Forest Research

Social Dimensions of Natural Colonisation for Woodland Expansion

Final Project Report 2023-25

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The Research Agency of the Forestry Commission

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Table of Contents

List of Figures

List of Tables

Executive Summary

1. Project was undertaken between April 2023 and March 2025
2. The objective of the research was to improve understanding of land managers decision making concerning the uptake of natural colonisation as an approach to woodland creation, to support delivery of England's woodland expansion targets, and inform future policy design by identifying:
    a. which incentive schemes supporting natural colonisation have/have not been taken up by which kinds of land managers, and the reasons behind this
    b. the information and knowledge about natural colonisation required by land managers and stakeholders
    c. how best to promote the uptake of natural colonisation.
3. Grant Support Mapping: An internet search and consultations with key informants from relevant organizations (e.g., Forestry Commission, Woodland Trust) were conducted to document the range of grant offers available for natural colonisation. Information on grant objectives, target audiences, geographical areas, and key components was collected and analysed. Grant offers fell into two groups, i.e. one explicitly supporting natural colonisation for woodland expansion, ii. the other more broadly focused on nature recovery. The mapping indicated the complexity of the grant landscape.
4. Grant Offer Data Analysis: Data from four of the grant offers (England Woodland Creation Offer (Forestry Commission), Grow Back Greener (Woodland Trust), Trees for Climate (England's Community Forests), North York Moors Woodland Creation Grant Scheme) was collected, cleaned, and collated into a combined dataset. Descriptive statistics and visualizations were generated using Excel functions to understand the uptake of natural colonisation across regions and land manager types.
5. Between April 2017 and August 2024, a total area of 351.84 hectares of land under the four grant offers included in the analysis was delivered as natural colonisation across 130 scheme agreements. This represents a very small percentage of total woodland creation, with natural colonisation accounting for less than 1% of newly created woodland in the UK between 2019 and 2024.
6. The majority, i.e. c.87%, of agreements using natural colonisation do this as a component of schemes which include tree planting. Areas put down to natural colonisation tend to be small, whether stand-alone or as part of mixed schemes, averaging between 2.2-2.7 ha across the grant offers included in the dataset: The areas planted with trees tend to be larger.

7. The uptake of natural colonisation grants varied across different types of land managers, with private owners (farmers and estate owners) being the majority. At the time of analysis the EWCO grant had been taken up by proportionately more private landowners, while England's Community Forests Trees for Climate fund had more public owners subscribe.
8. Grant offer Focus Groups: Three online focus groups were held with 21 woodland advisors and land managers who have used grant schemes, as well as land managers considering natural colonisation without using grants. Participants discussed their awareness, understanding, and factors influencing their choice of grant offers.
9. EWCO was the grant offer grant offer participants were most aware of, although the degree of knowledge about the natural colonisation option within EWCO varied. Awareness of other grant offers was minimal and location-dependent. Advisors played a crucial role in shaping land managers' awareness and understanding of the grant offers.
10. Suggestions for Improvement to grant design that participants mentioned included process improvements, but also:
    a. Increase payment rates to make the grant more tempting for those not already keen on natural colonisation.
    b. Consider upfront payments or quicker reimbursement schedules.
        i. Improving flexibility, i.e.
        ii. Tailor the grant offer to suit specific sites with a greater menu of options for ground preparation methods and wildlife population control.
        iii. Align conditions with the Woodland Carbon Code.
        iv. Support hybrid approaches that combine planting and natural colonisation.
    c. Increase visibility and promotion of the natural colonisation option within the EWCO offer.
    d. Use case studies and examples to show landowners the outcomes of natural colonisation.
    e. Specialist Support: Have specialist natural colonisation woodland officers to advise on site suitability.
11. The language and messaging surrounding natural colonisation was explored through discussion with land agents, advisors, woodland consultants, and land managers, including 19 people in 3 focus groups and 13 people in one validation workshop which asked participants for feedback on the research findings and interpretation.

12. Sentiment Analysis: NVivo software was used to analyse positive and negative views for each land manager type, related to the terms "natural colonisation," "natural regeneration," and others, including "rewilding".
13. This highlighted that the term "natural colonisation" is not widely used or understood. Natural Regeneration is more widely understood and positively received. It is seen as self-descriptive and beneficial, though sometimes vague and requiring further explanation.
14. The presentation of natural colonisation as an option within the grant offers influenced landowners' likelihood to use it. Effective communication should tailor language to the specific audience, using terms that resonate with their values and objectives. Terms should be positively branded and accompanied by compelling stories and case studies to increase awareness and understanding.
15. The experiences and 'natural colonisation journeys' of 12 land managers in England who used natural colonisation for woodland expansion over at least 10 years was conducted through semi-structured interviews and site visits. Researchers explored their perceptions, challenges, and support needs, as well as the outcomes of using natural colonisation.
16. Key findings from these cases were that:
    a. Natural colonisation was preferred for its lower costs compared with tree planting. Some received grants, while others saw it as low-risk. Most of the land managers had environmental motivations for using natural colonisation.
    b. Hybrid approaches, i.e. natural colonisation with some supplementary tree planting, were important for risk management. Due to unpredictable growth, many land managers chose to combined natural colonisation with planting to accelerate woodland establishment and increase species diversity.
    c. Land managers required better guidance. Success depended on adequate seed sources, soil conditions, and natural agents like jays. Some received conflicting advice.
    d. Challenges in Measuring Success. Grant criteria often required specific tree densities within set timeframes, ignoring the natural pace of woodland development and the value of successional habitats like scrub and grassland.
    e. Financial and Social Challenges. Many farmers relied on grants, but financial strain emerged after payments ended. Some faced community criticism for shifting from agriculture to woodland.

1 Introduction

1.1 Background

Natural colonisation is defined by this project as:

> *The creation of woodland through natural processes (e.g. from seed from nearby woodlands) on an area of "open land" which has not been covered by woodland in the recent past (e.g. 20 plus years).*

This stands in contrast to the term "Natural Regeneration". That term applies to areas of regeneration by trees within a woodland, or across land that was recently covered by woodland where there is likely to be an existing tree seed bank.

Providing support for land managers to expand woodland cover through natural colonisation was identified as a key action in the England Tree Action Plan (Action 1.14). Harnessing natural processes has the potential to contribute to increasing connectivity across treescapes, the restoration of biodiversity, and might also create resilient woodlands by enabling adaptation to local sites and the impacts of new pests and diseases. Such attributes are increasingly important in the face of the climate and biodiversity emergencies, and government commitments to Local Nature Recovery, Biodiversity Net Gain and ongoing threats from existing and novel pests and diseases. It will be private land managers, and large land-owning organisations, that will be responsible for delivering most of the government's woodland expansion targets, including land use change that uses natural colonisation. However, there is a paucity of research evidencing the social dimensions of natural colonisation, i.e., which kinds of land managers are/are not interested in natural colonisation as an approach, the associated risks and benefits they perceive, and the kind of support and advice they are looking for to implement natural colonisation on their landholdings.

This project was established to answer these questions. The first scoping phase of this research between 2021-2023 explored land managers attitudes towards natural colonisation in upland and lowland farming contexts[1]. Analysis of interviews with over 67 farmers, estate managers, woodland managers, eNGOs and others, were validated in a series of workshops with advisors and landowners. This resulted in a characterisation of land managers linking different preferences towards natural colonisation to one of three broad "identities", i.e. productive, conservation focused, and amenity focused.

Cluster analysis showed that most land managers understand the benefits and trade-offs between natural woodland expansion strategies and tree planting and take a balanced approach in their implementation of it as a strategy. Just 25% of the sample were more positive towards tree planting, and 10% were more positive towards natural colonisation.

[1] Social Dimensions of Natural Colonisation - Forest Research

Language and messaging around natural colonisation emerged as extremely important. Results indicated the term natural colonisation is not widely used or understood. Terms such as 'rewilding' disenfranchise many land managers, particularly farmers who perceive this to be land abandonment contrary to their productive and stewardship focused identities.

Land managers also identified support needs to be around more training and knowledge exchange about the major risks they identified, i.e., outcome uncertainty in terms of colonisation success, species mix and time to establish.

1.2 Objectives and work packages

This second phase of research was undertaken between 2023-2025 and sought to build on the scoping stage to realise the following objectives:

1. Explore the language and messaging surrounding natural colonisation, to support more effective engagement and uptake of natural colonisation with different kinds of land managers.
2. Identify which incentive schemes supporting natural colonisation have/have not been taken up by which kinds of land managers and the reasons behind this to inform future scheme design and delivery.
3. Investigate further the information and knowledge about natural colonisation required by land managers and stakeholders, to identify knowledge to action products supporting engagement and uptake.
4. Engage in knowledge exchange and dissemination activities suited to stakeholders and contribute to debates influencing future research direction.

The project organised itself into four work packages to realise these objectives:

1. Grant support for Natural Colonisation
2. Language and Messaging for Natural Colonisation
3. Land Manager "Outcome Journeys"
4. Evidence synthesis and collaborative output production

Each workflow addressed a set of specific research questions. These are described in the sections below.

2 Grant support for Natural Colonisation

2.1 Objectives and research questions

The scoping phase research showed that even though many (64%) land managers had experience with natural colonisation, they were not using incentives to support this approach - just 3% of the sample in that investigation said they had accessed grants. The reasons for this appeared to be a combination of: communication and promotion of the available incentives not resonating with land managers of different identity types; outcome risks land managers associated with the unpredictability of achieving the species mixes and densities required by incentive agreements; and the need for more information and knowledge to inform land managers about how best to mediate outcome uncertainty.

The objectives of the work package in this phase of the research were to:

- Identify which grant offers supporting natural colonisation have, or have not, been taken up by different kinds of land managers, and to explore the reasons behind this
- Provide this evidence in a form useful to policy makers and other stakeholders to help them improve the design of incentives, other support, and delivery mechanisms designed to encourage uptake of natural colonisation as an approach.

The objectives were achieved by answering the following specific research questions:

RQ1.1. What incentive schemes and support packages for natural colonisation are available to land managers; who are these aimed at and how are they delivered?

RQ1.2. How far have these grants and support packages been taken up?

RQ1.3. Are landowners and advisors' aware of the range of NC schemes, and do they properly understand the rates and conditionalities of those schemes? Are some schemes better understood than others?

RQ1.4. What factors influenced land managers uptake of specific grants? How influential were advisors, the rates and conditionalities, and type of delivery?

RQ1.5. What would improve grant uptake (e.g. scheme design – including hybrid approaches and maintenance payments, delivery/service, comms and messaging?) amongst different kinds of land managers in different regional contexts?

2.2 Method: Data collection and analysis

The methodological approach illustrated in Figure 1 below indicates the series of iterative research exercises and analytical episodes (shown in purple), data and evidence that contributed to answering the research questions (shown in the right-hand boxes). A detailed method for each step is described below.

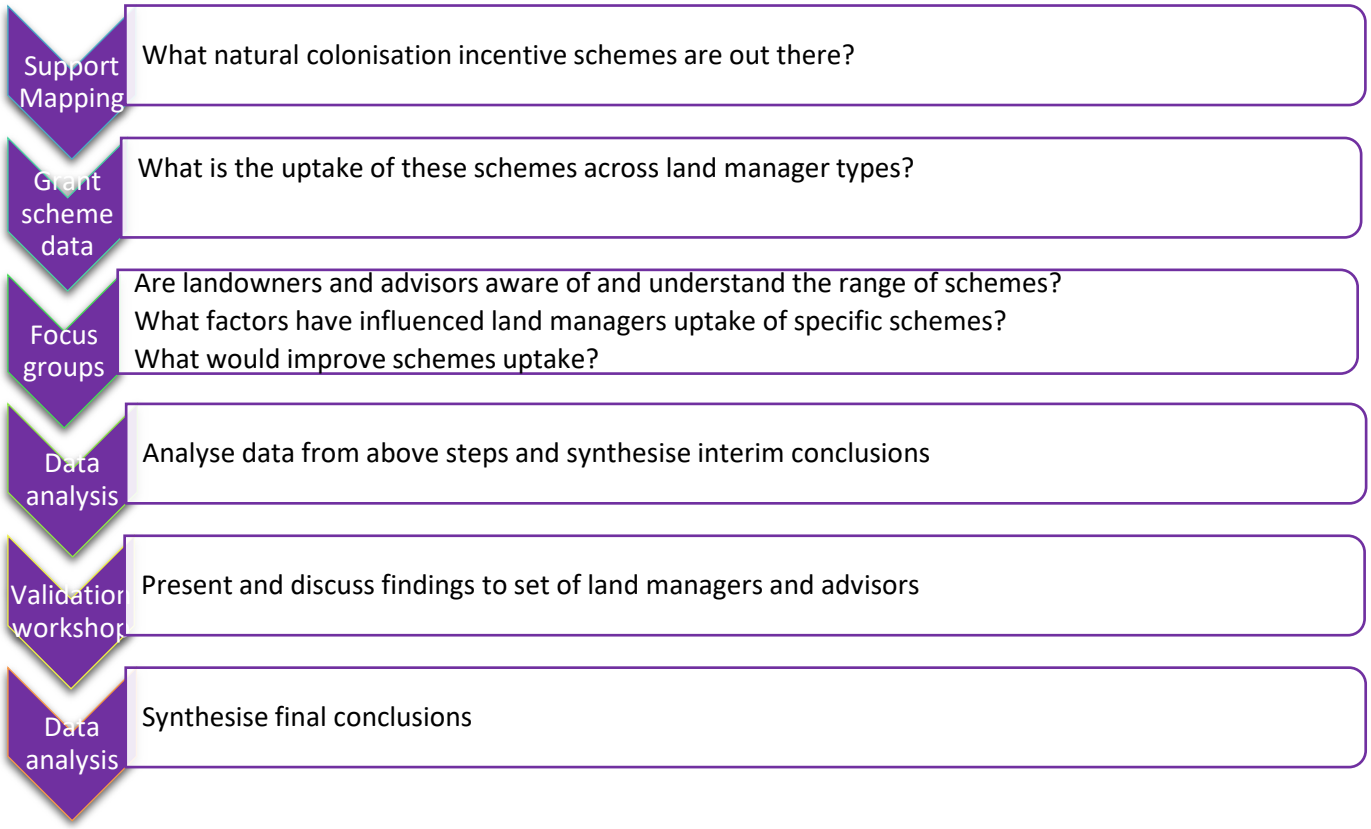


Figure 1. Methodological approach for WP1 understanding grants and grant uptake for natural colonisation

2.2.1 Support mapping

To document the range of grant offers available for helping land managers with natural colonisation, a map of the different options was created. This was undertaken by, i. an internet search through using relevant search terms vis Google, and ii. contacting key informants in relevant organisations (e.g. Forestry Commission, Woodland Trust, the National Forest, and England's Community Forests) to ask about grant offers they were aware of, or for details about offers they provided as an organisation.

Once a grant offer for natural colonisation was identified, the following information was collected: broad objective of the offer; the target audience; how long the offer has been available; the geographical area that was eligible; and the organisation responsible for managing the grant offer. Further information on the key components of the grant offer design, conditions, and finance available was then gathered through website materials. Where information published on the web was insufficient, this was requested directly from the funding organisation.

Analysis was undertaken by comparing the key components of each of the offers to demonstrate where there are differences and similarities in the offers. The incentive support map was initially developed in September 2023 and was shared with key informants and stakeholders via a webinar in October 2023. It has been iteratively revised over the course of the project in response to feedback and as some of the offers updated or changed components (e.g. length of agreement changed from 10 to 15 years for three of the offers in autumn 2023).

2.2.2 Grant offer data

To address RQ1.2, data on the uptake of different grant offers was collected and analysed. For any potential funding offers and streams, contact was made with the organisations responsible to first clarify if natural colonisation qualifies for their type of financial support. Table 1 shows which grant offers provided data. The following information was requested:

- The number of applications, both past since the scheme began and current.
- The location and local context of the applications, such as if the area of natural colonisation is expanding existing woodlands and if there are more applications from some areas of the country than others.
- The size (in hectares/ acres) and type of land the application is for, such as ex-agricultural, heathland, wetland etc.
- Type of applicant – whether it is an agent, owner, or organisation and whether they are a public/ private/ charity that apply for the funding.
- Grant 'stacking' – how many of the natural colonisation/ regeneration grant applications are in conjunction with grants/ funding for other woodland creation methods, such as planting.

Table 1. Grant offer data that was provided for analysis

Grant offer	Offer start date	Funding source	Delivery organisation	Specific natural colonisation targets?
England Woodland Creation Offer (EWCO)	2021	Nature for Climate Fund (NCF)	Forestry Commission	None specified
Grow Back Greener	2021	Nature for Climate Fund (NCF)	Northern Forest – Woodland Trust	110ha by 24/25 season
Trees for Climate (T4C)	2020	Nature for Climate Fund (NCF)	England's Community Forests	None specified
North York Moors Woodland Creation Grant Scheme	2017	Section 106 planning agreement	North York Moors National Park Authority	None specified

Analysis of the grant offer data provided followed this routine:

i. Raw data cleaning: identifying gaps and typos and correcting including discussion with data providers for clarification

ii. Raw data collation into a combined dataset: all data merged together, regularising variables, creating clear definitions of categories in discussion with data providers

iii. Generation of descriptive statistics from combined dataset: using summary tables and pivot tables using EXCEL functions

iv. Visualisation of descriptive outputs through EXCEL charts.

2.2.3 Focus Groups

To gather land managers and advisors views in response to RQ1.3, RQ1.4, and RQ1.5, three online focus groups were organised and held in November 2023: one for woodland advisors and land agents; one for land managers who have used a grant scheme for a natural colonisation project; and one for land managers who have carried out or are considering in the near future woodland expansion through natural colonisation without accessing a grant offer.

Participants were required to complete a consent form in the format of an online survey prior to attending. This informed participants about the research topic and logistics of the focus group; requested consent for the meeting to be digitally recorded; and explained how their data would be handled, treated, and stored in line with GDPR (2018).

We aimed to recruit 6-8 participants for each focus group. For the first two focus groups with woodland advisors/ land agents and land managers who have used one of the natural colonisation grant offers, we recruited through our networks and through the funding organisations' contacts with their applicants. For the final focus group with land managers without experience of natural colonisation grant offers, a professional market research company was procured and the farmers were paid a financial incentive for attendance.

The focus groups were held online via MS Teams videocall and the function of Polls was used to ask the participants three multiple choice questions about their awareness of the grant offers found in the support map; their knowledge of the grant offers conditionalities; and the factors that would influence their choice of grant offer. This provided structure to the 90-minute discussion and ensured all the relevant RQs were covered. The focus group question guide can be found in Appendix 2.

For the second focus group, only four participants were able to attend, therefore, two additional interviews were completed between November 2023 – January 2024 with land managers who are agreement holders of natural colonisation grant offers. The interviews lasted 40 minutes, were also carried out on MS Teams videocall, and followed the same question format as the focus groups but with a PowerPoint slide deck to display the survey questions instead of using the Poll function.

All the focus groups were audio-recorded and transcribed before being thematically coded using NVivo. A coding framework based on the research questions and focus group guide was used to structure the analysis and can be found in Appendix 3. After coding the results were synthesised into summary tables around the key themes and questions.

Table 2. Sample characteristics of focus group participants discussing grants (n=21)

Target group	Organisations/ grant applicants to recruit from	No. at focus group
Advisors	FC Woodland officers	2
	Woodland consultancy & management companies with agents	2
	eNGOs e.g. Woodland Trust	1
	Woodland officers and others with public/funding bodies e.g. local authorities, NPAs	2
	Total:	7
Land managers NC grant applicants	Forestry Commission EWCO	4 +1 interview
	Woodland Trust (Northern Forest) - Grow Back Greener programme - Natural processes fund	1 interview
	Total:	6
Land managers - not used NC grants	Outsourced recruitment through market research company – predominantly farmers with mixed woodland creation experience	8
	Total:	8
	Grand total	**21**

2.2.4 Validation workshop

In March 2024, a 90-minute, online validation workshop was held with a mix of land agents/ advisors, woodland consultants, and land managers and landowners e.g. farmers with various levels of natural colonisation experience. 13 participants were recruited through a market research company and financially incentivised to attend, ensuring that there was no overlap with previous focus group participants. All attendees completed consent forms prior to attending that followed the same format and information as the focus groups. The participants were provided with a summary of the research context and aims, the grant data analysis, and the focus group findings to read beforehand (see Appendix 4). The pre-reading document enabled the participants to prepare their thoughts and feedback before the workshop allowing more time to discuss whether or not the findings correlated with their knowledge and experience. The workshop was structured using a PowerPoint presentation to refer to the relevant tables of findings and ask the group whether the findings reflected their experience and raised any further questions. The

workshop was audio-recorded and transcribed, then analysed using NVivo and the same coding framework as the focus groups to synthesis the findings.

2.3 Results

2.3.1 The incentives and support available for natural colonisation: target audiences and delivery (RQ1.1)

The grant offers available for supporting natural colonisation grouped into two objectives:

i. one group of offers explicitly supported natural colonisation for woodland expansion,

ii. the other group were more broadly focused on nature recovery, such as creating scrub habitat.

Table 3 presents a summary of key information about the six grant offers found, with a more detailed comparison table in Appendix 1. All the grant offers are relatively young, with those aimed at woodland expansion being started between 2019-2023.

All the grant offers included natural colonisation as part of a range of methods for creating woodland or restoring natural habitats and were open to both spatially distinct (e.g. clump planting) and spatially intimate (e.g. low-density planting) hybrid methods of planting trees alongside natural colonisation.

England's Community Forests' (ECF) 'Trees for Climate' grant offer and the Northern Forest's 'Grow Back Greener' grant offer are funded through Defra's Nature for Climate fund (2021-2025) whilst the North York Moors' (NYM) Woodland Creation Grant utilises Section 106 planning agreement from a nearby mine, which is secured for 100 years. Some of the delivery organisations are involved in managing multiple grant offers, for example Woodland Trust is part of the Northern Forest whilst also providing their woodland creation grant offers, such as MOREwoods.

Table 3. Key information about the grant offers available for supporting natural colonisation

Broad objective	Scheme name and web link	Organisations responsible/ involved	Target audience	Start of scheme	Geographical area
Woodland expansion and creation	EWCO: Appendix 5: Natural colonisation guide	Forestry Commission	Land managers/ landowners	2021	England
	Grow Back Greener (Northern Forest) - Natural processes fund	Woodland Trust	Land managers/ landowners	2021/22	Northern Forest region
	ECF Trees for climate – natural colonisation	England's Community Forests (ECF)	Landowners and farmers	2020	15 areas of England where there are active community forests.
	North York Moors Woodland Creation Grant – no explicit term for natural colonisation	North York Moors National Park Authority (Via Section 106 planning agreement)	Landowners	2017	North York Moors National Park
	Farming & Forestry Grant	National Forest	Farmers	Piloting	Min. 50% in the national forest area
Nature recovery; climate; people; place	Farming in Protected Landscapes	Defra – moderated by each National Park Authority/ AONB	Farmers, land managers, and people who live and work in National Parks and AONBs	July 2021 to March 2025	In some NPAs/ AONBs e.g. NYM and Lake District
	Countryside Stewardship - Scrub creation and management	RPA and Natural England	Farmers and land managers	2015	England

The geographical spread of the grant offers varies. Only Forestry Commission's England's Woodland Creation Offer (EWCO) natural colonisation offer being available across England for the purpose of woodland expansion (see Appendix 5). Figure 2 shows the geographical distribution of the natural colonisation grant offers available in England,

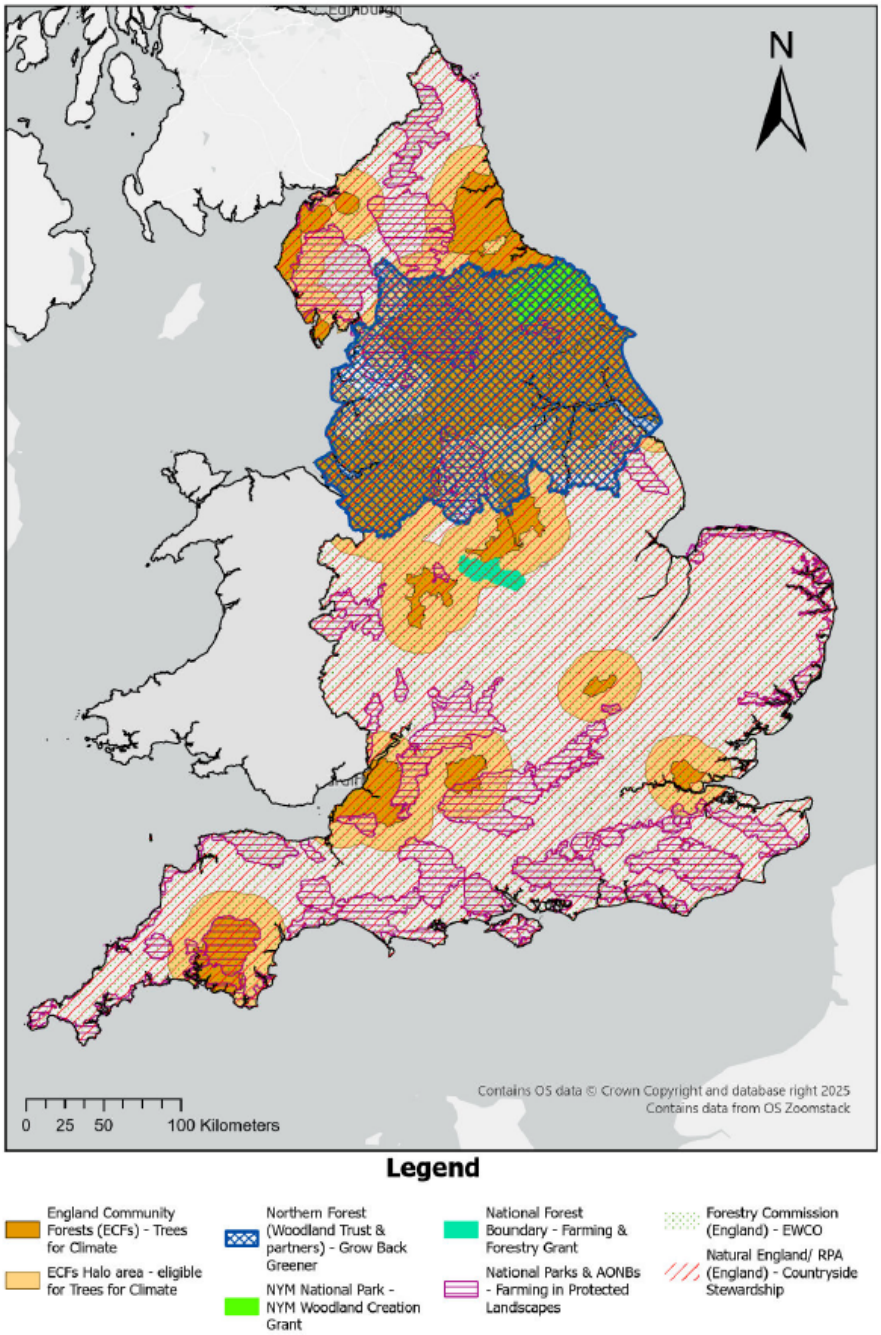


Figure 2. Map of different natural colonisation support schemes with colour coding for geographical areas where some schemes are exclusively available as of June 2024. (Mapping data gathered from funding organisations).

which highlights that there is more grant offers to choose between in Northern England. There are also varying degrees of flexibility in geographical restrictions between grant offers, for example, ECFs are able to fund woodland expansion outside their boundaries within a 10-mile buffer if it supports the surrounding community. Whilst there may be signposting between the delivery organisations, for those landowners and land managers in an area served by multiple grant offers, it could be difficult to identify and understand where differences exist between the offers. As one person put it:

> *there's a lot of schemes out there, there's a lot for farmers and land managers to read, and it can get confusing basically on what can be done where.*

Landowners' understanding around which grant offer is best suited to meet their objectives is influenced by the presentation of the grant offer, the application process, and the support provided by the delivery organisation. The presentation of natural colonisation as an option with the grant offer may influence the landowners' likelihood to use it. For example, the Forestry Commission and ECF present the option using the term 'natural colonisation', the Northern Forest grant offer uses the term 'natural processes' and the NYM grant states 'options for establishment using natural regeneration are available'. However, several participants used the terms 'natural colonisation' and 'natural regeneration' interchangeably with one expressing:

> *I always use natural regeneration, it's always been the forestry industry's terminology. Natural colonisation to me **is** natural regeneration*.

Participants shared that they experienced differing degrees of support from the delivery organisation when completing the application process for different grant offers. Those with experience of the Grow Back Greener (Northern Forest) and Trees for climate (ECFs) grant offers reported a high level of support for guiding through the application process, for example one respondent described it as "*so simple and easy*".

However, the experiences of support for those who applied to the Forestry Commission (FC) grant offer varied and tended to hinge on whether or not the landowner employed the assistance of an agent or advisor to ease the process. On the one hand, an independent landowner found the application process *"long, very difficult, and frustrating"*, whilst another with an advisor said it was a "*relatively easy process*".

For an overview of the similarities and differences between grant offers, the key features are presented in Table 4. The main similarities across the grants highlight that Grow Back Greener (Northern Forest) and Trees for climate (ECFs) tend to follow the EWCO Appendix 5 (FC) conditionalities, which includes:

- the site must be within 75m of 2 tree species of viable seed source,
- the scheme agreement length is 15years,
- a minimum no. of stems must be achieved by year 10 (100 stems/ha for EWCO and Trees for Climate and 400 stems/ha for Grow Back Greener) or else supplementary planting will be required to reach target.

However, the grant offers differ in terms of flexibility in payments, for example, EWCO Appendix 5 having a set payment structure for different components of the scheme including additional benefits (e.g. public access infrastructure) and re-imbursing agreement holders after expenses over the first 3-years. In contrast, Grow Back Greener (Northern Forest) and Trees for climate (ECFs) have a more flexible approach where there is no set level of funding but 100% of the capital costs will be covered with an incentive or a maintenance payment per hectare, which now align with EWCO rates. NYM follows a similar finance approach by covering 100% actual costs with an incentive payment dependent on the size of area but with no minimum number of stems requirement and a significantly longer agreement length of 25 years.

Table 4. Comparative summary of scheme conditions and finance available for supporting natural colonisation.

Scheme	Conditions of scheme					Finance available
	Site	Size	Outcome	Hybridity/compatibility	Time	
EWCO: Appendix 5: Natural colonisation guide	75m from viable seed source of min. 2 tree species.	Min. 0.1ha	60% woody cover and min. 100 trees/ ha by yr 10	Supplementary planting available and compatible with tree planting scheme. Supports registration with Woodland Carbon Code.	15yrs	Set list of capital costs reimbursed aligned with FC EWCO grant rates. Annual maintenance payments: £400/ha for 15yrs. Additional contributions (one-off payment with capital costs): Up to £11,600/ha.
Grow Back Greener (Northern Forest) - Natural processes	75m from viable seed source	Min 0.1ha *if part of larger planting project (min 0.5ha)*	400 trees (min. 0.5m tall) & shrubs/ ha by yr 5 (or yr 10 on challenging sites).	Supplementary planting available and compatible with tree planting scheme and WT Woodland Carbon Code.	15yrs	Covers up to 100% of capital costs on a site-by-site basis. 24/25 season and onwards: maintenance payments raised to £3068/ha over the 15year agreement with 50% payment in yr 1 and remaining 50% in yr 5.
ECF Trees for climate – natural colonisation	75m from viable seed source of min. 2 tree species. Grazing pressure must be removed.	Min. 0.5ha	60% woody cover and min. 100 trees/ ha by yr 10	Supplementary planting available before/ at yr 10 and compatible with tree planting scheme.	15yrs	Payments cover capital costs and bonus payment. No set level of funding but will match EWCO grant rates for woodland creation proposal as a minimum. Extra funding for high scoring applications (deliver public benefit in addition to hectares of woodland).

Scheme	Conditions of scheme					Finance available
	Site	Size	Outcome	Hybridity/compatibility	Time	
North York Moors Woodland Creation Grant	Advisor assesses suitability of native tree seed source.	Min. 1ha – (*can be in smaller areas/ with planting areas)*	20% mature canopy cover by yr 25, stock density can be variable.	Supplementary planting available and compatible with tree planting scheme. Open to wood pasture (low level grazing). Not compatible with Woodland Carbon Code as funding accounts for carbon capture already.	25yrs	Payment after works complete. Funding available for 100% of actual costs of capital works in yr1 and a five year follow up maintenance schedule. Projects over 10ha receive incentive £3,000/ha and projects of 5-10ha receive incentive of £1,000/ha.
Farming & Forestry Grant	25-50ha (combination of woodland, agroforestry and wildlife habitats and can be multiple landowners)					Variable – open to discussion and agreement, no defined budget.
Farming in Protected Landscapes	Variable – open to discussion and mutual agreement between NPA/ AONB and applicant.					Variable – open to discussion and agreement between NPA/ AONB and applicant
Countryside Stewardship: WD8 WD7 WD9 SW11 BFS6	For CS mid-tier or higher-tier holders on whole or part of parcels where land is temporary/ permanent grassland and (for higher tier) is next to existing scrub or woodland. SW11 and BFS6 for riparian areas only (6-12m wide). Invasive non-natives need to be controlled. Standing or fallen deadwood to be left in place. If a large area, consult FC re. if a Forestry EIA is required. Agreement length: 5 or 10yrs					Annual payments of: WD8: £514 per ha WD7: £276 per ha WD9: £74 per ha SW11/BFS6: £742 per ha

Scheme	Conditions of scheme					Finance available
	Site	Size	Outcome	Hybridity/compatibility	Time	
Biodiversity Net Gain	BNG agreements require high level of outcome certainty so natural colonisation could be permitted depending on site suitability Examples of relevant BNG units: mixed scrub; Lowland mixed deciduous woodland enhanced; Broadleaved woodland BNG is optional for land managers and compulsory for developers. Agreement length: 30yrs					Variable – depends on market fluctuations

The National Forest grant offer that is being piloted for farmers has no set budget, and the payment is open to discussion and agreement.

The grant offers that aim for nature recovery rather than explicitly woodland expansion include Countryside Stewardship, in which the WD7, WD8, WD9, SW11 and BFS6 are for creating scrub areas through natural colonisation. However, the restrictions state that the trees and shrubs cannot grow beyond 5m, so if this occurs the agreement holder must remove the trees to maintain the successional habitat. If the intention is to have full-grown trees, then the agreement holder must switch this portion of land from Countryside Stewardship to an FC grant offer for woodland creation before there is shrub and tree cover. For the Farming in Protected Landscape offer, the acceptance of financial support for natural colonisation varies depending on where the protected landscape is in England and whether or not woodland and the likely species that would naturally colonise if permitted, are considered part of the natural recovery appropriate to that area. For example, FiPL has been used to support natural colonisation in the Lake District NPA and North York Moors NPA through fencing areas and excluding stock, but also been used to support the removal of natural colonisation of Sitka Spruce (*Picea sitchensis*) in Northumberland NPA.

The target audience across the offers is largely the same, i.e. landowners and land managers, with only the National Forest presenting their grant offer as directly relevant for farmers. In terms of grant compatibility, the NYM grant offer is the only delivery organisation unable to combine their grant offer with the woodland carbon code as the funding source is already accounting for carbon. However, participants highlighted that there are inconsistencies between the conditionalities of combining woodland carbon code with the woodland expansion grant offer that presents challenges. For example, upfront claimable areas when using 'natural regeneration' in the woodland carbon code are defined as 50m from a viable seed source, with a further 50m permitted only following a successful seedling survey, in contrast to the grant offer's 75m rule.

2.3.2 Uptake of natural colonisation grants across different types of land managers (RQ1.2)

Between the period April 2017 – August 2024 a total area of 351.84 hectares of land under the four grant offers included in the analysis, were delivered as natural colonisation across a total of 130 scheme agreements. This is an under-representation of the national picture because our data does not include land owners using natural colonisation without grant support, it does not represent all available grant offers that include natural colonisation, and because we have only included schemes that have actually been delivered (i.e. the grant agreement has passed through the pipeline, and the scheme is being or has been delivered), not those still in the pipeline, (i.e. still being processed and finalised). Our data suggests that an additional 315.55 hectares were in the pipeline with the potential to be delivered by end of 2024/ 2025 season. None the less, as a proportion of total woodland creation across the grant offers, this represents a very small percentage by land area. The latest figures (Forestry Statistics 2024) suggested 74.46 thousand hectares of newly

created woodland were reported in the UK in between 2019-2024, showing the use of natural colonisation as a method of woodland expansion to be less than 1%.

Figure 3 illustrates the cumulative trend across seasons of delivery (i.e. the time at which the grant agreement was delivered), illustrating the increasing use of natural colonisation year on year since the commencement of the grant offers that include natural colonisation as an available component. Table 5 provides the total number of schemes from each of the grant offers, the number of those schemes with natural colonisation as a component, and the % of the total number of schemes that include natural colonisation.

Figure 3. Cumulative trend in natural colonisation grant component uptake (ha) across all grant offers by season of delivery April 2019- August 2024[2]

Table 5. % of all grant supported schemes which include Natural Colonisation as a component of woodland creation (April 2017 – Aug 2024)

Grant offer	No. of schemes with NC delivered	Total no. of schemes	% of all grant supported schemes which include NC (April 2017 – Aug 2024)
EWCO	168	869	19.3
T4C (ECF)	22	1,834	1.2
GBG (WT)	11	172	6.4
NYM	5	82	6.1

Figure 4 breaks down the total area of natural colonisation by the grant offers included in the dataset. This shows that to date, EWCO and T4C account for the greater proportion of natural colonisation delivered. Figure 5 shows the uptake across different regions of England. Notable here is a greater uptake in the South West. This pattern does not necessarily reflect the uptake of grant offers across regions. The stocktake of EWCO grants found an even spread across regions, with a slightly higher coverage in the East and East Midlands region (FC Head of Incentives Development and Compliance, *pers comm*, 2024).

[2] Source: Combined dataset covering period April 2019- August 2024. Data shows "delivered" and season of delivery. 'Delivered' means the grant has passed through the application pipeline, and is being delivered or has been delivered.

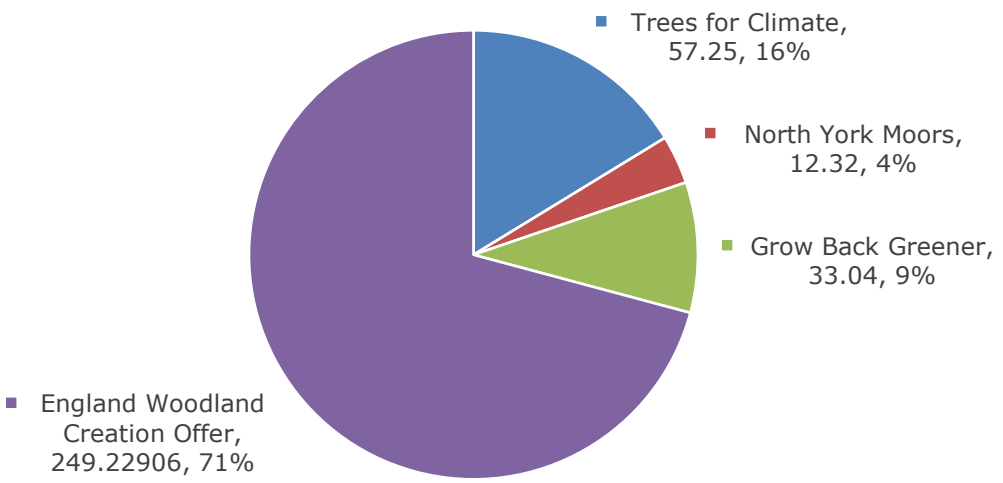


Figure 4. Proportion of total uptake of natural colonisation component (ha) across four grant offers April 2019- August 2024[1]

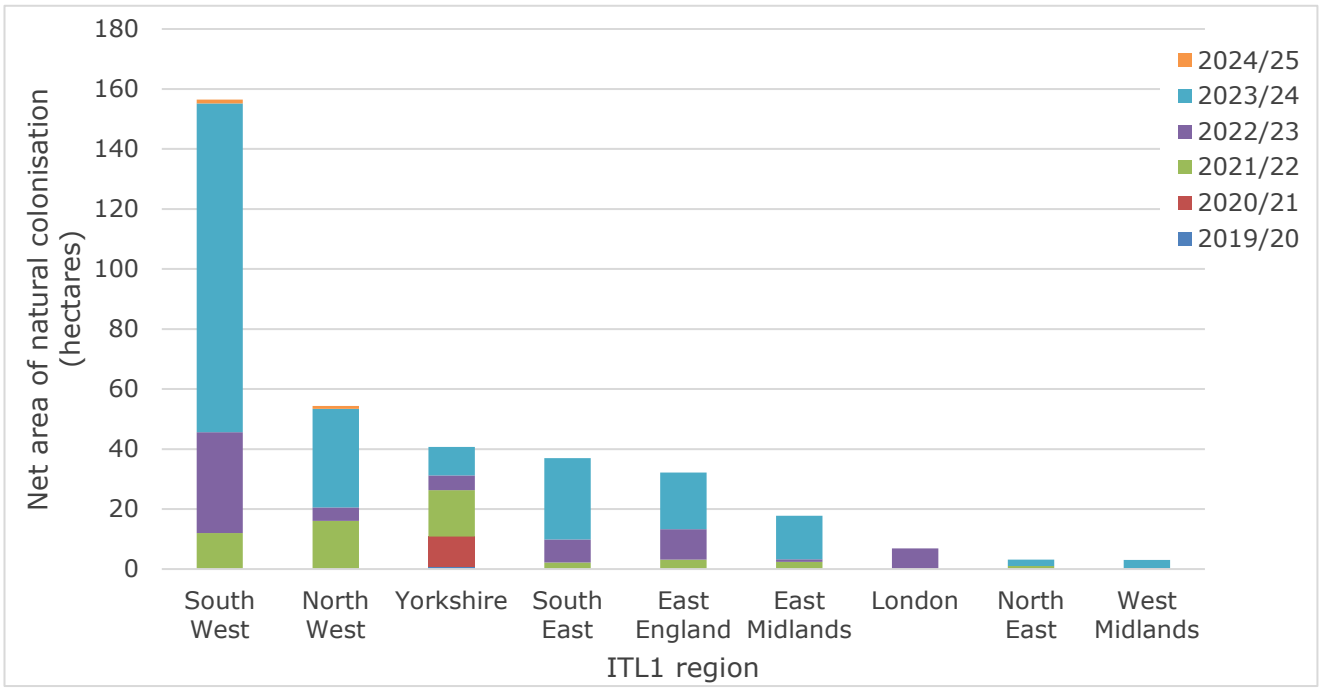


Figure 5. Natural colonisation grant component uptake (ha) across England's ITL1 regions by season of delivery April 2019- Augst 2024[3]

[3]Source: Combined dataset covering period April 2019- August 2024. Data shows "delivered" and may show season of delivery. 'Delivered' means the grant has passed through the application pipeline, and is being delivered or has been delivered.

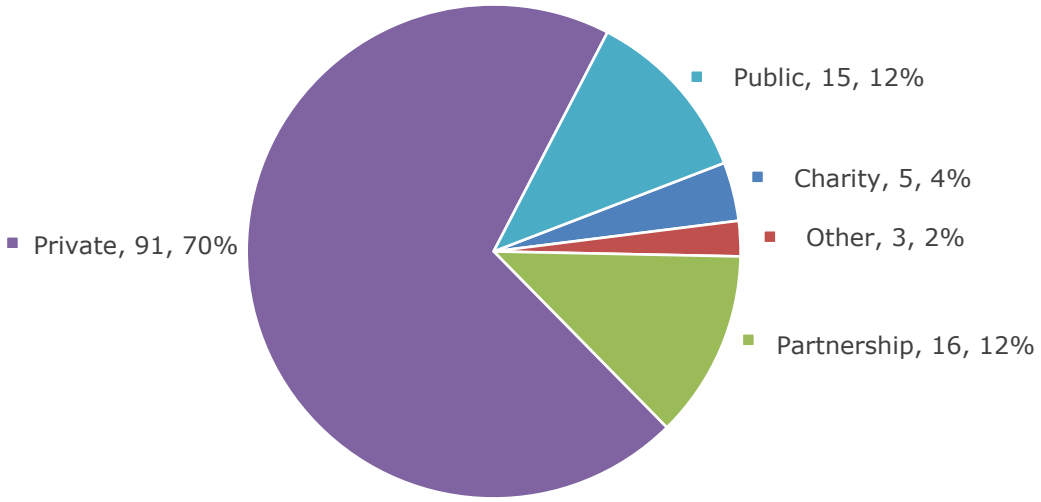


Figure 6. Proportion of natural colonisation grant agreements (n=130) by land manager type April 2019- August 2024[2]

Figure 6 shows the breakdown by the number of grant agreements of the different kinds of land managers choosing to use natural colonisation. Private owners (i.e. farmers and estate owners) are in the majority, with Partnerships (i.e. collaborations between land owners and managers, including organisations and public bodies) and Public landowners (i.e. Local Authorities) the next most numerous. Breaking this headline down further

Figure 7. Proportion of four different offers' grant agreements (n=130) taken up by land managers of varying types April 2019- August 2024[4]

Figure 7 shows which of the grants have to date attracted land managers of different types. The headline from this chart is that EWCO has engaged proportionately more private land owners (c. 80%), and has the greater diversity of land manager types; whereas England's Community Forests have engaged more public owners (c. 49%), through the Trees for Climate fund.

It is important to note that the majority, i.e. c.87%, of scheme agreements using natural colonisation do this as a component of schemes which include tree planting as indicated in Figure 8. Areas put down to natural colonisation tend to be small whether as stand-alone or as part of mixed schemes, averaging between 2.2-2.7 ha across the grant offers included in the dataset: The areas planted with trees tend to be larger (see Table 6).

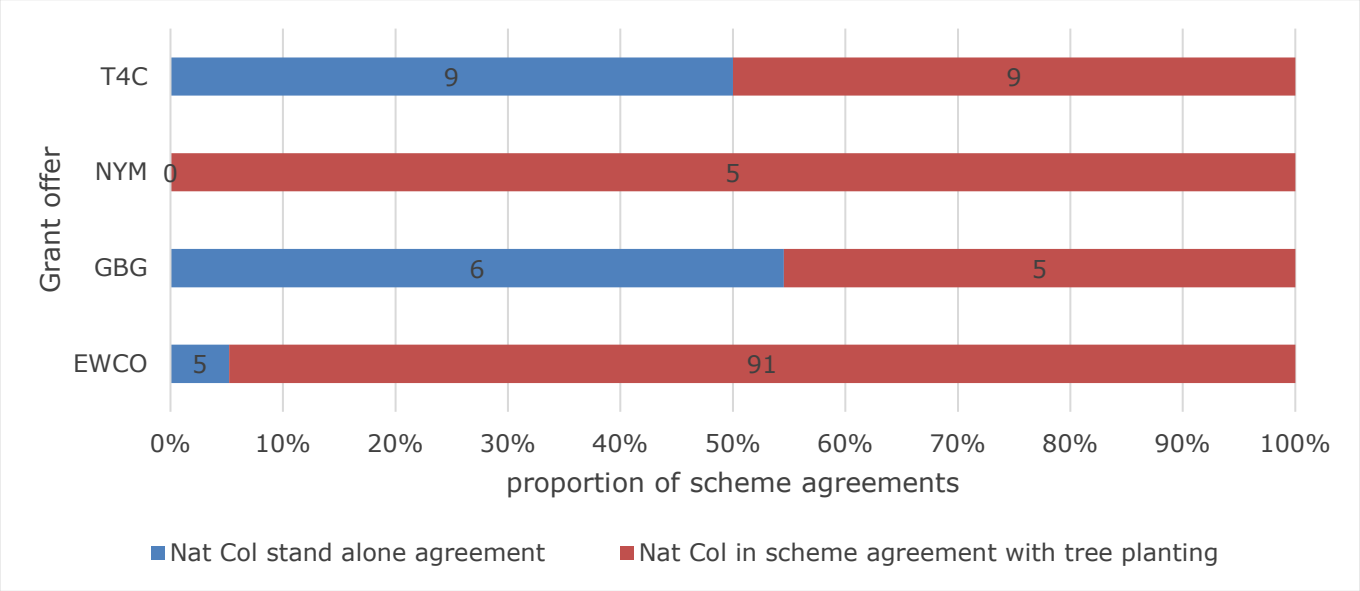


Figure 8. Proportion of agreements (n=130) where natural colonisation is included as a stand-alone scheme or as part of a scheme that includes tree planting April 2019- August 2024[5]

[4] Source: Combined dataset covering period April 2019- August 2024. Data shows "delivered" schemes. 'Delivered' means the grant has passed through the pipeline, and is being delivered or has been delivered

[5] Source: Combined dataset covering period April 2019- August 2024. Data shows "delivered" schemes. 'Delivered' means the grant has passed through the pipeline, and is being delivered or has been delivered.

Table 6. Average size of natural colonisation (NC) components in different schemes (n=130)[4]

Grant offer	Average area (hectares)		
	Stand-alone NC schemes	NC in schemes including planting	Tree planting in schemes with NC
EWCO	2.3	2.6	6
GBG	4.2	1.6	5.7
T4C	2.3	4.1	data issue
NYM	0	2.5	14.8
Average of all	2.2	2.7	6.4

2.3.3 Land managers and advisors awareness and understanding of natural colonisation grants (RQ1.3)

Participants in the focus groups and validation workshop were most aware of Forestry Commission's EWCO amongst all of the grant offers available, although knowledge of the Appendix 5 natural colonisation option within the EWCO grant offer varied. Amongst the advisor group, all participants were aware of EWCO Appendix 5 and most had personal experience using it (e.g. on behalf of a land manager or landowner). The land managers with natural colonisation experience along with one interviewee had all used EWCO Appendix 5 and had high awareness of the grant offer conditions, although those that had gone through the process without an advisor demonstrated more detailed knowledge. For example, one participant had flagged payment inconsistencies in the EWCO handbook to the Forestry Commission, which have since been corrected. The other interviewee had heard of EWCO although chosen to use the Northern Forest grant offer instead. Whilst the final focus group with land managers ranged from low awareness to no knowledge of the natural colonisation option within EWCO at all and minimal knowledge of other grant offers. Across the focus groups, the awareness of other grant offers depended on the participants' location with slightly greater recognition of the Northern Forest due in part to the Woodland Trust's involvement as the responsible organisation.

Knowledge of the other grant offers for woodland expansion from the support map was minimal and location dependent, with only those from the north of England having heard of or used the Northern Forest's Grow Back Greener grant offer. However, participants suggested other potential funding sources, most consistently Biodiversity Net Gain (BNG), as potential avenues for natural colonisation financial support. When asking participants about their awareness of grant offers for natural colonisation, they regularly returned to listing all woodland expansion grant offers and noted uncertainty as to whether they would support natural colonisation or not. One advisor shared their uncertainty around it by saying: "*I probably don't know enough about it to be advising on it, so I don't advise on it*".

The advisors who felt unclear on the different natural colonisation grant offers, including their objectives (scrub or woodland habitat), conditionalities and risk of outcomes were hesitant or tended not to recommend grant offers. They expressed a sense of confusion and contradiction about how the natural colonisation method fits in the grant landscape given some grants aim for scrub and others for woodland habitat. This sentiment was also

expressed by land managers who had not used the grant offers for natural colonisation as an additional reason for uncertainty of choosing the approach given the lack of control of the outcome habitat. However, it was not a sentiment shared by those land managers with natural colonisation agreements as the transitional stages of scrub to woodland was part of the appeal of natural colonisation as a method for woodland creation.

The source of participants awareness of grant offers varied between professional advice and a purposive online search. Where applicable, land manager participants' knowledge of grant offers tended to be mediated from their advisor. For those without an advisor, an online search led them to Forestry Commission's EWCO. Given all except one of the participants from both land manager focus groups were private landowners or tenants, the level of awareness reflects the private sector more than public. One participant noted that the greater awareness of EWCO compared with other grant offers could also be related to the design of the marketing and communication as being part of a menu of national agri-environment grants for landowners across England whilst other grant offers are branded as being more community-minded and location specific:

> *I think EWCO kind of gets folded in with all the funding opportunities for landowners alongside things like Countryside Stewardship, SFI, whereas these other funds appear – although it's not their intention - they're marketed more as kind of community funds or community pots of money.*

Most participants who had an advisor cited this as the key influence in shaping their awareness and understanding of the grant offers available and suitable to their land. The advisors referenced varied in association for example, part of an organisation e.g. FWAG, woodland consultancy business, or an officer associated with the delivery organisation. Table 7 provides a summary of the participants' awareness of natural colonisation grant offers, views on grant offer communication, and influences for their awareness and understanding.

Table 7. Summary of focus group data on the awareness, communication, and influence aspects of grant offers (n=21+13)

Grant offer	Awareness	Communication	Influences
EWCO Appendix 5 **(Forestry Commission)**	Aware of scheme but often confusion over details of offer: "*can I just double check this funding level for natural regen in EWCO*" More familiar with planting option: "*the EWCO grant lends itself towards planting because people like that instant, you know, there was a field and a few weeks later it's a nice row of trees in tubes and shelters and a nice fence round it.*"	Currently the Appendix 5 option: "*just looks like it's been bolted on*" A sense that the comms around natural colonisation: *"was pushed hard for a while and they've gone quiet now"* *"I'm normally quite sceptical about government grants and stuff like that, and I actually think the EWCO,*	Advisor influence and assistance appreciated to coordinate application: *"I've found that having an adviser from FWAG has been immensely helpful."* *"the EWCO came up and an adviser said to me, "Oh, have you heard of the EWCO? It's just come out. This is about the best scheme around." So*

Grant offer	Awareness	Communication	Influences
	EWCO seen as an enabling grant offer "*EWCO has been like revolutionary in the sense of how generous it is*."	*the information is quite easily accessible."* *"I just Googled it and the Forestry Commission scheme, EWCO I think you call it, was really the only one that came up, I think."*	*I looked at that and went for that one."*
Grow Back Greener (Northern Forest)	Most not heard of it unless they live in the area or have used it: "*But the Northern ones I wouldn't particularly know*."	Found out about it through delivering partner: "*it certainly helped knowing the right people and I didn't have to go through that sort of process*"	Advice by grant delivering partner: "*He said, you know, these would be really good for natural colonisation. And I was just like, yes, I'm happy to go with whatever you suggest*"
Other/ all offers	Amongst advisors - aware of grant offers but not natural colonisation part of the offer: *"I didn't know that supplementary planting was included. And I'll speak for myself rather than all of the other agents, but I probably don't know enough about it to be advising on it, so I don't advise on it."*	Improve signposting for land managers to choose grant offer based on their objectives. Email newsletters as a key source of information Call for visuals and case studies to explain what natural colonisation is.	Advisor influence noted most, and peer influence not mentioned.

The participants with awareness of the grant offer designs, noted that they were mostly compatible with other grants except where there were inconsistencies in the conditionalities e.g. Woodland Carbon Code. Many of the EWCO grant holders were also part of Countryside Stewardship and felt the two offers complemented each other across their whole landholding. Although one person felt "*the scheme isn't compatible with other ELMS schemes"* due to disputing the Rural Payment Agency's parcel number system with permanent boundaries, e.g. for each field, limiting the intimate mix of grant offers. Clawback was not viewed as a worry by those that were aware of all the grant offers having supplementary planting on offer. This contrasted with those with lower understanding of the conditionalities, who viewed natural colonisation as too risky to be suited to a woodland creation grant offer.

> *It's [natural colonisation] something that most commercial people shy away from, purely because they can't guarantee it's [stocking density] going to happen… whoever's providing that grant needs to see not just effort, they need to see sort of results*

There was a recognition that the grant offers were all relatively young and so components are still changing and improving, although there was uncertainty of if and how this would impact existing agreement holders, e.g. the increase from 10 to 15 years and increasing payment rates. EWCO's grant offer was perceived by several participants as "*generous*", although some felt that it was only sufficient to enable landowners to put trees where they had been wanting to rather than tempt them to convert land use without prior wish:

> *… it is increasing woodland cover, but it's not enticing people to suddenly do it, it's allowing them to do what they've always wanted to do*

Flexibility was emphasised as a key necessary feature for a natural colonisation grant offer in all the focus groups. This was both in the practical sense of offer design, i.e. allowing hybridity and providing more options for soil cultivation and preparation, as well as in providing a sense of trust that the land manager may know what the best approach for their circumstances. In terms of soil cultivation, advisors and land managers with natural colonisation agreements, emphasised the importance on guidance and funding for ground preparation techniques, such as screefing and scarifying:

> *ground prep is absolutely essential and properly funding that ground prep is absolutely essential in order to achieve the kind of speed of recovery for these 15-year, 25 year timescales.*

In terms of hybridity, this can be facilitated through allowing smaller areas to be put aside rather than whole fields, although this may currently be constricted by the 'parcel system' that the Countryside Stewardship and EWCO online system uses to avoid double funding. It seemed that if there were too many rules and conditions, i.e. the handbook was too dense and long, then the grant offer was likely to be seen as 'inflexible'.

Table 8 provides an overview of advisors and land managers' perceptions of natural colonisation grant offer designs.

Table 8. Land managers perceptions of natural colonisation grant offer design and components (n=21+13)

Grant offer	Offer design			
	Clawback	Compatibility	Payments	Flexibility/ restrictions
EWCO Appendix 5 **(Forestry Commission)**	Confidence around meeting required no. of stems - supplementary planting option gives "*a safety net*".	Mostly compatible with agricultural subsidies (Countryside Stewardship). Restrictions misalign with Woodland Carbon Code – 50m vs. 75m seed source.	"*confusion over the payment*": Unclear and vague payment conditions. Upfront capital limits size of applications. Additional payments/ha for biodiversity and public access: "*generous scheme*	Some rules are set in stone - officers should have more flexibility to make decisions to suit the site. "*a bit inflexible*" e.g. not allowed payments for tree guards.

Grant offer	Offer design			
	Clawback	Compatibility	Payments	Flexibility/ restrictions
			with the additional contributions"	
Grow Back Greener **(Northern Forest)**	Potential penalties not important – "*I don't envisage any problems*". "*the potential penalties if you like for not having that natural regen it doesn't really matter. It's neither here nor there in terms of the big picture of things*."	Compatible with Countryside Stewardship.	Attractive - additional payments for biodiversity capital items over and above tree planting items Option for upfront payments removes cash flow issues. "*considerably lower*" than EWCO's offering.	Hybrid offer with soil cultivation options. Flexibility respects that advisor/ landowner knows the site best.
Other/ all schemes	"*I'm not concerned about that*" Encourage risk taking.	Compatibility and flexibility are key.	Increase payment rates – insufficient incentive currently.	Flexibility is essential as "*one-size doesn't fit all*"

2.3.4 Factors influencing land managers uptake of specific grants. (RQ1.4)

The factors influencing whether land managers take up a natural colonisation grant offer and how they choose between offers, fell into three main themes:

- Perception of natural colonisation
- Perception of grant offer
- Support from the funding organisation with the grant offer

Firstly, there was consistent agreement across participants that land managers and landowners would need to either already be keen on using a more natural and slow process to woodland creation or be open to learning about natural colonisation before agreeing to a grant offer. Therefore, the first step is selling natural colonisation as an idea and having a clear understanding of the expectations and outcomes of using this woodland expansion approach. Participants who had no experience with natural colonisation had the perception that it is "*very tricky*", and "*it's the unknown*". The uncertainty of outcomes and functions for the woodland was also expressed by some, for example referring to natural colonisation being at risk of becoming a "*jungle*" and the need for a timber or food product: "*I want my trees to produce something other than being a wonderful wildlife habitat*".

Those who had used a grant offer tended to have more positive views informed by observing natural colonisation on or nearby their land: "*I've seen how fantastic that is over the last ten, 20 years*". In addition, these participants expressed that they were

independently seeking to use natural colonisation as it aligned with their personal objectives e.g. "*the main reason I did it was because I wanted diversity of habitat*" or due to an advisor suggesting it and being open to the idea e.g. "*He said, you know, "These would be really good for natural colonisation." And I was just like, yes… I'm happy to go with whatever you suggest*". Therefore, the perceptions of natural colonisation from the participants were influenced by personal experiences of observing natural colonisation nearby, suggestions from advisors and consultants, and views on the likely outcomes of this approach, including likelihood of meeting productive objectives.

Secondly, the perceptions of the grant offer are a key factor in the decision-making process for landowners. For example, some participants with low awareness of the grant offers found it difficult to understand how natural colonisation could fit into a grant offer structure:

> *it's such a difficult thing to do grant aided because, quite rightly so, whoever's providing that grant needs to see not just effort, they need to see sort of results. So yes, I'm not surprised by the lack of take up*

For those with more understanding of the grant offers, their perceptions of grant offers were regularly related to the payment rates and views on whether the grant offer is generous or not: "*EWCO's nearly always more generous than any other grant out there at the moment*". However, the grant offer choice didn't always come down to money, as their prior experiences with the funding organisation and their views on non-monetary support influenced their decision. As one participant expressed:

> *in terms of a design suggestion for a programme, it's more the relationship that I would want to have with a funder. There is a very different feel to working with the likes of the Woodland Trust, versus working with Defra… you cannot compare the two in terms of the application process and the way that you're made to feel as a person receiving that grant… It's more about your intentions are right, you did everything you could, you know, your land better than anybody, do what you think is right, we trust you. And that makes a huge, huge difference.*

Lastly, a further key factor influencing grant choice is the support provided by the funding organisation from the start of advising if the grant offer is suitable, assistance with completing the application process, through to arranging and carrying out work onsite. Here participants who had used the EWCO grant offer reported variable experiences on the level of support in part due to a consistent view that the application is a slow process that lacks a transparent timeline, and that it was unclear who to contact for updates. For one participant, they felt the EWCO team were resistant to progressing their natural colonisation application due to the desired scale of the project and this required escalation through the organisational ranks to achieve approval. For another participant, who completed the process unaided by a consultant would have preferred a choice of contact options, such as a phone number, rather than only email correspondence. However, two other participants noted that whilst the process required patience, when they did get through to someone from the EWCO team, they were "*really supportive*".

In contrast, the two participants who had used the Northern Forest's Grow Back Greener grant offer were both in praise of the support from the funding organisation and delivery partner. They felt they had their hand held throughout the process with the delivery partner completing the paperwork, arranging and overseeing the contractors, and annually returning to monitor the site. The experience of using the Grow Back Greener grant offer may vary between which delivery partner is leading the agreement scheme, with some partners occasionally facilitating direct delivery (coordinating and paying contractors) although this is not standard practice. Table 9 provides a summary of the factors influencing uptake of grant offers.

Table 9. Land managers' perceptions factors influencing uptake of grant offers (n=21 +13)

Grant offer	Perception of Nat Col	Perception of grant suitability	Support from funder
EWCO Appendix 5 **(Forestry Commission)**	"*we're thinking of doing some natural colonisation under EWCO on both sides of the river, but we think that there is a risk of both sides of the river turning into a jungle because it's always nice and wet, so it's protected*"	Depends on size of project – if a larger scheme then worth it for high payment rates. Advisor/ consultant required for application process as it is "*daunting and really time consuming*" for a lay person.	Unclear and inconsistent on who to contact for support. Slow to respond but "*really supportive*" Resistance rather than support from FC to sign-off applications. Feel powerless: "*you definitely weren't in control of the process*" Timeline of grant offer application slow and uncertain Contradictions within the manual/ contract.
Grow Back Greener **(Northern Forest)**	"*I'm not just chasing carbon, I'm not just chasing sort of payments but it's that holistic approach that's important to me.*"	"*Most flexible, user-friendly scheme I've come across*". Suitable for landowners without an advisor as delivery partner can assist with paperwork and contractors.	Sense of trust between funder and applicant and common sense approach Online support is quick and a phone number available. Informed and considerate advisors/ officers.
Other/ all offers	Prior interest in natural processes "*It's quite hard to sort of convey natural colonisation unless the landowner's already sort of bought into that idea of the transitioning habitat and how it's going to develop over time.*"	Lower risk outweighs higher costs: "*if landowners want trees they do tend to plant them, because it might be higher cost to start with, but it's actually lower risk I think*"	Increased support and guidance for farmers with woodland as they are not foresters. Speed and ease of payments matters for private landowners.

2.3.5 Suggestions for improvements to grant design and other support (RQ1.5)

The suggestions for improvements relate to two areas: the process of delivering the grant offer and the design of the grant offer. In terms of the process, participants expressed that the accessibility of the EWCO grant offer to lay land managers and landowners required improvement. A suggestion is having a phone number available for quick questions, having a consistent contact that the applicant can build a working relationship with for advice and guidance, along with offering webinars or accessible training on the application process[6]. Another key area for improvement in the process is providing a timeline so the applicant can plan ahead and knows whether the application is on track for progressing.

In terms of grant offer design, several participants expressed that whilst EWCO is "*generous*", the payment rate is still not sufficiently tempting to persuade those who are not already keen to use natural colonisation. The payment schedule should be considered given this was a notably factor for two participants choosing the Northern Forest grant offer instead of the EWCO. Lastly, the flexibility of the grant offer was emphasised by all focus group participants, regardless of experience, as many felt there needed to be a more tailored site-by-site approach with a greater menu of options to choose from, such as funding a wider selection of ground preparation methods and wildlife population control. Table 9 contains a summary of land managers suggestions for natural colonisation grant offers with exemplary quotes.

Table 10. Land managers' suggestions for improvements to grant offer design (n=21 +13)

Grant offer	Suggested improvements	Example quotes
EWCO **(Forestry Commission)**	Align conditions with Woodland Carbon Code. Support a choice of ground prep and maintenance methods. Up-front payments or quicker reimbursement. Simplify and speed up the application process – 6-month timeline. Have specialist natural colonisation woodland officers to advise on site suitability Increase visibility and promotion of natural colonisation option within EWCO offer	*"there is a mismatch between what the Woodland Carbon Code uses in its predictions… that has huge implications"* *"I think that needs to be reflected in the grants 100%, maintenance."* *"you have to have designated regeneration woodland officers, or EWCO woodland officers"* *"Payment rates and payments to be made up front would be really, really helpful, and payment rates generally increased"* *"a simple an application process as possible that's based on trust."* *"We don't promote it enough, whether that's through getting some decent case studies and examples we can show landowners of the outcomes"*

[6] NB. Research results were fed back to the Forestry Commission through the course of the project, so it is important to note that FC now has a call centre in place and a series of videos for guidance is was under review at the time of writing

Grant offer	Suggested improvements	Example quotes
		"Having one point of contact would really help with communications. Having a clear timetable. Yes, making it clear who is in charge of the application."
Grow Back Greener **(Northern Forest)**	Increase/ align payment rates with EWCO rates. Freeholder rights - Re-word contract so that scheme would carry over if property sold rather than seeking approval from funder to sell.	*"this natural colonisation… it's a relatively small payment."* *"it's very important to me that I'm the freehold owner of that land and through the Woodland Trust agreements they were challenging that freehold ownership."*
Other/ all offers	Increase flexibility e.g. hybrid approaches; adapt approach to suit land type and prior land use. Add more flexibility to facilitate a site-specific approach. Increase payment rates – insufficient incentive currently if not already self-motivated to used nat col and have trees in the area. Add payment option for lethal wildlife control. Woodland carbon code align their upfront claimable areas conditions to align with grant offers: 75m from seed source.	*I think we want to be promoting more species [diversity], so it's a combination of planting and natural colonisation which is why I think it works well."* *"a site-by-site assessment would be more beneficial in that, to make sure that the tax payers' getting value for money"* *"the flexibility around the process is really important"* *"What they need to do is get rid of all these schemes as separate entities and have one menu where you have EWCO, SFI and CS all on one menu that you can choose from."* *"payment rates generally increased"*

2.4 Conclusions

The key take aways from the work looking at land managers uptake and use of the available grant offers for natural colonisation are listed below and represented in Figure 9.

There is a continuing need to sell natural colonisation as an option for woodland expansion. This adds additional weight to the conclusions of the scoping work that we undertook in 2021-2023, which also found a need for generating more awareness and understanding about natural colonisation. Land managers need to know i. what natural colonisation is, ii. how it can help them achieve their land management goals, iii. and what the associated risks are.

Grant offer design should consider ways to include risk management strategies where appropriate and communicate these clearly, such as by allowing 'hybridity' in the form of supplementary tree planting (e.g. applied nucleation) or other strategies to ensure the required tree cover is achieved.

The grant landscape is complicated, so land managers need a better understanding of which grant offer suits them best to meet their objectives and site, and how different grant offers may or may not be compatible with one another. For example, complementarity between the natural colonisation elements of woodland expansion grants and BNG or carbon payments were a key concern.

The grant landscape can be contradictory. Natural colonisation implies progression to woodland cover, however grant offers for scrub elements do not allow this continued succession. This increases the complexity of navigation for land managers who require certainty about the risks of using natural colonisation from a land use classification perspective, including how this will change the land value. It also increases complexity for advisors who may be unclear on the distinguishing objectives of differing grant offers' objectives, either scrub habitat or woodland, which influences their recommendations of suitable grant offers to land managers.

Finally, land managers have restated the importance of support through an application development and submission phase, as well as a delivery phase. The support sought includes advice and guidance, as well as face to face interactions by different services and organisations at different points in the customer journey. All of this needs to be set in the context of everything else in the scheme for the landholding (e.g. alongside tree planting, additional contributions, or in addition to Countryside Stewardship).

Figure 9. Suggested customer journey to support uptake of natural colonisation grant component

3 Language and Messaging for Natural Colonisation

3.1 Objectives and research questions

Scoping work during 2021-23 produced a characterisation of land managers linking different attitudes towards natural colonisation to one of three broad "identities", namely productive, conservation focused, and amenity focused. The data showed that land managers under each of these identities did not routinely use the term 'natural colonisation' to describe woodland expansion through natural processes. Conservation identities tended to use the terms 'rewilding', or 'natural regeneration', public/amenity/utility identities tended to use the terms 'natural processes' or 'regeneration', and productive identities tended to use the terms 'natural regeneration' and expressed dislike for terms 'rewilding' and 'colonisation'. Further investigation of how the language and communication of natural colonisation could be improved was warranted by these results.

The purpose of this workstream was to:

- Explore the language and messaging surrounding natural colonisation, to support more effective engagement and uptake of natural colonisation with different kinds of land managers.
- Provide this evidence in a form useful to policy makers and other stakeholders to help them improve the design of incentives, other support, and deliver mechanisms designed to encourage uptake of natural colonisation as an approach.

The objectives were achieved by answering the following specific research questions, that were developed and refined in collaboration with stakeholders who provided advice and feedback throughout the project.

RQ2.1. What language are land managers from the three identified identity types using to describe woodland expansion through natural processes?

RQ2.2. What is conditioning the language land managers use? Are they always using the same terms? Why/why not?

RQ2.3. Why does natural colonisation as a phrase to describe woodland expansion through natural processes enfranchise/disenfranchise different landowner identity types?

RQ2.4. What language and messaging would land managers prefer and why?

RQ2.5. How can language and messaging promoting natural colonisation to different kinds of land managers (including farmers and foresters) be more enfranchising and engaging?

3.2 Method: Data collection and analysis

3.2.1 Rapid evidence review

A rapid literature review was conducted in June 2023 to explore existing evidence on the influence of language and messaging upon attitudes towards, and uptake of, woodland expansion through natural processes. The review focused on the terms 'natural colonisation', 'natural regeneration', or 'rewilding'. Two social scientists reviewed academic and grey literature and met to discuss, sift papers for relevance, and summarise the results. 10/139 papers made it through the sifting process.

3.2.2 Focus Groups and interviews with land managers

A Project Advisory Group (PAG) was formed in May 2023 comprised of stakeholders with experience, interests, or roles related to woodland creation/expansion through natural processes, in particular relating to natural colonisation. This included representation from the Woodland Trust, Natural England, Defra, Forestry England, the Forestry Commission, and Mersey Forest.

The PAG were consulted to ensure our research questions spoke to the evidence gaps highlighted in the rapid literature review and scoping work conducted between 2021-2023. Consultation and feedback on sampling and interview question guides was instrumental in co-designing our methodology for land manager focus groups and interviews.

An interview schedule was created which sought to establish the kind of language land managers use when discussing woodland creation or expansion through natural processes (See Appendix 5). We explored why they were using specific terms, exploring land managers own language and also specifically covering awareness, understanding, and attitudes for the terms 'natural colonisation', 'natural regeneration', and 'rewilding' which were prevalent in the literature as well as the phase 1 research data.

A purposive sampling approach was undertaken to recruit land managers representing each of the three identity types: conservation, public amenity, and productive. Participant identities were determined by their land management values/objectives and confirmed by self-identification. Participants were identified by leveraging researcher networks, through social media such as LinkedIn, and by reaching out to online communities and relevant membership organisations to request that they advertise the opportunity with their members. An over-sampling approach was taken to maximise the likelihood of reaching our target sample of 6-8 attendees per workshop.

Consideration was taken to ensure land managers who were under-represented in the sample from 2021-23 were invited to take part in the research, these included farmers, foresters, estate managers, utility companies, and local authorities. To reduce the risk of stakeholder fatigue and response bias, the research team ensured that individuals who had been drawn upon in earlier phases of the research were excluded. The PAG were supportive in suggesting further potential participants. Discussions with woodland officers and advisors were particularly helpful in extending the reach of the study.

Recruitment took place between July and September 2023. Not all invitees were able to attend the focus groups, so in the end we employed a mix of focus groups and interviews. Table 10 below describes the sample, with the final sample size being 19 in total meeting the 6-8 per target group. Those from productive identities proved most difficult to engage and only one person attended the focus group – which must be considered an interview.

Table 11. Sample characteristics of focus group participants discussing language (n=19)

Target group	Landowner type / Organisations to recruit from	No. at focus group
Conservation identities	Conservation charities	4 + 1 as an interview
	Advisory charity	1
Total		**6**
Productive identities	Farmer	4 as interviews
	Forester	3 as interviews
Total		**7**
Amenity identities	Amenity	1
	Utilities – water company	1
	Public Authority	1 + 2 as interviews
	England Community Forest	1
Total		**6**
Grand total		**19**

3.2.3 Validation workshops

Validation workshops were carried out following the analysis of the land manager interviews and focus groups. Three workshops took place in March and June 2024, each of which involved participants who represented each one of the three land managing identities. The discussions lasted 90 minutes conducted online over Microsoft Teams. A market research company was contracted to recruit the harder to reach identity types, and they offered incentives for their participation. A total of 22 people (7 conservation, 8 productive, and 7 amenity identities) took part in the validation workshops.

The purpose of these workshops was to engage a new group of representative land managers and present our data to them. The workshops were designed to facilitate engagement with our research findings to discuss, and validate the reliability, relevance, and applicability of our evidence by representatives from each target audience.

Validation workshop participants were provided with a summary of the research findings as well as a list of the questions to be discussed relevant to the identity type involved. The discussion centred on the following:

1. Does your awareness and understanding of 'natural colonisation', 'natural regeneration', and 'rewilding' match that of the evidence summary?

2. Do you agree with the evidence summary about how and why the terms 'natural colonisation', 'natural regeneration', and 'rewilding' are positive or negative?
3. Are there terms not captured in the evidence summary that you use to describe woodland expansion through natural processes?
4. Is it important to use one term with an agreed definition, or do you think it is more useful to have different terms that suit different audiences?
5. Is language and messaging as important as we think it is in encouraging land managers to consider using natural processes to increase tree cover?

3.2.4 Data analysis

The data collected during the focus groups, interviews and validation workshops was in the form of recorded transcripts. These were sent to a professional service for intelligent transcription. The transcripts were then uploaded NVivo 14 software for analysis.

After coding using CDA and sentiment analysis as described below, the exploratory and analytical functions in NVivo including matrix queries and text searches were carried out (see Appendix 6). Case data for the participants was also collected and used to disaggregate results by land manager identity type and to look for obvious patterns and differences.

Critical Discourse Analysis

A thematic inductive coding approach was taken to the transcript texts. This was based on Critical Discourse Analysis (CDA), a qualitative research method that examines how language functions and creates meaning in different social contexts. CDA emphasises the contextual meaning of language and explores themes such as power structures and the communication of values, beliefs, and assumptions [7]. CDA is closely related to discourse analysis which has been used to examine prevalent narratives in environmental politics[8][9] and has been used to better understand the discursive impacts of language on land managers perceptions of forest issues such as biodiversity loss[10]. Unlike purely linguistic

[7] Farrelly, M., (2019). Critical Discourse Analysis, In P. Atkinson, S. Delamont, A. Cernat, J.W. Sakshaug, & R.A. Williams (Eds.), *SAGE Research Methods Foundations.* https://doi.org/10.4135/9781526421036815631

[8] Hajer, M., & Versteeg, W. (2005). A decade of discourse analysis of environmental politics: Achievements, challenges, perspectives. *Journal of Environmental Policy & Planning*, *7*(3), 175–184. https://doi.org/10.1080/15239080500339646

[9] Leipold, S., Feindt, P. H., Winkel, G., & Keller, R. (2019). Discourse analysis of environmental policy revisited: traditions, trends, perspectives. *Journal of Environmental Policy & Planning*, *21*(5), 445–463. https://doi.org/10.1080/1523908X.2019.1660462

[10] Tuomo T et al. (2022) Discursive barriers to voluntary biodiversity conservation: The case of Finnish forest owners, Forest Policy and Economics, Volume 136, 102681, ISSN 1389-9341, https://doi.org/10.1016/j.forpol.2021.102681.

approaches, CDA is used to analyse larger segments of text, such as entire conversations. Using CDA as a guiding framework, we were able to use an iterative approach to identify key themes that emerged across the focus group and interview transcripts. These codes included: Awareness/Understanding; Associations (inc. positive/negative); Power and Ways of Knowing; Preferences; Social and Situational Usage (see Appendix 6)

After coding a minimum of three transcripts, researchers met to conduct an intercoder reliability exercise. They compared and discussed their approach and confirmed that the application of the coding framework had been carried out uniformly. Researchers also noted the emergence of some additional inductively derived codes. Following the intercoder reliability exercise, all transcripts were fully coded by the researchers.

Sentiment Analysis

Sentiment analysis was carried out in NVivo 14 to explore positive and negative views related to the terms 'natural colonisation', 'natural regeneration', and 'rewilding' for each of the three land manager identities. For each term, codes 'positives' and 'positive associations', and codes 'negatives' and 'negative associations' were aggregated together to generate reference counts of 'positive' and 'negative' sentiment. Matrix coding queries were carried out to categorise sentiment by land manager identity, resulting in three identity graphs exploring sentiment across each of the three terms.

3.3 Results

After describing the results of the rapid evidence review, the focus group, interview and validation workshop data is summarised below. We have chosen to present the results by identity type rather than by research question, so as to present clear pictures of the language preferences of each audience of interest. We then present a comparison between the identity types to draw some final conclusions.

3.3.1 Rapid Evidence Review

The review confirmed our prior understanding that a lack of evidence exists in this arena, particularly around evidence on the influence and impact of language and communication styles on attitudes and uptake of woodland expansion through natural colonisation. Key findings from the review were:

i. The term 'natural colonisation' rarely features in published social science research. In few cases, the term 'natural regeneration' featured. However, 'rewilding' dominated.

ii. All three terms were considered ambiguous, lacking consistent understanding, and difficult to communicate beyond as well as within the scientific community. These associations were attributed, in part, to a lack of clarity around definitions, the differential outcomes of these processes, and changing values and perceptions associated with these concepts.

iii. Studies highlighted how language must consider the target audience, and messages should be crafted and used with sensitivity to cultural and professional contexts and

preferences. The terms used can be highly negative if they imply changing land use in a way which is not viewed positively by social norms; this seems to be particularly true within the agricultural sector. Terms such as rewilding, for example, have been found to alienate particular land managers because of the strongly negative socio-political connotations.

iv. Language and communication around natural colonisation must be clear, with the use of non-technical language and consistency across organisations. In particular, the reviewed evidence highlighted communication failures between government departments which was seen as contributing to confusion, frustration, and a lack of confidence in knowledge exchange to customers, namely farmers.

3.3.2 Comparing land managers perspectives by sentiment

The analysis we present here is based on counts of coding references applied to the focus group and interview data. Coding references refer to the number of times a word or phrase is coded and therefore counted. The principal being applied is that the higher the frequency of coding references, the greater the important or significance of that word or phrase to the person or group being considered. Any one individual may mention the words or concepts being coded any number of times or none.

Amongst Conservation land managers, sentiment for natural colonisation and rewilding was predominantly negative (Figure 10). Only natural regeneration was more frequently referenced with positive sentiments than negative, suggesting that it may be regarded as a more popular term compared with the other two. It's worth noting that natural colonisation was starkly negative, with very little positive sentiment expressed, followed, to a lesser extent with a similar pattern for rewilding.

Amongst productive land managers, sentiment for natural colonisation and rewilding was predominantly negative (Figure 11). Only natural regeneration was more frequently referenced with positive sentiments than negative, suggesting that it may be regarded as a more popular term compared with the other two. It's worth noting that rewilding was starkly negative, with very little positive sentiment expressed.

Amongst the amenity identities, natural regeneration stands out as associated with only positive sentiment (Figure 12). On the other hand, sentiment towards natural colonisation is predominantly negative. This land manager identity had mixed opinions regarding rewilding, with very little difference between negative and positive scores.

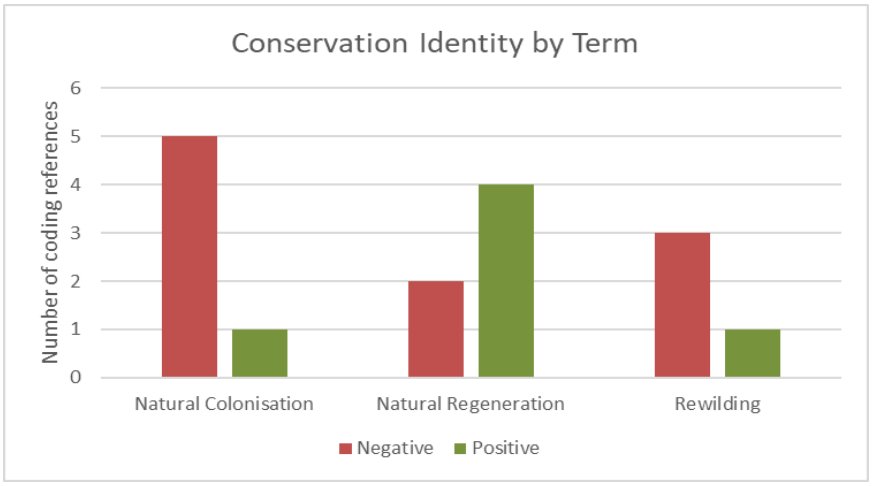


Figure 10. Conservation land managers sentiment towards linguistic terms (n=6)

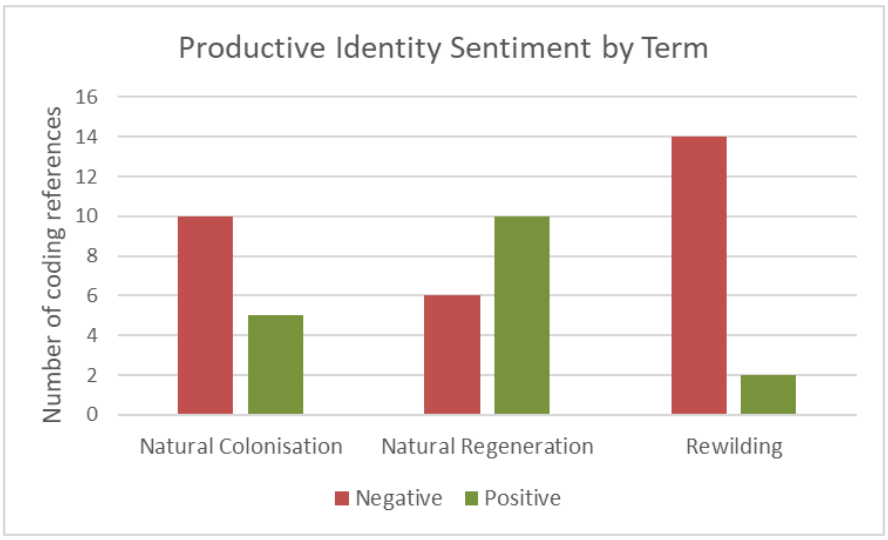


Figure 11. Productive land managers sentiment towards linguistic terms (n=7)

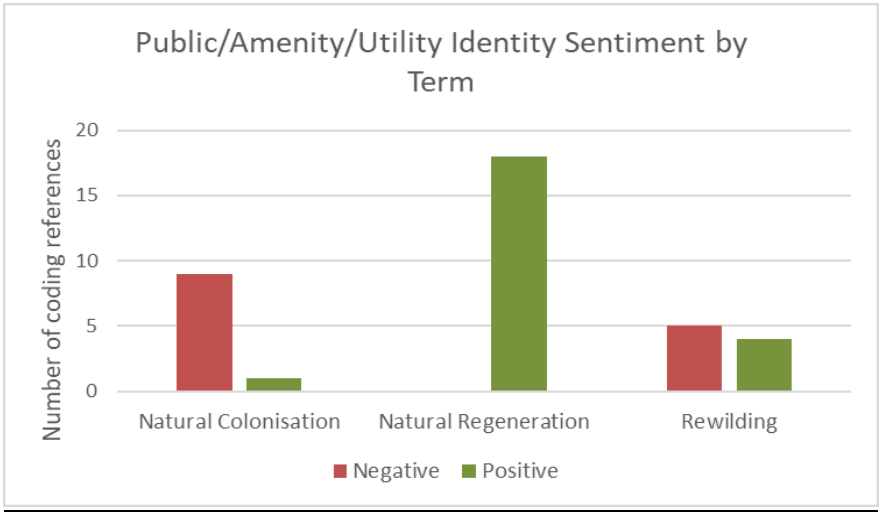


Figure 12. Amenity focused land managers sentiment towards linguistic terms (n=6)

3.3.3 Comparing land managers perspectives across the research questions

Table 12, Table 13 and Table 14 summarise land manager perspectives (research questions 2.1-2.5) and Table 15 summarises the results of the validation workshops. Appendix 7 provides additional detail. The results show:

- Rewilding is largely negative and disenfranchising to all identity types. Understood by conservation identities, but misunderstood by others. It is a term that divides audiences and should not generally be used. Productive identities, in particular farmers found the word deeply divisive along with the word 'scrub'. **Use with caution** if at all. 'Wilding' was the most mentioned alternative.
- Natural colonisation was poorly understood by all and the word colonisation provoked sentiments around colonialism. **Use with caution**. 'Natural processes' were the most often mentioned alternative.
- Natural regeneration was used very widely and appeared to be enfranchising to all audience segments. **Use widely**. Provide clarity on what natural regeneration processes are the subject of messaging and discussion.

Validation participants confirmed these findings (see also Table 14) and engaged in a long discussion about the merits of using natural colonisation and natural regeneration interchangeably. The broad conclusion allied with that of managers with productive identities, i.e. that this is an irrelevant consideration in everyday working, but may be important for professionals, and, e.g. grant offer design. However, increased communication about the different processes influencing natural approaches to increasing woodland cover are essential if land managers are to make informed choices about their land management options, rather than use emotional responses to marketing, advice and guidance which is framed in a disenfranchising way.

Other insights that came through from the validation workshops included:

Tailoring language to what land managers use and focusing on their aims and objectives is more likely to foster buy-in than leading with terms they might not like or identify with. Terms can be introduced later as part of the 'toolbox'.

Making space for hybridity in language and communications is crucial. Many land managers want to mix natural colonisation and tree planting, i.e. using hybrid approaches to meet their objectives. Using language such as 'natural' and 'wilding' implies a lack of management intervention which can be alienating and may also be misleading.

Terms can be disenfranchising or enfranchising. However, land managers wanted to argue that other considerations were more influential in their decision making and action around woodland expansion, namely e.g. grant offer design, payments for outcomes, and permanency of land use.

Language and communication is seen to be influenced by the government and others with power over the media. Terms without political connotations, that are neutral and academic are more likely to be accepted.

Table 12. Conservation identity views and preferences on the language associated with natural colonisation (n=6)

Terms: are they enfranchising or disenfranchising?			How is the use of language conditioned?	Preferred language and why?
Natural colonisation	**Natural regeneration**	**Rewilding**		
Overall sentiment **negative.** Considered **disenfranchising**. Perceived as a loaded term with negative and unpopular connotations, as 'technical jargon', and as exclusionary and marginalising. Potentially suitable for those without existing woodland and who would not empathise with 'expansion' terminology.	Overall sentiment **positive.** Considered **enfranchising**. Strong awareness and understanding, used in many contexts. Considered self-descriptive, popular, and positive. Seen as an important process in forestry/conservation. Potentially vague, requiring further explanation. Not seen as persuasive for those reluctant to move away from tree-planting. Potentially disenfranchising for those who want some intervention.	Overall sentiment **mixed**, leaning towards **negative**. **Unclear** whether **enfranchising** or **disenfranchising**. Term and process understood by **conservation identities**. Used regularly and interchangeably with natural regeneration. Perceived as 'reductive' of complex processes, ambiguous and risks creating misunderstanding and division. Needs adaption for clarity, e.g., 'woodland expansion through rewilding'. 'Wilder' seen as less divisive, suggesting a continuum, rather than absolute change.	**Workplace/Policy/Grants:** Natural colonisation necessary for communicating precise ecological processes, with Woodland Officers, and for documentation. **Social and situational usage:** Those with strong awareness and understanding of the three terms use them interchangeably with those they believed had similar understanding. **Audience:** Terminology is particularly important when engaging with those less familiar with the process. Limited awareness invites interpretations and connotations beyond actual definitions. Terms with negative connotations amongst specific audiences (e.g., rewilding and farmers) are actively avoided by some. To aid comprehension, participants adapted language to be more descriptive and related to the experiences of land managers.	**Natural regeneration favoured** and used most; the only term considered self-descriptive and therefore accessible to more land managers. The other terms suffer negative connotations. **Adaptations were made across all terms for clarity** and to accommodate a diversity of contexts and land managers. In some cases, descriptive language e.g. 'self-seeding', was used instead of any of any of the three terms. **Interchangeable use occurred**, but with recognition of the potential for miscommunication and misunderstanding. Recognition that **case studies and compelling stories** should be used to complement all terms, increase awareness, understanding and engagement in practices.

Table 13. Productive identity views and preferences on the language associated with natural colonisation (n=7)

Terms: are they enfranchising or disenfranchising			How is the use of language conditioned?	Preferred language and why?
Natural colonisation	**Natural regeneration**	**Rewilding**		
Overall sentiment **negative**. Term considered **disenfranchising**. Considered to have negative 'linguistic baggage', associated with colonialism, slavery, invasion, and imperialism. Awareness and understanding were low; 'technical', 'scientific', and needing explanation. Farmers referenced negative linguistic connotations associated with threatening their livelihood, invasive action, or a loss of land.	Overall sentiment **positive**. But **unclear whether the term is enfranchising**. Strong claims that it is well understood, used regularly, and has 'earned its place'. Possibly an ambiguous or 'academic' term; some farmers said that 'regeneration' was over-used, devaluing its meaning; some foresters suggested it needs explicit reference to trees/forests ('forest regeneration'). More appropriate in formal contexts whilst descriptive 'farm language' could be more enfranchising for landowners or farmers. Undesirable connotations were inextricable from opinions on the practice e.g. as a threat to traditional livelihood (farmers) and entailing risks or lack of confidence in funding (productive foresters).	Overall sentiment **extremely negative**. Term considered **disenfranchising**. Not clearly defined, negative associations and diverse interpretations. Practice recognised to have benefits/ opportunities. Claimed that the public see rewilding as incompatible with traditional farming and productive forestry (others suggested this was not true in practice). Farmers stressed that rewilding led to knee-jerk reactions in communities; in some cases, it was seen as a threat to their livelihood. Mistrust about marketing with suggestions that proponents vilify farming and forestry practices.	**Strong evidence that the terms are not well understood**; land managers left to work it out for themselves, leading to barriers to adoption. Negative feelings towards rewilding generated through the associated behaviours and ideologies of rewilders, perpetuated through **media representation.** General recognition of the need to adapt language to different contexts. Technical terms were seen as more appropriate in formal contexts (e.g. with conservation managers, the council, funders). **Peer-to-peer learning and social acceptance** condition the adoption and use of terms. Hesitancy to recognise positive rewilding action, especially by farming unions, due to fear of community backlash. Some scepticism about signing up to a 'movement' despite recognising the benefits.	**Strong evidence that natural regeneration was favoured** and used most regularly amongst all land managers; it was seen as positive, lacking negative connotations, well understood, and descriptive, thus reducing miscommunication. Natural regeneration was considered useful in formal contexts. In less formal contexts, descriptive language is preferred to specific terms. **Mixed views on the interchangeable use of terms**; it is helpful when communicating with different audiences but may risk miscommunication. Some argued that terms are irrelevant provided there is mutual understanding. Terms may be better received and less ambiguous with sufficient **advertisement, positive branding, and explanation with examples**.

Table 14. Amenity identity views and preferences on the language associated with natural colonisation (n=6)

Terms: are they enfranchising or disenfranchising?			**How is the use of language conditioned?**	**Preferred language and why?**
Natural colonisation	**Natural regeneration**	**Rewilding**		
Overall sentiment **negative**. Considered **disenfranchising**. Association with colonialism/imperialism makes it negatively loaded; felt this has subconscious impacts. Sounds like something happening 'to' your land (not positive). Associated with particular groups ('scientists') and professional contexts. Disenfranchising for lay audiences. Associated with a specific kind of action, rather than being more 'holistic' and 'allowing several processes to happen at once' (e.g., woodland creation, natural regeneration).	Overall sentiment **positive**. Considered **enfranchising**. Association of 'regenerative' with a 'process which is enormously beneficial'. Regeneration associated with 'improvement'. Associated with woodland creation (positively loaded) but may disenfranchise land managers who want to increase trees outside of woodland e.g., individual trees, hedgerows. Well understood across different audiences making it enfranchising and accessible.	Overall sentiment **mixed**, leaning towards **negative**. **Enfranchising** for lay audiences and some land managers, **disenfranchising** for others due to lack of clarity. 'A lovely idea', conjures lovely imagery and sentiment of how nice it would be to restore nature. Broad associations of 'wild' with 'nature', 'outdoors', popular with lay audiences. Can be disenfranchising for more technical audiences and land managers due to a lack of clarity in terms of the processes it represents: 'I don't know what we mean by 'wild'. Felt that some strong personalities in the movement can polarise audiences.	**Policy/Grants landscape:** Natural colonisation as a way of 'knowing' woodland creation ushered in by EWCO and grants, associated with the Forestry Commission/Natural England. Participants described 'forcing' oneself to use this language to fit with grants. **Industry:** Natural colonisation a 'technical' term of industry. **Academia:** Natural colonisation perceived as an 'academic term' that feels 'removed' from people who manage/own land. **Popular media and dominant personalities:** Rewilding an 'accessible' term as popularised through media and books e.g., Isabella Tree's book rewilding. **Social and situational use:** Using natural colonisation in technical contexts and natural regeneration or rewilding with lay audiences and clients. Natural regeneration as a cross-context 'catch-all'. **Audience:** Audiences and their understanding are crucial to acceptability of strategies.	Natural colonisation for some is more scientifically correct, but **natural regeneration preferred** due to broad understanding, positive connotations, easier 'sales pitch' and better 'marketability' with clients. On rewilding: Feeling that true rewilding can't be achieved in Britain e.g., in ecological terms with large predators so some interviewees didn't like to use it as felt its use was 'inappropriate': "'Wild' doesn't seem to fit in my brain as any of the restoration we are trying to do".

Table 15. Summary of insights from validation workshops with each of the three land manager identities (n=22)

Conservation Identity Type	Public/Amenity/Utilities Identity Type	Productive Identity Type
Overall agreement with evidence summary, including: Regen favoured and well used. Strong understanding of nat col, but less frequent use than evidence implies. Rewilding avoided, vague/inappropriate to others. Agreement: multiple terms favoured, refute that it might lead to miscommunication. Tailoring prevents exclusivity, opens conversation/scope for unpacking. Agreement: 'woodland creation'/(trees/woods/forests) should be explicit in term communication. <u>Additional points raised, expanding upon our evidence:</u> Not clear we can suggest terms are enfranchising, positives do not = more enfranchising. Alternatively, there was unanimous agreement that speaking more broadly to 'natural processes' was favoured over all terms. Language should complement the opportunity for hybridity and not imply it is a binary choice. Clarity and discussions of outcomes far more important than any terminology. In practice, advisors begin by asking about objectives, and expand from there. Terms come last. Regulatory context is a factor, language is influenced by stipulations set out in agreements (this goes beyond the points raised in evidence around grant specific language).	Overarching agreement with our interview/focus group summary - 'Of the terms, regenerative is the right one' (best understood/frequently used) 'not surprised by the sentiment graphs – dead right' (nat col mostly negative, regen mostly positive, rewilding mixed response) All participants disliked rewilding – 'no one can put a finger on what it actually means' – an ideal or vision that can be popular with the public but not a definable action. <u>However:</u> 'We shouldn't be limited by descriptors that are all part of the same toolbox' 'The methodology can change – the practicalities mean if you get hung up on the methodology and term up front you could miss out on what you're actually trying to achieve.' All participants felt it was most important to start with land managers, their objectives and desired outcomes, and to END UP seeing which grants and which terminology/defined processes (e.g., regen or nat col or tree planting) fit those aims, rather than trying to 'sell' land managers strategies which may be framed through terms that disenfranchise them. 'A term might have put them off – you start with what they want' Also felt like these definitions and leading with them when communicating on tree expansion	Overall agreement with evidence summary, and still unclear whether terms are enfranchising. Agreement: Own technical awareness lessened problematic terminology, that those lacking knowledge were most susceptible to negative interpretations. Rewilding not appropriate and only used by those outside of their community (This was starker than our evidence implied). Agreement: Natural regeneration was most palatable, yet it was regarded as an overused term in arable farming contexts, leading to potential confusion. Agreement with evidence on nat col Unanimous agreement that 'trees' or 'woodland creation' must feature in terms or language to clarify context. <u>Additional points raised, expanding upon our evidence:</u> Information is attained cross-sector, do not assume separation. Aid comprehension by using appropriate and consistent language, and do not add to confusion by introducing new terms LMs more concerned with outcomes than with language. Therefore, language must

Conservation Identity Type	Public/Amenity/Utilities Identity Type	Productive Identity Type
Association of rewilding = no intervention - is problematic for conservationists, who understand the necessity of intervention for biodiversity management. Similarly, contexts such as SSSIs favour preservation, thus nat col can be viewed quite negatively there. Language seen as important influencer in discouraging uptake, but other matters were more important re encouraging uptake – e.g. payments for outcomes, perceived permanence of land use, reg process, taxation etc.	ignores the necessity of hybridity for land management – 'It's a combination of all those methods – that flexibility and agility to use a combination of tools'	indicate viability and address likely interests. One term favoured over many (simplicity) –contrasts with evidence which presented mixed views

3.4 Discussion and conclusion

The research on language and messaging for natural colonisation revealed several key insights:

1. **Terminology Matters**: The terms used to describe natural colonisation significantly impact land managers' perceptions and willingness to engage with the concept. Terms like "natural colonisation" and "rewilding" often carry negative connotations and can be disenfranchising, particularly for productive land managers and farmers. "Natural regeneration" is more widely understood and positively received across different land manager identities.
2. **Audience-Specific Language**: Different land manager identities (productive, conservation-focused, amenity-focused) have varying preferences and understandings of these terms. Tailoring language to the specific audience is crucial for effective communication and engagement.
3. **Clear and Consistent Messaging**: Language and communication around natural colonisation must be clear, non-technical, and consistent across organizations to avoid confusion and frustration. Descriptive and relatable terms can help engage land managers who are less familiar with technical jargon.
4. **Support Needs**: Land managers identified the need for more training and knowledge exchange about the major risks associated with natural colonisation, such as outcome uncertainty in terms of colonisation success, species mix, and time to establish.
5. **Hybridity in Approaches**: Many land managers prefer a hybrid approach that combines natural colonisation with tree planting. Language and messaging should reflect this flexibility and not imply a binary choice between methods.
6. **Importance of Context**: The context in which terms are used significantly influences their acceptability. For example, "natural regeneration" is well-received in both formal and informal contexts, while "natural colonisation" is more suited to technical and academic discussions.
7. **Role of Advisors**: Advisors play a crucial role in shaping land managers' perceptions and decisions. Effective communication and support from advisors can help overcome negative perceptions and increase the uptake of natural colonisation practices.
8. **Visuals and Case Studies**: Using visuals and case studies to illustrate the outcomes of natural colonisation can help land managers understand and appreciate the benefits of this approach. This can be particularly effective in overcoming scepticism and building trust.

4 WP4 Outcome Journeys Case Studies

4.1 Objectives and Research Questions

The objective of this work package was to understand more about land managers experiences of using natural colonisation as an approach to woodland expansion. The research was undertaken through 12 case studies involving land managers in England who had used natural colonisation at least ten years previously. The research explored their perceptions, motivations, uncertainties, risks, and benefits from pre-establishment to the present day, documenting the factors that shaped their journey. A key component was understanding land managers' definitions of success and evidencing a variety of outcomes in the status of the woodland generated.

The objectives were achieved by answering the following specific research questions:

RQ4.1 How did land managers perceive outcome uncertainties and risks prior to adopting natural colonisation, and what factors facilitated their mitigated and resolution? (e.g., incentives, message framing, influence of advisors and peers)

RQ4.2 How did the process of natural colonisation unfold on their land, and did they undertake any actions to manage outcome uncertainties?

RQ4.3 How far have land managers original perceptions of risks and benefits been materialised, and what impact has this had?

RQ4.4 What types of support (e.g. information and knowledge), would land managers have found useful or recommend for others considering natural colonisation?

4.2 Methodology

4.2.1 Sampling and Recruitment Strategy

A purposive sampling approach[11] was employed to recruit land managers. The specific inclusion criteria were:

- Engagement with natural colonisation for woodland establishment
- Had a minimum of ten years' experience with natural colonisation on a single site
- Be located in England

[11] Participants are intentionally selected based on specific characteristics, criteria, or qualities relevant to the research question. Researchers use their judgment to choose participants who will provide the most useful data.

A sampling grid was developed to map candidates against additional criteria to maximise diversity of perspective (see Appendix 8). Diversity in cases was important, as this enabled key insights to be drawn across different environments, contexts, objectives, and outcomes, as well as provide the chance to find out more about approaches where natural colonisation was more challenging.

To maximise the likelihood of reaching our target sample of 6-12 participants, an over-sampling approach was adopted.

Recruitment occurred between late July and October 2024. Recruitment was undertaken through direct contact by using:

i. established connections made by FRs ecologists working on TWF-08 and other projects involved in a 'woodland creation chronosequence' study. This work had established a network of sites and land managers who had natural colonisation funded through the Woodland Grant Scheme 3 (WGS3). Initial efforts focused on contacting those land managers who had expressed a willingness to participate in further research.

ii. contact information from other available sources and datasets[12]

iii. the project steering groups contacts with land managers.

Table 16 provides the summary characteristics of the sample.

[12] for example, Panter, C., Caals, Z. & Lake S., (2021). Identifying Naturally Colonised Woodlands Study. Footprint Ecology.

Table 16 Summary characteristics of the Outcome Journeys case study sample (n=12) *NC = natural colonisation

Key	Site	Location (England)	Context	Objective	Size of landholding (ha)	Size of NC (ha)	NC* Start	Approach	Finance	Status
A	High Ash Farm	Norfolk	Tenant farmer with mixed farm, lowland	Conservation	259	2	2006	Natural colonisation	Higher Level Stewardship (HLS)	Mixed woodland
B	Jigsaw Wood, Milden Hall	Suffolk	Arable farm, lowland	Mixed productive and conservation	214	4.1	2003	Hybrid, natural colonisation with applied nucleation and seed scattering/ploughing	JIGSAW Challenge Fund - Forestry Commission	Mixed woodland
C	Bark House Bank	Lake District	Mixed holding farm, upland	Conservation	178	0.5	2003	Hybrid, plantation-led strategy with natural colonisation following unexpected seed dispersal	Woodland Grant Scheme 3, Farm Woodland Premium Scheme, National Parks Challenge Fund	Mixed woodland
D	Swannymote	Leicestershire	Forestry, lowland	Conservation and public amenity	22	2.2	2006	Hybrid, distinct areas of pure natural colonisation and blocks of planting	Woodland Grant Scheme 3	Mixed woodland
E	Dunge Valley	Peak District	Commercial private garden, upland	Conservation	47	11	1998	Hybrid, natural colonisation and applied nucleation	Woodland Grant Scheme 3	Established scrub with initial tree recruitment
F	Anonymous	Warwickshire	Livestock, forestry, lowland	Productive, with marginal conservation	n/a – not shared by participant	0.05	2001	Natural colonisation	No initial finance (now Countryside Stewardship – Higher Tier)	Scrub, some small trees

Key	Site	Location (England)	Context	Objective	Size of landholding (ha)	Size of NC (ha)	NC* Start	Approach	Finance	Status
G	Briddlesford Woods	Isle of Wight	Wildlife conservation, lowland	Conservation	157	15	2003	Hybrid, natural colonisation and planting applied nucleation	Jigsaw Challenge Fund, FC	Mixed woodland
H	Anonymous	Cambridgeshire	Wildlife conservation, lowland	Conservation	22	22	2002	Hybrid, natural colonisation with experimental direct seeding and low-density planting	Forestry Commission Woodland Creation Grant	Partially wooded scrub, young and open
I	Brookes Reserve	Braintree	Wildlife conservation, lowland	Conservation	24	4	1995	Hybrid, natural colonisation and low-density planting	Forestry Commission Woodland Creation Grant	Mixed woodland
J	Bassleton Beck Valley	Stockton	Local authority, lowland	No objectives	15	15	2002	Natural colonisation (unintentional)	No finance	Partially wooded / scrub
K	Stubhampton	Dorset	Mixed estate, lowland	Conservation	480	8	2012	Hybrid, natural colonisation with some experimental direct seeding	n/a – unconfirmed by participant	Mixed woodland
L	Multiple sites	Cumbria & Lancashire	Suckler beef and sheep, upland and lowland	Conservation	c.700	N/A	Various (30+ years)	Natural colonisation with some hedge planting	No finance	Various including mixed woodland, partially wooded, scrub, grassland.

4.2.2 Interviews and site visits

A semi-structured interview question guide was developed in collaboration with the steering group, who provided feedback on the types of questions to include and the insights sought. The research team adopted a 'life course' style of interview to explore each individual's experience and how it developed over time in relation to the management of the naturally colonised site. The interviews followed a chronological structure, with questions organised to understand the management context and perceptions before the establishment/utilisation of natural colonisation, through to active engagement in/period of natural colonisation, and concluding with a retrospective view of their experience and making recommendations to policy and other land managers regarding support needs. A copy of the interview guide can be found in Appendix 9.

12 semi-structured interviews were conducted with land managers between August and October 2024, which included:

- eight 60-minute calls conducted via Microsoft Teams or telephone, and four extended-length,
- four in-person interviews conducted during visits to the natural colonisation sites.

The in-person visits were organised to gather additional contextual information about the natural colonisation sites and land managers' experiences, including obtaining historic and present-day images and media relating to the sites. Interviews were audio-recorded, and later transcribed.

4.3 Results

Insights from the interview transcripts were summarised. Case studies were written using a structured template for consistency and clarity. The format was structured into four sections, including 'Context', 'Before natural colonisation', 'Period of natural colonisation', and 'Natural Colonisation in Retrospect'. In each section the researcher inserted a synthesis of the key points emerging from the transcripts, which included recommendations for policymakers and land managers.

Case studies were initially anonymous, as per the agreement made with participants. Drafts were shared with participants to provide opportunity for review and to make amendments. At this stage they were asked for their consent to publish, and their consent to de-anonymise their case study should they wish to do so. The advantage of this was that more information about the context of the case study could be shared. Participants could also choose to feature their case study as a StoryMap. Storymaps are an interactive platform that presents maps, text, and images, making the natural colonisation case studies more engaging for the public and stakeholders.

A copy of the individual case studies can be found in Appendix 10.

4.4 Conclusions: Cross-Cutting Insights

Twelve case studies present the experiences of land managers who have utilised natural colonisation as a woodland creation strategy. These case studies illustrate 'early adopters' of natural colonisation and hybrid approaches to woodland creation and expansion, as their experiences cover a period of between 10-29 years. The cross-cutting insights that emerged looking across the case studies are listed below. The case studies are referred to by the 'Key' letter presented in Table 16.

4.4.1 Lower costs, as well as creating valuable habitats, drives engagement with natural colonisation

Natural colonisation appealed to the land managers in the case studies because it was either free of any costs (Case study J), or had lower input and management costs compared to tree planting, because of the lesser upfront investment required, e.g. labour for ground preparation and planting, cost of tree guards (Case study B and D), and the availability of grants to cover the costs of protective measures like fencing against deer (Case study B and C). Grants also provided a fallback option of supporting planting costs if natural colonisation failed to establish and produce the desired density of tree seedlings/stems within specified timeframes (Case study A, B, and D). This arrangement made natural colonisation a low-risk strategy, with only minimal costs.

Environmental and conservation motivations were common among land managers choosing to use natural colonisation and hybrid approaches (All case studies, except I). While most land managers sought to create diverse habitats, some experienced the dominance of colonising herbaceous and tree species through the natural succession process, including willow (Salix spp), birch (Betula spp), creeping thistle (Cirsium arvense), and sallow (Salix caprea) (Case studies B, D, E, H, and I). They warned that this could be a risk to others using natural colonisation with the aim of creating species richness. Active management, such as thinning, was recommended to ensure that biodiversity and ecological objectives were achieved. This could represent an additional cost.

4.4.2 Natural colonisation is considered to carry a greater risk of failure and delay compared to planting, so hybrid approaches are adopted to minimise concerns and issues

Land managers in the case studies viewed planting as the more reliable method for woodland creation due to the unpredictability of outcome and species mix, the slower pace of establishment, and other challenges of relying on natural processes. Successful colonisation depends on adequate seed sources, suitable soils, and limited browsing pressures. Natural colonisation can fail if the seed source or the species diversity and density in adjacent areas is low, and the establishment conditions are poor, such as with upland soils (Case study E).

Although natural colonisation was seen as involving longer timescales, this was less of a concern for those site managers engaged in environmental schemes, or those prioritising habitat and biodiversity enhancement over rapid woodland development (Case study A, C, D, H, I, and L). For these kinds of land managers, the slower speed and transition through stages of woodland establishment, including a scrubby phase was desirable.

Those looking for faster establishment, and those in contexts that were less suited to natural colonisation, tended to adopt hybrid approaches that combined planting with natural colonisation to mitigate these concerns (Case studies B, D, E, G, and I). Supplemental planting, at low density or in 'clumps' (applied nucleation) was undertaken to speed natural processes (Case study B and G), as well as to achieve desired tree stem density (Case study G, H, and I), species diversity (Case study B and E), or to include climate resilient trees which may not be local to the area (Case study D and E). Some land managers in the case studies recognised that assisting natural colonisation by supplementary seeding (Case study B, H, and K) or taking and planting cuttings (Case study B and E), was important to ensuring the establishment of certain desired species as well as a woodland.

4.4.3 Land managers are not always aware of the ecological conditions driving natural colonisation, information and knowledge is important to success

Land managers recognised that effective natural colonisation requires sufficient nearby seed sources and suitable ecological conditions to be present. Almost all case studies advocated for better advice and guidance for those interested in this approach. Successful methods were seen as context dependent and often required tailored management, involving collaboration with experienced advisors and grant funders (Site A, B, C, D, F, H, I). Some land managers disagreed with advisors, facing calls for 'traditional forestry' instead of natural approaches (Site B) or recommendations for natural colonisation despite inadequate conditions, leading to failures (Site E). These experiences highlight the importance of quality assessment, advice, and collaboration between land managers and advisors. Success varied widely, with some sites needing significant intervention to protect from browsing (Sites B, C, H, I, J, K), while others did not (Sites A, D, F). Less frequent environmental factors, like high winds and storms, also influenced outcomes which are less predictable and harder to account for (Site A and C). Few sites used natural colonisation exclusively, but those that did and were considered a success often benefited from abundant seed sources, favourable soil, and natural agents like Jays (Garrulus glandarius). The diversity and complexity of experiences shown here further demonstrates the need for sufficient guidance and support for land managers who may be interested in engaging in natural colonisation as an approach but may not be familiar with the diversity of ecological necessities required to facilitate successful woodland/habitat creation.

4.4.4 How the success of natural colonisation is valued and measured should recognise the benefits of successional habitats and work to realistic time frames

More than half of the land managers in the case studies (Case studies B, C, D, F, G, H, and I) suggested that there should be greater acknowledgement of the ecological and biodiversity value of successional phases (e.g. grassland, bramble, scrub) in the natural colonisation process. The conditions of previous grant offers and the prescriptions associated with particular schemes tended to ignore this. For example, reducing the need for management such as bramble clearance, could have better supported successional habitats, which benefitted a range of bird species (Case study I). Designing grants that require specific numbers of stems per hectare within particular timeframes does not allow for successional stages that some land managers are looking for (Case study B, D, G, H, and I), or for the time it might take some sites to colonise through natural processes (Case study B, E, H and I). Consequently, land managers in the case studies suggested that how the value of natural colonisation is measured, and the timeframes allowed before the success of a natural colonisation scheme is judged, remain an important consideration for those currently designing policy measures.

4.4.5 Financial and economic pressures may drive engagement with woodland creation including natural colonisation, but long-term support may be necessary

For the farmers represented in the case studies financial uncertainties and increasing pressures on their agricultural businesses, was an important motivation to engage with woodland creation and environmental stewardship. This was partly to benefit from the grants available as a means to diversify income, and partly to manage the increasing risks and challenges presented by pest and disease outbreaks, e.g. bovine spongiform encephalopathy (BSE), foot and mouth disease (Case study A, C, and F). Some of the farmers in the case studies even described engagement in woodland creation as a matter of "survival", as sustaining their agricultural business was no longer viable (Case study A and C). A number of grants (See Table 16) providing annual payments for a period to cover income foregone when converting agricultural land to woodland, was a particularly appealing option for some farmers (Case study A, B, and F).

However, farmers found it difficult when grant payments ended. Naturally colonised woodlands offer limited opportunities for short and medium-term financial benefit as they are less likely, or take longer, to produce commercially viable thinnings or timber compared to planted woodlands (Case study B and D). For example, after 20 years of developing woodland through natural colonisation and hybrid approaches, a 4.1ha site yielded only £650 in income following thinning operations (Case study B). The end of grant payments can represent a shock to agricultural businesses if the lack of income from naturally colonised woodlands has not been properly understood or well planned for. Looking back, land managers in the case studies suggested that the income from grants and from natural

colonisation sites, did not compare favourably with maintaining agriculture in the long term. Conversion to woodland left them with financially unproductive land that offered few alternative income sources, even once woodland is established. These challenges were particularly acute for tenant farmers who had faced higher rental costs as landlords assessed greater risks associated with conversion to woodland (Case study A).

Transparent advice, that aligns woodland grant schemes with land managers' longer term financial goals, and better prepares them for transition out of grant schemes is something that the case study land managers recommended (Case study A, B, D, and E).

To ensure broader participation and sustained engagement, land managers recommended that current policy tool design should emphasise stronger financial returns, extended payment periods, and a gradual exit process to avoid abrupt transitions to better prepare participants for the future.

4.4.6 Peer group and public pressure can create difficult social situations for those using natural colonisation or creating new woodland on agricultural land

Land managers in the case study cohort reported that they had experienced some degree of hostility and criticism from neighbours and local communities, as people perceived their moves to create woodland as abandoning responsibilities to agricultural traditions, values and production (Case study A and E). Peer group support from advisors or 'like-minded' individuals was crucial for helping land managers cope with these psychological pressures (Case study A and E). Sites which were not in the public eye were less likely to experience these challenges (Case study B and D), other land managers were cautious about publicising the naturally colonised site in case there were pressures from the public to produce a more 'managed', less 'messy' appearance on site (Case study J). Balancing the complexity of needs, expectations and interests of different groups was recognised as significant challenge on many of the natural colonisation sites. These included neighbouring farmers who wanted to see quicker woodland establishment; dog walkers and visitors seeking well-maintained paths and environments; and naturalists who preferred little or no intervention and the natural progression of successional habitats (Case study H and I).

4.4.7 Land manager motivations and core values around natural colonisation changed little over time, but in some cases feelings of stewardship and responsibility grew stronger

The objectives, motivations, and values of most land managers regarding the establishment of woodland through natural colonisation have remained relatively stable over time. However, for those land managers who experimented with natural colonisation, and sought to observe and learn from the experience (Sites D, G, I, and K), success led to renewed enthusiasm and confidence in this approach, particularly due to the unique benefits it was seen to provide. Some productive farmers, through their experiences with natural colonisation, began to align more closely with conservation objectives. They expressed

increased enthusiasm for habitat creation and environmental stewardship, and developed a deeper connection to nature through learning (Site A). The impact of establishing woodland and contributing to broader landscape restoration and community connection was even more profound, providing new purpose and enhancing personal wellbeing (Site C).

5 Final remarks

The research has looked at a range of influences on why and how land managers make the decision to employ natural colonisation as an approach to woodland expansion. This underscores the importance of understanding the social dimensions if policy ambitions to increase the uptake of natural colonisation as an additional approach to achieving woodland expansion targets are to be successful.

The factors influencing whether land managers take up a natural colonisation as an approach included:

- **Perception of natural colonisation**: Land managers need to be keen on using natural processes or open to learning about them. They are averse to the risks they see inherent in the approach, which are to do with the uncertainty of outcomes, including species composition and stem density.
- **Land managers with conservation focused objectives, or with areas of land difficult to cultivate,** appear to be most interested in trying natural colonisation.
- **Perception of grant offers**: Payment rates, conditionalities, compatibility with other grants, prior experiences with funding organizations, and non-monetary support all influenced decisions.
- **Support from the funding organization**: Assistance with the application process and ongoing advice and support were crucial to land managers engaging with this novel approach to woodland creation and tree cover expansion.
- **Flexibility in grant conditions:** Rigid requirements regarding stem density and timeframes discourage some land managers. Greater flexibility, especially in recognizing transitional habitats, would improve uptake.

Key takeaways include:

- **Selling natural colonisation** as a viable option for woodland expansion: This means providing land managers with information about how natural colonisation might help them meet their objectives and using the right language to do so.
- **Language is important:** Tailoring communication to different land manager identities, using clear and relatable terms, and providing comprehensive support can enhance engagement and uptake of natural colonisation practices.
- Natural colonisation may be an attractive option for a range of land manager types, **but large-scale schemes are rare,** and present logistical and financial challenges that need addressing to encourage broader adoption.
- **Simplifying the grant landscape** for better understanding and compatibility: The complexity of multiple overlapping schemes can be a barrier. Clearer guidance and better coordination between funding bodies could improve accessibility.

- **Risk management strategies in grant design are important:** Many land managers are hesitant due to uncertainties in outcomes. Building in fallback options, such as allowing supplementary planting if colonisation fails, could improve confidence in the approach.
- **Hybridity as a preferred approach:** Many land managers use a mix of tree planting and natural colonisation to mitigate risks and accelerate woodland establishment. Policies should recognize and support this blended method as a practical, scalable solution.

Appendix 1. Comparative summary of grant offers

Broad objective	Grant fund and web link	Organisations responsible/ involved	Target audience	Age of scheme	Geographical area	Conditions of scheme	Finance available
Woodland expansion and creation	EWCO: Appendix 5: Natural colonisation guide	Forestry Commission	Land managers/ landowners	2021	England	75m from viable seed source of min. 2 tree species. Min. 0.1ha. 60% woody cover and min. 100 trees/ ha by yr 10. Supplementary planting available and compatible with tree planting scheme. Checks at yr 5 and yr 10. Supports registration with Woodland Carbon Code. Agreement length: 15yrs	Agreement holders can make £5k claims throughout the 3-year capital funding period and carry out the work in tranches. Standard costs: £1.72 /tree; £121.85/ha for scarification; £7.92/m (stock) or £10.27/m (deer) fencing. Actual costs (capped at 10% of capital costs): 40% of establishment infrastructure & 100% of recreation infrastructure. Annual maintenance payments: £400/ha for 15yrs. Additional contributions (one-off payment with capital costs): Up to £11.6k/ha.
	Grow Back Greener (Northern Forest) - Natural processes fund	Woodland Trust	Land managers/ landowners	2021	Northern Forest region	75m from viable seed source Min 0.1ha (if part of min. 0.5ha scheme) 400 trees (min. 0.5m tall) & shrubs/ ha by yr 5 (or yr 10 on challenging sites).	Can cover up to 100% of actual costs on a site-by-site basis. 21/22 – 22/23: bonus of £500/ha if stocking density met at yr 5 (or yr10). 24/25 season and onwards: Payments raised to £3068/ha over

Broad objective	Grant fund and web link	Organisations responsible/ involved	Target audience	Age of scheme	Geographical area	Conditions of scheme	Finance available
						Supplementary planting available and compatible with tree planting scheme and WT Woodland Carbon Code. Annual checks from yrs 2-5 Agreement length: 15yrs	agreement for with 50:50 payment schedule in yr1 and yr5. Funding can include specialist surveys, ground prep, management for tree establishment, fencing, public access, fence removal.
	ECF Trees for climate – natural colonisation	England's Community Forests (ECF)	Landowners and farmers	2020	15 areas of England where there are active community forests.	75m from viable seed source of min. 2 tree species. Min. 0.5ha 60% woody cover and min. 100 trees/ ha by yr 10 Supplementary planting available before/ at yr 10 and compatible with tree planting scheme. Grazing pressure must be removed (fence/ control). Agreement length: 15yrs	No set level of funding but will match EWCO grant rates for woodland creation proposal as a minimum. This approach allows extra funding for high scoring applications that deliver lots of public benefit in addition to hectares of woodland.
	North York Moors Woodland Creation Grant	North York Moors National Park Authority (Via Section 106 planning	Landowners	2017	North York Moors National Park	No seed source limit; native trees Min. 1ha (can be in smaller sections across landholding) 20% canopy cover by yr 25, stock density can be variable Supplementary planting available and compatible with tree planting scheme.	Payment post-works complete but Authority can commission work directly. Funding is available for 100% of actual costs for capital works in yr1 and a five year follow up maintenance schedule.

Broad objective	Grant fund and web link	Organisations responsible/ involved	Target audience	Age of scheme	Geographical area	Conditions of scheme	Finance available
		agreement)				Open to wood pasture (low level grazing). Not compatible with Woodland Carbon Code as funding accounts for carbon capture already. Agreement length: 25yrs	Projects over 10ha receive incentive £3k/ha and projects of 5-10ha receive incentive of £1k/ha Funding available for removal of tree guards if used.
	Farming & Forestry Grant	National Forest	Farmers	Piloting [TBC asked Heather]	Min. 50% in the national forest area	25-50ha (combination of woodland, agroforestry and wildlife habitats and can be multiple landowners)	Variable – open to discussion and agreement between landowners and the National Forest.
Nature recovery; climate; people; place	Farming in Protected Landscapes	Defra – moderated by each National Park Authority/ AONB	Farmers, land managers, and people who live and work in National Parks and AONBs	July 2021 to March 2025	In some NPAs/ AONBs e.g. NYM and Lake District	Variable – open to discussion and agreement between NPA/ AONB and landowner	Variable – open to discussion and agreement between NPA/ AONB and landowner
	Countryside Stewardship: WD8: Creation of successional areas and scrub WD7: Management of scrub	Defra rural payments & Natural England	Farmers, land managers, woodland owners	Started in 2006	England	For CS mid-tier or higher-tier holders on whole or part of parcels where land is temporary/ permanent grassland and (for higher tier) is next to existing scrub or woodland.	Annual payments of: WD8: £514 per ha WD7: £276 per ha WD9: £74 per ha

Broad objective	Grant fund and web link	Organisations responsible/ involved	Target audience	Age of scheme	Geographical area	Conditions of scheme	Finance available
	WD9: Livestock exclusion supplement					Invasive non-natives need to be controlled. Standing or fallen deadwood to be left in place. If a large area, consult FC re. if a Forestry EIA is required. Agreement length: 2yrs	
Carbon credits/ corporate social responsibility/ Private investment	Biodiversity Net Gain – can nat col be covered?	DEFRA	Land managers/ landowners	Feb 2024	England	Choice for land managers, compulsory for developers. E.g. relevant BNG units: mixed scrub Lowland mixed deciduous woodland enhanced Broadleaved woodland Agreement length: 30yrs	Unclear – depends on market fluctuations

Appendix 2. Grants Focus Group question guide

Focus Group question guide
Funding for natural processes (WA1)

Objectives of the discussion

Focus groups aim to address 3 research questions:

1. Are landowners and advisors' aware of the range of NC schemes, and do they properly understand the rates and conditionalities of those schemes? Are some schemes better understood than others?
2. What factors influenced land managers uptake of specific grants? How influential were advisors, the rates and conditionalities, and the mode of delivery?
3. What would improve grant uptake (e.g., scheme design – including hybrid approaches and maintenance payments, delivery/service, comms, and messaging?) amongst different kinds of land managers in different regional contexts?

Participant introduction at of start discussion

- Expected length of time of focus group
- Overview of topic – acknowledge that the term natural colonisation is often used interchangeably with natural regeneration/ succession/ natural processes – we are talking about the creation of new wooded areas and new treescapes, rather than restocking existing woodland.
- [*judgement call depending on no. of participants]* Round of introductions from attendees – name, organisation (if applicable), experience with natural colonisation; experience with natural colonisation grants/ schemes.

Theme 1. Awareness of available schemes

*Using the in-Teams **poll** function, ask the group the following question(s):*
1a – for non-scheme land managers: How seriously have you been considering woodland creation/expansion through natural processes (e.g. natural colonisation)?

- Already using it
- Seriously considering
- Just starting to think about it
- Not sure
- Not considering it at all

1. *ALL:* Please indicate whether you have heard of any of the following schemes? Please vote for all that apply
    - Forestry Commission's EWCO, Appendix 5: Natural Colonisation component
    - Countryside Stewardship wood pasture & scrub/ successional options
    - Farming in Protected Landscapes
    - England's Community Forests Trees for Climate programme
    - National Forest's Farming & forestry grant
    - The Northern Forest Grow Back Greener programme
    - North York Moors Woodland Creation Scheme

- Companies that offer private finance investment (e.g. Wilder Carbon)– *if ticked then which companies?*

*With the responses to the poll visible to participants, ask the following **discussion** question:*

2. Are there any other funding schemes supporting tree cover expansion through natural processes that you have heard of that are missing from this list? [discussion]

*Using the in-Teams **poll** function, ask the group the following question:*

3. Thinking about the detail of the schemes in this list you are aware of, what do you know about them? Please vote for the various options once the poll appears on your device.
    - Payment rates – what do you know about them
    - Time period agreement applies for
    - Limits of distance from seed source for natural approaches?
    - Flexibility to carry out a mix of planting and natural colonisation?
    - Minimum size of land to be eligible?

*With the responses to the poll visible to participants, ask the following **discussion** question:*

4. Why do you think some of these schemes are more familiar to you than others? (*Is it a question of comms and advocacy? Regional coverage? Familiarity with the funding body? Actual take up of the funds*)

Theme 2. Reasons for specific scheme selection

*Using the in-Teams **poll** function, ask the group the following question:*

5. *For advisors and scheme-holder land managers:* What factors influenced your choice to recommend and/or use any of these schemes?

   For non-scheme land managers: What factors have in the past and would influence your choice to use a scheme?
   Options for all:
    - Support given by funder (application and post-award)
    - Payment rates
    - Ease of application process
    - Flexibility – e.g. able to mix with planting
    - Recommendations from peer group
    - Recommendations from agent or similar (e.g. Woodland officer)
    - Messaging aligns with reasons & objectives for using nat col
    - Compatibility with other schemes (stacking)

*With the responses to the poll visible to participants, ask the following **discussion** question:*

6. Why do you think some of these factors seem more important than others? Are any of these factors associated with one of the schemes more than others?

Theme 3. Experience of schemes

***Discussion** question:*

7. *For advisors and scheme-holder land managers:* What were your experiences with different schemes?

- *Follow up questions for advisors:*

- Have you used more than one scheme?
- How have you found the experience of guiding clients through one scheme or another? (*Are there any notable differences in communication, application processes, support provided delivery, payment rates, or other elements of scheme design and delivery which make a difference?*)
- Is there anything more to say about the difference between schemes and why you chose one over another?

- *Follow up questions for scheme-holder land managers*:
  - Have you used more than one scheme?
  - How did you find the experience of applying for and using the scheme(s) you chose? did you feel supported during the process?
  - Would you recommend the scheme?

8. *For non-scheme land managers*: What was your experience of carrying out natural colonisation without funding? *[adapt wording for those who have not yet carried out natural colonisation]*
   - Did you consider applying for a funding scheme? If not, why not? If you did, why didn't you go through with it?
   - For you to consider scheme uptake, what would it need to include?
   - What would put you off going for a scheme in the future?

Theme 4. Improving scheme design

9. *For advisors and scheme-holder land managers:* What would improve/ would have improved your experience of the schemes?
   - Communications/ messaging
   - Scheme design – delivery/ rates/ conditions

10. *For all*: What are your suggestions for improving uptake of grants/ schemes?

Wrap up –

11. *For all*: Any other thoughts you would like to share on the topic of funding for natural colonisation?

Appendix 3. Grants thematic analysis coding framework

Theme	Definitions	Sub-nodes	Definitions
Awareness	Participants describing the different funding schemes they have heard about and their understanding of how they work.	BNG	Biodiversity Net Gain
		Carbon code	Woodland Carbon code
		EWCO	FC's EWCO - nat col offer (appendix 5)
		Misc. schemes	Miscellaneous schemes that do not fit into another category
		Private finance	Private finance funding streams and investments
		Understanding of offer	Comments and clarifications around how the schemes function
		Utilities funding	Funding schemes offered by utilities organisations (e.g. railway/ water/ flood agency)
Communications	How participants found out about and heard of the different funding schemes and natural colonisation options within them. In addition, how natural colonisation can be proposed to land managers as an approach to woodland creation.		
Influences	The role of advisors, peers, and the public on informing and influencing land managers' decision to use natural colonisation approach and funding offers.	Advisor influence	Role of advisors (e.g. land agents, consultants) in providing land managers' with information on different schemes and approaches available and suggesting which grants and woodland approaches to use.
		Peer influence	Role of peers in informing fellow land managers' choice of grants
Land manager type	Where a participant related an opinion, thought or argument directly to a specific role and land manager type.		
Offer design	Participants' views on the components of nat col grant offers and the factors that act as	Clawback	The penalties of not meeting the scheme requirements within the stated timelines.

	barriers and/ or barriers to the uptake of scheme offers.	Compatibility	How the nat col grant offers fit with the other agri-environment schemes available to land managers.
		Flexibility	The ways in which the grant schemes are able to tailor the offer (components and payments) to suit the land type and managers' objectives e.g. hybrid approaches.
		Payments	The benefits and barriers of the current payment offers and process of how payments are given to grant-holders.
		Restrictions	Conditions of the grant offers that restrict land managers' ability to use it or are off-putting.
Perception of suitability	Participants' perceptions on the suitability of natural colonisation as a woodland creation/ expansion approach and of the natural colonisation grants currently available.	Grants	Participants' view on whether or not the nat col grant offers are suitable and fit for purpose.
		Nat col	Participants' views on whether or not natural colonisation is an appropriate woodland expansion method.
Process experiences	Participants' experiences of using natural colonisation as a woodland creation/ expansion approach and of the natural colonisation grants currently available.	Grants	Participants' personal experiences of and feedback on the nat col grant offers.
		Nat col	Participants' personal experiences of and feedback on using natural colonisation as a woodland expansion approach.
Suggestions for improvement	Participants' views on how the natural colonisation grants could be improved to increase their uptake and the experience of using a grant.		
Support from funder	The extent and manner in which the funding organisations' provide assistance and 'hand-holding' to applicants and grant-holders for a natural colonisation grant.		

Appendix 4. Grants pre-reading for Validation Workshops

Forest Research

Evidence summary: Funding options for Woodland Expansion through Natural Processes

Introduction

Forest Research are exploring why land managers choose different woodland expansion strategies. Evidence suggests the **uptake of grants** for woodland expansion through natural processes is relatively low despite many managers using natural processes as a strategy to increase tree cover.

Over the past year, we have done more detailed research to develop a better understanding of why the different funding schemes available for natural processes may or may not be used by different kinds of land managers. This included comparing the uptake of four important grant schemes, the similarities and differences between schemes, and land managers' awareness, understanding, and preferences for choosing different schemes.

We would now like to discuss and validate our findings with land managers and advisors that have experience of the grants system around woodland expansion.

Prior to attending, we expect you to have read the following summary of the results in order to engage fully in the online workshop discussion. We would appreciate feedback on whether the results accurately reflect your knowledge and experience about woodland expansion grant schemes and how varying factors and formats of funding schemes influence land managers' choices on woodland expansion strategies.

Results

We examined data about 132 projects delivered between 2021 – July 2023 by the following four funding schemes:

- Forestry Commission's England Woodland Creation Offer (EWCO) Appendix 5 Natural colonisation.
- The Northern Forest's (Woodland Trust and England Community Forests partnership) Grow Back Greener Fund.
- North York Moors National Park's Woodland Creation Offer.
- England's Community Forests Trees for Climate Fund.

EWCO is available to the whole of England whilst the other schemes are only available in specific regional locations.

The data shown in Figure 1 and Figure 2 indicated that more private landowners are using EWCO, whereas charities and public landowners are using other funding such as Grow Back Greener and Trees for Climate.

Table 1 summarises the data gathered around the awareness, communication, and influence aspects of grant schemes. Table 2 summarises the data gathered from land managers and advisors about the components of the grant offer and experiences of the process.

Key questions for you to consider:

- What do you think about these results?
- Do the results reflect your experience?
- Do they raise any questions for you?
- Are there any gaps?

Fig. 1. Area (ha) of natural colonisation by grant type and land manager type, July 2023.

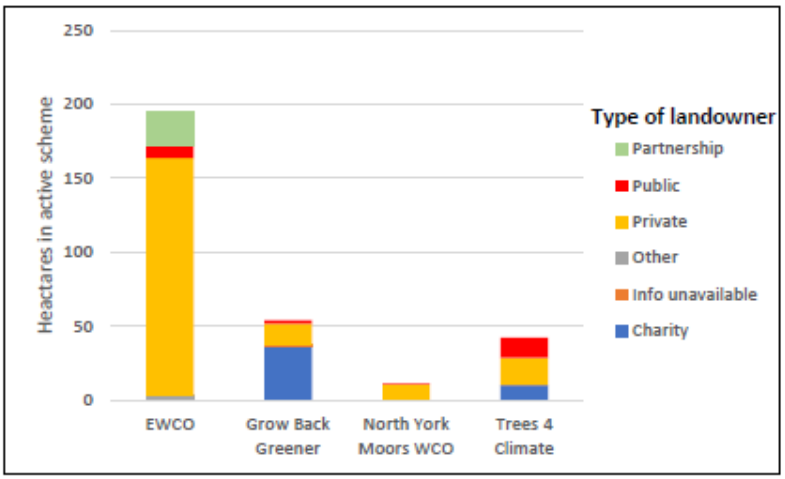


Fig. 2. Breakdown of proportionate uptake of grant type by different land managers, July 2023.

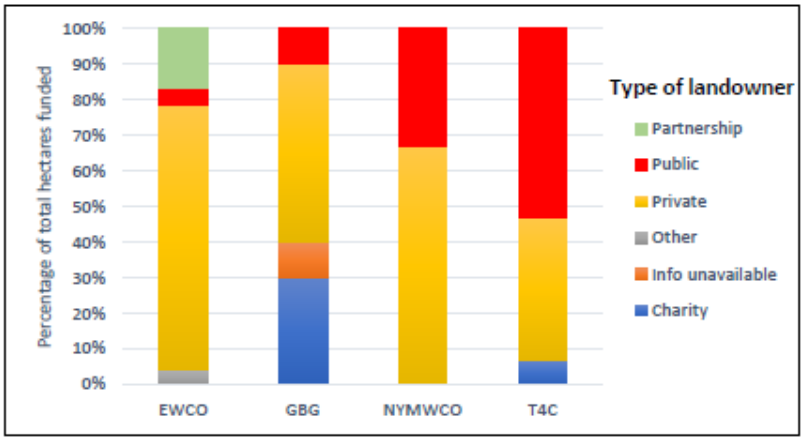


Table 1. Summary of data on the awareness, communication, and influence aspects of grant schemes.

Grant scheme (funding organisation)	Awareness	Communication	Influences
EWCO (Forestry Commission)	Aware of scheme but often confusion over details of offer.	Increase promotion of around benefits of natural processes.	Advisor influence and assistance appreciated to coordinate application.
Grow Back Greener (Northern Forest)	Most not heard of it unless they live in the area or have used it.	Found out about it through delivering partner.	Good advice by delivering partner of scheme.
Other/ all schemes	Aware of schemes but not natural colonisation part of the offer.	Improve signposting for land managers to choose based on objectives.	Advisor influence noted more and peer influence not mentioned.

2

Table 2. Summary of data about the components and experiences of grant schemes.

Grant scheme (funding organisation)	Offer design				Perception of grant suitability	Grant process experiences	Support from funder	Suggested improvements
	Clawback	Compatibility	Payments	Flexibility/ restrictions				
EWCO (Forestry Commission)	Confident to meet required no. of stems - supplementary planting option gives "a safety net".	Mostly compatible with agricultural subsidies (Countryside Stewardship). Restrictions misalign with Woodland Carbon Code.	"confusion over the payment": Unclear and vague payment conditions. Upfront capital limits size of applications. "generous scheme with the additional contributions"	Some rules are set in stone - officers should have more flexibility to make decisions to suit the site. "a bit inflexible" e.g. not allowed payments for tree guards.	Depends on size of project – if a larger scheme then worth it for high payment rates. Advisor/ consultant required for application process as it is "daunting and really time consuming" for a lay person.	Contradictions within the manual/ contract. Application process was "long, very difficult, and frustrating". Long lead-in time of at least a year which creates uncertainty in planning. If you have an advisor/ consultant it is a "relatively easy process".	Unclear and inconsistent on who to contact for support. Slow to respond but "really supportive". Resistance rather than support from FC to sign-off applications. Feel powerless: "you definitely weren't in control of the process"	Align conditions with Woodland Carbon Code. Support a choice of ground prep and maintenance methods. Up-front payments. Simplify and speed up the application process – 6 month timeline.
Grow Back Greener (Northern Forest)	Potential penalties not important – "I don't envisage any problems".	Compatible with Countryside Stewardship.	Attractive - additional payments e.g. biodiversity; public access. Upfront payments removes cash flow issues. "considerably lower" than EWCO's offering.	Hybrid scheme with soil cultivation options. Flexibility respects that advisor/ land-owner knows the site best.	"Most flexible, user-friendly scheme I've come across".	Delivering partner (Yorkshire Dales NPA) "takes all the hassle away" of the process – completed paperwork; organised and paid the contractors. More straightforward - quick, "so simple and easy". Work carried out well.	Sense of trust between funder and applicant and common sense approach Online support is quick and a phone number available. Informed and considerate advisors/ officers.	Increase/ align payment rates with EWCO rates. Freeholder rights - Re-word contract so that scheme will carry over if property sold rather than seeking approval from funder to sell.
Other/ all schemes	"I'm not concerned about that". Encourage risk taking.	Compatibility and flexibility are key.	Increase payment rates – insufficient incentive currently.	Flexibility is essential as "one-size doesn't fit all"	Grant conditions similar across all schemes.	How the funder makes you feel in the process. Speed and ease of payments matters for private landowners.	Increased support and guidance for farmers with woodland as they are not foresters.	More flexibility to facilitate a site-specific approach. Support for lethal wildlife control.

Appendix 5. Language Focus Group question guide

Questions for focus groups with land managers on language and messaging around woodland expansion through natural processes (focus on NC)

Woodland expansion terms frequently used

1. When discussing or engaging in woodland or tree cover expansion through natural processes, what specific words or terms do you most frequently use to describe these processes?
   - 1.1 What does that term mean to you?
   - 1.2 Do you remember where you picked that term up?
   - 1.3 Why do you think you use [the term they use] most frequently?
   - 1.4 Are there other terms you use less frequently to describe woodland or tree cover expansion through natural processes?

   Prompt: what are they?
   - 1.5 (If they are using multiple terms) Why do you use different terms?

     Prompts: is this for different audiences? To talk about different locations?

Natural colonisation (adapt depending on discussion around questions in section 1)

2. Have you heard of the term natural colonisation?

   If yes:
   - 2.1 What does this term mean to you?
   - 2.2 Prompt (if this doesn't come up in response to previous question) Do you use it to talk about woodland expansion through natural processes?
   - 2.3 Prompts: In what kind of situations/with what kinds of people?/ Do you remember where you picked up the term?

   If no go straight to:
   - 2.4 Whether or not you have used this term, what does 'natural colonisation' bring to mind for you? What thoughts does it trigger?

Prompt: positive/negative associations

Natural regeneration (If it hasn't come up in discussion already)

3. Do you use, or have you ever heard the term natural regeneration?

If yes

3.1 What do you use it to refer to? In what kind of situations/with what kinds of people?/ Do you remember where you picked up the term?

If no

3.2 Whether you have or haven't used this term, what does natural regeneration bring to mind/what thoughts does it trigger?
Prompt: positive/negative associations

Rewilding

4. Do you ever use the term rewilding to talk about woodland expansion through natural processes?
   4.1 What do you use it to refer to? In what kind of situations/with what kinds of people?/ Do you remember where you picked up the term?
   4.2 Whether you have or haven't used this term, what does rewilding bring to mind/what thoughts does it trigger?

Prompt: positive/negative associations

Preferences – does language matter? (if hasn't come up throughout discussion)

5. Do you think it matters that there are multiple terms to describe woodland expansion strategies through natural processes? How/Why does it matter?

5.1 Which term for woodland expansion strategies through natural processes do you think should be used or do you like that there are multiple terms?

5.2 Out of the terms we have discussed today which term for woodland expansion strategies through natural processes do you prefer? Or is there something else that would be better e.g., regenerative forestry?

5.3 Do you think the language and communication of natural processes is a barrier to land managers using these strategies to increase woodland cover?

Appendix 6. Language Discourse Analysis Coding Framework

Theme	Definitions	Sub-nodes	Definitions
Associations	Participants describing their associations with the term and the process	Negative	Negative associations with the term
		Positive	Positive associations with the term
Awareness and understanding	Participants awareness/understanding of the process/term. Including ecological understandings, such as the difference between processes of 'regeneration' and 'colonisation'		
Negatives	Negative sentiment expressed towards the term or process. Unlike the sub-nodes for 'Associations', an association is not required.		
Positives	Positive sentiment expressed towards the term or process. Unlike the sub-nodes for 'Associations', an association is not required.		
Power and ways of knowing	This code should identify the sources or schools of thought behind the terms, such as who is advocating for the use of specific terminology. For example, it might include phrases like "That sounds like something scientists would say" or questions about the terminology's validity. It should reference the power structures, disciplines, people, or places where the discourse originated.		
Preferences	Suggestions about a term might include preferences like "I'd rather see nat col used in policy" or "I prefer nat col over nat regen." These statements indicate a preference without expressing a positive or negative opinion.		
Social and situational usage	How the term is used, or thought to be used in particular situations and through particular social dynamics		

Appendix 7. Views on language by land manager identity

A piecemeal process of data summary took place to summarise the insights of land managers against the three main terminologies (natural colonisation, natural regeneration, and rewilding) discussed during interviews and coded in NVivo. Coding summaries were created through exporting matrix tables and then summarised manually into the following tables. These tables represent the perspectives of conservation; productive; and amenity identities.

Conservation identity Summary tables: Natural Colonisation

Associations	Awareness and understanding	Power and Ways of Knowing	Preferences	Social and Situational Usage	Sentiment
Colonisation is a loaded term that is difficult to isolate from negative and unpopular connotations such as 'colonialism' and 'slavery'. Colonisation is thought to imply threat or loss. To attract landowners/managers, participants suggested words such as 'expansion' to counteract the feelings generated. Less predictable outcomes. Financially attractive approach in terms of low inputs.	Strong understanding of the term/ practice. Use of the term was prevalent in some cases. Used interchangeably with other terms including natural regeneration. Admitted that interchangeable use may contribute to wider miscommunication. Claim that wider land managers lack awareness / understanding of the term.	The term is considered exclusionary and marginalising for some land managers. The use of the term is influenced by woodland officer (WO) and documentation preference / requirements. With these components there is a need to precise and clear on process / terminology. Technical jargon, glossaries, etc. are considered exclusionary to others and disconnected from most people's realities / understanding. Industry proponents must provide compelling stories and use descriptive / accessible language	Words related to 'expansion' are considered to be more positive than words such as colonisation which are not attractive in context of potential land management decisions. However, colonisation may be more suitable to those without any woodland, which wouldn't empathise with 'expansion' terminology.	The term was used, although in some cases interchangeably with natural regeneration. Considered appropriate when communicating with peers in sector, such as WOs or within documentation. The term was not considered appropriate for most land managers. Language used with other land managers was tailored, often using more descriptive language that was more culturally appropriate. Suggested that language or terms developed / used should be relatable with target audience objectives.	Overall, sentiment was mostly negative. Demonstrated a preference for natural regeneration. Positive sentiment relating to the merits of natural colonisation were recognised and better language / descriptive approaches (e.g. storytelling) considered a necessity to convey this – for example economic benefits as a strategy.

Conservation identity Summary tables: Natural Regeneration

Associations	Awareness and understanding	Power and Ways of Knowing	Preferences	Social and Situational Usage	Sentiment
The term was positively associated with improvements in biodiversity and habitats. Associated with rewilding, with some land managers using the terms interchangeably. 'Regeneration' is a popular term that sounds 'friendly' and 'soft'. Term is associated with natural processes taking place.	Awareness of the term and process amongst conservation land managers and those in the sector was considered strong. Recognised that awareness was lower among other land managers, and that language varies regionally and contextually. The term was regarded as 'vague' for other land managers, that more appropriate language was utilised such as 'self-seeding', 'natural seeding' etc. Some considered natural regeneration and rewilding to be interchangeable terms. Dialogue and action around the process is seen to be gathering increased momentum and popularity. Understood as ecologically superior to	Natural regeneration is interpreted differently by other land managers depending on experiences and practices. Terms used reflect individual perceptions shaped by their specific experiences with the land, in some cases this means that other terms are used such as 'scrubbed up'. Natural regeneration, speaking to natural processes, may conflict with some land managers need for a sense of 'control' or some level of 'intervention', and so terminology may need to be sympathetic to this. The creation of impactful case studies alongside terms such as natural regeneration is required to persuade and inform policymakers and politicians.	Preference is shown for this term, whereas 'natural colonisation' by contrast is not always favoured. The term is often referred to as 'Nat regen' and is considered a 'friendly' and 'soft' term. For some this term is particularly suitable in context of tree diseases such as Ash Dieback. There is acknowledgement that the term may remain unsuitable for some land managers who are less aware of the term and find it to be lacking enough self-description.	The term is favoured, used regularly, and widely by this land managing identity. Both amongst peers, and with other land managers, organisations, and local authorities. Use of the term arises in many contexts, including woodland creation more generally, but also in particular post-disease woodland areas, when discussing the generation of woodland near viable seed sources, and where natural regeneration is evident already. The term is considered self-descriptive by some. Recognition that language preferences vary and may require adaptation to suit other audiences. Particularly, using language that reflects specific experience and practices. Natural regeneration is considered an important aspect of conservation, and so features regularly in dialogue for this identity. Persuading policymakers/politicians to	Overall, sentiment was mostly positive for this term. Natural regeneration was seen as a positive, popular, and well used term both amongst those in the sector and amongst wider land managers. There was a mix of those who considered the term to be self-descriptive, or a little vague. Most appreciated that language needed to be tailored in some instances. Language is seen as being tied to practice, and some recognised that reluctancy amongst others to diverge from tree planting was a barrier to engagement. The term was seen to speak well to the ecological and biodiversity benefits of the practice, with a lot of enthusiasm shown for both the term, and the practice itself. Recognised that terminology alone wouldn't suffice to make

Associations	Awareness and understanding	Power and Ways of Knowing	Preferences	Social and Situational Usage	Sentiment
	tree planting in some cases. Lack of awareness of related funding opportunities.			recognise the benefits of natural regeneration over tree planting is seen as a challenge.	changes, case studies were required.

Conservation identity Summary tables: Rewilding

Associations	Understanding	Power and ways of knowing	Preferences	Social and situational usage	Sentiment
Associated with natural regeneration and used interchangeably. Rewilding regarded as completely 'hands-off', allowing natural processes to occur.	Strong understanding of the term rewilding and the processes involved amongst identity. Using the term 'rewilding' alone is considered too reductive as it attempts to package a complex set of processes under one word. As a result, it is understood to lead to 'misinterpretation' and 'different viewpoints' amongst other land managers. The term is divisive because it means different things to different people.	Reductive language (i.e. using a single term) is seen as contributing to misinterpretation and division amongst other land managers. Politicians and local authorities are seen to be aware of issues relating to term. That language, and the inferences made through comms should be sensitive to concerns the public may have. 'Wilder' was provided as an example of more sensitive / alternative wording, which was argued to be less divisive as it inferred a continuum of change, instead of absolute change taking place.	Rewilding was used interchangeably with natural regeneration. Adaptation to the term was a strategy suggested to reduce ambiguity. For example, "Woodland expansion through rewilding" was suggested to provide greater context / improve understanding. Avoidance of the term was preferred in some cases as the term was considered polarising', particularly when interacting with farmers who were regarded to express negative views towards the term / practice.	The term was used interchangeably with natural regeneration, however, in some instances the term was adapted or avoided depending on context. The term was understood to be potentially ambiguous for those less familiar with the processes. In these circumstances, adaptation and integrating further explanation is required in language and communication. The term was understood to be divisive and recommended to be avoided completely in farming contexts where the term was met with a polarised (negative) opinion.	Sentiment towards the term was mixed, with more negative than positive attitudes expressed. Conservation identities evidenced that they used the term and were favourable of the practices. However, participants acknowledged that the term was not suitable for everyone and that it was not self-descriptive as a single term, also that the term polarised opinion, recognising that the term was pejorative in farming contexts.

Productive Identity Summary Table: Natural Colonisation

Associations	Awareness and understanding	Power and Ways of Knowing	Preferences	Social and Situational Usage	Sentiment
Most associated negatively with colonialism/imperialism/slave trade. Many associated the term with natural regeneration, and to a lesser extent also rewilding. However, some felt that rewilding was completely different to natural regeneration and natural colonisation. Considered as a scientific or technical term. Associated with a lack of funding. Some recognised the biodiversity benefits. Replacement or loss of land or productive land. Absence of intervention or human action.	Most were not aware of the term, or at least struggled to confidently define it despite some initial assumptions that the term was fairly self-explanatory. Most regarded the term as lacking a wider consensus of understanding, especially in different contexts. Productive foresters claimed that awareness of the term was gained through specific channels, such as dealing with grant applications on behalf of clients.	Associated as a scientific term that might be used by individuals in industry who want to come across as morally or intellectually superior. Most were concerned that 'colonisation' was detrimental to uptake amongst farmers who may associate the term with a loss of their land, or invasive action.	Most suggested caution or felt a lack of enthusiasm to use the term Most preferred the term natural regeneration Many argued that the term needs to be packaged or expanded upon more positively and tailored to each audience Some were more positive about the use of the term, associating it with biodiversity benefits	Most did not use the term, either because they were unfamiliar, or it was not appropriate. Productive foresters claimed that they would not use the term with landowners / clients. Most claimed that the term required explanation and therefore not suitable Most used the term 'natural regeneration' Most made suggestions for alternative, or more preferable terms that could be used Some farmers suggested that peer acceptance was influential on language they used in social situations, especially when discussing changing land use, often requiring a descriptive approach that would be accepted and not be considered 'shameful'.	Overall, sentiment was mostly negative. Most felt that the linguistic baggage associated with colonialism, slavery, invasion, and imperialism was not enfranchising, particularly for farming audiences. There was some appreciation of having a technical term, especially in formal context such as grant applications. However, productive foresters would adapt their language to clients by avoiding the term, reserving its use to engagements with forestry officers / officials. Most considered the term to be unhelpful as awareness was very low amongst most groups and required explanation. This, in part, meant that use of the term was sometimes seen as condescending.

Productive Identity Summary Table: Natural Regeneration

Associations	Understanding	Power and ways of knowing	Preferences	Social and situational usage	Sentiment
Many recognised this term and regarded it as understandable and appropriate to most audiences. However, many also claimed the term could be considered ambiguous or an academic term, suggesting that the word should make explicit reference to trees. Some farming land managers associated the term with a threat to traditional livelihoods. Many used the term interchangeably with the term 'natural colonisation' during interviews, with some claiming there was semantic overlap. However, this term was not associated with rewilding. Some associated the term with cluttered environments, claiming it to be spatially distinct from planting. Many productive foresters claimed that the term and	Most land managers had come across the term. It was considered familiar, well understood, and well used. Some suggested that the term was not sufficiently intuitive, claiming that there should be specific reference made to trees, woods, or forests. Some productive farmers argued that it was an overused term in agriculture that was resulting in a loss of meaning. Some claimed the value of the term was context dependent and may not always be sufficient in particular landscapes.	Productive foresters gained awareness and used the term through dealing with grant applications and more formal contexts. Most favoured the term and suggested it was preferable, with some arguing that it had 'earned its place'. Some claimed the term was too academic, and therefore was not intuitive enough for people to understand. Some productive foresters gained awareness of the term through educational courses Some farmers spoke of peer-to-peer learning, claiming that farmers themselves drive the narrative amongst other farmers Some suggested that the terms different groups use are irrelevant, the priority is that we understand what each person means, therefore	Most land managers claimed they used this term regularly, claiming a preference over natural colonisation or rewilding. Many stated they were aware and accommodating of different terms used by others. The priority was about understanding each other, less about the term they used. Some claimed they would modify their words depending on the audience. Some felt there was need for a better word, that was more explicit about trees or woods. They made suggestions such as re-wooding,	Most tended to use this term in a variety of contexts, suggesting there was limited consequences (unlike rewilding) Both productive foresters and farmers claimed that they would use the term in formal contexts over informal. For example, farmers would use the term when speaking with conservation managers, the council, or with funders. Similarly, foresters would use the term when dealing with spreadsheets and grant applications. Some foresters claimed they would use more descriptive language with farmers or other landowners and clients. There were mixed views on whether there should be interchangeable use of terms, some claimed that a variety of terms was helpful for different audiences, whilst some	Overall, there was positive sentiment with most land managers claiming it was favoured, understood widely, and regularly used. Many felt that the term was descriptive and resulted in reduced miscommunication. Some felt the term sounded positive and lacked undesirable connotations unlike the other two terms. The negative connotations of the term are inextricably related to the practice: Some felt that the term was threatening, questioning their practices, especially in a farming context. Some farmers felt the term was beginning to lose its meaning, with overuse of the term in differing contexts such as 'regenerative farming'. Productive foresters often spoke about the risk involved, and the lack of confidence in a grant funding

Associations	Understanding	Power and ways of knowing	Preferences	Social and situational usage	Sentiment
practice was associated with a lack of benefits and that it was a marginalised practice in productive contexts.	There was recognition that the term might involve some intervention, but it was largely about allowing natural processes to play out.	enabling interchangeable terms to be used.	forest regeneration etc.	claimed it was adding to miscommunication.	context. There was also little awareness amongst some of the funding opportunities.

Productive Identity Summary Table: Rewilding

Associations	Understanding	Power and ways of knowing	Preferences	Social and situational usage	Sentiment
Most associated this as a term that should be avoided because of its controversial associations across many audiences. Unlike natural regeneration / colonisation, which was seen as similar, rewilding was described as distinct and occupying a different 'level'. Rewilding was associated with a type of ethos, religion, or movement that proponents subscribed to. Some farmers recognised that there was tension between the notion of rewilding and farming practices, with rewilding and its associated changing land use being regarded in a	Most considered the rewilding term to be contentious, arguing that there was diverse interpretations and lack of agreement on definition. Rewilding was recognised as a widely used term amongst the public, yet extremely controversial amongst certain audiences, especially landowners. Some actively avoid using the term rewilding due to the negative connotations. There is disagreement around what constitutes as 'real' rewilding,	Some claimed that the rewilding discourse is part of a wider marketing campaign that seeks to benefit from situating itself in opposition to modern farming. There was some recognition that others might feel that rewilding is an imposition on their livelihood, particularly in farming contexts. Some criticised the lack of discussion around what the term means, attributing this to the perpetuation of false interpretations and limited uptake and/or delivery.	Most agreed that the use of the term was often misunderstood and controversial, therefore it was carefully avoided, and other terms were used instead, such as natural regeneration. Many land managers recognised the benefits that rewilding could provide, and therefore did not necessarily reject the process itself. However, they recognised the consequences of discourse and interpretation as a barrier to this action, especially when discussing the wider community. Some productive foresters claimed that proponents of rewilding could be heavily critical of tree planting, claiming that rewilding should take place instead. It was argued that sustainable woodland management through planting was misunderstood by the public and rewilding proponents.	Some productive foresters argued that rewilding practices weren't always closely aligned with their objectives of woodland management which limited its usage as a term. Some foresters shared that the term was not used in the workplace, and that they were especially careful not to use it with clients due to the negative associations. Instead, there was a preference to use the term natural regeneration as it was considered more easily understandable and causes less issues. Farmers shared that the use of the term was frequently met with negativity amongst 'commercial' farmers, in particular during meetings. Farmers shared that there was hesitancy to recognise positive rewilding action, especially by farming	Overall, the sentiment was highly negative regarding the use of rewilding as a term. It should be noted that many land managers recognised the benefits of the process, especially in terms of biodiversity benefits. However, the concern shared amongst all land managers was the lack of clarity, or definition, that was leading to a lot of contention amongst the wider community. A lack of clarity was seen by many to result in the perpetuation of negative associations such as a threat to livelihoods, especially in the farming sector. This ambiguity has led to some likening the term or process to be part of a movement, or religion, that was creating division between differing communities. As a result, there was some mistrust around the marketing of rewilding, especially as there is significant money that can be made. There was a belief that rewilding as a discourse was being positioned in contrast to farming and

Associations	Understanding	Power and ways of knowing	Preferences	Social and situational usage	Sentiment
pejorative sense by some. Land managers often regarded the term as causing distress to others, but that wasn't necessarily something they admitted that they associated with. Some suggest the term is badly misunderstood, and there is unnecessary fear. Associated with biodiversity benefits, in this sense likened to the other terms.	with some experiencing critique from the public.	Some claimed that attraction to the term was tied with nature conservation interests, set in contrast to those with productive farming values.	Some found the juxtaposition between farming and rewilding to be insulting, claiming that farming demonstrated plenty of examples of positive behaviour in relation to climate change and biodiversity enhancement.	unions, who feared that by doing so it would generate backlash amongst the wider community. Some farmers recognised the importance of biodiversity enhancement and the opportunities that rewilding represented; however they were sceptical about signing up to a 'movement' or 'campaign', likened to a religion. Some claimed that they adapted their language to the audience. They would use rewilding with those who were expected to respond positively and opting to use alternative descriptive language such as 'creating areas of scrubland', with those expected to be less favourable to the term.	productive forestry, causing alienation amongst these groups. Overall, it was considered by most to be an unhelpful term and land managers suggested that other terms such as natural regeneration were much more positive and helpful.

Amenity Identity Summary Table: Natural Colonisation

Associations	Awareness and understanding	Power and Ways of Knowing	Preferences	Social and Situational Usage	Sentiment
Linguistic association with colonialism/imperialism and concern that this can't be separated from 'ingrained guilt' and thus disenfranchises. Colonisation as negatively loaded term – impacts subconscious associations. Colonisations sounds like something happening 'to' your land – this does not necessarily feel positive. Associated with particular groups e.g., 'scientists' and professional contexts. Not associated with lay audiences. Associate natural colonisation with a very specific kind of action, compared to woodland creation or regen which associate with being more 'holistic' and 'allowing several processes to happen'	Awareness of term linked to EWCO grant. Not a term heard or used by many in the public/amenity identity group before that. Even those using natural colonisation as a strategy often referred to it as regen due to lack of understanding or endorsement for natural colonisation. Question whether this distinction (and understandings and awareness of the distinction) between natural colonisation and natural regeneration matters in meeting woodland creation aims. Sense that nobody 'knows' the term natural colonisation. Difficult to raise awareness and understanding of natural colonisation in areas where this process for establishing woodland creation is rare.	Natural colonisation as a way of 'knowing' woodland creation felt to have been ushered in my EWCO and grants. Natural colonisation a 'technical' term of industry. Association of natural colonisation with the Forestry Commission and Natural England. 'Forcing' oneself to use this language to fit with grant offerings. 'Landowners come at it from a rewilding perspective, not a natural colonisation perspective.' Natural colonisation perceived as an 'academic term' - sense that this feels 'removed' from people who manage and own land. 'not a real world term' Natural colonisation not easily communicated as feels scientific.	Even those who understood and accepted the scientific distinction between natural colonisation and natural regeneration preferred to use the latter term. Natural colonisation for some is more scientifically correct but prefer natural regen due to more positive connotations and 'marketability'. Need for positive sales pitch - preference for using natural regeneration to natural colonisation as something perceived as more 'positive' by clients. Suggestion that natural 'woodland' colonisation would be preferable.	Feeling that everyone 'mixes' language depending on their audience to ensure suitability. Audience and what they understand is crucial to acceptability of strategies. Shared feeling that this isn't always taken account of by grant and policy makers. Natural colonisation 'not a term we bant around in the office' 'I force myself to use it (re grants) but it's not what I would usually use.' Not using natural colonisation with land managers.	Some individuals feel 'torn' as have positive feelings about using scientifically 'correct' language, but from a land manager engagement perspective feel more positive using natural regeneration. 'I understand it, I'm quite happy with it, but it's not a language we tend to use, I have to say, it's not something- I'd have to explain it if I started using it, I'd have to explain it to people. If I say, "This wood is expanding through natural regeneration'

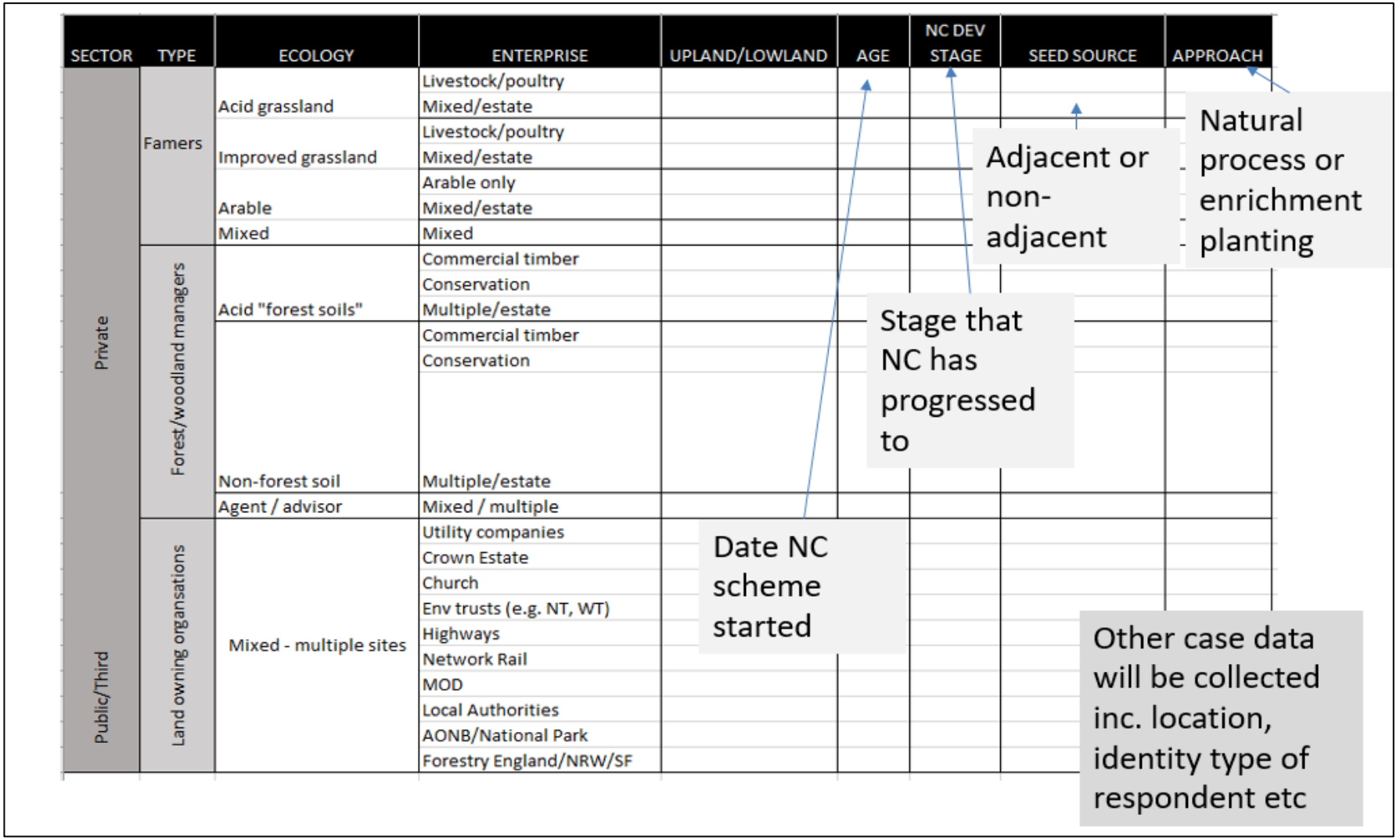
Amenity Identity Summary Table: Natural Regeneration

Associations	Awareness and understanding	Power and Ways of Knowing	Preferences	Social and Situational Usage	Sentiment
Association of 'regenerative' with a 'process which is enormously beneficial' Regeneration associated with 'improvement' Positively associated with potential for increased woodland cover and presence of trees. Of trees that can and do 'regenerate into the landscape' Associated with woodland creation – this can be positive as term is positively loaded, but can potentially disenfranchise land managers who want to increase trees outside of woodland. E.g., individual trees, tree lines, hedgerows. Associated regen with flexibility	All participants were aware of the term natural regeneration and felt clients and members of public also more aware of it than natural colonisation. All had used the term natural regeneration to describe woodland expansion through natural processes and all understood its mechanisms. broader phrase that can encompass natural processes and intervention. Awareness and belief in natural regeneration as a beneficial way of restocking woodlands. 'even if they don't understand the detail, everybody when you talk to them about it understands that it's coming from nature, that our involvement as modern human beings and managers is reduced.' If I say, "This wood is expanding through natural regeneration," I think that would be mostly understood by most people as well. 'lay audience wise, I do think that natural regeneration is much better understood'	Natural regeneration a term heard from college in the 1980s onwards. Natural regeneration less academic and scientific a term as natural colonisation Natural regeneration as a 'catch-all' – used across different groups, in different spaces	Preference for regeneration as a 'more accurate and positive term than colonisation'. Sense that colonisation is more 'reclamation' 'I think we hear nature, and 'regeneration', I think we hear improvement. So it's just nature doing improvement for us. And I think that's why I tend to lean towards that term, if I'm just speaking generally to people. So that's probably the one I'd say, at this point in time, is the one that I'd go for'	Even those using natural colonisation referred to it as regen as this was better understood and accepted. Natural regen referred to a lot in Continuous Cover Forestry management. Using natural regeneration with lay audiences and clients and using natural colonisation amongst technical audiences and colleagues. Using natural regeneration most often as it 'explains itself the easiest'	Regeneration widely understood as a positive term and used in a positive light. Natural regeneration sounds more positive than colonisation - 'positive' and 'happy' Feeling that regeneration is a positively loaded term, especially in the present day whereas 'colonisation could be a negatively loaded term'

Amenity Identity Summary Table: Rewilding

Associations	Awareness and understanding	Power and Ways of Knowing	Preferences	Social and Situational Usage	Sentiment
'wild' aspect of rewilding felt to have very broad associations – meaning 'nature', 'outdoors' – not necessarily clear in its associations. Associated with a mindset that we 'used to be wild' Associated with being 'hands off', 'letting nature do it's thing' – appeals to an imaginary of a pristine nature.	Sense that the public like the 'idea' of rewilding but that the reality of being totally hands off and what might happen would be less appealing to them e.g., a feeling that they don't understand what a truly rewilded landscape would look and be like. Felt there is awareness of the term rewilding across different audiences although not clear exactly what it means. Sense it has come to mean too many things and has lost meaning 'people will do no mow May and call it rewilding' 'wild' as a continuum that means very different things to different people – thus rewilding hard term to understand Rewilding as inefficient use of land	Some interviewees felt strong personalities behind the rewilding movement can be 'polarising' for wider audiences. Rewilding as an 'accessible' term as popularised through media and books e.g., Isabella Tree's book rewilding – but still not clear what it means Rewilding as a relatively new way of 'knowing' the environment – American research paper 'We are almost instructed to use the term 'natural colonisation' because that is the term that is in those documents, etcetera. So the term we are using is 'natural colonisation', most of the time professionally, however, most terms when we're speaking to people is just 'rewilding'. Landowners come at it from a rewilding perspective, not natural colonisation.	Feeling that true rewilding can't be achieved in Britain e.g., in ecological terms with large predators so some interviewees didn't like that it is being used 'inappropriately' ''Wild' doesn't seem to fit in my brain as any of the restoration we are trying to do'. 'it's become a bit of a ball and chain for conservation organisations that term.	Rewilding exciting for some audiences – captures lay people's imaginations – doesn't feel like a policy/government type of word. 'They don't call it rewilding farming they call it regenerative farming' 'There's still a group out there who I probably wouldn't use it in front of, if I was talking to them. And would talk more about- Take the 're' off and just talk about wilding, and it's interesting that Forest England has set up Wild Cause and a 'wildling office', it's not 'rewilding offices'. Not using 'rewilding' with visitors to sites – using phrases like 'wild experiences' and 'natural process-led management'	Rewilding not liked as a term as 'unclear' what it means/what processes it refers to. Rewilding 'a lovely idea' – linked to sentiment of how nice it would be to fully restore nature Lovely word for the imaginary it conjures up. I think the reason I don't like it, I don't know what we mean by 'wild'. Sense that rewilding was warmly met when first discussed in the 2000s, but that by mid 2010's had become 'toxic'

Appendix 8. Outcome Journeys sampling frame



SECTOR	TYPE	ECOLOGY	ENTERPRISE	UPLAND/LOWLAND	AGE	NC DEV STAGE	SEED SOURCE	APPROACH
Private	Famers	Acid grassland	Livestock/poultry					
			Mixed/estate					
		Improved grassland	Livestock/poultry					
			Mixed/estate					
		Arable	Arable only					
			Mixed/estate					
		Mixed	Mixed					
	Forest/woodland managers	Acid "forest soils"	Commercial timber					
			Conservation					
			Multiple/estate					
		Non-forest soil	Commercial timber					
			Conservation					
			Multiple/estate					
		Agent / advisor	Mixed / multiple					
Public/Third	Land owning organsations	Mixed - multiple sites	Utility companies					
			Crown Estate					
			Church					
			Env trusts (e.g. NT, WT)					
			Highways					
			Network Rail					
			MOD					
			Local Authorities					
			AONB/National Park					
			Forestry England/NRW/SF					

Appendix 9. Outcome Journeys Case Study Question Guide

Objectives of interview

(for interviewer to be aware of)
Use a life course style of interview guide to understand their journey, what they thought in the beginning, how they feel now, perceptions, reflections, and focusing in on 'success' – what does this actually mean to land managers when it comes to natural colonisation? What or who has influenced how they understand success? Has what success means changed over time? Looking back over their journey, what do they think might help other land managers to achieve success?

Introduction

(to open interview with participants)
Over the last two and a half years we have been researching the social side of natural colonisation. This has included land managers' understanding of this woodland expansion strategy, the benefits and disbenefits they feel it has, and understanding if and if so, how the language and communication surrounding this strategy, and the grants and incentives available, have or have not influenced decision-making on natural colonisation.
These interviews are the next phase of the research and are really about understanding the journeys of land managers who have been using natural colonisation. We want to better know how you came to choose the woodland expansion strategy in the first place, how things may have changed over time, how it has or hasn't helped to meet your land management objectives, and how you see success or failure in relation to natural colonisation.
A quick reminder, as per the consent form you filled out, that you don't have to answer any questions you don't wish to and are free to end the interview at any point.

Background information

In the first part of the interview, we want to gather background information about you and the land you manage.

1. Can you tell me a bit about the land you manage? *(probe: size/geography/land use/sources of income or financial support)*

2. How would you describe your role? (*prompt: What type of land manager, ownership status, do you work with others, i.e. shared management?)*

3. What are your main objectives in terms of managing the land? (*prompt: try to ascertain whether they identify with more conservation/amenity/productive etc./ Are your objectives shared by others involved in manging the land?)*

Past

Reminder for interviewer:

spatially distinct hybridity: where different approaches are used on individual blocks or patches across a whole land holding
spatially mixed hybridity: where natural processes are managed within a block, e.g. low-density planting (applied nucleation

Allowing/facilitating natural colonisation

How did you come to manage the land? (prompt: acquisition or inheritance / date/ previous parties involved in management prior)

What was the land like when you took over management? (prompt: prior land use, perspective on state of the land or the prior land use)

4. How did you originally incorporate natural colonisation as a woodland expansion strategy on your land? (*prompt: Approach taken, i.e. pure, or hybrid (spatially-distinct hybridity or spatially-mixed hybridity) / Also **initial** 'extent' of land use representing this development, i.e. how much land was set aside for this woodland creation approach)*

5. What were your motivations for using natural colonisation on your land? *(Probe: objectives/what did you hope/expect to achieve/why not a different strategy, e.g. planting).*

6. How did you become aware of natural colonisation? (*probe: people/places/organisations)*

7. How did you facilitate natural colonisation on your land (*prompt: funding, ground preparation, support from others)*

8. Did you face any initial barriers/obstacles at the start of your journey using natural colonisation? (*prompt:* ecological, financial, social challenges)

Present

In this section we want to explore the present day. To understand how the project has evolved, including the physical changes that have occurred on your land, as well as how your perspective, motivations, objectives may have changed.

Perspective on outcomes and success

9. Have your land management objectives changed at all since you first had natural colonisation on your land? If so, can you explain how, what, and why they have changed.

10. Looking at where you are today, would you say that natural colonisation on your land has been successful or not? Please explain why (e.g., has it helped you meet management objectives?).
    a. Can you explain what success and/or failure looks like to you, i.e. what features evidence this?
    b. Has success (or failure) looked the same at different time points in your journey? (*probe: have your ideas of success changed over time? Who or what has influenced how you see success?)*
    c. Do you see using hybrid strategies as a successful example of natural colonisation?

11. Have there been any unexpected benefits or opportunities from adopting natural colonisation on your land? (*prompt: e.g. skills/learnings, income, biodiversity*)

12. Are you experiencing any barriers or challenges in relation to the natural colonisation site?

Future

Now and reflections on change for others

13. How do you feel about natural colonisation now, having been on this journey to allow or facilitate it on your land? Were any of your original hopes and fears realised?

14. Looking back across that journey, is there anything you know now that you wish you'd known in the beginning? *(probe: what / why would you have liked to have known that?/ could you have known that in advance? Was this something you could have come to independently or would you have needed input from others (if so who)?)*

15. What, if anything, would have made your natural colonisation journey easier?

16. Thinking about where you've got to on your journey now, if you could go back in time would you have done anything differently?

17. Does anything that you've learned from your experience stand out as being particularly helpful for others interested in natural colonisation?

18. Is there anything in particular you feel Defra/Forestry Commission/Natural England need to change or provide to encourage other land managers to use natural colonisation?

19. Is there anything we haven't covered that you'd like to share with me as we wrap up the interview?

Appendix 10. Outcome Journeys Case Studies

Forest Research

High Ash Farm, Norfolk: using natural colonisation for woodland creation

Case study

Context

Chris is a second-generation tenant and arable farmer in Norfolk. Throughout the 1970s and into the early 2000s, he intensified agricultural production incentivised through government support. However, with worsening economic outcomes, the farm was placed into a Higher Level Stewardship (HLS) scheme in 2006.

Before natural colonisation

A 2 ha field was identified for the creation of woodland through natural colonisation as part of the HLS scheme. This contributed to the aim of undoing years of environmental degradation caused by intensive production systems. Identification of the natural colonisation site was facilitated by an advisor from the Farming and Wildlife Advisory Group (FWAG), who provided support and advice in designing the HLS scheme. This support was considered invaluable: 'their enthusiasm helped point me in the right direction.' The site had previously been put down to barley and sugar beet, but had been set aside for three years prior to HLS. At this stage it had developed into a tussocky grassland. Located at the bottom of a valley and bordered to the north by a large and mature mixed woodland, and further afield to the west by a coniferous woodland, the site was close to a viable seed source that allowed for natural colonisation.

Key facts

Land manager objectives: conservation
Location and setting: Norfolk, lowland farmland
Size of landholding: 259 ha
Enterprise: tenant farmer with mixed farm
Size of natural colonisation (NC): 2 ha
Implementation approach: natural colonisation
Financing: HLS scheme
Status of NC: mixed woodland
Age of NC: 18 years (started in 2006)

Period of natural colonisation

FWAG advised that there should be no intervention in the woodland's development, with natural processes alone dictating the outcome. By year three there were already many tree seedlings, including oaks (*Quercus* spp.), sweet chestnut (*Castanea sativa*), and hawthorn (*Crataegus* spp.). Eventually, Scots pine (*Pinus sylvestris*) also emerged: 'I've never seen Scots pine growing by themselves. So there's a lovely coniferous component.' Part of the success of the colonisation may have been due to limited deer pressure. Nonetheless, after the third year, guards were placed around some of the oaks to protect

their development. Grey squirrels (*Sciurus carolinensis*) ringbarked some of the oaks, but despite this the wood continued to develop and expand.

Natural colonisation in retrospect

Chris attributed the success of natural colonisation to the seed source from adjacent woodlands, as well as the role that jays (*Garrulus glandarius*) played in carrying and burying seeds (particularly oaks). The naturally colonised site was described as 'a beautifully mixed woodland' and was judged as a success because of the biodiversity and habitat generated, as well as the value now attributed to the site by the local community who enjoy it through permissive access. The success of the approach increased Chris' appreciation for nature and natural processes, deepened his connection with the role as a steward of the land, and highlighted the wider need for this type of restoration effort to restore biodiversity.

> 'If you want recolonisation naturally the jay is a brilliant bird for doing the work for you. That's the only way oak trees get uphill.'

Displaying a removed acorn, land manager describes the successful role that jays (*Garrulus*) play in caching oaks (*Quercus* spp.) into the ground, facilitating natural colonisation

However, there were some social challenges. The local farming community did not always support the engagement with HLS and the conservation and nature restoration aims that the scheme involved. Some people even suggested that the farming tenancy might be at threat. The transformation of some of the least-favoured areas for farming to 'some of the most beautiful and valued areas' on the farm did not guarantee the continuation of the HLS scheme. After 2016 there were no further payments, and entering into the scheme had resulted in doubled rents on tenant areas of the farm to cover the landlord's perceived risk of HLS. All of these factors highlight the difficult position of tenant farmers who are considering or investing in nature restoration, increasing woodland cover, and using natural processes to achieve this. An important issue here is the need for clear and understandable advice that helps farmers understand the risks and potential outcomes they need to plan ahead for, not only in terms of natural colonisation, but the uncertainty of continuing grant support, or the impact on whole-farm business planning.

> 'They [Defra/Advisors] evaporate and yet they are part of, very much part of what was happening here on the farm. It's as though they washed their hands of it, and you were left high and dry.'

A final remark is that 'the public have expressed their appreciation through donation and visitation, and the business continues to diversify to survive and safeguard the habitats it has created'.

Tenant land manager stood proudly next to a naturally colonised birch tree (*Betula* spp.) surrounded by other colonised trees including oak (*Quercus* spp.) and conifer

Funded by the UK Government through Defra's Nature for Climate Fund programme

Department for Environment Food & Rural Affairs

Forest Research

Jigsaw Wood, Suffolk: using natural colonisation and hybrid approaches for woodland creation

Case study

Context

Operating as an arable farm in Suffolk, Juliet and Christopher diversified their 214 ha landholding over time. Ten percent of the farm is in semi-natural created habitat, which includes young woodland, ponds, hedges, and ancient grassland. The overall objectives are predominantly productive, focused on income generation to keep the business running, including diversification into a self-catering enterprise. However, they also aspire to operate their business in 'the most sensitive, environmentally friendly way', so conservation interests are important too.

Before natural colonisation

Juliet, an ecologist, wanted to establish more woodland on the farm, and discovery of the 'Jigsaw Grant' in 2003 presented the ideal opportunity to realise this ambition. This government-funded scheme provided payments to link native woodlands across a landscape. Juliet and Christopher identified a 4.1 ha field that bordered two ancient woodlands. They saw the establishment of a new wood on this field to connect the two existing woodlands as an attractive opportunity, particularly as the grant covered establishment costs and 15 years of annual payments to cover any income foregone.

Key facts

Land manager objectives: mixed productive and conservation

Location and setting: Suffolk, lowland farmland

Size of landholding: 214 ha

Enterprise: arable

Size of natural colonisation (NC): 4.1 ha

Implementation approach: 15% natural colonisation, 85% hybrid facilitated through tree planting in clumps (i.e. applied nucleation and ploughing/seed scattering)

Financing: JIGSAW Challenge Fund - Forestry Commission

Status of NC: mixed woodland

Age of NC: 21 years (started in 2003)

Juliet was ecologically motivated to create a woodland with a diverse structure that encouraged biodiversity and genetic resilience. Promoting successional scrub through natural colonisation was considered a valuable way to achieve this. The diverse structure of the woodland was intended to support the creation of a healthy habitat, as well as an interesting and enjoyable space for recreation, both for their family and self-catered guests. They also hoped that in the long term the woodland would provide firewood and timber, which would feed wood burners on the farm.

Juliet was also drawn towards natural colonisation because of the reduced need for labour compared to a planting scheme. This was an important consideration on land where heavy clay presented significant planting and establishment challenges. The expectation that this method of woodland expansion would self-manage for growth and thinning, eliminating the need for tree tubes (which were disliked), was another important motivator. After some initial scepticism from Forestry Commission staff, who were accustomed to more traditional planting practices at the time, the application to employ natural colonisation was approved.

> 'We wanted a fenced wood and we wanted it to be a wild space from year one.'

Period of natural colonisation

The Forestry Commission advised that 15% of the site was in sufficient proximity to ancient hedgerows to receive a source of seed. The other 85% of the site employed 'assisted colonisation'. This required local provenance tree seeds to be collected from the neighbouring ancient woodlands; seeds were then mixed in buckets for stand types, and the local community helped to scatter these across a scarified surface. Seeds were also chisel ploughed across approximately an acre one year later following the application of acorns. Finally, there was supplemental planting through applied nucleation, where trees were planted in small groups, and in a straight line along a ride edge. Hazel (*Corylus avellana*), wild service (*Sorbus torminalis*), and small-leaved lime (*Tilia cordata*) were selected for this planting method.

> 'We wanted to do something that was more purist. I mean I'd like to think there'd be more genetic diversity than importing a load of trees from Holland.'

Wide ride systems were integrated to facilitate future management, and these were seeded with wildflowers. Ponds were dug, as well as blind ditch systems which mimicked the ancient woodlands. As the colonisation process evolved, some interventions took place, including the felling of goat willow (*Salix caprea*) to increase light and air circulation, and to provide deadwood habitat.

The project experienced two early challenges: the establishment of a non-competitive native grass mix on the site encouraged the presence of voles which went on to ringbark the emerging trees, and badgers damaged fencing which allowed deer to enter, although the fences were quickly repaired to prevent browsing damage.

A condition of the grant which required adequate tree numbers to be established by year three was not met. A 'fallback' agreement in the grant requiring planting could be used if the plan failed. However, in this case, the Forestry Commission recognised the early merits of the project and allowed for the continuation of the natural approach.

Twenty-one years on, Jigsaw Wood has now developed as a native woodland with the desired characteristics. These include an uneven age structure, a diversity of tree and shrub species, plenty of light, and a feeling that the site is 'alive'. This new habitat attracts many varieties of butterflies, birds, reptiles, and fungi, which are not present elsewhere on the farm.

Natural colonisation through hybridity in retrospect

Reflecting on the experience, Juliet observed that natural processes can create a range of environmental benefits, extending beyond simply producing a specific number of 'stems per hectare'. Tailored advice and support is an important factor in realising these outcomes. Many farmers do not have the ecological knowledge and awareness about the benefits of natural successional processes and the value of habitats such as 'scrub', so it is essential the right level of support and guidance is provided to engage more farmers. Juliet highlighted that there are significant long-term costs associated with woodland management, whatever the establishment method. If landowners are to be encouraged to 'lock up' their land as woodland, then better financial or tax incentives might be needed for woodland generated through natural processes.

The local community, including local school pupils and the farm's own Wildlife Watch group, came to support the scattering of seeds for the new woodland

Funded by the UK Government through Defra's Nature for Climate Fund programme

Department for Environment Food & Rural Affairs

Forest Research

Bark House Bank, Lake District: unintentional hybrid approach for woodland creation

Case study

Context

Myles is a fourth-generation farmer in upland Cumbria. His farm was traditionally a livestock enterprise with sheep, but the outbreak of foot and mouth disease in 2001 resulted in the loss of all stock. This traumatic event forced Myles to shift his business to contract fencing and walling, letting out fields on a short-term grazing licence, and eventually taking on a part-time post as a craftsperson in the Forestry Commission in 2010. He wanted to see the restoration of native hardwoods in the Lake District, motivated by the benefits it would have for wildlife, the environment, and the public.

> 'This woodland gave me the focus to carry on. Otherwise there was a point where I might not have been here... and it probably saved my life.'

Before natural colonisation

Myles was determined to plant woodland regardless of funding support. However, with the help from an acquaintance, he successfully secured around £100 000 to re-establish 40.5 ha of native hardwoods on the site called Bark House Bank wood. The funding came from a mix of Woodland Grant Scheme 3 (WGS3) and the Farm Woodlands Premium Scheme (FWPS), with an additional pot of funding described as the 'Challenge Fund', which had been allocated to the National Parks for the establishment of new native woodlands on a landscape scale.

> 'You've got to have someone that you trust to be competent to help with the paperwork.'

In 2002, a strong herbicide was aerially sprayed by helicopter to control the bracken covering 80% of the site. The ground was then mounded, creating raised areas of brown earth soil, ideal for establishing trees and shrubs.

Key facts

Land manager objectives: conservation

Location and setting: Cumbria, upland farm

Size of landholding: 178 ha

Enterprise: owner occupied, mixed holding

Size of natural colonisation (NC): 40.5 ha

Implementation approach: unintentional hybrid, plantation tree planting and ground prep with natural colonisation following unexpected seed dispersal and establishment

Financing: Woodland Grant Scheme 3 (WGS3) and Farm Woodlands Premium Scheme (FWPS) (plus Challenge Fund allocated to National Parks)

Status of NC: mixed woodland

Age of NC: 21 years (started in 2003–2004)

Period of natural colonisation

Myles explained that adjacent birch woodlands unexpectedly aided the establishment of woodland through natural colonisation. An easterly wind helped birch seeds spread over the open mounds, leading to significant tree establishment. He embraced this natural process, along with the planting, and observed squirrels carrying hazel seeds (*Corylus* spp.) and Jays (*Garrulus glandarius*) planting oaks (*Quercus* spp.). He attributed the success to effective ground preparation, with 50% of the site mounded and 20% left as open ground. To protect and manage the planted trees, he used 60-cm tubes with stakes to mark their location across the land that had not been mounded.

Illustrative Image: Mounding in the Scottish Highlands. Mounding involves creating raised areas of soil for tree planting, which improves drainage, aeration, and promotes healthier root growth.

Natural colonisation through hybridity in retrospect

Myles explained that natural colonisation was important to the success of woodland establishment, and that in hindsight they did not need to plant birch. Looking back, he would have conducted a wildlife survey to document the changes to biodiversity, which he attributed to natural colonisation and successional development of species present in a resilient woodland. Natural processes, along with planting with feathered edges, have helped to blend the woodland into the surrounding landscape.

His motivations have remained consistent throughout his journey, with a focus on achieving a good density of trees and biodiversity. He noted that though natural establishment was an unpredictable approach, it has renewed his confidence in the woodland's future due to ongoing successional processes.

Now 21 years old, the woodland requires thinning and control of squirrel ringbarking. Myles emphasises the need for ongoing support to manage established woodlands, particularly for older farmers who may face physical and financial challenges.

A view of Bark House Bank wood, Lake District

Funded by the UK Government through Defra's Nature for Climate Fund programme

Department for Environment Food & Rural Affairs

Forest Research

Swannymote, National Forest: natural colonisation adjacent to tree planting

Case study

Context

Simon is a Forest Estate Officer at National Forest Company (NFC), a charitable organisation creating and improving woodlands for both people and nature across their 200 square mile area. In 2004, NFC acquired a 22 ha site in Leicestershire called Swannymote, previously pastureland with small pockets of woodland along rocky outcrops and other hard-to-farm areas. Adjacent to the site is Cademan Woods, a Site of Special Scientific Interest (SSSI) and ancient-semi natural woodland, which, along with the on-site woodland pockets, has provided a viable seed source for natural colonisation.

Before natural colonisation

Simon designed a woodland creation project that utilised a spatially distinct hybrid approach, incorporating areas dedicated to natural colonisation (2.2 ha), areas where planting would take place (15 ha), and areas of open ground (4 ha). He was inspired to incorporate multiple areas of natural colonisation, since there was evidence of colonisation taking place across the site. The project was eligible for government funding through the Woodland Grant Scheme 3, of which natural colonisation was identified as a key provision.

Key facts

Land manager objectives: conservation and public amenity

Location and setting: Leicestershire, lowland farmland

Size of landholding: 22 ha

Enterprise: forestry

Size of natural colonisation (NC): 2.2 ha

Implementation approach: spatially distinct hybridity, mixing blocks using natural colonisation next to blocks with tree planting

Financing: Woodland Grant Scheme 3 (WGS3)

Status of NC: mixed woodland

Age of NC: 18 years (started in 2006)

Simon tends to design woodlands with 'curved edges'. To facilitate this, he hired a contractor with a tractor and flail to follow behind him as he walked and traced out areas to be naturally colonised, and consequently areas to be mown for the provision of a boundary. In addition, he dug out three pockets of wetland scrapes on the site, with the expectation that woodland would naturally colonise around the scrapes and provide a transitional buffer to the path.

During natural colonisation

Simon's plan to develop wetland areas was thwarted by free-draining soil, likely due to pre-existing agricultural drains.

'You'll see the wetland scrapes have all filled up with trees not water. That's all natural regeneration.'

However, this free-draining soil provided ideal conditions for natural colonisation. Once colonisation appeared in these areas, he decided to let it progress, noting that 'sometimes it's easier to go with nature than try and dictate it'. This approach led to significant growth. Simon found that exposing the subsoil by removing topsoil and coarse grass vegetation created good conditions for colonisation.

The colonisation of various tree species in all designated areas was deemed a success. Simon highlighted that wetland scrapes provided unexpected benefits for natural establishment. The circular perimeters allowed greater light exposure, promoting species diversity. This is evidenced by the establishment of Scots pine (*Pinus sylvestris*), oak (*Quercus* spp.), and elder (*Sambucus* spp.), which are often outcompeted and shaded-out by more vigorous species like willow (*Salix* spp.) and birch (*Betula* spp.). These small islands are also more easily managed than traditional block woodlands.

The three wetland scrapes dug out and pictured in 2007

Three colonised mixed woodlands on the site of the three wetland scrapes, pictured in 2024

'We hadn't invested anything therefore it didn't feel like anything we should protect.'

Simon acknowledged that unlike the planted areas, the naturally colonised areas weren't provided with browsing protection as there wasn't certainty there would be anything to protect. He suggested that a lack of predictability is a potential barrier to utilising natural approaches.

Simon realised his initial aspirations had to change due to the vigour of willow (*Salix* spp.) and birch (*Betula* spp.), which crowded out oak (*Quercus* spp.) and ash (*Fraxinus* spp.), preventing his objective of achieving an oak/birch mixed high forest. He deemed the cost of intervention too high for marginal oak returns. However, he was pleased with the emergence of a natural woodland and decided to let it take its own course. Simon suggested that squirrel ringbarking might form a natural control to allow the canopy to open up and give way to species such as oak in the future.

'You're just at a bit more of a whim to how it designs itself.'

Natural colonisation in retrospect

Simon warned that naturally colonised woodlands can result in poorer habitats with less biodiversity and structural diversity compared to planted areas. He explained that in the early years, dominant species can shade out other vegetation. He suggested that intervention or management, as seen in the planted woods, can enhance species diversity and ensure the emergence of intentional components, such as woodland edges with healthy shrub variety, which were lacking in the naturally colonised areas on-site.

Simon advocated for increased appreciation of the value of successional phases of scrub and the diverse ecosystems they provide. He also explained there can be a public benefit from experiencing diverse landscapes and suggested a shift in focus from tree planting targets to a broader view of creating more diverse and valuable habitats for wildlife, environment, and people. He suggested that naturally colonised woodlands may not always meet existing metrics for success, and policies should adopt wider measures to recognise their value.

Funded by the UK Government through Defra's Nature for Climate Fund programme

Department for Environment Food & Rural Affairs

Forest Research

Dunge Valley Nature Reserve, Peak District: using a hybrid approach for woodland creation

Case study

Context

David and Elizabeth acquired 47 ha of sheep-grazed land in 1995. With the primary objective of enhancing biodiversity, they quickly focused on creating woodland habitats, which were previously lacking in that area of the Peak District. This initiative aimed to boost local biodiversity at their site, known as Dunge Valley Nature Reserve.

Before natural colonisation

Motivated by a desire to see the creation of a patchwork of habitats that suit different species of flora and fauna, David and Elizabeth took up a woodland grant offer (WGS3). Following a survey, they were advised that natural colonisation would likely meet their objectives of achieving new woodland of maximum biodiversity with minimal inputs and costs. A total area of 11 ha around their home was earmarked for natural colonisation.

> 'Zero cost, zero input, I can see the attraction to the woodland grant people where it's a cheap way of getting tree coverage if the appropriate species are there.'

Key facts

Land manager objectives: conservation

Location and setting: Peak District, upland farmland

Size of landholding: 47 ha

Enterprise: commercial private garden

Size of natural colonisation (NC): 11 ha

Implementation approach: hybrid, natural colonisation that struggled, boosted by tree planting in clumps (i.e. applied nucleation)

Financing: Woodland Grant Scheme 3 (WGS3)

Status of NC: well-established scrub with inital tree recruitment

Age of NC: 26 years (started in 1998)

Period of natural colonisation

Natural colonisation did not achieve the desired outcomes and, after three years, there was no sign of tree seedlings, so this ultimately failed as an approach. This was attributed to a lack of local seedbank from which natural colonisation could progress.

The initial strategy was reconsidered, and tree planting was incorporated in 2001 in the third year of the project. Advice

> 'There were many parts of that area where there were no trees at all. To expect trees to miraculously appear just by fencing an area out within a relatively short space of time was absolute nonsense.'

and support was provided by the Peak District National Park (PDNP), Sheffield University, and Wythenshawe College. Volunteers from the college planted 6000–7000 trees in clusters, a technique ecologists call 'applied nucleation', and other areas were left open to create large glades. The advisors of the scheme were hesitant about David's plan to plant scrub like gorse (*Ulex europaeus*), blackthorn (*Prunus spinosa*), and hawthorn (*Crataegus europaeus*), which differed from traditional agricultural forestry, with uniform rows of trees. He aimed to create a resilient system to support birds and promote natural colonisation once a seed source was established. This resulted in a diverse patchwork of habitats, including trees, scrub, and glades.

Natural colonisation through hybridity in retrospect

An important early challenge was hostility from the local farming community to the idea of converting sheep grazing into woodland. Changing the use of productive farmland to an alternative can be emotive, and it was difficult to carry the local community along with the idea of change.

Illustrative image: sheep grazing in the Peak District (photo by Red Fox on Unsplash)

David acknowledged that natural processes have very long timescales, and that in difficult landscapes such as heavily grazed 'sheep country', the active introduction of species that are wanted may be the only way forward: 'you can't do one thing completely and just leave it alone and expect it to do its own thing. You've got to be pretty proactive.' The word 'natural' can be misleading, because active management and some level of intervention may well be necessary in certain contexts. Some environments are better suited to natural colonisation than others.

The merits of active management in developing woodland, such as controlling pernicious weeds and managing open spaces, is important to success. A comparison was made between the need for management of woodland succession with actively managed wildflower meadows on the site: 'If you've got a wildflower meadow, the last thing you want to do is pull the plug and just let them run wild because they'll eventually revert back to scrub [...] the only way to keep them the way they are is to graze them, take the hay cut off them, and keep them as a low nutrient environment.' Without active management the habitat objective may not be met.

David shared that navigating the grants and environmental schemes that might support natural colonisation is complicated, so advice and guidance is essential. However, this advice often has a financial cost, which could deter land managers from accessing it. Land managers are unlikely to adopt natural colonisation unless these barriers are removed. It is also financially challenging to a farming business if the areas of natural colonisation are not expected to generate any financial returns in the short- or medium-term.

Funded by the UK Government through Defra's Nature for Climate Fund programme

Department for Environment Food & Rural Affairs

Forest Research

Warwickshire Farm: a small patch of natural colonisation

Case study

Context

The landowner has farmed for 55 years and has substantial experience in forestry. Inheriting their family farm in 1974, the enterprise has mostly consisted of livestock, with some arable farming. While their main objective is productivity, they are also keen on diversifying and enhancing their woodlands to benefit the countryside.

Before natural colonisation

The farm was first inherited in the 1970s, when Britain's entry into the European Economic Community saw positive financial and other benefits for farmers. Support incentives and payments have always been important to the farm business. However, since the 1970s, economic and regulatory conditions have slowly changed, and, with the arrival of bovine spongiform encephalopathy (BSE) in the 1980s and 1990s, and foot and mouth disease in 2001, farming (particularly livestock farming) began to come under significant pressure, resulting in disenchantment.

This led the landowner to move towards diversification, exploring the potential of forestry to provide alternative economic opportunities. Two plantations were established on the farm in 2001 and 2003, the establishment of which was funded through the Farm Woodland Scheme between 2001 and 2015, which encouraged farmers to plant new woodlands on land formerly in agricultural use.

Key facts

Land manager objectives: productive, with marginal conservation

Location and setting: Warwickshire, lowland farm

Size of landholding: 60 acres of planted woodland and agricultural landholding (size unavailable)

Enterprise: mostly livestock and forestry, with some arable

Size of natural colonisation (NC): 0.05 ha

Implementation approach: natural colonisation

Financing: No initial finance. Now incorporated into Countryside Stewardship Higher Tier.

Status of NC: scrub, some small trees

Age of NC: 23 years (started in 2001)

Period of natural colonisation

A pipeline transporting water from Elan Valley in mid-Wales cut underground through their site, connecting to Coventry. Laid in 2001, it limited their options in terms of the management of this land. Unable to plant, they allowed natural colonisation to take place. Having built an awareness of natural colonisation through practice in patches across the farm and learning from resources such as 'British Wildlife' magazine, the landowner valued scrub, acknowledging the benefits for wildlife and conservation. They explained that the 0.05 ha area remained manageable, in part because they ran a scrub basher over the natural colonisation to ensure it didn't develop into one continual block. The area boasts a diverse range of trees and shrubs, which the landowner considers to be evidence of success. They are confident that the colonised area will continue to grow and thrive.

The landowner's view is that scrub hasn't always been a popular feature on farms, even among 'traditional' foresters as well as farmers. They suggest that scrub is now 'coming into vogue' which they see as a positive, representing opportunities for conservation.

Natural colonisation in retrospect

The landowner received no income for their woodlands for 5–7 years after the Farm Woodland Scheme ended in 2015, reducing their motivation to manage the sites. From winter 2024, they began to receive funding to manage the existing trees through the Countryside Stewardship Higher Tier, which would fund the management of the naturally colonised area for the first time. The funding brought essential revitalisation of the woodlands, but the landowner recognised that the pipeline would prevent any long-term planning.

> 'It's a threat there that at some stage they could come through again and make a corridor about 60 yards wide you know right through the whole farm like they did back in 1960.'

The landowner argued that although financial incentives for woodland creation can be generous, they must be economically attractive to mitigate perceived risks from landowners. For example, their plan to plant 13 ha of woodland on agricultural land through the England Woodland Creation Offer (EWCO) was being jeopardised by the potential removal of capital gains tax exemptions on profits gained from the sale of commercial woodlands.

The landowner felt that support in the form of advice and information is important, but that newly recruited advisors lack the necessary practical experience to sufficiently advise and guide land managers who are interested in engaging with natural colonisation and other woodland ventures. They suggested that 'you have to be fairly pragmatic and have patience and don't tear your hair out because things don't go quite right to start with', and that sufficient knowledge of the local environment is essential to provide much needed tailored support.

> 'I've done a lot of extra for diversity by taking grants and fully done them. I'm not one of those who just takes the money [...] I'm committed to enhancing the countryside.'

Illustrative Image: Forestry England advisor (photo courtesy of Forestry England)

The landowner believed that land managers should optimise opportunities for increasing biodiversity and provide benefits to the public when public money is spent. However, sharing their love of wildflowers, the landowner admitted that they would have preferred to invest in planting meadows than allowing the site to scrub-up naturally, noting that wildflower meadows do also provide rich biodiversity.

Funded by the UK Government through Defra's Nature for Climate Fund programme

Department for Environment Food & Rural Affairs

Forest Research

Briddlesford Woods, Isle of Wight: using a hybrid approach for woodland creation

Case study

Context

Jonathan is an ecological consultant who has managed Briddlesford Woods for the People's Trust for Endangered Species (PTES) for just over 20 years, including planning the approach to natural colonisation on the site. His experience with woodland management and creation spans over 40 years.

Before natural colonisation

The management objective for the site was primarily conservation, based on a 'habitat management approach', as well as maintaining the mosaic pattern of hedged fields within a wooded landscape. The site was acquired due to its existing woodland and conservation status for Bechstein's bats (*Myotis bechsteinii*). Prior to this, it was managed as a private estate with conventional farmland in the non-wooded areas. Creating new woodland across the rest of site was intended to strengthen the links between existing woods and extend the woodland habitat.

From the outset, the intention was to combine 'naturalistic' planting and natural colonisation. This decision was based on agreement with the local woodland officer that using the natural colonisation method for the whole site would likely not be possible. Any areas over 30 m away from the nearest seed source (woodland or hedgerow) were to be planted to ensure establishment. Planting was done in concentric ring patterns or 'targets', a technique called 'applied nucleation'. The nature and density of each circle vary when employing this technique and tend to look more like a 'fried egg', than perfect circles.

The ground was prepared by scarifying the grass. Although there were intentions to protect emergent trees with spiral guards or tubes, this was considered unnecessary due to the pace and success of colonisation that took place.

Key facts

Land manager objectives: conservation

Location and setting: Isle of Wight, lowland

Size of landholding: 157 ha (total PTES landholding)

Enterprise: wildlife conservation

Size of natural colonisation (NC): 15 ha

Implementation approach: hybrid, facilitated through tree planting in clumps (i.e. applied nucleation, and scarification of ground)

Financing: Jigsaw Challenge Fund, Forestry Commission

Status of NC: mixed woodland

Age of NC: 21 years (started in 2003)

In the early stages, the rough bare ground became a habitat for voles (*Arvicolinae* spp.), with barn owls (*Tyto alba*) and kestrels (*Falco tinnunculus*) arriving on site to hunt for them. The successional stages of grassland and bramble were highlighted as providing important ecological benefits and habitats, including rough grassland which benefited owls and kestrels, and bramble which was used by dormice, nesting birds, and invertebrates: 'We didn't want to lose that too quickly. We wanted it to go slowly through that phase.'

Period with natural colonisation

'It's a very effective way of creating woodland provided your conception of a woodland is broad enough to allow it to include patches of bramble scrub and bits of rough grassland as well as your traditional tree canopy. So, the objective is not to grow trees, but to create woodland. I think that's an important distinction.'

Using hybrid approaches was considered an effective strategy for creating woodland, provided that it was managed to include a varied age and species structure and patches of open ground: 'the objective is not to grow trees, but to create woodland. I think that's an important distinction.' The project was considered a success as they had established a diverse woodland, with 'natural patterning' as a consequence of underlying soil types, and including 'dense thicket woodland to more open glades' which may not have occurred through a planting scheme.

'You get a much [more] interesting woodland if you allow natural regeneration.'

As the site evolved, additional management practices were introduced, including a coppicing regime and the creation and maintenance of a system of rides. One of the future plans for the site is to begin to thin out the densest areas to allow for better natural regrowth. While the management is first and foremost aimed at maximising conservation value, where compatible with ecological values, there was a recognition that management could also maximise economic value, for example by thinning areas around commercially valuable trees.

There were initial worries, even at 10 years into the process, that the public saw the site as 'just a big bramble patch'. However, they 'held [their] nerve' and persisted with the approach, allowing natural colonisation to continue, knowing that the bramble was an important stage in the woodland development.

Unexpected benefits came in the form of wild service trees regenerating on the site, as well as an abundant population of Hazel dormice (*Muscardinus avellanarius*) and various species of breeding birds, such as whitethroat (*Sylvia communis*) and lesser whitethroat (*Sylvia curruca*), that moved in and thrived in the scrub and developing woodland.

Natural colonisation through hybridity in retrospect

After the original hopes for and benefits of a successful natural colonisation site were realised, it was necessary to think further about what the next stages might look like: 'should we be creating fine timber or habitat [...]?' There was still scope for reflection on what could have happened differently, including having allowed more cattle grazing to slow the establishment of natural colonisation and having opted for pure, rather than hybrid, natural colonisation or a lower density hybrid approach that required less planting.

Reframing definitions of success away from tree numbers and towards woodland creation by area was seen as key to encouraging uptake of natural colonisation, as well as highlighting the importance of successional stages and habitats generated in the creation of woodland.

Funded by the UK Government through Defra's Nature for Climate Fund programme

Department for Environment Food & Rural Affairs

Forest Research

Cambridgeshire wildlife conservation site: using a hybrid approach for woodland creation

Case study

Context

The land manager has been with the Wildlife Trust since before the site was purchased and has managed the site for 10–15 years.

Before natural colonisation

Conservation is the key focus of the Wildlife Trust, and so the objective for the site was to transform an 'arable desert' into a 'wildlife rich' woodland over time. The choice to employ natural colonisation, and not to plant trees in the first instance, was informed by an understanding of the need to facilitate a range of successional habitats in the journey from arable to woodland: 'it was meant to be slow.'

A deer fence, supported by grant funding, was constructed with hedgerows planted on the inside to provide initial connectivity along with ditches and a ride network. Bird surveys of the site showed whinchats (*Saxicola rubetra*), skylarks (*Alauda arvensis*), and meadow pipits (*Anthus pratensis*) in the early stages of natural colonisation.

The last crop of wheat was undersown with grass, with the aim of preventing an open soil surface that would be an ideal seed bed for weeds. Unfortunately, this produced a very dense mat of grass that may have contributed to a lack of natural colonisation of trees, but didn't stop invasion of creeping thistle (*Cirsium arvense*). Wind direction also had a bearing on tree regeneration. To meet the grant requirements to attain 1100 trees per hectare, tree planting began around year nine and ten. Expectations from the public, to have instant access to a new woodland habitat, reservations from local landowners about the potential for seed banks of weeds blowing on their crops, as

Key facts

Land manager objectives: conservation

Location and setting: Cambridgeshire, lowland conservation site

Size of landholding: 22 ha

Enterprise: wildlife conservation

Size of natural colonisation (NC): 22 ha

Implementation approach: hybrid using natural colonisation with experimental direct seeding and low-density tree planting

Financing: Forestry Commission – Woodland Creation Grant (WCG)

Status of NC: partially wooded scrub, young and open

Age of NC: 22 years (started in 2002)

well as scepticism from wildlife enthusiasts about the management of, for example, butterfly-friendly weeds, added social challenges to the implementation of natural colonisation.

Period of natural colonisation

While the conservation objectives remained the same through the period, new challenges emerged at different stages as the site developed. Rides that had been put in to facilitate different habitat areas proved problematic for drainage and resulted in waterlogging during an especially wet season. This environmental issue also became a social one, as the water drained on to neighbouring residential land.

> 'We weren't aiming for rows of trees in 20 years. We were aiming for a changing habitat. So it's all been a success.'

Natural colonisation was seen as a success as they had achieved their goal of converting a wheat field into a 'tree-dominated' habitat. Establishment of the wooded site was slower than anticipated, and considered to be between 5 and 10 years behind expectations. However, this lag time did not affect the overall perception of success and the understanding that this is the first step in a longer journey towards woodland: 'it's just slightly longer than what was planned.' Visual markers (e.g. tree cover) were only one model of success; changes in wildlife through the different stages of natural colonisation (e.g. invertebrates in the initial grassland and foraging birds in the subsequent scrubland) also evidenced the success of the process. Supplementing the initial approach with additional planting and using an intentionally mixed hybrid strategy to woodland creation from the start was suggested as a positive approach that could be repeated on other sites.

Expectations around the financial benefits of natural colonisation, given the lack of upfront cost of trees, planting, and tree guards, were challenged by the cost of regular weed management. Variations in the weather, especially in extremely dry and wet seasons, likewise had an impact of the progression of natural colonisation.

Natural colonisation in retrospect

The success of natural colonisation was recognised through their achievement of conservation objectives. The main takeaway was that expectations, in particular in terms of the timescale and financial calculation, should be managed, rather than changes in the practical approach taken.

> 'If you want woodland quick, I'd plant trees. If you're happy to have some trees eventually and have that interesting change over a long period of time, then [natural colonisation is] fine.'

Environmental and weather changes, as well as ecological and topological site features, for example having a large seed source in an appropriate wind path, rather than management interventions, were seen as having the greatest potential to have made the journey with natural colonisation easier.

Ride through the site with self-seeded willow (*Salix* spp.) in ditches

Better monitoring of wildlife throughout the whole natural colonisation journey so far would have helped evidence the successional habitats. However, there was a perception of limited funding for such long-term monitoring.

A central takeaway was to be 'relaxed about your timeline' and to be open to integrating both natural colonisation and tree planting on a given site. Context- and site-specific approaches to natural colonisation with flexibility in guidelines and feedback provided by funders and field officers were suggested as potentially instrumental in encouraging uptake of natural colonisation.

Funded by the UK Government through Defra's Nature for Climate Fund programme

Department for Environment Food & Rural Affairs

Forest Research

Brookes Reserve, Essex: using a hybrid approach for woodland creation

Case study

Context

Neil has been a woodland manager for a regional wildlife trust for over 30 years. He has been involved in the natural colonisation site since the very beginning, initially supporting the physical interventions on the site, and then as the site manager.

Before natural colonisation

This site consisted of an ancient woodland with two adjacent fields, each surrounded by woodland. It was decided that one of the fields that had been arable would be used to expand the woodland, while the other would be left as grassland. The choice to use natural colonisation as the approach to woodland expansion was informed by an understanding of the associated wildlife benefits of using natural processes and a desire to create a woodland by 'working with nature, rather than forcing it'. This decision was supported not only because natural colonisation was a relatively novel approach, but also due to the availability of a grant which could fund it. The initial objective was to rely solely on natural processes with no planting: 'we wanted it all natural.' However, a hybrid approach was adopted to ensure that minimum tree numbers for grant compliance was achieved, which featured low-density planting along with natural processes to facilitate woodland expansion.

Key facts

Land manager objectives: conservation

Location and setting: Braintree, lowland wildlife reserve

Size of landholding: 24 ha

Enterprise: wildlife conservation

Size of natural colonisation (NC): 4 ha

Implementation approach: hybrid using natural colonisation supplemented with low-density tree planting

Financing: Forestry Commission – Woodland Creation Grant (WCG)

Status of NC: mixed woodland

Age of NC: 29 years (started in 1995)

'Just don't be tempted to meddle, because people tend to meddle'

The main physical preparation undertaken on the site was putting up a deer fence to exclude the large local deer population, which was also supported by the grant. Some seed scattering and planting of disease-resistant elm trees also occurred, and rides were cut into the site. However, the overarching aim was to leave the site alone and 'see what happened'.

Period with natural colonisation

At the beginning of the journey, 'any tree was a good tree'. However, as sallow (*Salix* spp.) became an early and dominant coloniser, management interventions were needed to maintain the rides, including cutting back and thinning maturing sallow trees. With the neighbouring ancient woodland being a priority for management, the naturally colonised woodland received a lighter-touch approach. Over time, tentative plans emerged to consider the type of species mix for the natural colonisation site, which focused management on containing the sallow to promote greater species diversity.

Successful natural colonisation was defined as achieving a diverse habitat. Although tree planting was used, natural colonisation on this site was still considered a success.

> 'It's a long-term game and it will happen, it will be worth it, you just have to be patient and not rush things'

The ongoing challenges in managing a natural colonisation site were not ecological so much as social. These included managing the expectations of those who wanted to see woodland develop at a much faster pace, were disappointed to see bramble as opposed to trees, or did not want to see any trees cut or coppiced. Additionally, it was necessary to prevent public access through deer fencing. There was recognition that each woodland manager, conservationist, naturalist, dogwalker, or site neighbour had their own idea of how natural colonisation or woodland should look, or how it should be managed.

Natural colonisation through hybridity in retrospect

The site's success reinforced initial hopes that more people would recognise the benefits of natural approaches and appreciate the value of letting nature take its course. With hindsight, owing to the success of the natural approach, Neil would reconsider incorporating planting. Bramble (*Rubus* spp.) was highlighted as a critical successional habitat in natural colonisation and, were the process to be started again, he would avoid cutting rides at the start to encourage bramble cover.

> 'Bramble in itself is just fantastic for all sorts of things, dormice, and all sorts, use bramble throughout, so just having a thick bramble cover people don't like bramble but bramble in the right place and as part of natural regeneration is perfect, you know and just allow it to be. It will eventually do what it wants to do and it will become woodland'

Illustrative Image: Bramble reduces browsing pressure on young tree saplings and enhances biodiversity by providing habitat for mammals, birds, and invertebrates

Ultimately, future resource availability and management will determine the development of the site, with acknowledgement that the ancient woodland will continue to take priority over the newly expanded woodland.

> 'To me it's just patience and not rushing it, not worrying about it, and- because for years it didn't do an awful lot. You spent all this time and effort and money on putting up a deer fence, you want to see a success, and success really probably only came 10, 15 years later when things started to sprout up and you can see success coming.'

To encourage other land managers to adopt natural colonisation, Neil suggested that success should be measured at longer timescales, and not by tree numbers over a short time period, stating that natural colonisation is not an 'instant fix'. Greater communication with the public about the process on-site would have helped engage and guide people through this long-term journey.

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Department for Environment Food & Rural Affairs

Forest Research

Bassleton Beck Valley, Stockton: unintentional natural colonisation

Case study

Context

Dave is a countryside officer for a local authority with a history as a countryside ranger and has been involved with the land since it was left aside for natural colonisation.

Before natural colonisation

The council had owned a plot of land for over 30 years which was initially intended to be part of a road corridor for a housing development. However, the development was halted and so the road was never built. There was little pressure to do anything in particular with the site, so there were no specific objectives for the land. Virtually no management interventions were made on the site; it was simply left untouched, so the resulting natural colonisation was an unintentional outcome. The only interventions made on the site were to control invasive non-native species, in particular giant hogweed (*Heracleum mantegazzianum*), and to mow some of the access routes. As the land was publicly accessible, and popular with local residents, dog walkers and children, the local authority decided to build a cycling corridor through it. This led to some 'piecemeal' avenue tree planting along the cycle path.

Key facts

Land manager objectives: no objectives

Location and setting: Stockton, lowland site

Size of landholding: 15 ha

Enterprise: local authority

Size of natural colonisation (NC): 15 ha

Implementation approach: unintentional natural colonisation

Financing: no finance

Status of NC: partially wooded/scrub

Age of NC: 22 years (started in 2002)

Period with natural colonisation

Because natural colonisation objectives on this site were never clearly defined, what success might look like was also undefined. The presence of trees on the site was presented as one set of benefits. However, there was a significant amount of self-sown ash that had been affected by dieback, which represented a disbenefit.

Illustrative Image: Example of Ash leaves (*Fraxinus* spp.) infected with ash dieback (*Hymenoscyphus fraxineus*)

There was no specific management approach for natural colonisation on this site, nor were there any strategic land management objectives. As the local authority developed plans for a green space strategy and strategies for increasing biodiversity and nature recovery, it was possible that management of the site may have been influenced by these.

> 'If I was looking for a success criteria in natural colonisation, I wouldn't just look for blanket wall to wall trees, monoculture trees, which are predominantly ash. I would look for a good species and age composition with glades, with the sort of mosaic landscape that you would ideally like to see'

Were the site to have been more deliberately set aside for natural colonisation, success would have been recognised as achieving a range of tree species and diverse age cohorts. There was wariness about natural processes allowing invasive non-native species and single species stands to develop, but Dave recognised that success should be defined on a site-by-site basis.

The main benefit of natural colonisation on this site was that it required no cost for establishment or management. However, the local authority was reluctant to publicise the site as council-owned due to concerns that the public might view the lack of active management negatively and expect site development and improved facilities.

Natural colonisation in retrospect

The absence of specific objectives for the site proved beneficial in some ways, as it allowed for natural colonisation, and avoided pressure to plant trees (potentially through a planting grant) which may have led to a less-favourable 'single age, predictable species woodland'.

Raising public awareness of the benefits of natural colonisation and shifting perceptions toward accepting a 'non-intervention, non-management' approach were recognised as key factors in promoting natural colonisation as a viable method for woodland creation on sites with minimal or no management.

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Forest Research

Stubhampton Estate, Dorset: assisted natural colonisation for woodland creation

Case study

Context

James was the land manager for the Stubhampton Estate for nearly 40 years, with responsibility to multiple SSSIs (Sites of Special Scientific Interest) and the natural colonisation area, until 2019 when the estate was sold.

Before natural colonisation

The site was bordered by two blocks of SSSI-designated ancient woodland, primarily recognised for its lichen. These woodland blocks were originally separated by a field, which was later developed into a woodland, creating a natural link between them.

Illustrative Image: Example of two woodlands separated by a field

Key facts

Land manager objectives: conservation

Location and setting: Dorset, lowland estate

Size of landholding: 480 ha

Enterprise: mixed estate

Size of natural colonisation (NC): 8 ha

Implementation approach: using natural colonisation assisted by some experimental direct seeding

Financing: unconfirmed

Status of NC: mixed woodland

Age of NC: 12 years (started in 2012)

Initially, there were suggestions to fence off the site and plant around 350 trees. However, concerns about impact on the SSSI woodlands, along with the risk of introducing ash dieback (*Hymenoscyphus fraxineus*) and other diseases through planting stock, led James to reconsider this approach. Instead, he decided to erect a deer fence and simply leave the site to develop naturally, saying, 'we'll just leave it and see what happens'. The only activity undertaken to assist the natural colonisation was to collect acorns (*Quercus* spp.) from the neighbouring woodland and scatter them across the site.

Period of natural colonisation

The site was considered to be very successful in terms of the quick growth of a diverse mix of trees with virtually no intervention required except for the deer fence: 'We were basically amazed at how quickly things started appearing.' Growth occurred far quicker than they expected; with trees and scrub establishing across the entirety of the site, exceeding expectations.

> 'It's amazing how much has come. There's loads of silver birch, there's field maple, hazel, maythorns, all manner of stuff has come in there. It's incredible how much.'

At year seven, natural colonisation had progressed so well that interventions such as thinning became necessary. With the aim of developing mature trees to host lichen, thinning was required after four to six years to facilitate the growth of the trees: 'You don't want these little whippy things; you want something fairly substantial.' At this point the whole estate was sold, and the new owner took down the protective deer fence.

Illustrative Image: An example of lichen (likely *Xanthoria* spp.) growing on a tree

Natural colonisation was viewed as a low-cost, low-risk approach to creating woodland. It presented a reduced biosecurity risk compared with introducing new planting stock, which could inadvertently introduce new pests and diseases to the area and surrounding ancient woodlands. Additionally, it was seen as beneficial in terms of improving the genetic resilience of the woodland, as the species colonising would be naturally adapted to the local environment. There was also confidence in the success of natural colonisation due to the abundant seed sources from the adjacent ancient woodlands. Although no formal biodiversity monitoring was conducted, James noted that the site attracted various fauna, including mice (*Muridae*), woodcock (*Scolopax rusticola*), and grasshopper warblers (*Locustella naevia*), from the neighbouring farmland.

Natural colonisation and direct seeding in retrospect

The original objectives of the site, to create a linking corridor of successional habitats between existing blocks, was achieved, up to the point that the site was sold. Additional protection for natural colonisation sites was put forward as a possible solution to changes in ownership and management but ultimately the neighbouring SSSI woodlands were protected, but this site was not.

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Forest Research

Multiple sites in Cumbria and Lancashire: natural colonisation managed to create wood pasture

Case study

Context

Bill is a farmer who uses grazing livestock to manage multiple natural colonisation sites. Trained as an ecologist, he has been managing land for over 30 years.

Before natural colonisation

Objectives in managing multiple sites are defined by the landowners and are primarily nature conservation-related, as sites include Sites of Special Scientific Interest (SSSIs), National Nature Reserves, and those which are part of agri-environment schemes. On some of the sites, natural colonisation was already happening by default as there was no previous management, and sites ranged from closed-canopy secondary woodland, to scrub, and to grassland. Across all sites, cattle grazing was the main activity undertaken to achieve the conservation objectives of each site with an overall commitment to enhancing biodiversity by creating a more open mosaic of habitats. No tree planting had been undertaken on any of the sites and some parts had been cut back to retain the most important areas of grassland. There was an appreciation that natural colonisation was already underway and in combination with cattle grazing, this could produce a wood pasture habitat that was well suited to local conditions and the management requirements of the different sites. Natural colonisation was seen as an appropriate and, in many ways, unavoidable natural process that needed to be managed in order to facilitate the recovery of wood pasture habitats and to allow trees to establish in a more 'natural mix'.

Key facts

Land manager objectives: conservation

Location and setting: multiple sites in Cumbria and Lancashire, including upland and lowland farmland

Size of landholding: around 700 ha

Enterprise: suckler beef and sheep

Size of natural colonisation (NC): varies across multiple sites covering 700 ha

Implementation approach: natural colonisation, which may have been assisted on some sites by new hedge planting

Financing: no finance

Status of NC: varies across multiple sites including mixed woodland, partially wooded, scrub, grassland

Age of NC: 30–100 years

During natural colonisation

Success was defined differently for each site, which all had different management approaches and objectives. On some sites, grazing took place late in the year to give plants and insects more time to complete their life cycles. Livestock were thus only able to graze on the young shoots of trees and shrubs that had grown in the spring and summer. Deferring this browsing impact until later in the summer helped to establish natural colonisation. Thorny species such as blackthorn (*Prunus spinosa*), hawthorn (*Cretaegus monogyna*), and bramble (*Rubus* spp.) were all able to take advantage of this process and, although they often became 'quite vigorous, quite rampant', they also provided 'safe zones' for trees and shrubs that were less well-protected, such as ash (*Fraxinus* spp.) and oak (*Quercus* spp.), helping them to become established.

'We've had a bit of a fight on our hands trying to push back against these very negative opinions about the role of cattle and sheep in managing land.'

On some sites, natural colonisation may have become 'too successful', so that the balance between woodland, scrub, and grassland was weighted more towards woodland, resulting in excessive losses of the open habitats that are crucial for some insect species, particularly butterflies. A key part of the journey was understanding how the particular ecosystems on a site responded to different types of grazing. For example, the realisation that natural colonisation can be managed more effectively with cattle than sheep came from seeing how cattle 'interact synergistically with trees where these more woody kind of habitats occur'.

An ongoing challenge was pushing back against the negative perceptions the public had about the climate change impacts of cattle. Another challenge was maintaining an adequate level of ecological monitoring on the various sites, such that the perceived changes were often not backed up by data.

Natural colonisation in retrospect

Natural colonisation was seen as an 'iterative process': the grazing regime on each site often changed over time in line with site management objectives, which had to adapt to the different levels of natural colonisation. While initial objectives may often have been centred on a few particular species as targets for nature recovery, many have now taken on a broader view of conservation, framed by the wider context of climate change which is 'making nature conservation more difficult'.

'It's just fascinating to watch all these different elements. You know, you read about it in the books but you know, we can actually see it playing it out on the ground in front of us.'

An improved understanding of how grazing can help mediate the natural colonisation process was highlighted as helping site managers to achieve a better overall balance. Insights gained from adopting different site-specific approaches to grazing management facilitated new perspectives on natural colonisation as a means of expanding tree cover in ways that are perceived as more in tune with underlying ecological processes.

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