA (£m)	147
Employment	10,510

Source: BiGGAR Economics Calculations

11.1.4 Tenanted Agriculture

Estates generate income through letting out land to tenant farmers, and this support employment elsewhere in the business. In addition, these tenant farmers also generate economic impacts through their activities.

To estimate the economic impact associated with tenant farming, it was first necessary to know the share of different types of land. Based on the analysis set out in Section 11.1.3, it was estimated that 40% of land is tenanted, equivalent to around 0.9 million hectares. Of this, 0.1 million hectares would be arable land and 0.8 million hectares would be hill ground.

Impact of Leasing Agricultural Land

Estates would receive income from leasing agricultural land, generating income and supporting employment. Data from the agricultural survey[46] suggests that the average annual rent of LFA land is £27 per hectare, while the average rent of non-LFA

[46] Scottish Government (2020), Agricultural Survey Results: December 2019

land is £132 per hectare. On this basis, it was estimated that annual income to estates would be £34 million.

This income would support estates' activities and employment. Using economic ratios from land-based businesses, it was estimated that this supported 100 jobs directly on estates.

Table 11-6 Income and Employment Impact Leasing Agricultural Land

	Scotland
Income (£m)	34
Employment	100

Source: BiGGAR Economics Calculations

It was then necessary to estimate the economic impact associated with this income and employment using appropriate ratios and multipliers. This suggests that the total economic impact of leasing land for agricultural uses would be £34 million GVA and 420 jobs.

Table 11-7 Economic Impact of Leasing Agricultural Land

	Scotland
Employment	170
GVA (£m)	34

Source: BiGGAR Economics Calculations

Impact of Tenanted Agriculture – Supported

As with in-hand agriculture, tenanted agriculture will also generate economic impacts through its operations. Based on the type of land and the economic impact indicators per hectare, this suggests that tenanted agriculture on estate land supported employment of 3,860 and generated income of £290 million, with FBI of £43 million.

Table 11-8 Direct Economic Impact of Tenanted Agriculture

	Employment	Income (£m)	FBI/GVA (£m)
Arable	960	100	17
Hill ground	2,900	190	26
Total	**3,860**	**290**	**43**

Source: BiGGAR Economics Calculations

It was then necessary to estimate the indirect and induced impacts associated with tenanted agriculture, using multipliers for the crop and animal production sector. On

this basis, it was estimated that the total economic impact would be £80 million GVA and 6,340 jobs.

Table 11-9 Economic Impact of Tenanted Agriculture

	Scotland
GVA (£m)	80
Employment	6,340

Source: BiGGAR Economics Calculations

11.1.5 Crofts

Estates also generate income through renting crofts to tenants, and the tenants themselves generate economic impacts.

Croft Rents

To estimate the rents to estates, the number of tenanted crofts and the associated income was required. Evidence from the Scottish Government suggests that there are 21,186 crofts in Scotland, of which 15,137 were tenanted[47]. Of these 1,556 were rented from the Government[48] with a further 1,100 unworked crofts and 3,538 crofts on land owned by communities and other organisations such as the National Trust for Scotland. it was assumed that the remaining 8,943,would be rented from estates.

Evidence from a survey of crofts suggests that the median land rent would be £64[49], though the average is significantly higher due to a small number of crofts paying very high costs, which are likely to be mortgage costs, i.e. not paid to estates. On this basis it was estimated that the total income was around £1 million, supporting fewer than 10 jobs.

Table 11-10 Income and Employment from Croft Rents

	Scotland
Tenanted Crofts	8,943
Median Income (£)	64
Total Income (£m)	1
Direct Employment	<10

Source: BiGGAR Economics Calculations

Using economic ratios and multipliers for the rental sector it was estimated that this supported £1 million GVA and fewer than 10 jobs.

[47] https://www.crofting.scotland.gov.uk/facts-and-figures

[48] https://www.gov.scot/publications/land-reform-review-group-final-report-land-scotland-common-good/pages/67/

[49] Scottish Government (2018), Survey of the Economic Conditions of Crofting 2015-2018

Table 11-11 Economic Impact of Croft Rents

	Scotland
Total GVA (£m)	1
Total Employment	<10

Source: BiGGAR Economics Calculations

Activities of Crofts – Supported

Crofts also generate economic impacts through their activities.

The survey undertaken by the Scottish Government suggested that the median income associated with crofting activities was £3,967 (the average is higher but is skewed upwards by a small number of high responses, so the more conservative figure has been used). On this basis, it was estimated that the income to crofts would be £35 million.

Applying turnover/farm business income (of 0.30) and turnover/employee ratios (£30,500) for Specialist Sheep (LFA) farms[50], it was estimated that the direct impact of crofts would be £11 million GVA and 1,160 jobs.

Table 11-12 Income and Employment from Activities of Crofts

	Scotland
Tenanted Crofts	8,943
Median Income (£)	3,967
Income (£m)	35
Direct GVA (£m)	**11**
Direct Employment	**1,160**

Source: BiGGAR Economics Calculations

The total impact, after applying multipliers for the agricultural sector, would be £23 million GVA and 1,560 jobs.

Table 11-13 Economic Impact of Activities of Crofts

	Scotland
Total GVA (£m)	23
Total Employment	1,560

Source: BiGGAR Economics Calculations

[50] Scottish Government (2021), Economic Report on Scottish Agriculture

11.1.6 Woodland Management

Scottish estates are also significant owners of commercial forestry, which generates rents for estates as well as supporting employment in related forest industries.

As with agriculture it was necessary to estimate the share of commercial forestry owned by estates, and the economic activity associated with that land. There are around 1.5 million hectares of forest cover in Scotland, of which the public owns 32% and the private sector owns 68%[51]. A 2012 study by the Forest Policy Group suggests that estates own around 46% of forestry land in Scotland, which would be equivalent to around 467,000 hectares.

Impact of Forestry Ownership

Data on forestry employment from a 2015 study by CJC Consulting suggests that in 2012/13 around 1,000 people were employed directly by owners of woodland on forestry operations[52]. Using statistics on forestry cover, this suggests that on average woodland owners had 0.001 employees per hectare of woodland.

Based on forestry cover of 467,000 hectares, this suggests that estate owners employed had around 490 woodland management employees. Using turnover/employee data from the Annual Business Survey, it was estimated that estates had an income of £61 million from forest ownership.

Table 11-14 Income and Employment from Woodland Management

	Scotland
Income (£m)	61
Employment	490

Source: BiGGAR Economics Calculations

The total economic impact of forestry on estates was then estimated based on the GVA and employment provided in the CJC report. On this basis, the total economic impact would be £34 million GVA and 850 jobs.

Table 11-15 Total Economic Impact of Woodland Management

	Scotland
GVA (£m)	34
Employment	850

Source: BiGGAR Economics Calculations

Downstream Timber Activities – Supported

In addition to the income and activity supported at estate businesses, there will be downstream economic activity associated with harvesting, hauling and processing

[51] Forest Research (2022), Forestry Statistics 2021 - Woodland Area and Planting

[52] CJC Consulting (2015), The Economic Contribution of the Forestry Sector in Scotland

the timber. While this cannot be fully attributed to estates, without the timber provided by estates, a significant proportion would not take place.

The study undertaken in 2015[53], though now somewhat dated, provided data on employment and economic activity supported in these sectors. This allowed the economic impact per hectare to be estimated and after applying this, it was estimated that the economic impact supported by estate forests was £143 million GVA and 3,630 jobs.

Table 11-16 Total Economic Impact of Upstream and Downstream Timber Activities

	Scotland
GVA (£m)	143
Employment	3,630

Source: BiGGAR Economics Calculations

11.1.7 Renewable Energy

Estates are significant actors in the renewable energy sector, both owning and operating renewable energy installations and renting land to onshore wind farms.

A 2021 study on the economic impact of Scotland's renewable energy sector by the Fraser of Allander Institute[54] was used to estimate the economic impact of renewables owned and enabled by estates. This was used to estimate the average GVA and employment per megawatt (MW) associated with onshore wind, hydro and solar energy and this is presented in Table 11-17 below.

Table 11-17 Economic Impact of Renewables, per MW

	Employment	Income (£000s)	GVA (£000s)
Onshore Wind	1.1	294	120
Hydro	2.0	554	225
Solar	3.1	347	178

Source: Fraser of Allander Institute (2021), The Economic Impact of Scotland's Renewable Energy Sector

Estate-Owned Renewables

According to a study produced by the Energy Saving Trust[55], in 2019 estates directly owned 243MW of renewable energy, including 23MW of hydro power, 6MW of solar and 214MW of onshore wind.

[53] CJC Consulting (2015), The Economic Contribution of the Forestry Sector in Scotland
[54] Fraser of Allander Institute (2021), The Economic Impact of Scotland's Renewable Energy Sector
[55] Energy Saving Trust (2020), Community and locally owned renewable energy in Scotland 2019.

Using the analysis produced by the Fraser of Allander, it was estimated that income to estates from estate-owned renewables was £41 million and that they directly employed 70 employees.

Table 11-18 Income and Employment from Estate-Owned Renewables

	Scotland
Income (£m)	41
Employment	70

Source: BiGGAR Economics Calculations

Using figures from the Fraser of Allander Institute on total GVA and employment, it was estimated that the total economic impact associated with estate-owned renewables would be £32 million GVA and 290 jobs.

Table 11-19 Total Economic Impact of Estate-Owned Renewables

	Scotland
GVA (£m)	32
Employment	290

Source: BiGGAR Economics Calculations

Rents from Onshore Wind

In addition to this a very significant proportion of Scotland's corporately owned on-shore wind farms are also located on rural estates. While these facilities may not be directly funded by rural estates, they could not be developed without active support from estates and as such it is appropriate to include their impact. The main driver of this impact will be the total capacity of onshore wind located on estates.

The Scottish Government study quoted above suggests that around 1.4% of Scotland's on-shore wind generating capacity is owned by other locally based organisations, including community groups, local authorities and housing associations. Data published by Forest and Land Scotland (FLS)[56] shows that a further 13% of Scotland's on-shore wind capacity is located on FLS land. It was assumed that the remaining on-shore wind capacity was located on rural estates.

After subtracting capacity owned by communities and farms and by the Forestry Commission, it was estimated that estates hosted the remaining 7.3 GW of onshore wind.

Data from the Forestry Commission suggests that the average rent associated with onshore wind is around £11,100 per MW. Applying this to the estimated capacity installed on estates it was estimated that they received £81 million in rents. Applying

[56] FLS database of currently operating renewable schemes, accessed via https://forestryandland.gov.scot/what-we-do/renewables on 3/8/22

the turnover/employee ratio for land-based business suggests that this supported 230 employees within estates.

Table 11-20 Income and Employment from Onshore Wind Rents

	Scotland
Income (£m)	81
Employment	230

Source: BiGGAR Economics Calculations

Applying appropriate economic ratios and multipliers for the rented sector, it was estimated that the total economic impact would be £83 million GVA and 410 jobs.

Table 11-21 Economic Impact from Onshore Wind Rents

	Scotland
GVA (£m)	83
Employment	410

Source: BiGGAR Economics Calculations

It should be noted that this does not include the income and impact associated with the development and construction, including option and development fees.

Estate-Enabled Onshore Wind – Supported

In addition to the income to the organisation, estates enable the economic impact of wind farms.

Based on the analysis provided by the Fraser of Allander Institute, it was estimated that onshore wind enabled by estates would support an economic impact of £843 million GVA and 7,480 jobs in Scotland.

Table 11-22 Economic Impact from Estate Enabled Onshore Wind Farms

	Scotland
GVA (£m)	819
Employment	7,480

Source: BiGGAR Economics Calculations

11.1.8 Country Sports

Estates also generate economic activity through sporting activities on the estate, including stalking and fishing.

The starting point for the analysis was to estimate the share of estates that have sporting businesses, and then to estimate the income and employment associated with this.

Based on the survey undertaken to support the research it was assumed that estates spanning 84% of estates by land share hosted some sporting activities. Data from the income and employment from the survey was then used to estimate the income and employment associated with country sports. Therefore, it was assumed that income of per hectare would be £18 and one job would be directly supported per 3,300 hectares.

On this basis, it was estimated that sporting activities generate around £64 million income/year and directly supported 1,060 jobs.

Table 11-23 Income and Employment from Sporting Activities

	Scotland
Income (£m)	64
Employment	1,060

Source: BiGGAR Economics Calculations

Sporting activities also generate indirect and induced impacts, particularly due to seasonal employment. Analysis by BiGGAR Economics on behalf of Buccleuch Estates (not publicly available) was used to estimate these impacts. On this basis, it was found that sporting on estates generated £43 million GVA and 2,280 jobs.

Table 11-24 Total Economic Impact from Sporting Activities

	Scotland
GVA (£m)	43
Employment	2,280

Source: BiGGAR Economics Calculations

11.1.9 Tourism

Estates are significant contributors to the rural tourism economy, providing accommodation and visitor attractions, and attracting visitors to the countryside who generate benefits for the wider economy.

Visitor Accommodation

Estates generate economic activity directly through visitor accommodation.

To estimate the economic impact it was necessary to estimate the share of estates with visitor accommodation, the number of short-term lets and the income associated with each.

Evidence from the survey undertaken to support the research suggests that 64% of estates have visitor accommodation. Evidence from the survey also suggested that smaller estates have a higher density of short-term lets and this was applied to estimate the total number by size of estate. This suggests that there are 1,090 short-term visitor lets on estates.

Table 11-25 Visitor Accommodation

	Small	Medium	Large
Hectares per let	740	1,950	6,940
Total lets	202	735	154

Source: BiGGAR Economics Analysis

To estimate the total income associated with these lets, data was applied from the Scottish Accommodation Occupancy Survey[57], which suggests that the average income associated with a let was around £20,800. Therefore, it was estimated that estates received income of £23 million from short-term visitor accommodation. Applying turnover/employee ratios for the accommodation sector indicates that they supported 590 jobs.

Table 11-26 Income and Employment from Visitor Accommodation

	Scotland
Income (£m)	23
Employment	590

Source: BiGGAR Economics Calculations

It was then necessary to estimate the economic impact associated with this income and employment using appropriate ratios and multipliers. This suggests that the total economic impact of providing tourism accommodation would be £20 million GVA and 750 jobs.

Table 11-27 Total Economic Impact from Visitor Accommodation

	Scotland
GVA (£m)	20
Employment	750

Source: BiGGAR Economics Calculations

Visitor Attractions

Estates also operate visitor attractions such as stately homes, adventure parks, cafes and farm shops.

In order to estimate the economic impact, it was first necessary to estimate the share of estates with tourism and heritage attractions, then estimate the average visitors per hectare and the average income per visitor.

Based on the survey undertaken to support the research around 61% had a tourism and heritage attraction. Based on 44 responses, there were 1.3 million visitors and

[57] VisitScotland (2021), Scottish Accommodation Occupancy Survey

after excluding outliers, there were around 2.3 visitors per hectare. By applying this assumption to all estates with tourism and heritage attractions it was estimated that estates attract a total of 5.7 million visitors/year. A total of 8 of financial responses were received with £2.8 million in revenue, which, suggested that the income per visitor was £3.50 (after excluding outliers). On this basis, it was estimated that total income would be £20 million, and after applying turnover/employee ratios for the recreation sector and the food and beverage sector, it was estimated that they employed 360 people directly.

Table 11-28 Income and Employment at Visitor Attractions

	Scotland
Income (£m)	20
Employment	360

Source: BiGGAR Economics Calculations

It was then necessary to estimate the economic impact associated with this income and employment using appropriate ratios and multipliers. This suggests that the total economic impact of providing tourism accommodation would be £13 million GVA and 490 jobs.

Table 11-29 Total Economic Impact of Visitor Attractions

	Scotland
GVA (£m)	13
Employment	490

Source: BiGGAR Economics Calculations

Nature-Based Tourism – Supported

In addition to the economic impact of tourism activities that generate income for estates, such as accommodation, visitor attractions and sporting activities, estates also support wider economic activity through access to the outdoors.

To estimate this economic impact, it was necessary to establish the spend associated with visiting rural areas, and the share attributable to estates. It was also necessary to exclude the impact included elsewhere.

The level of holiday spending associated with domestic overnight visitors was taken from the GB Tourist[58], while the level of holiday spending from international visitors was taken from the International Passenger Survey[59] and day visitor spend was taken from the GB Day Visitor[60].

[58] Kantar/TNS (2020), The GB Tourist: 2019 Annual Report
[59] ONS (2021), International Passenger Survey 2019
[60] Kantar/TNS (2020), The Great Britain Day Visitor: 2019 Annual Report

To estimate the share of visitor expenditure associated with rural areas, an adjustment was made to account for the share of visits associated with landscape and scenery (based on the GB Tourist) or activities related to it (for day visitors). It was then assumed that only visits to the countryside/village or seaside/coast would take place in rural areas[61] or based on type of destination for international passengers[62] .

On this basis, the total visitor spending associated with rural areas was estimated to be £1.3 billion.

Table 11-30 Spending of Visitors

	Domestic Overnight	International Overnight	Day Visitor
Total spend (£m)	2,062	1,421	5,777
Associated with landscape & scenery	50%	50%	32%*
Associated spend (£m)	1,031	711	1,850
Associated with countryside/village & seaside/coastal	35%	78%**	22%
Rural spend (£m)	364	554	398

Source: BiGGAR Economics Calculations. *Based on visitors taking part in outdoor leisure activities and visitor attractions. **Share going to countryside or villages, coast or beaches, or visiting a national park.

It was assumed that estates share of visitor spend associated with scenery and landscape would be associated would be equal to their share of total rural land, which is 57.1%[63]. On this basis, the total visitor spending associated with estates was estimated to be £752 million.

[61] Kantar/TNS (2020), The GB Tourist: 2019 Annual Report/ Kantar/TNS (2020), The Great Britain Day Visitor: 2019 Annual Report. Other categories includes city/large town and small town

[62] VisitBritain (2020), Activities in Britain's nations and regions

[63] Glass et al (2019), The Effects Associated with Concentrated and Large-scale Land Ownership in Scotland: A Research Review

Table 11-31 Spending of Visitors

	Spend (£m)
Domestic Overnight	208
International Overnight	317
Day Visitor	227
Total	**752**

Source: BiGGAR Economics Calculations

On the basis of the £752 million in income to the tourism sector, the direct economic impact of nature-based tourism was estimated based on applying economic ratios for the tourism sector, which included accommodation, transport and food and beverage services[64].

It was then necessary to exclude the impact of activities taking place on estates that were considered elsewhere, including visitor accommodation, visitor attractions and country sports. After making these adjustments it was estimated that the total economic impact associated with nature-based tourism on estates was approximately £492 million GVA/year and 11,210 jobs.

Table 11-32 Economic Impact of Nature-Based Tourism, excluding Estate Impact

	Scotland
GVA (£m)	492
Employment	11,210

Source: BiGGAR Economics Calculations

11.1.10 Residential Property

Estates provide long-term residential accommodation to local people, receiving income and supporting employment through the management and maintenance of this housing.

In order to estimate the economic impact of housing, it was necessary to estimate the number of houses managed by estates, to make adjustments for housing considered elsewhere (e.g. agricultural tenancies) and to estimate the expected income.

Using evidence from the survey undertaken to support this research as well as surveys undertaken by SLE on their members, it was estimated that there were a total of 7,017 rented properties on estates, of which around 68% are rented at the market rate (see Section 7.1).

[64] Sectoral breakdown from VisitScotland (2020), Key facts on tourism 2019

Based on Scottish Government data on the private rented sector, it was assumed that the average income for a rented property on estates (at market rate) was £7,200. This is broadly in line with research on estates undertaken by Savills, which found that the average market rent was £6,900[65]. It also found that properties attracting below market rate paid rent equivalent to 74% of the market rate.

On this basis, it was estimated that the total income to estates was £46 million. Applying turnover/employee ratios for the land-based business sector suggests that this supported 130 people directly.

Table 11-33 Income form Rental Properties

	Rented Properties	Rental value (£)	Total (£m)
Rented (market rate)	4,788	£7,200	34
Rented (below market rate)	2,229	£5,300	12
Total	**7,017**	**-**	**46**

Source: BiGGAR Economics Calculations. Note, totals may not sum due to rounding.

It was then necessary to estimate the economic impact associated with this income and employment using appropriate ratios and multipliers. This suggests that the total economic impact of providing tourism accommodation would be £58 million GVA and 230 jobs.

Table 11-34 Total Economic Impact from Rental Properties

	Scotland
GVA (£m)	58
Employment	230

Source: BiGGAR Economics Calculations

11.1.11 Commercial Property

As significant landowners, many estates also lease premises to commercial tenants, which generates activity through income to estates. Commercial tenants also generate economic impacts, through this cannot be fully attributed to estates.

Rents from Commercial Properties

Leasing land and building for use by commercial tenants generates income for estates, supporting economic activity.

To estimate the economic impact of this activity it was necessary to estimate the share of estates that have commercial tenants, the average number of jobs employed by commercial tenants and the average income per job.

[65] Savills (2017), Scottish Estate Benchmarking Survey

Data from BiGGAR Economics' survey of estates suggests thar 61% of estates by size have commercial tenants. As more estates provided data on the number of jobs on estates than provided data on commercial rents, the average employment per hectare was estimated and then the average income per job. This was then used as the basis for estimating total income across estates.

After excluding outliers, it was estimated there is one job per 570 hectares, with the average commercial rent per job being around £3,000. On this basis, the average rental income per hectare was £5.

Therefore, it was estimated that estates had commercial tenants employing around 7,270 people, and that the total income to estates would be around £22 million. Applying turnover per employee for land-based businesses it was estimated that this directly supported 150 jobs at estates.

Table 11-35 Income and Employment from Commercial Tenants

	Scotland
Income (£m)	22
Employment	60

Source: BiGGAR Economics Calculations

Applying appropriate economic ratios and multipliers it was estimated that the total economic impact associated with commercial rents would be £22 million GVA and 110 jobs.

Table 11-36 Total Economic Impact from Commercial Rents

	Scotland
GVA (£m)	22
Employment	110

Source: BiGGAR Economics Calculations

Activities of Tenants – Supported

Tenants of estates will also generate economic impacts due to their activities.

The starting point for estimating this impact was the total number of jobs in estates' commercial tenants (7,270). Using data from the survey appropriate assumptions were then made about the sectors in which these businesses operate. The main sectors were manufacturing, retail, accommodation.

Appropriate economic ratios and multipliers were then applied to estimate the total economic impact of commercial tenants. On this basis, it was estimated that estates' commercial tenants generate around £334 million GVA/year and support around 9,980 jobs.

Table 11-37 Economic Impact of Commercial Tenants

	Scotland
GVA (£m)	334
Employment	9,980

Source: BiGGAR Economics Calculations

11.1.12 Total Economic Impact

Based on the analysis undertaken, the total income and employment associated with estates was estimated. This suggested that estates have:

- an income of £908 million; and
- directly employ 9,500 people.

Table 11-38 Income and Employment at Estates

	Income (£m)	Jobs
In-hand Agriculture	513	6,400
Forestry	64	490
Sporting	64	1,060
Tourism	43	960
Rental Operations	225	590
Total	**908**	**9,500**

Source: BiGGAR Economics Calculations. *Land-based businesses includes tenanted agriculture, crofts, commercial property, residential property and renewable energy rents.

The economic impact associated with estates' direct activities as well as activities that estates support was also calculated. This suggests that, estates:

- generate £487 million GVA and 16,100 jobs through their direct activities;
- support £1.9 billion GVA and 40,210 jobs through wider activities; and
- have a combined economic impact of £2.4 billion GVA and 56,310 jobs.

Table 11-39 Economic Impact of Estates

	GVA (£m)	Jobs
Direct Activities		
In-hand Agriculture	147	10,510
Forestry	34	850
Sporting	43	2,280
Tourism	33	1,240
Rental Operations	230	1,220
Total Direct Activities	**487**	**16,100**
Supported Activities		
Agriculture	103	7,910
Forestry	143	3,630
Renewables	819	7,480
Nature-based Tourism	492	11,210
Commercial tenants	334	9,980
Total Supported Activities	**1,892**	**40,210**
Total	**2,379**	**56,310**

Source: BiGGAR Economics Calculations

11.2 Economic Capital

As part of their operations, estates make capital investments to support their operations and enable future growth.

Using data from the survey (n=13) and excluding outliers that have higher than average capital investment, it was estimated that the average capital investment per hectare was £15.88. On this basis, it was estimated that estates invest around £72 million each year.

Table 11-40 Annual Capital Investment

	Scotland
Investment (£m)	72

Source: BiGGAR Economics Calculations

Estates also contribute to national capital by enabling new housing development.

Evidence gathered to support this research, which identified existing commitments at a number of estates (see section 7.2), suggests that on average rural estates are enabling the delivery of around 60 new homes/year across Scotland. To estimate the average capital contribution associated with this development the number of new homes developed was multiplied by the average value of a new build house in Scotland in 2020-21 (£268,100)[66]. On this basis the total capital contribution was estimated to be £16.6 million.

Typically, an assumption would be about the land value and this would be subtracted from the capital contribution. However, a report by Savills on behalf of the Scottish Land Commission[67] suggests that in rural areas, the value of land is likely to be negligible and therefore no adjustment has been made.

Table 11-41 Annual Value of New Housing

	Scotland
New houses	62
Average value	£268,100
Capital (£m)	16.6

Source: BiGGAR Economics Calculations

Taken together this implies that rural estates add nearly £89 million value to Scotland's stock of economic capital each year.

Table 11-42 Annual Value of New Housing

Value of Economic Capital Investment (£m)	Scotland
Capital investment by estates	72
Investment in new housing development	16.6
Total	**88.6**

Source: BiGGAR Economics Calculations

11.3 Social Capital

This section describes the approach and assumptions used to estimate rural estates contribution to Scotland's stock of social capital described in section 9.2.4.

Two source of social capital formation were considered in this section: the value of estates contributions to local groups and organisations and the value of the informal support they provide to members of the community. Both contributions were assessed based on the value of the time spent delivering them.

[66] Registers of Scotland (2022), Property Market Report 2021-22
[67] Savills (2020), The Role of Land in Enabling New Housing Supply in Scotland

Evidence for this was drawn from the survey of estates, which showed that 57% of estates participated in an average of around 2 different groups each year and 93% of estates provided an average of 2 different types of community service. It was assumed that each service provided and group supported would involve around 2 days input per year.

The cost of providing this input was measured by applying an average day rate for an estate worker of £187, which was based on data from the survey on the average salary of an estate worker.

11.4 Natural Capital

This section describes the assumptions used to estimate the contribution that rural estates make to Scotland's stock of natural capital described in section 6.4.

11.4.1 Agricultural Biomass

Scotland's natural capital accounts includes four categories of agricultural biomass: grazed biomass, feedstocks, arable land and horticulture.

Across Scotland around 70% of arable land is devoted to either grass or feedstocks. Applying this to the 374,000 hectares of arable land owned by estates suggests that estates produce around 20% of Scotland's stock feed. It was assumed that the remaining arable land was devoted to the production of crops for human consumption, which amounts to around 20% of the Scottish total. Data from SLE also suggests that member estates cover a total of at least 2.1 million hectares of hill ground, which is around 58% of the Scottish total rough and common grazing.

By combining these proportions to the overall profile of the asset base it was estimated that rural estates account for around 26% of Scotland's biomass asset.

11.4.2 Renewables

Evidence published by the Scottish Government[68] shows that in 2019 there were 731 MW of locally owned renewable energy capacity in Scotland, around a third of which was owned by rural estates. At that time this represented just over 5% of all renewable capacity in Scotland.

In addition to this a very significant proportion of Scotland's corporately owned on-shore wind farms are also located on rural estates. While these facilities may not be directly funded by rural estates, they could not be developed without active support from estates and as such it is appropriate to consider their impact here.

The Scottish Government study quoted above suggests that around 1.4% of Scotland's on-shore wind generating capacity is owned by other locally based organisations, including community groups, local authorities and housing

[68] Energy Saving Trust (2020), Community and locally owned renewable energy in Scotland 2019.

associations. Data published by Forest and Land Scotland (FLS)[69] shows that a further 13% of Scotland's on-shore wind capacity is located on FLS land. It was assumed that the remaining on-shore wind capacity was located on rural estates.

Taken together with the approximately 243 MW of estate owned capacity these assets account for around 7,536 MW installed capacity. This equates to around 69% of the total GW hours generated by Scotland's renewable asset base each year.

11.4.3 Timber

In total 67% of Scotland's timber asset is in private hands. Following the method described above for estate production it was estimated that rural estates account for c.41% of this, which equates to 27% of the total asset value.

11.4.4 Carbon Sequestration

Overall 53% of the carbon sequestration asset value in Scotland's natural capital accounts was associated with forest land and 47% was associated with grasslands.

Based on the method described above we know that rural estates account for c.27% of Scotland's forest estate.

Estates account for around 374,000 hectares of Scotland's arable ground. Statistics from Scotland's Agricultural Census show that around 69% of this land is given over to grass. Combining this with the 2.1 hectares of hill ground covered by rural estates suggests that rural estates include at least 2.3 million hectares of grass land, or around 47% of Scotland's total.

Applying these proportions to the overall composition of asset base suggests that rural estates account for c.37% of Scotland's total carbon sequestration assets.

11.4.5 Outdoor Visits

Analysis of Scottish visitor numbers undertaken to estimate the tourism impact of rural estates described above suggest that rural estates account for around 17% of total Scottish tourists and day visitors, suggesting that rural estates account for a similar proportion of Scotland's natural capital recreation assets.

11.5 Human Capital

This section describes the assumptions used to estimate the contribution that rural estates make to Scotland's human capital described in section 8.3.

11.5.1 Educational Field Trips

The number of school trips was estimated using SLE survey data which reported 225 trips taking place across estates. The average class size in Scotland is 23.2[70], which was used to estimate the total number of children who took trips as reported by the

[69] FLS database of currently operating renewable schemes, accessed via https://forestryandland.gov.scot/what-we-do/renewables on 3/8/22

[70] Scottish Government (2021), Summary Statistics for Schools in Scotland 2021

survey. Analysis of the Helping it Happen case studies showed a further 10,500 children took part in workshops organised by estates which did not take part in the survey and an additional 800 children took part in an initiative by Estates that Educate. Therefore, the total number of children estimated to have taken educational trips to estates was 16,500.

Research by Oxford Home Schooling[71] indicates that the majority of parents are willing to pay between up to between £101-£200 for school trips. Just over 10% were only willing to pay between £21 and £30, and around 1% said they wouldn't be willing to pay anything. A conservative estimate that parents would be willing to pay £25 for each child attending a school trip was used. Applying this to the 16,500 children who participate in educational activities at rural estates would give an estimated value of £0.4 million annually.

11.5.2 Apprenticeships

SLE survey data indicates that 41% of respondents to this question created apprenticeships. Across these 20 estates, 24 apprenticeships were created in total, an average of 1.2 apprenticeships per estate. 87% of these apprenticeships were with estates that are larger than 1,000 hectares (i.e. in the medium/large/very large categories). There are 754 estates across Scotland in these size categories[72] and it was assumed that 41% of these estates created apprenticeships. Applying an average of 1.2 apprenticeships per estate would suggest that rural estates across Scotland create 360 apprenticeships each year.

It was assumed that the net average lifetime earnings premium associated with a Level 2 apprenticeship was £69,300 using research by the Centre for Economics and Business Research (CEBR)[73]. This is 27% lower than a Level 4 apprenticeship (£94,400) but the more conservative of the two possible values has been used. Applying this to the number of apprenticeships created each year (360) would give an estimated lifetime earnings premium of £25.1 million.

[71] Oxford Home Schooling, Parents' opinions on school trips

[72] Scottish Land Commission (2019), The effects associated with concentrated and large-scale land ownership in Scotland: a research review

[73] CEBR 2016), Productivity and Lifetime Earnings of Apprentices and Graduates

BiGGAR Economics, Pentlands Science Park,
Bush Loan Penicuik, Midlothian, Scotland EH26 0PZ

info@biggareconomics.co.uk

biggareconomics.co.uk