



The future of ‘High Nature Value’ farming systems and their ability to provide public goods in a Post-Brexit world in the NUCLNP.

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List of abbreviations

Acronym	Definition
NUCLNP	Northern Upland Chain Local Nature Partnership
FBI	Farm Business Income
AES	Agri-Environment Scheme
BPS	Basic Payment Scheme
FBS	Farm Business Survey
NUTS	Nomenclature of Territorial Units for Statistics
NPA	National Park Authority
AONB	Area of Outstanding Natural Beauty
NNR	National Nature Reserve
HH	Health and Harmony: the future for food, farming and the environment in a Green Brexit

List of definitions

Acronym	Definition
FBI	Farm Business Income
AES (Income from)	The element of Farm Business Income from agri-environment schemes
BPS (income from)	The element of Farm Business Income from Basic Payment Scheme
Diversification (income from)	The element of Farm Business Income from diversified activities
Agriculture (income from)	The element of Farm Business Income from agricultural enterprises

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Executive summary

The Northern Upland Chain Local Nature Partnership (NUCLNP) covers over a million hectares of land managed by farmers in the protected landscapes of the Northumberland National Park, North Pennines AONB, areas of Kielder & the Tyne Gap, Yorkshire Dales National Park, Nidderdale AONB and the Forest of Bowland AONB. It encompasses managed upland landscapes that provide habitats for iconic animal and plant species, store carbon and provide accessible land for recreation use, alongside other public goods. This project set out to identify possible opportunities for the NUCLNP with a particular emphasis on ‘High Nature Value’ farming systems and opportunities post EU exit.

Analysis of Farm Business Survey (FBS) data found average income streams for LFA Grazing Livestock were highly dependent on CAP payments, notably Basic Payment Scheme (BPS) and Agri-Environment Schemes (AES). This dependency is also evident in a recent analysis by Defra (2018)¹, which identified that Direct Payments make up 83% of Farm Business Income (FBI) for tenanted farms, more than all other land ownership groups. The Agricultural Bill is currently progressing through the House of Commons and sets out the removal of Direct Payments over a seven year period to free up funding for public goods. Scenarios were produced to understand the impact of the removal of support payments, which showed that the average LFA Grazing Livestock farm will move to a break-even position with removal of Basic Payment Scheme to negative FBI with the removal of agri-environment payments. On the basis of this analysis, farming in the uplands is unlikely to be viable in the long term without public support. Without upland farming there would be a loss of traditional skills and innate knowledge on the management of the local landscape, which is necessary for delivery of a wide range of public goods. Actions need to be taken at a farm business level, within the agricultural sector (farmers and supply chain) and by policy makers.

A number of opportunities are highlighted in this report (see *Table 1*). A key opportunity for the NUCLNP, in terms of delivering against the Partnership’s Vision², is to develop schemes to maintain and better deliver public goods with support from policy and/or industry. The role that well managed and functioning ecosystems play in delivering vital public and private benefits is of growing interest to government, industry and the general public. The NUCLNP is in a strong position to deliver on this ambition with much of the governance infrastructure, public good potential and farmer cooperation already in place. Learning from Test and Trials has the potential to not only underpin the future Environmental Land Management scheme (ELMS) but to also lay the foundations for the creation of new market systems associated with public and private sector investment in the delivery of environmental benefits. In essence, the ambition is to develop economically viable farming systems, underpinned by ecologically sustainable land management.

¹https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/740669/agri-bill-evidence-slide-pack-direct-payments.pdf

² <http://www.nuclnp.org.uk/wp-content/uploads/2018/01/HNV-Farming-and-natural-capital.pdf>

NUCLNP Opportunities

		Phase 1 (present-2021)	Phase 2 (2021-2027)	Phase 3 (2027 and beyond)
Agricultural		1. Consider opportunities to be used in the uplands to increase productivity and efficiency, including technology or novel techniques. (HH, L, W)		
		2. Explore opportunities for decreasing inputs. (HH, L, W)		
		3. Explore opportunities for working collaboratively. (HH, W)		
		4. Explore opportunities to link with supply chains and add value to products. (HH, W)		
Diversification		5. Explore opportunities for PES schemes funded by the private sector. (HH, W, CS)		
		6. Explore opportunities for diversification (HH, W, L)		
		7. Provide information on exiting farming, including succession, use of apprentices and other opportunities outside of farming. (HH, W)		
AES		8. Where appropriate provide support to farmers in the NUCLNP to draw down funding, especially for infrastructure improvements from the current funding structure. (HH, W, CS)		
		9. Develop ideas for Test and Trials (HH, W)		
		10. Implement Test and Trials (HH, W)		
		11. Look for private funding for Test and Trials (HH, W, CS)		
		12. NUCLNP Hill farming Panel to offer insights into Hill farming to inform future policies including inspection regimes. (HH)		

Table 1 Opportunities identified

Identified from:

HH	Health and Harmony
W	Workshop

L	Wider literature
CS	Case Studies

1 Introduction

This project set out to identify novel ecologically sustainable economic opportunities for farming in the northern uplands. This involved a particular emphasis on ‘High Nature Value’ (HNV) farming systems and their ability to generate environmental benefits for public and private markets after the EU exit. To fulfil this objective the project comprised a number of workstreams:

- Farm Business Survey (FBS) data analysis;
- Health and Harmony coding and analysis;
- a stakeholder workshop; and
- case studies.

1.1 The Northern Upland Chain Local Nature Partnership (NUCLNP)

The NUCLNP was established in 2012 and aims to “*plan and deliver strategic environmental action enabling the recognition of the value of biodiversity in social and economic as well as environmental terms.*” The NUCLNP includes the protected landscapes of; Northumberland National Park, North Pennines AONB, areas of Kielder & the Tyne Gap, Yorkshire Dales National Park, Nidderdale AONB and the Forest of Bowland AONB (Figure 1).

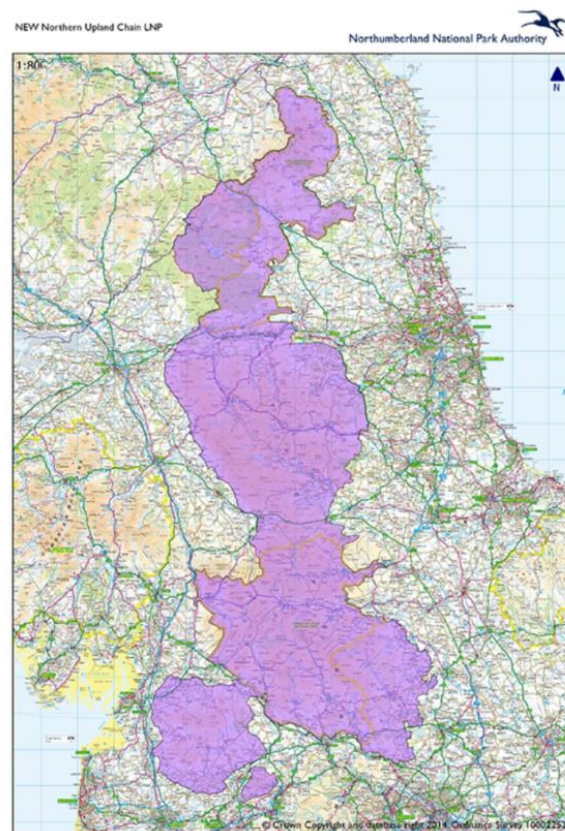


Figure 1 NUCLNP map

An integral part of the NUCLNP is the Northern Hill Farming Panel, a farmer-led initiative that is composed of farmers from across the NUCLNP and encourages discussion and political engagement on issues which affect hill farming. The bottom-up approach from the NUCLNP has been at the forefront of the creation of innovative systems to better deliver environmental outputs whilst supporting hill farmers and as a consequence has been integral in delivering the national Results-Based Agri-environment Payment Scheme (RBAPS) pilot in Wensleydale.

1.2 Health and Harmony consultation and the Agriculture Bill

The government's ambitions for farming in England were set out in a consultation document “Health and Harmony: the future for food, farming and the environment in a Green Brexit” (HH) at the end of February 2018 (closed in early May). It remains an important document as it gives detailed insight into the potential direction of future agricultural policy. Key themes highlighted in the document include:

- public money for public goods³;
- supporting rural communities; and
- ensuring fairness in the supply chain.

Three important time periods were identified (Figure 2), highlighting changes in government funding from the full payment of CAP Pillar 1 and Pillar 2 support until 2022 towards a policy with no direct payments and all support based on payment for public goods.

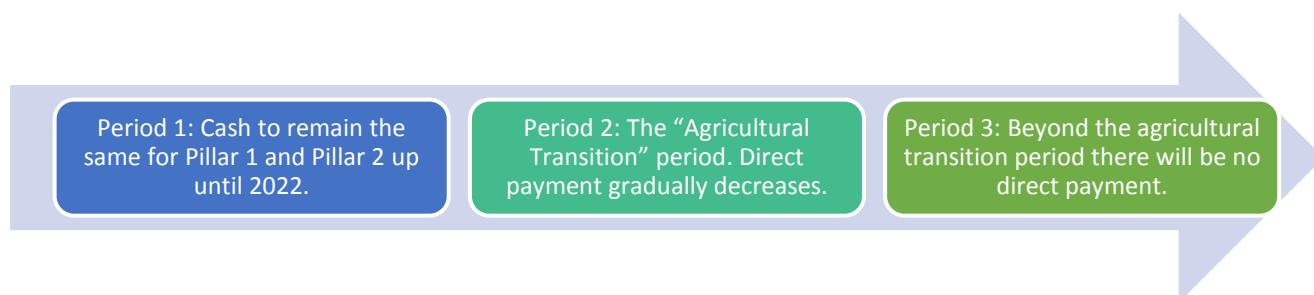


Figure 2 Three time periods identified in HH

The consultation recognised that upland farming is heavily supported by CAP direct payments (currently Basic Payment Scheme (BPS) and agri-environment schemes (AES). Further, upland farming is less able to make big gains in productivity due to the limitations of the land and reliant on volatile commodity markets. The analysis also highlights the valuable environmental benefits that upland farming provides, including those which could be termed ‘public goods’ and need to be supported by public funding to ensure their continued provision. NUCLNP and HNV farmland provide many public goods, including; carbon sequestration, amenity value, biodiversity (including a number of priority habitats and species), landscape appearance and clean water provision. These ‘goods’ represent an opportunity to develop new economic models that can underpin farming systems in a way that prevents potentially detrimental landscape scale farm system changes such as abandonment or intensification.

With reference to Figure 2, during Period 1 and 2 Defra will fund a number of Tests and Trials to help develop their future Environment Land Management Scheme (ELMS). ELMS will incentivise the delivery of environmental benefits through land and water management, such as clean air, clean and plentiful water; thriving plants and wildlife; climate change mitigation and adaptation; protection from and mitigation of hazards, as well as beauty, heritage and engagement with the environment, which improves mental and physical well-being. Different public goods were identified in HH which could be funded and the word cloud below depicts the public goods mentioned; the size of each word represents the number of times that public good was mentioned. This could provide an insight into the priorities for future Tests

³ A public good is defined as a commodity or service that is provided on a non-profit basis to all members of a society, either by the government or by a private individual or organization. In general, public goods are non-rivalrous (one individual can consume without reducing its availability to another individual) and non-excludable (it is impossible to provide without it being available for many to enjoy). Flood alleviation, water purification, air purification, carbon sequestration, public access and visual amenity are good examples. Biodiversity can also be considered a public good, though the benefit it provides is less tangible. By contrast other goods such as food and energy are generally private goods.

and Trials and also provided a basis to develop ideas in the workshop alongside a number of case studies outlined in Appendix 5.4.



Figure 3: HH public goods cloud

The Agricultural Bill was released in September 2018 and is currently progressing through the House of Commons. It provides the regulatory framework and timeline for reductions in direct payments over a seven year period (Figure 4), freeing up funding for public goods and delivery of a “Green Brexit”. It is expected that those who receive the largest Direct Payments will see greater change initially through the application of progressive reductions. There is an option to receive the future direct payments in advance as a lump sum, to enable investment, diversification or possibly fund an exit strategy.

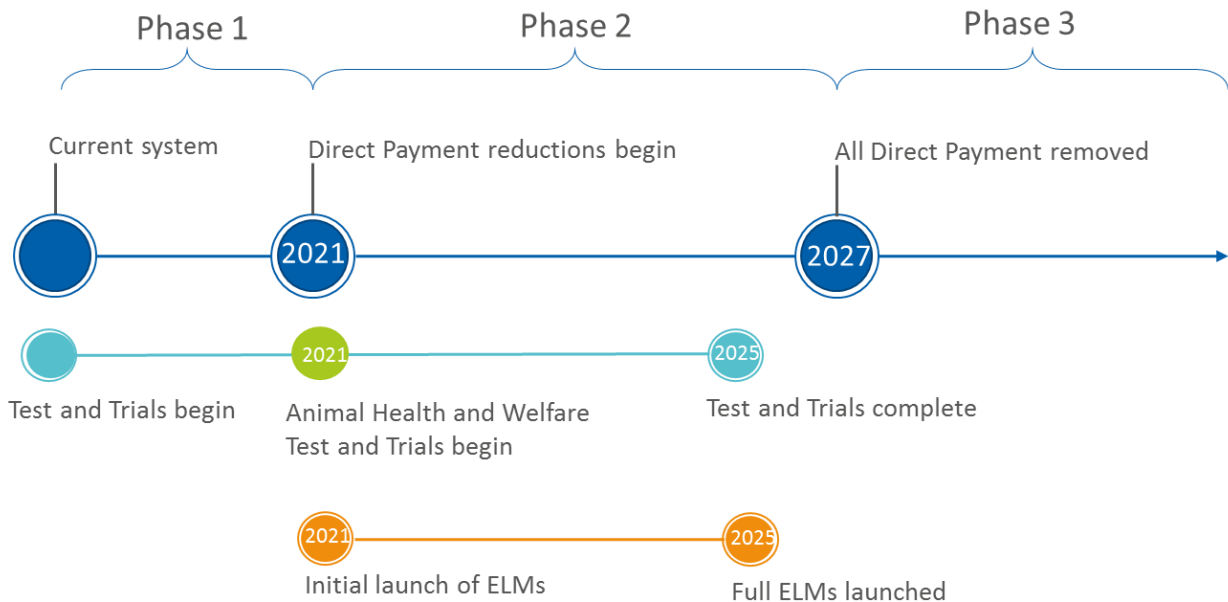


Figure 4 Agricultural Bill timeline for the removal of Direct Payment

The Agriculture Bill will need to set out new powers for the delivery of ELMS. The cost of ELMS will mostly be for payments to land managers and associated costs of the delivery of the scheme. However, at this time, no set budget has been determined for expenditure on agriculture after phase 2.

2 Method

2.1 FBS data analysis.

A focused review of relevant literature was undertaken to ensure that the methodology and outputs would be akin to other research in the region. See Appendix 5.1 for more detail.

Regional Farm Business survey data: FBS data was filtered by region at the NUTS⁴ 2 level to provide county-level data, which for the purposes of this research covered five regions, which were: Northumberland and Tyne and Wear, Tees Valley and Durham, Cumbria, Lancashire and North Yorkshire. The farm type “LFA Grazing Livestock” was selected. Data was selected for the years from 2011/12 through to 2016/17, utilising the latest dataset available. The average indicator value was taken from across the five regions for each year to calculate an annual average. Farm Business Income was then calculated, including the distribution of different income streams; the yearly averages for each income stream were then plotted against each other.

Policy scenarios: Scenario 1 was the baseline, the current scenario which takes the average of 2012-2015 to overcome the data omissions from 2015-17. Scenario 2 was the removal of income from BPS only and Scenario 3 was the removal of both BPS and AES – the ‘no subsidies scenario’ which is considered as the worst case scenario.

2.2 Health and harmony analysis

The Defra consultation “Health and Harmony: the future for food, farming and the environment in a Green Brexit” was coded to identify opportunities and public goods of interest. Themes were then identified across the Direct Payment reduction timeline. More details are available in Appendix 5.2.

2.3 Stakeholder workshop

On the 15th August 2018 ADAS facilitated a workshop under the instruction of the NUCLNP in Middleton-in-Teesdale to discuss the ‘*Opportunities for High Nature Value farming and their ability to provide public goods in a post-Brexit world*’. Board members from NUCLNP including farmers, stakeholders from designated areas (National Park Authorities (NPA) and Areas of Outstanding Natural Beauty (AONB) and other local NGOs attended to share their knowledge on the local farming landscape and opportunities after the UK’s exit from the EU. The workshop objectives included:

1. gaining views on the Farm Business Survey (FBS) data analysis of current economic position;
2. understanding the potential impacts of the proposed economic scenarios from the data analysis;
3. understanding what the NUCLNP Board think are the public goods in the NUCLNP region; and
4. gaining views and ideas on the development of a pilot scheme to pay farmers in the study area for delivery of public goods.

During the workshop stakeholders were split into 3 tables, each facilitated by an ADAS consultant. The stakeholders were allocated to tables to ensure a mix of interests and locations across the NUCLNP on each table. All notes on the discussions that took place were captured by facilitators on flip charts, then later converted into electronic notes. More details are available in Appendix 5.3.

⁴ Nomenclature of Territorial Units for Statistics

<https://www.ons.gov.uk/methodology/geography/ukgeographies/eurostat>

2.4 Case studies.

In discussion with ADAS experts, five case studies that were relevant to the NUCLNP and to the themes identified in the HH analysis were selected. A desk-based exercise was then conducted to highlight information on:

- beneficial impacts;
- opportunity costs;
- beneficiaries;
- funding; and
- governance.

More details can be found in Appendix 5.4.

3 Results

3.1 Current economic position

Using FBS data analysis Farm Business Income (FBI) was analysed for LFA Grazing Livestock farms in the following areas: Northumberland and Tyne and Wear, Tees Valley and Durham, Cumbria, Lancashire and North Yorkshire. It showed some initial variation in FBI between years, fluctuating between £35,000 and just under £20,000⁵ (Figure 5). FBI is split into four income streams; Agricultural, Diversification⁶, Agri-environment Scheme (AES) and Direct Payment. The average income streams for LFA Grazing Livestock farms highlighted a consistently large element of income from Direct Payment. The value of income from Direct Payment, AES and diversification remained relatively constant across the time period but income from agriculture, which was consistently negative, was much more variable.

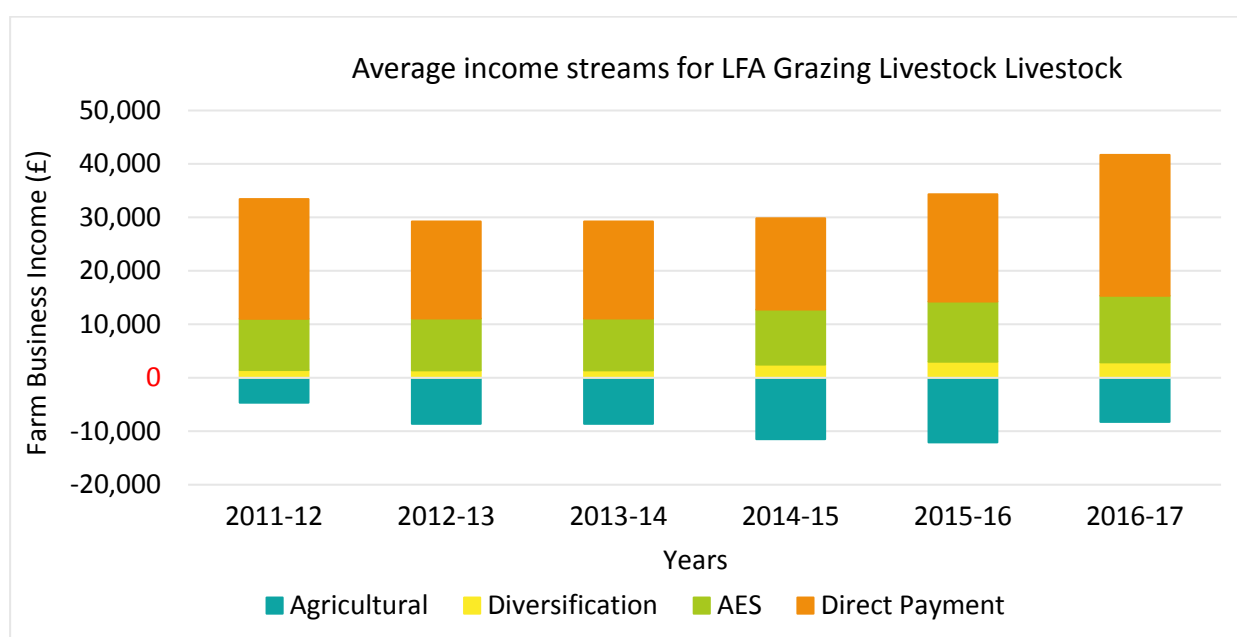


Figure 5 Average income stream for LFA Grazing Livestock

At the stakeholder workshop, participants felt that the overall Farm Business Income presented was higher than they would expect and had experienced on their farm but that proportions of the income stream were broadly consistent with their experiences. The HH paper noted that upland farming is heavily supported by direct payments and AES and is less able to make big gains in productivity due to the constraints of the land. It was also emphasised that a large amount of the NUCNLP is managed by tenant farmers and often returns from AES and even Direct Payments do not always go to the people managing the land. It was emphasised that Direct Payments make up 83% of Farm Business Income for tenanted farms, more than all other land ownership groups⁷.

Scenarios were developed to understand the impact of the removal of support payments (Figure 6). With the removal of direct payment, the average LFA Grazing Livestock farm FBI appears to break even (i.e. the

⁵ This was likely caused by increases in variable and fixed costs which were not compensated by increase in output from agricultural income plus the impact of a weak Euro against the Pound, particularly in 2014/2015, which affected the value of the Pillar 1 payments.

⁶ The definition of diversified activity adopted here excludes agricultural work on another farm and is restricted to non-agricultural work of an entrepreneurial nature on or off farm but which utilises farm resources.

⁷ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/740669/agri-bill-evidence-slide-pack-direct-payments.pdf

loss from the agricultural business is cancelled out by the income from agri-environment schemes) but it should be noted that this is without the farmer (i.e. the workforce) taking any salary – not something that would be considered ‘break-even’ in any other industry. When both direct payments and AES payments are removed, average FBI becomes negative. This makes upland farming without any support more vulnerable to market drivers and unlikely to be viable.

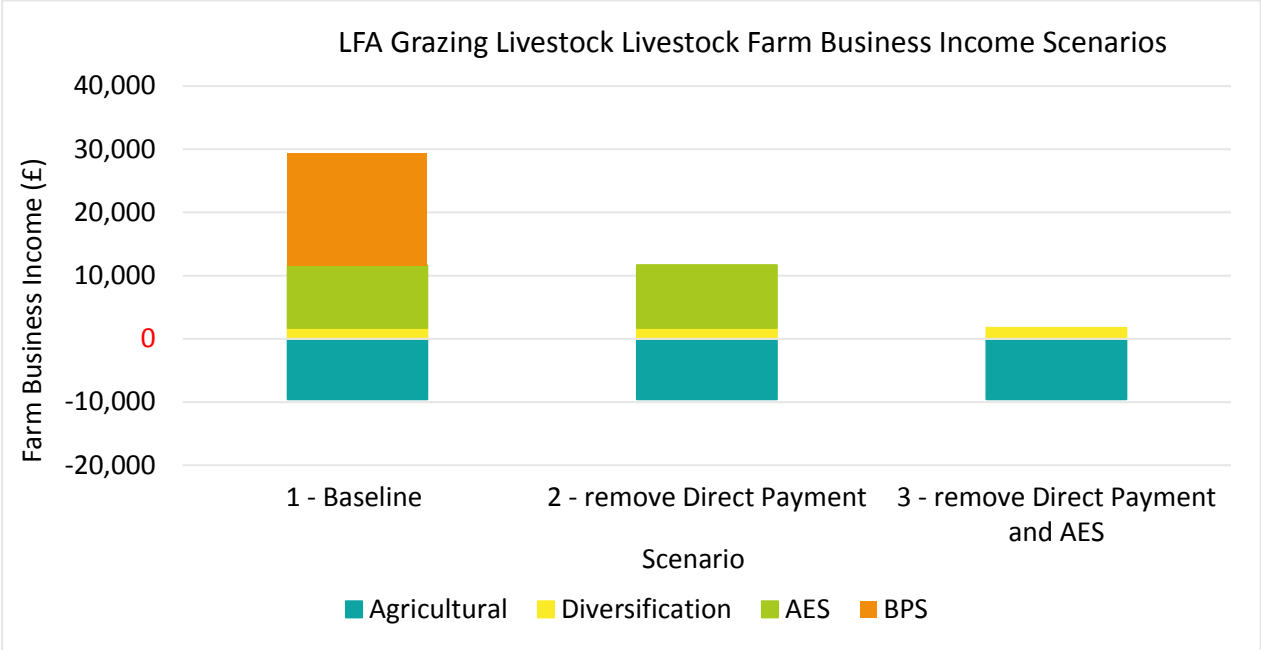


Figure 6 FBS data scenarios

This scenario analysis highlights a need for change in anticipation of future policy change, either through strengthening the economic performance of agricultural activity or through alignment with the public goods agenda. In the workshop farmers felt there was some scope to improve production efficiency (reducing variable costs, reducing fixed costs, looking at performance data, improving genetics etc.) while diversification and increasing off-farm income were also recognised as possible strategies. However, it should be recognised that this alone is unlikely to make up the loss in income from Direct Payment and farmers felt even if they took the actions they identified above, the loss of direct payment could lead to land abandonment or intensification of land and a loss of the multiple public goods that the uplands currently deliver. This has been recognised in similar landscapes in other areas of the country⁸.

“The uplands have the potential to benefit from new environmental land management schemes, given the nature of their landscapes and the many public goods that they deliver, such as biodiversity, flood risk mitigation and carbon sequestration. We will explore possible options on how we can best support such areas.”

Quote 1 Health and Harmony perspective on the uplands

Scenario analysis has been completed by other industry organisations, most extensively by AHDB. The Scottish scenario document best reflects the NUCLNP due to the percentage of LFA land and under all scenarios considered, they indicate a decrease in FBI ranging from 8-210%, dependent on public support, trade deals, labour and the regulatory environment⁹. If farm businesses become unprofitable and cease trading there will be fewer farmers with the knowledge on how to actively manage the landscape and the

⁸ Exmoor National Park (2018) Exmoor’s Ambitions: Our transformative proposal for sustaining and enhancing Exmoor’s farmed landscapes and communities after Brexit.

⁹ AHDB (2017) Exploring the implications of Brexit for agriculture and horticulture in Scotland.

farmed environment. Therefore, without action from farmers, the industry and policy makers there is a significant risk that there will be a loss of knowledge and skills required to deliver public goods through the farmed landscape.

In the NUCLNP upland farming does not follow a profit model that typifies other business sectors (Clark, 2018)¹⁰. The relationships between variable costs and production are not linear. Increasing production beyond a calculable Maximum Sustainable Stocking Rate (MSSR)¹¹, usually does not lead to an increase in profitability. Increasing inputs to correct for disadvantages such as weather or elevation does not lead to the desired increase in productivity. Rather the increase in production is not high enough to outweigh the increase in costs for inputs. Ultimately this leads to a less profitable enterprise.

In addition, Clark's research suggests that hill farmers, as a group, rarely adopt the sort of sound business practices common in other business sectors with few managing cash flows, undertaking realistic budgeting and even fewer attempting (or understanding) a break-even analysis of activities or measuring returns on total assets. Often, accounting profit is generated after the addition of agricultural support payments and/or the financial support of a spouse's income or other non-farming related income.

Clark's research recommends that it may be an economic necessity to reduce stocking rates (to the naturally sustainable level) to produce the maximum profit (i.e. the maximum positive differential between income and costs). Not only would this improve farm business viability, it would by default produces more resilient rural communities.

¹⁰ Chris Clark of Nethergill Farm gave a presentation titled 'Coping with change Managing uncertainty' at the Local Nature Partnership Annual Forum on 14th September 2018. This report is available at: <http://www.nuclnp.org.uk/lnp-annual-forum/>

¹¹ The point of maximum profitability for an upland livestock farming system is reached at the highest stocking level that can be fed solely on natural grass produced from within the holding

NUCLNP Opportunities

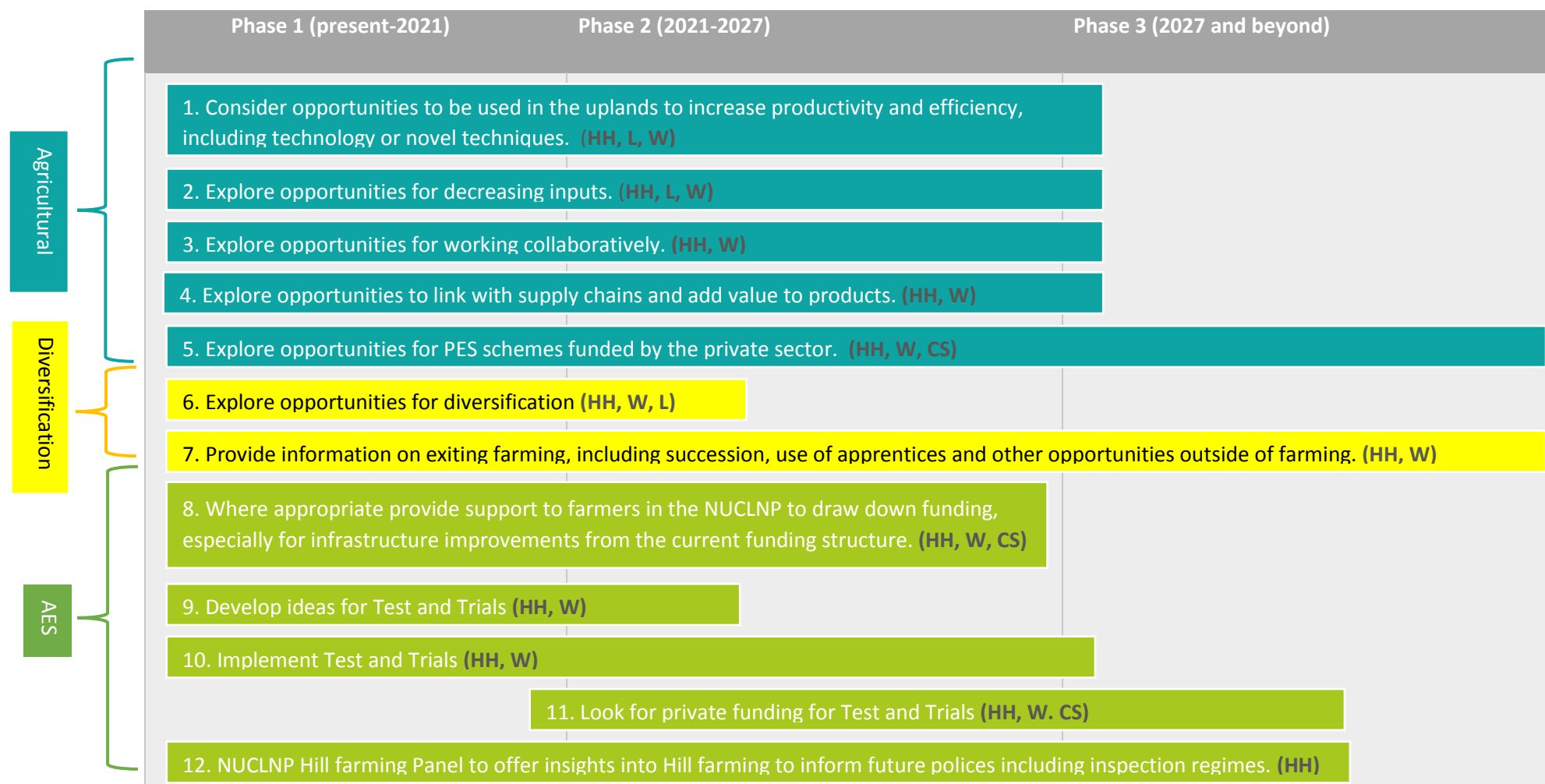


Table 2 Opportunities identified

Identified from:

HH	Health and Harmony
W	Workshop

L	Wider literature
CS	Case Studies

3.2 Opportunities for 'High Nature Value' post EU Exit

Scenarios were shared at the stakeholder workshop and risks and opportunities identified by stakeholders. Concurrently, the Health and Harmony document was analysed and opportunities identified. A summarised table of the opportunities is shown in **Error! Reference source not found.** These opportunities have been split into the same income streams as the FBI data:

- Agricultural
- Diversification
- AES
- BPS is expected to be removed by 2027.

3.2.1 Opportunities for the Agricultural income stream

1. Consider opportunities to be used in the uplands to increase productivity and efficiency, including technology or novel techniques. (HH, L, W)

2. Explore opportunities for decreasing inputs. (HH, L, W)

3. Explore opportunities for working collaboratively. (HH, W)

4. Explore opportunities to link with supply chains and add value to products. (HH, W)

5. Explore opportunities for PES schemes funded by the private sector. (HH, W, CS)

Opportunities 1-5 reflect the necessity for farmers in the NUCLNP to critically look at their businesses. This has been reviewed across sectors in several publications including Defra's recent publication "Moving away from Direct Payments"¹² and by toolkits such as AHDB's Fit for the future (FFTF) tool¹³. Although information is available for this opportunity and it should be a priority for farmers to look critically at their own farm businesses, the NUCLNP may have an opportunity to share and facilitate the uptake of information.

For most farmers in the NUCLNP it is very unlikely that improving productivity will be achieved by increasing production. Rather it will be likely to focus on what Clark identifies as the 'Maximum Sustainable Stocking Rate' for their holding and aiming to optimise efficiency and profitability. Clark's work should be considered in this process, including insights on decreasing inputs, increasing skills with IT and including all the partners within the farm business, especially those primarily associated with administration, in this knowledge exchange.

An alternative example which could fit into opportunity 1 and 2 includes a case study ADAS was recently commissioned by AHDB¹⁴ to understand if maximising forage and grassland utilisation by out wintering in-lamb ewes on swedes could improve enterprise margins. Utilising forage swedes to out winter in-lamb ewes has been practiced in New Zealand for several years. This practice reduces variable costs whilst maintaining high stocking rates to fully utilise both forage swedes and grass, these being two of the cheapest available feeds. ADAS produced full enterprise costings to compare the financial performance

¹²https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/740669/agri-bill-evidence-slide-pack-direct-payments.pdf

¹³ <https://www.ahdb.org.uk/brexit-fit-for-the-future>

¹⁴ <http://beefandlamb.ahdb.org.uk/wp-content/uploads/2014/02/73205-In-lambs-Ewes-on-Swedes-Final-Report-180515.pdf>

of the two sheep systems. The comparison found that crops such as swedes provide a cost effective alternative to housing sheep, with total costs/ewe reducing by a third and costs/ha down by half in the study. Despite fewer lambs being reared on the out wintered system, profit before rent and finance was improved by £302/ha over the conventional system. This example will not be suitable or be possible for many of the farms in the NUCLNP, but is indicative of a novel practice or technology which may be help to decrease input costs.

Opportunity 3 concentrates on collaborative working and fits across all of the focus categories. Collaboration could help to reduce fixed and variable costs by sharing machinery, labour and joining buying groups for inputs such as feed and veterinary products. It can also provide a focus for improving business performance by participating in farm benchmarking groups looking at performance and financial aspects of the business, and as a way of working in Test and Trials and the future Environmental Land Management Scheme (ELMS). Adding value to primary products (opportunity 4) was also raised by stakeholders. This included ideas around exploiting linkages between agricultural products and the upland landscape from which they were generated and exploring industry opportunities such as the Pasture for Life certification.

Opportunity 5 focuses on exploring PES schemes funded partially or completely by the private sector in the NUCLNP. Selling ecosystems services as part of the agricultural income was deemed as important by stakeholders at the workshop. However, it was also highlighted that this may call for a cultural change for some of the farmers in the NUCLNP. The process for this comprises three stages as outlined in Figure 7. The starting point is carrying out an Ecosystem service (ES) audit to determine what is currently delivered and what could be delivered from the area. Secondly, it is necessary to conduct analysis of the ES supply chains which includes the identification of existing schemes but crucially identifying the gaps between what already has a route to market and those which require additional institutions (collaborative systems of exchange) or evidence to make them function. Finally, it is necessary to engage with the identified businesses. The majority of current schemes focus on improving water quality and/ or flood alleviation, which fits well with the public goods delivered in the NUCLNP and identified during the workshop. There is a role for NUCLNP in identifying relevant and applicable schemes and providing clarity on which farmers are eligible, whilst also developing bespoke opportunities for area. Schemes in the area include; SCaMP 2 run by United Utilities with the aim to improve water quality and Forest Research's 'Slowing the Flow' at Pickering, which aims to improve flood alleviation.

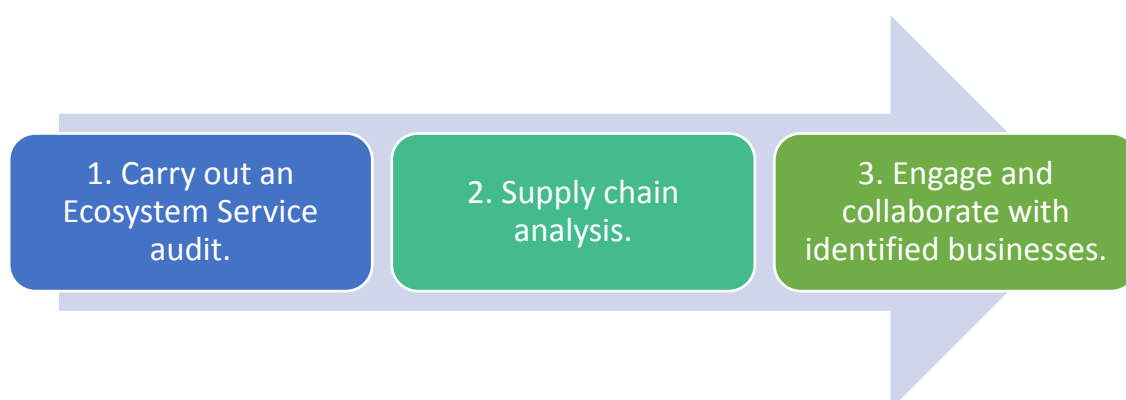


Figure 7 Opportunity 5 Identifying PES schemes

A project based in Wales, The Pumlumon project: case study three, is currently completing a Supply Chain Analysis of the project in order to gain an understanding of the flow of environmental benefits, or ecosystem services (ES), generated by the area from the perspective of stakeholders who benefit from the service. The project found that often these ES are undervalued for a number of reasons. For example,

whilst farmers are typically funded to deliver an individual service (e.g. cleaner water through tree planting), the management of that service often delivers additional services providing multiple benefits (e.g. air quality, biodiversity, soil improvements, etc.). A supply chain approach can help identify what these bundles of ES are and the associated beneficiaries. It can also be more practical and accurate in reflecting the value of the buyer's perspective and experience. Research shows that typical ES valuation can be limited in its impact as it doesn't effectively relate to why the ES is valued. The NUCLNP could build on the learnings from this project and conduct similar research understanding their local ES supply chains.

3.2.2 Opportunities for the diversification income stream

6. Explore opportunities for diversification (HH, W, L)

7. Provide information on exiting farming, including succession, use of apprentices and other opportunities outside of farming. (HH, W)

In 2017 the NFU reported that 62% of UK farmers have already undertaken some diversification to provide economic support to the rural economy¹⁵. The FBS analysis recognised that currently about 4% of the FBI in the regions analysed was made up of diversification practices. More recent studies have shown that higher amounts of diversification activity will lead to an increase in the likelihood of a business being economically viable¹⁶. Increasing and improving diversification activities in the NUCLNP was identified at the farmer workshop as an opportunity. However, variation in the success of diversification ventures on farm can be variable and before investing several aspects need to be considered (location, resources, current business economics etc.). There are three main diversification options¹⁷:

- Structural diversification- farm resources are redeployed or restructured into new non-agricultural products or services. (such as Bed and Breakfasts)
- Agricultural diversification- a new activity still situated within agricultural production. Involves the introduction of new or non-traditional crops. (such as bioenergy crops)
- Income diversification- includes all possibilities where non-specific household assets are used for non-agricultural activities unconnected to the farm. (such as a job in the local community)

Success is often associated with farms that have taken into account both the external environment alongside internal resources¹⁸. Importantly farm diversification should be bespoke with individual farms having individual resources and needs which need to be identified and fully understood before the appropriate diversification can be selected¹⁹. For some farms in the NUCLNP diversification may already be in place and additional diversification may not be appropriate.

During the workshop farmers felt that all options needed to be explored, including the possibility of leaving farming, opportunity 7. Alternatives to farming are needed for farmers who are either unable or unwilling to change their farm business to fit a Post-EU Exit industry. This should be a managed process

¹⁵ National Farmers Union, 2017. *How agriculture is changing: The importance of diversification*.

¹⁶ Barnes, A. et al., 2015. The influence of diversification on long-term viability of the agricultural sector. *Land Use Policy*, Volume 49, pp. 404-412.

¹⁷ Meert, H. et al., 2005. Farm household survival strategies and diversification on marginal farms. *Journal of Rural Studies*, 21(1), pp. 81-97.

¹⁸ Walley, K., Custance, P. & Smith, F., 2015. Farm diversification: A resource based approach. *Journal of Farm Management*, 14(4), pp. 275-290.

¹⁹ Mc Fadden, T. & Gorman, M., 2016. Exploring the concept of farm household innovation capacity in relation to farm diversification in policy context. *Journal of Rural Studies*, Volume 46, pp. 60-70.

and industry and government could play a role in supporting succession planning or a managed exit from farming.

3.2.3 Opportunities for the Agri-environment Scheme income stream

8. Where appropriate provide support to farmers in the NUCLNP to draw down funding, especially for infrastructure improvements from the current funding structure. (HH, W, CS)

9. Develop ideas for Test and Trials (HH, W)

10. Implement Test and Trials (HH, W)

11. Look for private funding for Test and Trials (HH, W, CS)

12. NUCLNP Hill farming Panel to offer insights into Hill farming to inform future policies including inspection regimes. (HH)

Opportunity 8 was highlighted in the workshop with a need to ensure infrastructure is up to date and in good condition in the possibility of short-term decreasing profits, leading to a future risk of underinvestment in farm infrastructure. NUCLNP could play a role in sharing current funding opportunities or seeking funding partnerships with the private sector where some shared objectives may be achievable. For example, sharing relevant payment for ecosystem services (PES) schemes in the area such as those piloted by Moors for the Future²⁰.

The role that well managed and functioning ecosystems play in delivering vital public and private benefits is of growing interest to government, industry and the general public. The majority of opportunities for the NUCLNP align with this interest, with a significant number of excerpts from HH and discussions in the stakeholder workshop focussing on opportunities for possible Test and Trials and the development of the future ELMS. It is clear that the NUCLNP is in a strong position to deliver on this ambition with much of the governance infrastructure, public good potential and farmer cooperation in place.

Workshop attendees showed a keen interest in participating in the implementation of future land management schemes, focussed on the delivery of public goods or ecosystem services. Attendees ranked different ecosystem services which were most important in the NUCLNP area. The top three ecosystem services were taken forward to discuss in smaller groups. The groups were encouraged to identify those goods delivered in the NUCLNP, identify their quantity, quality and location of the service and create the outline of a potential scheme based on delivery of that service. Case studies were shared at the workshop, and stakeholders built a framework for new Test and Trials. Three Test and Trials were developed considering different public goods. These frameworks, alongside the HH analysis and case studies were used to develop two Test and Trials which are well placed for the NUCLNP and would add value to the development of Defra's post EU Exit ELMS and Animal Health and Welfare Strategy.

Importantly opportunity 11 builds upon opportunity 5 (exploring relevant PES schemes and opportunities) 9 and 10 (developing and implementing Test and Trials). Few PES schemes in the UK have gone beyond pilot stage, despite public sector investment. Analysis of UK PES pilot schemes by Defra has found that this is not due to the projects being unfeasible or participants unwilling, rather that challenges have occurred surrounding metrics, governance and contractual frameworks and the time to build rapport across stakeholders and engage with potential buyers. The NUCLNP, through developing Test and Trials and identifying and engaging with relevant businesses, should overcome these barriers.

²⁰ <http://www.moorsforthefuture.org.uk/>

Ecosystem service	Farmer ranking
Aesthetic Landscape	1
Wildlife/ biodiversity.	2
Recreation – health and wellbeing	3
Water quality	4
Education	5
Animal health and welfare	6
Soil quality – erosion control	7
Inspiration/ Sense of Place	8
Flood alleviation	9
Climate regulation	10
Heritage/ sense of place	11
Pollination	12
Air quality	13
Pest control	14

Table 3 Public goods in the NUCLNP

3.3 Test and Trial 1: Management of upland landscape through grazing animals.

Aim: The uplands will be maintained and enhanced in order to deliver high priority habitats which support important species, historic environment and landscape features. The management of these habitats delivers: clean air and water, enhanced biodiversity and wildlife, public access to the countryside, protection of the rural environment, flood-risk mitigation and carbon reduction. This will incorporate the full range of public goods outlined in Health and Harmony.

Public goods delivered: Management of livestock and grazing leads to delivery of a wide range of public goods which are identified as benefits in the NUCLNP Vision and are also referenced as public goods in H&H. These include: biodiversity (high priority habitats and species, habitat network opportunities), carbon storage, clean water supply, high quality food production, natural flood management, historic environment, soil management, landscape character, geodiversity and access & recreation.

The public goods are present throughout the NUCLNP and not just linked to nationally-designated wildlife sites, and are delivered by upland livestock farmers who are responsible for:

- management and timing of nutrients, for sward structure management and control of injurious weeds and non-native species;
- maintenance of walls and hedges;
- selection of livestock species and where appropriate breeds (heritage breeds or genetic characteristics of livestock may be needed for certain habitats); and
- management of livestock (and appropriate control of pests and predators).

It is possible to identify public goods that can be delivered in all areas of the NUCLNP. Further refinement is needed to value these public goods as part of the Test and Trial.

Test and Trial process: The Test and Trial will use trusted advisors to form whole farm plans to identify the features that are managed with livestock or dependant on livestock for their continuation, which deliver public goods. Together with the farmer, the advisor will identify the priorities and the appropriate course of action, such as to maintain and enhance. Measurable targets will be set which will be linked to the payments on delivery, agreed with the farmer. A short contract (1-2 pages) will be issued with the farm plan, which will be simple to understand. An initial step in the Test and Trial will be to agree on a framework for how outcomes will be measured and the financial value associated with those outcomes. The value for the targets should be based on the public goods delivered (quantity and quality) and based on the value to society.

Fundamental to the Test and Trial will be collaborative events and meetings that will consider the other opportunities in the NUCLNP, for example decreasing inputs. This will provide added value to both the scheme and farmers. Topics could include:

- Increasing on farm efficiency.
- Sharing local initiatives.
- Succession.

Attending these events will form part of the scoring for payment by results.

Test and Trial payments: It is expected the Test and Trial will be funded by Defra (in line with their policy priorities) with the ambition of investigating the potential for private funders at a later date. Some potential investors were already identified in the workshop including; Defra, environmental charities (e.g. National Trust, water companies, landfill tax, development mitigation). The Test and Trial will provide payments to those who manage the livestock and land to deliver the priorities.

Collaborative events

Throughout the Test and Trial there will be collaborative events and meetings which will consider the **farm business and industry opportunities**.

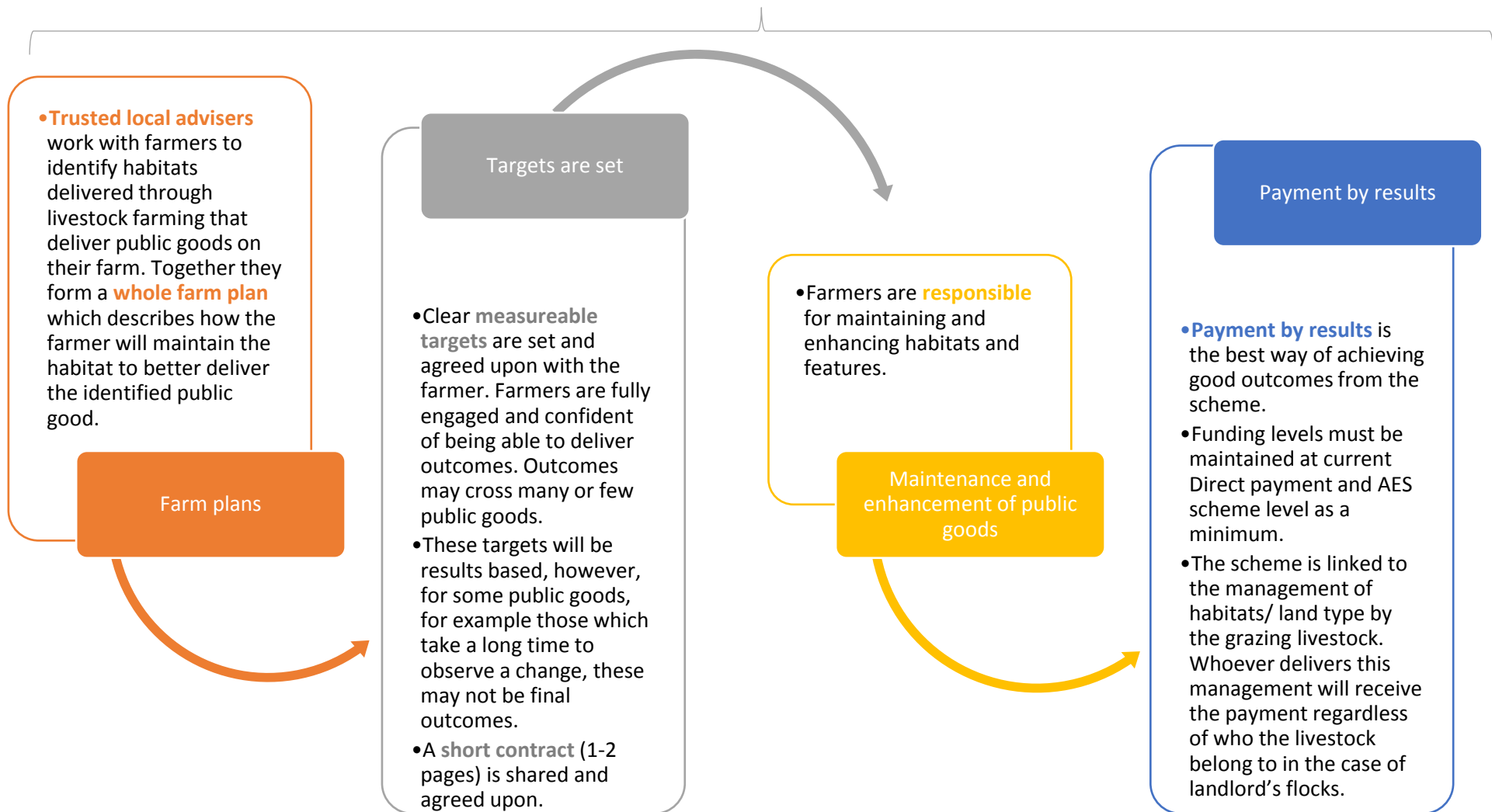


Figure 8 Scheme process

3.4 Test and Trial: 2: Animal Welfare.

There is another clear Test and Trial which the NUCLNP are well placed to deliver in the longer term.

“As part of our move to higher regulatory standards, we will develop publicly-funded schemes for farmers to deliver animal welfare enhancements beyond the regulatory baseline that are valued by the public but not sufficiently provided by the market. We will focus on enhancements that deliver the great impact and benefit.”

Quote 2 Health and Harmony on animal welfare

This is less well developed, but fits well into Defra’s priorities and timeline of defining higher animal welfare standards by 2020, introducing animal health and welfare Test and Trials in 2021, with animal health and welfare measures up and running by 2025. NUCLNP should be involved in defining high animal health and welfare with Defra, potentially using farms in the area as case study farms. Poor animal and plant health reduces productivity, however a quarter of livestock farms still do not have an animal health plan.²¹ The workshop highlighted a farmer perception there can be trade-offs between farming for environmental outcomes and animal health and welfare and this risk should be addressed to avoid such situations arising. However, there are many recognised synergies for example farming more extensively can lead to a decrease in the passing of sheep to sheep pest and diseases and more of an opportunity for extended grazing periods.

²¹ Defra, Government Statistical Service (2018) Moving away from Direct Payments

4 Conclusion

Farming in the uplands is unlikely to be viable in its current format in the long term without some form of public support. Land abandonment or unmanaged change in upland farming could lead to a loss of traditional skills and innate knowledge of the local landscape which underpins delivery a broad range of public goods when managed sustainably. Actions need to be taken at all levels - within farm businesses, within the agricultural sector and supply chain as a whole, and by policy makers. A number of opportunities to address change have been highlighted in this report, most notably the opportunity for the NUCLNP to transition to focus on delivery of public goods and developing Test and Trials. It is essential that public investment is targeted towards these HNV landscapes to ensure continued and enhanced delivery of public goods.

The most advanced Test and Trial was developed in coordination with farmers from the NUCLNP and focuses on delivering habitats and other upland landscape features through management of livestock grazing. Key principles of the Trial include using local trusted advisors, farmers being fully engaged with formulating farm plans and monitoring changes, and payment by results. The NUCLNP currently has many of the elements to deliver this test and trial in place, including; engaged farmers, a governance structure, and successful collaboration across the landscape.

The initial part of this Trial will be to set out a framework for identifying and quantifying public goods and valuation of these in line with society's needs. The NUCLNP is an area which benefits from local, knowledgeable advisers, previous projects and initiatives and has attracted significant academic research projects. The Tees-Swale project will bring together conservationists, farmers and landowners to engage in a new collaboration through which they undertake a large-scale programme of habitat improvement. This wealth of information should be the basis on which the parameters for management of the features within the upland landscape is derived. In addition, the value of the public goods needs to be robustly calculated using appropriate methods to ensure that the Test and Trial is robust when scrutinised by Defra. A second Test and Trial focussing on animal health and welfare should be developed over a longer timeline.

The role that well managed and functioning ecosystems play in delivering vital public and private benefits is of growing interest to government, industry and the general public. Learning from Test and Trials has the potential to not only underpin the future ELMS but to also lay the foundations for the creation of new market systems associated with public and private sector investment in the delivery of environmental benefits. In essence, an economically viable farming system underpinned by ecologically sustainable land management.