

Key drivers for land manager decision making in Loch Lomond and the Trossachs National Park and opportunities for addressing constraints to woodland creation

SEFARI Fellowship with Loch Lomond and the Trossachs National Park Authority

Final Report



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Acknowledgements

I would like to thank the land managers, landowners, forestry agents and stakeholder representatives, who took part in this research, for taking the time to share their insights and experiences. I would also like to thank the research advisory group for providing guidance throughout the duration of the project. The project benefitted from funding from SEFARI Gateway, the knowledge and impact hub for SEFARI, and the Scottish Funding Council's University Innovation Fund and continual support from Loch Lomond and the Trossachs National Park Authority.

Citation

This report should be cited as: *McMorran, R. (2021) Key drivers for land manager decision making in Loch Lomond and the Trossachs National Park and opportunities for addressing constraints to woodland creation. SEFARI Fellowship report.*



1. Background

1.1 Policy and land use context for woodland expansion in the National Park

Current government policies on forestry in Scotland and across the UK place considerable emphasis on both sustainable management and forest expansion¹. The revised Scotland's Forestry Strategy (SFS)² (2019-2029) includes an objective to increase the current area of forest cover in Scotland to 21% (from 18.8%) by 2032, with an initial target of 12,000 hectares of new woodland per annum in 2020/2021, 14,000 hectares in 2021/2022 and 15,000 hectares per annum by 2024-2025. The SFS emphasises the importance of developing multipurpose forests and increasing the contribution of Scotland's forests to sustainable economic growth, as well as improving the resilience and environmental quality of forests and their contribution to enhancing human health and well-being. The Scottish Forestry Climate Change Programme³ further emphasises the role of woodland creation that fits with broader land use, enhancing land-based carbon stocks and using trees and forests to reduce greenhouse gas emissions and mitigate the risks of climate change to Scotland.

Agricultural land use (predominantly sheep and cattle grazing) accounts for 62% of the National Park, and represents the dominant land use by land area, with tourism and recreation also important as an employer and income generator (LLTNP 2016). Woodland cover accounts for 31% of the park, nearly a quarter (23%) of which consists of native woodland, including upland birchwoods, oakwoods (temperate rainforests), native pinewoods and other native woodland components (LLTNP 2019). In addition, 24% of the woodland is listed on the Ancient Woodland Inventory (i.e. established since 1860 or earlier) and 6% consists of Plantations on Ancient Woodland Sites⁴ (PAWS), with 4% designated as Sites of Special Scientific Interest (SSSI) and 2% as Special Areas of Conservation (SAC). The woodland components, therefore, include key components of the National Park's biodiversity and habitats, including Scotland's most southerly Caledonian Pinewood remnant (LLTNP 2019). The remainder of the woodland consists of productive conifer forests (62% of the total woodland resource), and represents an important timber resource. The majority (59%) of the woodland in the park is managed as part of the National Forest Estate (a relatively high level of public forest ownership relative to some parts of the Highlands) (LLTNP 2019). Private landowners (farms and estates) manage less than 40% of the woodland resource, although own a larger proportion of the native and ancient woodland components, with much of the privately owned woodlands representing smaller and more scattered woodlands (LLTNP, 2019). Environmental NGOs (e.g. RSPB, Woodland Trust Scotland, and

¹See the [England Forestry Strategy](#) and the [Woodlands for Wales Strategy](#)

² <https://forestry.gov.scot/forestry-strategy>

³ <https://forestry.gov.scot/forests-environment/climate-change>

⁴ Areas that are recorded on the Ancient Woodland Inventory but are currently under non-native tree cover

National Trust for Scotland) also own a number of wooded or partly wooded sites in the park. The privately owned woodland resource in the park, therefore, exists within a mixed and constrained land use context, dominated by small and medium sized hill farms, and a number of mixed estates which commonly incorporate sporting and tourism interests, in addition to agricultural and (in some cases) productive forestry interests.

Within Loch Lomond and the Trossachs National Park (LLTNP), the current National Park Partnership Plan⁵ (2018-2023) includes a target of 2000 additional hectares of planted or naturally regenerated woodland (native and/or productive) within the park by 2023. This expansion is envisioned as delivering multiple benefits including carbon sequestration, habitat connectivity, landscape enhancement, natural flood management and increased recreational opportunities. Selecting the appropriate design and species/woodland type in the most suitable location in the park is a key aspect of woodland creation, to ensure multiple benefits are delivered and negative impacts are avoided. A new Trees and Woodland Strategy⁶ for the National Park was developed in consultation with stakeholders from 2018 to 2019 and approved in 2019, to drive further sensitive woodland expansion across the National Park. Analysis undertaken as part of this strategy identified over 23,000 hectares of land in 'preferred' areas for woodland, with a further 38,000 hectares in 'potential' areas for new woodland creation

Critically (despite the majority of the existing woodland in the National Park being publicly owned), most land in Scotland (and in the LLTNP) is owned and managed privately and the majority of new woodland creation in Scotland in recent years has been undertaken by private landowners (Forest Research, 2020⁷). Despite an emphasis on woodland expansion in Scottish and UK policy in recent decades, it is apparent that planting targets have not always been met and many woodlands are not being actively managed (Lawrence and Dandy, 2014). Nevertheless, recent years have seen increased uptake in response to improved application processes, favourable grant rates and increased promotion, with 11,200 hectares of new planting in Scotland in 2018-2019 (surpassing the target of 10,000ha and an increase of 4,100ha from the previous year), 11,050ha of new planting in 2019-2020 and 10,660ha in 2020-2021, despite challenges relating to prolonged bad weather and the Covid-19 pandemic (Forest Research⁸ 2019, 2020, 2021). The majority of UK-wide tree planting during this period (over 80%) has occurred in Scotland, with 64% of new planting in 2020-2021 consisting of conifers and the remainder being broadleaved species (Forest Research, 2021).

Factors constraining uptake of woodland creation may include woodland expansion potentially conflicting with existing owner objectives, limited market opportunities for wood products (or limited site accessibility), the complexity of the grant scheme application process and regulatory constraints (Lawrence and Dandy, 2014; Lawrence and Edwards, 2013). Existing tenancy structures, as well as established landowner attitudes and behaviours, can also act as barriers to woodland expansion (Lawrence and Dandy, 2014). The Woodland Expansion Advisory Group (WEAG)⁹ identified (in 2012) marginal agricultural land as offering the greatest scope for woodland expansion in Scotland, despite recognising a cultural divide between forestry and farming in Scotland. To address barriers to woodland expansion the WEAG recommended that future planting should complement existing uses, the complexity of incentive schemes should be reduced, and the availability of advice increased.

The area of new woodland creation in the LL and T National Park in 2018-2019 (258ha or 2.3% of national woodland creation¹⁰) was broadly proportional to the land area of the National Park relative to Scotland (2.4% of Scotland), with 64% of this new woodland consisting of native species. Nevertheless, this is considerably less than the planting rate required to achieve the 2023 target for the park of an

⁵ <http://www.lochlomond-trossachs.org/wp-content/uploads/2018/02/NPPP2018-23-web.pdf>

⁶ <https://www.lochlomond-trossachs.org/park-authority/publications/treesandwoodlands/>

⁷ Forestry Statistics (2020) [Woodland Area and Planting](https://www.forestry.gov.uk/tools-and-resources/statistics/forestry-statistics/)

⁸ See Forestry Statistics: <https://www.forestry.gov.uk/tools-and-resources/statistics/forestry-statistics/>

⁹ <https://scotland.forestry.gov.uk/images/corporate/pdf/WEAGFinalReport.pdf>

¹⁰ Data from [Indicator 1](#) (Woodland Creation) for the National Park Plan.

additional 2000ha. In addition, two specific woodland creation schemes developed for delivery in 2018-2019 in the National Park were not progressed due to land management constraints, with the Park Authority currently involved in a number of new woodland schemes which offer considerable potential for further woodland creation in future years¹¹. To address constraints to uptake of woodland creation the Park Authority developed a small-scale planting grant scheme¹² in 2020 and developed a fellowship in partnership with the [Scottish Environment, Food and Agriculture Research Institutes](#). This report presents the findings of the fellowship research, which focused on identifying key constraints to woodland creation uptake and related opportunities for enhancing future uptake.

1.2 Research context

The successful implementation of forestry policy relies heavily on aligning policy goals with the motivations, attitudes and values of land managers and landowners (Thomas et al., 2015; Urquhart et al., 2010; Lawrence et al., 2010). This critical dimension of land use policy shifts the focus from land capability for woodland creation, towards an emphasis on decision making processes, motivating factors and behavioural change. A range of behavioural theories and frameworks have been applied (or offer scope for application) to studies of decision making and land manager/owner behaviour. These include the Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975), which subsequently evolved into the Theory of Planned Behaviour (TPB) (Ajzen and Madden, 1986), the Health Belief Model (HBM) (Rosenstock, 1974) and the transtheoretical Stages of Change (SoC) model (Prochaska, 1979; Prochaska and Diclemente, 1983), all of which have a predominant focus on the *individual* as the agent of change (O'Brien et al., 2017).

Innovation theories have also become increasingly prominent in recent decades, including the Diffusion of Innovation Theory (DIT) (Rogers, 2003), which focuses on behaviours (or 'innovations') themselves as agents of change, and Social Practice Theory (Reckwitz, 2002; Shove et al., 2012), which contends that practices are the outcome of shared experiences and relationships. Following increased uptake and use of behavioural economics in public policy (see Dolan et al., 2010), this field has also begun to be explored within land management in relation to behavioural change. One area of relevance to forestry is the concept of the 'nudge' (Thaler and Sunstein, 2008), which can be defined as interventions which influence people's choices without limiting their options, or appreciably altering their relative costs (Moseley et al., 2014). Fundamentally, these frameworks require an understanding of decision-making processes beyond a conceptualisation of woodland creation as a single decision undertaken at the level of the individual, towards understandings of pathways of change and networks of influence on land managers. The first sub-section below initially expands on the importance of 'intervention pathways' and the role of nudges in relation to land manager decision making. The second sub-section briefly reviews some of the most relevant holistic decision-making frameworks for land manager decision making in relation to woodland creation as a basis for structuring this research and the analysis of results presented in later sections.

1.2.1 Intervention pathways and nudges

Halpern (2015) proposed a grouped framework for policy nudges, dividing them into four broad categories using the EAST acronym (Easy, Attractive, Social and Timely). Specific examples of nudges include: providing default options and simplifying applications (easy); personalised messaging and using trusted messengers (attractive); communicating what others are doing and their successes and use of networks (social); and ensuring options are relevant at specific points in decision making processes (timely) (Moseley et al., 2014). Critically, nudges do not represent a replacement for regulatory frameworks and incentives but can be used to influence choices and facilitate longer term behavioural change, by reducing perceived constraints, including (for example) through overcoming

¹¹ See: <https://www.lochlomond-trossachs.org/park-authority/what-we-do/national-park-partnership-plan-2018-2023/delivering-partnership-plan-year-1/key-indicator-1-woodland/>

¹² See: <https://www.lochlomond-trossachs.org/park-authority/how-we-can-help/funding-grants/tree-planting-grant-scheme/>

mis-conceptions about trade-offs or profitability through deliberation and shared learning (Thaler and Sunstein, 2008).

Moseley et al. (2014) (see also Valatin et al., 2016) applied the concept of nudges to the challenge of increasing woodland creation in the UK to address climate change mitigation and adaptation goals. Their research used the EAST framework and 'Stages of Change' model (see Section 2.2), to disaggregate the decision making process around woodland creation into specific behavioural elements (e.g. considering location options, reviewing incentives, seeking advice, understanding regulations, implementation etc.). This allowed the researchers to identify specific intervention points for applying nudges, which (in combination) offer the potential for woodland creation, through addressing barriers and stimulating the necessary set of component behaviours at the most appropriate stages (Moseley et al., 2014). As Ambrose-Oji (2019) notes, facilitating behavioural change requires specific understanding of the 'pathways' and 'moments of change' and specific interventions may be required at different stages of the decision making process to facilitate land managers committing to new woodland creation. As shown in Table 1, a combination (or sequence) of passive (e.g. awareness raising) and more active (e.g. one to one engagement on specific opportunities) nudges can be applied to encourage woodland creation (Valatin et al., 2016).

Table 1. Types of nudges and application to woodland creation by EAST category (Valatin et al., 2016)¹³

Category	Nudge	Behavioural insight	Application to woodland creation
EASY	Defaults	Individuals asked to opt-out (rather than opt-in) to schemes	Ask land managers to register whole land holdings as the default (rather than just areas for which grants being currently applied).
	Simplification (Format)	Make it clearer and easier	Ensure information is easy to understand and language is clear; pre-populate application forms
	Remove friction	Identify and remove actual or perceived barriers	Identify any 'sticking points' in the bureaucratic and operational process of woodland creation and offer a service to deal with them
ATTRACTIVE	Salience	Draw attention to key points	Highlight the role of woodland creation in meeting climate change mitigation and adaptation goals, less well known (e.g. tax) benefits of woodland ownership, and opportunities to gain additional income through carbon markets
	Messenger	People are heavily influenced by who communicates information	Encourage land managers to become a 'woodland champion' to reinforce woodland planting as a social norm
	Personalisation	Personal messages increase response rates	Add hand written instructions and contact details to information packs and application forms
	Affect	Use strong feelings to prompt decisions	Highlight regions or business types with a high carbon footprint and emphasise the negative environmental effects (while highlighting the opportunities offered by woodland creation)
	Incentive design	People focus on short-term rewards	Restructure incentives for woodland planting so they are 'front-loaded' and fit well with helping to meet other management objectives, e.g. improving adjacent habitat
SOCIAL	Social norms	Tell people what others are doing so that people are made explicitly aware of other people's good behaviour	Highlight the 'pro-social' behaviour of land manager's neighbours and peers who plant woodland
	Networks	Using social networks to encourage collective behaviour	Encourage collective interest in woodland planting (e.g. by increasing grant rates once a threshold level of woodland creation has been achieved in a locality)
	Commitment	Public commitment makes action more likely	Encourage public commitments to create woodlands (and then publish pledges on websites)
	Exemplify	Individuals often respond to reciprocity and fairness	Encourage woodland creation through example and by public commitments
TIMELY	Priming	People are influenced by subconscious cues	Prime target audiences with woodland creation success stories and demonstration sites
	Framing and mental accounts	People assign decisions to different mental accounts	Promote options that allow people to assign woodland creation to different mental accounts (e.g. as a retirement fund, or source of non-market benefits)
	Key moments	Timing interventions at critical points	Introduce interventions following media coverage of climate change or flood events or at key life stages when and managers are open to change (e.g. retirement from active farming, or new ownership)

Potential nudges for stimulating woodland creation, therefore, cover a broad range of options (Table 1), including dissemination of user-friendly information, reducing bureaucracy, highlighting benefits and the use of exemplar projects and public commitments to woodland creation to increase the likelihood of action. An important dimension relates to the use of trusted 'messengers' and peer to peer (two way) communication (as opposed to unidirectional knowledge flows from consultants alone), to ensure effective outreach and wider collective interest in woodland creation. Moseley et al., (2014) also recommend tailoring nudges to different types of land managers (e.g. farmers, estate owners, investors etc.) to reflect their differing motivations and circumstances and the different stages they may be at in the decision-making process. This reflects the findings of a recent review of studies characterising land

¹³ For a full review and table showing proposed nudges organised by key Stages of Change (contemplation, preparation, action etc.) see [Moseley et al.](#), (2016)

managers in Scotland, which concluded that policy interventions and knowledge exchange should be designed to target specific land manager types more effectively (Ambrose-Oji, 2019).

Valatin et al., (2016) also identified the importance of social networks in the pre-contemplation and contemplation stages of decision making, to draw on collective experience to encourage behavioural shifts, and at the action/maintenance stages for ongoing information sharing and re-framing of challenges and opportunities. To be effective, a nudge-based approach is therefore likely to require interactions across a network with land managers, consultants/agents, peer groups and wider stakeholders, and use of multiple sources of information and forms of deliberation and engagement (Ambrose-Oji 2019). Following a case study-based approach, O'Brien et al., (2018) concluded that multifaceted forestry interventions are particularly effective at promoting sustainability behaviours in relation to woodland creation. Based on a review of the behavioural change literature and incorporating facets of many of the key theoretical frameworks outlined above, these authors recommended that interventions seeking behavioural change: i) are grounded on an understanding of individual's and groups' values and motivations; ii) seek to affect the wider social and physical context of its target groups; iii) adopt a multifaceted approach at various scales; and iv) facilitate active involvement by participants in project design and implementation.

In relation to applying and learning from nudge-based approaches Valatin et al., (2016) highlight the potential for pilot studies for testing approaches and modifying future interventions accordingly. While these authors note the relevance of randomised controlled trials to testing nudges, they also note the importance of gathering further qualitative evidence relating to interventions and informal use of 'nudges' in forestry for gaining insights into their effectiveness. This could involve assessing the impacts of nudges over time and/or assessing manager response to specific interventions (e.g. workshops, knowledge transfer, in-person meetings) in a specific area. Critically, due to the importance of targeting individuals *and* their networks, any nudge-based approach is likely to require an understanding of networks and the specific local contexts (and related challenges) which land managers operate within.

1.2.2 Frameworks for researching land manager decision-making

Existing engagement processes and financial incentives for encouraging woodland creation have often been shown as having a relatively limited or partial effect, which suggests other motivational factors can play an important role (Dandy, 2016; Duesberg et al., 2014; Eves et al., 2015). As recent research on alternative options for grouse shooting in moorland areas concluded, existing land manager objectives and the specific land use context and constraints on a landholding (land use mix, productivity, climatic constraints, land capability etc.) can have a critical influence on land manager decisions relating to future land use change (Mc Morran et al., 2020). As Dandy (2012) states, '*land-managers are not 'blank canvasses' waiting passively to receive information to show them the 'best' way forward*'. In relation to woodland neglect, Dandy (2016) concludes that decision making is deeply embedded in social, economic and environmental contexts' and '*land-managers are already on a particular management 'pathway' or 'trajectory' at the point in time when decisions are made*'. These contextual factors can act as a barrier to uptake of woodland creation, as well as being relatively complex to disentangle with the aim of developing effective interventions. As a result of these embedded land use models, land-management behaviour change is most likely to occur at particular times and under certain circumstances, such as ownership change / inheritance, in response to crises or threats (e.g. flooding, climate-change), or through the spread of innovation (Dandy, 2012).

A key starting point for taking a multifaceted or 'nudge' based approach to influencing decision making therefore, is the development of an in-depth understanding of the factors influencing decision-makers. Dandy (2012) developed a comprehensive decision-making framework (Figure 1) for forestry based on qualitative research with land managers, with the aim of enhancing targeted engagement. This framework identified twenty-seven interrelated categories of influence, divided into four higher level categories of economic (including market forces and incentives), social (including concerns relating to

regulatory controls and bureaucracy), physical-environmental and operational factors. Some of these factors have been identified previously; however, as Dandy (2012) notes, others, such as social networks, personal interests, land-management cultures, and risk, have not, and therefore require further research to ensure effective future engagement with landowners. As shown in Figure 1, knowledge is not identified as a single factor, but as a feature of the relationships between managers and influencing factors. Knowledge therefore acts as a filter through which land managers perceive the full range of factors, with their respective knowledge also influenced by their land management culture (i.e. which knowledge is used, retained and accepted and which sources and forms of information are trusted). While this framework provides a comprehensive set of influencing factors which can be used as a basis for wider work, the framework does not assign any relative 'weight' or level of importance to different factors.

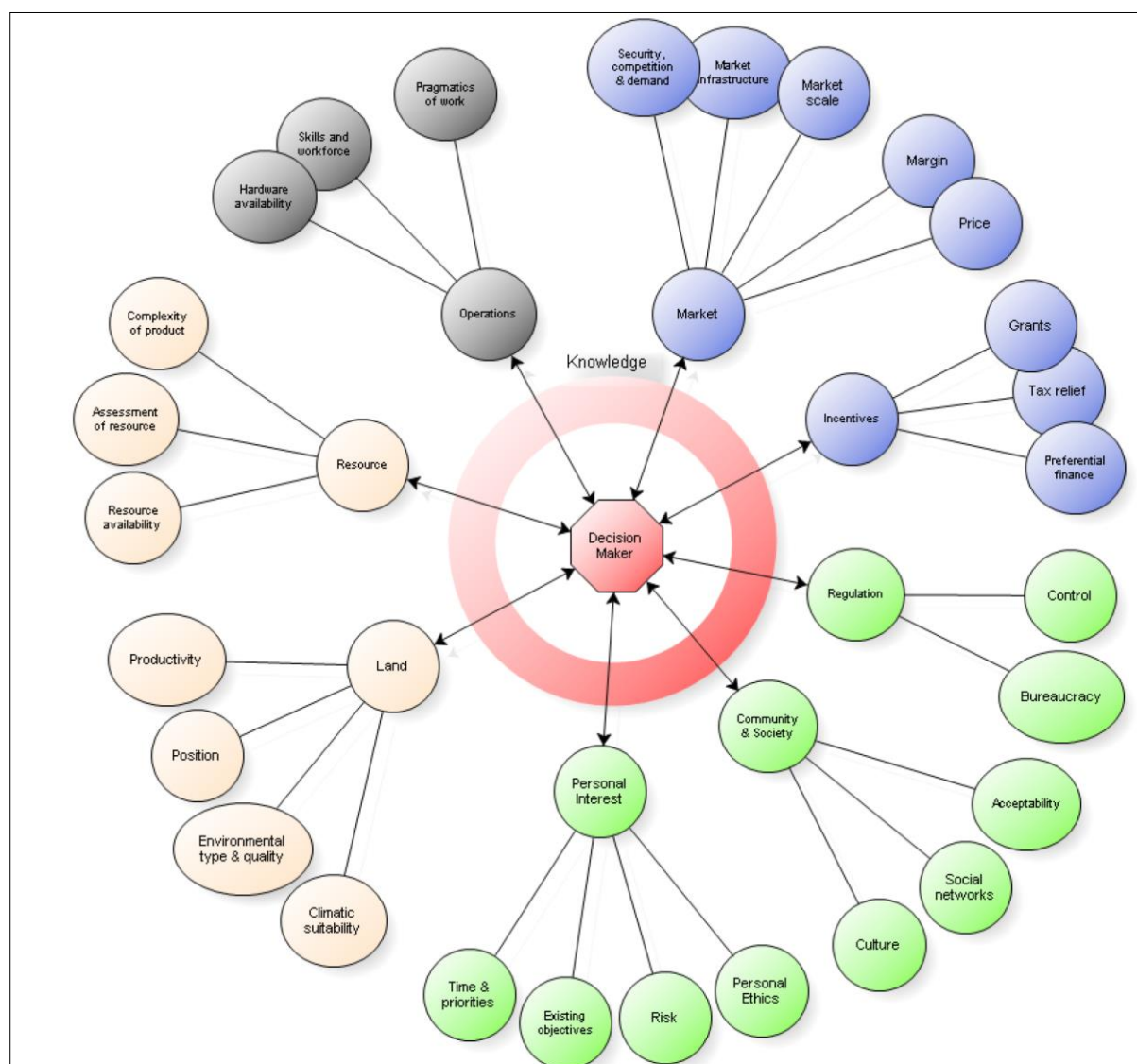


Figure 1 Framework of influences on private land manager decision making for forestry (from Dandy, 2012)

In an assessment of farmer attitudes to environmental management (and related behaviours), Mills et al. (2017) proposed a holistic decision-making framework which is also relevant to uptake of woodland creation (see also Mills et al., 2013). To explain farmers uptake of environmental management measures the framework (Figure 2) combined two key dimensions as: i) *ability to adopt*, which related to finances, labour, environmental constraints etc.; and ii) *willingness to adopt*, which related to behavioural dimensions (attitudes, beliefs, values and norms) and was grounded in the Theory of

Planned Behaviour (Ajzen and Madden, 1986). Additionally, engagement with farmers, (including advisors, networks and local governance structures) is conceptualised as a third key element.

To an extent 'willingness to adopt' in the Mills et al. (2017) model reflects personal interest, community and bureaucracy (control) factors in Dandy's (2012) framework, while 'ability to adopt' is reflected in the broad range of factors relating to land, resource, operational and market driven factors. Importantly, the inclusion of 'farmer engagement' as a distinct component by Mills et al. (2017), further reflects the separation of 'knowledge' as a distinct component or 'filter' in Dandy's 2012 framework. Critically, it is the interaction between these factors which influence decision-making outcomes and recognition of this complexity and inter-relatedness offers scope for supporting the development of more effective engagement strategies and policy interventions.

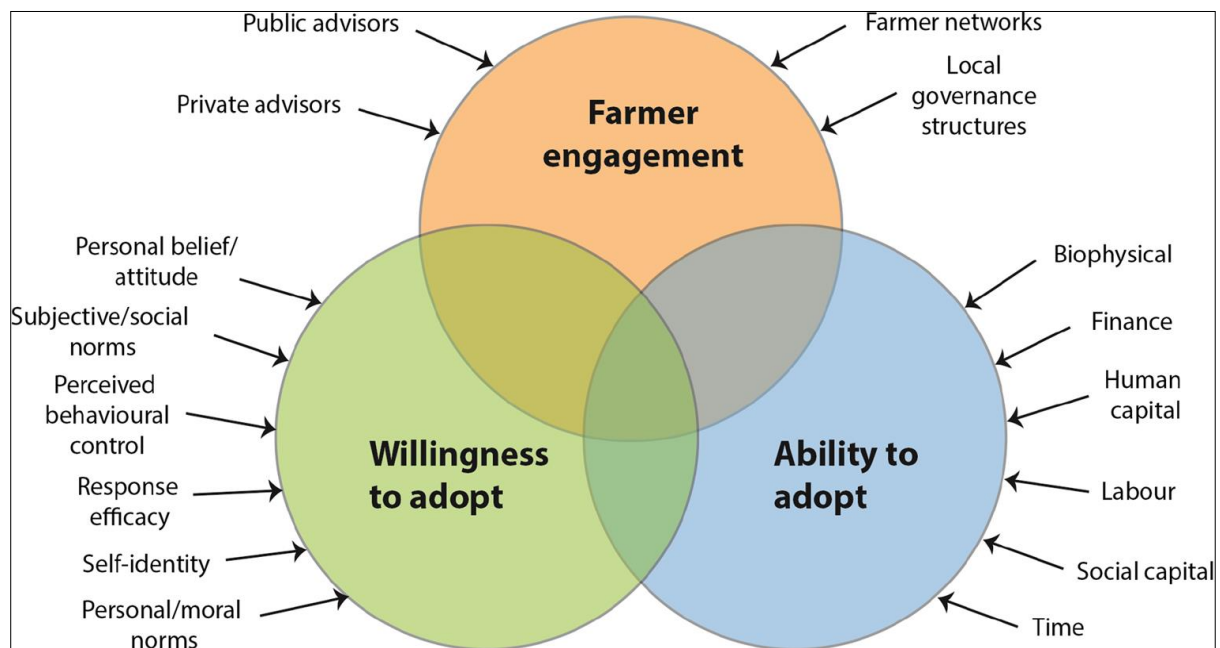


Figure 2 Factors influencing farmer environmental decision making (Mills et al., 2017)

In a study of landowner attitudes to woodland creation and management in the UK Lawrence et al. (2010) highlighted the lack of qualitative research in this area, with quantitative surveys seen as failing to enhance understanding of how cultures and networks shape values and decision making processes and how those may change in response to knowledge exchange and experience. These authors recognised regional variability in landowner attitudes and the importance of the wider context for decision making (e.g. other land uses, specific regulatory aspects etc.), emphasising the need for research which puts decisions about woodland in the landowner's complete context and incorporates all relevant stakeholders (e.g. managing agents, community woodland groups, farmers and tenant farmers, corporations etc.) and considers the networks within which they operate.

The summary of evidence outlined here highlights the potential of a qualitative approach applied at regional scale for determining key place-specific constraints and opportunities relating to woodland creation. Interviews with land managers selected from across a specified area (i.e. Loch Lomond and the Trossachs National Park) offer considerable scope for identifying prevailing cultural/land management narratives (and the role of peer-to-peer learning), case specific examples of constraints and opportunities for woodland creation and regional variation in these constraints and narratives.



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2. Project aim and objectives

The proposed research is focused on exploring land manager (including landowner) perspectives on key opportunities and constraints relating to the creation of new woodland within Loch Lomond and the Trossachs National Park. Reflecting the emphasis on multipurpose woodland within Scotland's Forestry Strategy, the research will consider the potential for woodland expansion (with an emphasis on native woodland) which delivers multiple benefits (e.g. climate change mitigation and adaptation, biodiversity and natural capital gains, health and well-being etc.) within the wider land use and policy context of the National Park. The proposed methods place an emphasis on close researcher-practitioner interaction to develop an enhanced and nuanced understanding of the drivers for decision making relating to land use change. The research process offers considerable scope for advancing existing land manager engagement in woodland creation during the implementation of the National Park's new Trees and Woodlands Strategy, with the research contributing to the National Park Partnership Plan (2018-2023) woodland creation target.

The overarching aim of the proposed research was:

To investigate key drivers (opportunities and constraints) for land manager decision making in relation to the creation of new multipurpose woodlands and improve understanding of how constraints to woodland creation can be overcome in practice.

To address this aim four specific research objectives were proposed:

- i) Review existing pertinent research on constraints to woodland expansion and determine the implications of key findings for the proposed research and future woodland expansion in the LL and T National Park and Scotland.
- ii) Investigate land manager perspectives of key drivers (opportunities and constraints) for decision making relating to new woodland creation and related land use change.
- iii) Determine wider stakeholder perspectives on constraints and opportunities for new multipurpose woodland expansion.
- iv) Facilitate knowledge sharing related to key opportunities and constraints and identify solutions for overcoming constraints to woodland expansion in practice.



3. Methods and Approach

To address the above objectives two main phases of work were conducted: i) literature review and scoping; ii) land manager interviews and forestry agent/consultant interviews. The literature review and scoping phase was used to establish an up-to-date research context and develop a framework for the research (see previous section). The landowner and forestry agent interviews phase represented the core research component. The interviewees were selected from relevant sub-areas within the National Park following discussions with National Park officers and the scoping phase of the research.

3.1 Literature review and scoping

To develop a focused context for the research a literature review was undertaken which incorporated collation of recent research of direct relevance to woodland expansion within the National Park and Scotland more generally. Google Scholar and Scopus were used as the main search engines and the review included relevant Forest Research studies on land manager behaviour¹⁴ and productive woodland creation¹⁵, previous research conducted as part of the Scottish Government's Strategic Research Programme on landowner attitudes and behaviours¹⁶. The specific topic/search areas reviewed included:

- Behavioural change and decision-making frameworks for land managers and landowners;
- Theoretical frameworks for understanding the individual as the 'agent of change', including the Theory of Planned Behaviour, Health Belief Model and Stages of Change Model;
- Social Practice Theory and Diffusion of Innovation Theory and the relevance of land manager social networks to land management 'cultures' and social influences on decision making;
- Decision-making pathways and the application of 'nudges' to address barriers to woodland creation and facilitate behavioural change;
- Land manager categorisation/typologies and implications for encouraging woodland creation.
- Specific influences on decision making around woodland creation, including social, economic, environmental and capacity factors and the role of knowledge transfer and communication.

Some of the key points and more relevant findings from this review have been presented in the previous section.

¹⁴ See <https://www.forestresearch.gov.uk/research/behaviour-of-private-land-owners-and-managers/> and <https://www.forestresearch.gov.uk/research/review-landowners%C3%A2tm-attitudes-to-woodland-creation-and-management-in-the-uk/>

¹⁵ See: <https://scotland.forestry.gov.uk/images/corporate/pdf/productive-woodland-prospects-in-Scotland-report-2013.pdf>

¹⁶ See: <https://www.hutton.ac.uk/research/archive/2011-16/realising-lands-potential/land-manager-attitudes-and-behaviours>

In addition to the literature review component five scoping interviews were undertaken as the basis for creating awareness of the research, identifying major contextual factors and key barriers to woodland creation and for informing the research process and any subsequent knowledge exchange or communication of the findings. This included interviews with representatives from: i) Scottish Forestry; ii) National Farmers Union of Scotland; iii) Cairngorms National Park Authority; iv) Scottish Land and Estates; and v) Forest Research. In addition, the early stages of the research included discussions with National Park staff, including in relation to the potential areas of focus within the park and the process for developing a geographically representative landowner/land manager sample.

3.2 Land manager and forestry consultant interviews

Interviews were undertaken with land managers (including landowners) from across the National Park in combination with a sample of forestry agents/consultants with experience in developing woodland creation schemes within the park boundary. An initial wider sample of 40 land managers was identified for the first phase of contacting land managers and securing approximately twenty final interviewees. Due to the dominance of private landowners within the National Park, the sample group was drawn predominantly from the private land sector, with a small number of land managers from NGO-owned holdings also included. The initial sample included landowners, estate managers, farmers and foresters.

To ensure a diverse sample which is reasonably representative of the diversity of landholding types and regional contexts of the park the sample group incorporated three levels of stratification: i) ensuring a sufficient spread in landholding sizes; ii) ensuring land managers are selected from landholdings with differing objectives (e.g. sporting oriented estate, mixed land-use estate, farm holding etc.); and iii) accounting for some of the regional diversity across the park by selecting interviewees from different areas within the park. In addition, to ensure interviewees were selected in areas which offer significant woodland expansion potential, interviewees were identified in conjunction with National Park staff based on a review of data on existing landholdings, to identify landholdings of different sizes and types, particularly within locations identified as preferred (or potential) areas for woodland expansion within the Trees and Woodland Strategy. Potential alternative interviewees were also identified during this phase, to allow for a degree of non-response from the initial sample while maintaining sample diversity.

Interviewees were contacted initially by the National Park Authority (due to the requirement to protect contact information held by the National Park) and where land managers responded positively, they were then referred to the researcher for follow up. This process resulted in a final sample of 17 land managers representing 17 different holdings (7 estates, 6 farm holdings, 3 conservation holdings and 1 privately owned woodland) from across the park. In total 9 of the interviewees were both the manager and owner of their property, with the remaining 8 interviewees representing (non-owning) estate managers or conservation managers (See Table 1). All interviews were conducted either through Zoom or Microsoft Teams due to the requirements for social distancing during the main research period. Despite the barriers to face to face engagement, this resulted in a significant level of in-depth of discussion to allow for the elaboration of case specific challenges and opportunities. Interviews had a target length of one hour and in most cases, this was achieved.

During the initial contact phase interviewees were provided with a project information sheet and participant consent form. The key topics discussed during the land manager interviews included: i) current emphasis on woodland creation and drivers for this; ii) current perceived opportunities for further woodland expansion (woodland area, types, management objectives etc.) and underlying drivers for this; iii) perceived constraints to woodland expansion (bureaucratic, economic, land use conflicts etc.); iv) potential enabling factors for woodland expansion including advice and guidance, markets and financial support, networks and other factors. All interviews were recorded and partially transcribed. A full breakdown of the landholdings within the land manager sample by holding type and main activities is presented in Section 4.1. All land manager interviewees are referred to by a specific anonymised numeric identifier (LM1, LM2, LM3 etc.) within the results write-up.

In addition to the land manager interviewees, a further nine interviews were conducted with forestry agents/consultants who were either taking forward new woodland schemes currently within the National Park or had been involved in woodland schemes in the area in the past. These interviews were undertaken due to the important role consultants play in taking forward woodland creation schemes, both in the National Park and nationally (with this group often absent from research on land manager perspectives). The sample included representatives from forest management companies operating nationally, independent forestry consultants and consultants operating within smaller firms or as specialists within specific areas (e.g. farm woodland or woodland restoration). Collectively the agent group had been involved in advising over twenty different landholdings in the National Park, with some of the larger forestry management companies also managing extensive forested areas near or around the boundary of the park. These interviews followed similar discussion themes to the land manager interviewee group and included discussion relating to specific woodland schemes on holdings in the park, with a particular focus on challenges for taking schemes forward and key opportunities for supporting woodland creation. The forestry agent interviewees have been anonymised and are referred to using a specific numeric identifier (A1, A2, A3 etc.) within the results. The following results sections have combined land manager and forestry agent interviews in terms of the write up, but forestry agent perspectives have been separated within the main text or in topic boxes where necessary or relevant.

3.4 Research ethics and participant anonymity

To ensure the research was conducted to a high ethical standard the sampling method and interviewee process and questions were subject to an internal application to the SRUC Social Science Ethics Committee. A project information sheet was provided to all research participants outlining the origins, objectives and funding for the research. Participants were also provided with a participant consent form. SRUC acted as the main research organisation, with research findings only shared with the National Park Authority on an anonymised basis following initial analysis. All collated data was stored on secured SRUC drives and anonymised wherever suitable and/or relevant.



4. Landholding characteristics and woodland creation aspirations

4.1 Sample Landholding characteristics and recent land use shifts

The sample consisted of a mix of landholding types, including traditional mixed estates (7), farm holdings (6), conservation holdings (3) and one privately owned woodland (Table 2). All of the private estates in the sample were managed for multiple land uses, including farming (in all cases) and a varying balance of sporting land uses, forestry and woodlands, environmental schemes/conservation, tourism interests (mainly holiday lets) and other forms of diversification (hydro schemes, cafes, business lets etc.). The majority (5) of estates had at least one farm tenant (with one heavily tenanted estate). Two of the estates had commercial forestry interests and on a third this area of activity was expanding. The farm holdings (6) included one large mixed farm, with a similar mix of activities to the smaller estates, three hill farms (with a mix of sheep and beef cattle), one smaller owner occupier who also held a long term tenancy of a larger area of hill ground and one smaller owner occupier. All six farms operated within a relatively constrained upland land use context (including very high and steep ground in some cases), which restricted the opportunities available to them for future land use change. Three NGO-owned conservation landholdings were also included in the sample, all of which were managed predominantly for a combination of conservation and habitat restoration and visitor management objectives (with the largest also running a mixed hill farm). In addition, one smaller privately owned woodland was also included, which was managed for biodiversity and amenity objectives.

The landholdings varied in terms of the length of current ownership, with most of the estates having been under long term (100-500yrs+) family ownership (with one estate having been under the same ownership for around 30 years). The farm holdings were also predominantly family owned, with three under long term (50yrs+) family ownership and two under family ownership for less than 20 years. One of the farms was held under a long-term lease arrangement and under organisational ownership. The sample included a mixture of holdings from small farms (smallholdings) to very large, diversified estates (Table 2). The holdings in the sample were widely distributed across the National Park, with a part of the holding sitting outside the park boundary in a small number of cases. The interviewees included estate owners who managed their holdings (3), estate managers (4), four owner-occupier farmers, one member of farm staff and one owner occupier that also held a long term tenancy on a larger area of hill ground, three conservation site managers and one private woodland owner (see Table 2).

Table 2 Participant landholdings, interviewee type and main land use activities¹⁷

Type and size	Interviewee	Tenants	Land use mix/objectives
Mixed private estate (Very large)	Estate manager	Multiple tenants	Farming (sheep/beef); deer stalking, shooting and forestry
Mixed private estate (Very large)	Estate manager	Multiple tenants	Farming (beef/sheep), forestry, tourism, rural businesses
Mixed private estate (Large)	Estate manager	None	Farming (sheep); deer; hydro schemes; holiday lets
Mixed private estate (Large)	Owner-manager	1 tenant	Farming (beef/sheep), sporting, forestry, conservation and tourism
Mixed private estate (Large)	Owner-manager	Two tenants	Farming (beef/sheep), environmental schemes, sporting (low intensity) forestry, holiday lets
Mixed private estate (Medium)	Estate manager	None	Farming (beef/sheep) forestry; hydro schemes, holiday lets, sporting, tourism, environment
Mixed private estate (Medium)	Owner-manager	1 tenant	Farming (sheep), deer stalking, hydro scheme, holiday lets, some commercial forestry
Hill farm (Large)	Owner occupier	None	Farming (sheep/beef); woodlands, sporting and venison business; holiday lets
Hill farm (Medium)	Farm staff	None	Diversified hill farm, (beef/sheep) and tourism
Hill farm (Medium)	Owner occupier	None	Farming (sheep/beef), visitor access, limited deer, some tourism
Hill farm (Medium)	Owner occupier	None	Sheep/beef and holiday lets
Hill farm ¹⁸ (Medium)	Owner-occupier and tenant	None	Beef/sheep; holiday lets and tourism business, hydro scheme
Hill Farm (Small)	Owner occupier	None	Beef/sheep and holiday lets
Conservation holding and farm (Large)	Site manager	None	Conservation/restoration; farming (beef/sheep)
Conservation holding (Medium)	Site manager	1 tenant	Conservation /habitat restoration and visitor management
Conservation holding (Medium)	Site manager	One tenant	Conservation and visitor management
Private woodland (Small)	Owner/ manager	None	Amenity and conservation

The land managers were asked to outline any major changes on their landholdings in recent decades. The most identified change (recognised by almost all land managers) related to reductions in livestock stocking densities and, in particular, reductions in the size of sheep flocks, with some holdings reducing their flocks by half since the 1990s. In some cases, this had occurred in conjunction with changes to stocking regimes and an increased emphasis on beef cattle (suckler herds). These shifts were perceived as linked to changes in agricultural payments as well as wider pressures including labour availability and declining viability of hill farming. As one farmer explained, the changes on his farm were part of a wider pattern of change:

'From the 1980s...things changed, so there were agricultural changes, which was a direct response to the changes to the support and then additional environmental schemes that became available and so there are much lower stocking densities on our hill ground now, especially in winter...that brought other changes, you had to do other things. That is a wider change, you see it all around the Cowal peninsula they are all declining and hardly any hill sheep farms are left now' (Farmer, LM12)

Some interviewees also identified indirect impacts of these changes, with two farmers noting that the removal of sheep flocks from their neighbours' ground had required them to fence off their land to avoid their sheep flocks ranging beyond their holdings (LM5, LM7), and one estate manager linking a rise in the prevalence of tick and decline in grouse numbers to flock reductions in the wider area (LM9).

¹⁷ Landholding sizes have been generalised to very large (>10,000ha), large (2500ha-10,000ha), medium (500-2500ha) and small (<500ha) for anonymity purposes.

¹⁸ The majority of this holding was under a long term tenancy agreement.

The second most frequently identified change, which was linked to livestock reductions, was an emphasis (on almost all estate and farm holdings) towards increased diversification of activities since the 1980s. This had been driven by declining agricultural support for large sheep flocks and emergent opportunities (e.g. support for renewable energy), as well as increased costs, longer term agricultural uncertainty, increased visitor numbers (i.e. a market) and in two cases a change in management emphasis (linked to changes in personnel/succession). The development of tourism businesses and in particular holiday cottages was the most common form of diversification, with other examples including environmental schemes, hydro schemes, business property lets and venison marketing. In three cases, estates had also taken farm tenancies back in hand, with these changes driven by retiring tenant farmers and an objective to increase future flexibility for land use change on these areas of ground.

A further shift in land use (and landcover) identified by some land managers, also linked to the reduction in stocking densities, was an increase in woodland cover either on their own or neighbouring holdings. This had occurred either due to their own or neighbour's efforts to establish woodlands (see Section 4.2) or as a natural habitat response to reduced grazing. NGO-owned conservation landholdings (two of which historically had been sheep farms) had substantially reduced grazing pressure through stock and deer reductions (where feasible) and their use of woodland exclosures had resulted in substantial woodland regeneration. As one farmer explained:

'It is just happening anyway, if you take the sheep off...and we don't have many deer here so regeneration is happening now which is starting to impinge on the grazing areas. The farm is rewilding whether we like it or not! Birch scrub now appearing so the sheep don't keep that back and that is whether you want it or don't want it regardless of your objectives' (Farmer LM10)

However, on some other holdings (LM16, LM10) land managers noted that the reduction in sheep stocking densities and increased woodland creation had led to rising deer numbers, which in turn had implications for fencing requirements for natural regeneration. A further shift recognised by both NGOs and private estate respondents was an increase in visitor numbers in recent decades, resulting in challenges relating to path erosion, parking pressures and littering. This was perceived as requiring an increased focus on visitor management and communications on responsible access.

4.2 Woodland characteristics on sample landholdings

Table 3 summarises the area and types of existing woodland on the (grouped) participating landholdings, as well as an estimate of recent woodland creation across the holdings and aspirations for future (next 5yrs) woodland creation schemes. These figures represent estimates (provided by interviewees) in some cases and are for the entire landholding sample as opposed to the specific components of the sample, which sit wholly within the National Park boundary. The estimated total woodland area across the sample landholdings (which had a combined land area of 75,675Ha) was 6700Ha, with the majority occurring on the seven estates (4372Ha), with 1850ha of this on the conservation landholdings and a smaller component (500ha) on the farm holdings. This suggests an estimated woodland cover of 9% of the total area, although removing the largest estate from the sample increases this woodland cover figure to an estimated 11% of the land area across the sample. This area of woodland (6700ha) equates to approximately 13% of the woodland in the National Park, or 35% of the woodland area not held as part of the National Forest Estate¹⁹ (i.e. under private or NGO ownership).

¹⁹ Based on a total woodland area of 51,400ha in the National Park (or 31% of the land area) 19,300ha of which is not part of the National Forest Estate (figures taken from the NP [Trees and Woodland Strategy](#))

Table 3. Current woodland on landholdings and woodland creation aspirations

Type and size of holding	Current woodland area and type	Recent woodland creation	New woodland aspirations
Estates (7) (total area: 56,775Ha)	(4372Ha) (<2000Ha commercial conifer; remainder (~2400Ha) combination of planted mixed broadleaf, semi-natural/ancient woodland	Total recent woodland creation within last 5-10yrs (~450-550Ha) mainly mixed/productive schemes and smaller areas of mixed broadleaf (~100ha of total)	Total aspirational schemes: (~1100Ha) predominantly mixed productive-native schemes, less emphasis on native amenity/biodiversity schemes (~250Ha of total)
Farm holdings (6) (10,000Ha and ~1000ha leased)	(~500Ha) (predominantly mixed broadleaf, native semi-natural woodlands. Smaller commercial conifer component (<50Ha)	(~85ha) last 10yrs native schemes, and 250-300ha native woodland last 15-20yrs (and increased natural regeneration)	(~440Ha) Predominantly one large scheme at early stage of development; smaller native and regeneration schemes (~70-80ha of total)
Conservation holdings (3) (and 1 private woodland) (7,900ha)	(~1850Ha) (including regeneration schemes/exclosures). Predominantly mixed native broadleaf and Atlantic Oakwoods	(~1700Ha) - longer term planting and regeneration native woodland schemes - over 20-25yr timescale	Further natural regeneration (exclosures: ~50-100ha), some native planting and one specific native planting scheme (20Ha)
Total land area (75,675Ha)	Total forestry and woodland (~6700Ha)	(~535-635Ha) last 5-10yrs on estates/farms; Additional ~2000Ha over last 20-25yrs (mainly conservation holdings)	Total new woodland aspirations: (~1500-1600Ha) . Combination of schemes with emphasis on mixed productive schemes, potential carbon schemes and mixed native broadleaf.

The total woodland area in the sample included approximately 2000ha of productive conifer, including some long established (1700s) conifer rotations on one estate and plantations (mainly on two other private estates) established in the 1900s and some smaller conifer blocks. There was also a range of native woodland blocks, scattered semi-natural woodland areas and designated woodland sites, including coastal temperate rainforest (Atlantic oakwood) sites and a native semi-natural pinewood remnant. In addition, the conservation holdings contained some relatively large areas of recently restored native pinewoods and temperate rainforest (over 1800ha combined), with regeneration schemes and deer population reductions an important feature of management on these sites. With the exception of longer term native woodland remnants and woodland schemes established as part of environmental stewardship schemes, the majority of woodland on the sample holdings had been established under previous woodland grant schemes, with unaided natural regeneration also occurring on some holdings (LM5, LM10, LM12). Two private estates (LM6 and LM7) had benefitted from reacquiring land previously sold, which had been afforested in the intervening period. These acquisitions had allowed both estates to increase their forestry (i.e. mixed productive conifer) holdings.

4.3 Perceived costs and benefits of existing woodland on landholdings

In most cases, land managers did not perceive the woodlands on their holdings as resulting in a high level of annual costs, although some acknowledged this was partly due to the woodlands on their landholdings being undermanaged. Two farming interviewees (LM10, LM13) perceived the woodlands on their holdings as '*cost neutral*' but of relatively limited beneficial (financial or otherwise) value to their holdings. On sites with commercial forestry operations, land managers identified considerable ongoing management costs, which were subsequently offset against income and management grants. Three land managers referred to the challenge of offsetting costs against income generation for smaller scale woodlands, as proactive management even of smaller woodland areas required staff time, with relatively limited potential for significant income generation without efficiencies of scale. Three land managers (LM4, LM5, LM12) referred to their woodlands as undermanaged and neglected, which as one explained sometimes led to the woodlands being perceived as a management burden:

'Some of the woods are...an unexploited resource, no real use...and probably seen as a management challenge and maintenance costs more than any benefit because of deer management and fencing maintenance...none of it is suitable for earning income so it's little used' (Estate manager, EM4)

Fencing costs were the most frequently identified cost, with some landowners having received grant aid to support fencing maintenance or new fencing. Three landowners (LM4, LM15, LM16) identified the poor condition of some existing fences and fencing needs on steep ground as their most significant future cost, although some also identified opportunities relating to woodland management grants and fencing which could benefit other land uses (e.g. agriculture). Additional costs identified by a minority included costs for monitoring designated sites, insurance for fire risk and plant health or safety felling.

In relation to the perceived benefits of woodlands on their holdings, most farmers and estates with significant farming interests repeatedly identified the importance of the livestock shelter function of their woodlands. Two land managers (LM12, LM12) also identified the contribution of woodlands on their land to soil stability and retention due to the potential for erosion from high rainfall events. In addition, farm interviewees identified biomass potential and woodfuel as important current or future woodland values. Estate managers identified a broader range of woodland values (Box 1), including in relation to asset diversification and future timber income (see Section 5.2.1/2), benefits for sporting land uses (as habitat for deer and game birds), biodiversity benefits and in relation to contributing to the estate landscape (amenity values) and context for estate-based tourism.

Box 1 Estate manager perspectives on woodland values to their holdings

'The woodland has an important revenue value for felling, as a capital asset, some areas provide shelter for livestock and we also have some specific shelter belts. We also then have a sporting enterprise and smaller woodlands are part of that, but also the native aspects and all the forestry really provides the context for other activities on the estate like visitors, the tourism, so it is integral to the landscape mosaic particularly on the lower ground' (Estate manager, LM7)

'They have multiple values, the historic woods have amenity and biodiversity value and they contribute hugely to the look and feel of the place and the landscape of the estate and the woods complement the other activities on the estate, whether that's for livestock shelter or sporting aspects tourism aspects...and there is a biomass boiler so we are interested in wood chips' (Estate manager, LM11)

There is timber income from commercial forestry crops, amenity and biodiversity benefit from native woodlands and that is part of the context for the visitor aspects and we have a pheasant shoot and also some shelter belts so there is a farming aspect' (Estate manager, LM2)

Two interviewees (LM5, LM9) also identified the multi-purpose benefit of woodland fencing in relation to effectively 'zoning' their holdings to exclude livestock from steep ground and facilitate potentially conflicting land uses in the same landscape. Both private and conservation holdings highlighted the wildlife and conservation function of woodlands, in relation to species (e.g. black grouse) and habitat conservation. On conservation holdings, woodlands were also perceived as having a critical demonstration and educational value for visitors and in terms of demonstrating the biodiversity benefits of specific management regimes. In some cases, these '*biodiversity values*' were linked to managers placing a specific personal value on wildlife aspects and relating this to specific incidents of species or habitats which had benefitted from the presence (or expansion) of woodlands in recent years (Box 2).

Box 2 Land manager perspectives on the wildlife values of the woodlands on their holdings

'One of the main things is that...the Oak woods are a wildlife corridor and we get all sorts...red squirrels, roe deer, woodpeckers, badgers, osprey and reptiles, so that is important to us, on a personal level but also we want to make sure what we are doing is right for the environment' (Farmer LM14)

'For us probably the biggest benefit of the woodland is the wildlife and just seeing that or knowing it is benefitting, we have had a barn owl here with two clutches of chicks this year, that is something we like to see and it is rare for here. That is mainly down to the mice and voles which use the woodland and there is a lot of them around at the moment' (Estate manager, LM5)

Overall, several farmers and estate managers recognised that the existing and potential future woodlands on their holdings were likely to have increasing importance to their business model going forward, either linked with productive components, or in relation to their potential natural capital values.

4.4 Recent and new woodland creation aspirations

Table 3 (Section 4.2) summarises recent woodland creation as estimated by land managers for their holdings. An estimated 530-630Ha of new woodland had been established on the landholdings in the sample over the last 5-10yrs, with an emphasis on mixed productive schemes and smaller areas of mixed native broadleaved woodlands and native pinewoods, with most of the woodland creation on farms (<100Ha of the total) consisting of native schemes. A significant area of native woodland (~1700Ha) had also been restored across the conservation holdings over a longer (20-25yr) timeframe.

Land managers also estimated their woodland creation aspirations for the next five years, which totalled 1500-1600Ha across the 17 holdings. This included a range of potential schemes, with an emphasis on mixed productive schemes, native woodland creation for carbon units and smaller scale mixed native broadleaf schemes. Most of the aspirational woodland area was located on private estates (~1100Ha), around a quarter of which consisted of amenity/biodiversity schemes, with the remainder being mixed-productive schemes, with a further 440ha of aspirational schemes on farm holdings (most of which related to one large prospective scheme) and 50-100Ha related to regeneration and planting on conservation holdings. The combined area of aspirational schemes (1500-1600Ha) would equate to an estimated 22-24% increase in the woodland area across the 17 landholdings. Notably, these represent woodland creation aspirations only and as noted by some interviewees, whether they occur (and their final scale and timescale) will relate to a combination of factors (see Section 5). In addition, the sample was purposive and self-selecting and therefore more representative of land managers with some interest in woodland creation rather than of all land managers across the National Park. Nevertheless, these estimates are indicative of current positive attitudes towards woodland creation (with only one land manager explicitly stating they had no interest in woodland creation) and represent a test bed for assessing ongoing constraints for woodland creation in the National Park going forward.

As two estate managers (LM4, LM11) noted, uptake of woodland creation is related to a combination of external opportunities and pressures and an internal process of prioritisation of activities over time. As one explained:

'We only have so much capacity and you have your objectives and you assess those against your capacity and what is available to you and where you are in working through those...woodland aspects coming to be more of a priority for us now and looking at options for mixed schemes and discussing the best timescale for that in terms of the available opportunities' (Estate manager LM11)

Woodland creation opportunities were also assessed in relation to management and/or conversion of existing woodlands and plantations on land holdings, including through the process of developing a Long Term Forest Plan (LTFP) in some cases: *'We have been scoping out potential new planting areas and have identified over 500Ha of possible planting so we are hoping to flesh that out further, but that*

is also being considered in terms of managing the existing woodlands, so even if we are not creating new woodland we may be doing other things in the woodlands' (Estate manager, LM5).

Both estate managers and farmers repeatedly referred to the importance of new woodland '*fitting in*' and complementing existing activities on their landholdings. On some holdings this was perceived as requiring a small-scale incremental approach to avoid major change while optimising land use: '*We will increase woodland cover over time, but a lot of this will be smaller scale, so maybe not a big stat for hectares converted, but it will diversify the landscape and range of trees and bring some of the less productive areas into better use. A 30Ha scheme may seem small but it is a big change when it increases your woodland cover by 30%*' (Farmer, LM5).

In addition to integrating with other land uses, a further aspect referred to by conservation and some private owners, was the potential for new woodland creation to enhance woodland connectivity within holdings or at landscape scales, including through grazing reductions to encourage montane scrub and riparian woodland. Landscape scale approaches were referred to by both estate and conservation holding managers as increasingly important but necessitating a challenging balancing of fencing and grazing reductions. As LM5 and LM7 explained, grazing pressure necessitated fencing for woodland creation, with both steep terrain and higher net costs acting as limiting factors for smaller or more linear woodlands. Reflecting some of the points made by the land managers, the perspectives of forestry agent interviewees on the current uptake of woodland creation are shown in Box 3.

Box 3 Forestry management agent perspectives on new woodland creation uptake

Forestry agent interviewees collectively viewed any apparent upturn in interest in woodland creation in the National Park as part of a wider pattern of increasing interest in forestry, linked to policy targets, increased awareness and a stable Forestry Grant Scheme. Several agents (A3, A4, A5, A7) referred to a recent rapid increase in promotion, with farmers perceived as more aware of the opportunities relating to native and productive woodland creation. As one stated: *'Interest has gone up definitely, there is a lot of new information, more promotion...Scottish Farmer now do a forestry feature every three weeks...and everyone has ideas and is talking about it and worried about climate change and aware of the markets.'* (Forestry agent, A4). Nevertheless, reflecting the points made by land managers on aligning the timing of land use changes with emergent opportunities, some agents (A5, A9) suggested that some landowners may be hesitant to commit to schemes due to wider uncertainty. As A9 stated:

'If people think a huge gravy train is coming they may be inclined to hold off for better times and there is a lot of uncertainty just now, although the wind is in the right direction I think in the short term people are a bit cagey about committing at this particular moment. But there is such a drive for more woodland creation it will work through' (Forestry agent, A9)

Interest and uptake of woodland creation were perceived as varying in relation to location/region, grant levels and other factors (physical constraints etc.). Two agents (A2, A3) noted the potential for higher uptake in some regions linked to higher grant rates (in particular the additional Central Scotland Green Network Grant contribution (£2500 or £750 per/ha) in Central Scotland) as resulting in lower levels of uptake in other regions (e.g. the National Park). A2 and A8 also referred to the impact of investment companies undertaking woodland creation at larger scales on woodland creation rates. As one stated: *'There are really two different strands of activity, farmers and smaller scale schemes and larger scale investment driven forestry...yesterday I was looking at a 200ha plantation scheme in the morning and a 0.5ha native scheme in the afternoon'* (Forestry agent, A2). This *'dual strands of activity'* perspective was also reflected in the target market for different agents/forestry companies, with some larger companies focusing on the larger scale investment-driven market, while others focused more on native schemes or the farm-forestry market (although a diversification of activity was evident even among the largest companies). Additionally, as A8 noted, current uptake of woodland creation was in fact very mixed in terms of scheme size, with an average scheme size in Scotland of 26ha over the last year.

The type of woodland creation being undertaken was seen as variable and linked to wider objectives, land use context and owner needs for short term income versus a longer-term investment-oriented perspective (A3, A5). This shorter term perspective was referred to by some (A3, A4) as resulting in farmers often being more interested in productive schemes as *'the language of a growing crop that generates a clear income over a specified time period was one that farmers could relate to'* (Forestry agent, A3). As A1 noted, the desire to increase efficiencies and develop viable forestry operations on larger estates also required an emphasis on increasing productive conifer components to facilitate a more regular felling regime (and income). Some agents (A2, A6, A7, A8) specifically identified an ongoing shift in the motivations of their client base, with owners increasingly interested in natural capital values, including biodiversity and the potential for carbon schemes (see Section 5.2.3). As A4 noted, landowner objectives also had to be assessed against site suitability, as well as consideration of the National Park context, which required a greater emphasis on native species (see Section 5.1.5).



5. Decision making influences for woodland creation uptake

This section sets out the results from the land manager and forestry agent interviews organised under three main themes: i) Individual, social and cultural factors; ii) economic factors, markets profitability and incentives; and iii) environmental and resource/capacity factors. A fourth cross cutting theme is also presented on the role of advisors, knowledge exchange and skills development.

5.1 Individual, social and cultural factors

This section sets out findings on the motivations and attitudes of landowners and managers and their management ethos, with a follow-on section on the relevance of ownership change and succession to land use change. These broader motivations represent the management context for decisions relating to woodland creation. The third sub-section sets out findings relating to the role of identity, peer networks and cultural factors, including the perspectives of forestry agents on the influence of cultural factors on woodland creation. The fourth sub-section focuses on land manager and agent perceptions of regulatory controls and approval processes for woodland schemes. Collectively, these factors are variable and context specific (i.e. in relation to land use mix, holding scale etc.) and relate to an owner or manager's '*willingness to adopt*' woodland creation. Individual, social and cultural factors also relate to owner/manager knowledge of woodland management and their use of advisors. The perceived role and motivations of forestry agents are set out in Section 5.4.1 as a cross-cutting theme.

5.1.1 Owner and manager attitudes, motivations, and management ethos

The land manager/owner group, when discussing their motivations, commonly referred to the management ethos of their holding directly, with most seeing their personal motivations as directly intertwined with the management ethos and objectives of their holdings. Four main themes of motivation and ethos were apparent: i) financial sustainability and succession planning; ii) rural community sustainability; iii) environmental and conservation ethos; and iv) productivist motivations. These were emphasised to a greater or lesser extent by different interviewees. Table 4 presents the main components of the four themes and example quotes which reflect related perspectives in each case.

While the main themes have been distinguished here to illustrate the range of underlying motivations, they were commonly referred to as being interlinked, with managers required to balance them against each other: '*The whole process is about constantly trying to achieve a balance between environmental, economic and social outcomes, the environmental side has been increasing...because of owner motivations and wider opportunities. Every decision is a blend of all these factors...what you do is determine in which parcel which will take precedence*' (Estate manager, LM11). Estate managers and farmers also referred to the importance of land uses complementing each other, to ensure landholdings worked as an integrated whole in both financial and land use terms (LM2, LM5, LM6, LM15). A number of estate managers also referred to the importance of strategic decision making and a long-term perspective (LM2, LM5, LM6, LM7). As one stated: '*You use the land short term, but you take long term management decisions, considering the long-term picture...what will the picture be in 20 years' time? We always say live as if you'll die tomorrow but farm as if you'll live forever*' (Estate manager, LM6).

Table 4 Key motivations and values of land managers across the sample

Motivations	Related example quotes from land managers/owners
Theme A. Financial sustainability and succession planning	
Generating sufficient income to cover costs and diversifying;	<i>'Want to sustain estate as a viable business that's looking after the countryside long term'</i> (Estate manager LM2)
Financial stability to enable delivery of other objectives;	<i>'Financial sustainability is key...trees could work if they don't impact farming or deer, but has to make financial sense...can't make decisions that aren't financially sound'</i> (Estate manager, LM9)
Facilitating long term family retention and inheritance of a viable asset.	<i>'Main thing is keeping our head above water or we won't be here, so diversification can help, the hydro scheme has helped'</i> (Farmer, LM10)
	<i>'Financial sustainability...but fundamental only in terms of enabling other aspects...It must be better when I leave...package as a whole has to work'</i> (Estate manager LM6)
	<i>'To keep it as a functioning viable unit by integrating across activities...to hand it to next generation without it being asset stripped...would become unviable. You need a fair acreage to achieve economies of scale on this ground'</i> (Farmer, LM5)
	<i>'To ensure the estate can retain itself and its integrity and viability long term'</i> (Estate manager, LM7)
	<i>'Running a sustainable unit, reason to diversify was to stay on the land...need an income to achieve that...and objective is to leave it to sons'</i> (Farmer LM12)
Theme B. Rural community sustainability	
Contributing to local economic impact and job creation;	<i>'Long term sustainability...and fostering jobs, estate very important locally and we aim to help grow the local economy...lots of families employed'</i> (Estate manager, LM2)
Playing an active role in the community and long-term links;	<i>'We are known in the community and supply...local businesses with outputs...and involved in tourism group...create jobs and very involved in community'</i> (Farmer, LM12)
Maintaining rural communities	<i>'Very interested in community...huge amount of history...enterprises are part of the estate community as is the sheep farming...need to retain those communities'</i> (Estate manager, LM7)
	<i>'Community aspects and job creation are important to us...vice chairman of [a local partnership initiative] and we take the community seriously'</i> (Estate manager, LM6)
	<i>'Focus is linking agriculture and tourism and basically rural sustainability, farm to farm, forest to farm. Business model is good and a part of the community'</i> (Farmer, LM15)
	<i>'Conservation aims should be compatible...not a desire to take farming out of the hills, more trying to balance it with supporting livelihoods'</i> (Conservation manager, LM8)
Theme C. Environmental and conservation ethos	
Sustainable land management and environmental responsibility;	<i>'Owners see they have an important role in wider rural context...in deer management...peatlands and woodlands...of increasing importance and environmental schemes'</i> (Estate manager, LM4)
Habitat and species conservation/restoration;	<i>'Conservation ethos...and restoration of degraded habitats, to achieve a balance where we can have as much...natural habitats as possible either not being harmed by the grazing or with extensive enough grazing'</i> (Conservation manager, LM8)
Visitor engagement and promoting best practice	<i>'We feel we have a responsibility as a landowner to the environment, to contribute to improving that and the habitats on our land'</i> (Estate manager, LM6)
	<i>'Conservation ethos improving and restoring the woods and our own recreation, and reducing the deer numbers'</i> (Private woodland owner, LM16)
	<i>'Approach has to be environmentally sound while maintaining viability'</i> (Farmer, LM5)
	<i>'Role is to have a positive impact on species and habitat condition while promoting good practice...and being an exemplar to other places'</i> (Conservation manager, LM14)
Theme D. Productivist motivations	
Retaining a traditional land use	<i>'Would call myself a farmer at heart in my blood. Actively involved in lambing, calving but...broad minded as look at all enterprises on the estate as equally important. I want to be proud of our products... [and] I feel a responsibility to my livestock'</i> (Estate manager, LM6)
Personal connection/identity linked to farming	<i>'Agricultural land use, running a hill sheep farm as a business and traditional holding...Our role is food production...looking after the stock, good animal husbandry'</i> (Farmer, LM13)
High quality animal husbandry/outputs	<i>'Personal enjoyment, to go out to the hills is great...all the sheep going off the hills is sad, it is important for us to keep a reducing industry going'</i> (Farmer, LM10)
	<i>'Need to keep up sheep farming [in areas where] sheep are gone its very rank ground not nice to walk on, if you do that everywhere the hillwalkers will be first to complain'</i> (Farmer, LM5)

Financial sustainability or viability was referred to by most interviewees as a critical ‘enabling factor’, which facilitated long term retention of their holdings (and succession planning) and a financial ‘self-sufficiency’. Financial aspects were considered holistically and referred to in relation to allowing managers to achieve their land management objectives. As one explained: *‘We must have sustainable financial management to improve the holding and our resources for future generations. Recently we have probably had more emphasis on environmental, but it is holistic, we are not focused exactly on financial returns for the sake of it...but broadly it pays for itself or is profitable or else you can’t achieve your other objectives’* (Estate manager, LM4). With the exception of NGO-owned holdings, the landholdings in the sample were primarily dependent on income derived from activities on their holdings.

The rural community sustainability theme was referred to by all landowner types, with estate managers placing particular emphasis on their long-term role in the community, including in relation to job creation. Both farmers and estate managers also linked this theme to an emphasis on maintaining traditional land uses (sporting and livestock farming) to ensure rural livelihoods were retained. Some estates also emphasised the impact of their diversification on job creation, while some farmer interviewees noted their long-term family role in the community and linkages with local businesses. Environmental dimensions were often referred to in relation to playing a stewardship role and improving holdings and the desire to *‘leave the holding in a better state than when we inherited it’* (Farmer, LM5). Conservation land managers placed the greatest emphasis on large-scale conservation and a visitor engagement ethos, while also acknowledging their role in the local community and economy. Productivist dimensions, which emphasised retaining livestock production and high quality animal husbandry, were most apparent on farms and on estates with strong farming interests and link directly to the importance of farmer identity in relation to woodland creation uptake (see section 5.1.3).

5.1.2 The role of ownership or generational change on landholdings

A further factor recognised by both the land manager and forestry agent groups, was the potential for motivations to evolve or shift rapidly in response to a change in ownership or a generational change in management (i.e. retirement of an owner and a younger family member taking over). The impacts of ownership change or generational shifts were evident within the landholdings sample, with the two newest owners (LM15, LM16) both actively exploring options for woodland creation schemes and one farmer (LM12) acknowledging that a key driver for woodland creation was to facilitate his sons inheriting a viable diversified farm unit. The impacts of generational change were also evident on one of the smaller estates (LM9) and on one of the larger hill farms (LM13), in relation to efforts to diversify to ensure longer term financial survival. This perspective on generational or ownership change as a ‘tipping point’ for land use change was reinforced by comments from forestry agent interviewees in relation to farm holdings (see Box 4). In addition, both A5 and A8 referred to examples of recent woodland schemes on estates for carbon and woodland habitat restoration, which were linked to either generational change or an estate purchase by a new owner: *‘we definitely see that now in our clients, a move towards rewilding schemes and carbon interest and the younger generation coming through, who sometimes have a bit less interest in the hunting, shooting and fishing element of estate ownership’* (Forestry Agent, A8). These agents (A2, A5, A8) also identified a lower level of interest in woodland creation among longer term resident owners relative to new owners, linking this to the fact these established estates/farm holdings were operating embedded land use models and therefore potentially resistant to any large-scale changes which would disrupt or alter existing systems.

Box 4 Forestry agent perspectives on the role of ownership changes on woodland creation

'You will go and speak to a farmer...been working there all his life but the son is there too and he is taking it on afterwards...and the son is sitting there listening and thinking...I have been back to many farms where the father has retired or passed away and the son is saying I am not doing what my father done working himself to death on a farm, we could put some trees in here and make a fair amount while retaining the better ground for farming. So it is generational, changing as it goes...younger farmers coming in having new ideas...and trying to find ways of diversifying'. (Forestry Agent, A2)

'Most tree planting happens because of a change in ownership, it is a misapprehension that existing owners do most of the planting. Scottish forestry tend to go after existing owners...but historically it's happened when they have sold their land and a new woodland oriented purchaser arrives or someone takes over. If you are a sheep farmer for sixty years you're unlikely to suddenly change...but many farmers are close to retirement...so will have to make a decision...that is when things change. The long-term owners have not done much of the planting in the park' (Forestry Agent, A5)

'Farming families have changed...kids move away and do not always come back to the farm. That is where you see whole farms being sold off, which is when you see a land use change. So whether the next generation takes on the farm or it goes on the market is important' (Forestry Agent, A7)

5.1.3 Farmer identity and cultural factors

Reflecting the productivist theme in Table 4, some land managers (LM10, LM12) linked their views on woodland creation directly to their identity as a farmer. As one stated: *'I am a sheep farmer...so not a particular tree lover and there are lots of trees appearing partly because of the reduction in stock...so we are losing ground, our focus is on retaining the sheep'* (Farmer, LM10). Others spoke about the attitudes of their neighbours or farm tenants (LM6, LM7), in relation to how individual views on woodland creation were linked directly to self-identify:

'I remember speaking to a shepherd who retired, and he said he liked not seeing trees during his work because open ground was his livelihood...and some farming neighbours will see it as a loss of agricultural land, so you look at what defines what you are about' (Estate manager, LM6)

This estate manager (LM6) viewed farmer resistance to woodland creation as an issue of *'mindset rather than one of margins'*, suggesting that grant availability would not necessarily incentivise all farmers to plant. This was perceived as requiring a more fundamental shift towards perceiving forestry as complementary to their business (LM6, LM5). This view was reinforced by forestry agent experiences (see Box 5), who identified an emotional link to farming, embedded land use models and a lack of forestry skills as translating into a lack of confidence and negative perceptions of forestry.

Box 5 Forestry agent perspectives on cultural barriers to woodland creation uptake

'Confidence is an issue...and there is a need for cultural shifts. Farmers can be nth generation, sheep is in their blood, what they want to do, what they know...hard to get past that'. (Forestry Agent, A3)

'There's lots of emotive factors, farmers are quite right rightly tied to the land and a feel for it...forestry is seen as the enemy...If farmers decide to do it...to make money and diversify, that's a different kettle of fish but if they see it as imposed on their interests it can be difficult'. (Forestry Agent A9)

'Farmers have always done things a certain way, they have always farmed...they don't really know a difference. Most places you go are keen on doing it, but it just takes a change in attitude. Most farms, there is always space for trees and farming, and we would try to facilitate that. (Forestry Agent, A2)

Other interviewees referred to an ongoing *'total disconnect'* between farming and forestry and the lack of a *'farm-forestry culture equivalent to mainland Europe'* (Conservation manager, LM3), as a barrier to woodland creation. This was reinforced by forestry agents, who related this disconnect to the historic *'separation of farming and forestry'* between estates and farm tenants, which has resulted in an engrained perception that *'forestry is seen as taking land off farming'* (A3, A9). As A9 explained:

'Tenants intrinsically...have a deep loathing of forestry...it has always been the landlord's thing and in the past that was used as the way landlords could take farms back...so it has a bad feeling for a lot of tenant farmers, and in their soul they find forestry a bit threatening'. (Forestry Agent, A9)

This 'trade off' between these land uses was apparent on one of the estates (LM7), which had recently afforested part of an area which had been taken back in hand from a retiring farm tenant. This separation of forestry and farming was also associated by some agents and land managers (A9, LM6, LM3) with a poorly developed sense of land use integration on some holdings and an undervaluing of woodland resources, leading to many woodlands being under managed. As A9 stated:

'For farmers woodlands are often seen as somewhere to shelter sheep and doing the best for the forest is a sideshow to farming, but if they are diversifying then it is a resource. So...you either get indifference and put the sheep in or fell it all for my wood boiler, neither is great for forestry'. (Forestry Agent, A9)

High apparent levels of individual land manager awareness of (and potential interest in) woodland and environmental opportunities (see Section 4.4) was seen as being offset by a **recent 'backlash'** from the farming sector, due to an increasing perception of forestry as a threat to hill farming. This was linked to *'cyclical effects'* and the current strength of forestry markets (Section 5.2) and the view that *'investment driven large scale afforestation'* was resulting in whole farm buyouts and the incremental loss of hill farming communities (LM10, LM12, A3, A9). As one agent explained:

'There has been a big theoretical shift, in terms of farmers being more accepting of greening...and woodland as a potential source of income, that combined with climate change is creating a lot of interest. But more recently there has been a backlash and the farming lobby has become more entrenched...and negative towards forestry as it is such a threat now'. (Forestry Agent, A9)

Integrated farm-forestry was therefore recognised as offering greater scope (over large-scale investment forestry) for supporting development of a farm-forestry culture (A9, A3, LM3, LM6). As A9 explained: *'In social terms, it is probably much better to keep farmers on the land who are part of the community... A lot of the forestry buyers, well...some are very different, but many...just want the investment so although you go through the motions...it's not very localised in terms of benefits'*. (Forestry Agent, A9).

In relation to the National Park most interviewees recognised that (outside of Scottish Forestry's influence and Forestry and Land Scotland activity) forestry and woodland culture was not particularly coherent or prevalent within the region. Nevertheless, several estates (LM2, LM6, LM7) expressed support and interest in strengthening forestry sector activities within the National Park. Both LM6 and A2 also recognised the importance of direct involvement in woodland creation and management and the longer term incremental effects of recent, current and future woodland schemes (including small scale initiatives) on the development of a longer term woodland culture within the National Park: *'Getting involved, planting trees...and then when those trees grow and people interact with them, generational change...that will build momentum around woodlands'* (Forestry Agent, A2). As A8 and LM3 noted, the development of a more visible and coherent woodland culture in the park also related to a gradual forestry upskilling across the land manager community, both to facilitate the identification of woodland-related opportunities and for taking forward woodland enterprises in the future.

5.1.4 Peer to peer communication and the neighbour effect

A further factor referred to by interviewees from all landholding types and by forestry agents, related to the role of peer groups and experiencing woodland creation schemes (directly or on a neighbour's land) for altering attitudes towards woodland creation. This was linked to shared experiences through trusted channels and 'first-hand' experience of new woodland schemes. As one farmer explained:

We are thinking of diversifying...and our neighbour knows a lot about it [woodland creation] and has done a scheme and he is helping me put together a proposal. So a combination of the grants being favourable and our neighbour providing the advice, that has been a big influence. And...four farms around us have planted in last few years so it is the natural run of things now for us' (Farmer, LM13)

This 'word of mouth' effect was also referred to by forestry agents, who frequently mentioned their experiences of land managers referring to the activities of their neighbours and the 'ripple effect' between land managers as a key influence on woodland creation uptake (see Box 6). Previous direct experience of woodland creation (and experiencing the benefits) was also linked to decreasing the perceived risks and uncertainties linked with future schemes for land managers (LM7, A7). As one agent explained, undertaking smaller schemes 'created confidence for owners, if it all works out, and they gain an awareness of the process and the benefits for them' (Forestry Agent, A3). Some interviewees highlighted the potential of agroforestry schemes in relation to stimulating interest as they offered scope for integrating trees into a holding without loss of existing land uses (LM1, LM15, A5)

Box 6 Forestry agent perspectives on the influence of peer to peer communication on woodland creation

'Once they see the benefit of it...they tend to do it again and word of mouth is critical. There isn't one farm I have been to where the farmer doesn't mention someone they know who has done a scheme and made X amount of money'. (Forestry Agent, A2)

'We see the ripple effect all the time. Do one good job and the guy over the fence speaks to his neighbour and then approaches us. Your best advert is your last job'. (Forestry Agent, A5)

'They hear about it from other farmers, that is critical...not going to go for it unless they find out from other farmers...It doesn't take much, you just need a few people that have made a success from it and then there is such a network of communication with farms, if you just get a few influencers or champions...that would show that despite some farmers having an intrinsic problem with forestry if the money is sufficient and they can retain their existing farming they will go for it (Forestry Agent A9).

5.1.5 Perception of regulatory controls

In broad terms, the views of land manager interviewees of the National Park as the regional planning authority were either neutral, or broadly positive. The majority (9) stated that they valued their relationship with the National Park Authority, with some recognising that the NPA had limited capacity and were 'constrained by wider park policy and bureaucracy' (LM5, LM6). As one stated:

'I would say we get on very well with the National Park, have worked with them on lots of projects. Previously I think they had a lot of vision and were prepared to do bigger things but they got tied up in regulation and covering their back more recently and a lot of pressure from various interest groups and FOI requests...now perhaps they struggle a bit to see what the vision is' (Estate manager, LM6).

Some smaller landowners felt the National Park had had a limited impact for them, with the exceptions noted by this group being park support for habitat impact assessments within their Deer Management Group and the provision of advice (LM10, LM12). In addition, some (LM4, LM6, LM16) argued for greater engagement between the National Park Authority and land managers. As one landowner stated:

'They are doing their best...the staff are good people trying to do a good job...but they are not really engaging as fully as they could be with farmers in particular....there are still plenty of small farmers and family farmers in the NP, a lot of hill land and when I read the website it feels like their main audience is visitors...an ongoing programme of farmer engagement...would be great' (Landowner, LM16)

Nevertheless, two of the smaller landowners in the group (LM15, LM16) had both received advice on woodland creation from the National Park which they viewed positively, with one having successfully applied for the National Park Tree Planting Grant.

Land manager interviewees referred to woodland creation as a complex process which can take considerable time to implement, with complicating factors including site designations, EIA requirements on sensitive sites or for larger schemes and the requirement to develop a Long Term Forest Plan (LTFP) to facilitate Forestry Grant Scheme applications (LM4, LM6, M14). The constraint most frequently identified by land managers and agents linked to regulatory aspects related to the timescales for consultations and obtaining feedback on scheme proposals from Scottish Forestry and the National Park Authority (see Box 7). Some forestry agents referred to timescales from 12-24 months to achieve approval (A1, A5, A8, A9), with the process perceived as exacerbated by a large volume of detailed feedback and requirements for changing schemes (A1, A3, A9). Both A8 and A9 linked perceived delays to the complexity of modern schemes, organisational capacity (in both the NPA and Scottish Forestry) a current high number of applications, and structural changes within Scottish Forestry. A1 and A5 also suggested that forestry had a low prioritisation within the National Park Authority, relative to planning or landscape concerns (with implications for aspects such as forest access roads), which were seen as taking precedent, resulting in a bureaucratic consultation process within the National Park Authority:

'The woodland officer in the National Park Authority is very approachable, very helpful and...gives a good, informed opinion. But you have him advising from a woodland perspective...but then you are off to the landscape person and a landscape appraisal, but I don't think they have an awful lot of experience of forestry. They know what looks pretty...and then you have to go to the planning people around getting access...which is also challenging. As a whole thing it could be more joined up' (Forestry Agent, A1)

Based on these concerns some agents (A1, A5) argued for a streamlining of the application process on the basis that it would encourage proposals and facilitate higher levels of woodland creation.

Box 7 Land manager and agent perspectives on woodland scheme feedback timescales

'The biggest barrier for us has been the feedback from the National Park. For example...we [recently] applied for an EIA determination to plant a small area of native broadleaf in an area surrounded by native broadleaf woodland and it took six months to get that approved...It is miniscule detail rather than looking at the bigger picture...that is causing frustration. For one scheme some time ago...it took four years to get consent. (Forestry Agent, A1)

'Process was slow...impact assessment and lots of surveys. The National Park woodland plan had identified this glen and we thought if we came up with something that would expedite anything we try to do, but still had to keep a lot of people happy. They had identified where they want trees but they weren't falling over backwards to make it simple...an uphill struggle...Would be good to try to streamline the process...Could some of that could not be short circuited for...native woodland schemes...a lot of spending just to start a scheme moving' (Estate manager, LM5)

'The process for getting a scheme approved is very difficult...unnecessarily long winded...If you start you will not get approval within a year. We are thinking what next...but no chance of planting before 2022...hopeless at churning through decisions. We need a transparent speedy decision-making process with Scottish Forestry and the National Park, that's an impediment' (Estate manager, LM2)

Some forestry agents (A1, A2, A3, A5, A9) argued that the perception of the National Park as a region where woodland creation proposals faced above average approval timescales and more stringent approval requirements created greater uncertainty and risk, which represented a potential barrier to uptake of woodland creation for landowners. As two agents stated:

Scottish Forestry...has had a lot of new blood in...less experienced, so paperwork slowed down a bit, so combined with the National Park, that can take a 6-8 month scheme a year or 18 months to get it approved in the park. So there is a bigger delay. That may explain why schemes are not going through in the National Park, if timescales double people will invariably go elsewhere. The landowners want to move fast, they don't understand the delays. I had a landowner recently shouting at me after a month, you are not moving fast enough where is my contract! Mostly it is just impatience. (Forestry Agent, A2)

'There is probably a higher risk of a scheme being declined in the National Park so forestry investors may not see the park as a good place to invest...because of perceived risk of getting approval so have probably voted with their feet and gone somewhere where there is more certainty'. (Forestry Agent, A8)

The perceived added complexity and longer timescales for woodland schemes was also recognised by some agents as equating to higher upfront financial costs for owners:

'If I am doing anything in the National Park, I would double the cost and the time you are going to spend on it than for elsewhere. That's because of the park authority and sensitivities, longer timescales and you will have to make more compromises. Any planting scheme is a gamble but in the National Park it is double the risk in terms of what you end up with versus what you wanted' (Forestry Agent, A9).

Despite criticisms relating to approval timescales, both owners and agents recognised that aligning schemes with regional sensitivities and requirements was critical, and where this was embraced schemes were generally progressed (LM6, LM7, A2, A4, A9). As one argued: *'experience of going through the planning process in the National Park for something else hardens you as to what to expect and it is a valid process...so the woodland creation scheme was less of a shock for us'* (Estate manager, LM6). A second estate manager agreed with this sentiment: *'The process is ok, probably no more red tape than I expected for...We had a more frustrating experience in terms of putting a road into an existing woodland...might have seemed very negative if we had come to it with no former experience'* (Estate manager, LM7). Forestry agents also recognised the importance of taking regional sensitivities into account in proposals and involving stakeholders from the outset (A4, A5). Others (A8, A9) emphasized the importance of fostering good working relationships and an open dialogue with stakeholder organisations to build trust and ensure obstacles were identified at an early stage.

Box 8 Agents on the importance of recognising sensitivities in woodland proposals in the National Park

'If someone new is starting it feels like a brick wall...and the speed of feedback is a bit slow but if you work with them and get feedback in time then you can relay that to your clients. Even the big commercial companies do recognise the constraints. They will push for the maximum commercial component but even they realise they have to modify their plans. I get on well with National Park staff, it is mainly about modifying your aspirations a bit'. (Forestry Agent A2)

'The National Park status is ok on new woodland creation, we have seen bigger hurdles than the park authority...sometimes it makes it easier as you know who you are dealing with and you know the policy...so it is about matching what they want...but that's fine, as a commercial business we make as much money planting native as conifer so we don't have a preference'. (Forestry Agent, A5)

'I don't think it [the National Park] is a big positive or a big negative for woodland creation. They want to see more woodlands but it is a national park so there are sensitivities for landscape and all that and native is seen as preferable so you work with that' (Forestry Agent, A4)

The most commonly referred to area of sensitivity in relation to woodland schemes in the National Park related to commercial forestry, or more specifically the emphasis on productive conifer elements within a proposal (i.e. productive component as a % of the total scheme). As one agent explained:

'It's easier outside the National Park to do commercial, so it tends to be about reducing the amount of commercial as a proportion of your scheme, outside you could probably get 60-70% commercial conifer under UKFS requirements, inside the park you will get less. For new schemes we go straight to National Park and the first thing they say they want native broadleaves. So, we agree but balance that against an element of commercial...if you get 40-50% commercial you are doing well'. (Forestry Agent, A2)

This was referred to as a negotiation, due to the potential for higher returns (and lower long term financial risk) from Sitka Spruce than for other tree species, with A1 for example, noting that they often included a higher component of commercial conifer within initial scheme proposals on the basis that this would be diluted downwards by 10-15% (following consultation). However, as A2 noted, if initial scheme proposals failed to adequately account for the sensitivities within the National Park this was likely to require a greater degree of scheme modifications and further feedback at a later stage.

In some cases, forestry agents (and some land managers) equated a perceived '*bias towards native*' in the National Park as a product of a wider historic devaluing of commercial forestry in Scotland:

'When the National Park started conifers...were seen as toilet rolls, and...tax breaks and there was nothing good about commercial forestry. So...the way the forestry advisor worked was entirely anti anything to do with production...all to do with low impact and landscape. I think that culture is still there and there is a sort of presumption...against commercial forestry. They pay lip service to it, but they don't really like it because you have to put in roads...so a lot of downsides for the park (Forestry Agent A9)

Others (A1) linked the perceived positioning of the National Park in relation to productive forestry as partly relating to the existing high levels of productive conifer plantations on Scottish Forestry land within the park. A8 also argued that the potential contribution of productive forestry for mitigating climate change (through sequestration and substitution) and in relation to strengthening the park economy, were under recognised currently within National Park. Nevertheless, others perceived the emphasis on native woodland in the National Park's woodland strategy as understandable given the park context (A4, A5), with A7 arguing that a National Park should focus on native woodlands, connectivity and enhancing biodiversity, particularly given the current dominance of non-native conifers in the region.

Land managers had mixed views in relation to the National Park's Trees and Woodland Strategy, with some broadly supportive, while a minority acknowledged they had not considered the strategy in detail. Two (LM11 and A3) suggested the areas identified as potential and preferred did not always reflect the reality on the ground in terms of suitability for woodland due to physical constraints and/or access, arguing that proposals would need to be considered on a site-by-site basis in conjunction with the strategy maps. LM6 also identified a need for greater one to one engagement with land managers to support them in identifying opportunities and streamlining the process. Other land managers (while broadly supportive) argued that the strategy reflected a high-level document which lacked additional support for encouraging woodland creation '*on the ground*' (LM3, LM4, LM6, LM11).

Some land managers and agents (LM2, LM6, A8) identified the strategy as an opportunity for promoting the role of forestry and woodlands in the National Park going forward. As one stated:

'It's great they have a strategy...we don't like it all as it is probably a bit too native oriented...but it will influence our decisions in the future. They need to be more glued together with Scottish Forestry and use that to evangelise about forestry and successful schemes to encourage others to do similar things. They have an important role to play in management and creation of woodland'. (Estate manager, LM2)

Nevertheless, reflecting the constraints discussed previously, other agents (A1, A3, A8, A9) argued that the strategy lacked clarity or was limited in relation to recognising the potential for well-designed productive woodland schemes in the park and related benefits.

In addition to regulatory constraints, land managers also recognised the importance of considering community concerns in relation to new woodland schemes in the National Park. Several (LM3, LM6, LM8, LM14) referred to the challenge of managing community concerns around changes which had the potential for impacting landscape, access, wildlife or culturally important features. As one outlined:

'You often feel like you are being kicked all the time and it is difficult as what people want can be mutually exclusive, people conflict within the community on what they want from us! Community engagement is not easy as there is not a unified way of thinking for them either'. (Estate manager, LM6)

Forestry agents reinforced this view, with A8 and A9 recognising that community interests represented an important 'unknown' factor for woodland schemes, which were potentially exacerbated in the National Park due to landscape sensitivities. This was perceived as requiring a proactive approach and early engagement with communities and wider stakeholders when taking forward new schemes.

5.2 Economic Factors – Markets, profitability and incentives

This section sets out findings relating to economic factors, with the first sub-section discussing the influence of forestry and agricultural markets on the relative financial attractiveness of woodland creation. This is followed by a discussion of the influence of forestry income timescales and the potential for generating income from smaller scale forestry markets. The third sub-section sets out opportunities and challenges relating to carbon markets and their potential for incentivising woodland creation, with the final sub-section setting out the perceived role and influence of financial incentives. Collectively these factors form an important set of 'external behavioural influences' and predominantly relate to an owner or manager's 'ability to adopt' woodland creation.

5.2.1 Markets and relative profitability for forestry and agriculture

All of the forestry agent interviewees recognised the current buoyancy of forestry markets and in particular the increases in timber and forestry land values in the UK in recent years, as influential in relation to land use outcomes (with UK log values now equivalent to EU forest log prices). This buoyancy was seen as driving investment in forestry and woodland creation, with knock-on economic impacts (A4, A5, A9). These market trends were seen as further compounded by improvements in valuing natural capital assets related to forestry (A8) (see Section 5.2.3). These market shifts were occurring in parallel with agricultural policy shifts and changes in agricultural markets. Current strong lamb prices were perceived as facilitating investment in agricultural activities in some cases (LM10, LM6). However, this was offset against a projected decline in lamb prices in 2021²⁰, rising staffing and input costs, increasing legislative requirements and an uncertain long term context in relation to trade (Brexit) and future agricultural support payments (LM5, LM10, LM12). Forestry agents reinforced this view (see Box 9), recognising longer term uncertainties as potentially highly influential in relation to the long-term retention and viability of marginal hill farms, with implications for both uptake of woodland creation on existing holdings and/or farm sales to forestry investors (A4, A7, A9).

²⁰ See the [UK Sheep Outlook Report for 2021](#)

Box 9 Forestry agent perspectives on the impact of forestry and agricultural markets

'Always going to be a competition between upland farming and forestry and they are terrified of what is going to happen going forward with trade...and uncertainty in relation to support systems...land for sale now always attracts forestry interests not farming interests, so the direction of economic travel is absolutely in favour of forestry replacing a lot of upland grazing. Currently a forestry buyer will outbid any agricultural buyer, so effectively we are in that position already so it is the shortage of land that will slow it down' (Forestry Agent, A9).

'Farmers are looking at current land uses, their profitability and constraints...so the changes happening outside of forestry are becoming bigger drivers. Sheep farming is becoming less viable and we see many farmers struggling to make ends meet at the smaller scales and environmental requirements post Brexit could squeeze this further' (Forestry Agent, A3)

'Its volatile prices go up for timber but then also for sheep, so it really depends on the longer term a bit. When sheep prices do down that encourages people further' (Forestry Agent, A4)

'Many farmers are on the edge financially...an ageing farmer population...and not all have children interested in farming. Once they start losing sheep...we will see a rapid change'. (Forestry Agent, A8)

These market factors, combined with an evolving policy context (climate change, land reform, agricultural policy), were seen as collectively increasing the drive among farmers and estate owners to diversify and make more productive use of marginal areas to enhance their financial resilience (A6, LM7). Some expressed a long-term commitment to their farming activities, while recognising the need to capture new opportunities where possible, either related to a land use change (i.e. woodland creation) or business diversification (e.g. tourism) (LM5, LM6, LM7, LM10, LM11). As LM6 noted, previous estate diversification (a hydro scheme, café, holiday cottages and re-investment in farming) had increased the financial resilience of the estate during the Covid-19 pandemic. As apparent from Section 4.4, most land managers recognised the potential for woodland creation as a diversification opportunity, in relation to grant capture, future timber or biomass income, or carbon income. As A4 and A1 noted, for most landowners, the decision as to whether to create woodland related to the potential contribution of that land use change to the retention and financial sustainability of their holding long term.

5.2.2 Income timescales and small-scale forestry market potential

One constraining factor for some land managers for diversifying into forestry related to the longer-term income timescales for productive forestry, with 'pure farmers' seen as reliant on annual income streams linked to their current activities (LM6, LM7, A4, A2). As A4 outlined, obtaining income from *'a thinning in year 18-19 and a felling at year 35-40 might be ok if you have a big farm and can shift land uses around, but not if you have limited land and that means losing your annual income'*. This was perceived as requiring a change in mindset, and consideration of cashflow needs in the shorter term versus long term capital gains (A4). A2 and LM7 also noted the requirement for a continual longer-term outlook was also critical to allow land managers to respond to market opportunities, with forest plans and felling licence applications requiring long timescales for approval. The complexity and approval timescales for developing new schemes also necessitated higher up-front costs, which represented a perceived risk (in cashflow terms) for some farmers and landowners (A5, A9). As one agent explained:

'You have a landowner being involved with a consultant for a couple of years and paying a bill to get it approved which is uncertain...most do get approved...So if you ask for £10,000 up front it is a hard sell...Might not get a result for 2-3yrs...The initial grant won't cover all costs but after 2-3yrs it goes into a positive cash flow situation'. (Forestry Agent, A5)

Both land managers and agents also recognised the increasing potential for generating income from smaller scale forestry markets, including biomass and woodfuel. A4 and A9 both argued that increasing

demand for biomass offered scope for shortening income timescales due to the increased value of thinnings from conifer and broadleaf woodlands and the potential for using spare farm capacity (e.g. sheds, tractors etc.). This was also reflected in the interest shown by both smaller and larger landowners in the sample holdings in biomass, particularly in relation to supplying their own biomass boilers (LM4, LM5, LM11, LM14). The potential for shorter rotations (~30 years) for Sitka at higher yield classes at high timber values also represented an opportunity to close the farm-forestry divide, due to high profitability relative to traditional livestock farming activities (A9). Nevertheless, others recognised the need for greater expansion and promotion of smaller scale woodland enterprise and markets, including within the National Park, to increase awareness of related opportunities (LM3, LM6, LM7, A5).

5.2.3 Carbon markets

The increasing potential for generating income from marketing carbon units under the Woodland Carbon Code (WCC) was recognised by most of the forestry agents and several land managers, as an increasingly important driver for new woodland creation. This included an example of a recent scheme on one of the landholdings (LM7) which had been successfully accredited for carbon units and several owners interested in taking forward WCC accreditation as part of future schemes. Nearly all forestry agent interviewees had been involved in schemes seeking WCC accreditation, including schemes in the National Park, with agents noting a surge of interest in registering schemes from mid-2020 onwards (A2, A3, A5, A6, A7, A8, A9). A3 and A5 both identified the reality of existing successful schemes as key to building interest among land managers, with carbon increasingly seen as a financial asset. Some agents (A4, A6, A9) highlighted the importance of being able to demonstrate 'additionality'²¹ under the WCC requirements, which resulted in certain schemes not being eligible (e.g. a scheme receiving a substantial regional grant supplement) and created challenges for registering woodland schemes retrospectively. Nevertheless, for suitable schemes the sale of carbon units was perceived as acting as a potential alternative 'top-up' to shift them to a financially viable position (A3, A4, A5). Four main strands of discussion relating to carbon emerged from the interviews and are summarised below

i) *Efficiencies of scale and aligning with woodland scheme objectives*

While some agents (A6, A7) recognised that WCC registration was possible for smaller (<10ha) schemes (and two of the smaller landowners expressed interest in WCC accreditation) due to a simplified application process for 'small' projects, most agents referred to '*efficiencies of scale*' for carbon schemes due to fixed registration costs, survey requirements and time costs (LM3, A4, A6, A9). In addition, three land managers (LM2, LM3 and LM6) felt the 'carbon model' was more suited to larger and more permanent native woodland schemes. In contrast, generating income from carbon through productive schemes was seen as less feasible, which resulted in some land managers perceiving carbon schemes as 'a permanent change in land use' which would result in a loss of future land use flexibility (LM2, LM6). As LM2 explained, such a permanent change required a high degree of long-term market certainty, which was not currently the case with carbon markets:

'If we had 100ha and we planted a permanent woodland for carbon...it's a one way land use decision...so you don't make that in the hope you might end up with a good carbon income... You cannot go down that journey without certainty...it must have an ongoing income function. At £26 a tonne it means you don't need to plant it commercially, but at £7 no way...you need the carbon market to replace the cost of not harvesting it'. (Estate manager, LM2)

Nevertheless, as A9 and S2 noted, scope existed for mixed woodland schemes with productive conifer components and substantial native components (e.g. 30% of a 200Ha scheme), which could be registered and marketed for carbon income. In addition, some interviewees referred to examples of

²¹ Under the WCC [additionality requirements](#) a project is only 'additional' if it requires carbon income to turn it from a project which is not financially viable (in its own right, or compared to an alternative non-woodland use) to one which is financially viable.

collaborative schemes in the National Park, where agents had linked schemes across ownerships to 'scale up' effectively to reduce costs and maximise carbon income (LM16, A7, A8).

ii) Carbon as an uncertain emergent market

Both agents and land managers referred to carbon as an emergent or 'immature' market, which resulted in increased scepticism and uncertainty around potential returns (A1, A8, A9, LM2, LM4, LM6). This was perceived as exacerbated by some over-stating of carbon income potential by some of those operating in the carbon market (A3, A4, A5). As A5 explained:

'Some people are promising very high prices. We had a client approached by a carbon salesman, told him he would get Yield Class 24 Sitka...and £30 per carbon unit, but...no one else was seeing those growth rates. We need independent impartial advice...on the income potential'. (Forestry Agent, A5)

In addition, carbon prices varied widely (from £7 to £20 a tonne) between schemes, with buyers often interested in more ecologically beneficial schemes, which command a higher carbon price (A6). This was perceived as creating further uncertainty and elevated expectations around returns from WCC schemes. A8 and A9 also highlighted the potential for longer term risks and uncertainties, including (for example) in relation to tree diseases and storm events and potential large-scale tree losses.

iii) Carbon market transparency

Reflecting the uncertainties linked to the immaturity of the carbon market, land manager and agents frequently referred to a lack of independent market information and confusion in relation to carbon values (LM2, LM9, LM13, A5, A7). As LM2 explained, current pricing appeared to vary, with different carbon marketing companies paying different rates to landowners and selling at different (higher) rates to the companies buying carbon units, resulting in an apparent lack of market transparency. The lack of market transparency was also referred to by agents (A6, A7, A8), who acknowledged that landowners may not always be aware of the pricing their carbon was being sold on to companies for. This factor, combined with the overall market opportunities for carbon, had led to some of the larger forestry management companies to develop their own 'in-house' carbon marketing teams, to provide this service directly to landowners/investors.

iv) Validation and carbon neutral land use

Some agents and land managers (A3, A4, LM6, LM14) raised concerns relating to the sale of carbon units as potentially justifying emissions elsewhere as opposed to contributing to climate change mitigation through additional carbon sequestration. As A4 argued: *'there is a lot of double counting and smoke and daggers...I like to know it's sucking in the carbon not that we are selling it all off...that is justifying emissions, there is potentially no benefit to the planet. Some people are making a lot of money out of this and if it is just facilitating holiday travel that's just stupid'*. Some land managers related this view more directly to their own landholding and the view that they may be required to offset their own emissions in the future (i.e. Net Zero commitments), which necessitated a cautious approach to marketing carbon (LM6, LM11). As A2 noted, this highlighted the importance of gaining WCC accreditation for new woodland schemes where relevant, to ensure carbon could be marketed in the future or used to offset estate or farm emissions as part of a carbon accounting process. In this regard, future legislation relating to Net Zero was seen as a potentially key driver of future carbon prices (A6).

5.2.4 Land-based financial support mechanisms

Most land managers and agents viewed planting grants as fundamental for enabling them to consider and take forward woodland schemes, in relation to reducing the initial outlay and financial risk. Importantly, grants represent one key factor among a range of other factors influencing woodland creation. As LM11 and A2 noted, grants also influence the scale and type of schemes undertaken, with

these interviewees both identifying increased grant rates for broadleaf planting (within target areas) as having influenced their inclusion of a larger component of broadleaf planting in recent schemes. As some agents (A2, A4, A3, A8) noted, not all woodland schemes were dependent on grants to be financially viable (due to timber prices etc.), but despite this, the removal of woodland grants would most likely result in a severe decline in woodland creation. Both land managers and agents viewed the current Forestry Grant Scheme positively, referring to current grant rates as sufficiently generous, attractive for owners and sufficient for stimulating woodland creation (LM5, LM7, A1, A3). The Forestry Grant Scheme was also referred to as a stable scheme *‘delivering the bulk of what is required from it’* (A3), with a very high success rate for applicants, which was perceived as critical to build confidence and reduce the perceived financial risks associated with woodland creation (A4, A5).

An important related influence referred to by five land managers (LM5, LM9, LM12, LM13, LM15) was the ability for landowners to retain Single Farm Payment entitlements on afforested ground under the current SRDP. This was referred to by some managers (LM5, LM11, LM15) as further *‘reducing the perceived risk related to a long-term change to their business model’* (LM15). Nevertheless, as A2, A8 and LM15 noted, *‘agricultural payments may not be around forever’* (Forestry Agent, A2), with A8 noting the potential for future subsidy systems to be based on a payment for ecosystems services model, which offered potential benefits for landholdings with diversified land uses. Across the interviewees, four key themes emerged in relation to current incentive mechanisms, which are summarised below.

i) Achieving financial tipping points

Four agents (A2, A3, A4, A9) referred to the Central Scotland Green Network planting grant supplement (a grant top up of £2,500 or £750 per hectare) being unavailable within the National Park, as a disincentive for landowners to undertake woodland creation. As A3 explained *‘that annoys or dissuades many landowners from planting as grants are seen as not good enough relative to outside the Park’*. While these interviewees recognised that new native woodlands and diverse conifer schemes in the National Park received a 10% uplift on FGS rates²² (to reflect the emphasis on new woodland in the NP Trees and Woodland Strategy), this was seen by some as limited relative to the CSGN top up rates and insufficient to account for planting constraints in the National Park. A3 and A4 both suggested that without a substantial grant supplement, landowners did not make a sufficient surplus to incentivise them to undertake schemes based on the FGS grant. A4 and A9 proposed a park-specific premium (of £2000 per hectare) linked to preferred/potential areas in the Trees and Woodland Strategy, as the most impactful mechanism for moving beyond a financial tipping point for increasing woodland creation in the Park. As one agent argued, a premium offered scope for *‘owners to cover all their costs on challenging sites and for more land to come forward from farmers as opposed to from farm buyouts and investment forestry, which is probably where most of it is coming from just now’* (Forestry Agent, A9).

ii) Managing financial risk and uncertainty

One factor influencing grant uptake recognised by some land managers (LM1, LM4, LM5) related to the risk of the loss of management grant payments following the three-year assessment, subject to scheme losses (i.e. tree failure rates and resulting stocking densities). As one land manager explained:

‘A key aspect of why landowners are slow to engage in woodland creation is the perceived risk. For our scheme...due to a certain percentage of failure of the trees, we did not get all our final grant payment. That was a Woodland Grant Scheme grant with phase three originally to be after five years. But we did not get the payment for this until after the fifteenth year.’ (Land manager, LM1)

This concern was confirmed by other interviewees, with A4 linking the uncertainty around grant payments and tree failure rates with reduced uptake among some groups and a current increased

²² See: <https://www.lochlomond-trossachs.org/park-authority/blog/national-parks-trees-woodlands-protected-enhanced-new-strategy/>

emphasis on large-scale investment planting, which generated income from multiple sources including grants, timber and carbon. Grant payment risks were seen by some (LM4, LM5, LM6) as compounded by slow payment timescales, resulting in high upfront costs for landowners. As one land manager explained: *'We took out a big loan from the bank to cover the establishment costs before grant came through...and it was very, very slow to pay out...at one stage we were laying out £200,000 in one lot, but Scottish Woodlands were delayed with certain aspects...and that helped us'* (Land manager, LM5).

Recently, some potential for supporting landowners undertaking smaller (<50Ha) woodland creation schemes in relation to up-front costs was noted in relation to the development of a low-interest Small Woodland Loan Scheme²³ by Scottish Forestry, although it was acknowledged this would not address cashflow challenges for larger schemes with limited cash reserves (A5, A4). A further measure highlighted by some agent interviewees (A1, A7), was the availability of small grants (through the Farm Advisory Service and from the Cairngorms National Park Authority's Woodland Challenge Fund) to support the initial stages of developing an application to Forestry Grant Scheme. Both agents and land managers (A1, A7, A8, A9, LM4, LM12, LM15) suggested such an approach could act as a supportive 'nudge' to ease potential grant scheme applicants into the process in the National Park.

iii) Matching grant options to woodland creation schemes

Some land managers referred to difficulties in matching the available options under the FGS to their schemes. This reflected comments above in relation to aligning schemes with grant requirements for stocking densities and growth rates on less productive sites (LM4) and specific comments on covering the costs of fencing and providing insufficient support for regeneration-based schemes. Four land managers (LM6, LM8, LM14, LM16) referred to the risks associated with undertaking regeneration schemes due to the low payments rates and potential for losing some of the grant payments due to insufficient stocking densities. As LM8 explained, site surveys had shown very variable regeneration rates across their holding, leading to nervousness about relying on natural regeneration to obtain the grant payments. While LM14 acknowledged that the required stocking densities for regeneration schemes had been reduced under the FGS, the lower grant rates for low density schemes was seen as making them unappealing for most owners. As this interviewee stated: *'When Scottish Forestry came out and looked he said ours was the only regeneration scheme he had ever looked at, so I think it is seen as too much trouble for owners to look at regeneration as it's a low grant rate and a bit of a risk...so it maybe isn't taken up much'* (Land manager, LM14). As one land manager noted, fencing sometimes represented the limiting factor for achieving the grants payments for regeneration schemes, as, in some cases, using the more suitable ground required fencing over steep slopes or across access routes, which was not feasible due to costs and practical constraints. Some land managers (LM8, LM16) and one agent (A7) argued that current options under the FGS were limited for those mainly interested in biodiversity, with less scope for regeneration schemes and 'naturalised woodlands' with lower stocking densities, due to a focus on specific species and stocking density targets.

iv) Grant scheme complexity and smaller woodland creation schemes

The final point identified on incentives related to the perception by some forestry agents that due to the complexity of the current FGS it was less cost effective for smaller woodland schemes (particularly <10ha). A3 argued that the complexity of the application process resulted in schemes below this threshold being less financially viable, with the standard short-term 'break even' position for landowners being above the 10ha threshold. This was perceived as resulting from an intentional focus within the current FGS on productive and larger-scale schemes, which had reduced the options (relative to the previous WGS) available for smaller woodlands and shelter belts (A2, A3). In addition, smaller schemes often included a higher proportion of capital costs than for larger schemes due to fencing requirements and a lack of scale efficiencies, reducing the potential for cost savings (A3, A7). In some cases, larger landholdings had overcome this by combining multiple separate planting blocks into one larger scheme

²³ See: [Scottish Forestry - Small Woodland Loan Scheme](#)

or increasing the size of their proposal, an option unavailable to much smaller owners, with some potential recognised for owners to collaborate on schemes to increase efficiencies of scale. One area perceived as having value in terms of demonstrating support and engaging smaller owners or ‘new entrants’ to woodland creation related to the availability of smaller planting grant schemes (LM3, LM12, LM14), including the National Park’s Tree Planting Grant²⁴ and the Woodland Trust’s small planting grants²⁵. Nevertheless, as A3 and LM11 noted, these schemes were targeted at very small-scale woodland creation and required an element of management time and paperwork for a limited return.

5.3 Environmental and resource/capacity factors

This section outlines influences for decision making relating to environmental and resourcing or capacity factors. This includes a summary of environmental constraints, followed by a second sub-theme relating to the availability and suitability of land for planting and a final sub-theme relating to capacity and resourcing, including forestry skills gaps and the potential for collaborative woodland creation schemes. These factors relate primarily to a landowner or land manager’s ‘**ability to adopt**’ woodland creation.

5.3.1 Environmental constraints

Both land managers and agents often referred to physical constraints as a defining feature of the National Park, with some farm holdings including large areas of ground over 2000ft. This created challenges relating to soils, steep slopes and accessibility, which limited the scope for new planting on some holdings (LM4, LM5, LM10, LM12, A4, A7). These factors also had cost implications, with elevated fencing costs on higher and more remote holdings due to the need for helicopter transport for materials, rough ground and increased labour costs (LM8, LM10, LM12). Environmental constraints, including severe weather events, also had potentially serious cost implications, as one estate manager explained: *‘We had an amazing flood last year, wiped out miles of fencing, river changed course and we had 60 landslides. I don’t think we’ve had water like that down the river since the ice age... You have to fence native woodland unless you are willing to take a big hit, so very careful where we are putting fences and some are inaccessible...that’s the main mitigating factor for woodland creation, where can we put in a fence that won’t get knocked by landslides, snow or floods’* (Estate manager, LM5).

The need for fencing was largely dictated by grazing pressures, with challenges relating to deer management discussed frequently in relation to woodland schemes (LM1, LM3, LM6, LM8, LM16). While deer represented a commercial opportunity for some estates, they were also identified as a management cost for effective woodland establishment, particularly for schemes using natural regeneration and/or on conservation focused holdings where even low deer densities represented a challenge in the absence of fencing (LM3, LM8, LM14, LM16). This was compounded by the presence of dense plantations on or near some holdings, which deer used as cover during the day, making stalking and population counts challenging (LM8). Feral goats and sheep are also viewed as a challenge which can not always be managed by fencing due to their movements and limitations on fencing in some areas (LM8, LM14). LM8 and LM10 also recognised the potential for livestock reductions to result in increased deer numbers on some holdings. As recognised by some land managers (LM5, LM8, A7) a further important environmental threat related to plant health and tree diseases, with invasive species (and particularly Rhododendron) also noted as a widespread woodland invasive in the National Park.

5.3.2 Land availability and suitability for woodland creation

Most land manager interviewees referred to barriers for woodland creation which related to the availability of suitable land (LM3, LM5, LM8, LM9, LM10), the limited scale of their landholding (LM12, LM15, LM16), loss of farming capacity (LM6, LM7, LM10, LM11, LM12), or impacts on other existing land uses (sporting land uses and/or visitor access and habitats) (LM7, LM9, LM10, LM14, LM16). The

²⁴ See: <https://www.lochlomond-trossachs.org/park-authority/how-we-can-help/funding-grants/tree-planting-grant-scheme/>

²⁵ See: <https://www.woodlandtrust.org.uk/plant-trees/large-scale-planting/>

scale of holdings in the National Park was smaller than in some other parts of Scotland, with effective land use trade-offs and increasing the economic viability of woodland creation recognised by some land managers as more feasible on larger estates (LM1, LM11, LM17). Some specifically identified a need to retain grazing for their livestock and the concern that afforestation was a permanent change to their business model: *'you need to be very certain with trees as it's for the long term and ensuring it's not going to cause you problems with other land uses'* (Estate manager, LM6). Four land managers (LM7, LM9, LM10) also referred to the permanency of a change to woodland cover and the potential longer-term loss of flexibility and control. As LM7 explained, this was also considered in relation to land-based financial support measures:

'Depends on how it integrates long term with farm support...remember once it's planted it's a one way street, it is difficult to get it back so it is a fundamental decision for a property...which affects your business model and your ability to respond to future change'. (Estate manager, LM7)

As identified previously some farmers referred to natural regeneration on their land due to reduced livestock densities, which had reduced the area of land available for grazing (LM10, LM12), with LM12 estimating that over 100ha of birch regeneration had occurred in recent years. Some land managers also referred to designations, protected species and areas of deep peat, which restricted the availability of land for planting and/or constrained their ability to plant a large block, due to the mosaic of habitats and soil types in a specific area (LM6, LM9, LM11). As LM11 explained:

'Some designated site constraints...also the biggest bit of the estate has too much contiguous peat or patchwork peat, you could fence an area off but only plant in a patchwork. And most of the other suitable land for planting is where the farming is, that's a harder conversation' (Estate manager, LM11)

Two estates (LM7, LM17) also referred to the potential for new woodland creation to impinge on their sporting operations due to the loss of open ground and lower ground deer over wintering areas and the potential for forestry to provide cover for predators. In addition, a minority (LM9, LM14) referred to the potential for new woodland schemes in apparently suitable areas to conflict with access routes due to fencing needs. These views on land availability were reinforced by agents, with A9 identifying current policy uncertainties as resulting in some estate managers delaying land use change decisions due to an emphasis by long term resident owners on retaining a balanced land use mix. As A5 noted:

'Availability of land to deliver new woodland is a constraint now, we are seeing a pent-up demand from external sources and policy...but historic resident owners are not doing enough as they don't have the land available...That is a combination of their existing objectives and also low interest rates, so probably less pressure to do something different from what they have done historically' (Estate manager, A5)

Despite these concerns, land managers recognised the potential benefits from an integrated approach, which used less productive/marginal ground for woodland creation and associated shelter, carbon and biodiversity benefits (LM5, LM9, LM11). As LM11 stated: *'Important for us to think strategically and use what are perhaps neglected areas more effectively to change the balance a bit and capture the collateral benefits of diversification and climate change, we can benefit the farm with these woodlands as they can allow us to replace fencing at a lower cost to the farming operation'*.

A further specific barrier to land availability related to the challenges of planting on tenanted ground. This included agricultural tenancies but also two farms with specific tenancy arrangements relating to areas of their ground, which were perceived as restricting their planting options (LM1, LM10). Farm tenants were viewed as either uninterested (due to the need to retain grazing land) or insufficiently incentivised to plant due to a complex decision-making process and the need to come to an agreement around grant payments (LM2, LM6, LM7, LM11, LM17). As one estate manager explained:

'I don't see tenants driven to undertake woodland schemes...unless there was a major restructuring of farm support, I can't see a big incentive commercially or personally for them...the tenant would need to come out of part of their farm. There are woodland leases, we have one, but it was quite specialist and done with a forestry company...to allow them to plant and harvest one crop of trees. So that is possible but it is complicated and there are what ifs in there, like a serious windblow...who bears the cost, so it is a bit of a minefield for a tenant' (Estate manager, LM7)

This view was reinforced by agents (A2, A4, A9). As one stated:

'The farm-tenant landlord thing is...one of the biggest constraints because you just don't have enough money to go around from the grants to make it worth everyone's while. If you could get the tenants able to make money out of forestry in ways that fitted with their farming system, that is where this combination of grants and private carbon funding could make all the difference. But there are the legal constraints and by the time you split up the pot there is not enough money to go around to make it very worthwhile for either party so it tends to just not happen'. (Forestry Agent, A9)

Reflecting these perspectives, some agents and estate managers (A6, A9, LM6, LM7) recognised the existence of farm tenancies as a potential longer-term barrier to woodland creation on their holdings due to the inheritable nature of secure tenancies. This was illustrated by one example of an estate buying out a tenant when the tenancy became available, and developing a 200ha woodland scheme (LM7). Despite these barriers, agents also recognised the potential benefits of woodland creation on tenanted land for tenants and estate owners (A2, A4) and some examples of successful afforestation on tenanted ground were evident among the estates in this study based on specific tenant-owner agreements (LM2, LM7).

5.3.3 Capacity and resourcing

Most land managers identified their forestry skills and experience as limited, with some having considerable experience of mixed estate management but varying knowledge of forestry specifically (LM2, LM4, LM7, LM9, LM11). In addition, those managing conservation holdings (LM3, LM8, LM14) had varying levels of experience of woodland management and had progressed woodland restoration schemes 'in-house'. One estate manager (LM6) also had more extensive experience of productive forestry, with LM7 also recognising a strong interest in forestry. Staffing capacity with relevant forestry experience was therefore limited across the sample, with some of the farm holdings (LM5, LM10, LM12) also identifying limited staff capacity (and higher staff costs) more generally, which reduced their ability to prioritise woodland related activity. Some agents (A3, A5, A9) reinforced the view that staff and manager time was a limiting factor for uptake of new woodland creation:

'A key barrier for farmers is time to consider it but then time to actually manage it...We will say they will need to weed a new woodland...we go back and no weeding has been done, so time is an issue for farmers in relation to staying on top of maintenance they are just always busy' (Forestry Agent, A3)

In relation to increasing capacity, land managers (LM3, LM8, LM14, LM15, LM16) and forestry agents (A3, A8, A9) recognised greater potential for collaboration between landowners for sharing capacity (e.g. staff, machinery) and generating scale efficiencies in relation to woodland creation, silvicultural management, timber production and generating income from carbon. Collaborative approaches also offered opportunities to facilitate strategic landscape scale approaches, improve woodland connectivity and share experience (LM3, LM8, LM14). Both landowners and agents (LM3, LM15, A5, A8) also identified the potential for greater support for landscape scale schemes under future models of land based financial support and the relevance of the emphasis on large-scale approaches through the

emergent Regional Land Use Partnership pilots²⁶ in Scotland. As one agent argued, landscape scale approaches offered scope for smaller owners to develop cost-effective multi-purpose forestry schemes:

'Why don't three landowners get together and each contribute some ground and have the other land uses elsewhere on their land...That would justify putting in a road and managing that area productively, could have native woods elsewhere on the properties and space for farming to maximise subsidy benefit. We do need to start viewing land use change and woodland creation at a landscape scale...It may be acceptable to have...productive conifer in a certain area as the landscape can tolerate that or you can mitigate that. Or other areas what you need may be [habitat] corridors'. (Forestry Manager, A8)

This limited capacity at landholding level reflected agent concerns that the wider forestry sector was currently facing a severe shortage of forest managers (see Section 5.4.3) due to increased forestry activity and woodland creation (A3, A5, A8, A9). A5 and A8 identified this gap as an opportunity for increasing training and output of relevant forestry/resource management graduates across Scotland and collaborative initiatives between colleges/training providers and other key stakeholders.

5.4 The role of advisors, knowledge exchange and skills development

This section sets out the final cross-cutting theme relating to the role of advice and guidance and knowledge exchange in woodland creation uptake. The first sub section focuses on the key role of advice and guidance and sets out land manager and forestry agent perspectives on the role of forestry agents in relation to woodland creation in the National Park. The second sub-section summarises findings relating to the perceived role of knowledge exchange and forestry and woodland management skills development in relation to future woodland creation uptake.

5.4.1 The role of forestry advisors

Due to the limited forestry skills and capacity referred to by most land managers and the technical nature of forestry, eleven holdings in the sample had used (or would use) professional forestry management agents/consultants when taking forward new woodland schemes. In addition to this reliance on professional expertise, some land managers also referred to the importance of learning through experience of smaller scale woodland management or creation (LM1, LM12, LM15, LM16) and getting advice from the National Park Authority and Scottish Forestry (LM4, LM11, LM15, LM16), as well as from a neighbour with relevant experience (LM13). The importance of impartial advice for owners for encouraging woodland creation was highlighted by some agents (A3, A8). As A8 stated:

'In Grampian because of low uptake, Scottish Forestry are trialling funding woodland advisory officers...to do site visits to farmers...look at what options they have, discuss their objectives and how to accommodate woodland and fit that with allowing them to manage the land more effectively...proper advice, certainly helpful and might help target and unlock things'. (Forestry Agent, A8)

The most frequently referred to rationale for contracting agents was in relation to their ability to rapidly assess the best options available to a landowner (including grants) and access sufficient skills and experience (i.e. capacity) to develop a technical woodland scheme proposal and navigate the planning and regulatory system. The role of agents was linked by some land managers (LM2, LM4, LM5) to reducing the risks and uncertainties associated with undertaking a technical forestry scheme and increasing their confidence to take a scheme forward. In several cases, the use of agents appeared to represent a combination of land managers using their own awareness and knowledge to identify an opportunity and employing agents to implement technical design and silvicultural aspects and decrease any uncertainties relating to gaining scheme approval. This reflects the view of agents themselves in relation to their role and influence, which are set out in detail in Box 10.

²⁶ For further information on the Regional Land Use Partnerships see [here](#).

Box 10 Forestry agent perspectives on their role and influence in the National Park

Forestry agents identified their role as a combination of providing owners with advice on their options for woodland creation and related grant options and managing scheme implementation (A2, A5). Agents were also responsible for managing large parts of the park's privately owned forest resource, playing a role in the park's forestry economy through employing contractors and facilitating silvicultural management and woodland creation (A5, A8). Most agents recognised their level of influence on scheme characteristics as varying according to owner certainty and knowledge, with most owners having a reasonably clear idea of what they wanted to achieve and employing the agent to develop a more detailed design and implementation plan (A2, A4, A5). As one agent described:

'Most know what they want, it's not often they ask us what to do, sometimes you translate for them...to tell them what type of woodland can deliver what. There was one owner didn't have a clue and we said what do you want and pieced it together for him, but most know what they want'. (Forestry Agent, A2)

A3 and A5 also framed their role in terms of a two-way dialogue, with farmers in particular seen as interested in productive forestry but often unsure of what species mix or scale of scheme to pursue, which required agents to present them with short and longer term financial implications for a variety of options to identify the most suitable approach. Others (A1, A8) identified their main influence as relating to forest design planning and good silvicultural practice: *'We have got an influence...through designing and sending over the detailed design plan for the scheme, so in terms of how we apply sensible forest design principles to that'* (Forestry Agent, A1). A4 and A5 also identified the importance of identifying the advantages and values of forestry and woodlands within the context of the owners holding and making the case to support landowner decisions:

'The owner is always swayed by other factors...and people they have had a longer relationship with...So usually you are not a decision maker at all we are handicapped bit players trying to make the case for forestry and usually if there is enough money in it for them they will do it' (Forestry Agent, A9)

'It's giving them the nudge to get them to do it, that may come from a generational change, or a sale, or being convinced by people like us that it is the right thing to do at this stage. Landowners know forestry is there as a positive option for them it's just nudging them over the line' (Forestry Agent, A5)

In relation to their own personal or professional values three agents (A2, A4, A9) said they valued mixed or 'multipurpose' forestry due to their productive forestry backgrounds and the capacity of mixed schemes to deliver a wide range of objectives and generate income to support management. In contrast, A7 aligned their values more closely with environmental and biodiversity interests, which was reflected in their professional interest in native woodland schemes, while recognising the importance of commercial schemes for delivering on economic forestry goals. Others (A1, A6, A5, A8) placed an emphasis on being 'client driven', which in some cases required an investment-oriented commercial forestry focus, while in others (due to changing client objectives) required an emphasis on broader objectives (e.g. natural capital). Some agents also identified their role in relation to keeping aware of policy and regulatory shifts and developments within their sector, as well as influencing policy going forward, with some agents having contributed to policy development and improving the knowledge base for forestry management through research initiatives and forestry sector market development (A2, A8)

5.4.2 The role of knowledge exchange and outreach

Interviewees recognised the importance of information exchange in relation to increasing awareness and land manager confidence to undertake woodland creation, particularly for smaller scale landowners (A2, A3, A8, LM3, LM15, LM16). As one farmer explained:

'We took part in a webinar with the Soil Association, had an expert on agroforestry with cattle...we didn't even realise that was possible. And we spoke to advisors, from the National Park and the Soil Association when we were planting the trees...very helpful free advice' (Farmer, LM15)

Some agents and owners also highlighted the need for good quality impartial advice and information on key topics due to ongoing uncertainty around land use, markets, and policy, with specific areas of interest including carbon markets (see Section 5.2.3), smaller scale forestry markets (see Section 5.3.2) and agroforestry (A3, LM3, LM15). While some interviewees (A1, A4) argued that knowledge exchange was insufficient to create land use change without the support of other measures, others (A8, LM3, LM15, LM16) felt that information sharing was becoming increasingly important to challenge engrained attitudes and allow owners to learn and adapt to future changes and threats. As A8 explained:

'Webinars and things do work. You have to challenge people's thinking; people know what they know but they don't know what they don't know! Some may have the inspiration then to try something. We have this chasm that we call climate change and we can't do it in steps we are going to have to leap across...there is going to have to be a lot of change very quickly. I think that those land managers that move more quickly and more positively will get more benefits from those changes.' (Forestry Agent, A8)

Two land managers (LM3, LM16) highlighted the importance of events and outreach for addressing engrained perceptions and facilitating dialogue between stakeholders and land managers 'on the ground'. This was seen as relevant (for example) to addressing the apparent perception that undertaking woodland creation in the National Park was more challenging than in some other parts of Scotland (see Section 5.1.4) (A2, A3, A5). Both landowners and agents (A2, A8, LM3, LM16) emphasised the importance of a localised approach that fostered direct engagement between (trusted) peers, reflecting the importance of the influence of neighbours taking on woodland creation schemes and the ripple effect (Section 5.1.4). Both A2 and LM16 argued that localised outreach, where participants knew or were aware of each other, would receive greater uptake and offered scope for strengthening the perceived role of land managers in the National Park. As LM16 explained:

'It would be great to have a programme of engagement with farmers going around local areas and having meetings...giving the farmers...the initiative and say what's the agenda you want for this local meeting...obviously other stakeholders can then put in their own issues...Pie and a pint maybe...Give them some ownership and responsibility for the National Park and defining what is it we need...as well as the National Park defining what they need from the land managers and residents' (Landowner, LM16)

5.4.3 Forestry and woodland skills development

As outlined above land managers often lacked forestry experience and skills, which was referred to as potentially affecting land managers' perceptions of woodlands as a diversification opportunity (LM11, LM14). Smaller scale owners and some farmers expressed an interest in forestry and woodland related training (LM12, LM13, LM15, LM16). Some interviewees (LM6, A3, A5) also highlighted the specific need for increased awareness and experience of woodland related commercial opportunities at smaller scales (i.e. woodfuel or biomass enterprises), reflecting the market opportunities described in Section 5.2.2. A3 and A9 both argued that training and direct experience in forestry enterprises offered scope for utilising spare farm capacity (machinery etc.), increasing land manager/farmer forestry knowledge and skillsets and contributing to the development of a farm-forestry culture (see Section 5.1.3). As A3 explained, increased direct involvement of farmers in forestry activities offered considerable potential for increasing their confidence in undertaking future woodland creation:

'Establishment is complex and a new woodland needs to be right from the start, farmers do not have the expertise, a lot of information to consider to execute a woodland scheme...It is a challenging to expect farmers to become foresters, but they could prune, thin and do some harvesting and they

understand markets. What would help is farmers being able to understand what they want to achieve and taking more of an active interest and they would then be in a better position'. (Forestry Agent, A3)

The forestry skills gap was also reflected in concerns raised in relation to wider capacity gaps across the forestry sector, with several forestry agents referring to insufficient availability of forest managers and forestry graduates to address the increasing demand across the sector related to increased woodland creation and investment in forestry (A5, A8, A9). Some interviewees related this to the closure of forestry schools and an incremental loss of silvicultural capacity across Scotland. A5 recognised the potential for the National Park Authorities to play a role in relation in highlighting career opportunities in forestry and working with other stakeholders to promote increased development of relevant qualifications and training across Scotland. Some interviewees (LM7, A1, A3) also noted the importance of alternative approaches to involving a wider range of people in woodland management, including through community woodlands²⁷ and the development of 'woodlot'²⁸ enterprises and woodland crofts.

²⁷ In the National Park these included [Crianlarich Community Woodland](#) and [Cormonachan Woodlands Trust](#) (among others).

²⁸ A woodlot enterprise had been established on one of the estates in this study, which involved the estate setting aside a small area of under managed woodland and asked for proposals from individuals or groups to manage it and establish a wood-based enterprise based on removal of non-native trees and re-establishment of an oak woodland (with three people currently managing the woodland as a cottage industry).



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6. Discussion and conclusions

The findings from this research demonstrate a high level of interest in woodland creation at small to medium and larger scales (i.e. >100ha) within the land manager sample. This suggests that the National Park's current woodland creation target (an additional 2000ha of woodland by 2023) is broadly consistent with current levels of interest in short term uptake of woodland creation. Notably, the sample of landholdings in this study, while diverse in terms of geographic representation, size and type, represents a purposive and partly self-selecting sample. Those included may therefore view woodland creation more positively than some other landholdings in the National Park. A degree of hesitancy is also evident among some owners in relation to taking forward new woodland schemes, due to uncertainties around future agricultural support and carbon funding and the perceived challenges of undertaking woodland creation in the National Park. Nevertheless, with a combined interest within the sample for creating over 1500ha of woodland in the next 3-5 years, this suggests the potential and capacity for new woodland creation exists to match current targets – which further reinforces the importance of identifying current constraints to scheme development and implementation and providing additional support measures where required. As apparent from sections 4.1-4.2, natural regeneration is also occurring on holdings across the park, including as part of fenced regeneration schemes, but also naturally, mainly due to reduced livestock grazing pressures in recent years. This represents an important additional opportunity for increasing the area of native woodland across the National Park.

The findings of this study (Sections 5.1-5.4) reflect many of the constraints to woodland creation identified in previous studies, including that financial incentives represent only one of a combination of social, economic and environmental/capacity factors which can constrain uptake (Dandy, 2012; Lawrence et al. 2010; Lawrence and Dandy, 2014; Lawrence and Edwards, 2013). This study has also revealed several more regionally specific narratives, including perceived regulatory constraints and delays relating to the sensitivities associated with woodland creation in the National Park, reduced uptake linked to higher grant rates in other areas (linked to the CSGN²⁹ grant top up) and the high existing levels of conifer forest as driving (apparent) negative perceptions of productive forestry in the region. The scale of land holdings (i.e. more smaller holdings than in some other parts of the Highlands for example) and steep slopes in parts of the National Park were also identified as limiting factors for new woodland schemes, with the low level of farm and estate sales also linked to low uptake, due to the embedded land use models on long term holdings and the links between landownership change and afforestation identified in this research and in previous studies (Dandy, 2012). The key themes to emerge from this research are discussed under four main headings below:

²⁹ The [Central Scotland Green Network woodland creation top up grant](#) provides a specific and relatively high level of additional planting support not available outside of the Central Scotland area.

i) Managing perceptions of undertaking woodland creation and building trust

As shown in Section 5.1.4 there is a perception among some landowners/managers and agents that undertaking woodland creation in the National Park is more challenging than in some other parts of Scotland, due to planning sensitivities, longer delays for proposal feedback, higher related costs and a requirement to reduce the conifer component (which currently provides more certain levels of economic returns) of mixed schemes. These constraints were linked to a perceived reduction in scheme profitability and an increased level of financial risk, which increased landowner hesitancy in relation to uptake. Similar bureaucratic constraints/delays have been reported in previous research (e.g. Lawrence and Edwards, 2013). However, Mackinnon (2016) also identified the poor quality of some submitted grant scheme applications (at national level) as requiring a considerable amount of additional work by conservancy staff to help the application navigate the approval process. In addition, based on analysis of data from the Casebook Management System, Mackinnon (2016) showed that nearly 80% of applications were cleared with within 5-9 months of submission, with a significant amount of the time dealing with applications appearing to predate the application submission. This suggests many applications do incorporate a considerable pre-application phase of work including consultation on design proposals and it is notable that the number of applications and area of woodland creation being approved has increased substantially in recent years, increasing consultation and approval workloads. Notably, most agents in this study did recognise the increased sensitivities within the National Park and the need to modify proposals to ensure they were approved by Scottish Forestry (with the National Park Authority as a consultee). Scope would therefore appear to exist for further dialogue and trust building between the National Park Authority and agents, in relation to increasing clarity around the requirements of the Park Authority and the challenges faced by agents in relation to progressing schemes.

ii) Achieving financial tipping points

As apparent from Sections 5.2.1-5.2.3 market factors, including non-forestry (i.e. agricultural and carbon) markets are increasingly becoming as important as direct financial support for forestry, in terms of influencing land use change. High timber and forestry land values are an increasingly important driver of investment in afforestation, which is offset against longer term concerns around the economics of hill farming (despite current high lamb prices), due to agricultural policy (and farm payments) uncertainty. The market, therefore, has the potential to drive further afforestation, both in relation to the sale of land/farms and investment driven large-scale afforestation and for existing farm diversification to ensure longer term financial viability for the next generation. Both the improved profitability of smaller scale markets (e.g. biomass, woodfuel) and the increased potential for carbon markets to provide an alternative 'top-up' for suitable schemes through WCC certification, represent increasingly important drivers for future uptake of woodland creation. The National Park Authority (in addition to Scottish Forestry) may therefore have an important role to play in enhancing and promoting local/smaller scale markets (and relevant case study examples) and increasing the flow of information to improve clarity and transparency in relation to the potential for generating income from carbon. Opportunities may exist for developing knowledge exchange and stakeholder discussions in relation to the Woodland Carbon Code in parallel with communicating information and engaging stakeholders in relation to the Peatland Code³⁰, both of which represent opportunities for landowners across the National Park to mitigate climate change through woodland creation and peatland restoration and generate income from carbon.

Section 5.2.4 identifies the critical importance of incentives for enabling woodland creation (i.e. ability to change), while recognising that this is offset against a multiplicity of wider (willingness to change) factors within landowner decision making processes, and that grants have their own associated risks

³⁰ The [Peatland Code](#) is a voluntary certification standard for UK peatland projects (e.g. restoration initiatives) that can be used as the basis for marketing carbon benefits of peatland restoration, by providing verifiable assurances that the benefits being sold are quantifiable, additional and permanent. All projects under the WCC and Peatland Code are now listed on the [UK Land Carbon Registry](#). This registry places all PC and WCC projects within a single online platform (the HIS Markit Environmental Registry).

(due to the potential for scheme failure and grant losses). Fundamentally, grants represent the main mechanism for reducing financial risk and while the current 10% FGS grant uplift (for native and diverse conifer schemes) in the National Park represents an additional incentive for new woodland creation, a further 'locational premium' or top-up offers considerable scope for increasing uptake of woodland creation in the National Park (as recognised in this report), in conjunction with supporting afforestation of the preferred and potential areas within the Trees and Woodland Strategy.

Critically, despite apparent current hesitancy on the part of some landowners to progress woodland schemes, market factors (timber and carbon), perceived threats to hill farming and agricultural support, farmer demographics and/or succession, and favourable grant rates, may collectively be creating a 'tipping point' for some landowners who have not yet undertaken woodland creation, to consider altering their embedded land use or farming model or (in some cases) selling their land to forestry investors.

iii) Managing risk and uncertainty

Risk and uncertainties represent a pervading theme and have been identified in relation to environmental factors (grazing pressures and fencing challenges, weather, tree disease etc.) which may affect scheme failure, financial risks (in relation to loss of grant payments, uncertainties around generating income from carbon, longer term uncertainties about agricultural payments) and risks associated with regulatory factors (scheme approval delays, requests to alter scheme designs and increased scheme development costs). Collectively or in isolation these factors can lead to a lack of confidence and increased hesitancy or resistance to altering an embedded land use model (despite the available opportunities) without a significant underlying driver or intervention occurring (e.g. succession or change in ownership). In practice, risk is currently managed through obtaining grant support and using available advice, including through discussing schemes with National Park and Scottish Forestry advisors/woodland officers and employing forestry agents, who play a key role in supporting landowners in identifying suitable opportunities and navigating the grants and regulatory systems. Forestry agents therefore reduce the risk to owners through applying their expertise to scheme design and implementation, which reflects the broader trend outside the National Park of most woodland schemes being progressed by agents. In terms of longer-term uptake of woodland creation, increasing local-level woodland advisory officer capacity (through the National Park Authority and/or Scottish Forestry) offers considerable potential for developing opportunities for known/trusted local contacts to nudge landowners effectively towards schemes which complement their existing land use models. In addition, further scope exists for the National Park to provide some financial support for landowners to undertake a woodland creation options appraisal with a professional forestry agent³¹. Collectively, trusted intermediaries and advisors, stable long term support mechanisms and clear and consistent policy direction represent critical aspects of managing risk and uncertainty going forward.

iv) Building confidence and nudging woodland creation uptake at different scales

As recognised in Sections 5.1.1-5.1.4 individual and social factors play an important role in influencing decision-making outcomes in relation to new woodland creation. A change in management or ownership (i.e. through succession or a land sale) represents one particularly important potential intervention which can have a rapid influence on 'willingness to adopt factors', which reflects previous relevant research (e.g. Dandy, 2012). In addition, many of the aspects relating to variable owner motivations and the link between farmer identity and resistance to afforestation, reflect those seen in previous studies (Burton, 1988; Neumann et al., 2007; Eves et al., 2015; Mills et al., 2017). Nevertheless, as identified here, despite the potential for land sales to 'release' land for afforestation, the concept of 'whole farm buyouts' may also create a degree of wider resistance to afforestation among some members of the farming community due to the potential for negative effects for the retention of hill farming communities. The

³¹ It should be noted that the National Park Authority launched a [Woodland Creation Planning Fund](#) in 2021 which offers support (of £1500-3000) for some additional costs incurred as part of a woodland creation proposal (e.g. surveys, landscape assessments etc.) for schemes within the National Park.

incremental development of a farm-forestry culture is therefore likely to have an important role to play both regionally and nationally across Scotland, in relation to building farmer confidence to undertake woodland creation to diversify and enhance the financial viability of their farm holding.

As identified in Sections 5.1.4 and 5.4 peer-to-peer communication and sharing of experiences of woodland creation across land manager networks can play an important role in increasing wider uptake (moving beyond the individual as the sole agent of change). In combination with sufficiently favourable financial incentives and targeted advice and guidance, peer-led learning can be instrumental in encouraging land managers to take the first step towards prioritising their consideration of a change in their land use model. As identified in previous studies, a lack of confidence or other practical or capacity barriers can translate into land managers failing to undertake new activities regardless of their underlying values or attitudes, a phenomenon referred to as the value-action gap (Blake, 1999; Mills et al., 2017). Critically, this has implications in relation to the policy interventions and support measures which are likely to have the greatest impact of certain groups of land managers and the potential role of 'nudges' and the key position of forestry advisors in relation to supporting land managers in bridging the gap. Facilitated networking, particularly at local levels, may therefore offer scope for information sharing using trusted intermediaries (e.g. neighbours), in combination with expert input (e.g. on carbon markets or agroforestry), to build confidence and signpost viable and acceptable routes to diversifying holdings and altering land uses (which reflects the findings of previous studies e.g. Ambrose-Oji. 2019). This process may also offer potential for land managers to identify opportunities for collaborative woodland creation schemes with support from the relevant agencies and forestry advisors.

In addition, enhancing forestry and woodland related skills and experience across the wider land management sector (due to existing skills and capacity gaps) represents an important opportunity for enhancing land manager confidence and facilitating incremental shifts in land management cultures. One opportunity in this regard relates to the potential for smaller scale 'gateway' woodland creation schemes, to generate experience of undertaking woodland creation without a substantive impact on existing land use models. Opportunities may also exist in relation to assessing the scale of unplanned woodland regeneration across the park and assessing and communicating the impacts and potential benefits of natural regeneration (for farmers and wider stakeholders) on farmland in the National Park, including in relation to biodiversity benefits, livestock shelter, sport shooting and carbon sequestration.



7. Recommendations

This section presents a series of concise recommendations based on the key findings and the discussion and conclusions from the previous section.

Reaching financial tipping points for woodland creation

- i) Retention and further promotion of the existing National Park Tree Planting Grant Scheme. This should include a further exploration by the National Park of the potential for expansion of this scheme, potentially through working with Scottish Forestry and other stakeholders (e.g. Woodland Trust Scotland), to develop a gateway woodland creation funding mechanism for schemes under 5 hectares (or as a 'top-up' for smaller schemes).
- ii) Exploration with Scottish Forestry and other relevant stakeholders of the potential for an additional locational premium for suitable new planting within the National Park in conjunction with a targeted approach to incentivising new planting within the potential and preferred areas identified within the National Parks Trees and Woodland Strategy.

Enhancing advice and local-level guidance on woodland creation

- i) Provision of targeted financial support by the National Park and/or Scottish Forestry, and awareness raising in relation to existing available support, for forestry consultants to carry out woodland creation options appraisals for interested land managers
- ii) An assessment of the potential for increasing the available local-regional Scottish Forestry-National Park Authority woodland officer/advisor capacity to provide advisory site visits with landowners, ongoing support in relation to the development of woodland creation scheme applications and for liaising with forestry consultants to identify opportunities and advise on potential sensitivities at an early stage of the process.

Building knowledge and confidence for undertaking woodland creation

- i) The development of a local-level programme of engagement with (and between) land managers across the National Park to discuss prominent issues and share information and examples relating to woodland creation and wider land use activities. It is proposed this should be facilitated by the National Park Authority with support from wider stakeholders and direct input to the design and format of the process by land managers.
- ii) Developing a process of ongoing dialogue and engagement with forestry agents operating across the National Park as a forum for sharing information, including in relation to

- communicating sensitivities and specific scheme requirements (i.e. managing expectations) within the National Park and for raising issues/perceived constraints and potential approaches for managing these.
- iii) Developing a series of webinars (as a partnership initiative between the NPA and SRUC) and/or site visits (subject to Covid-19 restrictions) to facilitate local-level/regional information sharing on 'hot topics' (e.g. carbon markets and agroforestry) and in relation to successful recent woodland creation schemes at different scales.
 - iv) The development of a programme of training and a specific 'woodland creation for farmers' training day in conjunction with relevant key partners (e.g. Scottish Forestry, Woodland Trust Scotland and NFUS). Additional training elements should include practical woodland management skills and opportunities for small-scale woodland enterprise development.

Long term monitoring of woodland creation uptake and ongoing barriers

- i) The final recommendation relates to establishing a longer-term process to complement the monitoring of woodland creation against the woodland creation targets within the National Park Plan. It is proposed that the land managers which identified potential new woodland creation schemes within this research be re-contacted (by an independent researcher) for brief updates over the next 2-3 years to assess progress and ongoing barriers and how they might best be addressed, effectively utilising the National Park as a test bed for assessing ongoing constraints and emergent woodland creation opportunities going forward. In particular, the impact of ongoing and future support measures and nudges (knowledge exchange, small grants scheme, options appraisals support etc.) should be monitored to assess their uptake and impact on woodland creation for application in other contexts outside the National Park.

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