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FARMING FOR THE NATION
AONB Tests & Trials for ELM

Final Project Report to Defra

This is the Summary Report covering the 14 individual project reports from the following AONBs:

- Blackdown Hills
- Cornwall
- Cranborne Chase
- Dorset
- East Devon
- Forest of Bowland
- Kent Downs (3 projects)
- Nidderdale
- North Pennines
- Quantock Hills
- Surrey Hills
- Tamar Valley

T&T name:	046. Farming for the Nation: AONB Tests and Trials for ELM
T&T contractor:	National Association for Areas of Outstanding Natural Beauty (NAAONB)
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Executive summary

Headline messages from this Test and Trial

Overall: Environmental Land Management schemes will help tip the balance in favour of more profitable and sustainable systems (such as conserved forage, organic manures, legume-rich swards and healthy soils) through a combination of the actions and payment rates they offer and by convening suitable advice and guidance.

Land Management Plans: These should be non-technical, adaptable, working documents, based around a map showing current assets and a table of opportunities linking management actions to the public goods produced.

Spatial priorities – guiding principles: Environmental Land Management in AONBs should support nature-friendly farming ('land sharing') in preference to dividing land use between high intensity food production and reserves set aside for nature ('land sparing').

Spatial priorities – use of data: Access to good quality environmental data on the current extent and condition of environmental assets is essential.

Advice and guidance – indicators of success: There should be a simple set of indicators which farmers can use to check on progress in achieving environmental outcomes, with specialist support and coordination for landscape scale impact, where payments are linked to land management actions rather than outcome.

Advice and guidance – co-design with participants: Farmers welcome the opportunity to collaborate on the co-design of guidance through knowledge exchange so that their practical management knowledge experience is used to influence how outcomes are achieved on the ground.

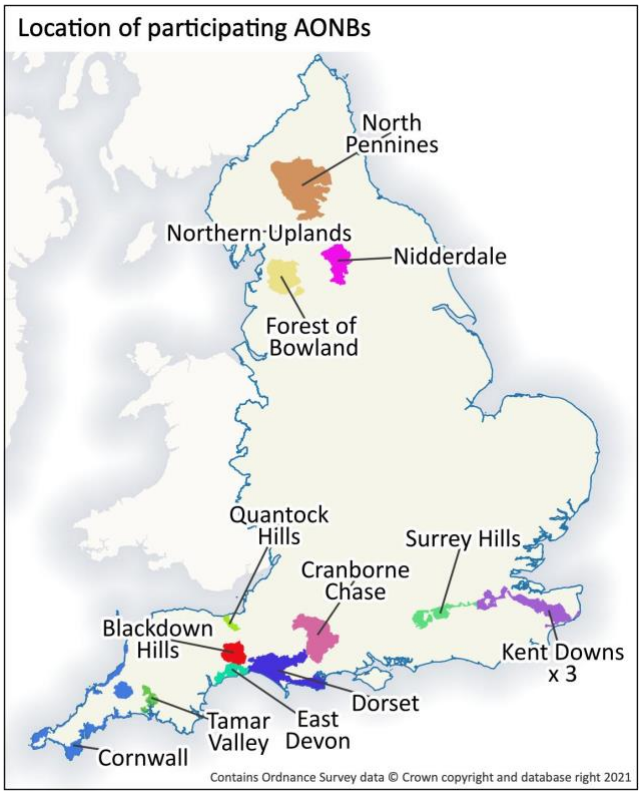
Payments – The transition to Environmental Land Management schemes: There is growing anxiety amongst farmers in protected landscapes about the financial impact that declining BPS payments will have on their businesses and their ability to sustain current environmental assets, before the full-range of Environmental Land Management schemes and opportunities become available.

Convening of ELM priorities and delivery: AONB's relationships with their farming and land managing communities are deepening through initiatives including the Farming in Protected Landscapes programme. The development of Local Nature Recovery Strategies and AONBs' own Nature Recovery Plans will sharpen the land management focus of AONB Management Plans. These factors will put AONB Partnerships and their staff in an excellent position to support the convening and roll out of ELM schemes at a local level.

Overview of project activity

The Farming for the Nation Test and Trial (T&T) for Environmental Land Management (ELM) has involved a suite of 14 co-ordinated projects delivered by 12 Area of Outstanding Natural Beauty (AONB) Partnerships across England through the National Association for AONBs (NAAONB). These took place between November 2019 and June 2021.

The projects have used the resources and experience of the AONB Units, supported by external facilitators and specialist consultants, to engage with well over 200 farmers and land managers. The AONBs have worked with their participants to explore key aspects of the Government's future Environmental Land Management programme.



Within an overall framework of six strategic objectives, the AONBs have undertaken a range of enquiries including:

- Gathering and mapping environmental data to identify existing assets and potential opportunities;
- Holding workshops with farmers, land managers and other participants to agree landscape-scale opportunities and to co-design farm-level actions;
- Working with individual farmers to identify financial choices for their businesses and the way that ELM actions and payments can support these; and
- Examining how advice and guidance can be provided most effectively to support beneficial activities on farms.

Throughout most of the timescale of the projects, Covid-19 restrictions have had a significant impact on the work with participating farmers and others. As a result, workshops were held online or through small socially distanced outdoor meetings.

Collaboration and joint learning between all 14 projects took place online through a regular series of webinars at national and regional levels. Quarterly progress reports containing project outputs and emerging findings have been submitted to Defra throughout the project.

Themes and research questions addressed

The original proposal for this programme set out six strategic objectives that have guided project activity. These fit closely with the six themes subsequently developed by Defra for the Test and Trial programme.

The table on the following page shows the key research questions that projects have sought to address in relation to Defra's six Test and Trial themes. Not all projects have addressed all these questions.

Key research questions that have guided enquiries and activities

T&T theme	Research questions
Land Management Plans	• What are the important components to include in a LMP? • What have been the views of farmers/land managers in relation to these LMP components or processes?
Advice and guidance	• In what way has the provision of advice and/or guidance helped ensure knowledge exchange and capacity building, and build ambition and confidence? • What does an effective structure of local advice and knowledge-exchange look like? • How does the way that advice and support is best provided vary between different types of farmer and land manager? • What role should self-assessment by farmers/land managers play in monitoring the success of LMPs?
Spatial prioritisation	• How have T&Ts defined local priorities and with whom? What has your experience been of engaging with key stakeholders, including farmers/land managers to identify ELM priorities? • What types of information, knowledge or skills have been applied to identify spatial priorities? • What information is needed to convert existing spatial objectives and policies, such as AONB Management Plans, into spatial frameworks?
Collaboration	• What types of collaborative activities are most effective for engaging land managers? • Under what circumstances has collaboration helped to facilitate learning and develop skills among participants?
Payments	• How feasible are Natural Capital based payment rates for incentivising farmers to deliver public goods compared to other payment rates? • How can payment levels be set so that they reflect the value of the public goods provided, as well as the costs experienced by scheme participants? • How could the methodology for calculating ELM payment rates be refined to better reflect the true opportunity costs (for each individual land manager)?
Innovative delivery	• To what extent have T&Ts identified and used innovative tools and mechanisms to contribute to the development of LMPs and delivery of anticipated outcomes?

Top five learning points from project results

1. Components of Land Management Plans

Testing out formats for Land Management Plans (LMPs) has been a core activity of most of the projects. Experience of preparing plans and feedback from participating farmers has shown that, at a bare minimum, LMPs should be non-technical documents, based around

- a map showing current assets (with many projects using the concept of natural capital to describe these); and
- a table of opportunities linking management actions to the public goods produced.

Most projects have concluded that LMPs should include information about the farm business that can help the farmer and their adviser consider the business management and financial aspects of the Plan. In addition, come projects have examined how landscape scale objectives and other external policy objectives can be identified in the Plan. A map is considered to be a clear way of showing these where they are spatial.

Farmers wish the Plan to remain flexible and amendable as a working document. Although the Plan might be written with a five to 10-year action plan, there needs to be opportunities to review the plan within this period. Farmers would also like the Plan to contain a longer-term vision (25 years+).

2. Structures for providing advice, guidance and knowledge exchange

It is clear from several of the projects that farmers welcome the opportunity to collaborate on the development of guidance using a process of knowledge exchange. This allows their practical management knowledge experience is used to influence how outcomes are achieved on the ground. This will overcome the distrust sometimes encountered in recent agri-environment schemes (AES) which have been seen as inflexible and overly prescriptive. The role of 'farmer ambassadors' and other facilitators who are trusted within the farming community is a good way of engaging with farmers who have previously not been involved in AES.

Existing Facilitation Fund groups and farm clusters provide an opportunity to continue their purpose of knowledge sharing and training. They should have a formal role in the roll out of Environmental Land Management, with continuing support for professional facilitation.

There is concern that there may not be enough good advisors available to roll out Environmental Land Management quickly and effectively. However, there are people in the farming community who would develop the necessary skills if there was demand. An element of training and induction for advisors will be important to ensure consistent and high-quality advice, although farmers were wary of a formal process of accreditation which it was feared would be bureaucratic and add cost.

3. The role of farmer self-assessment in scheme delivery

Feedback from most of the participating farmers shows that they like the idea of having a simple set of indicators of success that they can use to check on progress in achieving environmental outcomes. While they expected to be able to understand what was being measured and how this was relevant to the outcome (and public good), most farmers expected that they would need specialist support (for instance to do ecological monitoring) or would need local adviser-led training sessions to take it on themselves. Where monitoring of outcomes related to landscape scale (i.e. in relation to clusters of collaborating farms), this should be done centrally by a coordinator. Farmers were wary of the results of monitoring of outcomes (for instance species surveys) to be linked straight back to payments. Rather payments should be linked mainly to the delivery of land management actions.

4. Identifying spatial priorities at a landscape scale

There is strong census from the projects that access to good quality environmental data on the current extent and condition of environmental assets is essential. Investment by Defra in making existing datasets accessible and in filling significant gaps in data will be important. There will be a need to integrate historic environment data so that this public good is not overlooked.

Existing datasets that identify landscape-scale environmental opportunities such as the Working With Natural Processes (EA) and Habitat Networks (NE) data are helpful to guide targeting decisions. However, farmers do not like maps of their land that show 'white space' – which occurs in some of these datasets - that implies there are no environmental opportunities or priorities on these areas.

Landscape Character Areas (LCAs) have been used by several projects to identify areas with consistent broad environmental characteristics. Farmers have appreciated being involved in co-designing priorities at this scale and welcome opportunities to shape objectives across groups of farm holdings. Farmers have tended to favour objectives that work with their existing farming systems and, conversely, have been reticent or opposed to objectives that require land use change.

AONB Management Plans are important strategic documents, identifying the aspects of natural beauty which should be conserved and enhanced and also setting out policies and actions for priorities. Most existing Management Plans do not contain spatially specific guidance but projects recognised that the development of Local Nature Recovery Strategies (LNRS), supplemented by AONB's own Nature Recovery Plans (as per the AONB's 'Colchester Declaration') will enable future Management Plans to guide delivery of Environmental Land Management.

AONBs, like National Parks, are internationally recognised as 'cultural landscapes' that are distinguished by sustainable agricultural and forestry systems that have evolved in balance with their landscape. This approach prioritises a nature-friendly farming ('land sharing') approach in contrast to one in which land use is divided between high intensity food production and areas dedicated to nature ('land sparing'). Experience of the projects suggests that using Environmental Land Management schemes to support a multi-functional land sharing approach to agricultural land use will require continuing co-design that recognises the social context and personal motivations of farmers; integration with markets and supply chains for private goods; and a payment structure that takes account of the overall viability of the farming system, recognising that whole-enterprise costs of nature-friendly farming systems require public support as well as specific input costs of delivering environment outcomes.

5. The transition from the Basic Payment Scheme and the approach to setting payments in Environmental Land Management schemes

There is growing anxiety amongst farmers in protected landscapes about the financial impact that declining Basic Payment Scheme (BPS) payments will have on their businesses and their ability to sustain current environmental assets, before the full range of Environmental Land Management schemes and opportunities become available. Without BPS underpinning farm profitability, current Countryside Stewardship (CS) payment rates will not be sufficient to cover farms' costs of delivery and many farmers may be forced to discontinue current management activities. Most farmers see merit in a mix of 'payment by results' and 'income foregone' approaches to setting payments.

Projects in agriculturally less favoured areas such as the uplands concluded that many farming businesses could improve profitability (or reduce their losses) by reducing external input costs (such as concentrate feeds and artificial fertiliser), relying more on farm-based inputs (such as conserved forage, organic manures, legume-rich swards and healthy soils). Environmental Land Management schemes can help tip the balance in favour of these more profitable and sustainable systems both through the actions and payment rates available through the Sustainable Farming Incentive and Local Nature Recovery scheme, but also by convening suitable advice and guidance.

Final Summary Report

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Abbreviations and definitions

AONB	Area of Outstanding Natural Beauty. *The landscape designation.*
BPS	Basic Payment Scheme. *Financial support for farmers originating in the EU Common Agricultural Policy.*
CaBA	Catchment Based Approach. *A programme supporting local partnerships in collaborative water catchment management.*
CS	Countryside Stewardship. *The agri-environment scheme operating in England since 2016.*
ELM	Environmental Land Management. *The programme of agri-environment payment schemes being developed by Defra.*
HLS	Higher Level Stewardship. *A tier within the Environmental Stewardship agri-environment scheme that operated in England from 2004*
LCA	Landscape Character Assessment. *A methodology for defining the distinctive characteristics of landscapes*
LNR	Local Nature Recovery. *A scheme within Environmental Land Management.*
LNRS	Local Nature Recovery Strategy. *A proposal in the Environment Bill.*
LR	Landscape Recovery. *A scheme within Environmental Land Management.*
NAAONB	The National Association for Areas of Outstanding Natural Beauty. *The charity that supports and develops the network of AONB Partnerships.*
NFM	Natural Flood Management. *Actions to reduce the risk of flooding that work with natural processes.*
NP	National Park. *The landscape designation.*
SFI	Sustainable Farming Incentive. *A scheme within Environmental Land Management.*
T&T	Test and Trial. *The research programme support the co-design of Environmental Land Management.*
UKHab	The UK Habitat Classification. *The new unified and comprehensive approach to classifying habitats in the UK.* https://ukhab.org

1. Introduction

In-depth description of themes and research questions

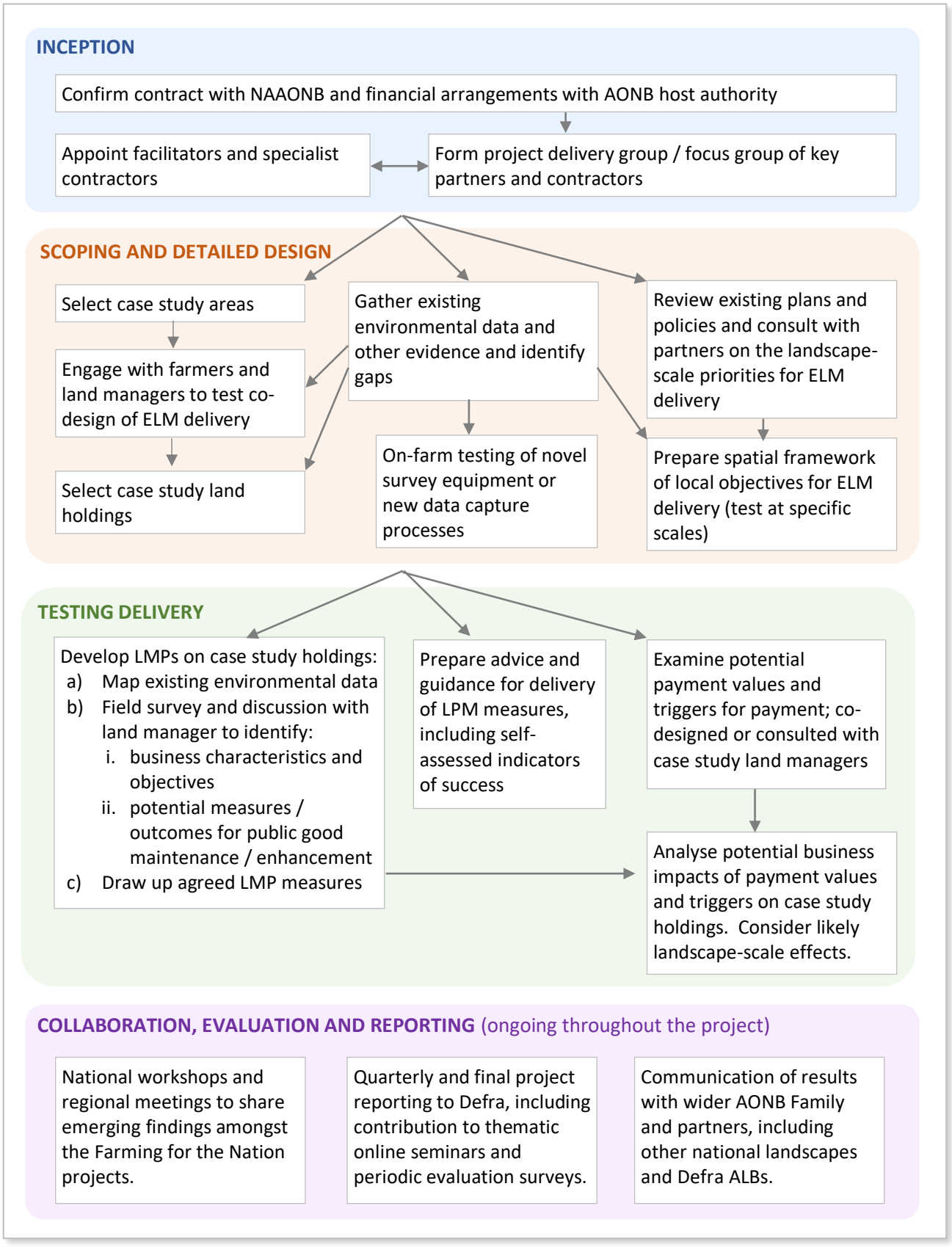
The Farming for the Nation Test and Trial (T&T) for Environmental Land Management (ELM) was designed around a set of six strategic objectives. These map closely with Defra's six T&T research themes, as shown in **Table 1.**

Table 1: Farming for the Nation Strategic Objectives and read-across to Defra themes

Farming for the Nation Strategic Objectives	Defra themes
1. **AONB MANAGEMENT PLANS AS STRATEGIC SPATIAL FRAMEWORKS** To trial, with stakeholders, the role of AONB Management Plans as strategic spatial frameworks for informing and targeting the delivery of public goods through ELM.	• Spatial prioritisation • Collaboration
2. **INTEGRATED LAND MANAGEMENT PLANS** To co-design, with land managers, integrated ELM Land Management Plans that work at the land holding and farm cluster scale, derived from AONB Management Plans.	• Land Management Plans • Spatial prioritisation
3. **INDICATORS FOR SUCCESS** To co-develop a series of self-assessed indicators of success for schemes that farmers understand and can use.	• Advice & guidance • Innovative delivery
4. **MONITORING, VERIFICATION AND PAYMENT TRIGGER** To co-develop and test a monitoring and verification payment system.	• Payments • Innovative delivery
5. **TESTING GUIDANCE** To test with stakeholders the scope and ability for the new ELM system to deliver broad and innovative multiple environmental, social and economic objectives as identified in the 25 Year Environment Plan.	• Advice & guidance
6. **EVALUATING COLLABORATION** To test the efficacy of collaborative working across and between protected landscapes.	• Collaboration

The 14 Farming for the Nation projects followed a similar project design process which is illustrated in **Figure 1**.

Figure 1. Project design components (Note: Not all components were present in all projects)



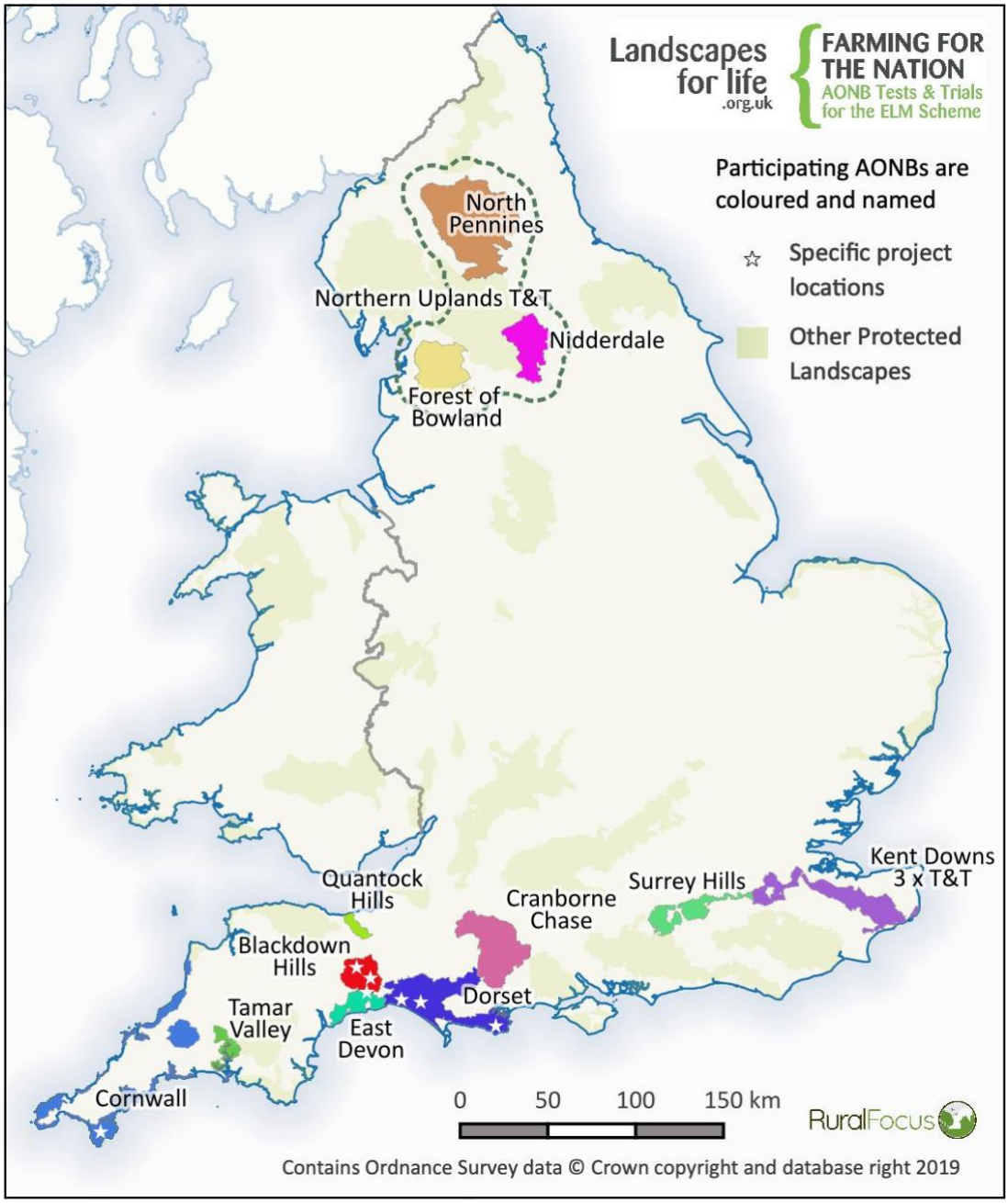
Background and context to the T&T

The Farming for the Nation T&T was co-ordinated by the National Association for Areas of Outstanding Natural Beauty (NAAONB) on behalf of the 12 participating Area of Outstanding Natural Beauty (AONB) Partnerships: Blackdown Hills, Cornwall, Cranborne Chase, Dorset, East Devon, Forest of Bowland, Kent Downs, Nidderdale, North Pennines, Quantocks, Surrey Hill and Tamar Valley. The three northern upland AONBs (Forest of Bowland, Nidderdale and North Pennines) adopted the same project aims and design and closely co-ordinated their activities.

The NAAONB established its own governance arrangements to oversee delivery. It appointed a small team of consultants to administer and evaluate the projects and facilitate collaboration between them. Regular liaison took place with Defra's nominated project officer and reports were submitted quarterly.

Figure 2 shows the location of the AONBs. The objectives of each of the projects are summarised on the following page.

Figure 2. Locations of the Farming for the Nation projects



Summary objectives of each project

Blackdown Hills	To explore how investing in the capacity of landowners to liaise and build trust amongst themselves, supported by holistic spatial data, can improve ELMS take-up in high nature value landscapes.
Cornwall	To examine how ELM can use a fuller understanding of natural capital and ecosystem services to provide a step change for the biodiversity and heritage of the Lizard Peninsula whilst also delivering wider multiple benefits for local communities.
Cranborne Chase	To gain consensus from farmers and other stakeholders on how to deliver the public benefits of well managed farmland in Cranborne Chase, using a process of workshops, mapping of natural capital and preparation of Land Management Plans on selected holdings, and the testing of guidance and advice.
Dorset	To explore the fundamentals of a Strategic Landscape Plan and how this can effectively be represented at a farm scale, working with three groups of farmers representing a diverse range of landscapes and farming types. Also to explore the requirement of effective guidance for managing gorse scrub on chalk downland.
East Devon	To test collaboration between individual farm holdings in a discrete sub catchment of high nature value pasture farming to develop local priorities for delivery of public goods making use of enhanced habitat opportunity mapping.
Kent Downs #1 Enhanced Access	To work with farmers and land managers to understand the barriers to enhance access to landscapes and nature for public benefit and co-develop a template of practical ways that ELMs can support much better, more diverse access.
Kent Downs #2 Natural Flood Man.	To assess the effectiveness of natural flood / drought management practices in delivering improved resilient water management in the landscape and supporting wider landscape and AONB Management Plan policies, in order to inform delivery through ELM.
Kent Downs #3 Viticulture	To devise interventions that can be adopted by the growing number of wine growers in South East England as part of ELM, according with vineyard management practice to secure investments in public goods (natural capital enhancements and access).
Northern Uplands	To test approaches for implementing ELM, through collaboration with participating farmers, which supports high nature value farming and land management in the northern upland AONBs of the Forest of Bowland, Nidderdale and North Pennines; whilst ensuring that farming in the uplands remains resilient and profitable.
Quantock Hills	To test approaches to preparing Land Management Plans that ensure the integrity and setting of Quantock Hills while sustaining and improving the supply and reliability of public goods. The project includes business planning with participating land managers to ensure the sustainability of benefits.
Surrey Hills	To deliver, through co-design, a landscape scale approach in the Surrey Hills to identifying priorities, payments and contracts, supported by innovations in mapping and remote sensing.
Tamar Valley	To test and trial a mix of new to market soil scanning technologies, to understand if they are able to produce replicable and consistent results to measure and assess the natural capital position of the soil and its capacity to deliver ecosystem service benefits through ELM.

2. Methodology

Summary of methods used

Workshops & meetings with farmers / land managers	All of the projects have engaged with selected groups of farmers and land managers in their AONBs through collective workshops and/or individual meetings. A process of co-design with farmers, land managers and other key local stakeholders, is a core element of most of the projects. Specialist inputs from experienced facilitators and land management advisers have been used to lead the workshops with participating farmers and land managers.
Workshops with key stakeholders and partners	Many of the projects have established a stakeholder advisory group to meet at key points during the project. The role of these groups is to advise the project on issues such as selection of case study areas, landscape-scale priorities and objectives and access to environmental data. Organisations represented typically include Natural England, Environment Agency, Forestry Commission, Local Authorities (countryside and historic environment sections), National Farmers' Union, Country Land and Business Association and Local Environmental Records Centres.
Data gathering and analysis	All of the projects have used externally-gathered evidence to support their tests and trials. This includes spatial (GIS) data on land cover, habitats, species and the water environment. Some projects have partnered with specialist data providers such their Local Environmental Records Centre or a University.
Field assessments of participating land holdings	A number of the projects are undertaking field surveys on participating farmers and holdings, often based around the concept of natural capital. Specialist land management advisers and/or ecologists have been contracted to undertake these surveys. The Covid-19 pandemic has meant that some surveys due in summer 2020 were delayed to 2021. Some projects (e.g. Dorset and Nidderdale) are making use of existing environmental survey data recently commissioned by the AONB.
Desk reviews of spatial frameworks, plans and best practice	Understanding the local priorities for ELM delivery is a core element of most projects and reviews of spatial frameworks and other plans (including the statutory AONB Management Plans) are part of this. Projects with a specific thematic focus are undertaking reviews of relevant research (for instance the Kent Downs Enhanced Access and Natural Flood Management projects).
Liaison between projects	Exchanging information between projects, including sharing of results and discussion of challenges, has taken place during quarterly national workshops as well as regional meetings or conference calls.

Each of the 14 projects have produced their own final report (consisting of a summary report of around 40 pages plus appendices containing the project outputs).

Project outputs providing evidence to Defra themes

Reports and other outputs from projects that relate to Defra's T&T themes are listed below. The sequence of T&T themes covered is as follows:

A. Land Management Plans	C. Spatial prioritisation	E. Payments
B. Advice and Guidance	D. Collaboration	F. Innovative Delivery

Defra Theme	AONB Project	Relevant outputs
A. Land Management Plans	Blackdown Hills	• Co-designed Land Management Plans (LMPs) for 19 participating holdings. An example (redacted) of one LMP is provided in the final report. Each LMP contains sections on the farm business, farm holding (land use etc), its neighbours, a summary of opportunities and an annotated farm map.
	Cornwall	• Preparation of three case study Individual Farm Action Plans, co-created with participating farmers. These calculate the public good value that would be generated from each Farm Action Plan based on four ecosystem services on seven land cover types.
	Cranborne Chase	• Co-designed Land Management Plans for six participating holdings based on an on-farm interview with the farmer, an overview of farm operations and land stewardship approach and a survey of the farm, with actions based on the results of the natural capital assessment for each holding.
	Dorset	• Nine LMPs (referred to as Farm Scale Plans) to deliver the Strategic Landscape Framework (see below), co-designed with participating farmers
	East Devon	• 13 Land Management Plans were produced using the High Level Stewardship (HLS) Farm Environment Plan methodology. Open discussions with participants were used to explore potential indicators of success and models for verification.
	Kent Downs #1 Enhanced access	• A set of 23 case study reports giving examples of where permissive access has been used to manage and enhance public access to the countryside; and showing how access options could be used to overcome barriers to access.
	Kent Downs #2 Natural Flood Management	• Severn case studies addressing the barriers that farmers face when joining schemes that promote natural flood management actions; and identifying what would be needed to improve take-up and focus interventions in the most appropriate places.
	Kent Downs #3 Viticulture	• Case studies with 18 grape growers in the Kent Downs and Surrey Hills AONBs, and South Downs National Park (NP), examining how actions that result in public goods might be applied at the vineyard level. • Three additional case studies were prepared by the project facilitator to draw up worked examples of environmental best

		practice in viticulture, identifying where and how actions could be applied on individual holdings. • A report on environmental best practice in row fruit (orchard) production, including comparisons with viticulture, prepared by specialist consultants.
	Northern Uplands (all three AONBs)	• 19 Management Plans completed each based on annotated maps and a matrix-style table cross referencing opportunities on the farm. The rows show land management options and columns show public goods; some plans include a natural capital audit.
	Quantock Hills	• Codesigned farm-scale land management plans that deliver public goods within a sustainable farming model through peer to peer and adaptive learning. Trialled use of AONB Management Plan as a strategic framework. • 20 Land Management Plans written by the farmer or land manager to outline how they will deliver public goods on their holdings. It includes basic metrics on the farm business, addresses each public good (of the three priority public goods identified for the project area), and identifies where public goods are or could be delivered on the holding. Followed up with questionnaires.
	Surrey Hills	• A briefing document 'Recommendations for ELM schemes' containing a section on payment, based on discussion with landowners and management
	Tamar Valley	• Report on the use of three new soil scanning technologies on 15 farms, identifying farming and soil husbandry techniques to improve soil management to increase natural capital and ecosystem service delivery
B. Advice and guidance	Blackdown Hills	• Conclusions on the role of Farmer Ambassadors as advocates for the ELM scheme who are familiar with the local area and trusted by local farmers and land managers.
	Dorset	• Guidance developed and tested with 12 farmers on the management of a) species-rich grassland and b) farmland birds, focussing on the South Purbeck area.
	Cranborne Chase	• Rapid Assessment Tools for use by farmers / land managers were developed and tested, based on scorecards kindly shared by Dartmoor NP colleagues. These covered hedgerows, rivers and riparian habitats. Further rapid assessment tools were drafted (including soil health, birds and pollinators) but not tested.
	East Devon	• One-to-one advice is the preferred option. Participating farmers and land managers do not have the time or inclination to study complex guidance and prefer to bring in expertise, with the reinstatement of an application fee. Open discussions identified the need for a facilitator to oversee the collaboration process.

		• Self-assessment and indicators of success were discussed with participants. Simple records (e.g. photographic evidence or in-field records of cultivation, etc) were achievable. Where a level of expertise might be required (for example a botanical survey to determine grassland diversity) participants would prefer to contract a specialist with the cost covered within the annual incentive payment.
	Kent Downs #1 Enhanced access	• A review of literature and evidence on barriers to access in the countryside by under-represented groups, prepared by a specialist consultant.
	Kent Downs #2 Natural Flood Management	• A literature review of natural flood management measures, creating a database of links to the most valuable information. This was used to create a spreadsheet that could be used by farmers to find information about Natural Flood Management (NFM) measures and what permissions would be required.
	Kent Downs #3 Viticulture	• Research report from a specialist consultant identifying best environmental practice in viticulture around the world, including contributions from researchers in New Zealand and Australia. • A set of recommended actions for wine growers covering topics included soil regeneration, ground cover, restoration of species-rich grassland, native trees and hedges, biodiversity features, public interpretation and permissive access
	Northern Uplands (all three AONBs)	• 19 detailed Farm Business plans that identify the point of maximum sustainable output (management without input). • Information on self-assessed indicators for success has been gathered through discussions focussing on existing schemes across the UK. Evidence has been gathered through minutes of meetings and discussions.
	Quantock Hills	• Co-designed indicators of success assessed using questionnaires, the first on record keeping, evidencing management and option prescriptions. The second on indicators of success for specific land management options that were popular during the land management plan discussions.
	Surrey Hills	• A briefing document 'Recommendations for ELM schemes' containing a section on advice and guidance, based on discussion with landowners and management. • A briefing document with recommendations on balancing provision of access with delivering nature recovery based on discussions with landowners and managers.
C. Spatial prioritisation	Blackdown Hills	• A report using the natural capital approach on available spatial data examining the extent and condition of natural capital assets, proposing priority areas for action through ELM. • Analysis of the AONB Management Plan (policies and actions) as a potential strategic spatial framework for ELM delivery

Cornwall	• A Natural Capital Prospectus for the project area (Lizard Peninsula) setting out an investment offer for delivery of six ecosystem services (water quality, flood alleviation, biodiversity, carbon sequestration and storage, cultural heritage and landscape and beauty) with a gross value of natural capital of £120M - £535M and a net value of new natural capital created of £3.7M - £15.8M. • A Landscape Recovery Framework for the project area setting out how the Environmental Land Management schemes can be delivered locally, with sections on pressures, opportunities, guidance, and delivery.
Cranborne Chase	• A natural capital assessment covering 30 water catchments (and all participating farms) and four ecosystem services (carbon storage, air purification, pollination, and flood mitigation), using the EcoservR app, in collaboration with Liverpool John Moores University. An iterative process involving the researchers and farmers produced a composite map combining the four ecosystem services showing potential areas of greatest change or needed improvements.
Dorset	• Three Strategic Landscape Plans (Brit Valley & Marshwood Vale, Cerne & Sydling Downs and South Purbeck) to create a strategic spatial plan that prioritises the delivery of public goods through ELM. Nine farm walks held to discuss the Plans with farmers.
East Devon	• An HLS Farm Environment Plan methodology was adopted for surveys and mapping of the Land Management Plans. The collected data was compared against various national and local data sets. The work found that national data sets did not accurately reflect the reality of natural capital present within a small catchment which has little history of conservation or of agri-environment uptake.
Kent Downs #1 Enhanced access	• A series of nine workshops held with countryside management and access organisations, farmers, landowners and land managers to discuss barriers to access and how to overcome them • Mapping using publicly available datasets on access provision, demand and opportunity to highlight the areas in Kent and Medway that might benefit most from enhanced or additional access routes.
Kent Downs #2 Natural Flood Management	• A natural flood management modelling and communication tool covering the Darent catchment based on new GIS analysis, combining a hydrological model with landscape characteristics. Maps created from the tool were tested with farmers. • The creation of landscape sensitivity maps for the Darent catchment using Landscape Character Assessment (LCA), dividing the area into high, medium and low sensitivity to woodland planting, hedgerow planting and reservoir creation.

	Northern Uplands (all three AONBs)	• Prototype Statement of Priorities developed from the AONB management plans - a clear, concise list of regional priorities to help landowners identify their own options and opportunities where collaboration could bring added value and benefits.
	Quantock Hills	• A Landscape Spatial Framework created using a Natural Capital approach through collating existing datasets to map NC in the project area based on an assessment of existing land use and designations. Land management priorities were derived from ELM objectives and cross referenced with the Quantock Hills AONB Management Plan to provide local priorities. The Framework was used to produce targeting maps to use when developing the Land Management Plan.
	Surrey Hills	• Surrey Hills AONB Nature Recovery Strategy - A landowner and manager-led approach to making space for nature. A landscape-scale strategy drawn up through engagement with three farm facilitation fund groups in Surrey, focussing on seven key habitats and associated indicator species.
D. Collaboration	Blackdown Hills	• Collective discussion in the two case study zones, facilitated by the two farmer ambassadors was used to generate a progressive consensus on land management for delivery of public goods.
	Cornwall	• Creation and facilitation of a Farmers and Agencies Joint Working Group to co-design the Landscape Scale Management Plan for the project area.
	Cranborne Chase	• Workshops with participating farmers discussing the findings of the project, including the land management plans, natural capital assessment, rapid assessment tools and farmer survey.
	Dorset	• Use of an online video, informing four workshops with participating farmers and organisations to discuss the usefulness of Strategic Landscape Plans to inform Farm Scale Plans
	East Devon	• T&T participants were happy to work together when selecting from a list of potential actions and ensuring that there was connectivity between landholdings. It was recognised that some form of facilitator would be needed for this. Participants were strongly opposed to any mechanism that might make them responsible for ensuring that other farmers and land managers had delivered the collaborative agreement for landscape or multiple holding scale actions.
	Kent Downs #1 Enhanced access	• Workshops with participating farmers and land managers examining barriers to enhanced access and suitable access management actions
	Kent Downs #3 Viticulture	• Workshops with vineyard owners and staff from the Kent Downs and Surrey Hills AONBs, and South Downs NP, discussing environmental management actions suitable for viticulture.

	Northern Uplands (all three AONBs)	• A series of documented webinars and virtual meetings, workshops and demonstrations that engaged the 19 participating farms across the three AONBs; and a series of documented collaboration meetings and training events for the staff of the three AONBs. A clear agreement that landscape-scale working is more productive than holding scale.
	Quantock Hills	• Workshops and farm walks with participating farmers and land managers to discuss the Landscape Spatial Framework and its application through individual Land Management Plans.
	Surrey Hills	• Workshops with participating farmers, land managers and stakeholders leading to the preparation of the Nature Recovery Strategy for the Surrey Hills
	NAAONB	• Quarterly workshops with the AONB staff and contracted facilitators from each of the projects, themed around key topics and discussing common findings.
E. Payments	Blackdown Hills	• A set of costed annual options and capital items for hedgerows, grassland, riparian and water areas and woodland, including payment rates, developed in combination with participating farmers.
	Cornwall	• Assessment of payment levels for the three case-study Individual Farm Action Plans based on a comparison of three different valuations methods for the farm opportunity map: 1) Ecosystem Services Valuation, 2) Valuation based on the current Countryside Stewardship options and payments structure and 3) Qualitative research with the individual farmer on the minimum level of incentivisation required to deliver the Farm Action Plan.
	Cranborne Chase	• Conclusions and recommendations arising from workshops with farmers on their needs and expectations regarding payments.
	East Devon	• A set of payments developed in collaboration with participating farmers covering 11 management actions covering hedges, grassland, woodland, water quality and soils
	Kent Downs #1 Enhanced access	• A report to estimate costs of providing a variety of access enhancements and employing community facilitators. This was combined with evidence of legal and insurance liabilities to provide indicative payment rates for access-based actions within schemes.
	Northern Uplands (all three AONBs)	• 19 detailed Farm Business plans that identify the point of maximum sustainable output (management without input) linked to a payment allocation model that explores the results of varying payment rates for public goods on both farm profitability and the delivery of the public goods. • 'What's a Hill Worth' report sets out a mapping approach to quantify natural capital and service flows that are not be measured by established natural capital accounting methods.

	Surrey Hills	• A briefing document on 'Funding Nature Recovery' based on discussion with landowners and management • A briefing document 'Recommendations for ELM schemes' containing a section on payments, based on discussion with landowners and management
F. Innovative delivery	Blackdown Hills	• Use of aerial photography analysis by specialist contractors, The Westcountry Rivers Trust, to identify UKHab grassland types
	Cornwall	• Preparation of a costed Natural Capital Prospectus for the project area setting out an investment offer for delivery of six ecosystem services with a gross value of up to £535M.
	Cranborne Chase	• A natural capital assessment covering four ecosystem services (carbon storage, air purification, pollination, and flood mitigation), using the EcoservR app, in collaboration with Liverpool John Moores University.
	Northern Uplands	• Preparation of farm business plans that identify the point of maximum sustainable output (management without input).
	Surrey Hills	• Exploration of how a target list of species could galvanise discussion with farmers and other stakeholders in the preparation of a 'Making Space for Nature Plan' for the AONB and guide the adoption of land management actions in ELM schemes.
	Tamar Valley	• Use of new soil scanning technologies to undertake enhanced analysis of soil condition.

Outputs relevant to other Defra interests

Several of the projects have undertaken work that provides valuable evidence to other aspects of ELM design and implementation. The relevant research questions and outputs from these projects are as follows.

Kent Downs AONB #1: **Enhancing public access and engagement**

This project tackled the following research questions:

1. Can schemes provide enhanced access to the countryside and greenspaces?
   a. What are the barriers to farmers and land managers to take up and how can they be overcome?
   b. To what extent could schemes pay to overcome these barriers?
2. Can schemes help address unequal levels of access to the countryside and greenspaces by different and more diverse demographic groups?
   a. Where is access to the countryside and greenspace needed most?
   b. What actions can overcome the barriers to those that are most under-represented in the countryside and greenspaces?
3. Can schemes help to divert access away from the most sensitive sites, for instance those of nature conservation interest?

The main outputs from the project were as follows:

- **26 case studies** of enhanced access opportunities to examine how proposed actions might be applied on the ground. This included five example farms with costed actions.
- **A literature and evidence review** on which communities experienced most inequality of access and why this was the case. It also made recommendations about how this inequality could be addressed, some of which could be incorporated into schemes that reward public goods.
- **A mapping exercise** using publicly available national datasets to identify areas where population densities are highest, pressure on public access is highest and where communities that access the countryside least often are located. The mapping aimed to establish if it was possible to prioritise where actions should be targeted,
- **A report on the legal and insurance liabilities** faced by farmers and land managers when providing permissive access was commissioned.

The project report includes 10 key findings.

Kent Downs #2: **Natural flood management**

This project focussed on the Darent catchment in Kent and tackled the following research questions:

1. What are the barriers that stop farmers and land managers implementing NFM?
   a. What are the knowledge-based barriers?
   b. What are the logistical and financial barriers?
2. How can NFM actions within environmental land management schemes maximise public benefits, examining a. Widespread adoption, b. Flood risk mitigation and c. Multiple benefits?
3. How can environmental land management schemes help deliver protected landscape management plans and have a positive impact on landscape character?

The main outputs from the project were as follows:

- **Severn case studies** with seven practitioners and farmers in the Darent Valley that allowed a more detailed assessment of expert opinion as well as talking to farmers about how they felt about NFM on their land
- **A database of NFM measures** was created and used to construct an information tool that allowed farmers and advisers to instantly access information about NFM measures as well as examples of its application.
- **Specialist mapping software**, HydroloGIS, was used to create a prioritisation model for NFM measures in the Darent catchment. Additional information from the information tool and from landscape character mapping were incorporated to create a mock-up version of a communication tool to help farmers make informed decisions.
- **A simple mapping exercise** attempting to create an alert system for the impact of NFM on landscape character was carried out looking at tree planting, hedge planting and the creation of large waterbodies.
- **A design proposal of NFM measures** appropriate for the environmental land management schemes

The project report includes five key findings.

Kent Downs #3: **Viticulture**

This project covered vineyards and viticulture across the Kent Downs and Surrey Hills AONBs and South Downs National Park and tackled the following research questions:

1. Can scheme actions deliver public goods within the vineyard setting?
   a. Are specific vineyard-based actions required or can generic actions be applied?

b. What incentives are needed for vineyards to take-up scheme actions?

2. Can scheme actions help to mitigate the impact of vineyards on landscape character?
3. Can scheme actions for viticulture be applied to other fruit grown in rows?

The main outputs from the project were as follows:

- **Reports of workshops** with vineyard managers and owners covered the actions they felt might provide public goods, the barriers that would make people reluctant to join schemes and how these barriers could be overcome.
- **18 case studies** were carried out with grape growers to explore the research questions in more detail and examine how actions that result in public goods might be applied at the vineyard level.
- **A research report** by viticulture consultants, Vinescapes examined best environmental practice around the world and included contributions from researchers in New Zealand and Australia.
- **Recommendations** were developed for how viticulture could deliver public goods through schemes that reward environmental land management. These were then refined into a series of recommended actions appropriate for the schemes.
- **Additional research** into the public goods that could be provided by row fruit growers was conducted by Consult80. Actions that were appropriate for row fruit were recommended and compared with those recommended for viticulture.
- **Worked examples of 'best-practice'** were created with vineyards. These studies identified where and how actions could be applied on individual holdings.

The project report includes five key findings.

Tamar Valley: **Soil scanning and public goods**

This project had three research objectives:

1. To operate three soil scanners over land where there is comprehensive baseline data to understand if the systems provide consistent and reliable data;
2. To understand the practical issues around use and implementation of the technology – i.e., soil, climate and field conditions, field size, crop growth stage and scale of precision required to adequately assess soil data across fields and farms; and
3. Identify the costs and realisms of implementing such a system across a range of farms through an outcome focussed remuneration system.

The main outputs from the project were as follows:

- **Comparative results and analysis of soil scanning from the three technologies** on thirty-five fields located on 15 farms, selected as a sample of grassland, arable and horticulture.
- **Ground truthing** of maps produced from the soil scanners
- **Reports for each of the farmers**, delivered through advisory visits and discussion of the results on farm, with commentaries from the farmers on the usefulness of the results.
- **A summary of the scanner attributes**, including any practical issues encountered with their use.

Highlights of any limitations with the approach

Covid-19 and the move to online meetings

The Covid-19 pandemic has been a major constraint on project activity for the majority programme. Most meetings with project teams, partners and participating farmers/land managers were moved online. The experience of engaging with participating farmers and land managers using online meetings has varied significantly, giving us important lessons for post-Covid interactions in which online meetings are likely to play a greater role. There is evidence of a divide between older and more technologically cautious farmers, farmers (encountered by projects working in remote areas such as the uplands) and younger more technologically adventurous farmers (encountered by projects working in capitally intensive sectors such as horticulture and arable farming).

The projects in the Northern Uplands, the Quantock Hills and East Devon AONBs concluded that online meetings are a poor substitute, particularly when it comes to generating trust and confidence in collaboration and co-design amongst farmers who do not know each other or the project team well.

Other projects, including in the Cornwall, Dorset, Cranborne Chase and Surrey Hills AONBs found that online meetings offered opportunities to give online presentations (sometimes pre-recorded to allow viewing at leisure), demonstrate GIS mapping or gather feedback using online surveys. They also found that online meetings can attract younger farmers who might not meet in person and those who do not have the time to travel to meetings. However, they also recognised that online meetings are not good at fostering deliberative discussion or generating consensus from diverse views.

Lack of information about ELM

A second limitation that has constrained the detail into which the projects can go into aspects of ELM design has been the lack of information on how the three schemes will operate. Details of the Sustainable Farming Inventive (SFI) pilot standards came too late to enable discussion of the measures and payment levels with farmers involved in the projects.

Discussions with participating farmers in projects such as Cranborne Chase and Quantock Hills AONBs reveal that lack of information is already negatively influencing farmers' perceptions of ELM. Some conclude that their future lies in maximising productivity at the expense of natural habitats and public goods. There is concern that restructuring that is already taking place, as farm business adjust to declining BPS payments, will lead to losses of natural capital and reduce their ability to take advantage of the new schemes when they are launched.

Access to data

A third limitation that has constrained some of the projects' ability to prepare accurate Land Management Plans and landscape-scale priorities has been access to spatial data. Projects have accepted that environmental data is often patchy and out of date (for instance Phase 1 habitat survey data) or does not exist (such as for field boundary types).

However there have been frustrations about a lack of access to environmental data that does exist but which, for commercial reasons, has not been available to the projects. AONBs benefit from licensing agreements through their host local authorities that cover many datasets, including the local authority historic environment record and Environment Agency data. Three specific datasets that were not available to some of the projects were:

- Soils data from the National Soils Research Institute
- Information about non-statutory nature conservation sites (Sites of Interest for Nature Conservation, also called County Wildlife Sites) held by local environmental records centres
- Species records, also held by local environmental records centres (although often originating from volunteer recorders or sectoral NGOs such as Butterfly Conservation and Plantlife).

In the case of the latter two datasets, the data was often available internally within the AONB but licensing conditions prevented it being shared with project contractors and participating farmers. For all three datasets, projects suggest that Defra should reach national agreements (potentially through the Geospatial Commission) making the data freely available.

3. Results and discussion of key findings

This chapter is split into three parts, each examining the results of the projects against a separate set of issues, as follows

Part 1: Lessons learned against Test and Trial themes and research questions

Part 2: Findings in relation to the three ELM schemes being developed

Part 3: Findings in relation to land use sectors and landscapes

Part 1: Lessons learned against Test and Trial themes and research questions

This section takes each of the Test and Trial themes and the research questions listed below in turn. The research questions are taken, or adapted from, the document 'ELM Test and Trials Monitoring and Evaluation Research Questions and Suggested Indicators for T&Ts' (ICF, February 2020). The AONB projects from which the conclusions are drawn are shown in the right-hand column by their initials.

Test and Trial themes and research questions covered in this section

T&T theme	Research questions
Land Management Plans	• What are the important components to include in a LMP? • What have been the views of farmers/land managers in relation to these LMP components or processes?
Advice and guidance	• In what way has the provision of advice and/or guidance helped ensure knowledge exchange and capacity building, and build ambition and confidence? • What does an effective structure of local advice and knowledge-exchange look like? • How does the way that advice and support is best provided vary between different types of farmer and land manager? • What role should self-assessment by farmers/land managers play in monitoring the success of LMPs?
Spatial prioritisation	• How have T&Ts defined local priorities and with whom? What has your experience been of engaging with key stakeholders, including farmers/land managers to identify ELM priorities? • What types of information, knowledge or skills have been applied to identify spatial priorities? • What information is needed to convert existing spatial objectives and policies, such as AONB Management Plans, into spatial frameworks?
Collaboration	• What types of collaborative activities are most effective for engaging land managers? • Under what circumstances has collaboration helped to facilitate learning and develop skills among participants?
Payments	• How feasible are Natural Capital based payment rates for incentivising farmers to deliver public goods compared to other payment rates? • How can payment levels be set so that they reflect the value of the public goods provided, as well as the costs experienced by scheme participants? • How could the methodology for calculating ELM payment rates be refined to better reflect the true opportunity costs (for each individual land manager)?
Innovative delivery	• To what extent have T&Ts identified and used innovative tools and mechanisms to contribute to the development of LMPs and delivery of anticipated outcomes?

Theme A. Land Management Plans

What are the important components to include in a Land Management Plan?

Essential components of LMPs: Experience of preparing plans and feedback with participating farmers has shown that LMPs should be non-technical documents, avoiding jargon and written from the perspective of the business rather than the scheme administrators. NU B CC D

At the bare minimum, two elements are considered most essential:

- a map showing current assets (with many projects using the concept of natural capital to describe these) and
- a table of opportunities linking management actions to the public goods produced.

Most projects have concluded that LMPs should include information about the farm business (see further below).

In addition, some projects examined how landscape scale objectives and other external policy objectives can be identified, demonstrating how actions listed in the plan have responded to these. Again, a map is a clear way of showing these where actions are spatial. This issue is covered further below under the Spatial Prioritisation theme. NU D QH

The importance of a business perspective in LMPs: Work with participating farmers in the three Northern Upland projects has shown that an adviser-supported assessment of the financial position of the farming businesses is an essential part of the process of preparing a LMP, particularly for the Local Nature Recovery (LNR) and Landscape Recovery (LR) schemes in ELM. Without an understanding of the financial situation facing the business, it is very likely that the farmer will not have the confidence to make the changes that are needed to deliver enhanced ELM objectives. In the Blackdown Hills it was found that starting with the farm business was a good route into the LMP process, as it allowed the farmer to contextualise the discussion about environmental options and public goods. NU BH

As a simpler alternative to undertaking a detailed analysis of the business in the LMP, the Cranborne Chase project found that focusing on the ways that the farm's agronomic and business operations could be integrated with the proposed ELM actions provides a more feasible approach. CC

> ***Case study example – Incorporating a financial analysis tool in Land Management Plans.*** The Northern Upland projects used an approach to economic performance on upland livestock farms developed by Nethergill Associates as a precurser to drawing up Land Management Plans. This approach determines profitability before and after support payments are taken into account, and in relation to fixed and variable costs. The tool seeks to identify the Maximum Sustainable Output (MSO) – a point at which no inputs are required to boost or supplement the natural grass available on the farm. It aims to be a first step in the process of protecting and enhancing natural capital on upland hill farms.
>
> The projects found that farm businesses need advice and support to move towards the MSO. It takes time to explain this concept to farmers and for farmers to think about how it affects their business. Every farm business is different and requires careful analysis and then advice on how to move forward.

Using a natural capital approach to identify environmental assets: Several of the projects used the concept of natural capital as the way to map and quantify the assets providing public goods in LMPs. Although the concept was initially unfamiliar to most of the participating farmers, it was one they were comfortable with, appreciating the way it a) emphasises the non-market values of environmental assets they look after and b) provides a consistent approach across all CC C BH FoB

the public goods covered by ELM (for instance habitats, water resources, stored carbon and public recreation).	
The importance of data to show the current extent and condition of natural capital: There is a need for accurate and fine-grained data to inform LMPs, providing the baseline for future action and indicating priorities for conservation of existing assets and opportunities to create or enhance new assets. All the projects have collated existing data from national and local sources but they have identified that much of the existing data is old or unreliable at a holding scale. Inaccurate data which leads to wrong assumptions can be worse than no data since. Much of the national data provides a coarse resolution and is out of date and local data is often patchy. Projects have listed examples of new datasets that will be needed to fill gaps and enable ELM delivery and monitoring.	All

Case study example – Using Natural Flood Management (NFM) data to guide action in Land Management Plans. The Nidderdale AONB incorporated NFM into its farm plans. The data was drawn from Yorkshire's Integrated Catchment Solutions Programme, a 5-year Natural Environment Research Council funded programme with the mandate to rapidly deploy the UK's existing environmental research and expertise to solve problems in the Yorkshire region. The main lessons learnt from this project are as follows:

- Mapping offers a vital first step in distinguishing risk areas within land holdings to target to reduce flood and diffuse pollution risk by installing interventions.
- Mapping can help reduce field-work time by distinguishing the main areas of interest on the land holdings.
- Support is required to help feed in local knowledge of the area and farming style, complete ground truthing and engage with the landowner – without the landowner being on board with the interventions, the desired outcomes will not be achieved.

The proposed interventions to help reduce fine grained sediment run off and decrease flood risk for the land holdings in this study are: leaky woody dams, hedgerows, buffer strips, tree planting and offline ponds. Soil management techniques such as reducing compaction can also offer large benefits.

What have been the views of farmers/land managers in relation to these LMP components or processes?	
Timescales for LMPs: Farmers wish LMPs to be flexible and amendable as a working document. Although the Plan might be written with a five to 10-year action plan, there need to be opportunities to review the plan within this period to take account of issues such as changing agricultural markets and weather. The LMP should also have a longer-term vision for the business (25 years+), and must contain the necessary funding commitments for land use changes that will take place over long timelines such as conversion of land to agro-forestry (wood pasture).	NUC

Theme B. Advice and Guidance

In what way has the provision of advice and/or guidance helped ensure knowledge exchange and capacity building, and build ambition and confidence?

The importance of trusted advisers: There is evidence that many farmers do not currently have a regular relationship with either environmental or agronomy advisers. Farmers participating in the projects felt that advice on these topics will be essential to help them navigate the agricultural transition and introduction of ELM.

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The projects found that word of mouth recommendations from within the farming community for advisers who are knowledgeable about the area and give practical advice are a powerful motivation. The Blackdown Hills project explored this through the appointment of 'farmer ambassadors' – see case study below.

There is evidence that AONB teams/associates are seen as trusted advisors more so than other agencies such as local authorities.

Case study example – Farmer ambassadors in the Blackdown Hills. Uptake of agri-environment schemes in parts of this AONB have been historically low ever since the Environmentally Sensitive Area scheme operated in the 1990s. Reasons put forward for this have included the relative remoteness of the Blackdown Hills landscape, the perceived restrictions of agri-environment agreements, and competitive nature of schemes. To address this, the project appointed two farmer ambassadors to undertake the initial peer-to-peer approach to farmers in the two selected target zones, to gain their agreement to take part in the project and to remain as their local point of contact. The farmer ambassadors were selected for their local knowledge and networks, and their direct involvement in farming. Both farmed in or near the target zones and could speak positively about agri-environment schemes from their own personal experience. Both were paid on equal terms with the rest of the T&T team (expert advisors and coordinator). Their participation included committing a day to accompanying an expert advisor for a farm walk to compile a Land Management Plan, taking part in follow-up discussions on public goods and payment levels, and being available for phone consultations.

The peer-to-peer advocacy approach fronted by the two farmer ambassadors proved to be a highly effective mechanism for bringing farmers into a dialogue about ELM. It was powerful enough to overcome previous reluctance on the part of some farmers to engage in a dialogue about agri-environmental support. Local knowledge and connections, a farming perspective, and the credibility of being a working farmer, all contributed to this success.

Avoiding jargon and pejorative language: Despite the best efforts of Defra, much of the language in use for the development of new schemes, including 'spatial prioritisation', 'spatial data' and 'convening' is regarded by farmers as jargon which presents a barrier between them and what the schemes are seeking to do.

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Some farmers, particularly those who have been engaged in environmental work over many years, resent the use of the term 'nature recovery' as the basis for supporting environmental work on farms since it implies that their land is currently nature poor.

AONB's trusted relationship with their farming and land managing communities. AONBs recognise that they will have an important role as 'interlocutors', helping to communicate ELM language and processes to farmers. AONBs have long standing relationships with farming and landowning interests through representation on their Partnerships and through their project activities. These relationships have been strengthened through the Defra-funded Agri-environment Advocacy project which operated in 2020-21 and through the current Farming in Protected Landscapes programme. This will put them in an excellent position to support the roll out of ELM schemes at a local level.

What does an effective structure of local advice and knowledge-exchange look like?	
Structures for providing advice, guidance and knowledge exchange: It is clear from many of the projects that farmers welcome the opportunity to collaborate on the development of guidance using a process of knowledge exchange. This is because it uses their practical management knowledge experience to influence the achievement of outcomes on the ground. This will overcome the distrust that has developed in recent agri-environment schemes (AES) which were often seen to be inflexible and overly prescriptive.	BH, ED SH NU C KD QH
Numbers of advisers that will be needed: There is concern that there may not be enough good advisors available to roll out ELM quickly and effectively, although there are people in the farming community who would develop the necessary skills if there was demand. An element of training and induction for advisors will be important to ensure consistent and high-quality advice, although farmers were wary of a formal process of accreditation which it was feared would be bureaucratic and add cost.	CC
Skills sets required from advisers: The three Northern Upland projects have found that Land Management Planning is a multi-disciplinary skill requiring a good level of technical knowledge including IT and ecology as well as an understanding of the prevailing policy framework and familiarity with farming systems and enterprise structures. This suggests that in each area a cadre of well-networked specialists, who can cross-refer their services and specialist knowledge, will be needed. The same conclusion was found in the Blackdown Hills AONB and also that the mixing of skills sets and experience/perspective which came from the farmer ambassadors working alongside specialist advisors, was fruitful.	NU
How does the way that advice and support is best provided vary between different types of farmer and land manager?	
For the high value 'unsupported' sectors, high quality advice may carry more value than incentive payments: The Kent Downs Viticulture project worked with vineyard owners and their staff to identify environmental management opportunities in wine growing. It became clear that, in this high value sector which is not accustomed to receiving public subsidy, the payments offered by agri-environment schemes are not a significant motivation for engaging with agri-environment schemes. However, the participants were much more interested in getting well-informed specialist advice on the environmental measures that could be integrated within viticulture production. Although not tested by the AONB projects, it is likely that similar motivations will apply to land managers in other unsupported sectors (for instance field and nursery horticulture, pigs and poultry) and amongst 'residential landowners' (people who have bought farm holdings but earn their income from other sources).	KD
Farming credibility is particularly important where farmers have previously rejected agri-environment schemes: Several projects found significant levels of hesitancy from some farmers in joining agri-environment schemes (AES), in some cases arising a decade or more earlier from negative experiences of scheme rules or individual project officers or advisers. As noted earlier (see case study box for farmer ambassadors in the Blackdown Hills), these 'AES hesitant' farmers are more likely to engage with someone who they see as being part of the farming community.	BH ED
What role should self-assessment by farmers/land managers play in monitoring the success of LMPs?	
The role of farmer self-assessment in scheme delivery: Feedback from most of the participating farmers shows that they like the idea of having a simple set of indicators of success that they can use to check on progress in achieving environmental outcomes. Surveys	QH NU

of participating farmers in the Quantock Hills (see case study below) and Cranborne Chase AONBs showed high levels of existing record keeping on environmental outcomes by farmers, including on soil condition farmland bird populations and water quality. ED CC

While they expect to be able to understand what is being measured and how this is relevant to the outcome (and public good), most farmers expect that they will need specialist support (for instance to do ecological monitoring) or will need local adviser-led training sessions to take it on themselves. Where monitoring of outcomes related to landscape scale (i.e. in relation to clusters of collaborating farms), this should be done centrally by a coordinator.

While farmers felt that indicators of success should focus on the outcomes achieved, not the means used to provide them (i.e., results not prescriptions), they point out that unforeseen events such as weather or disease can postpone or prevent success. Farmers emphasised that they should not be penalised where these things are beyond their control. In cases where the expected outcomes do not transpire, payments should only be withheld where recommended land management actions have not taken place.

Case study example – Farmer surveys on self-assessed indicators of success in the Quantock Hills. The Quantock Hills AONB Project ran two sequential online surveys for participating farmers, covering farmer monitoring of current schemes and potential indicators of success (IoS) for ELM schemes. The results showed there was widespread support for the role of evidence-gathering by farmers and land managers, suggesting it has the potential to play a greater part in monitoring the delivery of public goods by ELM schemes if sensitively designed. A significant minority point out that the rigidity of the current system does not allow for unpredictable or erratic adverse events. Currently, the time spent preparing evidence and records for scheme claims averages at only a few hours but varies widely (23% of respondents taking more than one day), reflecting the complexity of some agreements, but also the disparity between technical abilities among respondents. Reservations were expressed at the apparent 'disconnect' between success criteria for prescriptions and achievement of the environmental outcome aimed for, suggesting that that IoS for ELM schemes should focus on the result (not the means) and the intended public goods. In terms of how IoS results are gathered, there was support for a 'bridge' organisation to collate evidence and check assessments, as an intermediary between the RPA/Defra and farmers.

Theme C. Spatial prioritisation

How have T&Ts defined local priorities and with whom? What has your experience been of engaging with key stakeholders, including farmers/land managers to identify ELM priorities?

Spatial prioritisation is a process not an outcome: Projects have found that communicating spatial priorities to farmers needs to be seen as a deliberative process, usually involving their chosen adviser, in which strategic-level opportunities are discussed in the context of the farm's enterprises, business objectives and chosen practices. Discussions with farmers, land managers and other stakeholders about what is 'the right thing in the right place' (i.e., where ELM actions will have the most beneficial effects) should be seen as the start of a conversation that will develop over many years.

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Case study example - A Landscape Spatial Framework in the Quantock Hills. The project developed a Spatial Framework using a Natural Capital approach through collating existing datasets to map NC in the project area based on an assessment of existing land use and designations. Land management priorities were derived from ELM objectives and cross referenced with the Quantock Hills AONB Management Plan to provide local priorities. The Framework was used to produce targeting maps which offered greater context at a landscape scale, facilitated discussions around public goods and helped evidence the public goods delivered through current management practises, but did not contribute significantly to encouraging the uptake of new management. The targeting maps were often improved with the local knowledge and experience of the landowners and farmers which provided better context and detail, although the maps helped incorporate wider landscape considerations into the discussion of land management. The Landscape Spatial Framework was used to create a series of maps for each holding visited including a baseline natural capital map, a designations map and four targeting mas covering the priority public goods. Some participants felt that a land use approach alone did not accurately represent natural capital, quality of assets and management history were important additions.

The need for simple 'farmer-facing' guidance on ELM priorities: Feedback from participating farmers/land managers shows that spatial priorities must be presented simply and consistently in a way that allows them to identify what they can do on their own land. There is currently a wide gulf between the language, complexity and fragmentation of published environmental objectives and the need for a single (integrated) source of guidance ('plan-on-a-page') needed by busy farmers and their advisers.

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Case study example – Co-design with farmers of a Landscape Recovery Framework on the Lizard Peninsula. The Cornwall project worked with a group of farmers to draw up a set of landscape-scale objectives that could be applied on individual farms. The project team adapted their approach when it became clear that their initial list of ambitious nature recovery objectives, involving significant land use change from productive agriculture to semi-natural habitats, was not supported by most farmers and was unlikely to be taken up. Farmers wanted to see objectives that could be achieved within current enterprise structures and that maintained levels of farm production. As a result, objectives that focussed more on enhanced management of existing land use (e.g. nature-friendly farming) rather than taking land out of farming (e.g., nature wilding) were drawn up. The project concluded that ELM incentives for enhancing nature within productive farming system must extend beyond the SFI, so that the LNR and LR schemes can incentivise more co-ordinated and ambitious opportunities to recover nature within these productive farming systems.

Landscape-scale opportunity mapping should not contain 'white space' or 'black lines': Farmers have commented that it is not helpful to them to identify the best environmental

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options for their land where opportunity maps show 'white space' that implies there are no opportunities. It is also clear that hard boundaries on opportunity maps, implying a precision to where opportunities exist, are not helpful. A heat-mapping or blurred boundary approach on a map, establishing quantitative targets that apply across the whole area, or simply a statement in text of the conditions where opportunities may be most appropriate, are more helpful and enable farmers to match opportunities most closely to the situations on their own land.	
What types of information, knowledge or skills have been applied to identify spatial priorities?	
The importance of data to identifying spatial priorities at a landscape scale: As noted above under the Land Management Plan theme, the projects have found that access to good quality environmental data on the current extent and condition of environmental assets is essential to map and communicate key opportunities at a strategic scale. Investment by Defra in making existing datasets (such as for species and soils) accessible and in filling in significant gaps in data (for instance using remote sensing data to better map different types of field boundary and grassland) is important. There will be a need to integrate historic environment data into strategic mapping so that this public good is not overlooked. Landscape character areas (LCAs) have been used by several projects to identify areas with consistent broad environmental characteristics. Farmers have appreciated being involved in co-designing priorities at this LCA scale, welcoming the opportunity to shape objectives that apply across groups of farm holdings	All
The availability and cost of data: Portals such as MAGIC.gov.uk and datasets available through the CaBA Partnerships provide easy and free access to many of the most important datasets needed for LMPs and landscape-scale prioritisation. However, there are two notable areas where data is expensive to obtain and where Defra's involvement in making it more available will be welcomed. These are soils data (National Soils Research Institute, Cranfield) and species data and County Wildlife Sites (Local Environmental Record Centres).	All
Using local knowledge to interpret data: The projects have confirmed that local knowledge is essential to contextualise and understand the significance of data. Inputs from specialist bodies such as the Environment Agency and Local Authority archaeology teams, who understand the implications of their own data, is often invaluable and can be a time-saver. Nevertheless, projects warn that simply relying on stakeholder inputs risks 'baking-in' long held assumptions that may no longer be valid. Two of the Kent Downs Projects have highlighted the dangers of unconscious bias from decision makers and opinion formers, showing that objective data analysis and stakeholder engagement both have a role to play in ELM spatial prioritisation work.	BH C D KD
Optimal scales for spatial prioritisation: Projects have used both landscape character areas and catchments as the geographical basis for distinguishing priorities for ELM and both were supported by farmers. Where AONBs are relatively small and consistent in landscape character they are also likely to be good geographical units for spatial prioritisation. In contrast, administrative units such as Local Authorities are not suitable since they tend not to reflect changes in land use and environmental character.	All

What information is needed to convert existing spatial objectives and policies, such as AONB Management Plans, into spatial frameworks?

AONB Management Plans as spatial frameworks for ELM Delivery: AONB Management Plans are important statutory documents, identifying the components of natural beauty (often referred to as 'special qualities') which should be conserved and enhanced; and setting out policies and actions for priorities. The projects found that existing AONB Management Plans tend not to contain spatially specific guidance since they were not prepared with detailed land management guidance in mind. However, projects recognised that the development of Local Nature Recovery Strategies, supplemented by AONB's own Nature Recovery Plans (as per the AONB's Colchester Declaration) will enable future Management Plans to guide ELM delivery.

Case study example – Transferring objectives from the Blackdown Hills AONB Management Plan to ELM. An early task in this project analysed the statutory Management Plan for the AONB (2019-24) to determine how many of the 55 policies in the Plan provided spatial priorities that could be applied to ELM. The analysis showed that 22 policies had a spatial element, most falling under the headings in the Plan of Biodiversity and geodiversity; Historic environment and cultural heritage; Natural Capital and ecosystem goods and services; Farming, forestry and land management; and Access and enjoyment. The project concluded that the large majority of these 22 policies were relatively generic and did not indicate which parts of the AONB should be prioritised. For those policies that offered themselves to spatial definition using mappable data, the identification of priority locations for delivering those policies may be guided by a concentration of data points (eg high density of habitat) or an absence of data points (eg low take-up of agri-environental agreements), depending on the criteria adopted for targeting.

Other strategic documents that identify spatial priorities for ELM: The projects have identified a wide range of other local plans and policies that are relevant to ELM scheme delivery. However, most of these, like AONB Management Plans, are not ambitious or broad enough to address the goals of the 25 Year Environment Plan. This suggests that new thinking is required building on the existing objectives in published documents. Local Nature Recovery Strategies (LNRS) should address this issue but it will be important that LNRS are not limited to biodiversity planning but also address public goods such as beauty, heritage and engagement and hazard reduction.

AONBs contribution to convening of ELM at a local level: AONBs have well-established partnership relationships with their constituent Local Authorities, Arm's Length Bodies and other stakeholders, which operate through their statutory Boards or Advisory Committees and through officer contacts. These provide a good basis for developing farm and local landscape scale guidance from shared strategic objectives.

D

AONBs are strongly supportive of the need for a local convenor role and would be keen to work alongside them, contributing to the spatial prioritisation work and promoting collaboration by farmers. There could be significant advantages in embedding the convenor role in AONB teams, giving them access to the expertise of other AONB staff, contacts with relevant stakeholders and a position within the local authority structure.

Theme D. Collaboration

What types of collaborative activities are most effective for engaging land managers?

The value of existing discussion groups and networks. Many of the projects found that existing initiatives that bring farmers together on a geographical basis provide an appropriate basis for developing further joint working at a landscape scale. These may be groups established under the Countryside Stewardship Farm Facilitation Fund or as farmer cluster groups or as the farming networks that have been supported through The Prince's Countryside Fund. Although investment may be needed to extend their membership or reinvigorate their activity, these groups have established a presence and have facilitators who have developed good local contacts. In project areas where there has been relatively little group activity, such as the Dorset AONB, farmers perceived these initiatives as being worthwhile and many would be interested in taking part.	D BH ED
Lessons from Covid on online collaboration. As noted earlier in this report (under 'Highlights of Limitations'), the move to online meetings that was necessitated by the Covid pandemic, revealed the pros and cons of digital engagement. Using platforms such as Zoom and Teams can draw in people who would not travel to meetings and is an accessible way of sharing presentations, while online surveys can record views and contributions in a structured way. However, the technology itself can create a barrier, particularly to people who are unfamiliar with it and tends not to be as effective as a face-to-face meeting in developing deliberative discussion and consensus. There was evidence of an upland/lowland divide, with projects in the uplands (the three Northern Upland projects and the Quantock Hills) and also the East Devon Umborne Valley concluding that online meetings do not provide an adequate replacement for the planned face-to-face engagement.	All
Providing effective local forums that bring together farming and land managing interests with other stakeholders: Many of the projects involved a mix of participating farmers and other stakeholders in their co-design work, particularly in establishing landscape-scale opportunities and priorities. They found that the AONB Partnership structure and the established relationships that AONB staff have with key organisations and with data providers, including Local Environmental Record Centres and bodies like the Wildlife Trusts, greatly facilitated this institutional joint working. Furthermore, AONBs' links to national policy through Natural England and their core funding from Defra, ensure that AONB-led initiatives are well suited to presenting national policies (such as the 25 Year Environment Plan) to local stakeholders.	D C SH NU KD BH
Hearing about and sharing experiences from other regions or countries can build collaboration between neighbours: Projects in the Northern Uplands reported that group discussions with participating farmers benefited from learning about farming experiences in other regions. In Nidderdale, farmers were interested in visiting and hearing from upland livestock farmers in the Yorkshire Dales. In all three Northern Upland AONBs, hearing about the experiences of farmers from Ireland's Burren project drew interest in collaborative action (see case study below).	NU

Case study example – Learning about farmers' experiences in the Burren on Ireland's west coast helped build consensus in the Northern Uplands. The Northern Upland project organised a presentation by Brendan Dunford from the Burren Programme that stimulated discussion and was enthusiastically received by participating farmers from all three AONBs. Conclusions included that they Burren project had created a cultural shift towards valuing biodiversity; farmer engagement is better in smaller, more locally-focussed schemes; Better collaboration is achieved where schemes earn from one another; Farmers' relationship with the agricultural department (Ireland) Agriculture has improved; and the 'Kitchen Table' approach works the best in farmer engagement

Inclusive approaches to co-design. The project team in the three Northern Uplands AONBs considered the research on harder-to-reach farmers from Sheffield and Reading Universities through a meeting with Dr Jilly Hall. The research suggests that part-time and older farmers, or smaller and remote farms, might find it more difficult to engage and have their voices heard. Farmers want a continuous local adviser and ELM contact who they can trust and build up a longstanding relationship with. Discussions highlight how important face-to-face on farm advice and support is.	NU
Under what circumstances has collaboration helped to facilitate learning and develop skills among participants?	
The need for knowledge sharing and feedback to improve scheme delivery: AONBs' experience from previous agri-environment schemes and feedback from farmers shows that schemes are most effective at achieving their intended outcomes where there is a positive feedback-loop of learning, in which the experiences of agreement holders influence improvements in scheme design. Co-design of ELM must be an ongoing process and the necessary mechanisms and resources need to be in place to allow it to happen.	C
National learning between the AONBs taking part in this Test and Trial: Collaborative learning from this test and trial has taken place between AONBs at several scales. The project officers at the three Northern Upland AONBs have met regularly to exchange information and plan joint activities. The Kent Downs Viticulture Project has involved joint work between the Kent Downs and Surrey Hills AONBs and the South Downs NPA on this growing sector which is of environmental interest in all three areas. A series of quarterly national workshops organised by the National Association of AONBs for all 12 AONBs involved in this Test and Trial has shared key learning between the projects, covering upland, lowland pastoral, arable, coastal and peri-urban environments in most regions of England. The project managers feel that collaboration in scheme design and delivery between local scheme convenors is an effective way of spreading best practice. There is also a broader point about the collaboration needed between the Protected Landscapes, Arm's Length Bodies, Local Authorities, farming and landowning bodies, environmental charities and other stakeholders to create a collective culture for the effective promotion and delivery of ELM schemes. This should operate at local and sub-national levels but will require commitments at a national level.	All
Practical demonstration and training builds collaboration: Several projects, including the Blackdown Hills and Quantock Hills noted that the experience for farmers of coming together with their peers (particularly those from the immediate locality) in the same space to discuss environment actions can be highly productive in encouraging farmers to think beyond their usual assumptions, and be bolder than they might be as individuals, when they see that others around them are minded to take action. In the Blackdown Hills project this occurred in the context of hedge management discussions	BH D QH

Theme E. Payments

How feasible are Natural Capital based payment rates for incentivising farmers to deliver public goods compared to other payment rates? How can payment levels be set so that they reflect the value of the public goods provided, as well as the costs experienced by scheme participants?

Several projects had discussions with participating farmers about the rates of payment that they felt would be needed to encourage them to adopt ELM actions. In all cases, farmers stated that current rates offered by Countryside Stewardship would not be sufficient when Basic Payment Scheme payments had been withdrawn. This particularly applies to ELM actions requiring the conversion of farm land to less economically productive uses such as woodland or wetland.

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There was a strong consensus from participating farmers that ELM schemes should move beyond the income foregone model to recognise the value of public goods provided. Some form of natural capital-based payments will be particularly relevant in nature-friendly (or High Nature Value) farming systems that currently operate at a loss. Most farmers see merit in a mixed approach that combines payment by results for public goods and payments for costs of delivery, including income foregone. Payments may need to recognise variations between different parts of England (in both the public goods provided and the costs of delivery) and could take advantage of market testing approacjes (such as using challenge funds and auctions) to establish appropriate levels in different areas.

The projects that examined with farmers the specific levels of payment that they felt recognised the public goods provided, including Cornwall and the Forest of Bowland (see case study boxes) and East Devon, found there were significant methodological and conceptual complexities. They felt there is a need for ongoing research to establish and adopt a standardised method for valuing public goods.

Farmers participating in the East Devon AONB project were clear that a financial benefit is needed to alter patterns of behaviour and that this is more than income foregone. Payment suggestions were made to the group that either reflected the rarity of habitat and therefore the relative value to the public or comparative payments to the productivity of alternative land management practices.

Case study example – Comparison of enhanced natural capital values relative to payments needed by farmers from ELM delivery on the Lizard Peninsula. The Cornwall AONB project undertook two separate calculations for the delivery of the Landscape Recovery Framework actions that were co-designed with their participating farmers.

Firstly, they calculated the net increase in natural capital value based on five ecosystem services (see case study 'Preparing a Natural Capital Prospectus for private sector investment' on the page after next). This gave a gross value of the public benefits maintained and enhanced of up to £535M across the project area (based only on five ecosystem services). Secondly, they asked the participating farmers to calculate the payments they would need to adopt all the actions on their farms. This minimum asking price from the farmers average out at £556 per Ha. This represented an average £3:1 return on investment on the gross value of public goods provided over a 10-year period (i.e., every £1 payment to farmers resulted in £3 in public goods).

Case study example – The 'What's A Hill Worth?' study on the Pendle Hill within the Forest of Bowland AONB. The recent 'What's A Hill Worth?' study focussing on the Pendle Hill area used a series of GIS layers to show the natural capital resource, demand and availability. The data identified how three holdings could adapt to deliver more public goods, using agri-environmental support to compensate for loss of production. The study found that current levels of support would have to rise by 28% without BPS income. The report suggests that the AONB landscape afforded some opportunity for diversification to partially bridge this gap.

How could the methodology for calculating ELM payment rates be refined to better reflect the true opportunity costs (for each individual land manager)?

The transition from BPS and the approach to setting payments under ELM: There is growing anxiety amongst farmers in protected landscapes about the financial impact that declining BPS payments will have on their businesses and their ability to sustain current environmental assets, before the full-range of ELM schemes and opportunities become available. Without BPS underpinning farm profitability, current CS-based payment rates will not be sufficient to cover farm's costs of delivery and many farmers may be forced to discontinue current management activities, resulting in a loss of valuable natural capital and decline in public goods. The Cranborne Chase AONB project concluded that further income loss could drive farmers towards increased production and away from sustainable agriculture and conservation, contradicting the aims of the 25 Year Environment Plan.	CC QH ED D
The fragile economic viability of High Nature Value farms: Projects in agriculturally less favoured areas, such as the uplands, concluded that many farming businesses could improve profitability (or reduce their losses) by reducing inputs, from which environmental benefits would also derive. This is true of grassland systems where, as the reports commissioned by the Northern Upland projects from Nethergill Associates show, maximum profitability for upland livestock farms is achieved at the point of Maximum Sustainable Output (MSO) – a point at which no inputs are required to boost or supplement the natural grass available on the farm (see case study under Innovative Delivery Solutions). Even when this point is achieved, the North Pennines project found that most of their participating farmers would still require other income to survive. This could be achieved where farmers are paid for providing public goods which derive from the higher natural capital which results from farming at, or close to, the MSO. The profitability (or viability) of High Nature Value farms is more sensitive to the payment rates for different habitats than any other factor in the allocation model and needs to be considered very carefully.	NU QH
Incentivising actions that deliver spatial priorities: Projects that involved farmers in the co-design of spatial priorities concluded that including an incentive element in Local Nature Recovery Scheme payments (perhaps as a percentage uplift) where actions take place in target areas will encouraging farmers to select 'the right thing in the right place'.	C QH
Long term funding commitment for long term land use change: As noted earlier under the Land Management Plan theme, farmers have made clear that to undertake significant changes to their land use, involving actions that take many years to fulfil (such as the establishment of wood pasture or rewetting of moorland), they will need guarantees of adequate payments over this period.	NU ED C

What role might private finance play in the delivery of public goods for future ELM schemes?

Opportunities and constraints for private sector investment in public goods: The Cornwall AONB project prepared a Natural Capital Prospectus to attract and guide private sector investment in ecosystem services (see case study below). They found that investment-ready mechanisms currently available are the biodiversity offsetting and woodland and peatland carbon codes and	C

their Prospectus is the starting point in developing investment-ready projects. However, more can be done, including by government, to incentivise investment in nature recovery, such as the kind that has already been achieved for social impact investing. Opportunities for private sector investment exist where specific stakeholder companies can see clear benefits, such as the water companies investing in water quality measures, tourism businesses investing in landscape aesthetics, or insurance companies investing in reduced flood risk. Work is needed better to quantify the benefits and outcomes of nature recovery projects. They found that The Cornwall AONB Trust (a Charitable Incorporated Organisation established to support the AONB designation) could provide a vehicle through which investments can be made, matching farmer's activities to deliver the Landscape Recovery Framework.

Case study example – Preparing a Natural Capital Prospectus for private sector investment on the Lizard Peninsula. The Cornwall AONB drew up a Natural Capital Prospectus to address the possibility of private sector investment, potentially matching Defra's ELM funding, to deliver the enhancements agreed by participating farmers in the project's Landscape Recovery Framework. The Prospectus is an outward-facing document aimed at investors and the Cornwall AONB Charitable Trust as potential brokers. It seeks to describe the investment area and delivery partners, highlighting to investors the benefits and potential value of the offer. Based on valuations of five ecosystem services (water quality, water regulation, wild species diversity, carbon sequestration and carbon stock), the Prospectus gives a gross value of the public goods that would be generated from delivery of the Landscape Recovery Framework of up to £535M and a net (additional) value of up to £15.8M.

Theme F. Innovative Delivery

To what extent have T&Ts identified and used innovative tools and mechanisms to contribute to the development of LMPs and delivery of anticipated outcomes?

Three diverse examples of innovative approaches that were explored are described below as individual case study summaries.

Case study example – Using an assessment of Maximum Sustainable Output to assist farm business planning and environmental performance in the Northern Uplands. The three Northern Upland AONBs contracted a specialist farm business adviser, Nethergill Associates, to undertake an analysis of current farm performance on each of the 19 participating farms. This used data on each farm's variable and fixed costs and outputs to analyse current profitability ('Return On Total Assets' or ROTA) and to establish where the optimal level of economic and environmental performance would be, using the concepts of Maximum Sustainable Output (MSO) and Environmental Stress Index (ESI). The assessments found that current profitability was heavily dependent on public subsidy and that even after including public subsidy only four of the 19 farms achieved a ROTA of 15% or more. The assessment found that if all 19 farms were to move to the MSO levels that were established by the study, their collective outputs (the value of products sold) would fall to 72% of current levels but, because of significant savings in costs, their profit would rise by a factor of 2.27 times. The approach distinguishes between farm business costs that support environmental outcomes (Productive Variable Costs or PVCs) and those which substitute for them (Corrective Variable Costs or CVCs). An example of a PVC is the grazing of livestock on biodiverse permanent pasture compared to a CVC where livestock are fed on bought-in cereal rations. Optimal environmental performance occurs where PVCs are maximised and CVCs are minimised.

The use of the MSO approach on the 19 participating farms was found to be helpful. Although it resulted in some uncomfortable discussions around kitchen tables about the unsustainability of current systems, it demonstrated that, given sufficient payments for provision of public goods, most businesses can enhance both their profitability and environmental performance.

Case study example – Use of indicator species in the Surrey Hills as a focus for identifying environmental priorities with farmers and land managers. The Surrey Hills AONB project explored how a target list of species could galvanise discussion with farmers and other stakeholders in the preparation of a 'Making Space for Nature Plan' for the AONB and guide the adoption of land management actions in ELM schemes. The species initially considered included well-known 'flagship' species such as the nightingale, silver-studded blue butterfly, harvest mouse, great-crested newt as well as species with lower levels of general recognition such as horseshoe vetch and the barbastelle bat. Specialist inputs were used to draw up an information sheet for each species, describing the land management actions needed to support and enhance their populations (links here). Workshops were held with a selection of farmers and other stakeholders to consider this species approach and how it could be used to guide Land Management Plans.

Most of those involved liked the approach and felt that using indicator species gave a welcome focus to discussions. It was noted that some of the chosen species were extremely rare or currently absent from the AONB and would be difficult to get back in the area. Landowners did not want to disappoint themselves if they targeted returns were unachievable. In some cases targeting management on a single species could be too narrow (and not provide the range of ELM public goods) and there was discussion about broadening this to groups of species which would lead to overall habitat improvements.

Case study example – Soil testing in the Tamar Valley. This project recognised that soil health is an integral part of landscape management and ecosystem service delivery and that testing of soils using the latest technologies could provide a robust benchmark of soil health, helping to monitor a range of ELM public good outcomes including carbon sequestration, water quality and crop biodiversity. Three scanning technologies (electro-magnetic induction, electro conductivity and gamma-ray detection) operated by three separate companies were selected and fifteen farms with a variety of crops and enterprises agreed to take part, with scanning of 35 fields in total. Advisory visits to each farm assisted farmers to understand the scanning and soil sampling process and to identify which results were most useful in terms of making farm management decisions that promote soil health and natural capital delivery.

The project concluded that soil assessment is a vital part of farm management and currently assessing soil health and structure cannot be done using any of the trialled soil scanning technologies alone. For instance, assessment for soil compaction still needs human interaction and requires digging soil profile pits. Requirement for such assessment (for example, as part of LMP development, linked to payment schemes) is a useful tool to engage farmers in soil health (including carbon) issues, compaction identification and remedial management requirements.

While the new technology offer opportunities that existing manual assessment does not, when combined with the ongoing need for physical calibration, the analysis remains relatively prohibitive for most farmers. This may change if more widespread soil health management is required as part of payment schemes incentivising eco-system services (as part of 'public good'). Increased use of scanning in combination with physical calibration has the potential to become more useful and cost-effective when considering the potential to group fields' together post-scan for the purposes of LMP development.

It was noted that, based on feedback from farmers and advisors in the study, there is considerable value in ensuring a good level of support from local and trusted specialist advisors in helping the farmer interpret the results and decide on an appropriate plan of action to best utilise them (for example in the development of a LMP).

Part 2: Findings in relation to the three ELM schemes

Defra has enquired whether the projects have conclusions that are of specific relevance to the three ELM schemes, the Sustainable Farming Incentive (SFI), Local Nature Recovery (LNR) and Landscape Recovery (LR). The projects were designed before the structure of ELM was announced and information about the structure and content of the SFI was released as the projects were coming to an end. No detailed information is yet available on the other two schemes, LNR and LR. As a result, the conclusions set out below are based on discussion with project leaders rather than specific results from the projects.

We have not repeated conclusions already covered under the T&T themes, even where, on topics such as payments, advice and indicators of success, these are relevant to specific ELM schemes.

Sustainable Farming Incentive

We understand that the SFI will be delivered as a simple-entry national scheme to support sustainable agricultural practices and systems. Engagement by the AONB projects with farmers suggests that if delivery of the SFI is based entirely on national promotion and a national application process, there is a risk that its reach and impact will not achieve its full potential. Experience by AONBs suggests that many farmers will rely on locally-based advice to apply the SFI to their business and the roll out of the SFI should include provision for this, such as through the local convening of ELM schemes. This is particularly relevant to farmers who have not previously engaged in agri-environment schemes for whom contact with trusted advisers and others is essential in overcoming any hesitancy they have.

Experience from the AONB projects that have included an appraisal of the businesses' objectives as part of preparing a LMP (including the inclusion of an economic assessment in the Northern Upland AONBs), suggests that this process will help ensure that the economic advantages and constraints of adopting sustainable farming practices are fully taken into account by the business.

There is a danger that national delivery of the SFI will send a message that this scheme is about universal practices that apply equally everywhere and there is therefore no need to encourage uptake of certain SFI standards in areas where they will be of most benefit. Experience from the AONBs suggests this is not the case and that adoption of advanced standards in areas of greatest environmental need will greatly enhance the scheme's outcomes. Examples of this are the adoption of:

- the advanced arable and horticultural soils standard 2022 on soils in poorest condition (where organic matter content has declined to low levels and where leaching of nutrients to ground and surface water is high)
- the intermediate and advanced improved grassland soils standard 2022 in intensive dairy farming landscapes where regular reseeding and high intensity of management has reduced sward diversity

Furthermore, in some AONB's as in the wider countryside, specialisation in agricultural land use has reduced cropping diversity (with arable cropping lost in grassland areas and vice versa). This has had a negative effect on both biodiversity (for instance farmland birds and invertebrates) and landscape character. It remains to be seen whether the menu of SFI standards will provide an incentive to reverse this specialisation and encourage more cropping diversity. However, it is another example of where local prioritisation of standards, possibly through variation in payment rates, would enhance the outcomes from the scheme.

Local Nature Recovery

Little is currently known about what the LNR scheme will offer and how it will work. The assumption by most of the projects has been that it will fill the space of Mid and Higher Tier Countryside Stewardship (CS), with sufficient resources to ensure that it is available on all land where there is an environmental need to support the proposals put forward by farmers and land managers.

We note that CS has not had the uptake and impacts that were intended and is failing to reach its potential, although the introduction of simplified Wildlife Offers in 2020 is improving the situation. Although the projects did not explore in detail the reasons for low uptake, the consensus is that the scheme's main weaknesses have been its perceived complexity, remote and onerous application process, inflexibility in which options could and could not be included in an agreement, and low rates of payment relative to costs and income foregone. In contrast, the breadth of options and outcomes offered by the two tiers, and the way the options are described as outcomes, have not been a concern and considered helpful by most farmers and land managers.

Our projects found that some farmers are critical of what they perceive as the overly prescriptive nature of some options in previous schemes (for instance the limits placed on stocking densities without taking account of the productivity and condition of the vegetation cover). However, we found that many farmers were wary of moving to a scheme designed solely around achievement of outcomes, fearing that overreliance on unpredictable and long-term outcomes over which they do not have full control could increase the risk to them of non-compliance. There was a preference from many for schemes to describe clearly the intended outcomes and to state intermediate actions, delivery of which would be 'fall back' proof of compliance if the outcomes were delayed or derailed by circumstances outside the farmers' control.

Landscape Recovery

We look forward to hearing more in coming weeks about the LR scheme and how it will be piloted in 2022/23. AONBs have considerable experience of delivering projects that adopt a Landscape Approach and which are designed to fulfil specific environmental and heritage outcomes. Almost all AONBs have run projects funded through the Heritage Lottery Fund's Landscape Partnership Programme and several have experience of other similar funding streams such as the Interreg Programme, Defra Pathfinder or Natural England initiatives. Experience shows that running themed, spatially focussed and time-limited projects, which we assume will be how the LR scheme operates, requires a different set of processes to running an ongoing agri-environment scheme. Successful components of such projects include:

- Including sufficient time at the start to build a strong partnership of the organisations from the public, private and third sectors that will promote, support and deliver the project;
- Co-designing with partners a clear strategy and project plan with SMART milestones, KPIs and lines of reporting;
- Having a focus on how the long-term legacy of the project will be secured after funding is complete;
- Using a parallel evaluation process to learn lessons and fine tune activities through the project; and
- Maintaining regular communication on progress with key participants, audiences and stakeholders

The AONBs have liaised with Natural England over several 'shovel ready' landscape-scale projects that can be taken forward at short notice as pilots for the LR scheme.

Part 3: Findings in relation to land use sectors and landscapes

The role of 'nature-friendly' farming in Protected Landscapes

There has been debate in some projects, particularly in those testing spatial priorities and landscape-scale frameworks. about the balance between land sparing and land sharing as land use objectives. The former seeks to make nature wilding the priority on land with greatest biodiversity and least value for food production, allowing high-yielding agriculture to take priority on the most productive farmland. The latter (land sharing) promotes nature-friendly farming systems (such as low intensity mixed farming or regenerative agriculture) on all land, allowing nature to flourish throughout a farmed landscape. In practice the two need not be mutually inclusive at a landscape scale, but they are helpful in framing discussion over the strategic objectives of ELM investment at a local level – such as through a process of convening spatial priorities.

The term 'Protected Landscape' has a particular meaning and relevance to the role of farming, as defined by the IUCN categorisation of AONBs and NPs in the UK. These designations are recognised internationally as 'Category V Protected Landscapes' where "*the interaction of people and nature over time has produced an area of distinct character with significant ecological, biological, cultural and scenic value: and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other values".* This IUCN guidance acknowledges that these areas are distinguishing by *"Unique or traditional land-use patterns, as evidenced in sustainable agricultural and forestry systems and human settlements, that have evolved in balance with their landscape".* This gives emphasis to a land sharing approach in which nature-friendly farming is at the heart of land use, rather than one in which land use is divided between high intensity food production and reserves dedicated to nature. This approach underpins much of the work that AONBs do with their farming communities, although they recognise that there is a range of opinions, both amongst farmers (some wishing to prioritise more intensive production) and conservation interests (who may wish to pursue opportunities for rewilding).

The implications of these two alternative approaches for public investment through ELM schemes are significant. The experience of the AONB projects suggests the following.

A. **Supporting a land sharing approach** to multi-functional nature-friendly farming systems will require[1]:

- A continuing commitment to co-design that recognises the social context and personal needs and motivations of farmers, including (for many) their strong ties to the land, to food production and to established social relationships and sources of advice, and a natural conservatism to change;
- Integration with, and support for, the markets and supply chains for the private goods (food, fibre, energy, tourism etc) that influence and help maintain nature-friendly farming systems. This includes support for quality assurance, chain of custody and branding schemes, and income diversification such as farm tourism or environmental contracting. It should also integrate with the emerging private markets for natural capital and ecosystem services.
- A payment structure that takes account of the overall viability of the farming system, recognising that whole-enterprise (fixed) costs of nature-friendly farming systems may require public support as well as specific input (variable) costs of delivering environment outcomes. Where these farming systems are not profitable without a level of underlying public support, a payment structure based purely on income-foregone calculations will not be sufficient.

B. In contrast, **supporting a land sparing approach**, if this is considered appropriate, will require:

[1] These conclusions are supported in particular by the consultancy report commissioned by the Northern Uplands projects from Nethergill Associates

- A regulatory and cross-compliance regime that ensures high intensity agricultural production does not take place at the expense of basic standard of environmental protection and management; and
- A targeted approach to land use planning to identify the areas where a 'nature wilding' approach will be most cost-effective and deliver most benefits and can be combined with, or avoids harming, broader social and cultural objectives.
- Blended finance approaches that take advantage of private markets for natural capital and ecosystem services.

The uplands

Looking across the findings of the projects that have taken place in upland landscapes, these areas have distinctive characteristics compared to lowland landscapes that require a tailored approach to delivering environmental land management. These distinctive characteristics include:

- The high density of existing natural capital, often on designated sites, that exists on many (but not all) upland farms;
- Economic disadvantages (including the poor productive quality of the land and geographical remoteness) of these areas, producing a lack of viable market alternatives to existing land use;
- The significance of agricultural employment and farm-based tourism to the local economy;
- A reliance for the provision of many public goods on grazing by hardy breeds of beef cattle and sheep and on traditional management systems and skills associated with these livestock;
- The importance (and fragility) of collective management on the commons that cover large areas of unenclosed land; and
- The multi-generational nature of most family-based businesses and a conservatism and wariness of change.

Evidence from the projects in this Test and Trial that have taken place in the uplands points to high levels of uptake in all three ELM schemes and suggests that local convening and co-ordination, working with professional advisers and environmental NGOs, will be particularly important to getting the best results from the schemes.inter

Farming sectors which have relied relatively little on public subsidy

In contrast to the uplands, a very different situation applies to farming sectors that have traditionally received less public support, both from decoupled schemes such as the Basic Payment Scheme and from agri-environment schemes. These are the dairy, horticulture, pig and poultry sectors and also, but subject to very different pressures, the forestry sector.

The conclusions from the projects in this Test and Trial are that achieving the outcomes and goals set out in the 25 Year Environment Plan in these sectors will require much more than the incentives likely to be available from the ELM schemes. Bespoke approaches, working with the appropriate industry bodies and quality assurance schemes, and tailoring scheme incentives and actions to fit within the commercial constraints and opportunities that exist within these sectors will be needed, if uptake of ELM schemes is to approach those likely in the traditionally more supported (arable and grazing livestock) sectors.

4. Overall Conclusions

Components of Land Management Plans

Testing out formats for Land Management Plans (LMPs) has been a core activity of most of the projects. Experience of preparing plans and feedback from participating farmers has shown that, at a bare minimum, LMPs should be non-technical documents, based around:

- a map showing current assets (with many projects using the concept of natural capital to describe these) and
- a table of opportunities linking management actions to the public goods produced.

Most projects have concluded that LMPs should include information about the farm business that can help the farmer and their adviser consider the business management and financial aspects of the Plan. In addition, come projects have examined how landscape scale objectives and other external policy objectives can be identified in the Plan. A map is considered to be a clear way of showing these where they are spatial.

Farmers wish the Plan to remain flexible and amendable as a working document. Although the Plan might be written with a 5-10 year action plan, there needs to be opportunities to review the plan within this period. Farmers would also like the Plan to contain a longer-term vision (25 years+).

Structures for providing advice, guidance and knowledge exchange

It is clear from several of the projects that farmers welcome the opportunity to collaborate on the development of guidance using a process of knowledge exchange. This allows their practical management knowledge experience is used to influence how outcomes are achieved on the ground. This will overcome the distrust sometimes encountered in recent agri-environment schemes (AES) which have been seen as inflexible and overly prescriptive. The role of 'farmer ambassadors' and other facilitators who are trusted within the farming community is a good way of engaging with farmers who have previously not been involved in AES.

Existing Facilitation Fund groups and farm clusters provide an opportunity to continue their purpose of knowledge sharing and training. They should have a formal role in the roll out of Environmental Land Management, with continuing support for professional facilitation.

There is concern that there may not be enough good advisors available to roll out Environmental Land Management quickly and effectively. However, there are people in the farming community who would develop the necessary skills if there was demand. An element of training and induction for advisors will be important to ensure consistent and high-quality advice, although farmers were wary of a formal process of accreditation which it was feared would be bureaucratic and add cost.

The role of farmer self-assessment in scheme delivery

Feedback from most of the participating farmers shows that they like the idea of having a simple set of indicators of success that they can use to check on progress in achieving environmental outcomes. While they expected to be able to understand what was being measured and how this was relevant to the outcome (and public good), most farmers expected that they would need specialist support (for instance to do ecological monitoring) or would need local adviser-led training sessions to take it on themselves. Where monitoring of outcomes related to landscape scale (i.e. in relation to clusters of collaborating farms), this should be done centrally by a coordinator. Farmers were wary of the results of monitoring of outcomes (for instance species surveys) to be linked straight back to payments. Rather payments should be linked mainly to the delivery of land management actions.

Identifying spatial priorities at a landscape scale

There is strong census from the projects that access to good quality environmental data on the current extent and condition of environmental assets is essential. Investment by Defra in making existing datasets

(such as for soils, non-designated sites and species) accessible and in filling in significant gaps in data (for instance using remote sensing data to better map different types of field boundary) is important. There will be a need to integrate historic environment data into strategic mapping so that this public good is not overlooked.

Existing datasets that identify landscape-scale environmental opportunities such as the Working With Natural Processes (EA) and Habitat Networks (NE) data are helpful to guide targeting decisions. However, farmers do not like maps of their land that show 'white space' – which occurs in some of these datasets - that implies there are no environmental opportunities or priorities on these areas.

Landscape Character Areas (LCAs) have been used by several projects to identify areas with consistent broad environmental characteristics. Farmers have appreciated being involved in co-designing priorities at this LCA scale and welcome the opportunity to shape objectives that apply across groups of farm holdings. Farmers have tended to favour objectives that work with their existing farming systems and, conversely, have been reticent or opposed to objectives that require land use change.

AONB Management Plans are considered important strategic documents, identifying the aspects of natural beauty (defined by many as the AONB's 'special qualities') which should be conserved and enhanced and also setting out policies and actions for priorities. Most existing AONB Management Plans do not contain spatially specific guidance but projects recognised that the development of Local Nature Recovery Strategies (LNRS), supplemented by AONB's own Nature Recovery Plans (as per the AONB's 'Colchester Declaration') will enable future Management Plans to guide delivery of Environmental Land Management.

AONBs, like National Parks, are internationally recognised as 'cultural landscapes' that are distinguished by "Unique or traditional land-use patterns, as evidenced in sustainable agricultural and forestry systems and human settlements, that have evolved in balance with their landscape". This approach prioritises a nature-friendly farming ('land sharing') approach in contrast to one in which land use is divided between high intensity food production and areas dedicated to nature ('land sparing'). Experience of the projects suggests that using Environmental Land Management schemes to support the former multi-functional approach to agricultural land use will require a continuing commitment to co-design that recognises:

- the social context and personal needs and motivations of farmers;
- integration with the markets and supply chains for the private goods provided by farming;
- and a payment structure that takes account of the overall viability of the farming system, recognising that whole-enterprise (fixed) costs of nature-friendly farming systems may require public support as well as specific input (variable) costs of delivering environment outcomes.

The transition from the Basic Payment Scheme and the approach to setting payments in Environmental Land Management schemes

There is growing anxiety amongst farmers in protected landscapes about the financial impact that declining Basic Payment Scheme (BPS) payments will have on their businesses and their ability to sustain current environmental assets, before the full range of Environmental Land Management schemes and opportunities become available. Without BPS underpinning farm profitability, current Countryside Stewardship (CS) payment rates will not be sufficient to cover farms' costs of delivery and many farmers may be forced to discontinue current management activities. Most farmers see merit in a mix of 'payment by results' and 'income foregone' approaches to setting payments.

Projects in agriculturally less favoured areas such as the uplands concluded that many farming businesses could improve profitability (or reduce their losses) by reducing external input costs (such as concentrate feeds and artificial fertiliser), relying more on farm-based inputs (such as conserved forage, organic manures, legume-rich swards and healthy soils). Environmental Land Management schemes can help tip the balance in favour of these more profitable and sustainable systems both through the actions and payment rates available through the Sustainable Farming Incentive and Local Nature Recovery scheme, but also by convening suitable advice and guidance.