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**Economic and environmental impacts of changes in support
measures for the English Uplands: An in-depth forward look
from the farmer's perspective**

Final Report

to

Defra

by

Countryside and Community Research Institute

and

Food and Environment Research Agency

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Contents

Executive Summary	4
1. Introduction	13
Research requirement	14
2. Methodology	15
Research approach	15
The farmer survey	15
THE RESEARCH FINDINGS	21
3. The importance of public support payments	21
The economic context	21
Economic analysis of the farm interview data	22
4. The current situation on farms and recent change	28
Farm business adjustments.....	28
Adjustment combinations and the influence of policy, economic and social factors	36
Recent changes in livestock grazing.....	42
5. Future change on the farm and policy awareness	44
Future change on the farm	45
Policy awareness	49
6. The future of farming in the uplands: The farmers' perspective	50
Economics of upland farming	50
Farming Community and farm practice.....	52
7. Reacting to potential changes in public support payments: Farmers and their farms	56
Engagement with the scenarios.....	57
Farming profitability and farm practice.....	58
Farmer views on the broader impacts of a reduction in direct payments.....	68
8. Reacting to potential changes in public support payments: The environmental impacts	69
The environmental case studies	70
Farmland habitats.....	72
Likely environmental impacts of management changes in response to the experimental policy scenarios.....	74
The broader environmental impacts of changes in farm practice	78
9. Conclusions and implications for Defra	83
Overall conclusions	83
Implications for Defra.....	89
Annex 1. The farmer survey: farm and farmer characteristics	92
Annex 2. The experimental scenarios	93
Annex 3. Economic analysis of the sample for the influence of policy on profitability and other related factors	95

This report, prepared for Defra, presents the findings from a short research project and conveys the views of the authors and, critically, the individual farmers interviewed. It does not necessarily represent the views of Defra. This research, based on in-depth analysis with a sample of upland farmers, should not be taken as an indication of policy intent but seeks to inform a wider understanding of issues affecting agriculture and the environment in the uplands.

The researchers and Defra are indebted to the farmers (and farming families) who gave time and valuable insights for this project. The researchers would also like to thank the Defra Steering Group, Rebecca Brione, Emma Clare, Lindsey Clothier and Tony Pike, for their support and assistance through all stages of the research.

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Executive Summary

This research contributes to Defra's understanding of how upland farming in England is likely to be affected by potential changes in income resulting from policy changes. The study specifically provides insights from farmers to view issues from a farm business and farm practice perspective. It also builds upon Defra's 2009 Uplands farm Practice Survey (Uplands FPS) and adds depth to the understanding of attitudes and likely responses to policy changes.

Commercial farming in the uplands has been under sustained economic pressure for many years, characterised by consistently low levels of profitability and a high dependency on agricultural and environmental payments. The extent to which public support payments contribute to hill farm incomes raises questions as to how upland farmers would react to either the significant reform or abolition of pillar 1 payments in a renegotiated Common Agricultural Policy (CAP). The aim of this research was to determine the extent to which changes in public funding would lead farmers to radically change their approach to farming or exit farming altogether and to consider the implications of such change for the achievement of environmental objectives for the uplands. Understanding the key aspects of variation of how farmers might react to such changes will be important in developing strategies to support sustainable farming systems in the uplands.

The research project is based mainly on primary data acquired through 83 face-to-face farmer interviews and 16 environmental case studies but it also draws contextual and benchmarking data from existing sources (Farm Business Survey data, Uplands FPS and Rural Development Impacts Study (RuDI)). At least 10 farmer interviews and 2 environmental case studies were undertaken in each of the 8 core upland areas identified by the Uplands FPS. The interview schedule was designed to tease out greater detail about farmer decision-making and the causal linkages between policy changes and farm system and farm practice changes. The farm interviews were recorded and afterwards a written summary of each interview was prepared using the recording and the completed interview schedule. The case-study interviews considered in more detail various aspects of farm management that could have environmental impacts.

To investigate how farmers might react to a reduction in direct payment income they were presented with three experimental scenarios, a main scenario and two variations:

Main scenario:

- 20-40% reduction in SP by 2013.
- Change from HFA to Uplands ELS.
- Regulations - tightened but no major changes.
- Prices: Sheep -5%, beef -20% by 2013, inflation low.
- Implication: Reduction in direct payment income, payments based more on environmental outcomes.

Variation A:

- Basic income support but stronger regulation.
- Increased money for agri-environment schemes (AES) in real terms.
- Move from ELS to HLS and focus on landscape scale schemes, high value areas and features.
- Implication: Harder to access environmental payments and more management requirements for same level of payments.

Variation B:

- Pillar 1 (SPS) phased out between 2015 and 2020.
- Focus on AES objectives. Same funding level as the main scenario.
- Implication: Large fall in direct support and reliance on market prices.

Research findings

The Uplands FPS found that under the current policy framework a significant number of farmers (21%) said that they did not expect their business to continue beyond the next five years. This is compounded by over a quarter of farms (27%) having no recorded successor. Findings from the interview survey (undertaken almost a year later) suggest that this figure could be considerably higher and, irrespective of any changes to support payment, there are already significant changes to the structure of upland agriculture in the pipeline. The long-term trend toward fewer but larger farms is likely to continue with the rate of change also likely to increase. There is potential for large areas of the uplands to change hands within the next 20 years, which could have major repercussions for how the land is managed. Findings from the interview survey also suggest that the proportion of hobby and lifestyle farmers in the uplands could already be considerably higher than the Uplands FPS estimate.

The economic analysis of the farms taking part in this study confirmed the challenging conditions that most of the businesses are already operating under. Few of the farmers interviewed made a consistent profit from farming and many said they were unlikely to do so in the near future. The farm interviews also confirmed the important contribution made by public support payments, particularly the SPS, to farm incomes in all regions and across all enterprise types. Overall, few farms are achieving profit levels that exceed the total amount of public support payments.

When we asked farmers what they thought the future held for the uplands their overall response was one of resigned pessimism and they focused on the themes of economic decline, and the impact that it was having on, the farm community and farm practice. For some, they felt that a 'tipping point' had already been reached in respect of changes to farming communities and the farming systems that they supported. For others, threats to the farming community and farm systems were apparent but they felt there were opportunities for adaptation to build a more sustainable future. Crucial to the perception of this vision was the retention of public support measures and a

sustained increase in livestock prices. However, for a smaller, third group of interviewees, the continuing loss of farms and farm families from the uplands was seen as presenting opportunities for those remaining farm businesses to expand and develop.

There was a large degree of consensus among farmers that over time, the farmed landscape could be comprised of a relatively small number of large-scale, extensively run farms that would most likely focus on low input/output sheep systems. This was seen as a means of those businesses remaining viable, particularly in the SDA, where there were limited opportunities to develop other activities. From our discussions with farmers about the farm practice changes that might take place across the uplands we conclude that the environmental consequences of an extensive sheep only management system could be a reduction in diversity of enclosed land at the landscape scale, accompanied by a reduction in biological diversity and a loss of landscape features. However an improvement in resource protection could be likely with reduced livestock numbers, particularly of cattle. The more productive areas may develop more uniform swards with lower overall biodiversity value and habitats such as hay meadows, which are a product of carefully targeted management, might be lost. On less productive enclosed land species unpalatable to sheep are likely to increase which would tend to drive further extensification and enlargement of holdings. In the medium term there could be an overall benefit to biodiversity, however as these less productive species became dominant overall biodiversity could be reduced.

There was general agreement among the farmers that most of the better quality land in the uplands would continue to be farmed, but that some of the more marginal and inaccessible land might not be actively managed and therefore become effectively 'abandoned' but this would not be widespread. The environmental implications of this would depend on the spatial arrangement and type of land, with the potential for a greater variety of habitats to develop. Furthermore, because such land would remain only a part of much larger holdings on which sheep production remained the main focus, there would be no direct incentive for farmers to dispose of it and thus for it to be used for other purposes such as forestry or leisure. Nevertheless, where topography and settlement patterns favour it, this landscape of large-scale extensive farms would be interspersed with numerous smaller holdings occupied by three other kinds of occupant: ex-commercial farmers who remain primarily due to cultural ties and are reluctant to give up farming altogether; multiple income-source farmers with off-farm employment and limited time to devote to farm management; and hobby and lifestyle farmers not reliant on their farms for income, for whom land management is primarily a leisure activity.

Most farmers were aware of the CAP reforms and were concerned that a reduction in public support payments might take place. However, very few reported that they were actively changing their businesses in preparation for such a reduction. The adoption of a 'wait and see' stance with regard to future policy changes was a recurring theme. When the discussion turned to the experimental scenarios it was the commercial farmers, particularly those with

a high financial dependency on public support payments, who were most engaged. However, among the commercial farmers there were also examples where the farmer did not engage fully in the discussion. Here there was a general disinclination to believe that public support could be reduced without livestock prices increasing, thereby maintaining incomes and lessening the need to make adjustments. Combining this evidence with the farmers' responses to the question about their concerns of potential changes in policy, would suggest that a substantial proportion of upland farmers are largely unconcerned about, or in some cases unaware of, the potential changes to public support payments that may take place.

Response to the main scenario

In response to the main scenario the adjustments proposed by farmers tended to be incremental and based upon the types of adjustment they had undertaken in the past. Cost cutting, making moderate changes to livestock enterprises and joining/increasing involvement with agri-environment schemes were the most common types of adjustment contemplated. When asked how these changes would affect the viability of the farm business a common response from farmers was that the economic situation would remain challenging unless there were sustained price increases for their livestock outputs.

There was little evidence that systematic intensification or super extensification would be likely to take place among the cross-section of farms under this scenario. Some farmers mentioned expanding the size of the farm through land acquisition, but the general response was to discount expansion as a potential form of adjustment due to a lack of available land. It should be noted, however, that this is a response which is somewhat time-dependent, in that the current trends already suggest significantly more land becoming available in the next 5-10 years. It was also noticeable from the interviews that few of the farmers were contemplating taking their farm businesses in a different direction to the path that they were already on.

These findings would therefore suggest that under the main scenario there would continue to be a decline in the number of commercial farm businesses in the uplands, as a result of gradual and opportunistic enlargement among those who wish to stay in the business, balanced by a significant number of retirees making land available to them. Continued simplification of management systems on higher land could be anticipated, whilst trends in the management of lower land would be more variable, with some intensification and some extensification, depending upon the main business focus of the land manager. The current decline in cattle numbers on upland holdings can be anticipated to continue, notwithstanding the relative encouragement for their retention under AES agreements, for as long as beef production remains more costly, more time-consuming and/or less profitable than all-sheep systems in which a wide variety of management strategies and breeding approaches can produce a range of business options. A reduction in cattle numbers has the potential to reduce the diversity of swards on productive inbye land and could lead to the expansion of species unpalatable to sheep. In the short term overall diversity is likely to increase but dominance of such

species will result in a decline in biodiversity. Overall, reduced livestock numbers, particularly cattle, is likely to have a positive, if limited impact on diffuse pollution. The disappearance of dairy farms from most upland areas could also be envisaged, under this scenario, within the next decade, with associated loss of cultural diversity and value, and reduced opportunities for added-value upland farming strategies.

What the trends also show is that business decisions are influenced by policy options, but that AES funding is insufficient on its own to influence the basic trends in farming systems, which have been more influenced by the combination of market and pillar 1 support conditions. These will tend to disincentivise cattle farming and to favour cross-bred sheep flocks. Where cattle are currently retained mainly to fulfil AES conditions, it must be questioned whether this will continue under the main scenario.

Response to variation A

The first variation to the main scenario, a more closely targeted AES, prompted a varied response from the farmers. A common response was to say that they would do exactly the same as they would do for the main scenario. However, this scenario attracted increased interest from farmers in all areas and across all enterprise types, including dairying. A common concern among those farmers who were interested in the modified AES was that they thought their farms would not have sufficient environmental capital and therefore be excluded from participation. Nevertheless there was another group of farmers who were interested in the modified AES but thought that it would be difficult to reconcile the way they would have to farm with a reduced Single Payment, with the requirements of AES – that is, they saw participation in a more demanding environmental scheme as potentially requiring sustained, if not increased, SPS support to make it possible. Concerns were frequently expressed about the viability of the core enterprises that would 'underpin' many AES agreements. Finally, there was a group of farmers that showed little interest in participating in AES. This group was characterised by farmers who said they valued their independence and elderly farmers who were concerned about making any long-term commitment.

These findings would suggest that in the uplands, at least, a majority of farmers have an open attitude towards the notion of taking on more, and more demanding, AES options. This probably reflects the fact that such a high proportion of these farms are already in schemes and thus the notion of 'doing a bit more in return for a bit more' is not unpopular. However, it is also apparent that in addition to an offer of more targeted AES funding, there needs to be sufficient financial stability underpinning the farm business – either from improved market conditions or from sustained or even increased pillar 1 funding – to give farmers the confidence to commit to new schemes. It is clear that AES goals and measures cannot be viewed in isolation from the wider economic conditions facing these farms.

Where significant environmental capital exists, participation in AES is likely to remain high under this scenario and existing high value habitats such as moorland and hay meadows should be retained and their condition potentially

improved. However, a more targeted and demanding AES is likely to exclude those currently participating in lower tier schemes. There is therefore a risk that low input grasslands and maintenance of rough grazing and stone walls will be removed from AES. Although the economic situation and enterprise changes mean that significant intensification of these areas is unlikely, aspects of management such as a return to supplementary feeding and less maintenance of stone walls could have a negative environmental impact.

Response to variation B

The types of adjustment being contemplated in response to Variation B were often very different to those being contemplated in response to the main scenario. In the latter, farmers were contemplating adjustments that were often incremental and extensions of previous patterns of adjustment. In response to the phasing-out of direct support the same farmers were now contemplating a more radical set of adjustments to their farm businesses. The key driving force behind these changes was their dependence on public support payments for income. Without the Single Payment, many of the livestock enterprises were simply unviable. Faced with such a situation it is not surprising that many farmers would contemplate far greater changes to their businesses than under the main scenario.

When asked how these changes would affect the viability of the farm business there was a very mixed response. For some the adjustments would reduce their reliance on income from the core agricultural enterprises, as the focus of their business shifted to non-agricultural activities. For some, particularly those whose income was heavily dependent on producing livestock as commodities, the long-term future of their business became uncertain. Finally, for some, the loss of the Single Payment was seen as an opportunity to expand and thereby improve the long-term viability of their businesses.

Under this scenario some of the farmers said they would radically change their approach to farming and there was clearly significant potential for super-extensification of upland management to take place. The interviews found that 40% of farmers said they would contemplate leaving agriculture under this scenario, thereby releasing considerable areas of land to those who remain. There was also evidence that some farmers would introduce much lower input/output grazing systems in response to the loss of direct payments and/or a need to take off-farm work to compensate.

The environmental implications of very extensive sheep only enterprises with low labour inputs are significant and negative for both biodiversity and landscape, although there would also be modest and positive reductions in diffuse pollution. Habitat diversity of the inbye land is likely to be reduced and many hay meadows could be lost with losses to biodiversity and a change in landscape. Losses of stone walls and traditional farm buildings are likely to have an impact on the landscape. Sward diversity of the more productive enclosed land could also be reduced. Over time, unpalatable species would be likely to increase on enclosed land. Some increase in these species should have biodiversity benefits for higher trophic groups, but overall biodiversity losses would occur if these species become dominant over large

areas, as is implied by these trends. The impact on moorland is less clear. These habitats might be retained in AES if the requirements can be reconciled with the wider farm management, but this might entail stock remaining on moorland with little husbandry, with potential negative welfare and biodiversity impacts. It is likely that there would be some withdrawal of management and shooting interests may become more dominant.

The cumulative impact of such a scenario would appear to be considerable, in that the management effort devoted to upland farming over large areas of land could be anticipated to decline dramatically. It is likely that fewer people would manage the land, farming systems would be simplified and some of the least accessible and least productive areas could become un-managed. At the other end of the scale, more accessible areas might be populated with larger numbers of hobby and lifestyle farms, but with such small holdings as to have only localised impacts upon environmental management, landscape quality and biodiversity. These changes are predicted irrespective of what might happen to agri-environment schemes and funding.

Implications for Defra

The trend to larger farms and fewer farm families in the uplands is a longstanding process. However, the rate of change appears to be accelerating. In the past, farmers' cultural attachment to the land and the "way of life" was a very important factor keeping them farming in times of economic stress. The weight of evidence from this study, supported also by indications from the larger Uplands FPS sample, is that this "way of life" attachment for many young people is now not enough for them to contemplate farming in the uplands. Under the current policy framework at least a quarter of upland farms, probably more, are unlikely to continue as independent units into the next generation.

If pillar 1 was phased out altogether, the findings of this study suggest that as many as 40% of commercial farmers from across the uplands of England could make plans to leave farming. This is likely to initiate a major period of agricultural restructuring in the uplands. The potential nature and extent of this occupancy change raises a number of issues for Defra, as follows:

- The loss of farm businesses is likely to be widespread across all regions and all farm types. Tenant farmers will have particular problems leaving agriculture because they have often not been able to save sufficient funds for their retirement, implying significant social challenges for this particular sub-sector.
- From a social and economic perspective, the withdrawal of large numbers of farmers, and their families, from agriculture over a relatively short period of time could have a significant negative effect upon local service providers and the local economy related to farming. Whilst relatively small in respect of its total contribution to rural economic output, the cultural and geographic impact of farming-related activity can be significant and thus could be expected to negatively affect other

sectors such as tourism and leisure, including sporting and amenity provision.

- Occupancy change, where control over land passes from one person to another, is known to be a major trigger of changes in farm practice, in whatever direction. This is likely to increase the vulnerability of existing habitats that are sensitive to management change, although it may also offer new opportunities for enhancement of areas which are currently highly degraded due to decades of inappropriate management.
- The type of occupancy change is also an critical influence on management practice and there is an expectation among the farmers we interviewed that, in view of the uncertainties of future market conditions, there will be a growth in informal and insecure tenancies which might encourage inappropriate short-term management strategies which may not be based upon long-term sustainability and could erode past AES environmental benefits. While agri-environment schemes have been very successful in managing inputs and grazing regimes on a wide range of habitats, increased levels of occupancy change could introduce greater uncertainty in securing long-term management through this mechanism. It is by no means certain that new occupiers will retain inherited AES as an integral part of their business planning. On the other hand, from a purely pragmatic perspective, scheme negotiators should eventually have far fewer individual businesses to deal with as they seek to secure appropriate management over the majority of the land area.

When attention is turned to the farmers who plan to remain in farming despite the changes discussed in these scenarios, another set of issues is raised.

- While most farmers were aware of potential CAP reform, very few were actively changing their businesses in preparation for the reforms. Farmers appear more accustomed to reacting to change than preparing for it. Heavy dependence on public support payments, particularly the Single Payment, make many farms economically vulnerable to any future reduction. This implies that some businesses will fail to survive despite the best intentions of the farmers themselves.
- In response to the scenarios discussed, the types of adjustment contemplated by those seeking to remain in farming (cost cutting, extensification and simplification of livestock enterprises, non-agricultural sources of income) tend to reduce the time available for farm operations. Farmers were concerned about the implications of this for animal welfare and the maintenance of the farmed landscape. A shortage of skilled labour, both on and off the farm, might become a major factor limiting the delivery of environmental benefits on upland farms and biological and landscape diversity will be lost.
- Intensification is likely to be restricted to inbye land. However, it is also likely to be very uneven both within and between farms. Accessibility, as well as productive potential, is an important factor. On some farms extensification and intensification of inbye fields may take place side by

side. Although the risk of diffuse pollution may increase under intensification, the overall environmental impact will be limited.

- Many farm businesses will remain under economic stress, despite the adjustments being made, which could undermine the effectiveness of AES. The key issue here is that without pillar 1 support or profitable livestock enterprises, AES based on the income-forgone principle may be beyond the financial capability of some farms.
- On some farms, farm practice is becoming increasingly dependent on AES and disconnected from the farm's commercial farming activities. This is particularly the case with the management of moorland habitats. In these instances, it seems likely that active management of such land would not continue if the AES schemes ended.
- It is unlikely that market forces will encourage farmers to continue with mixed livestock farming. On commercial farms, overall, there will be a continuation of the trend from cattle to sheep, which will have generally negative implications for biodiversity with swards either losing diversity or becoming dominated by a limited range of unpalatable species. However, on those farms where AES now exert a significant influence upon the economics of moorland management and thus cattle have been retained mainly for that reason, this research suggests that radical cuts in pillar 1 support would be sufficient to undermine this influence.
- The trend towards more extensive livestock systems will have a generally positive impact on resource protection and pollution control. However, localised intensification in certain places on inbye land could have detrimental impacts which could negate wider positive trends. It could also be speculated that systems employing less skilled labour could lead to a higher incidence of accidental point-source pollution from a variety of routine farm management tasks, as well as from lower levels of farm animal welfare. In turn, increasingly strong environmental regulation could act in combination with reduced time and resources for management, to push farms towards even more simplified systems.

In conclusion, it does appear as though farming in the English uplands does face challenges and opportunities in respect of changes to systems and practices which have been established over the past half-century. Whilst these have undoubtedly led to significant damage in past decades as a result of over-intensive management of sensitive habitats and features, their anticipated decline over the next decade appears likely to present as many environmental challenges as it offers opportunities (to reverse past negative trends). The key drivers to these trends appear to be the combination of market prices, changes to pillar 1 support levels and future trends in environmental regulation and disease control. If major reductions in support are made, this study suggests that there will be significant losses of both labour and skills for upland land management within the farm sector. The result of these losses seems likely to be a less economically productive, less culturally differentiated landscape with relatively low biodiversity, compared to its potential if more active and appropriate management could be achieved.

1. Introduction

The Countryside and Community Research Institute (CCRI) and the Food and Environment Research Agency (Fera) were commissioned by The Department for Environment, Food and Rural Affairs (Defra) in October 2009 to undertake an assessment of potential economic and environmental impacts of changes in support measures for the English uplands.

This research is intended to improve Defra's understanding of how upland farming in England is likely to be affected by potential changes in income resulting from policy changes. The study specifically sought insights from farmers with an objective to view issues from a farm business and farm practice perspective.

In 2009 hill farmers in England received over £200m in central government funding, known as public support payments, through the Single Payment Scheme (SPS), agri-environment payments, and the Hill Farm Allowance (HFA). These public support payments constitute a significant proportion of upland farm income. Incomes for these farmers are traditionally low and have declined in recent years. While incomes have increased in 2008-2009 as a result of heightened market prices, they remain relatively low compared to lowland farms.

The shape of Government support for upland farmers will change over the next five years e.g. in June 2010, the Uplands Entry Level Scheme (Uplands ELS) replaced the HFA. There will also be changes to the SPS, the main source of public support to hill farmers. The SPS is likely to change in two ways. Firstly, it will be subject to increased modulation and fiscal discipline under the current Rural Development Programme. This process is expected to impact in different ways on different types of upland farmer, with some seeing their SPS receipts fall, while for others it might rise. However, the depreciation of Sterling against the Euro between 2007 and 2009 has provided a cushioning effect. The second and more radical change to the SPS is likely to be introduced post-2014 as a result of the Common Agricultural Policy (CAP) reform process. The extent to which SPS payments contribute to hill farm incomes raises questions as to how upland farmers would react to either the significant reform or abolition of pillar 1 payments in a renegotiated CAP.

The key domestic policy driver for uplands support is the delivery of environmental benefits. Upland farming is an important provider of biodiversity, landscape and cultural heritage and contributes to a range of ecosystem services such as climate regulation through carbon storage, clean water supplies, flood regulation and recreational opportunities (see Reed et al., 2009)¹. This project establishes how upland farmers would be likely to react to changing levels of upland support and what the implications are for the continued delivery of environmental benefits and the general condition of farming in the English uplands.

¹ M. S. Reed et al. (2009) The future of the uplands, *Land Use Policy* 26, 204-216.

Research requirement

Aims

In light of the policy background outlined above, Defra wanted to gain a greater understanding of how hill farmers are likely to respond to changes in economic support from government. In particular, to what extent would a rise or fall in public support payments lead farmers to radically change their approach to farming (e.g. through intensification or super-extensification), or exit farming altogether? And how are these approaches likely to vary according to region, type of farming, age, and type of tenure?

The main research question addressed is:

'What will be the likely effect of possible changes in support scenarios on farming practices (with emphasis on the environmental impacts such as grazing intensity) and farming profitability in the English uplands?'

Understanding the key aspects of variation of how farmers might react to such changes – whether differentiated by region, by farm type or land tenure, by other aspects of the farm situation or by farmer or farm family context - will be important in developing strategies to support sustainable farming systems in the uplands.

Objectives

The key objective for the research was to build on Defra's recent Uplands Farm Practices Survey (Uplands FPS) (Defra, 2009)² and add depth to the understanding of attitudes and likely responses to policy changes. The Uplands FPS, undertaken 'in-house' by Defra in the spring of 2009, was a quantitative postal survey with responses from over 1,000 farmers in the uplands and other Less Favoured Areas (LFAs) across England. The survey explored attitudes, farming practices and intentions for the future.

It was always envisaged that a more in-depth follow-up study would be required and about a third of respondents indicated that they would be willing to take part in further research. The Uplands FPS results provide valuable information particularly about changes in grazing practices and highlight some key issues about the future.

Structure of the report

The remainder of this report is divided into seven chapters. Chapter 2 provides details of the research methodology. Chapter 3 considers the importance of public support payments to the viability of upland farming under the current policy framework. Chapter 4 focuses on current farm business management and recent changes recorded during the farm survey. In Chapter 5 attention is turned to the farmers' plans for their holdings and their concerns about potential policy changes. The farmers' views on the future management

² Defra Agricultural Change and Environment Observatory (2009) The Farm Practices Survey 2009: The Uplands and other Less Favoured Areas (LFAs) Survey Report, DACEO Research Report No. 16.

of the uplands are reported and discussed in Chapter 6. Chapters 7 and 8 focus on the likely responses farmers would make to changes in public support payments and the potential impacts on farm profitability and the environment. The Final chapter presents the conclusions of the research and draws out some of the implications for Defra.

2. Methodology

Research approach

The Upland FPS indicated a recognition by farmers that changes in support mechanisms will be important. This further in-depth research helps fully assess the links between farmer awareness of impending changes in support and the likely implications for the farm business and related environmental impacts. This research builds on this level of understanding and uses detailed, high quality interviews with a cross-section of upland farmers.

The research project is based mainly on primary data acquired through face-to-face farmer interviews but it also draws contextual and benchmarking data from existing sources (Farm Business Survey data, Uplands FPS and Rural Development Impacts Study (RuDI)).

The farmer survey

Context: Farming in the uplands

Farming in the uplands is traditionally centred on the farm family and is associated with the limited use of hired labour, especially in comparison to lowland farms. Many upland farms have a continuity of occupancy with farming families stretching back two or more generations being a common feature. However, upland farming also faces a number of socio-economic pressures, which threaten the future of many farm businesses including low returns from core agricultural enterprises, dependence on public support payments, limited opportunities for diversification that will make a significant contribution to household income, an aging farm population and lack of successors wishing to continue the family business.

The typical upland farm comprises two main categories of land, which are differentiated by their productivity and topography with land use intensity decreasing with altitude. The lowest and most productive land is occupied by improved pasture and the meadowland, which provides a summer crop of silage or hay for winter-feed as well as grazing at other times of the year. More occasionally there may be arable land where root crops and cereals are grown. This land, commonly known as inbye, is the most intensively managed part of the farm often involving grassland reseeding and significant inputs of farmyard manure (FYM) and artificial fertilizers. The second category of land, in contrast to the inbye, is much less productive. This land is largely unimproved and composed of semi-natural grassland or moorland vegetation. Depending on local history this land may have been enclosed to create large fields, known in different regions as allotments, newtakes and intakes, or

remain unenclosed and used for common grazing of sheep and/or cattle. In some areas the allotments will experience more intensive management than the open moorland.

The choice of enterprises is constrained by the harsh physical conditions and is based around livestock production. Purebred hill sheep enterprises traditionally occupy the areas of high fell and moorland associated with the harshest conditions. A low lambing percentage and the need to retain a high proportion of female lambs to replenish the breeding flock means that the productivity of hill sheep flocks, in terms of reared lambs for sale, compares unfavourably with lowland flocks. In addition, hill lambs tend to be lighter and have poorer conformation than lowland breeds resulting in a reduced market value. Suckler beef, producing weaned calves for fattening in the lowlands, has traditionally been the companion enterprise to purebred hill sheep across much of the uplands.

Further down the hill, where physical conditions begin to improve, farmers have engaged in crossbreeding hill ewes with a downland ram to produce a larger lamb with improved conformation compared to purebred hill lambs. These crossbred lambs are either sold for breeding or for fattening. The last 20 years or so has seen the introduction of new breeds into the uplands heralding an increasingly complex pattern of production, particularly among sheep enterprises. At the same time, there has been a growing tendency to finish both lambs and calves on the farm in an attempt to improve economic margins.

On the fringes of the uplands and in the valley bottoms dairying has traditionally been a favoured enterprise, particularly in areas such as the Yorkshire Dales and the Peak District where there was also a significant rural industrial population. However, in the last quarter-century there has been a rapid decline in dairy enterprises in the uplands as production has been concentrated in fewer but larger herds located in areas with less demanding physical and climatic conditions.

Defining the farming population

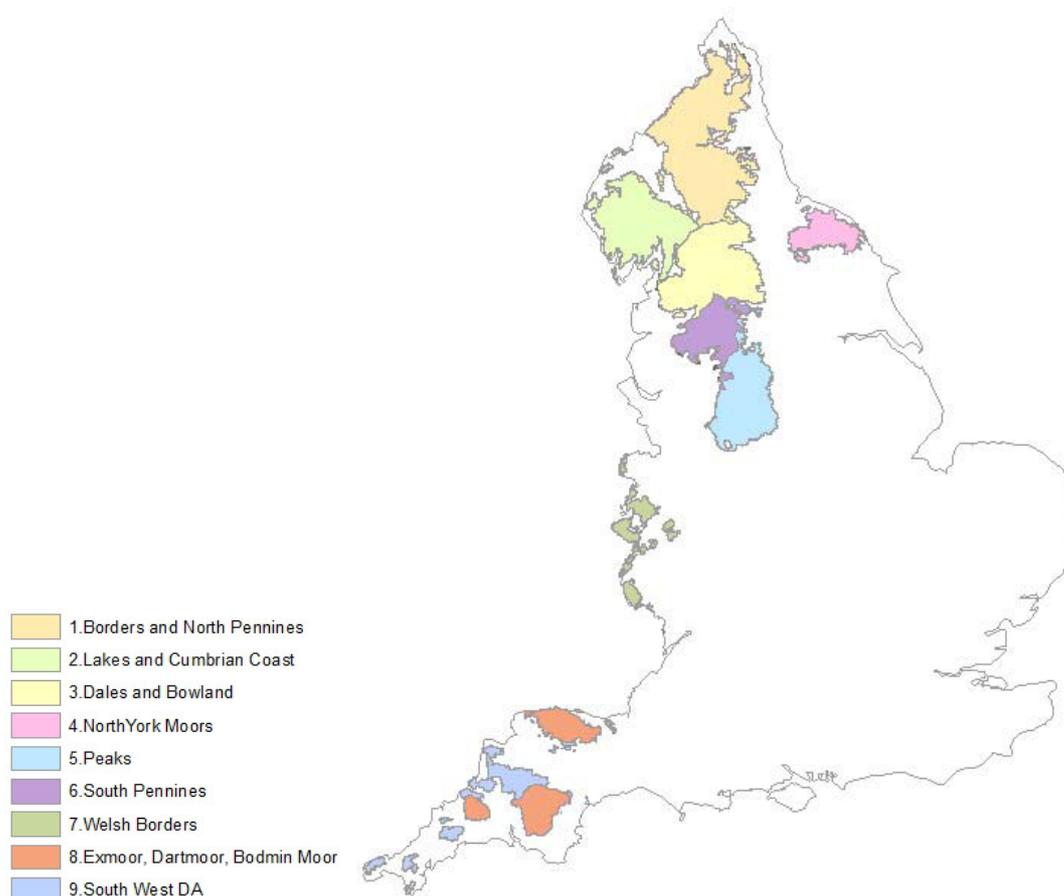
To define the boundaries of the uplands, the Uplands FPS survey adopted the European Union's LFA designation. This identifies socially and economically disadvantaged areas where farming becomes marginal and less profitable because production costs are high and productivity of the land is limited by physical factors such as harsh climate, short growing season, poor soil fertility and drainage, steep slopes and high altitudes. Such physical constraints are often combined with geographical isolation from population centres, which increases transport costs. In 2008 there were 19,200 farm businesses claiming SPS with at least one parcel of land in the LFA. The Uplands FPS applied thresholds to reduce the survey burden on farmers where LFA land was not a significant part of their farm area and to exclude very small land holdings. To be included in the survey, businesses had to have:

1. at least 20 hectares of LFA land and at least a third of their total land area contained within the LFA; or

2. at least 5 hectares of land entirely within the LFA.

Furthermore, businesses within the South West LFA Disadvantaged Area (DA) were excluded as these areas were considered to be more lowland in character. This reduced the number of farm businesses by 36% to 12,333. The Uplands FPS sampled 2,027 of the 12,333 businesses located within eight upland regions (see Figure 2.1). Just over 1,000 farmers completed the survey and of these 344 said they were willing to take part in a further phase of research. The farmers interviewed for this research were selected from the group of 344.

Figure 2.1: The Upland regions



Source: Uplands FPS

The Uplands FPS found that many of the broad structural elements of traditional upland farming, described above, have been retained. The survey found that nine out of ten farms (89%) are under family control and of these 72% have been established for more than one generation. Livestock production remains dominated by sheep and beef enterprises while specialist dairying is becoming increasingly rare (Table 2.1). In terms of the types of land that make up the farms, the Uplands FPS found that while the traditional combination of improved and unimproved land is most common (56%), over one-third of farms (35%) contain only improved land and one in ten (9%) contain no improved land at all (Table 2.2).

Table 2.1: Enterprise combinations recorded on upland farms

Enterprise combination	%
Sheep & Beef	44
Sheep	26
Beef	13
Dairy, Beef &/or Sheep	9
Dairy	5
Other	4
Total	100

Source: Uplands FPS

Table 2.2: Land type combinations recorded on upland farm

Land type combination	%
Traditional (Moor, rough grazing & improved)	19
Traditional (Moor & improved)	6
Traditional (Rough grazing & improved)	30
Improved	36
Moor & rough grazing	2
Rough grazing	6
Moor	2
Total	100

Source: Uplands FPS

The sample for the interview survey

Each of the eight upland regions has its own unique character and agricultural practices can vary significantly between regions according to farm structure, land use management and biophysical factors. To capture this regional variation, a target of at least ten interviews in each region was set (Annex 1). The farms were also selected to ensure that the key farm and farmer characteristics included in the Uplands FPS were well represented in order that the research could investigate how approaches to business management and farm practice varied in relation to family processes, region, type of farming, type of tenure and size of farm business. This meant that a cross section of farmers was investigated in depth to gain an insight into the causal mechanisms at work and how these different factors affect decision making in

upland farming. It is, however, important to point out that the sample was not designed to be statistically representative of the 12,333 upland farms identified by the FPS survey and no attempt is made to extrapolate the findings across the whole of the population. Instead, what this survey does is to explore the often-complex interactions between the different factors that influence decision making at the farm level. Where appropriate, the findings of this largely qualitative survey are linked to findings of the Uplands FPS.

Sixteen of the farm interviews (two per upland region) included more detailed investigation of the likely impacts of farm practice change on biodiversity and the natural environment. Farms were selected to represent as broad a range of habitat types as possible. To do this, farm boundary data supplied by Defra were combined with Land Cover Map 2000 data. On the case study farms an ecologist conducted part of the interview. To assess the spatial nature of past and potential changes, maps showing the farm as well as its ecological interest were annotated. This enabled a more detailed and environmentally linked appreciation of some of the main farm-level changes envisaged in response to the policy change scenarios.

In total, 83 interviews were completed, including five pilot interviews and 16 environmental case-study interviews.

Interview schedule

The interview schedule was designed to tease out greater detail about farmer decision-making and the causal linkages between policy changes and farm system and farm practice changes, building upon the insights provided by the Upland FPS results. The interview schedule was semi-structured and covered six inter-related topics:

1. A review of current farming structure and practices and recent changes in the farm business (covering enterprise mix and structure, dependence upon farm income and public support payments, use of land areas and level of intensity of management, and extent of current policy interactions – schemes and regulations).
2. Broader contextual information to improve understanding of the rationale behind changes, such as tenure, business organisation, family processes and succession, diversification and incomes sources.
3. Examination of the impact of market changes (inputs and outputs) and other drivers such as regulation on decisions and how these interact with policy.
4. An examination of the farmer's response to previous policy changes and his/her awareness of planned and potential policy change.
5. Discussion concerning the anticipated impact of policy changes on the farm business in terms of system changes, changes to enterprises and enterprise balance, and stocking practices and grazing levels.
6. Discussion concerning the impact of policy changes on the profitability of farm businesses.

In addition, the case study interviews considered in more detail various aspects of farm management that could have ecological impacts and included issues such as supplementary feeding, access to water, measures taken against parasites and the management of moorland and bracken.

To investigate how farmers might react to a reduction in direct payment income they were presented with three experimental scenarios, a main scenario and two variations. The scenarios used are included as Annex 2 and their key features are:

Main scenario:

- 20-40% reduction in SP by 2013.
- Change from HFA to Uplands ELS.
- Regulations - tightened but no major changes.
- Prices: Sheep -5%, beef -20% by 2013, inflation low.
- Implication: Reduction in direct payment income, payments based more on environmental outcomes.

Variation A:

- Basic income support but stronger regulation.
- Increased money for agri-environment schemes (AES) in real terms.
- Move from ELS to HLS and focus on landscape scale schemes, high value areas and features.
- Implication: Harder to access environmental payments and more management requirements for same level of payments.

Variation B:

- Pillar 1 (SPS) phased out between 2015 and 2020.
- Focus on AES objectives. Same funding level as the main scenario.
- Implication: Large fall in direct support and reliance on market prices.

The farm interviews were recorded and afterwards a written summary of each interview was prepared using the recording and the completed interview schedule. Direct farmer quotations and extracts from the interview summaries are used throughout the report to emphasise the farmers' perspective on different issues. However, to maintain farmer confidentiality, some of the detail has been omitted in places. Quantitative data were entered into a Microsoft Excel spreadsheet for the economic analysis.

THE RESEARCH FINDINGS

3. The importance of public support payments

The economic context

The Farm Business Survey (FBS) uses a sample to monitor the annual economic performance of over 6,000 upland livestock farms and provides a valuable insight into the economic health of upland farms from year to year. The FBS covers roughly half as many livestock farmers as the Uplands FPS and focuses on the more commercial sector of upland farming, excluding farms with a 'standard labour requirement' less than 0.5 units (see Harvey and Scott, 2010).³ The FBS data show that it is very difficult for livestock farmers to generate a profit from their farm businesses on a consistent basis irrespective of their size, enterprise mix and diversity of farm incomes and that without public support payments these farms would incur substantial financial losses.

These LFA farms depend to a substantial extent on public payments (Single Payment Scheme, Hill Farm Allowance, and Agri-environmental payments) together accounting for 37% of their revenues. Although there is substantial variation amongst the farms in terms of their commercial performance, most of these farms could not survive in their present form as commercial businesses without the public payments.

Harvey and Scott (2010)

The FBS annual reviews also show that profitability has been low and support payment dependency high for most of the previous decade and shows that commercial farming in the uplands is a challenging occupation and is likely to remain so. The main reason for this poor economic performance is that input costs for the core agricultural enterprises (sheep and beef) consistently exceed output prices and the majority of agricultural enterprises covered in the survey make a financial loss. This leads the FBS to conclude that sheep and beef farming on their own in the LFA is simply economically unsustainable and highlights the critical role non-agricultural income streams play on LFA farms.

The findings from the farm interviews are very much in line with the situation described by the FBS. Few of the farmers interviewed made a consistent profit and many said they were unlikely to do so in the near future. The farm interviews also confirmed the important contribution made by public support payments, particularly the SPS, to farm incomes in all regions and across all enterprise types. Overall, few farms are achieving profit levels that exceed the total amount of public support payments. A detailed analysis of the economic data from the farm interviews is included as Annex 3 and a summary of the main findings is presented here.

³ Harvey, D. and Scott, C. (2010) Farm Business Survey 2008/2009: Hill Farming in England, Rural Business Research.

Economic analysis of the farm interview data

It is clear that there is a high level of income dependency among upland farms on public support payments of various kinds, as indicated by the fact that the majority of the farms analysed in this study produced levels of profit (income over costs) at or below the amount received in support payments. This finding is consistent with recent FBS-based analysis of upland farm economics (Harvey and Scott, 2010). The main determinant of farms with a lower than average level of subsidy dependence is the presence and significance of off-farm and non-agricultural income. Only a few farms had been able to reduce their dependence by achieving higher than average levels of performance from farm enterprises alone. In general, based upon their reported profit, smaller farms appeared to perform well in this respect, but this was found to be largely because the cost of family labour was not included in the calculations being used by the farmer to assess profit levels (effectively the family's time was rewarded only by profits, not by a wage).

The Single Payment is by far the most significant form of public subsidy payment, for these farms. Agri-environment payments are generally a small contributor, but can be quite significant for some farms. The HFA payment by its nature relates to the area of land farmed and is a relatively low payment per hectare. It therefore has a relatively small influence on profit, at any scale of operation. It becomes a little more significant to the upland farmer with access to relatively large amounts of common land to which it has been apportioned. Conversion to Uplands ELS seems unlikely to increase support payments for the majority of farms⁴ as the extra management payments, over and above the basic ELS, would appear to be similar in amount to the amounts currently being received as HFA payments.

The survey had hoped to use information about Single Payment entitlement to indicate winners and losers in the transition to flat rate and the move from direct payments based on historic headage, to fully decoupled area payments. However, it proved to be too difficult to source reliable data with which to undertake this analysis. On a basic assessment of the likely winners and losers from the change, in respect of farm structure and history, the indications from this study are that the expected ultimate losers are already receiving less Single Payment than the winners and, by definition, this gap will widen each year. The losers are also more likely to be tenant farmers and hence they may perhaps be more exposed to the consequences of income loss than owner-occupiers, who have a stronger asset base and more flexibility to diversify their business or to restructure it.

In terms of environmental impact measured relative to average stocking rate calculated roughly for the whole holding, it would appear that there is little association between overall stocking rate and agri-environment scheme participation. This may be perhaps because farmers have altered their management on other parts of the farm upon the introduction of AES

⁴ Although there will be a potential increase in income for a very small minority of specialist dairy farms which may have some eligible land for entry into UELS, where it was previously ineligible for HFA

management to some parts of it. There does not appear to be any association between average stocking rate and past subsidy receipts as indicated by the level of history in the Single Payment entitlement.

There are interesting and largely predictable inter-relationships between farm size and farm type, and labour usage and farm type (cattle and especially dairy herds requiring more labour; largest farms tending to be mainly sheep). These linkages may help to explain the apparent lack of correspondence between total support payments and farm size or profit, before taking any account of farm type. Beef farms are relatively labour intensive but receive quite high levels of support payments, particularly the Single Payment. Sheep farms, by contrast, have much lower labour utilisation and lower support payments. Dairy farms, not surprisingly, use more labour than other types and have lower support payments than beef farms, both for SPS and for HFA and agri-environment payments in particular.

It is hardly surprising, given the variation by farm type, that labour usage on upland farms is not consistently correlated with public support payments. Whilst total subsidies do tend to increase in line with increased labour usage there is a wide variation in the sample, reflecting these other factors which influence labour use more strongly than the level of support. Thus it should not be expected that total public support payments to these farms would have a discernible direct or indirect effect on employment on farms, if measured in isolation from these other factors. This is of course not to say that support does not have an employment effect, though – it just means that any such effect cannot be detected from generalised analysis such as this.

Variations in the importance of public support payments

The majority of farmers interviewed (59) said they relied on their farm businesses to provide an income and are managing commercial operations.⁵ On all but four of these farms, the farmers reported that the public support payments made an important contribution to their household income and many would be making a loss without the payments (Table 3.1). It is particularly important to gain a deeper understanding of the behaviour of this group of farmers, as they are the ones whose viability will be most affected by any future changes in public support payments. It is also important to gain a better understanding of this group from an environmental as well as an economic perspective as commercial farmers control land management over a large part of the uplands and tend to operate more complex farming systems (Table 3.2).

⁵ In the Uplands FPS, 50 recorded themselves as full-time commercial holdings and nine as part-time commercial holdings.

Table 3.1: The importance of farm business income and public support payments

Importance of farm business	Public support payments		
	Important	Not important	Total
As a source of income (Commercial)	55	4	59
Not as a source of income (Hobby)	1	10	11
Withdrawing from agriculture	4	9	13
Total	60	23	83

Source: Farm interviews

Table 3.2: The importance of farm business income, farm size and agricultural enterprise mix

Importance of farm business	No. of farms	Average area (ha)	Agricultural enterprise mix			
			Beef and Sheep	Sheep only	Beef only	Dairy
As a source of income (Commercial)	59	228	32	11	6	10
Not as a source of income (Hobby)	11	29	3	5	3	0
Withdrawing from agriculture	13	62	3	5	4	1
Total	83	174	38	21	13	11

Source: Farm interviews

Eleven farmers were farming as a hobby or lifestyle choice⁶ and did not expect their farms to make a major contribution towards their income. On these holdings most of the household's income tended to come from off-farm sources and, perhaps not surprisingly, public support payments were often considered to be a minor influence on the way they managed their farms. It was not the intention of the farm interview survey to specifically sample hobby and lifestyle farms (ten of the 11 were classed as part-time commercial businesses in the Uplands FPS). However, during the interviews it became apparent that the farm businesses were contributing little to household income and the behaviour of the farmers was sufficiently distinct from the commercial farms to warrant separate analysis

Thirteen farmers were withdrawing from commercial farming⁷ and were in the process of winding down their businesses. For 11 of the 13 farmers the process would be completed within the next five years. Here the importance of public support payments to farm income was more varied and was linked to the control of assets and the area of land that had been retained. It was

⁶ In the Uplands FPS, ten recorded themselves as part-time commercial holdings and one as a hobby/lifestyle farm.

⁷ In the Uplands FPS, seven recorded themselves as full-time commercial holdings, three as part-time commercial holdings, two as hobby/lifestyle farms and one was leasing land on short term agreements.

apparent from the interviews that winding down the farm business was the dominant process at work and this distinguished this group from the commercial businesses.

From our discussions with farmers on the subject of public support payments it was clear that direct payments are being widely used to support livestock production, especially suckler cow enterprises. Those who were farming on a commercial basis largely rejected the notion that the Single Payment could be treated as separate to their agricultural enterprises. These farmers commonly reported that they could not survive without the SPS and that it was essential to the way they farmed. These findings are consistent across all regions and particularly noticeable on farms located entirely within the Severely Disadvantaged Area (SDA) and on farms producing sheep and/or beef as outputs.

"Without the Single Farm Payment we needn't get out of bed in the morning."
(Dairy, beef and sheep farm, Lake District)

"Last year the farm made around £28,000 you see it's a lot less than the subsidy...with no support we're losing £30,000 basically."
(Sheep and beef farm, North Pennines and Borders)

"Without the Single Farm Payment we would lose £12,000 a year. Without it, I don't know, we wouldn't be able to employ anybody. We couldn't really afford to keep less stock. It's very important."
(Sheep and beef farm, Lake District)

In contrast to the commercial farm businesses, hobby farmers reported that public support payments were not of great economic significance, for example:

Mr. and Mrs. R run a beef farm. Mr. R. is retired having had a long professional career outside farming. They own most of their farm and have been farming for over 10 years. They run a suckler herd that has been reduced in recent years, as he is getting older and less able to manage the stock. Total public support payments are less than £5,000 and contribute less than 5% to household income. Non-agricultural income is very important consisting of a private retirement pension augmented by a bed and breakfast enterprise. Mr. R. said that the farm was subsidised by his private income and as his children were not interested in taking it over the farm would be sold in a few years. The suckler enterprise was described by Mrs. R. as "the most expensive hobby you've ever had."
(Hobby farm)

Among the hobby farmers there were also examples where the public support payments were being used to contribute to the running costs of loss making farming activities rather than generating an income.

Direct payments also tended to be less important in terms of income among the group of farmers who were withdrawing from farming and winding down their businesses. For example:

Mr. and Mrs. B. bought their farm in the early 1990s, previously being tenants, and were both nearing retirement. Their children are not interested in taking over the farm. The farm had been losing money for several years but all the debts would be cleared when the farm was sold as it was worth many times more than the original purchase price. This allowed them to farm in the way they wanted.

(Withdrawing from agriculture)

In another case the farmer reported that the Single Payment was playing an important role in easing his withdrawal from farming by providing an income as he wound down his suckler enterprise.

Cultural attachment to farming

While the evidence from the FBS and the farm interviews shows that farming in the uplands is under considerable economic stress, the findings of the RuDI project (see Dwyer et al. 2010)⁸ also highlight a strong cultural attachment to farming associated with decision-making, which does not appear entirely economically rational. This helps to explain why some businesses continue when, in the strict accounting terms used by the FBS, they appear to be economically unsustainable.

Many farmers in upland areas face a poor or declining quality of life, as measured in respect of working hours, social networks and, for some, conventional measures of poverty (e.g. income, health, access to services, education and training), but they persist because they have a remarkably strong commitment to the non-material quality of this lifestyle, including cultural and natural environmental attachment, and they are prepared to subsidise it with funding from outside the sector.

Dwyer et al. (2010)

This cultural attachment to farming is also borne out in the results of the Uplands FPS, which showed that 95% of farmers thought that it is very important or important to maintain the upland way of life. The desire to stay in farming is also very strong with 41% of respondents saying they would do all they could to remain in farming and a further 38% said they would try to remain in farming. Tellingly, only 2% said they were thinking of leaving farming for another career. A closer look at the farm interviews shows an equally strong attachment to farming including new entrants as well as farmers from well-established farm families:

Why had he wanted to remain in farming all these years, despite making no profit from it? "It's just purely the way of life. I really do enjoy working with the animals." He then pointed to a rosette on the sideboard. "To get one of those, the amount of work involved, it's like a buzz you get. So it's really just a way of life." But he did comment that his wife had a slightly more jaundiced view of farming, having been brought up on a farm where there was insufficient money.

(Sheep farm, Lake District)

"You've got to be positive. There are so many who are so down and I say why do it?" He loves what he's doing and wouldn't change it for the world. Having said that, he's never had a holiday in 30 years. He went to Spain on his honeymoon and hated it! And he has had one weekend away when they went to Scarborough. His biggest worry is if

⁸ Dwyer, J., Condliffe, I., Short, C. and Pereira, S. (2010) Sustaining marginal areas: the case of the English Uplands, RuDI Work package 8: case study report, CCRI.

he gets ill. "In the past you had farming families and someone who could cover for you."

(Beef farm, North York Moors)

Mr. S. grew up on a farm but his father wasn't a full-time farmer and he has always wanted a farm of his own. He was working in industry to begin with and was able to buy a small farm. Mr. and Mrs S. would like to increase the size of their farm and expand his traditional cattle herd. "The key thing we want to do on this farm is to make it nice again."

(Sheep and beef farm, Lake District)

A question that remains unanswered, however, is to what extent can such cultural attachments serve to counteract the broader pressures acting upon upland farming? Indeed just how many of these economically and socially stressed farms will be able to continue and for how long? In recent years there have been numerous reports that upland farming is on the brink of collapse and will be tipped over the edge by the next shock to hit the sector, such as Foot and Mouth Disease (FMD) in 2001 or the introduction of the SPS in 2005. The Uplands FPS and the RuDI study show that, to date, the decoupling of support from production and episodes of animal disease have had a significant, rather than fatal, impact on the structure of upland farming.

Another key question is at what stage does the longstanding trend towards fewer but larger farms, managed by a falling number of farm families, reach a point where the farming community can no longer function effectively and the farming systems, along with their environmental and social benefits, start to disintegrate? An important indicator of likely future structural change in upland farming is the rate at which farms are being lost. The Uplands FPS found that one in four farmers (27%) do not expect their farms to continue beyond the current generation, which in itself is likely to result in a major reduction of farms. However, evidence from the farm interviews suggests that the proportion of farms without a successor may be considerably higher. Eleven of the 34 farmers who said that succession was uncertain in the Uplands FPS questionnaire said in the farm interviews that there would be no succession. It would appear that there may have been a certain degree of wishful thinking involved regarding succession when it came to completing the questionnaire which was not apparent in the interviews. For example:

Mr. O. is in his mid 50s and his children do not want to farm (one has left and the other is about to go). He intends to carry on as usual, retaining the same balance of enterprises and keep ticking over until he is 65. He said he had the option to sell up if things get too difficult. He is not prepared to tighten his belt further when he could sell up.

(Sheep and beef farm)

When asked what would happen to their farms, all the farmers without a successor said that the land would be sold or the tenancy relinquished. None of these farmers thought that their farms would survive as independent units and all felt that existing farms would amalgamate the land.

When he gives up, Mr. V. says he could see the house being sold as a separate house for holiday homes, and the land let off or sold. But he couldn't see it continuing as a hill farm. "Perhaps the National Trust could buy it."

(Sheep Farm)

4. The current situation on farms and recent change

Farm business adjustments

Understanding how farms have changed in the recent past⁹ provides a context within which to understand their capacity for future change. Therefore, before investigating how farmers were likely to respond to future changes in policy, it is important to know something about current management and how farmers have responded to economic and social changes in the past.

The interview survey confirmed that many of the farmers, who depend on farming to generate income, have been subject to sustained economic and social pressures. Depressed prices, high input costs, the introduction of the SPS, animal disease (FMD, BSE and bovine tuberculosis (bTB)) and family circumstances, including a lack of a successor, were identified by farmers as key factors influencing their business decisions and driving changes in farm practice. A key issue here is the low level of profitability of the core agricultural enterprises; sheep, beef and dairying. In response to these pressures farmers have adjusted their businesses in a number of different ways:

- **Conventional and non-conventional agricultural adjustments:** Changes in respect of conventional agricultural production -stock numbers, types, systems, farm costs, non-conventional agricultural activity - including provision of environmental goods and services, e.g. agri-environment schemes
- **Non-agricultural and off-farm adjustments:** Non-agricultural activity – including tourism and recreation and the re-use of ancillary buildings and land, off-farm employment, off-farm business opportunities, investments and pensions.
- **Asset realisation:** The sale of land, buildings, shares and other assets.
- **Make no change:** Potentially accepting a lower standard of living, as over time economic pressures will tend to reduce income.
- **Leave commercial farming:** Retire, take up another career, farming becomes a hobby.

The adoption of these different types of adjustment activity is not mutually exclusive and a farm business may include more than one at any time. As a farm business develops it may change from one type of adjustment activity to

⁹ What time period constituted the recent past was left to the farmer to determine. This was deliberately left open so that farmers could discuss the changes that were significant to them.

another as circumstances change.¹⁰ Before exploring the nature of the changes taking place on the interview farms it is worth providing some context by highlighting some of the relevant findings from the Uplands FPS and the RuDI study.

Variations in farm business adjustment: Findings from the Upland FPS and the RuDI study

Although taking a snapshot of farm business activity, the Uplands FPS provides a valuable insight into some of the types of adjustment activity taking place across the uplands. The survey showed that commercial farming remains the core activity for most upland farms with 60% of farmers regarding their farms as full-time commercial holdings and a further 22% as part-time commercial holdings. Over half of all farmers (52%) said that their farm business provided most or all of their household income. However, over half of all farms (56%) also have a diversified activity or other source of income contributing to farm income. Almost half (48%) of all farmers have some form of off-farm diversification or other income, while 25% of upland farms have an on-farm diversified enterprise. These findings show that while commercial farming remains a very important activity across the uplands, farmers are adapting by making adjustments to both on and off farm resources.

The RuDI study also provides an insight into the changes occurring on 27 case study farms located in two upland areas, the Forest of Bowland and Exmoor. This survey looked at changes taking place over a broader time frame (2000 to 2009) than the Uplands FPS and found similar adjustments taking place with farmers making changes both on and off the farm. The RuDI study identified four distinct but overlapping 'strategies' for farm business development:

- **Farm size change:** Expansion was achieved through the renting and purchase of land to maintain or increase income by spreading fixed costs over a larger unit to gain economies of scale. Expansion was frequently triggered by the needs of succession.
- **Farm enterprise change:** Achieved by reducing the number of enterprises.
- **Changes in the intensity of land use:** Often achieved through a complex series of management changes on different parts of the farm.
- **Changes to income sources:** Achieved through earning non-farming and off-farm income to supplement or subsidise the farm income.

While all these 'main strategies for business development' were easily recognisable among the cross-section of farms taking part in the interview survey, the survey uncovered a broader range of adjustment activities taking place. In particular, there were more examples of farmers who were in various stages of disengagement with commercial agricultural production.

¹⁰ See for example, Evans, N. (2009) Adjustment strategies revisited: Agricultural change in the Welsh Marches, *Journal of Rural Studies* 25, 217-230.

Variations in farm business adjustment: The farm interview survey

The farm interviews identified a broad range of adjustment activities taking place relating to the use of both on-farm and off-farm resources (Table 4.1). All but two of the farmers who rely on their farm businesses to provide an income had made conventional agricultural adjustments (see Table 4.2), including changes to farm costs and livestock enterprises. They were also frequently involved in various forms of non-conventional agricultural and, to a lesser extent, non-agricultural income generating activities. Changes to farm area were less common and depended to a large degree on land being available in the right location for farmers to take advantage of this form of adjustment. Where the farm business was not a source of income there was a greater focus on off farm activity. Farmers who were withdrawing from agriculture were also actively involved in making a wide range of adjustments associated with winding down their farming activity.

Table 4.1: The importance of farm business income and type of adjustment

Importance of farm business	No. of farms	Type of farm business adjustment				
		Farm costs	Livestock enterprises	Land area	Non-conventional agriculture	Non-agricultural & off farm
As a source of income (Commercial)	59	53	51	15	46	36
Not as a source of income (Hobby)	11	3	4	0	4	11
Withdrawing from agriculture	13	10	11	4	7	10
Total	83	66	66	19	57	57

Source: Farm interviews

Conventional agricultural adjustments

In recent years conventional farming enterprises have been placed under significant economic pressure and farmers have responded by making adjustments to their enterprises and farm practice. These adjustments include changes to costs, the number of and balance between enterprises, the intensity of production and farm area.

Farm costs

Cost cutting was widespread across all regions and farm enterprise types. A common type of adjustment used by farmers has been to cut costs by reducing both full and part-time hired labour. Very little hired labour is now used. The use of contractors is common, especially for cropping and manure spreading to reduce machinery costs. Contractors are also widely used for labour intensive activities such as sheep shearing and field boundary maintenance.

“You can’t justify having that amount of money tied up in machinery, that isn't going to turn a wheel from one month to the next”

(Sheep farm, Lake District)

Mr. and Mrs. S. have a family partnership with their son who works full-time on the farm. In recent years they have reduced the hired workforce in an attempt to keep costs down. In the past six people worked full-time on the farm now there are only two (Himself and his son). They have also stopped investing in machinery, which Mr. S. feels can no longer be justified, and they now rely on contractors for all the major farming operations; silage, manure spreading and clipping.

(Sheep and beef farm, North Pennines and Borders)

There has also been a significant reduction in fertilizer use, due to a combination of recent price increases and the trend towards more extensive livestock systems. In the discussion of past changes, it was clear from the farmers' responses that to cut farm costs was often an immediate response to an adverse economic situation but that it was often only a short-term solution and that savings could not continue to be made indefinitely. Additional adjustments would have to be made further down the line.

Agricultural enterprise change

Change in the balance between agricultural enterprises has also taken place across the uplands. An important change has been a reduction in suckler herds, which was strongly influenced by episodes of animal disease, particularly FMD and bTB, and the removal of headage payments. However, suckler enterprises were also seen as more flexible than sheep in that numbers could be reduced or expanded according to changes in cost. Farmers also recognise the land management value of suckler cows, in the form of manure production and grazing, but are concerned about their economic viability.

"We used to have 90 suckler cows when it was headage payments, now it is 40 odd, but sheep numbers have more or less stayed the same, it didn't really affect them."

(Sheep and beef farm, Yorkshire Dales and Bowland)

The growth of sheep only farms was raised as an issue in the more general discussion about changes taking place in the uplands. Some of the farmers mentioned the problems in maintaining grassland quality experienced by other farmers when they converted to sheep only enterprises. While they did not experience the problem on their own farms they had witnessed a deterioration in grassland quality elsewhere. Farmers reported that sheep enterprises have tended to be managed more extensively since the withdrawal of headage payments, although there were some farmers who had reduced numbers but also changed breeds and were managing them quite intensively in terms of time and effort to maximise outputs.

The loss of headage payments and the move to the SPS led Mr. E. to reduce his sheep flock by around 25% as it wasn't cost effective to keep the numbers higher.

(Sheep and beef farm, Peak District)

There had also been a widespread move out of dairying, which was attributed to low economic margins and the scale of investment, in particular for diffuse pollution control, required to remain viable.

Where suckler enterprises remain, they tend to operate under a more extensive system than previously. In terms of beef rearing enterprises, it was

commented that it was hard to make a consistent profit in the uplands because of the short growing season and high cost of inputs. There was little in the way of intensive fattening taking place and there was a heavy reliance on grassland systems.

Enterprise balance is also influenced by a number of social processes. In some cases farmers said that their choice of enterprise was strongly influenced by personal preference and this could be as important as the underlying economic viability of the enterprise. Changes in enterprises were also often related to farmers' capacity to manage livestock, as they grew older. This was particularly apparent on farms where the farmer was the sole operator and where there was no successor.

Mr. O gave up his cattle four years ago. He used to have a suckler herd of 30 Limousin cows. He gave up partly due to the stress of bTB and all the testing involved. Also because he had a few wild cattle and he was concerned about being on his own and getting hurt. He was finding it physically harder to cope with them.

(Sheep farm)

Intensification and extensification

Intensification and extensification were also important forms of farm business adaptation. Intensification was often mentioned in association with farm expansion. When a farm acquired new land there would often be a selective intensification of the better quality land on the enlarged and reorganised holding. The main focus was on areas of grass and cropland where productivity gains would be greatest. However, this type of intensification was often accompanied by less intensive land use on other parts of the holding, including rough pasture and moorland.

Farmers reported that extensification was often associated with episodes of animal disease, the introduction of the SPS, an increase in off-farm employment, participation in agri-environment schemes and situations where the farm business was being wound down. Since the decoupling of support payments a significant number of farms had changed to a more extensive system where they carried less stock and bought in less feed and fertiliser.

Mr. and Mrs. T. own a 200 ha sheep farm. Mr. T. is now in his 70s. There is no succession as none of his children are interested in taking on the farm when he retires. Mr. T. is now winding down his farm business and is progressively renting out parts of the farm on short-term leases. The farm has also responded to policy changes in the past. When headage payments were available they kept all the livestock they could but when this stopped and SPS started they reduced the flock size. Since 2005 they have reduced breeding ewe numbers down from 1000 to 300. Mr. T. is now concentrating on improving the quality of his stock and noted that the reduction in numbers had been beneficial to the health of the ewes and lambing percentage has gone up. "A *sheep's worst enemy is another sheep.*" The reduction in sheep numbers had coincided with the winding down of the farm business and the leasing out of land.

(Sheep farm)

Farm size (area)

Farm expansion, through buying or renting additional land to increase output and spread costs, was a common form of adjustment used by farmers who planned to stay in farming and who had secured the succession of their farms

into the next generation. However, these farmers often reported a shortage of land to buy or rent on a long-term basis. There were also concerns about the growth of insecure tenancies, which although providing short-term flexibility made it difficult for farmers to plan their businesses over the long-term. Concern was also expressed over the management of this type of land as it discouraged investment and maintenance. The farm interviews also found examples where farmers had purchased or rented additional grazing land to accommodate livestock that have to be excluded from moorland and rough pastures, for all or part of the year, as part of AES stocking density prescriptions. For some farmers the decision to expand was strongly influenced by the rarity of opportunity to acquire land which joined or was close to their farms. Farm contraction, through the sale or renting out of land, was mainly associated with farmers who were winding down their businesses. Farm succession and tenure were particularly important influences on farm contraction.

Non-conventional agricultural adjustments

The main forms of non-conventional agricultural adjustment encountered during the farm interviews were adding value to conventional enterprises and the provision of environmental goods and services through agri-environmental schemes.

Adding value

Adding value to sheep and beef enterprises has been an important adjustment activity. There is now less focus on using traditional pure hill sheep breeds to produce store lambs. Purebred hill flocks have tended to be reduced and in some cases dropped altogether. This change has been accompanied by an increase in the number and size of crossbred flocks and an increase in the production of fat lambs. Fewer farmers now use traditional breeds within their suckler herds with the emphasis being on more productive continental breeds. However, the interview survey also recorded examples where farmers had gone the other way and replaced their continental cows with traditional breeds. The reasons behind this move were attributed to the traditional breeds' ease of management and maintenance and occasionally the additional income derived from AES livestock options.

There is now greater focus on producing quality livestock more in line with consumer demand. Some farmers were reducing their reliance on selling through auction marts and engaging in various forms of direct selling and through supermarket contracts. The survey also found that on some of the farms there has been a move away from sheep and beef store production and into specialist pedigree breeding stock. An important motivation for such changes was that in areas affected by bTB, particularly in the South West Moors and the Welsh Borders, reliance on store sales was often perceived to be too risky compared to closed fattening systems where stock could be sent directly for slaughter with or without bTB clearance. Dairy farmers also reported that they were under sustained economic pressure and that margins were small. A number of them had responded by adding value through direct marketing and processing.

Agri-environment schemes

There was a strong engagement with the 'classic' agri-environment schemes and the more recent Environmental Stewardship scheme. Farmers reported that ELS generally fitted in well with their current management practises and that their farms had sufficient environmental value to meet the entrance requirements without causing too much disruption. The CSS and ESA scheme were particularly valued for their capital grant options. From an economic standpoint, farmers reported that the regularity of the payments throughout the length of the agreement assisted with financial planning.

Where farmers have not entered into AES this was commonly due to a reluctance to have controls placed upon their actions. However, elderly farmers were often put off the schemes by the length of the agreements and the amount of paperwork involved. Here there was concern about what would happen if they were unable to carry on farming. Not wanting the scheme agreements to create a burden for their surviving family was an important factor in their decision-making.

Non-agricultural sources of income

The interview survey found that on some of the farms there had been an increase in off-farm employment and on-farm diversification, as farmers sought to reduce their reliance on mainstream livestock enterprises. Examples of on-farm activities included the provision of accommodation in the form of bed and breakfast, holiday cottages and camping. Agricultural contracting, using the farm's machinery and the farmer's craft skills, was also widespread across all areas. The farm interviews recorded a range of off-farm employment activities involving the farmer or, more often, other members of the farm family. State and occupational pensions were important on some of the farms and there were examples where off-farm business interests and investments were important sources of income.

It was also found that there could be a significant impact on farm practice if labour was taken away from the farm to generate the non-agricultural income. For example, where the farmer was the sole worker but also had an off-farm job it was often the case that the farm system and enterprise structure would be simplified to fit in with the hours available to work on the farm.

From discussion with the farmers there was found to be a wide degree of variation in the relationship and balance between non-agricultural and off-farm sources of income and the farm's agricultural income. For some of the farmers interviewed, conventional agriculture was the core activity to be supported by other activities that were not undertaken out of choice. It was clear from the interviews that some of the farmers saw rearing and selling livestock, although currently unprofitable, as 'real' farming and their other activities were just a means to this end. In other interviews, however, it was clear that the non-farming activity was of central economic importance and that the farm enterprises were of limited economic value. Not surprisingly, perhaps, this situation was common among the hobby farmers.

Asset realisation

The farm interviews recorded three examples where assets had been sold. In two of the cases land was sold to generate income as the farms were losing money, while in the other case a farmer has sold a small area of land for development to generate capital for investment in the farm's existing agricultural enterprises.

Leave commercial farming

By its nature the farm interview survey was unlikely to identify farmers who are leaving agriculture completely to take up another occupation and no examples of this were recorded. However, 13 farmers were identified who had decided to retire from farming and were at various stages in winding down their businesses. This group included examples where the farmer planned to retain an interest in the land and farm as a hobby and examples where the farmer was heading towards complete retirement.

On ten of the 13 farms there were children and the absence of offspring to take over the farm was not an issue. From the interviews it was clear that either the parents had decided that their farms were no longer viable businesses and had actively discouraged their children from taking up farming or the children had decided that farming was not for them.

Mr. A. said that his two sons were not going to take over his land. "I wouldn't let them, ... get yourself a trade." He says that it is too hard being a farmer, with very poor economic returns.

"My son keeps telling me to get a proper job like him ... (laughing) always reminding me how much he earns."

(Withdrawing from agriculture)

Mr. C. says they have a son who thankfully has no interest in farming. He is working outside farming and doing very well for himself. Mr. C. says there is no comparison with the amount of money he earns. "It is not on this planet." Sometimes his son looks at him and he says, "you've got to get a life you."

(Withdrawing from agriculture, North York Moors)

Once the decision had been made by farmers not to focus their efforts into creating a viable farm business for the next generation, those who owned assets had a greater degree of flexibility in how they managed their farms. It was sometimes the case that plans were being made to transfer assets to the next generation but not in the form of a viable farm business. For example:

Do you think any of your children will take over? "I would think so, the young one is very interested, but not as a farm. He could make it into a little estate, sort of renting out but still looking after it, he'll still have the house."

(Withdrawing from agriculture, Peak District)

There was a clearly defined group of middle aged and elderly farmers with no succession but who had considerable assets, mainly in the form of land. It was common among this group to see a gradual winding down of the farm business. Typically, this was characterised by decreasing levels of productivity, low or even negative levels of profitability, manageable levels of debt or no debt at all, and a simplification of management practices

associated with a reduction in labour inputs. Here farm income was often being supplemented by the renting out of assets, in the form of land and/or buildings, or increased bank borrowing set against the value of the farm. These farms were likely to be sold to generate funds for the farmer's retirement.

Adjustment combinations and the influence of policy, economic and social factors

The previous section looked at the individual elements of farm business adjustment. It is, however, also important to take a holistic view of the adjustments taking place at the farm level as a precursor to investigating how these farms are likely to respond to potential changes to policy and public support payments. The reason for this is that decisions about future business management and farm practice are often strongly influenced by the farmer's, and farm families', current circumstances and have been moulded by decisions made in the past. Clearly, when looking at the potential for future change all farms do not start from the same position.

The early parts of the interview schedule paid particular attention to gathering information on the farm's current situation and any recent changes that had been made. The purpose here was to understand how the farm had developed and why it was being farmed in the present way. The completed interviews were analysed to determine how the internal and external drivers of farm business change - policy, economics, episodes of animal disease and family circumstances; combine at the farm level to generate different types of adjustment response. Particular attention was paid to exploring how the economic, social and physical character of each farm business influenced the nature of these responses.

The farm interviews found that as a group the farmers had made considerable adjustments to their farm businesses. Table 4.2 shows that the majority of farmers had made changes in at least two of the three main categories of adjustment.

Table 4.2: The importance of farm business income and adjustment combinations

Adjustment combinations	Importance of farm business			Total farms
	Source of income (Commercial)	Not a source of income (Hobby)	Withdrawing from agriculture	
Conventional agricultural Non-conventional agricultural Non-agricultural & off-farm	28	4	6	38
Conventional agricultural Non-conventional agricultural	18	0	1	19
Conventional agricultural Non-agricultural & off-farm	6	1	2	9
Conventional agricultural	3	0	2	5
Non-agricultural & off-farm	2	6	2	10
No changes	2	0	0	2
Total number of farms	59	11	13	83

Source: Farm interviews

The economic analysis showed that most of the commercial farms in the interview survey have been under sustained economic pressure, characterised by rising input prices and depressed markets for outputs. This economic pressure provides a context for many of the management decisions and changes that had taken place on the farms. However, it was also clear from our discussions with farmers that episodes of animal disease, particularly the FMD outbreak of 2001, and the introduction of the SPS in 2005 were major factors that influenced a range of farm management decisions. Other policy drivers, in the form of cross-compliance and Nitrate Vulnerable Zone (NVZ) regulations, were generally seen by farmers to be of lesser importance.

Summaries of the sections on current and past management from three of the 83 farmer interviews are presented here to illustrate some of the ways in which the drivers of change combine at the farm level to produce different types and combinations of response. The summaries also illustrate how the interactions between different factors were teased out during the farm interviews.

Summary 1

The farm in this first example is aiming for long-term viability and has secured succession in place. The direct and indirect impacts of animal disease have caused a major change in direction for this farm leading to a number of major adjustments taking place. Here the previous beef and sheep system has been replaced by a more extensive sheep system, which incorporates both ELS and HLS agreements. However, farm business income is small and also

heavily dependent on public support payments. Looking to the future this farm is likely to be particularly vulnerable to any changes to public support.

Mr. O. and his son are in partnership on a 200 ha sheep farm in the SDA. It is a traditional hill farm with areas of moor, rough grazing and inbye land. Succession is secure and the business is expected to continue for at least 20 years. The farm has no other sources of income and would make a significant loss without the public support payments. The farm business profit for 2009 was less than £10,000 while support payments totalled £50,000.

Both Mr. O. and his son work full-time on the farm and no hired labour is employed. Contractors are used at times where extra labour is required (clipping and dipping) and to keep machinery costs down (haylage making).

He says the aim for the sheep enterprise is to have a simple, lower maintenance system. The farm has 500 breeding ewes in three flocks: A purebred hill flock of Swaledales, a flock of Swaledales put to a Bluefaced Leicester tup and a flock of North of England mules put to a Texel terminal sire. The Swaledales are generally kept on the moor and higher land with hogs off wintered locally. The crossbred flocks graze the inbye. In winter they are fed haylage, sugar beet and concentrate. Concentrate is also fed to some of the lambs to help finishing. Generally, all lamb outside. All of the wether lambs are sold fat. The pure and crossbred ewe lambs are sold as shearlings, as breeding stock or kept as replacements. The marts are used for all sales. Other avenues have been tried but they want to support the mart.

Major animal diseases have had a significant impact on the farm. In the mid 1990s the farm was a mixed beef and sheep operation with 70 suckler cows and 800 ewes and employed a herdsman. BSE led to a fall in the price of fattened cows from £900 to £200. By 2001 the number of suckler cows had dropped to 45. The farm was infected by FMD and all stock culled. This major event prompted the family to take a step back and reassess their farm business. As a result they agreed to introduce a less intensive farming system.

Post FMD it was decided not to return to cattle rearing. The main reasons for dropping the Suckler cow enterprise was a combination of low profitability and a shortage of labour as their herdsman had moved to another job during the FMD period. It was also decided to reduce the number of breeding ewes. The move to a more extensive sheep-based system would also allow them to join agri-environmental schemes and the payments would help compensate for the drop in livestock income. The farm now has ELS and HLS agreements. The ELS options include very low input grassland. The HLS options include grassland management for birds and wall and hedgerow restoration. The schemes were joined partly for income but also from a desire to leave a positive environmental impact.

He says a reduction in inputs has taken place partly due to the introduction of the extensive sheep system and partly due to the Environmental Stewardship prescriptions. The land receives little in the way of inputs, just sheep manure from the pens. No bagged fertilizer is used and the land hasn't been limed for a long time but may be in need of some.

He says that the switch to SPS has made little financial difference but has been positive, as it has allowed them to farm less intensively. The move out of cattle also means that there is less need for capital investment in equipment. Cross compliance has not had much impact owing to the AES and extensive nature of the farming. Care has to be taken with supplementary feeding. Although the farm is located within an NVZ the designation has not had an impact.

Summary 2

The farm in this example had undergone a number of adjustments in recent years. While the sources of household income had been diversified beyond the sheep and beef enterprises the farm business was still heavily dependent on public support payments. The introduction of the SPS had led to a reduction in sheep numbers, which also coincided with a decision to move to a more extensive sheep system deployed over a larger farmed area with lower inputs. These decisions had taken place at a time when the farmer had thought his son would not succeed him on the farm and he was winding down his business. However, all this changed when his son unexpectedly returned to the farm. Now the farm has adopted a new form of business diversification in an attempt to increase income and the farmer is contemplating intensifying production from the sheep enterprise. As with the previous example, the farm's high dependency on public support payments is likely to make it vulnerable to any changes in public support.

Mr. and Mrs. E have a mixed tenure sheep and beef farm. They were originally in dairying but the enterprise was dropped in the 1980s. The farm is 80ha of which 60ha is improved pasture. The remainder is rough grazing and woodland. There is no moorland. The farm had recently increased in size when land became available to rent. Mr. E. says the additional land was needed for sheep grazing as he was reducing fertilizer inputs. The farm's income is derived from the agricultural enterprises, support payments in the form of the SPS and AES, and on-farm accommodation. The farm business profit is similar to the support payments. Without the support payments business profit would be less than £5,000.

Until recently Mr. E. was slowly winding down the sheep and beef enterprises and thinking about retirement, as his children had shown no interest in the farm. There has, however, been a major change in farm policy as Mr. E's son has unexpectedly changed his mind and decided he wants to farm.

Mr. E has been cutting back on sheep numbers; he had 350 ewes ten years ago. He was sure his son wasn't going to farm and he was slowly cutting down on numbers. *"It would have been touch and go whether I could have gone on any longer at the present level. I might have cut back more and sold a little land or rented it out. Now he wants to farm I'll have to stick with it!"* Now that his son has returned Mr. E. thinks that there is capacity to increase stock numbers on the farm.

Mr. E. works full-time on the farm and his son is now part-time splitting his time between the farm and a local agricultural college. Mrs. E works part-time on the farm and looks after the paperwork and the holiday accommodation. Mr. E used to make heavy use of contractors but now that his son has returned they have bought machinery and will do more of the work themselves. They will also start a contracting business to bring in additional income.

They have 260 breeding ewes, with 175% lambing percentage and keep about 40-50 ewe lambs for replacements. The breed is a Texel-cross. FMD was the trigger for changing their breed. Before FMD they bought 40-50 Welsh mules from Montgomery every year, but since FMD they have bred their own replacements. They now keep a mainly closed flock so that there is little risk of any disease, such as scab. The lambs are sold from July to Christmas and they fatten all the lambs. They bring the sheep in for lambing. They also have a suckler herd of 15 cows with 100% calving. Mainly Limousin crosses – mainly all home bred and kept for 12-15 months. They go out early May and return in middle November and are over-wintered indoors.

They have a CSS agreement on their farm, which will run out soon and Mr. E. intends to look at Uplands ELS. They also have an ELS agreement. The schemes have suited the farm, as they tend to mow quite late anyway.

The loss of headage payments and the move to the SPS led Mr. E. to reduce his sheep flock by around 25% as it wasn't cost effective to keep the numbers higher. Also it looked as if his son would not be returning to the farm. Whilst Mr. E. had reduced stock in response to 2005 CAP reform, there have been other influencing factors. FMD prompted a change to a closed flock and high fertiliser prices have meant he has cut back a lot of fertiliser usage. Applications on the pastures have been reduced by over half. He mainly applies it on the sheep pasture now, just enough to try and boost the lambs.

He says that cross compliance has not influenced the way he farms. He just feels like he is being watched all the time. The Environment Agency has come out to check his muck spreading and sometimes he can't take it all in. He is in an NVZ and has to keep muck spreading records. He might have to put in a bigger muck storage facility, so he has enough for four months.

Summary 3

The third example illustrates some of the issues faced on tenant farms in the uplands. A key factor influencing the management of the farm is the determination of the farmer not to reduce his stock numbers, as his cows are his major asset. This is causing a potential conflict with the adoption of the Uplands ELS. The farmer feels he has little room for manoeuvre in adjusting his agricultural enterprises and non-agricultural activities provide a greater contribution to household income.

Mr. and Mrs. C. have a small rented farm (<50ha) All the land is improved pasture and there is no rough grazing or moor. There will be no succession as their children are not interested in taking on the farm. They plan to keep farming for another ten to 20 years. The farm is too small to support the family and Mrs. C. provides on-farm accommodation and also has an off-farm job. Mr. C. says that his wife is the main breadwinner and that without the Single Payment the farming side of things would have lost a lot of money. Mr. C works full time on the farm and they do not use contractors. He might help his neighbour out with bale wrapping and he'll do the same for him.

They have 50 mixed breed suckler cows in a closed system. Mr. C. says he has no intention of expanding and can't get any bigger without a big investment. They are just a bit squeezed at moment and currently need to buy in around 50 bales of silage to tide them over. If they needed to expand they would need another shed, if they needed another shed then they would need more land. They bring the cattle in the last week of Oct and they are back out by late April or early May. Since they started Mr. C. says they've never seen a good time. They went straight into BSE and then FMD. The prices at moment are too good to be true. They use 12 tonne of fertiliser a year. The FYM goes back on the land, and they have just loose house straw so there is no slurry. They also use 40 tonne of lime a year, as it is very hungry land.

They have joined ELS and before that they were in CSS for 10 years. The farm buildings were in a bad state of repair and they got a grant for dry-stone walling. The priority for the landlord was the buildings. They didn't need to make many changes to their management practices. They will look into Uplands ELS but Mr. C. says it needs a bit of thought, as they don't want to reduce their stocking rate. They struggled to get the points with ELS as the stock is the priority and he is not going to reduce numbers to score a few points. He strongly believes that once you take your cattle off you will never be able to get them back on. With the price of cows these days you wouldn't be able to afford them. *"Because at the end of the day that herd out there is my pension policy. It's what I'll have to live off when I retire."*

The farm made a profit of less than £5,000. *"To be honest we aren't in it for the money."* He thinks that sometimes farming doesn't suit a profitable time. Once you get money in your pocket everything else seems to go up in price e.g. fuel bills, vet bills, straw for bedding is £30/acre and not long ago he was paying £12-13. The landlord will be looking at the amazing prices they are getting, but he just thinks short term. They are actually not that much better off.

No changes were made when the SPS was introduced. They knew what they could run off the holding and stuck with that. In terms of cross compliance, Mr. C. tries to go by the book, but this winter he has never seen the place so wet and you have still got to run the tractor around.

Regional similarities and differences

As noted previously, each of the eight upland regions has its own character. The farm survey identified a number of differences between the regions in terms of the different types of farm business adjustment that had taken place in the recent past. The evidence for this came from discussion with farmers about the changes that has taken place on their holdings and from more general discussion about the changes taking place in their area.

The South Pennines stood out from the other regions in terms of its farming structure. Here, particular issues were raised about farming in the urban fringe relating to stock management problems, such as sheep worrying, vandalism and the theft of livestock and equipment. Off-farm working and part-time farming was common. The farms were generally small but had better quality land. There was also a high demand for country residences and land from lifestyle farmers and non-farming interests. There was also less interest in Environmental Stewardship, particularly HLS as some of the farmers thought their farms had little to offer in terms of environmental value.

In those regions where the farms commonly possess a well defined upland land-use profile of moorland, rough pasture, improved pasture and meadow, a number of broadly similar changes in land use had occurred.¹¹ There had been a reduction of stocking on the moorland and rough pasture largely as a result of FMD, the removal of headage payments and entry of much of this land into AES. This had been accompanied in some cases by a concentration of sheep enterprises on the better quality grassland.

The moorland areas of the uplands are often subject to a complex arrangement of property rights where more than one individual may have the right to use the land for different purposes. Multiple land use is an important factor influencing farm practice, particularly in the in the north of England (Lake District, North Pennines and Borders, Yorkshire Dales and Bowland and the North York Moors). Shooting estates and water utility companies own large areas of moorland and have an interest in managing the land for non-agricultural outputs (i.e. grouse and clean water supplies which require careful control of livestock grazing). The farm interview survey found examples where such non-agricultural interests had a strong influenced the land management practices of farmers who tenanted the land:

¹¹ i.e. all regions with the exception of the South Pennines, Peak District and Welsh Borders.

Mr. D. is a tenant farmer on a large upland estate. He says that pretty much all he does has to fit in with the estate's policy for managing the moorland. He says that it was made very clear to him when he took over the tenancy that the grouse came first and the sheep came second. Mr. D. went into the tenancy with his "eyes wide open" and says that the low rent he pays, is compensation for the restrictions the estate places on his use of the moorland. Mr. D. says that in the past the shooting estates would try and get their tenants to reduce sheep numbers on the moors because they were overgrazing the heather, but numbers had come down quite a lot after headage payments were dropped. However, now there is a major problem with 'ticks' which is threatening grouse numbers. The estate has introduced a tick eradication programme (by inoculating the sheep with a chemical that kills the tick) and wants the farmers to increase sheep numbers again so that ticks can be kept under control. He says that this has led to a very complicated situation where some farmers have been happy to increase numbers, while others have got used to living with less stock and don't want start driving their sheep onto the high moor where the ticks are.... Mr. D. says there has been talk of entering the moor into an AES but there are issues with the stocking rates required by the tick eradication programme and what Natural England would like to see.

The management of cattle enterprises in the South West Moors and Welsh Borders was strongly influenced by the contraction and risks of contraction of bTB.

Recent changes in livestock grazing

To conclude this chapter attention is turned to the impacts on farm practice, particularly livestock grazing, of some of the farm business adjustments discussed above. Appropriate levels of grazing are important for maintaining many valuable upland habitats. In the past, headage-based livestock support schemes encouraged increases in livestock numbers leading to overgrazing in many areas. The introduction of the area-based HFA in 2001 and the decoupled SPS in 2005 has removed much of the economic rationale for high stocking rates but instances of overgrazing have been replaced by concerns that farmers are undergrazing or abandoning their moorland while at the same time intensifying the management of their improved or semi-improved grassland.

Recent changes in livestock grazing: Findings from the Upland FPS and the RuDI study

The Uplands FPS investigated these issues by recording changes in land management practices on the three main upland land types: moorland, rough grazing and other grassland. The questionnaire asked farmers to indicate what changes they had made to grazing on the different types of land over the previous four years (2005 to 2009). Overall, the survey found that the majority of farms had not made any changes to their grazing levels. However, where there had been change this was largely to reduce grazing. The fact that 36% of farmers had reduced or stopped grazing on moorland would suggest that destocking of moorland is quite a common occurrence. The main reason, reported by farmers (64%), for reducing stock numbers was compliance with AES prescriptions which suggests that much of this land is now being managed for environmental purposes and the risk of over and undergrazing should be reduced. With regard to the intensification of improved grassland,

the Uplands FPS found little evidence that farmers had increased grazing on this type of land.

There is little evidence that those that have reduced or stopped grazing moorland have in turn increased their grazing on better quality grassland. 35% ($\pm 9\%$) had also reduced their grazing on "rough grazing" and 22% ($\pm 8\%$) had reduced their grazing on other grassland whilst the remainder had largely made no change to their grazing levels.

(Uplands FPS)

The RuDI study also investigated the issue of whether farmers were now undergrazing on the moor and intensifying their better quality land. The findings on the RuDI study support the evidence from the Uplands FPS of a decline in moorland grazing but also found there had been significant changes on the better quality grassland as well. The RuDI study found that the combined impact of livestock disease episodes (FMD and bTB) and decoupling in 2005 encouraged livestock farmers to adjust their businesses to a more extensive livestock system which was partially compensated by entering the businesses into agri-environment schemes. This has resulted in a reduction of stocking levels, notably on the moorland areas of the farm. However, in over half the RuDI case studies, there had also been a subtle but significant change in the emphasis of the overall land management, away from a focus upon purebred hardy stock on the moor and towards breeding and rearing a higher proportion of stock on the better quality inbye grassland. On many of the farms in the RuDI study, the movement of stock away from the moorland areas and its entry into agri-environment schemes has meant that moorland is frequently no longer an integral part of the farming system. The RuDI study concluded that the traditional upland pattern of farming, involving the integrated management of moorland, rough grazing and inbye land, was in danger of breaking down in the two study areas.

Recent changes in livestock grazing: Findings from the farm interview survey

The farm interview survey also found examples where the combination of FMD, the introduction of the SPS and availability of AES agreements had encouraged farmers to adjust their livestock enterprises by reducing sheep grazing on the moor and increasing numbers on the inbye.

Mr. R. has 1,400 breeding ewes; 600 pure Swaledales and 800 Texel mules that are put to a Texel terminal sire. All lambs not kept as replacements are sold as fat. Most of the Swaledales are kept on the moorland. Those with twins tend to stay down together with the crossbreds on the better land. Some of the mule hogs are away wintered (up to 20 miles away.) Mr. R. said that his AES agreement required less sheep on the moor so three years ago they decided to drop their suckler cow enterprise (30 cows) and the excess sheep from the moor were switched to the inbye. Dropping the suckler cow enterprise also saved labour (they had additional help for the cattle) and reduced the animal handling safety risk.

There were also examples where the decrease in moorland grazing was achieved without making many changes to inbye management. This was achieved through carrying less stock, by an increase in the away wintering of stock or by securing additional grazing land. It was not always the case that

decisions to extensify production predated decisions to enter agri-environment schemes.

Some of the farmers interviewed said that AES agreements had been particularly successful in addressing the overgrazing that had been encouraged by headage payments. Farmers reported that heather regeneration had taken place and there had been an increase in species diversity on the areas of rough grazing and moorland that had been entered into the schemes. This was largely confirmed by the environmental case studies. In the regions where common land was widespread it was reported that AES was a significant factor in holding together the traditional system of management. However, it was also reported in the South West Moors that some farmers found it difficult to enter their moorland into AES because the isolation of the main farmstead in relation to the moorland meant that it was difficult to meet AES prescriptions regarding stock management on the moors.

During the interviews there were also examples where farmers mentioned that the rough grazing and moorland parts of their farms, which were in the schemes, were becoming disconnected from their commercial farming activities and the active management of such land could not be guaranteed if the schemes ended. This was a particular issue on farms where farmers had significantly reduced or no longer kept a purebred hill flock and where the production system now focussed on crossbred sheep located on the better quality land. These findings are very much in line with those from the RuDI study.

“We found it wasn't worth keeping the Swales so we got rid of them. We get our neighbour to graze the intake with his sheep ... he's always short of grazing, and that keeps Natural England happy.”

(Dairy and sheep farm)

However, there were also examples where the pattern of management appears not to have changed much, with farmers continuing to use the two types of land for agricultural production.

“Things haven't changed for the last 20 years or so. We can't do much else with the land on this farm.”

(Sheep farm, North Pennines and Borders)

Overall, the findings from the farm interviews are consistent with the Upland FPS and RuDI study results in terms of decline in moorland grazing. In terms of the management of the inbye there seem to be a greater variation of management practices taking place on the interview farms compared with the RuDI study.

5. Future change on the farm and policy awareness

Before presenting the farmers with the different policy scenarios they were asked about what changes might take place on their farms over the next five years. In particular, were there signs under the current policy framework of

farmers radically changing their approach to farming or exiting farming altogether? Then they were asked what potential changes in policy they were most concerned about. This was done to gain a better understanding of their awareness of what might happen in the future.

Future change on the farm

When farmers were asked about changes they expected to take place, a frequent response was that they didn't think there would be many adjustments at all and that they would largely keep doing what they had been doing in the past.

"We can't really change a lot. The type of farm we have. You can't plough anything. You just, hopefully, keep going. If stock remains a decent price you should manage to make a bit of profit." He says it is the market price that determines how well he does financially. He will stay in farming "because I don't know anything else. You like doing what you are doing and as long as you get a reward you carry on."

(Sheep and beef farm, Lake District)

Mr. K. feels that the balance of enterprises for him is very limited, and that he can't do anything else. He says he will stay farming as long as it breaks even.

(Sheep and beef farm, South West Moors)

Mr. D. says that no changes are intended as far as they know. The balance of income sources will remain the same although beef and sheep will be up this year. So within the next few years the system will stay the same. Although he is in his 70s Mr. D. said, "I'm not retiring yet I will keep going. You can't just stop. I've been working here for 50 years."

(Dairy, beef and sheep farm, Welsh Borders)

For some it was very difficult to plan for the future, as there were often uncertainties:

Mr. K. says their future is completely uncertain. The rented land "could go tomorrow", while the landlord is very nice but he runs it for his family so they could pull out anytime. The tenancy agreements are short. Mr. K. says the only security is the land they own. He took a farm in FMD, which helped him out as nobody else wanted it but landlord quickly forgot the favour. "When the rent review came I was excluded from grazing land." So the future depends on whether they can continue to rent land. The balance between the sheep and beef enterprise will stay the same but ultimately depends on access to land. Winter carrying capacity for the sheep flock is a limiting factor – they would not reduce cattle numbers.

(Sheep and beef farm)

"It's not easy looking forward that's the problem ... Milk prices are very important to us, ...you tell me what's going to happen?"

(Dairy and sheep farm, Yorkshire Dales and Bowland)

However, as the discussion developed during the interviews it became apparent that many farmers were considering making adjustments to the way they farmed, it was just that they considered them to be routine rather than anything that was particularly different. For example, the move from the HFA to the Uplands ELS was sometimes seen in this way:

Little change is anticipated in the farm business over the next 5 years. However, Mr. C. also said they will need to apply for the Uplands ELS and, because they were early

joiners of the ELS, they will have to renegotiate the whole Stewardship agreement. This is seen as an opportunity for them to enter higher payment options.
(Sheep farm, South Pennines)

Fifty one of the 83 farmers were considering making adjustments to their farms and the types of adjustments varied markedly depending on their current farming situation and the types of adjustment they had made in the past (Table 5.1). From the interviews it was clear that decisions and adjustments made in the past often set the context for what would happen to the farm in the future. For example, there were some very obvious and clear differences in the plans being made by the farmers who were in the process of withdrawing from agriculture and those being made by commercial farmers who wished to continue making a living from their farm businesses.

Table 5.1: The importance of farm business income and future change

Importance of farm business	Considering changes		
	Yes	No	Total
As a source of income (Commercial)	37	22	59
Not as a source of income (Hobby)	4	7	11
Withdrawing from agriculture	10	3	13
Total	51	32	83

Source: Farm interviews

For those farmers who were in the process of winding down their businesses there was a clear link between past and future adjustments. Here the farmers tended to talk about how they were phasing in their withdrawal from agriculture. The discussion was often about when and how much of their land would be sold or rented out and the order in which they would be giving up different enterprises and sources of income.

Mr. A. has quite clear plans for the future, which involves imminent retirement (Something they had been working towards for a while). If all goes to plan then by the end of 2010 and into 2011 they intend to only have the horses and a few head of stock and all the rest of the land will be let. They have some property that they are selling and once that has sold they will sell all the stock. They will both be collecting their pension; they will have money from the horses and from subsidies (SPS). They will keep 10-12 acres for the horses and 20 acres at the far end of the farm, which is not easy to access without traipsing through the farm with stock. This land will have a few head of stock and be kept for tax reasons. They have someone nearby who will look after the stock any time. "As long as you keep some stock and are hedge cutting you are still farming." He says it is what they have worked towards and they have never had any proper holidays. His mother carried on and on until she jiggered herself up. His dad was lucky in a way because he had folk working for him. But some of these folk they get to 60-65 and they're hobbling up and down on a stick and his wife is not big enough to be knocked about by the cows, as she is 5ft nothing.

(Withdrawing from agriculture)

Mr. and Mrs. B. intend to sell up in the next 5 years as they will be too old and frail to look after the farm and it wouldn't make sense to pay someone to look after it. They will go and live near their daughter. The farmland will be rented out until they sell. Mr. B.

feels sure that the nearby absentee landlord would rent it, or the guy next door. He thinks the house would make a good retirement home.

(Withdrawing from agriculture)

Of particular interest to this study is what type of future the group of commercial farmers envisaged for their farms. To what extent are they thinking of radically changing their approach to farming or exiting farming altogether?

The interview survey found numerous examples of farmers who were planning to exit farming. When questioned about future changes, ten of the 59 commercial farmers said that they had decided to leave farming and wind down their businesses. The main influences on their decision to leave farming tended to be a combination of economic pressure, increasing age and ill health and the lack of a successor. Interestingly, five of the farmers were in the 40-54 age category and from the interviews it was clear that the farmers were not prepared to carry on farming into old age. The farmers' responses very much echoed those farmers who were already withdrawing from agriculture with regard to the phasing of their exit from farming.

He is uncertain as to how long he will carry on farming. It depends on how he feels some days. "I'm not hurting today." He has to handle the sheep on his own, other than a couple of hours help with lambing. He thinks that in the next five years he will probably sell the sheep, depending on his health. He says it is unfortunate that he doesn't have any other interests, and there are a lot of people like him. He is lucky in that he has his grandchildren and he will keep some sheep for them to look after when they visit as long as they want it. He will rent out the land and he thinks there will be people to take it on.

(Sheep farm)

For the remaining commercial farmers, who planned to stay in farming, the discussion often focused on how they were responding to existing economic, social and policy pressures and the challenges they faced in keeping their businesses viable into the future.

Mr. E. firmly believes they can't continue as they are. They have both taken off-farm jobs to help keep the farm going but now they have less time on the farm. Mr. E says they need to consider how to maintain an off-farm income to have the lifestyle they want on the farm. Having less sheep won't be right for the farm, as the grass won't regenerate itself.

(Sheep farm)

From the farm interviews there was little evidence to suggest widespread intensification or super extensification was being considered over the next 5 years. However, there was one example of a farmer who was planning a systematic programme of land improvement:

Mr. A. has recently taken over the family farm and believes he can make the farm profitable again. He feels the only way he can do this is to bring the farm out of the ESA and improve the productivity of the farm. He aims to build up the beef enterprise and produce "Rolls Royce silage" which requires a lot of drainage, ploughing and reseeded. "I'd love to grow maize because its such a high energy feed for beef cattle so if we could grow it... That's the difference with the local farmers who are like, still 200 years ago, roaming around on their little tractors and a few sheep here and there."
(Beef farm)

There were other instances where farmers talked about their desire to increase production through land improvement but they also said they were not going to make any changes.

"At present the bit that isn't drained is a hundred odd acres, it will only carry cattle in June, July and August. If we got that drained we could carry another 40 head of cattle or we could go to more lowland sheep on that section. Maybe switch 200-300 ewes on to it. The potential is there to keep more and to run another member of staff as well."
Mr. B would do it if the improvement grants came back.
(Sheep and beef farm)

It was more common for the commercial farmers, who were planning change, to contemplate similar types of adjustment to those they had undertaken in the past. For example, some of the farmers were looking at developing their livestock enterprises in conjunction with participation in AES. It also emerged from the interviews that many of these farmers had already adopted this type of adjustment in the past and because of this experience the farmers were more amenable to this type of adjustment in the future.

Mr. R said he was taking over from his father (his father was in his 80s) and will certainly be looking to enter another AES when the ESA finishes. He will also be looking into organic farming. The total area of the farm will stay the same. If anything he might reduce the number of cattle if things became difficult. They intend to keep their current breed mix in the future. Mr. R. says inputs costs and meat prices are the main drivers. His children are still small so he's not sure about the long-term future.
(Sheep and beef farm)

Mr. C. envisages he would keep the same system in the future but he is contemplating changes to the balance between enterprises. No intensification is planned as Mr. C has just signed an HLS agreement, which restricts stocking rates. They already have an ELS agreement. He doesn't think they will expand as it's very difficult to get more land, but "It's up to the lad." They are now talking about putting their son on the tenancy. Mr. C. said they will carry on with much the same system – maybe less suckler cows and lower stocking rates depending on input costs. "It's no good trying to buy a profit in." The suckler herd would not go they would just make it smaller. Mr. C. said it depended on circumstances - how serious TB becomes and whether the government will take it seriously. If it became too expensive to keep cattle due to feed prices they will reduce numbers.
(Sheep and beef farm)

In other cases, decisions made in the past about conventional livestock enterprises or off-farm employment had set some farmers on courses of action they felt could not be reversed:

Mr. J. said he had dropped his purebred Swaledale flock after FMD and concentrated on his crossbred flocks. He said many farmers in the dale had done the same and there is no going back now. "What's done is done."

(Dairy and sheep farm, Yorkshire Dales and Bowland)

Mr. E. said the farm was unviable and he had to get a job to help support the family. His wife also has a full-time job. Working away meant that he couldn't put the hours in on the farm. They needed to make the farm easier to manage so they decided to drop the beef enterprise and keep the sheep. This is how they would farm from now on.

(Sheep farm, Peak District)

The evidence from the farm interviews suggests that under the current policy framework, the decision of farmers to exit from farming is a significant process. However, there is less evidence to suggest that the remaining farmers are contemplating many dramatic adjustments to the way they farm. Overall the nature of the adjustments being contemplated could be described as incremental rather than radical.

Policy awareness

Most farmers were aware of the CAP reforms and were concerned that a reduction in public support payments might take place. However, very few reported that they were actively changing their businesses in preparation for such a reduction. The adoption of a 'wait and see' stance with regard to policy was a recurring theme in many of the interviews.

"Who knows what's going to change. I know we (UK Govt.) want to get rid of it (the CAP), but the French will never let that happen. We'll just carry on like we always do."

(Dairy and sheep farm, Yorkshire Dales and Bowland)

Potential changes of concern are that there does not seem to be much preparation by Government or farmer organisations for the next round of CAP reform. "Farmers seem to think that they won't need subsidies. Maybe production subsidies will need to be re-introduced."

(Sheep and beef farm, South Pennines)

Mr. G. says they don't know which way policy wants them to go. One year one thing is the right thing to do and the next year it's not. Some of it doesn't make sense at all. On the one side the government is pushing enterprise, on the other side is the environmental stuff, which is so holistic. They don't know where they are. "They want you to be sharp and business minded and then the other way. It is very confusing."

(Sheep farm, Welsh Borders)

However, there were a number of examples where farmers have sought to lessen their dependence on the SPS in anticipation of a reduction.

Mr. F. says he knows that the Single Farm Payment might not last forever he wants to keep flexible. He says that they did not want to be too dependent on subsidies so after FMD the family decided to diversify their income. What was a 100% sheep and beef farm was now in two different types of AES and developing a successful alternative business that had a significant turnover. Mr. F. says that in the future the main effort would be to expand the alternative enterprise and realise its considerable potential.

(Beef and sheep farm, North York Moors)

Awareness of the imminent change of the HFA to the Uplands ELS was universal among the commercial farmers, although some of the farmers confessed to being rather vague on the detail.

Concern was also expressed about a wide range of regulatory policies, which often included comments about the fear of doing something wrong.

He is mainly concerned about increases in regulation and more red tape in the future. Ear tagging is particularly worrying, as he doesn't think double tagging will work. Most will be ripped out after 12 months.

(Sheep and beef farm, Peak District)

They feel that policy is geared towards diversification rather than making farms more profitable. There is great uncertainty about policies, for example the Water Framework Directive. They are all complete unknowns and they don't know which angle they will come at you next.

(Dairy farm, Peak District)

6. The future of farming in the uplands: The farmers' perspective

The final question in the interview schedule, before the future policy scenarios were presented, asked the farmer what he/she thought would happen in the uplands. This question elicited many in-depth and often long responses and provided farmers with an open opportunity to present their views on future change beyond the boundaries of their own farms and beyond the next five years.

From the interview survey it was clear that, overall, there was a considerable degree of pessimism, indeed resignation, about the future for upland farming. Much of the response was centred around two key themes, the poor economic conditions in upland farming and the impact that it was having on the farm community and farm practice.

Economics of upland farming

Economic decline

For some of the farmers the point where upland farming had begun a terminal spiral of economic decline had already been reached:

Mr. M. considers that upland farming has been dead for some time. It has not gone away only because of the tenacity of the farmers. Any other business in the same financial situation would have gone long ago. Some businesses will survive but traditional systems with hefted flocks etc. will not.

(Sheep and beef farm, South Pennines)

"I think we have just about gone too far down the road, to fetch it back. The upland farmer is a very ageing population. And they can't last a great deal longer. Now, modulation has been taken off us at a fantastic rate, about £10,000, which has been given over to Natural England. Now, what are they spending it on?... You have got to make it (farming) profitable. How can you ask a young lad to come into a thing where he is not going to own his own car. He is going to go out in his father's car for years on

end. And his friends all own their own cars. You ask him to work longer hours, for less money. They won't do it."

(Sheep and beef farm, Lake District)

Mr. G. says they are not hopeful for farming in the area. On the hill there are only two children farming. There will be bigger farms that won't be as sensitive as smaller farms. "You can't learn to lamb a ewe over night. You watch your dad do it." In forty years time they can't say they want ten farmers, as they won't be there.

(Sheep farm, Welsh Borders)

Mr. A. considers hill farming to be fundamentally an uneconomic activity. He expects to see much more extensive farming systems "ranching." Especially because agri-environment schemes have reduced stocking on the Commons and this disrupts the farming system.

(Withdrawing from agriculture, Lake District)

At risk but not reached the tipping point

For others the risk of decline was there but the tipping point had not been reached. Recurrent themes here included the need for recent prices to be sustained over the coming years, the need to maintain economic links between the upland and lowland farms and a need for changes in the direction of policy.

Mr. V. thought that there was a real risk of losing farmers from the most disadvantaged areas where the conditions were the most difficult. He felt there was a real problem in transferring these farms to the next generation as many sons and daughters did not want such a harsh life. He also felt that there was no longer a farming ladder and the cost of entering farming was beyond the scope of most people unless they were already part of farming families.

(Sheep and beef farm, North York Moors)

"Farming would be fine if we could get better prices. You can have as much subsidy as you want but unless the end product is making a nice trade ... we still have to get a good market price even with payments. We don't want the supermarkets to think we've got the support so they can bring the price down because that doesn't work either. We have got to have a bit of both unless there will be no hill farmers"

(Sheep farm, North Pennines and Borders)

"I think there will be a future, with these more picturesque areas, but I don't know about some of the other areas. At the top end of these dales the Swaledale sheep is more or less our life, but if they are strictly commercial, I just don't know. You are better off farming lower down. If the mule keeps going and the Swaledale keeps going then these areas will be all right, if that stops being strictly commercial then its ranching I'm afraid... It all depends on the lamb prices, these last two years it's been good. ... Compared to recent years the prices have been a lot better ... the strength of the pound, these last two years is the only thing we think that has done it. As soon as that goes the meat market forces us into the ##### as we call it, to put it crudely."

(Sheep and beef farm, Yorkshire Dales and Bowland)

He feels that if upland farming is going to survive there will have to be a relaxation of some environmental conditions. He feels that destocking of moorland has gone too far, leading to scrubby conditions that are good neither for animal production nor wildlife. As long as Government want AES they will need farmers to manage the land.

(Sheep farm, Peak District)

Opportunities for restructuring

However, counter views about the future of farming were also expressed. Here the reduction in farms and an increase in farm size was not seen as necessarily a negative development. Views were expressed on the need for the older generation to make way for farmers with new ideas and dynamism:

"I think in the next ten years half the farms need to go bankrupt, now whether that's a particularly bad thing or a good thing I don't know. Maybe it should have been done ten years ago and we might have had it all sorted out by now. I think it's progress in one way, I've got an expanding farm and if some of my neighbours don't disappear I can't get any bigger, is one way of looking at that. They have created a system where my neighbour is 83 .. he gets his Single Payment and is ##### about with a few bullocks. They couldn't do it, but they should make it compulsory that you can't draw both old age pension and the Single Payment... because those old guys are blocking the system up a bit."

(Sheep and beef farm, Yorkshire Dales and Bowland)

"A lot of the local farmers around here still think they should be able to make a living from 70 acres, forty cows and a few sheep, but unfortunately it's wake up, smell the roses ... them days are gone. You need to be highly productive... you need to times everything by four. Rather than buying five tonnes of corn in bags you need artic. loads of barley delivered to reduce your price. It's all about numbers unfortunately. ... The thing about farming is that it is black and white; you either do it or don't do it. And if you do it you need to do it right."

(Beef farm, Peak District)

"There are those that love farming and do it for the lifestyle, but this can't be done anymore, as the farms have to be run as a business. Many are not helping themselves, and are stuck in their ways. There is a new generation of farmers running on who are more proactive on the management and business front and the practicalities of getting it to work."

(Dairy farm, Peak District)

Farming Community and farm practice

Succession

A lack of financial viability was often seen as the major reason for a lack of succession:

"You have got to keep the younger people in the Dales, I don't think there is enough income, I really don't think there is enough income. There is not enough money to keep people in farming, it's bred into them but then again you have got to have a reasonable living. This year is an exceptional year because of the currency and you can't see that lasting forever and a day."

(Dairy and Sheep farm, Yorkshire Dales and Bowland)

Mr. C says he doesn't know where the next generation will come from. He doesn't see the younger generation at the market. "It's nice when you go there and an elderly farmer calls you son." There is not the money there to keep them in farming.

(Withdrawing from agriculture, North York Moors)

"There isn't many younger people coming into hill farming, well there is my son and perhaps one or two further up the dale, but there isn't many. A lot of farms have no one to follow them and the farms are gradually getting bigger and bigger and bigger. ... In the last 20 or 30 years more than half the farms have gone ... At one time 70 acres was a farm for a man, you could make a living on 70 acres, now you can't."

(Sheep and beef farm, Yorkshire Dales and Bowland)

Mr. B. mentioned the high average age of farmers in the area and the lack of sons who were interested in taking over. He felt that very few would come back in, because they can make more money, with less work, elsewhere. He also mentioned that there are a number of incomers, who all have jobs elsewhere.

(Sheep and beef farm, Lake District)

"A lot of the younger ones, well they're not interested in farming. They see our way of life and think I don't want that. 'I want a 9-to-5', and so they go and work in an office or whatever and get a decent wage and time off. I don't get a lot of time off. I don't want a lot of time off. It's the way I've lived all my life, but my kids don't want that. When I have gone that's the lot for the farm. ... The land will be sold."

(Sheep farm, Yorkshire Dales and Bowland)

Skills

The farm interview survey found farmers often thought that the social structure of upland farming was under pressure and there was a growing shortage of 'core skills' involving animal husbandry, land management and boundary maintenance. In many of the interviews farmers reflected on the way economic pressures were forcing them to farm in a way that was not best suited to the livestock or the land.

"They have been training people to dry stone wall, we went to see an exhibition, well it was disgraceful compared to what Dales people can wall. Those walls would collapse. We do a lot of things that are really skilful; we were just brought up with it. When we're gone who's going to do it."

(Sheep and beef farm, Yorkshire Dales and Bowland)

More broadly Mr. T.'s view on farming in the uplands is one of less farmers. He has noticed a very significant drop (three times less) in numbers during his career. The "nicer ones have gone" while the "harder business minded ones" have remained. The farmland will be managed less intensively and more neighbouring land being taken on, more use of contractors etc. Mr. T. considers that there will be problems with labour shortages, for example for lambing and shearing. Also there are growing issues on animal welfare. "The dedicated stockmen are gone." Overall, Mr. T. feels there are less skilled people about.

(Sheep and beef farm, South West Moors)

Mr. O. said that upland livestock husbandry is very specialised and most upland farmers are past mid-way through their careers. He is concerned that not enough people are coming through to learn and practice those husbandry skills. If they are lost, then the uplands will, "become a jungle."

(Sheep and beef farm, Yorkshire Dales and Bowland)

Another recurring theme was that hill farming could not simply be switched on and off and once resources and skills had been lost it would be difficult for them to be reintroduced:

"The thing is, if we take all this land out of production some time in the next 30 years we might need it. Who will be left to farm it? It takes 3 years to grow a calf. I know environmental schemes are a good thing and the rest of it and I do agree with them in one way, but I do think they have taken them a little bit too far in some instances. If you lose the skills out of the hills, if you lose the people you aren't going to get them back."

(Sheep and beef farm, Yorkshire Dales and Bowland)

Networks

There was frequent reference to the breakdown of management practices on moorland commons where there had been a decline in the number of active graziers. It was also said that in many areas effective management was often dependent on participation in AES.

Mr. B. says changes in the use of the Common are a big issue. "No one much else is grazing the common, so ours are spreading out a bit now." He said that now that there are less sheep on the common, his are doing better but that he has to go further to find them. Which means more work, meaning you have to question whether it is worth it. He makes full use of his entitlement. Until five or six years ago the common rights were fully utilised. A combination of farmers getting older and retiring, farms being sold to incomers... there simply aren't the farmers there used to be. "The last five years, the numbers have been drastically cut back." He felt the common was now not getting grazed enough and certain vegetation is getting out of control. The time taken to get sheep off the common is what has put many farmers off using them.

(Sheep and beef, Lake District)

Mr. R. says that after FMD there was a danger that people would stop using the Commons as many were dropping their Swales and running Mules. He said that ten years ago at the top of the dale you wouldn't have seen a Mule but now they are everywhere. He felt part of the reason that the hill flocks survive is that they have been able to put the Commons into CSS. He knows that many of the farmers complain about the rules but there wouldn't be many sheep up there without CSS. He felt there would be a lot of trouble if the scheme was to stop.

(Dairy farm, Yorkshire Dales and Bowland)

Social worth

Another theme arising from the interviews focused on farmer perceptions of their own worth. These were centred on notions of good husbandry and the production of high quality livestock. It was argued that policies aimed at supporting upland farming, including agri-environmental policy, needed to recognise just how important producing livestock was to farmers.

"People need to stay in farming, they are not going to stay around here just to put up a wall, take the money and not keep livestock ... I think they need livestock or some of them will go crazy. Managing livestock is what a hill farmer is there for, whether that is wrong or what I don't know, but that is what is embedded in us."

(Sheep and beef farm, Yorkshire Dales and Bowland)

"We've always wanted to produce food, for years they were saying (the government) produce more and that's what we've done. Now, I find it hard keeping less... you know, my mind keeps thinking you should be keeping more."

(Sheep farm, North Pennines and Borders)

However, there were others who thought that farmers needed to embrace more fully the notion that they were there to provide environmental benefits as well.

Mr. M. says he expected the subsidies to move towards the environment from the Single Farm Payment. "Some of the older hands don't like that. You have had a whole generation of people who have been paid to produce, and you have got to re-educate them."

(Hobby farm, Lake District)

Farm structure

There was a large degree of consensus among farmers that, over time, the farmed landscape would become dominated by a relatively small number of large-scale extensively run farms that would most likely focus on low input/output sheep systems. This was seen as a means of remaining viable, particularly in the SDA, where there were limited opportunities to develop other activities. There was general agreement that most of the better quality land in the uplands would continue to be farmed but that some of the more marginal and inaccessible land might not be actively managed and therefore become 'abandoned' but this would not be widespread. This landscape of large-scale extensive farms would be interspersed with numerous smaller holdings occupied by:

- Ex-commercial farmers who remained primarily due to cultural ties and were reluctant to give up farming altogether;
- Multiple income-source farmers who often took up off-farm employment and had limited time to devote to farm management;
- Hobby and lifestyle farmers who were not reliant on their farms for income.

Mr. G. thinks some farmers will give up in the next few years, not least because they don't have anyone to take over. As farmers come to retire, the farms will be sold. More likely, split up. Neighbouring farmers will take part of them, or maybe incomers. This has happened around here he said. They use their land, but not for farming. They won't make a living from it. They will have other income. *How do you view this process?* "You like to see farms, farmed." He felt that the ideal farm size would be about the size of their farm (c. 150ha). Any less and you wouldn't make enough money.

(Sheep farm, Lake District)

Most of the farmers in the dale, apart from one or two, have an off-farm job. One is a full-time fireman, another a contractor, another beats for other people and another works for his brother on a dairy farm.

(Beef farm, North York Moors)

Mr. B. felt the dominant trend would be to larger but less well-managed farms. He said that he could already see in the area that farms were getting too big for the labour input. He said one man looking after 1,000 ewes and 300 cattle was not right it was not farming. He said that the ideal situation would be to pay farmers to produce quality stock with higher levels of animal husbandry. This was not happening the uplands were in danger of being ranched.

(Withdrawing from agriculture)

Some of the farmers interviewed were particularly concerned about the impact that a move to larger and more dispersed farms would have on animal welfare:

Mr. O. Says that he doesn't agree with the way people are beginning to farm in the area. The neighbouring farm was taken over by a farmer "well he calls himself a farmer" who lives miles away on another farm and visits the stock on the farm very infrequently. Mr. O. says that he is fed up of rescuing his neighbours stock from the bog and wet ground that is adjacent to his farm. He says that his neighbour spends more time travelling between his farms than he does on them. "You can't farm livestock from the front seat of a pickup."

(Withdrawing from agriculture)

A view was also expressed that a move to large-scale farming would be detrimental to AES provision:

Mr. R. feels that larger scale will effectively allow an industrial care of the environment, which complies with all regulations. "I think you get less individual care of the environment." He made the comparison with industrial food, which is very 'safe', but does not have the same qualities as artisan food. "So, for example, if you say you want daisies, you will get fields of daisies. If you didn't say you wanted buttercups as well, guess what, no buttercups. Whereas, if it was a smaller scale approach, you would get the daisies and the buttercups because the people would understand that that is what you meant."

(Hobby farm, Lake District)

From the farmers' responses it is clear that many see the uplands still being farmed in the future and there was little in the way of comment on the movement of land out of agriculture into alternative uses such as forestry. For many farmers it would be likely that there would be a continuing trend toward large-scale farming and this would bring with it an extensification of production across the uplands, especially on the less improved pastures and moorland. It would also appear that they do not envisage widespread land abandonment and that some form of management will take place, even if it is simply 'ranching'. However, there is an interesting question as to when the reduction in management activity associated with 'ranching' actually turns into abandonment.

7. Reacting to potential changes in public support payments: Farmers and their farms

To investigate how farmers might react to a reduction in direct payment income they were presented with three experimental scenarios, a main scenario and two variations (Table 7.1). The effect of these potential changes in support on farming profitability and farm practice will be considered first. Attention will then turn to the likely environmental impacts in Chapter 8.

Table 7.1: The policy scenarios

Main scenario:

- 20-40% reduction in SP by 2013.
- Change from HFA to Uplands ELS.
- Regulations - tightened but no major changes.
- Prices: Sheep –5%, beef –20% by 2013, inflation low.
- Implication: Reduction in direct payment income, payments based more on environmental outcomes.

Variation A:

- Basic income support but stronger regulation.
- Increased money for agri-environment schemes (AES) in real terms.
- Move from ELS to HLS and focus on landscape scale schemes, high value areas and features.
- Implication: Harder to access environmental payments and more management requirements for same level of payments.

Variation B:

- Pillar 1 (SPS) phased out between 2015 and 2020.
- Focus on AES objectives. Same funding level as the main scenario.
- Implication: Large fall in direct support and reliance on market prices.

Engagement with the scenarios

Those farmers who depended on their agricultural businesses to provide an income and those who had a high financial dependency on public support payments were most likely to engage in discussion about the different scenarios. For some of the hobby and lifestyle farmers and some of those winding down their businesses the discussion could prove rather 'academic' and of limited interest, as they thought that such changes did not concern them directly. As a result much of the discussion below focuses on the group of commercial farmers.

Mr. H. says that none of the scenarios would affect him and he was unlikely to make any changes. He would simply become more reliant on the off-farm income.
(Hobby farm, South West Moors)

"Thankfully, I'll be gone by then and it will be someone else's problem."
(Withdrawing from agriculture, North Pennines and Borders)

However, among the group of commercial farmers there were also examples where the farmer did not engage fully in the discussion.¹² Here there was a general disinclination to believe that public support could be reduced without livestock prices increasing, thereby maintaining incomes and lessening the need to make adjustments. Reference was made to a cheap food policy

¹² 11 of the 59 commercial farmers provided limited information.

operating within Europe and that prices would have to rise if that policy stopped. Such discussions often included issues of food security. A common theme was the impending world food shortage and the role upland farmers would play in increasing production.

“In my opinion, I think there's going to be a big shortfall of food in this country, shortly. When it does happen, all the environmental lot will have to take a back seat while production is increased. Because the population is not getting any less and shipping all this lamb in from New Zealand and Australia.” Mr. B. feels that within 10-15 years there will be a shortfall in meat.

(Sheep farm, Lake District)

Putting this evidence together with the farmers' responses to the question about their concerns of potential changes in policy, it would suggest that a substantial proportion of upland farmers are largely unconcerned about, or in some cases unaware of, the potential changes to public support payments that may take place.

Farming profitability and farm practice

Farmers withdrawing from agriculture

The economic analysis showed that on the majority of commercial farms there was a high level of dependency on public support payments, even among those with diverse sources of income. It was also clear from farmers' responses during the interviews regarding their current financial position that many were under economic pressure. But just how many of them would be prompted to leave farming altogether, as a commercial activity, if public support payment were to change?

Although not wanting to place too much emphasis on the quantitative analysis of the cross-section of farms in the survey, it is instructive to look at the proportion of commercial farmers who said they would leave agriculture under the different scenarios (Table 7.2). Before the scenarios were presented the farmers were asked about the immediate future of their farms (5 years) and 10 of the 59 farmers (17%) indicated that they had decided to leave farming. The main influences on their decision tended to be a combination of economic pressure, increasing age and ill health and the lack of a successor.

Table 7.2: Commercial farmers leaving agriculture under the different scenarios

Commercial farms	At the time of the interview	Next 5 years	Farms (%)		
			Main scenario	Variation A	Variation B
Continuing farm business	100	83	79	79	59
Withdrawing from farming	0	17	21	21	41
Total	100	100	100	100	100

Source: Farm interviews

Under the main scenario and Variation A, the proportion of farmers saying they would contemplate leaving farming increases slightly (1 farm). However, under Variation B, the withdrawal of pillar 1 support altogether, the proportion of farmers contemplating leaving rises quite dramatically from 21% to 41%. In

all the cases the reason given for leaving was that the farm business would not be economically viable:

Mr. K. says the business would not be there in 10 yrs. The land would probably be amalgamated. Under the price scenario of a 20% drop in beef prices, he would definitely be out of business. It may come to the point where the farm won't pay. He feels that some of the 'slack' might be taken up by adjacent farmers (owner occupiers without pressure of rental costs), but perhaps not all.

(Beef farm, South West Moors)

A closer look at the characteristics of the farmers who would leave commercial farming under such circumstances shows that there are examples from across all the upland regions and from all the main enterprise types. There are also examples from the main tenure groups (Owner occupied, mixed and rented) as well as farms that depended on conventional enterprises to generate income and those with multiple sources. These findings suggest that potentially the loss of farms could be geographically widespread and affect all parts of the farming system:

"If that's the way it's going to be, it would be no use messing about with farming. It's like running a shop; if you lose money every year there comes a time when you just have to pack it in. I try not to think about that, really."

(Sheep farm, Yorkshire Dales and Bowland)

In response to Variation B. he says it would be almost too drastic to contemplate. They might turn to energy crops. He also thinks it would depend on what compensatory effect there might be on stock prices. They might do what neighbours have done and back out of 'real farming' and let the land for summer grazing and seek off farm work.

(Sheep and beef farm, South West Moors)

"If there is no Single Farm Payment and the prices have dropped that much, then we would have to stop farming. We couldn't do it... What's the point? Go and drive a white van. ... I'd be a fool to carry on."

(Dairy, beef and sheep farm, Lake District)

Mr. E says his response to Variation B. would be to "dump the rented land", stop drawing subsidy, farm for pleasure without interference and make money elsewhere. "The money side wouldn't stack up." Mr. E. says he would "just walk away from Defra."

(Sheep and beef farm, South Pennines)

From the farm interviews it could be seen that family circumstances were a particularly important influence on whether or not a farmer would continue farming under Variation B. In cases where farmers had secured succession, particularly with offspring already working on the farm, they were likely to continue farming. In contrast, on farms where there was no successor in place it was common for farmers to contemplate bringing forward their retirement. The farm interviews found examples of farmers in their 40s and 50s, who had indicated in the Uplands FPS that they would be farming for another 10-20 years and beyond, who would now consider pulling out of farming, for example:

Mr. O. says he would think of leaving the industry- it would be cutting it close, they have tightened their belts that much already and could do so again but could not continue for long. It's a nice living in this place but to work seven days a week so hard for little

reward and with the children not interested he would cut his losses and enjoy the later years of his life by selling the farm.

(Sheep and beef farm, Welsh Borders)

Responses from farmers who were already winding down their businesses showed that some of them were using the Single Payment to cushion the fall in income. However, the loss of the Single Payment was likely to speed up the process of disengagement on some farms:

Mr. B. says that if the Single Farm Payment was removed altogether, then he would consider bringing forward his retirement plan and the sale of the farm (either all or part of it) "There would be no point hanging around." It would depend a lot on how the payment was phased out.

(Withdrawing from agriculture, North York Moors)

There was also evidence to suggest that tenant farmers would find the withdrawal from farming more difficult:

Mr. A. says if the Single Farm Payment is phased out he will retire. He doesn't know how they will pay for retirement. The farm is paying for electricity, telephone, running of car and landrover, and heating the house. If he retires they will suddenly have all these bills to pay themselves and nowhere to live. In the past tenant farmers would sell deadstock and livestock and it bought them a very nice house. He doesn't think it will do that now.

(Sheep and beef farm, North York Moors)

The farmers were also asked what would happen to their land if they were to stop farming. As with the farmers who were already leaving agriculture, the stock response was that they thought their farms would not survive as an independent business and that larger units would amalgamate the land.

The evidence from the interviews suggests that the abolition of pillar 1 in a renegotiated CAP would lead to a substantial loss of commercial farm businesses and initiate a period of radical restructuring of upland farming.

Farmers continuing with their businesses

In this section attention is turned to how the farmers, who have decided to continue with their businesses, would adapt to the different potential policy scenarios. Again the focus is on determining if there are any signs that farmers are contemplating radical changes in their approach to farming.

The main scenario

Overall, the types of adjustment being contemplated in response to the conditions described in the main scenario were similar in nature and extent to the changes farmers were already contemplating when they were asked about the future development of their farms. In response to the main scenario the adjustments proposed by farmers tended to be incremental and based upon types of adjustment they had undertaken in the past. Cost cutting, making moderate changes to livestock enterprises and joining, or increasing involvement with, agri-environment schemes were the most common types of adjustment being contemplated.

When asked how the changes they were contemplating would affect the viability of the farm business a common response from farmers was that the economic situation would remain challenging unless there were sustained price increases for their livestock outputs.

Would the farm remain viable? "I don't know if we are really viable now. That's a difficult question ... so many unknowns. It will be difficult but it always is. But we would like to think we could adapt... I don't know... Fat lambs would have to be £100 and a suckler calf £2,000. Hill farmers need support; you can't farm here without the subsidies"

(Dairy and sheep farm, Yorkshire Dales and Bowland)

There was little evidence that systematic intensification or super extensification would be likely to take place immediately among the cross-section of farms under this scenario. Expanding the size of the farm through land acquisition was mentioned in two cases, but the general response was to discount expansion as a potential form of adjustment due to a lack of available land. It was also noticeable from the interviews that few of the farmers were contemplating taking their farm businesses in a different direction to the path they were already on. For example, developing non-agricultural enterprises or off-farm employment where none was present before. Where these activities were present, farmers often said they would be developed further to compensate for any reduction in direct payments.

In response to a reduction of 20-40% in public support, the interviews identified a group of farmers who said that they would contemplate making only limited changes to their farm businesses and farm practice. It was common for such farmers to talk about their resilience, mentioning that there were always 'ups and downs' in farming and they would 'take it on the nose', that they would 'weather the storm' and hope things might be better in the future.

With respect to the main scenario, Mr. D. says he would keep the farm going, 'take it on the nose'. However he does not think he could become more efficient to deal with less Single Payment and lower market prices "We're good at maximising profit already - we can't really become more efficient -we can't feed the animals less food." He contests the scenario, i.e. that the beef prices will go down.

(Beef farm, Welsh Borders)

Main Scenario: Mr. E. says it could affect profitability but not too seriously. "It's something we would have to weather. We've had these price increase and decreases before." They wouldn't make any changes -possibly with inputs - but no change with livestock numbers. A few years ago they played the subsidy game by buying in more units and claiming on them but can't do that now.

(Dairy, beef and sheep farm)

For some the challenge was seen as one of surviving medium-term shortfalls in income against the expectation of long-term price rises.

Often the initial response, particularly on beef and sheep farms, would be to cut costs by not replacing machinery, increasing the use of contractors and limiting inputs. There were examples among the small number of farms with hired labour where the farmer would contemplate making cutbacks.

Under the Main scenario Mr. M. did not see himself making many changes. He felt that he would probably not buy a new vehicle.

(Sheep and beef farm, South West Moors)

"The cost of everything has gone through the roof, the cost of tractors, machinery, everything's gone up. We would have to make do with less and buy less and keep hold of stuff until it won't work anymore. We shall keep going because it's a way of life and what do you do otherwise... It's a way of life and we would have to, sort of, accept it"

(Sheep and beef farm, Peak District)

However, there was also widespread awareness among the farmers that they could not continue to cut costs and make efficiency improvements indefinitely.

With regard to agricultural enterprises, a limited amount of restocking sheep enterprises would take place on farms that had previously reduced numbers in response to the removal of headage payments. Suckler enterprises would undergo further reductions or be dropped altogether:

Mr. O. says he could not see how anyone would keep cattle because they are essentially subsidised through the Single Farm Payment now for them and management benefits. He says he would keep the sheep enterprise but it would become more extensive and involve a reduction in management. They would spend less time on farm management and perhaps more work off farm.

(Sheep and beef farm, Yorkshire Dales and Bowland)

Will your farm still be viable? "I have to say yes because (its) survived ups and downs over the years. But it would jeopardize upland farming. They would start reducing inputs to compensate. There comes a point when you're keeping the animals and they are not keeping you. If it becomes too expensive to keep (the) cattle they would have to be reduced."

(Sheep and beef farm, Welsh Borders)

There would also be a continuation of the trend of reducing the quantity of stock while at the same time focusing on improving quality and adding value:

Mr. and Mrs. K. think that they would be able to cope with the reduction in the Single Payment resulting from the main scenario. "We've made fair contingencies" was the response suggesting that they could cope with this set of events. Mr. K. said that they would probably reduce the number of cattle overall but increase the pedigree herd and aim to get a premium for "top notch" quality.

(Sheep and beef farm)

The most common response among dairy farmers would be to implement a moderate increase in the intensity of production, usually by increasing herd size and using more fertilizers. However, input regulations could provide a limiting factor here:

Mr. R. believes the farm could be expanded but is being held back by the NVZ nitrogen restrictions. The limit is 170 kg/N/ha, but he currently has a derogation to use 190 kg. He thinks he could easily push it to 210 units or 10kg per hectare more and run the farm efficiently at that. They could put another 10-15 cows on the farm, but they don't dare go down that route, and then find they can't get the derogation in four years time, as they would struggle for land. They don't want to spend money to expand and then find they are pulled back even more than they are at the moment. This they see as the

biggest single restriction to the farm. Mr. R. also added there is not enough additional land to take on in the area.

(Dairy farm, Peak District)

Some of the farmers reported that they had the potential to intensify production but that the key trigger would be a sustained increase in market prices.

For farmers who already had experience of combining conventional livestock production with participation in AES, further adjustments along those lines were often being contemplated as a response to a fall in direct payments. It has already been noted that a familiarity with the schemes, combined with the changes in enterprise management they had already undertaken, made this a potentially attractive form of adjustment. This was particularly the case where farmers thought they had potential to add an HLS agreement to an existing ELS agreement.

Main scenario: Mr. J. says that putting some of his land into an HLS agreement would be one option. He already had an ELS agreement, getting most of his points from a lot of little fields with walls. He had someone round who suggested that his allotments would be suitable for HLS and he might try that, although he might have to reduce his sheep numbers a bit.

(Dairy and sheep farm, Yorkshire Dales and Bowland)

The mix of enterprises and stock numbers and land area would all stay the same. They would respond by cutting back on any new machinery. They also might consider going more into environmental schemes.

(Sheep and beef farm, Peak District)

Variation A: A more closely targeted agri-environment scheme

The first variation to the main scenario, a more closely targeted AES, prompted a varied response from the farmers. A common response was to say that they would do exactly the same as they would do for the main scenario.

There was, however, a mixed group of farmers who said they would be interested in applying for a more targeted and better-rewarded AES. This group included a significant number of farms that also had non-agricultural sources of income.

Mr. D. says that putting more emphasis on the environment and going into AES would certainly be a strategy. He has looked at HLS but decided it was not for him as it was too restrictive. However in different circumstances he might consider a more demanding AES. He would certainly become more extensive if needs be. One option might be to marginally decrease the number of cows and he might have a few sheep, as they are "input friendly."

(Beef farm, Welsh Borders)

They would be interested in doing more environmental work as long as it paid. They would consider going into HLS once CSS has finished. They would be prepared to cut back production if they were compensated to do environmental work. However, he can't see that happening as there was supposed to be a shortage of food.

(Sheep and beef farm, Peak District)

A common theme among those farmers who were interested in the modified AES was that their farms would not have sufficient environmental capital and therefore be excluded from participation:

He would consider the environmental options if it was viable, although he might not be in a target area. They are not in the prettiest part of country “when five miles south you are into North York Moors National Park which is much prettier.” He says he is a “fringe farmer” to Middlesbrough with big ICI and British Steel plants.

(Sheep and beef farm, North York Moors)

Mr. A. says he would be willing to enter the farm into an improved agri-environment scheme agreement, but he thought that his farm would not have enough environmental value to attract the higher payments. Therefore, he will continue to manage the farm as he would under the main scenario.

(Withdrawing from agriculture, North Pennines and Borders)

There was another group of farmers who were interested in the modified AES but thought that it would be difficult to reconcile the way they would have to farm with a reduced Single Payment with the requirements of AES, particularly among dairy farms which tended to be farmed more intensively than other enterprise types:

Mr. R. says it all depends on the type of AES proposed. They have looked at HLS but believe it is not viable for their farm. What you gain on the AES they would more than lose on production. He believes a lot of AES schemes are geared to arable or hill farms and an AES in the dairy farm scenario doesn't work. It would reduce production considerably. They could go on to 170 kg limit and buy land further away, and then they may be able to lock extra land into an AES. But the payments would have to be high to cover the costs of renting or buying further land. They had a consultancy looking at HLS on the rented 20 acres, but it wasn't going to cover their loss of production. “They wanted bits all over the farm to make corridors, but you can't have small inefficient plots running through a dairy farm, it wouldn't work.”

(Dairy farm)

Concerns were also expressed about the viability of the core enterprises that would underpin many AES agreements:

Mr. R. thought that this would be attractive in the short term but worried about the viability of the core enterprises of sheep and beef. He felt that given their experience of working with higher-level options in the ESA they would be able to meet the greater entry criteria but the costs of fulfilling the prescriptions might outweigh the benefits. Depending on what the schemes were, he thought they might be able to join without too much modification to the core business. He thought that the AES payments might also be sufficient to keep the cattle.

(Sheep and beef farm, Yorkshire Dales and Bowland)

Finally, there was a group that showed little interest in participating in AES. This group was characterised by farmers who said they valued their independence and elderly farmers who were concerned about making a commitment:

Under Variation A. Mr. B. says he would like to carry on as he was now. He thought his low input system would meet the strict environmental requirements so he would not have to change anything. He would have to consider very carefully entering into a long-term agri-environment scheme because he would be selling the farm soon. Also he

was sceptical that his farm would have sufficient environmental value to attract a high-level type scheme.

(Withdrawing from agriculture, North York Moors)

Mr. V. says he could adapt his farm to this scenario (Variation A.) without making too many changes to management practices. As the farm was relatively extensively managed he thought that strict cross compliance regulations would not impinge too much on existing farm practice. He said that given his experience of the Countryside Stewardship Scheme he would not be particularly interested in joining a higher-level scheme unless the payments were very attractive indeed.

(Sheep and beef farm, North Pennines and Borders)

Mr. L. says he would consider venturing into agri-environment schemes that had greater restrictions, but only very reluctantly. He was not in favour of agri-environment schemes with a high level of bureaucracy and restrictions. If the agri-environmental payments remain the same and his stocking levels had to be further reduced he could not see how the farm could remain viable. He thought he would have to take an off-farm job to make ends meet but wondered if with higher management obligations he would be able to do this or afford to pay contractors

(Sheep farm, Yorkshire Dales and Bowland)

Variation B: Phasing out of pillar 1 support

The types of adjustment being contemplated in response to Variation B. were often very different to those being contemplated in response to the main scenario. In response to the main scenario farmers were contemplating adjustments that were often incremental and extensions of previous patterns of adjustment. In response to the phasing out of direct support the same farmers were now contemplating a more radical set of adjustments to their farm businesses.

The key driving force behind these changes was the dependence on public support payments for income. Without the Single Payment many of the livestock enterprises were simply unviable. Faced with such a situation it is not surprising that many farmers were contemplating far greater changes to their businesses than under the main scenario.

When asked about how the adjustments they were contemplating would affect the viability of the farm business there was a very mixed response. For some, the adjustments would reduce their reliance on income from the core agricultural enterprises, as the focus of their business shifted to non-agricultural activities. For others, particularly those tied to producing livestock in bulk for sale through auction marts, the long-term future of their business was less certain. Here these farmers often repeated views that there were limited opportunities for change and that they would have to accept a lower standard of living or leave agriculture. Finally, for some, the loss of the Single Payment was seen as an opportunity to expand and improve the long-term viability of their businesses.

Under this scenario there was evidence that some of the farmers would radically change their approach to farming and there was potential for super extensification to take place. Interestingly, the main source came from the farmers' views of what might happen to the uplands in general as a result of the withdrawal of the Single Payment. The farm interviews found that 40% of

farmers would contemplate leaving agriculture under this scenario and thereby releasing considerable areas of land. There was also evidence that some farmers would introduce low input/output grazing systems in response to the loss of direct payments and a need to take off-farm work.

The farm interviews showed that in addition to the cost-cutting that would take place on most farms, farmers were also considering a significant restructuring of livestock enterprises, stocking levels, farm size and involvement in AES and non-agricultural activities. However, perhaps the most radical adjustment being contemplated, compared to the main scenario, was to leave commercial farming altogether (see table 7.2):

Mr. and Mrs. K. think that they would be able to cope with the reduction in the Single Payment resulting from the main scenario. "We've made fair contingencies" was the response suggesting that they could cope with this set of events. Mr. K. says they would probably reduce the number of cattle overall but increase the pedigree herd and aim to get a premium for "top notch" quality... However, for Variation B. they say they would not be viable on the amount of land they had and would look into opportunities for relocating and possibly farming abroad... They would not be prepared to go into AES under Variation A., as they are too restrictive and they have had a bad experience in the past.

(Sheep and beef farm)

Mr. C. says they could adapt to the main scenario. It would not be so bad as they have no money borrowed. If the finances got tight Mr. C. says he could always go back to work (off-farm) if he had to... If the Single Farm Payment went completely Mr. C. says they could not survive. Although they had diversified into B&B and don't live above their means they feel it would be the end for the farm. Without the SFP Mr. C says there will be a lot of vacant farms in the area.

(Beef farm, North York Moors)

Many of the commercial farmers, who planned to maintain their farm businesses, would contemplate reorganising their whole business and make a series of interlinked adjustments involving both agricultural and non-agricultural sources of income. These adjustments were often quite complex and depended a great deal on family circumstances and the farm's resources. For example:

Mr. D. says that any loss of subsidy would be a problem for the farm but they would just have to manage (main scenario). They would try and become more efficient but they were pretty efficient already. They could reduce spending on machinery and use more contractors but he did not know if it would save much in the short term. He would look to keep the stocking the same, perhaps a few less. Perhaps cut fertilisers some more... Variation B: "It would mean we would have to cut down on stock and one of us would probably have to get a job. I'd probably end up looking after the stock ... I don't know whether the cattle would go or the sheep would go, but we'd probably end up getting rid of one of them and the other one would have to go out and get a job. Its drastic, well its like £20,000 you would have to do something."

(Sheep and beef farm, North York Moors)

Mr. C. says that under Variation B. he could not carry on dairy farming. "The logical thing would be to sell the dairy cows and pocket some money and get rid of the overdraft, and then farm in a different way." If he goes into HLS, he will not be able to milk cows, they simply couldn't grow enough fodder. They would be unable to put on any artificial fertiliser. They would look at 40 or 50 suckler cows and maybe lift the numbers of sheep as well. He also says that he would have to talk to his son and it

might be they sell up and move somewhere outside the National Park where they can farm more competitively.

(Dairy beef and sheep farm, Lake District)

Mr. V. says that if the Single Farm Payment were to be removed they would instigate a dramatic cost-cutting exercise. He says they would not spend anything on inputs (machinery and fertilisers). They would also seek to diversify further, including more off farm work and contracting. He would certainly not invest in the farm at all. However, he would not change the enterprise structure or stocking rate if he could help it. He says he is not keen on a higher-level type schemes as they were too restrictive.

(Sheep and beef farm, North York Moors)

Despite this complexity it is possible to draw some broad conclusions on the types of adjustments that are being contemplated. There was a broad distinction between the livestock farms (sheep and beef) and the dairy farms in terms of their responses to the withdrawal of support. The livestock farms showed a tendency towards extensification and dairying towards intensification. Family circumstances were also an important influence on how farmers, and their families, engaged with non-agricultural activities. However, there were examples of similar types of adjustment taking place in all the regions and types of tenure.

With the loss of the Single Payment a common response mentioned by farmers would be to scale back their agricultural enterprises by simplifying enterprise structures and reducing stock numbers. The overall trend was to one of more extensive livestock enterprises. Suckler cow enterprises appear to be at particular risk of contraction or being dropped altogether, because of their perceived lack of profitability without the bolster of the Single Payment. The trend from beef to sheep looked likely to be continued.

Variation B: They would try to keep the enterprises the same as long as there was a little bit of profit. They might cut back on the suckler cows if they weren't paying and concentrate on the sheep. They would also have to cut back a lot on expenses, other than the essentials. He thinks that they could just about remain viable without the Single Farm Payment.

(Sheep and beef farm, Peak District)

Where farmers had flocks of purebred hill sheep there was a mixed response. Some farmers talked about maintaining numbers, particularly those whose flock were tied to agri-environment management prescriptions or shooting estates. Others mentioned there may be opportunities to focus more on crossbreeding. Reducing numbers and increasing quality was a common theme among both cattle and sheep farmers.

As with the previous scenarios, combining a reduction in livestock numbers with AES participation was a common form of adjustment mentioned by farmers, although a number of broader concerns arose during the discussion relating to the role of AES in a policy framework that did not include direct payments (see below).

Under Variation B. making adjustments to farm size was more important than under the main scenario. This was essentially because 40% of the farmers

were contemplating withdrawing from farming. However, there were examples where the farmers said there might be opportunities to enlarge their farms.

Mr. V. says his response to this reduction in farm support would be to spread his costs of production across a larger area of land. He would increase the farm's area and the size of his sheep and beef enterprises (but not to the extent that required additional labour). He predicted that a significant number of farmers in the area would stop farming and release their land. He thought that rental prices would fall which would enable farmers like him to expand.

(Sheep and beef farm, North Pennines and Borders)

In another case, the farmer thought a possible way forward would be to expand by acquiring high conservation value land, which then could be put into AES.

Farmers often said that they would respond by reducing their reliance on agriculture by diversifying their income. However, they were often much less specific as to how this would be achieved than in the discussions about how they would change their agricultural enterprises. They frequently said they would have to get another job and left it at that. It was clear that off-farm employment could have significant repercussions for the management of the farm. In particular, farming practice would be simplified in response to a reduction in on-farm labour.

"I would have to go and find an outside kind of a job, be a contractor or do a bit of walling, maybe. I've done that before. I will have to cut down stock so that I can manage that way. I don't know ... if the support was reduced I would reduce my stock. We would have fewer inputs, maybe try a different breed, and go with more Texels. Texels can look after themselves very well; if a Texel loses flesh then there is something seriously wrong. We can feed them a lot less, I know there isn't the same amount of lambs, but there is less work that goes with the amount of lambs. You can turn a Texel and its lamb out onto these higher pastures and they will do as well as anything else."

(Sheep farm, Yorkshire Dales and Bowland)

Some farmers said that it might even influence their participation in agri-environment schemes as they often had labour intensive management prescriptions.

Farmer views on the broader impacts of a reduction in direct payments

When farmers spoke more generally about the impact that the loss of the Single Payment would have on the uplands it was clear from the response that many thought that a significant proportion of farms did not have the capacity to make the necessary adjustments to survive such a change and that the opportunities for both on and off-farm income diversification were very limited.

"if you are talking about this scenario, well I would say, in this dale there will be just three or four big ranches, that's the future its ranching if we have no Single Farm Payment... Farmers would say ' we'll just throw some sheep out', well they do this in Derbyshire now, they just turn the sheep out, don't manage them at all and just take the lamb crop off. There will be all sorts of problems, stuff dying, and stuff dying in lambing

because they haven't got the labour. That's the way they have done it, but whether that is the future I don't know, it would be a mess I would think."

(Sheep and beef farm, Yorkshire Dales and Bowland)

The issue of land prices and rental values was also raised. Some hoped that a reduction of support payments would feed through into lower land prices and rental values, which would benefit farmers who were looking to expand. However, there was concern that there could be a significant time lag and there would be an increase in insecure tenures, which would make long-term planning very difficult. It was also reported that there would be an increase in the number of farms being used as 'satellite holdings' to provide summer grazing for lowland farms and that standards of management might fall on land used in this way.

A reduction in direct payments might have a negative impact on participation in AES. On many farms the Single Payment makes a significant contribution to farm income and is frequently used to support sheep and beef enterprises. These enterprises are often essential management tools within AES agreements. It was suggested that a significant reduction in support payments might weaken some farms to such an extent that they become unviable and would not be in a position to participate in AES. This issue was also raised during the RuDI study.

During discussions about the role AES played on farms, it was reported that AES payments, based on the profit forgone principle, would not on their own be sufficient to ensure the farm's economic survival. A recurring theme in the interviews was that if farmers could not make money through their core activity of producing livestock then joining additional agri-environment schemes would not change the fundamental issue of economic viability. Either farming had to be profitable to begin with or agri-environment schemes had to provide an element of profit.

For some farms, a reduction in direct payments was likely to result in business structures and management practices that were not compatible with objectives and prescriptions of AES. It was thought that market forces might not encourage farmers to maintain purebred hill sheep enterprises and suckler cow enterprises based on traditional breeds.

8. Reacting to potential changes in public support payments: The environmental impacts

The sixteen environmental case studies included more detailed investigation of the likely impacts of farm practice change on biodiversity and the natural environment. The findings from the case studies were then considered alongside the full set of farmer interviews. This was undertaken to provide a broader perspective of possible environmental impacts of potential changes in public support payments. During our discussions with farmers it was noticeable that they were better able to talk about potential changes to farm practice than they were about the potential impacts in terms of biodiversity

and the natural environment. This was particularly the case when discussing management changes to the inbye and improved grassland. However, there was often greater discussion on the potential environmental impacts of changes to farm practice on areas of rough grazing and moorland. In contrast to the preceding chapters there is less use of direct farmer quotations to illustrate particular points and more reliance on our interpretation of the likely environmental impacts of the potential changes to farm practice reported by the farmers.

The environmental case studies

The sixteen environmental case studies include examples of 'traditional' upland farms with inbye land in the valley, more extensive intakes of rough grazing on the hillsides and open moorland, with some moorland present only as common or shared grazing rights. Other farms do not have moorland and some holdings, particularly in the upland fringe areas have no rough grazing. Although most of the farms are classed as LFA grazing, the range of enterprises encountered comprise various levels of production intensity, including intensive dairying, relatively intensive sheep and beef production, extensive sheep and beef production, an organic system and holdings where all the grazing is rented out. Half the case study farms are entirely within the SDA part of the LFA, six were mixed LFA types and two were entirely within the DA.

An environmental summary was prepared after the interview and field survey for each of the farms. The summary considered the likely on-farm environmental impacts of farm practice change for each of the experimental policy scenarios. An example environmental summary is presented below:

The farm

The holding represents ~~~ha of land located in two areas of the valley, although within each area, blocks of land are not contiguous and the area at some distance from the farmhouse consists of 6 separate blocks of land. Each area represents a 'traditional' (if rather disjointed) upland farm incorporating parcels of inbye (much of which is relatively species rich), rough grazing and moorland. Some of the enclosed moorland is designated as an SSSI. In addition the farm has grazing rights on ~~~ ha of common land. The inbye land ranges from very flat fields on the valley bottom to steep valley sides in places and semi-improved parcels at higher altitudes. The farm has ELS, HLS and an ESA agreement that includes around ~~ ha of hay meadows and the moorland. One area of moorland supported significant populations of dwarf shrub heath, the other area represented a combination of mire habitats and acid grassland. Stone walls and traditional farm buildings were characteristic of the local area and were generally well maintained.

Management

Stock approx. 0.31 LUs ha⁻¹

Sheep: ~~~ breeding ewes of which two thirds are pure bred and the rest crossbred. There is no away wintering and only twins are lambed indoors.

Cattle: ~~~ suckler cows are housed indoors between September/October and May/June. Cattle initially graze the more productive pastures in May but are then transferred to higher, less productive ground as a management tool. Supplementary feeding begins in early January. Hay/silage is scattered on inbye land and close to, but not on the moorland areas. Sheep have been dipped once in the last 3 or 4 years, and the farm now preferentially uses pour on or injects.

Inputs

Inorganic compound (20:10:10) fertiliser is applied to the inbye, except those fields in ESA Tier 2 at a rate of 125 kg ha⁻¹ to grazed areas in May and to hay meadows in June. FYM from the cattle is applied to the inbye land. A single application is made primarily to the hay meadows, but also to other inbye areas if sufficient FYM is available, although reduced cattle numbers mean that manure is scarce.

Very little herbicide is applied. Rushes are a problem on the farm and were sprayed a few years ago, however this did not control them and growth was stronger 2-3 years later. The farmer now relies on grazing with cattle and cutting in areas where cattle do not graze, to control the rushes.

Outputs

About ~~~ha of inbye are mown for hay or silage, although yields have been reduced over the course of the ESA agreement because of the restrictions on fertiliser inputs. Hay is cut preferentially, but silage is made when the weather dictates. Fields are not cut until ~~~ according to the ESA agreement, although the farmer observed that this practice was allowing rushes to proliferate.

Other management

The heather moorland is burned traditionally on a 7 year cycle, but the areas in ESA are on a 15 year cycle. Some bracken control through aerial application of herbicide was undertaken 7 years ago during August, however the density of bracken in these areas is increasing again. There is a shoot on the farm.

Farmer feedback

The farmer was clear about the benefits of cattle grazing to control rushes and generally improve the balance of productive species in the sward. However, the losses of cattle from the dale were reducing the opportunity to manage land in this way. The farmer had considered giving up the suckler herd because of the high costs associated with its maintenance. However, because they actively use the cattle to manage the land they have decided to retain the herd. Parts of the farm are in an SSSI and cattle had been excluded for 10 years. However, the sward became so rough that sheep lost condition and NE have now asked for cattle to graze the area again.

The experimental scenarios

Main: Inputs might have to be reduced further. The sheep enterprise would be maintained, since it could be managed extensively with minimal inputs and allow more income generation off-farm. However, the suckler herd would not be viable, despite its value for land management. This scenario could result in a reduction in the species and structural diversity of inbye swards as a result of the loss of cattle with their less selective grazing habit, but reduced inputs and stocking rate might have the opposite effect. However, more uniform management of blocks of fields could lead to less variability of habitat between fields and consequently lower value for other species. If the AES was not maintained there could be further reductions in field-to-field variability and significant loss to biodiversity (particularly for plants, but also for associated invertebrates and birds) if hay meadow management was discontinued.

The condition of moorland and rough grazing communities are unlikely to improve under lower stocking rates, since they are already low. The shooting interest on the moorland with dwarf shrub heath is more important to the condition of these habitats which will depend on the frequency of burning. If burning is too frequent, in order to maximise productivity and cover for grouse, the overall biodiversity value of these areas could be compromised, with negative impacts on other species which require different stages in heather development and sensitive bryophyte communities. Reductions in inputs might further reduce the risk of leaching, however inputs are already limited under the ESA agreement, therefore benefits are likely to be minimal. Loss of cattle is likely to lead to an increase in noxious weeds, which may increase the use of herbicides, although this is unlikely to have a significant impact on diffuse pollution.

Variation A: The farm could be in a position to take advantage of more demanding agri-environment schemes because the area was one of high environmental value and features that had been maintained under the ESA (dwarf shrub heath, hay meadow, stone walls and traditional farm buildings) would continue to be maintained. The farm would continue with agri-environment schemes on moorland areas. However, they might not be able to fulfil the requirements on some areas where cattle grazing is a requirement if suckler herds were lost because they were not economically viable.

Variation B: This scenario is likely to result in much greater extensification or 'ranching', which could have a significant and detrimental effect on various environmental aspects on the farm. The careful but labour intensive management of the swards by cattle, which is currently practiced, could be lost under this scenario and this could lead to species such as rushes (*Juncus* spp.) increasing on much of the inbye land and reduced productivity of the swards in terms of supporting sheep. The hay meadows, managed as part of the ESA agreement, currently only receive FYM. This might cease under more extensive management and in the absence of cattle on the holding and diversity might increase as a result of this reduction in nutrient inputs. However it is more likely that there will be losses in diversity because reduction in management inputs will mean that grazing and cutting regimes will be simplified and applied to larger blocks of land, thereby removing much of the field to field variability. In addition management of groups of fields would have a significant impact on field boundaries, which would cease to perform a function and, in the absence of agri-environment payments, it is likely that many walls would not be maintained.

The diversity of the rough grazing would similarly be reduced if cattle were no longer used to manage the sward. Because of the importance of shooting on this holding it is unlikely that the moorland would be managed more extensively.

Farmland habitats

The field survey recorded a broad range of farmland habitats. Inbye land surveyed as part of the environmental case studies ranged from short term leys with only ryegrass present through to diverse, less intensively managed permanent pasture with a large number of species sometimes present, particularly on less accessible steep slopes. On many farms, particularly in wet areas, fields that had been relatively improved but now had substantial rush cover were present, providing structural diversity and quality habitat that could be utilised by a range of invertebrates and ground nesting birds.

Current management has maintained a diverse range of habitats including relatively improved in-bye with areas dominated by rushes, rough grazing with a more diverse range of species interspersed with wet flushes and open fell comprising acid grassland, bracken, bog and heathland dominated by *Vaccinium myrtillus* (*bilberry*), all interspersed by rocky outcrops and screes. Although there is some disagreement over the impact of the current stocking rate on the open fell, it is likely that current stocking rates have improved the condition of many of these habitat types.

(Sheep and beef farm, Lake District)

Less improved pastures and those with relatively sparse populations of rushes were often considered by the farmer to be rough grazing, but were classed as inbye after field survey. Rough grazing represented a mixture of vegetation communities, often present in mosaics within intake land parcels. These included previously improved grassland that was now dominated by rushes, acid grassland which included species such as *Molinia caerulea* (purple moor-grass), *Nardus stricta* (mat-grass), *Festuca ovina* (sheep's-fescue), *Agrostis* spp. (bents) and mire communities where sedges, rushes and bryophytes

were dominant. Many of these communities represent degraded heathland habitat. There was considerable overlap between vegetation communities present on the intake land and those on open moorland or enclosed fell, where acid grassland and mire communities were present alongside dwarf shrub heath dominated by *Calluna vulgaris* (heather) or *Vaccinium myrtillus*.

There was significant overlap between the areas described as rough grazing and those described as moorland. Many of the species present were the same, but the smaller land parcels, with species in common with the in-bye, were considered as rough grazing. Species present included: *Juncus squarrosus* (heath rush), *Molinia caerulea*, *Festuca* spp. (fescues), *Agrostis* spp. (bents), *Deschampsia cespitosa* (tufted hair-grass) and *Cynosaurus cristatus* (crested dog's-tail) with some *Calluna vulgaris*. Lapwings were observed in this area. The three moorland areas are somewhat different in character, but grouse were seen on two of the three areas and lapwings were recorded on one area. The area contiguous with the in-bye is a mixture of moorland/rough grazing dominated by calcareous grassland and by boggy habitats dominated by mosses with *Molinia caerulea*, *Juncus squarrosus*, sedges, *Festuca* spp. and *Agrostis* spp. with sparse *Calluna vulgaris*. The area that has been in CSS for over ten years includes rocky outcrops and screes. Around 40% of the area is dominated by *Juncus squarrosus* and mosses with *Agrostis* spp., *Festuca* spp., *Nardus stricta* (mat-grass) and other rushes. A further 40% is dominated by grass species such as *Festuca* spp., *Molinia caerulea*, *Agrostis* spp., *Nardus stricta* and *Deschampsia cespitosa*, with mosses. In these areas there was evidence of regeneration of *Calluna vulgaris* and *Vaccinium myrtillus*. *Calluna vulgaris* is dominant on around 10% and a further 10% is bog habitat dominated by mosses. The third moorland area, which is in its first round of CSS is a mosaic of somewhat degraded habitat dominated by grasses such as *Deschampsia cespitosa*, *Agrostis* spp. and *Festuca* spp., rushes (*Juncus effusus* (soft-rush) and *Juncus squarrosus*) with sedges and mosses. Around half of this area is dominated by sedges and rushes and half by grasses.

(Sheep farm)

Small pockets of woodland, some of which had been planted under woodland grant schemes, were present on most farms. Woodland represented a significant proportion of the land area on only one farm. Across all habitat types, areas that were less improved were typically those that were less accessible to agricultural operations because of the topography or because fields were remote from the main holding. For example, one relatively intensively farmed holding in the Welsh Borders had grass leys on the flat hilltops, but the lower slopes were too steep for reseeding or silage cutting and hay was cut on these areas. As a result, swards were more diverse. In the North York Moors an isolated field on one holding had been ungrazed and unfertilised for over 20 years and had attracted interest from the National Park because of its diverse flora and, in particular, its orchid populations.

The effects of potential changes in farm practice on these habitats and associated biodiversity are complex and often contradictory. A change that is beneficial for one group of species is often detrimental to another and the precise outcome will be site specific and difficult to predict. Also, change in management may affect the local diversity and the landscape scale diversity differently. Overall benefits will depend on the existing range, quality and extent of habitats. For example, reversion of improved land to degraded acid grassland would add diversity in an area dominated by improved inbye land, although for higher trophic groups these benefits may be limited if sufficient habitat is not present. Alternatively, where acid grassland is dominant,

maintenance of improved enclosed areas would be likely to benefit overall diversity. However, the analysis of the environmental case studies alongside the full set of farm interviews identified a number of likely environmental impacts resulting from farm practice responses to the experimental policy scenarios.

Likely environmental impacts of management changes in response to the experimental policy scenarios

This section summarises the likely environmental impacts in response to the experimental policy scenarios based on our discussions with farmers about the potential farm practice changes that would take place on their farms.

The Main scenario

As noted in the previous chapter the adjustments proposed by farmers in response to the main scenario tended to be incremental and based upon types of adjustment they had undertaken in the past.

The farmer was expecting to maintain the management of the farm in a similar manner. He wanted to keep the diversity of the enterprises. Overall the farm represents little biodiversity value, being dominated by improved in-bye land, however the very low inputs meant that there are unlikely to be resource protection issues.

(Sheep and beef farm, North York Moors)

Overall, farmers thought few of the changes they were contemplating would have significant environmental impacts.

However, it was common for farmers with suckler and beef enterprises to contemplate a reduction in cattle numbers, or in some cases the removal of the enterprise altogether and this could potentially result in significant environmental impacts. The different grazing characteristics of cattle and sheep are likely to result in lower plant diversity, especially on more productive swards that do not have populations of less palatable rushes and weeds as sheep will not graze a range of less palatable species. Hence in the longer term, although plant species diversity is likely to decline, there will be greater structural diversity which will benefit a range of invertebrate and ground-nesting bird species. Ultimately however, if rushes become dominant, diversity of higher trophic species is also likely to be reduced.

The loss of cattle grazing as a management tool would be significant and it is likely that coarse grass species such as *Molinia caerulea* and *Nardus stricta* would become more dominant. Cattle could also exert some control of the bracken, which otherwise is likely to expand on the lower fell slopes since the landlord will not allow other control measures.

(Sheep and beef farm, Lake District)

Mr. F. says that the farm would probably extensify in terms of livestock management, by reducing cattle numbers and increasing the sheep:cattle and the Swaledale:Mule ratios in order to concentrate more on other enterprises. This could have detrimental effects on some land parcels where cattle grazing would help control the expansion of rush cover, which was becoming dominant. However, if less silage was required, and therefore inputs were reduced, there could be benefits to resource protection.

(Sheep and beef farm)

Some reductions in fertiliser inputs to inbye and some intake land might also occur under this scenario as a cost-cutting measure and because less conserved fodder would be required in the absence of cattle. This might, to a degree, counteract the likely loss of plant diversity under sheep only grazing systems, and would reduce risks of diffuse pollution.

This scenario would prompt Mr. V. to significantly reduce inputs, but the enterprises would remain the same. These changes could be expected to have the greatest impact on resource protection issues. However existing inputs are low, therefore diffuse pollution is unlikely to be a problem on this holding. Over time it is likely that species diversity of the in-bye land would increase. However changes would be limited in the short term since current inputs are low.

(Sheep and beef farm, North York Moors)

Main scenario: Mr. L. says that a reduction in the SFP would prompt a corresponding reduction in stocking rates and inputs, although inputs are already low. The sheep system would be simplified to allow Mr. L. to seek an off farm income. These changes would be likely to result in some increase in sward diversity on the in-bye land. Continued reductions in fertility are more likely to promote species diversity than reductions in stocking rates, which are already relatively extensive. Therefore environmental benefits could be attributed to a continuation of the current management rather than a response to the scenario. However, less management input of the land is likely to reduce overall diversity of swards as management simplifies and all fields are treated in the same way. Impacts on resource protection could be small, since inputs are already very low and further reductions in stocking rates are likely to have little impact on soil compaction and poaching (except if supplementary feeding continues) since stocking rates are already low. Reductions in stocking rates on the moorland and in-take areas should sustain the regeneration of heath species in some areas, although the balance of grazing is important in maintaining dwarf shrub heath. It is possible that, over time, undergrazing will result in significant scrub development and Mr. L. is concerned that stocking rates are already too low. The field visit did not show any evidence of this and it is likely that, in the shorter term at least, further reductions in stocking rates will be beneficial, promoting further regeneration of heath species in some areas and protecting sensitive bryophyte communities in wetter areas.

(Sheep farm)

Assuming AES participation continues there is likely to be relatively little impact on moorland habitats, except, in specific circumstances, if cattle had previously grazed these areas. There may be an increased emphasis on higher-level AES, which might benefit some moorland areas. The farmer interviews also found that farmers who were already participating in AES were often contemplating deepening that participation. This is likely to lead to further environmental maintenance and enhancement on the farms involved.

Mr. F. says that stocking levels would remain the same, but the farm might explore further opportunities to participate in agri-environment schemes. Inputs would probably remain the same because the farmer indicated that there was not much to reduce. The more improved swards may increase in diversity over the longer term since inorganic fertiliser inputs have been reduced in the past 3-4 years, but any effects will be realised only slowly. Assuming the areas in CSS remain in a similar agri-environment option, these swards will remain improved but relatively diverse although with limited structural diversity on most fields where rush cover is low. The rough grazing is likely to continue to be a wet, structurally diverse area with a wider range of acid grassland species than are typical for the surrounding area and with mature scrub and isolated trees which will be beneficial for wider biodiversity.

(Sheep and beef farm)

Modest intensification on dairy farms is likely to raise the potential for diffuse pollution. However changes are likely to be limited and restricted to marginal upland areas.

The farmer says that the dairy herd would increase to compensate for the losses in SFP. This would also require some increase in inorganic fertiliser use. Only limited intensification, in terms of increased dairy numbers, is likely since the farmer cannot afford the outlay of new buildings. However, a larger dairy herd would increase the risks of nutrient and sediment pollution and, unless carefully managed, would aggravate poaching and soil compaction issues. A small increase in the dairy herd is unlikely to have significant impacts on biodiversity, although ground-nesting birds were present and breeding success could suffer under increased cattle numbers.

(Dairy, beef and sheep farm)

Variation A: A more closely targeted agri-environment scheme

For those farms with significant environmental capital, most of the farmers would continue in AES even with more restrictive management if it were cost effective. As such, moorland habitats and hay meadows are likely to be maintained and AES management may result in the retention of small numbers of (traditional breed) cattle. However, there were also cases where the farmer would be reluctant to participate in a more restrictive scheme.

The farmer says he would enter a more restrictive AES only reluctantly, since he considered stocking rates were already too low on the moorland and additional management requirements would entail greater cost. However, this would be likely to maintain regeneration of heath species that is occurring on some of the moorland areas and protect bryophyte communities. Greater management input is also likely to promote habitat diversity by maintaining differential management between fields and wider biodiversity would benefit if greater structural diversity in the vegetation were promoted.

(Sheep farm)

The farm was unlikely to enter an HLS-type agreement because Mr. V. felt the management requirements would be too restrictive. He felt that the *Calluna vulgaris* dominated moorland was turning to scrub because the stocking rates were too low.

(Sheep and beef farm)

Those farms without significant environmental capital could be at a disadvantage under a more closely targeted scheme and some would consider acquiring land with high environmental value in order to enter AES.

The response would be similar to the main scenario. The farmer felt that there was little scope to consider an agri-environment scheme currently because of the absence of features (an ELS agreement would have to be based on low input grassland management or grassland buffer strips). A more competitive agri-environment scheme would probably exclude this farm altogether.

(Dairy, beef and sheep farm)

Some of the farmers also reported that if the economic situation allowed it a small number might withdraw from schemes if they felt the management was not appropriate. Options mentioned by farmers under lower tier schemes that might be lost include rough grazing maintenance, low input grassland and stone wall maintenance. Loss of rough grazing options is likely to result in an increased use of supplementary feeding with localised impacts on the sward and risk of diffuse pollution in some circumstances. Inputs to some areas

currently under low input grassland options could increase accompanied by a higher risk of diffuse pollution, but this is unlikely to be widespread and increases may be limited.

Variation B: Phasing out of pillar 1 support

Under this scenario a particularly difficult question to answer is what would the environmental consequences be for land that would be given up on the many farms where the farmer said they would contemplate leaving farming altogether? The extent to which any existing environmental benefits are retained, enhanced or eroded will depend to a large extent on the incoming management regime.

In our discussions with farmers who were contemplating giving up their farms a common expectation was for an existing farmer, who was acquiring more land, to come in and 'do a better job than I could'. Here the expectation was that their farm would be well managed and farmed 'properly'. This view, however, often did not coincide with their views of what is likely to happen to farming in the uplands as a whole. Here it was common for farmers to talk disapprovingly about a trend towards large scale, extensive farming systems where the land would not be well managed. Other farmers were aware that future management depended on the type of farmer who took over their land.

Mr. E. says that it is unlikely that the farm would survive in its current form. They would consider agri-environment schemes although it would depend on what was required. However, it was considered most likely that the farm would have to become part of a larger holding, either as a larger upland farm or combined with a lowland farm. These changes could have significant implications. Mr. E. thought that as part of a larger upland farm, the land was likely to be managed more extensively. This could have benefits for resource protection with reduced diffuse pollution in terms of sediment runoff and nutrient leaching. Benefits to biodiversity would be likely to be minimal in the short to medium term because swards currently have limited diversity. The implications of combining the farm with a lowland holding would depend entirely on the management system adopted, but changes could be significant. Mr. E. felt that without grazing, the area would rapidly turn to scrub.

(Sheep and beef farm)

Under this scenario many farmers were contemplating simplifying their farming systems and reducing stock numbers. In general livestock farming would become more extensive with a particular reduction in cattle numbers. These changes are likely to have a detrimental impact on both landscape character and biological diversity, although these effects could also be accompanied by reductions in diffuse pollution. In addition, inputs are likely to be reduced, leading to a lower risk of diffuse pollution, although inputs are generally quite low and changes may therefore be limited.

Variation B: The farmer says that the farm would seek to retain the current enterprise mix, but would consider reducing the suckler herd if profits fell. Reductions in the suckler herd, which would be accompanied by reduced FYM/slurry applications, would also contribute to reduced nutrient inputs and therefore potentially increases in species diversity. However, significant reductions in cattle numbers could reduce the diversity of grazing which is beneficial in generating structural diversity in swards which in turn benefits many invertebrate species. Under lower grazing and cutting intensity, the wetter areas at a distance from the farm would develop much greater structural diversity. (Sheep and beef farm)

The management of moorland habitats under AES may be retained, although areas may be grazed to fulfil AES requirements with little management of the stock. However, the requirements of the schemes may not be compatible with altered farming practice and some land may experience intensification of grazing management while other areas may see a withdrawal of active management.

The broader environmental impacts of changes in farm practice

In this section attention is turned to a number of broader environmental issues that arose from our discussions with farmers as they spoke about their farms and more generally about the changes to farm practice that might take place in their areas.

Growth in low input/output systems

If there is an increase in low input/output systems there is likely to be benefits for water quality and a decrease in fertility levels which may be accompanied by increases in plant species diversity in the long term. However, resource protection issues are highly case-specific as they are dependent on factors such as soil type, distance to water course, slope and rainfall, all of which can be very localised. On the whole, diffuse pollution is largely proportional to livestock numbers; therefore a low input/output system could be expected to reduce the impact on resource protection. However, reduction in losses of nutrients in particular may not be immediately apparent as the changes to the soil/water system can take several years to equilibrate.

Increased sheep:cattle ratio or exclusive sheep grazing

A shift in the balance of livestock types is likely to have a significant impact on the management of inbye land. Over recent years there has been a reduction in the number of cattle in the uplands and if this continues there are likely to be significant environmental impacts. Sheep preferentially graze more palatable species of grasses and graze the sward very evenly and short, whereas cattle are less selective and less uniform grazers that produce localised disturbance. Cattle grazing, therefore promotes more diverse swards, both in terms of species diversity and structure, which has benefits for invertebrate species and ground nesting birds. In addition, less selective feeding exerts some control over less palatable species such as *Molinia caerulea*, *Nardus stricta* and rushes which can otherwise become dominant in the sward. Loss of cattle is therefore likely to have negative impacts overall on biodiversity.

“People have kept less and less cattle, they cost an awful lot to keep does a suckler cow, if we cost them we're probably all losing money, that's why they're disappearing there will be no cows left before so long, some fellas have none at all. But we think you need cattle to keep the vegetation right... it gets too rough and coarse with just sheep.... We have thought about getting rid of them all, but I think we've kind of changed our minds.”

(Sheep and beef farm)

A decrease in cattle number is likely to be beneficial to soil and water quality, as cattle tend to cause poaching to a greater extent than sheep. There will

also be less opportunity for pollution by veterinary medicines, faecal organisms and nutrients (as contained in excreta), although the risk from sheep would remain.

Reduced emphasis on grazing management

A rangeland type of farming, with larger units and lower management inputs, is likely to increase the uniformity of management between land parcels and reduce attention to management of habitats and other features such as boundaries. If stocking rates fell, less conserved fodder might be required on some farms and is likely to result in lower fertiliser inputs and FYM would be reduced or eliminated.

These types of change are likely to be detrimental to biodiversity through reduced diversity in type and timing of grazing, cutting and agrochemical inputs. Although inputs would be lower under a more extensive system, inappropriate timing of inputs could have negative impacts on resource protection. There was evidence that on some farms, management inputs were high in order to target grazing management, but it is assumed that this approach would not be possible in a very extensive system.

" All we ever look at is have we got enough cows because you have to have a certain number to keep right. We just manage the cows like we presume our grandfather did... just move them round ... some pastures will support more cows than others ... it varies."

(Sheep and beef farm)

On the case study farms, most grass was cut for silage. More extensive management could further shift the balance in favour of silage as a result of limited labour resources. It is therefore possible that the targeted management associated with hay meadows could be lost under a system with limited management and the botanical and invertebrate diversity associated with these habitats would also be threatened.

Reduced emphasis on grazing of less productive land

Dwarf shrub heath is maintained by burning and grazing management and the quality of the habitat depends on the balance of burning frequency and stocking rate. Similarly, other moorland communities are maintained by a balance in grazing pressure, with both overgrazing and undergrazing leading to poor condition of the habitat.

On many of the farms agri-environment scheme prescriptions have reduced stocking rates, particularly on moorland and rough grazing. Evidence for regeneration of heathland species was not always apparent in the environmental case studies; however, there were signs of regeneration on some holdings. On one farm in particular there was clear evidence of *Calluna vulgaris* and *Vaccinium myrtillus* regeneration on moorland that had been in CSS for more than ten years.

Moorland management is likely to be affected by ownership, whether grazing rights are shared, shooting interests (on dwarf shrub heath), the location in relation to other land types on the holding and of course the presence of AES.

Most of the moorland areas surveyed for the environmental case studies were managed under an AES. However, on one holding in the South Pennines, the parties with grazing rights to common moorland had not been able to agree on the appropriate management. The lack of similarity in management was a problem for the farmer, who pointed out the difficulties of keeping a hefted flock unless all graziers supplementary fed to encourage stock to remain in a particular area. Gathering stock over such large areas is impractical unless all those involved gather at the same time. The farmer suggested that these difficulties might mean that he did not exercise his grazing rights on the common in future, although there were many factors that would influence this decision. Another farmer in the Lake District highlighted the cost of gathering:

Mr. Z. said that they have to get the sheep off the fell five or six times a year. Depending on how they themselves are fixed, they will get as many as three people in to help. He felt that in total they were probably paying out another wage. 'I've heard one farmer say, recently, that if he nailed his Fell gate shut due to the number of people he has to hire in to get the sheep off the fell, financially he would be better off as long as the payments kept coming for the fell'.

(Sheep and beef farm)

It seems likely that, in some situations at least, either stock will be left on the moorland throughout the year without management simply to satisfy AES requirements, or that stock will be removed from moorland. The latter situation could lead to undergrazing of these habitats with possible increases in scrub. It must be remembered that all semi-natural habitats are a product of management and that conditions that benefit one species will exclude others. Increases in scrub and woodland would have benefits for woodland species. A greater diversity of habitats would benefit overall biodiversity if the balance of area and spatial distribution were suitable to maintain populations of a greater range of species. However, large-scale expansion of scrub would have a negative impact on species on open moorland.

The increase in crossbred sheep flocks, which was a common response to all the scenarios, could lead to undergrazing of moorland habitats if sheep are no longer hardy enough for higher, more exposed land, although there was no evidence from the environmental case studies that this effect had already occurred with increases in crossbred flocks over the past few years. Some farmers perceived that undergrazing of *Calluna vulgaris* under AES was a fire hazard. Uncontrolled burning generates much higher burn temperatures and could lead to significant damage to sensitive species and habitats. In addition, this could have a significant impact on surface water as burning can release relatively large amounts of nutrients, metals, and carbon into streams that would normally be low in these compounds, disrupting the aquatic ecosystem.

Supplementary feeding restrictions under AES and cross-compliance were considered problematic by a number of farmers and field assessments suggested that feeders were not moved sufficiently often to avoid localised sward damage. Some kept sheep on the moorland through the winter by providing supplementary feed in immediately adjacent rough grazing. On one farm, this practice had led to localised sward damage but did avoid damage to the more sensitive moorland habitats

Less maintenance of traditional features

Field surveys indicated that many stone walls and traditional farm buildings were well maintained. Although not all received AES payments, farmers were often very positive about the capital payments they had received as part of CSS/ESA agreements.

"It's been a good thing really, the land is a bit out of the way and the walls were getting into a state of disrepair and it was going to cost a small fortune to put up. But now it's all up, it's all fenced and it is all gated, and it looks really well. It will suit me for years to come, it will see my lifetime out anyway."

(Sheep farm)

However, field observation indicated that, on most farms there were some features in varying states of disrepair. One intensive dairy farm had allowed its stone walls to deteriorate over many years and the function had been replaced by post and wire fencing. Although farmers currently invest significant resources in maintaining field boundaries, not always as part of AES, there is already a tendency to maintain those boundaries that are important for management and allow those which no longer have a function to deteriorate. Under a more extensive management system, many walls would become functionally redundant both because fields would no longer be managed individually and because there would be fewer holding boundaries as units enlarge. The increase in sheep numbers at the expense of cattle could exacerbate these effects, because cattle are managed in smaller functional units. In addition, there is likely to be a shortage of skills to maintain these features. It seems likely that the process, which has been proceeding over many decades at a slow rate, will accelerate with significant consequences for landscape. Similarly, traditional farm buildings are unlikely to be maintained unless AES make this economically attractive. The shift towards fewer cattle may also contribute to a lack of management where traditional farm buildings are still used to house cattle during the winter.

Selective intensification

Although widespread intensification was unlikely, a proportion of farmers suggested that modest intensification might occur on some areas of the holding. Fertiliser use had been reduced on many farms over recent years. However, there was some evidence that this trend would not be maintained on the more intensively managed farms/fields.

Mr. D. says he would increase the pedigree cattle to compensate for losses in SFP income. Increases in cattle numbers could have an impact on both biodiversity and resource protection issues. Greater cattle numbers could increase the winter feed requirement and would be likely to encourage higher inorganic fertiliser inputs on the silage areas in order to produce sufficient winter feed. Assuming that higher inputs did not include reseeding any fields, the short-term impacts on sward diversity would be small. However, greater effects on invertebrate populations associated with fields containing rush populations would be likely if significant control of the rushes was achieved through greater cattle grazing. More intense management of silage fields or higher stocking rates of pastures could also have an impact on breeding bird populations, such as lapwing which are present on the farm.

(Beef farm)

One farmer had entered fields into low input options of CSS, but intended to increase fertiliser use on this land to improve productivity once the agreement expired. Higher nutrient status will favour a small number of plant species therefore there will be negative effects on plant diversity, which would obviously be greatest on swards that currently support the greatest diversity. However, changes would be long term and most significant where greatest sward diversity is present. Intensification of the inbye land is likely to result in a further increase in the proportion of grass cut for silage rather than hay and in the number of cuts with inevitable negative impacts on biodiversity for all groups.

Mr. V. says he would respond by increasing both the land area and stock numbers with little change in stocking rate and no change in inputs except on the land coming out of CSS. Inputs and stocking rates have been reduced under the CSS and ELS agreements and in response to the cessation of headage payments. In the past, the land was relatively improved and highly stocked and the reduction in inputs is likely to have reduced the potential for nutrient and sediment pollution. The rush fields provide good habitat for invertebrates and breeding birds. An important factor on this farm was the likelihood of increased inputs once the CSS agreement expires. Mr. V. says the fields covered by CSS agreement could have 100 more sheep and 15 more cows if the fields were fertilised. He suggested the return of land improvement grants for liming and fertilisers. The farm could be intensified by the addition of extra fertilisers and this is likely to happen once the CSS agreement expires because the farmer did not like the low input grassland options and would not be entering HLS. Although this is likely to have limited impacts on vegetation diversity, improvements to the rush dominated fields could significantly reduce their ecological value for a range of invertebrates and for ground-nesting birds. Increases in inorganic fertiliser use have the potential to increase nutrient pollution and if they are accompanied by higher stocking rates, to increase the risk of soil compaction and runoff.

(Sheep and beef farm, North Pennines and Borders)

There is the potential for increased water pollution due to intensification. Whilst there will be greater uptake of nutrients applied (i.e. more livestock eating the more nutritious grass), the farm nutrient status will only be maintained where animals are then moved off the farm (to slaughter, or sold). If animals remain on the farm, the consumed nutrients can then be excreted and are then re-available for loss to water. A higher density of livestock will also increase the potential for poaching and sediment loss to water. Selective intensification could therefore cause localised pollution, but the extent of this will be case-specific depending on, for example, proximity of water courses to the areas of intensification.

Dairy farms were the most likely to suggest the possibility of modest intensification in future. However, both dairy farms visited as part of the environmental case studies were on marginal upland areas, were farmed relatively intensively and the biodiversity value on these farms was relatively limited. Therefore, some intensification should not have significant impacts on biodiversity.

Bracken (*Pteridium aquilinum*) was considered a problem on half of the case study farms. On most of these holdings some attempt had been made to control it, by either cutting or herbicide applications. The presence of bracken can impact on water quality in two ways. Bracken produces carcinogens that

can leach through the soil, and there is the potential for the herbicide asulam to enter watercourses during control. Asulam is one of the pesticides that contribute to drinking water protection areas failing Article 7 Objectives of the Water Framework Directive. If intensification led to an increase in attempts to control bracken, there could be negative effects on water quality, on a small number of invertebrate species associated with bracken stands (e.g. High Brown Fritillary (*Argynnis adippe*) which is a BAP species) and on other species of fern if herbicide control was used. But on land subject to extensification, bracken is likely to expand where grazing, or other forms of control are prevented and in other areas it will be limited to steep valley sides.

Reduced AES participation

In the future, farmers with limited environmental capital might be unable to enter more demanding higher-level schemes and may withdraw from AES altogether. Significant extensification could also result in withdrawal from AES. The level of management requirement to meet site-specific prescriptions might not be possible with reduced labour availability and it is likely that habitats such as hay meadows could be lost. In addition, the maintenance and repair of features such as stone walls and traditional farm buildings may no longer be undertaken where labour is in short supply and without the financial support of AES. Many farmers indicated that they would contemplate leaving farming if there were significant reductions in the public support payments. The environmental consequences would obviously depend on the new management regimes. However it is possible that land would be withdrawn from AES in these circumstances, with an associated threat to a range of sensitive and high value habitats.

Some of the farmers interviewed were also concerned that current AES prescriptions were leading to undergrazing of moorland resulting in 'scrub' development and a fire hazard. One farmer suggested that he might withdraw from AES if the management requirements became more restrictive. Any intensification of the less productive habitats is likely to impact on both biodiversity and diffuse pollution.

9. Conclusions and implications for Defra

Overall conclusions

Commercial farming in the uplands has been under sustained economic pressure for many years, characterised by consistently low levels of profitability and a high dependency on agricultural and environmental payments. The extent to which public support payments contribute to hill farm incomes raises questions as to how upland farmers would react to either the significant reform or abolition of pillar 1 payments in a renegotiated CAP. The aim of this research is to determine the extent to which changes in public funding would lead farmers to radically change their approach to farming or exit farming altogether and to consider the implications of such change for the achievement of environmental objectives for the uplands.

The Uplands FPS found that under the current policy framework a significant number of farmers (21%) said that they did not expect their business to continue beyond the next five years. This is compounded by over a quarter of farms (27%) having no recorded successor. Findings from the interview survey (undertaken almost a year later) suggest that this figure could be considerably higher and, irrespective of any changes to support payment, there are already significant changes to the structure of upland agriculture in the pipeline. The long-term trend toward fewer but larger farms is likely to continue with the rate of change also likely to increase. There is potential for large areas of the uplands to change hands within the next 20 years, which could have major repercussions for how the land is managed. Findings from the interview survey also suggest that the proportion of hobby and lifestyle farmers in the uplands could already be considerably higher than the Uplands FPS estimate.

The economic analysis of the farms taking part in this study confirmed the challenging conditions that most of the businesses are already operating under. Few of the farmers interviewed made a consistent profit from farming and many said they were unlikely to do so in the near future. The farm interviews also confirmed the important contribution made by public support payments, particularly the SPS, to farm incomes in all regions and across all enterprise types. Overall, few farms are achieving profit levels that exceed the total amount of public support payments.

When we asked farmers what they thought the future held for the uplands their overall response was one of resigned pessimism and they focused on the themes of economic decline, and the impact that it was having on, the farm community and farm practice. For some, they felt that a 'tipping point' had already been reached in respect of changes to farming communities and the farming systems that they supported. For others, threats to the farming community and farm systems were apparent but they felt there were opportunities for adaptation to build a more sustainable future. Crucial to the perception of this vision was the retention of public support measures and a sustained increase in livestock prices. However, for a smaller, third group of interviewees, the continuing loss of farms and farm families would from the uplands was seen as presenting opportunities for those remaining farm businesses (i.e. theirs) to expand and develop. To some extent, these perspectives appeared to vary geographically, with most pessimism apparent in the South Pennines, for example, whereas in areas with a strong cultural identity such as Bowland, views were less negative.

Notwithstanding these different perspectives, there was a large degree of consensus among farmers that over time, the farmed landscape could be comprised of a relatively small number of large-scale, extensively run farms that would most likely focus on low input/output sheep systems. This was seen as a means of those businesses remaining viable, particularly in the SDA, where there were limited opportunities to develop other activities. From our discussions with farmers about the farm practice changes that might take place across the uplands we conclude that the environmental consequences of an extensive sheep only management system could be a reduction in

diversity of enclosed land at the landscape scale, accompanied by a reduction in biological diversity and a loss of landscape features such as stone walls and traditional farm buildings. However an improvement in resource protection could be likely with reduced livestock numbers, particularly of cattle. The more productive areas may develop more uniform swards with lower overall biodiversity value and habitats such as hay meadows, which are a product of carefully targeted management, might be lost. On less productive enclosed land species unpalatable to sheep are likely to increase which would tend to drive further extensification and enlargement of holdings. In the medium term there could be an overall benefit to biodiversity (invertebrates and breeding birds), however as these less productive species became dominant (because of a lack of any grazing control, in sheep-only systems) overall biodiversity could be reduced.

There was general agreement among the farmers that most of the better quality land in the uplands would continue to be farmed, but that some of the more marginal and inaccessible land might not be actively managed and therefore become effectively 'abandoned' but this would not be widespread. The environmental implications of this would depend on the spatial arrangement and type of land, with the potential for a greater variety of habitats to develop. Furthermore, because such land would remain only a part of much larger holdings on which sheep production remained the main focus, there would be no direct incentive for farmers to dispose of it and thus for it to be used for other purposes such as forestry or leisure. Nevertheless, where topography and settlement patterns favour it, this landscape of large-scale extensive farms would be interspersed with numerous smaller holdings occupied by three other kinds of occupant: ex-commercial farmers who remain primarily due to cultural ties and are reluctant to give up farming altogether; multiple income-source farmers with off-farm employment and limited time to devote to farm management; and hobby and lifestyle farmers not reliant on their farms for income, for whom land management is primarily a leisure activity.

Most farmers were aware of the CAP reforms and were concerned that a reduction in public support payments might take place. However, very few reported that they were actively changing their businesses in preparation for such a reduction. The adoption of a 'wait and see' stance with regard to future policy changes was a recurring theme. When the discussion turned to the experimental scenarios it was the commercial farmers, particularly those with a high financial dependency on public support payments, who were most engaged. However, among the commercial farmers there were also examples where the farmer did not engage fully in the discussion. Here there was a general disinclination to believe that public support could be reduced without livestock prices increasing, thereby maintaining incomes and lessening the need to make adjustments. Combining this evidence with the farmers' responses to the question about their concerns of potential changes in policy, would suggest that a substantial proportion of upland farmers are largely unconcerned about, or in some cases unaware of, the potential changes to public support payments that may take place.

Response to the main scenario

In response to the main scenario the adjustments proposed by farmers tended to be incremental and based upon the types of adjustment they had undertaken in the past. Cost cutting, making moderate changes to livestock enterprises and joining/increasing involvement with agri-environment schemes were the most common types of adjustment contemplated. When asked how these changes would affect the viability of the farm business a common response from farmers was that the economic situation would remain challenging unless there were sustained price increases for their livestock outputs.

There was little evidence that systematic intensification or super extensification would be likely to take place among the cross-section of farms under this scenario. Some farmers mentioned expanding the size of the farm through land acquisition, but the general response was to discount expansion as a potential form of adjustment due to a lack of available land. It should be noted, however, that this is a response which is somewhat time-dependent, in that the current trends already suggest significantly more land becoming available in the next 5-10 years. It was also noticeable from the interviews that few of the farmers were contemplating taking their farm businesses in a different direction to the path that they were already on.

These findings would therefore suggest that under the main scenario there would continue to be a decline in the number of commercial farm businesses in the uplands, as a result of gradual and opportunistic enlargement among those who wish to stay in the business, balanced by a significant number of retirees making land available to them. Continued simplification of management systems on higher land could be anticipated, whilst trends in the management of lower land would be more variable, with some intensification and some extensification, depending upon the main business focus of the land manager (e.g. whether just rearing, or rearing and fattening stock). The current decline in cattle numbers on upland holdings can be anticipated to continue, notwithstanding the relative encouragement for their retention under AES agreements, for as long as beef production remains more costly, more time-consuming and/or less profitable than all-sheep systems in which a wide variety of management strategies and breeding approaches can produce a range of business options. A reduction in cattle numbers has the potential to reduce the diversity of swards on productive inbye land and could lead to the expansion of species unpalatable to sheep. In the short term overall diversity is likely to increase but dominance of such species will result in a decline in biodiversity. Overall, reduced livestock numbers, particularly cattle, is likely to have a have a positive, if limited impact on diffuse pollution. The disappearance of dairy farms from most upland areas could also be envisaged, under this scenario, within the next decade, with associated loss of cultural diversity and value, and reduced opportunities for added-value upland farming strategies.

What the trends also show is that business decisions are influenced by policy options, but that AES funding is insufficient on its own to influence the basic trends in farming systems, which have been more influenced by the

combination of market and pillar 1 support conditions. These will tend to disincentivise cattle farming and to favour cross-bred sheep flocks. Where cattle are currently retained mainly to fulfil AES conditions, it must be questioned whether this will continue under the main scenario.

Response to variation A

The first variation to the main scenario, a more closely targeted AES, prompted a varied response from the farmers. A common response was to say that they would do exactly the same as they would do for the main scenario. However, this scenario attracted increased interest from farmers in all areas and across all enterprise types, including dairying. A common concern among those farmers who were interested in the modified AES was that they thought their farms would not have sufficient environmental capital and therefore be excluded from participation. Nevertheless there was another group of farmers who were interested in the modified AES but thought that it would be difficult to reconcile the way they would have to farm with a reduced Single Payment, with the requirements of AES – that is, they saw participation in a more demanding environmental scheme as potentially requiring sustained, if not increased, SPS support to make it possible. Concerns were frequently expressed about the viability of the core enterprises that would 'underpin' many AES agreements. Finally, there was a group of farmers that showed little interest in participating in AES. This group was characterised by farmers who said they valued their independence and elderly farmers who were concerned about making any long-term commitment.

These findings would suggest that in the uplands, at least, a majority of farmers have an open attitude towards the notion of taking on more, and more demanding, AES options. This probably reflects the fact that such a high proportion of these farms are already in schemes and thus the notion of 'doing a bit more in return for a bit more' is not unpopular. However, it is also apparent that in addition to an offer of more targeted AES funding, there needs to be sufficient financial stability underpinning the farm business – either from improved market conditions or from sustained or even increased pillar 1 funding – to give farmers the confidence to commit to new schemes. It is clear that AES goals and measures cannot be viewed in isolation from the wider economic conditions facing these farms.

Where significant environmental capital exists, participation in AES is likely to remain high under this scenario and existing high value habitats such as moorland and hay meadows should be retained and their condition potentially improved. However, a more targeted and demanding AES is likely to exclude those currently participating in lower tier schemes. There is therefore a risk that low input grasslands and maintenance of rough grazing and stone walls will be removed from AES. Although the economic situation and enterprise changes mean that significant intensification of these areas is unlikely, aspects of management such as a return to supplementary feeding and less maintenance of stone walls could have a negative environmental impact.

Response to variation B

The types of adjustment being contemplated in response to Variation B were often very different to those being contemplated in response to the main scenario. In the latter, farmers were contemplating adjustments that were often incremental and extensions of previous patterns of adjustment. In response to the phasing-out of direct support the same farmers were now contemplating a more radical set of adjustments to their farm businesses. The key driving force behind these changes was their dependence on public support payments for income. Without the Single Payment, many of the livestock enterprises were simply unviable. Faced with such a situation it is not surprising that many farmers would contemplate far greater changes to their businesses than under the main scenario.

When asked how these changes would affect the viability of the farm business there was a very mixed response. For some the adjustments would reduce their reliance on income from the core agricultural enterprises, as the focus of their business shifted to non-agricultural activities. For some, particularly those whose income was heavily dependent on producing livestock as commodities, the long-term future of their business became uncertain. Finally, for some, the loss of the Single Payment was seen as an opportunity to expand and thereby improve the long-term viability of their businesses.

Under this scenario some of the farmers said they would radically change their approach to farming and there was clearly significant potential for super-extensification of upland management to take place. The interviews found that 40% of farmers said they would contemplate leaving agriculture under this scenario, thereby releasing considerable areas of land to those who remain. There was also evidence that some farmers would introduce much lower input/output grazing systems in response to the loss of direct payments and/or a need to take off-farm work to compensate.

The environmental implications of very extensive sheep only enterprises with low labour inputs are significant and negative for both biodiversity and landscape, although there would also be modest and positive reductions in diffuse pollution. Habitat diversity of the inbye land is likely to be reduced and many hay meadows could be lost with losses to biodiversity and a change in landscape. Losses of stone walls and traditional farm buildings are likely to have an impact on the landscape. Sward diversity of the more productive enclosed land could also be reduced. Over time, unpalatable species would be likely to increase on enclosed land. Some increase in these species should have biodiversity benefits for higher trophic groups, but overall biodiversity losses would occur if these species become dominant over large areas, as is implied by these trends. The impact on moorland is less clear. These habitats might be retained in AES if the requirements can be reconciled with the wider farm management, but this might entail stock remaining on moorland with little husbandry, with potential negative welfare and biodiversity impacts. It is likely that there would be some withdrawal of management and shooting interests may become more dominant.

The cumulative impact of such a scenario would appear to be considerable, in that the management effort devoted to upland farming over large areas of land could be anticipated to decline dramatically. It is likely that fewer people would manage the land, farming systems would be simplified and some of the least accessible and least productive areas could become un-managed. At the other end of the scale, more accessible areas might be populated with larger numbers of hobby and lifestyle farms, but with such small holdings as to have only localised impacts upon environmental management, landscape quality and biodiversity. These changes are predicted irrespective of what might happen to agri-environment schemes and funding, in that time.

Implications for Defra

The trend to larger farms and fewer farm families in the uplands is a longstanding process. However, the rate of change appears to be accelerating. In the past farmers' cultural attachment to the land and the "way of life" was a very important factor keeping them farming in times of economic stress. The weight of evidence from this study, supported also by indications from the larger FPS sample, is that this "way of life" attachment for many young people is now not enough for them to contemplate farming in the uplands. Under the current policy framework at least a quarter of upland farms, probably more, are unlikely to continue as independent units into the next generation.

If pillar 1 was phased out altogether, the findings of this study suggest that as many as 40% of commercial farmers from across the uplands of England could make plans to leave farming. This is likely to initiate a major period of agricultural restructuring in the uplands. The potential nature and extent of this occupancy change raises a number of issues for Defra, as follows:

- The loss of farm businesses is likely to be widespread across all regions and all farm types. Tenant farmers will have particular problems leaving agriculture because they have often not been able to save sufficient funds for their retirement, implying significant social challenges for this particular sub-sector.
- From a social and economic perspective, the withdrawal of large numbers of farmers, and their families, from agriculture over a relatively short period of time could have a significant negative effect upon local service providers and the local economy related to farming. Whilst relatively small in respect of its total contribution to rural economic output, the cultural and geographic impact of farming-related activity can be significant and thus could be expected to negatively affect other sectors such as tourism and leisure, including sporting and amenity provision.
- Occupancy change, where control over land passes from one person to another, is known to be a major trigger of changes in farm practice, in whatever direction. This is likely to increase the vulnerability of existing habitats that are sensitive to management change, although it may also offer new opportunities for enhancement of areas which are currently highly degraded due to decades of inappropriate management.

- The type of occupancy change is also an critical influence on management practice and there is an expectation among the farmers we interviewed that, in view of the uncertainties of future market conditions, there will be a growth in informal and insecure tenancies which might encourage inappropriate short-term management strategies which may not be based upon long-term sustainability and could erode past AES environmental benefits. While agri-environment schemes have been very successful in managing inputs and grazing regimes on a wide range of habitats, increased levels of occupancy change could introduce greater uncertainty in securing long-term management through this mechanism. It is by no means certain that new occupiers will retain inherited AES as an integral part of their business planning. On the other hand, from a purely pragmatic perspective, scheme negotiators should eventually have far fewer individual businesses to deal with as they seek to secure appropriate management over the majority of the land area.

When attention is turned to the farmers who plan to remain in farming despite the changes discussed in these scenarios, another set of issues is raised.

- While most farmers were aware of potential CAP reform, very few were actively changing their businesses in preparation for the reforms. Farmers appear more accustomed to reacting to change than preparing for it. Heavy dependence on public support payments, particularly the Single Payment, make many farms economically vulnerable to any future reduction. This implies that some businesses will fail to survive despite the best intentions of the farmers themselves.
- In response to the scenarios discussed, the types of adjustment contemplated by those seeking to remain in farming (cost cutting, extensification and simplification of livestock enterprises, non-agricultural sources of income) tend to reduce the time available for farm operations. Farmers were concerned about the implications of this for animal welfare and the maintenance of the farmed landscape. A shortage of skilled labour, both on and off the farm, might become a major factor limiting the delivery of environmental benefits on upland farms and biological and landscape diversity will be lost.
- Intensification is likely to be restricted to inbye land. However, it is also likely to be very uneven both within and between farms. Accessibility, as well as productive potential, is an important factor. On some farms extensification and intensification of inbye fields may take place side by side. Although the risk of diffuse pollution may increase under intensification, the overall environmental impact will be limited.
- Many farm businesses will remain under economic stress, despite the adjustments being made, which could undermine the effectiveness of AES. The key issue here is that without pillar 1 support or profitable livestock enterprises, AES based on the income-forgone principle may be beyond the financial capability of some farms.
- On some farms, farm practice is becoming increasingly dependent on AES and disconnected from the farm's commercial farming activities.

This is particularly the case with the management of moorland habitats. In these instances, it seems likely that active management of such land would not continue if the AES schemes ended.

- It is unlikely that market forces will encourage farmers to continue with mixed livestock farming. On commercial farms, overall, there will be a continuation of the trend from cattle to sheep, which will have generally negative implications for biodiversity with swards either losing diversity or becoming dominated by a limited range of unpalatable species. However, on those farms where AES now exert a significant influence upon the economics of moorland management and thus cattle have been retained mainly for that reason, this research suggests that radical cuts in pillar 1 support would be sufficient to undermine this influence.
- The trend towards more extensive livestock systems will have a generally positive impact on resource protection and pollution control. However, localised intensification in certain places on inbye land could have detrimental impacts which could negate wider positive trends. It could also be speculated that systems employing less skilled labour could lead to a higher incidence of accidental point-source pollution from a variety of routine farm management tasks, as well as from lower levels of farm animal welfare. In turn, increasingly strong environmental regulation could act in combination with reduced time and resources for management, to push farms towards even more simplified systems.

In conclusion, it does appear as though farming in the English uplands does face challenges and opportunities in respect of changes to systems and practices which have been established over the past half-century. Whilst these have undoubtedly led to significant damage in past decades as a result of over-intensive management of sensitive habitats and features, their anticipated decline over the next decade appears likely to present as many environmental challenges as it offers opportunities (to reverse past negative trends). The key drivers to these trends appear to be the combination of market prices, changes to pillar 1 support levels and future trends in environmental regulation and disease control. If major reductions in support are made, this study suggests that there will be significant losses of both labour and skills for upland land management within the farm sector. The result of these losses seems likely to be a less economically productive, less culturally differentiated landscape with relatively low biodiversity, compared to its potential if more active and appropriate management could be achieved.

Annex 1. The farmer survey: farm and farmer characteristics

Variable	N Pennines & Borders	Lake District	Yorkshire Dales & Bowland	NY Moors	S Pennines	Peak District	Welsh Borders	SW moors	Total
Upland FPS	67	52	70	40	24	36	20	35	344
Interviews	9	10	14	10	10	10	10	10	83
Enterprise									
Sheep	8	10	13	6	6	6	8	8	66
Beef	7	6	7	7	6	7	7	8	55
Dairy	0	1	4	1	2	2	1	0	11
Farm type									
LFA livestock	9	9	9	9	7	9	8	8	68
Dairy	0	1	4	0	2	1	0	0	8
Other	0	0	0	1	1	0	2	2	6
Land type									
SDA only	5	8	3	1	4	4	5	8	38
Both	4	0	10	6	4	3	4	1	32
DA only	0	2	1	3	2	3	1	1	13
Land comb.									
Traditional	8	9	10	6	6	7	7	6	59
Other	1	1	4	4	3	3	3	4	24
Size									
> 100 ha	7	4	10	3	2	3	4	4	37
20-100 ha	1	4	3	5	5	6	6	4	34
<20 ha	1	2	1	2	3	1	0	2	12
AES									
AES	7	8	12	8	3	9	7	8	62
No AES	2	2	2	2	6	1	2	2	19
Labour									
Full-time	7	5	11	7	6	6	9	6	57
Part-time	1	5	3	3	4	4	1	4	25
Age									
Over 55	5	6	7	5	4	5	6	6	44
Under 55	4	4	7	5	6	5	4	4	39
Succession									
Successor	4	3	4	3	4	5	4	0	27
Uncertain	3	3	7	3	4	4	4	6	34
No succession	2	4	3	4	2	1	2	4	22
Business future									
10-20 yrs	5	4	6	5	4	6	5	2	37
5-10 yrs	2	3	4	1	3	1	2	3	19
<5 yrs	2	3	4	5	3	3	2	5	26

Source: Upland FPS

Annex 2. The experimental scenarios

The main scenario

This represents an indicative scenario of how policy may evolve over the next 10 years. Although somewhat speculative it is based on a current understanding of early thinking emerging from the European Commission. Obviously Commission thinking could yet evolve further (and change), and any future policy framework will be the result of negotiation between the Commission, 27 Member States, and the European Parliament. This scenario is definitely not a consultation on future policy options or a statement of policy intent.

Policy scenario:

CAP support evolves along the following lines: both income support and environmental payments will continue, but there is a shift in the balance of funding between income support (SPS) and agri-environment schemes. For example the SPS budget reduction could be 20% - 40% in real terms over ten years as the shift to area payment is completed. Although as a share of support agri-environment scheme will increase, the level will remain at most the same. Implication – reduction in direct incomes, payments based more on environmental outcomes.

Schemes: HFA ends 2010. Uplands ELS is introduced as planned (with a transitional period for existing old scheme agreement holders), and HLS and ELS continue much as they are now. Budget remains about the same.

Wider regulatory framework. Policy will also evolve along current lines i.e. cross compliance and wider Water Framework Directive measures will mean an increasing burden on farmers in respect of monitoring livestock and reducing waste / pollution.

Accompanying price assumptions: Prices remain fairly firm for fat lambs but prices for hill ewes fall a little, short term, and then stabilise after 3-4 years (5% reduction). Prices for more productive breeds rise. Prices are less buoyant for beef and increasingly differentiated according to quality, provenance and market outlet of products. Commodity beef prices fall 20% over the medium term (2013). The costs of bank borrowing remain low compared to the recent past, but new loans may be harder to access. Inflation remains low.

Variation A: More closely targeted agri-environment scheme

A basic income support payment remains, but with stronger environmental requirements (e.g. strengthened cross-compliance) attached to it. Under pillar 2 (agri-environmental payments), there will be a move from ELS towards HLS and this will increase as a proportion i.e. more money will be focussed on schemes operating at the landscape scale that offer added value.

Entry to the schemes will be more demanding but whole-farm agreements with annual and capital payments will be available for meeting certain management prescriptions. High value areas and features will be targeted especially places and features important for water, carbon storage and wildlife (this should include most upland and hill areas, except inbye land which is improved).

Not all areas will benefit. Implication – harder to access environmental payments and more management requirements for same level of payments, capital payments will remain for the short-term.

Variation B: Radical reform scenario

Through a carefully managed transition, direct income support (Pillar 1) would be phased out by between 2015-2020 and EU spend on agriculture would become increasingly targeted towards agri-environment (Pillar 2 type) objectives, particularly for maintaining and improving the natural environment.

Government involvement in the provision of training and skills would play an important role to help farmers adapt to changed circumstances, and there would be increasing roles for R&D etc in supporting agriculture as it meets the challenges of the future. Implication – Although there will still be ELS and HLS there will be a fall in direct support and more reliance on market prices.

Annex 3. Economic analysis of the sample for the influence of policy on profitability and other related factors

Introduction

The economic analysis is intended only as a background to the study whose focus is mainly behavioural rather than economic and mainly qualitative rather than quantitative. There was a trade off between the amount of data that could be obtained to provide detailed economic analysis and the exploration of policy scenarios and the issues behind farmer behaviour in the face of policy change. Even at a fairly basic level the data capture of economic information has been imperfect and this illustrates some of the difficulties involved. The analysis and the sample sizes that could be used have been constrained by the difficulties but not unduly, given the nature of the task.

It has been necessary to exclude from the analysis those farms where there was a 'nil' response to relevant questions. The reasons for nil responses might be due to personal circumstances, a lack of knowledge sufficient to provide figures, or reluctance by the farmer to provide the information. As a result the number of responses available for analysis varies, according to the data items being considered. For example the number of farmers providing full data on the amount of support payments received and the farm's profit was 44 out of the 83 farmers surveyed (i.e. 53%). 61 farmers supplied quantified SPS data (73%). On stocking rate calculations 77 farms (93%) supplied sufficient data to estimate a total per holding stocking rate but only 62 (75% of the survey) supplied the farm size information which enabled conversion of this into an average stocking rate per hectare.

Support payment dependency

Overall

The overall level of support payment dependency is high. In Figure 1 it can be seen that very few of the farms were achieving profit levels that exceeded the amount of total support i.e. the combined amount of the Single Payment (SP), the Hill Farm Allowance (HFA) and agri-environment scheme (AES) payments. The average level of profit was £24,999 with average support payments totalling £38,233, per farm.

On average, the farms that reported making profits which exceeded total support payments were smaller in size than those for which reported support payments were greater than profit (106 ha, versus 269 ha). They were much more likely to be owner occupied (60% versus 32%) and also more likely to be supported by non-agricultural income (29% of the profit from non-agricultural sources versus 11%).

Looking at individual cases, for the 30% of farms (13 out of 44) that reported making more profit than the total received in support payments, they divide roughly into three equal-sized groups: those with exceptionally high non-agricultural income; those with income only from agriculture but with specific indicators that would explain exceptional agricultural productivity performance; and a third group with a combination of non-agricultural income, owner-

occupation and indicators of above average profits from agricultural enterprises. Out of the first group (4 out of 13) that reported having non-agricultural income comprising over half their profit, one farm had non-agricultural income that was responsible for 100% of their profits and in another case, the reported share was 90%.

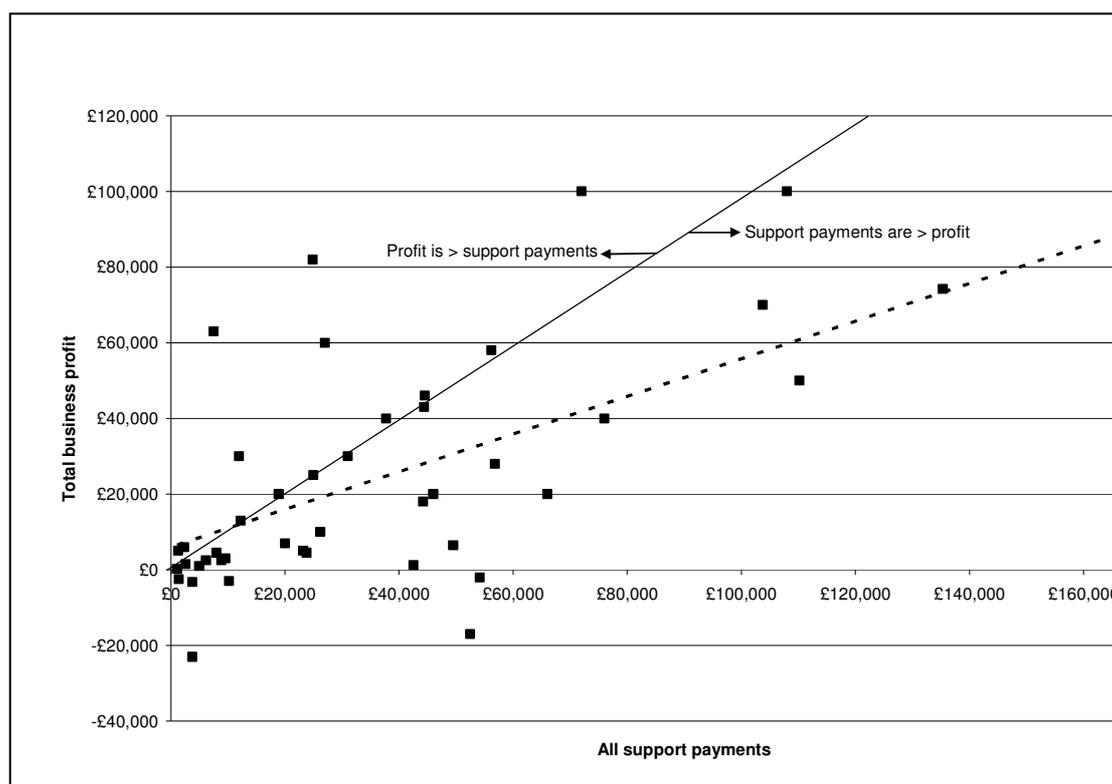
Out of the second group (5 out of 13) which had no non-agricultural income, each farm had circumstances which would explain relatively high profit performance from agricultural enterprises. These were generally larger than average farms, more intensively managed and stocked, with high physical performance indicators (eg growth rates/ milk yields / lambing percentages, etc) and usually relatively little employed labour. Two of these farms had high performance sheep flocks with lambing percentages of 180% and 185% respectively. One had a large 1,000-ewe flock run with only one part-time stockman and two casuals (doubtless employed just at lambing time). One had a small suckler herd but no other labour than the farmer, and this holding had a fairly high stocking rate. The remaining farm was a dairy farm with a herd of 115 cows run with only two part-timers as paid labour. This group appears to demonstrate, therefore, that very low-labour and/or high productivity strategies can be found currently on some farms in upland areas.

The remaining third of the farms that reported making more profit than the total support payments received had some non-agricultural income and various combinations of characteristics associated with above average profit from agricultural enterprises. In addition, many were owner-occupiers, which may be significant.¹³

The linear regression line in Figure 1 has a slope which is less than that of a line showing the break-even point between support payments and profit. This indicates a tendency that, as total support payments increase, the conversion of payment into profit declines. One possible reason for this is that profit as a basic measure commonly takes no account of the value of labour contributed by the owners of the business, who will tend to take drawings from profit rather than wages. The benefit of not accounting for family labour becomes less as farm size increases, as it is more likely that paid labour will also be needed to manage the business. Another issue is that of non-agricultural income which may effectively cross-subsidise the farming enterprise. Smaller farmers may well be part-time farmers or those who have diversified into non-agricultural business activities. This is both less easy to fit around the demands of running the farm and less necessary, for larger farmers. The average size of farm without non-agricultural income was 295 hectares whereas the average size of farm with non-agricultural income was 122 hectares. Presence of non-agricultural income obviously makes it more likely that the farmer or farm family can make a profit that exceeds the total support payments. One other size-related issue that can affect profitability is the level of owner-occupation (see footnote), and it is the case that the proportion of land rented tends to increase with overall farm size, in this sample.

¹³ In that owner-occupiers, particularly if longstanding and therefore relatively asset-rich with low borrowings, often face lower actual costs than tenants, who must pay rent on a regular basis.

Figure 1: Profit vs all support payments

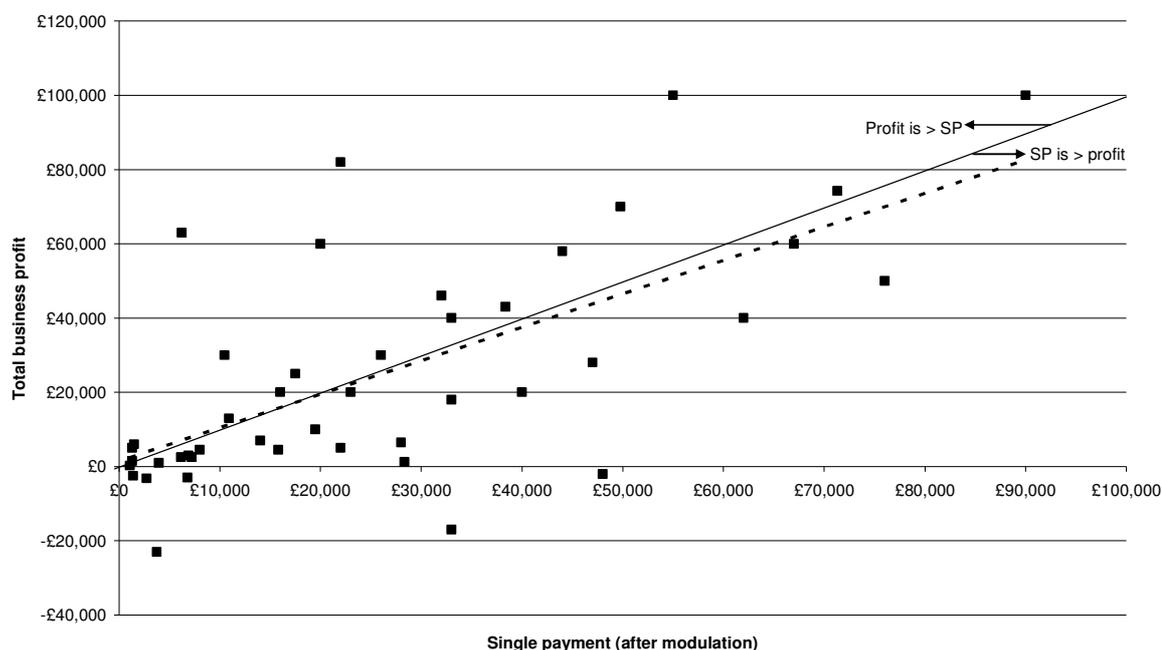


Note: the dotted line is an ordinary least-squares linear regression curve derived from the two variables and the solid line denotes the boundary where profit and support payments are equal.

Influence of the Single Payment alone on profit

The single payment per farm averaged £26,166 i.e. just under 5% more than the average profit reported. It can be seen that there is quite a close fit between a linear regression line and a line representing a £ for £ relationship of Single Payment and profit in Figure 2. This suggests that in terms of 'conversion efficiency' of Single Payment to profit there appear to be no obvious scale effects. Just under half of the farms (20 out of 44) had profit that exceeded the Single Payment. The associations are similar to those that describe reasons why farms make profit that exceeds all support payments i.e. higher non-agricultural income (24% versus 17%) and a high proportion of owned land (65% versus 35%). The influence of performance in terms of agricultural productivity was less obvious than in the previous analysis e.g. average lambing percentage was 121% on the farms with profit that exceeded SP, and 115% where it was less.

Figure 2: Profit vs Single Payment



Note: the dotted line is an ordinary least-squares linear regression curve derived from the two variables and the solid line denotes the boundary where profit and support payments are equal.

Influence of agri-environment schemes (AES) on profit

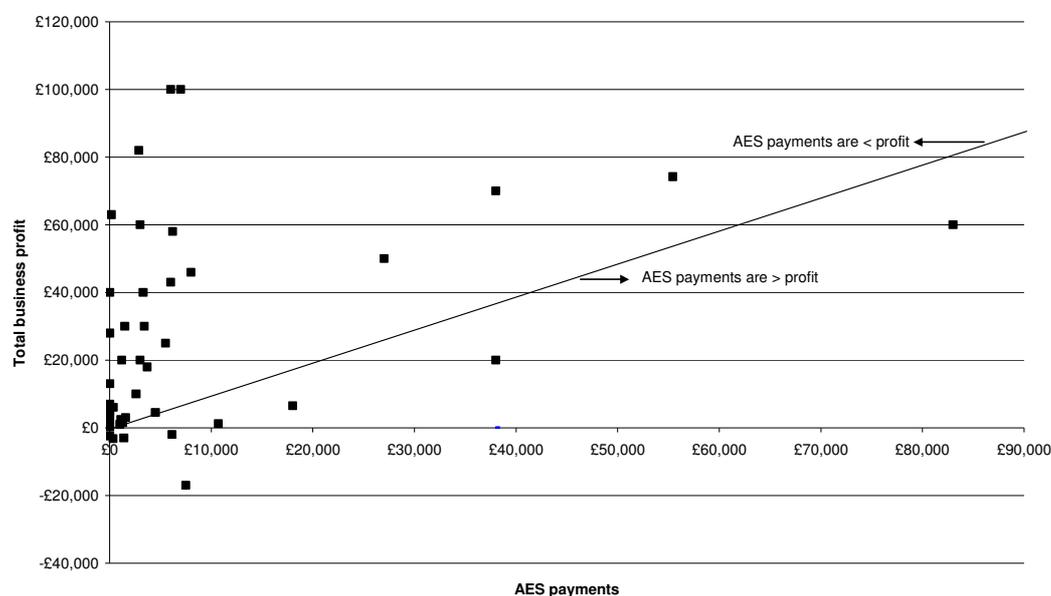
AES generally have made a relatively low contribution to total support payments compared with SPS, contributing £8,543 per farm on average i.e. about 14% of all support payments. AES income is likely to make an even smaller proportional contribution to profit because payments are only intended to compensate for income foregone and costs incurred, whereas the Single Payment's main role is that of income support. As Figure 3 shows, the majority of farms have a relatively low level of AES payments but for a few it is significant.

There were 6 farms where AES payments exceeded the overall farm profit. On these farms AES payments, unsurprisingly, represented a higher than average proportion of all support payments (35% versus 14% for all 44 farms). The contributions ranged from 19% up to 58% of all support payments. There was an association with particularly low stocking rates (ranging from zero up to just 0.38 GLU/ha). The circumstances between the farms in this category, however, seemed far from identical. There was one very small farm (20 ha) amongst the six and one very large one (at over 1,800 ha), while the others were around the average size for the sample as a whole. Only one of the six farms had any non-agricultural income and hence they typically had a high dependence on support payments of all kinds. There do not appear to be any other factors that make these farms stand out.

However, it is worth noting, in this analysis that the overall distribution of data points on the graph suggests that most farms have a relatively low level of

AES payment irrespective of their total business profit levels, so the evidence to infer any causal relationship between these 2 variables is weak.

Figure 3: Profit vs agri-environment scheme payments



Note: the solid line denotes the boundary where profit and support payments are equal.

Influence of HFA on profit and prospects in the conversion to Uplands ELS

The HFA payments averaged £3,958 per farm i.e. somewhat under half the level of AES and about 9% of total support payments. The influence on profit was not large. The average farm size in the subsample was 221ha with on average 28 ha of common land giving an average HFA payment per hectare of £15.90/ha. However, calculations based on the area claimed for Single Payment in the SDA moorland and non-moorland indicate that this figure is less than might be expected.

Calculating HFA payments from the data provided is complex. Focusing only on those 41 farms that made an HFA claim but had less than 350 hectares of SDA land avoids the complication of taking into account the reduced payments at varying rates over this size threshold. It is possible to make some comparisons of expected and actual payments in order to test the robustness of this dataset. The average recorded HFA payments for 7 of these farms were somewhat higher compared to the calculated payments. Payments may vary where HFA claimants receive payment enhancements, but these would only enable a maximum 10% variance from the calculated value, whereas the variance found was greater than this for 6 of the 7 farms on which this discrepancy occurred. For the remaining 34 farms for which this checking was possible, the actual claim was less than the calculated amount. This could be due to farmers deciding not to claim on all their HFA eligible land, but it could also be a result of inaccuracies in the areas used to claim SPS.

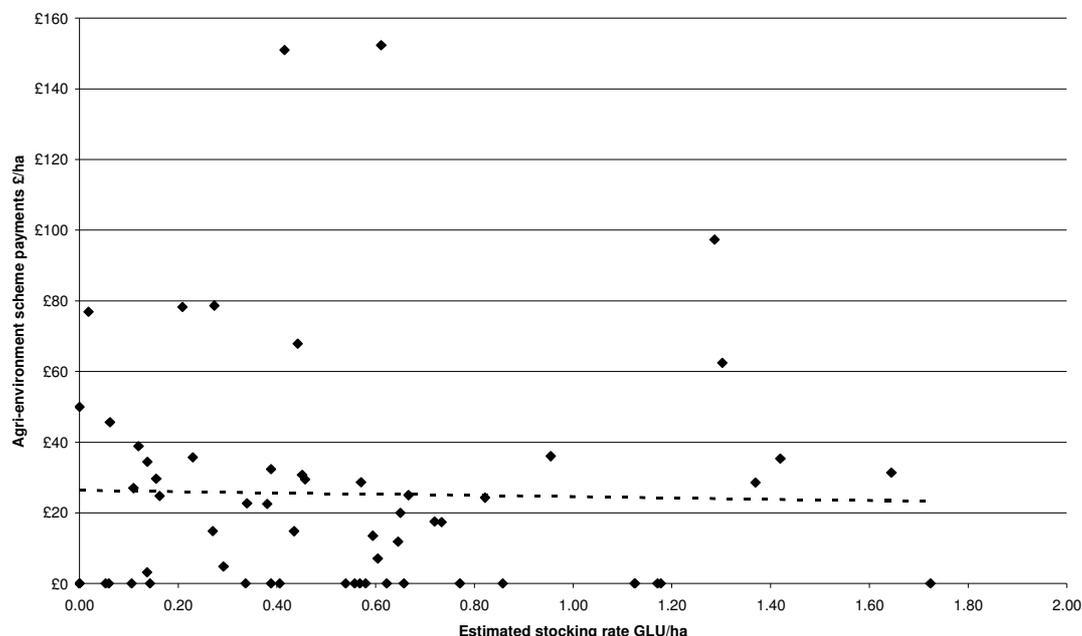
As a result of the discrepancies between actual and calculated HFA payments it is difficult or unreliable to indicate whether support payments will potentially increase or decrease following the policy shift from HFA to Uplands ELS. But the extra £32/ha which is offered above the basic ELS (£15/ha for moorland blocks of over 15ha) would appear to be roughly at, or possibly below, the calculated HFA payment of £29.24/ha (i.e. depending on the adjustment for the larger moorland blocks).

Environmental implications – stocking rate associations

Association between AES payments and stocking rate

Figure 4 shows that there appears to be almost no association between overall average stocking rate and AES payments. Some of the highest average stocking rates are on farms that receive AES payment and some of the lowest are on farms that receive none. It is a crude measure as it stands because the stocking rate only includes sheep, beef and dairy and no adjustment is made for land quality i.e. to reduce the value of rough grazing to enable direct comparison against rates on managed pasture, as is done by the Farm Business Survey in calculating Utilisable Agricultural Area (UAA). However, it is interesting how high some of the payments are and that the AES association with lower average stocking rates is not greater. It is possibly an illustration of how farmers may 'zone' their land use to manage their most productive land more intensively, whilst managing the land on which they have stocking rate limits imposed under AES less intensively.

Figure 4: AES payment vs. stocking rate



Note: the dotted line is an ordinary least squares linear regression curve derived from the two variables

Association with flat rate of SP

It was thought that an emphasis on flat rate of Single Payment (i.e. entitlements with little or no 'history' from previous subsidy claims) would associate with lower stocking rates. This is because of the likely association of low current stocking rates with low stocking rates in the past as evidenced by a low history of direct payments. However, that logical association between low current stocking and low amounts of historical entitlement does not reliably exist and there is no evidence to support this when looked at on an individual farm basis.

The inter-relationship between support payments, farm type and labour usage

Table 1 shows the average size of farm (excluding common land) and the average amount of labour for the four basic farm types identified in the survey. The farm types were specialist beef, mixed, specialist sheep and dairy. Most of the dairy farms also had beef and/or sheep enterprises although some did not.

Table 1: Total farm size, labour and support payments by farm type

		Beef	Mixed	Sheep	Dairy
Number	n =	16	18	15	7
Farm size	Hectares	82.1	236.8	227.9	117.9
Labour	Units (FTE)	1.44	1.88	1.32	2.37
Area/labour	Ha/labour unit	57	126	173	50
SPS	£	£16,895	£30,510	£18,215	£16,297
HFA	£	£2,300	£3,555	£3,228	£1,171
AES	£	£3,184	£10,302	£8,439	£2,109
Other	£	£0	£218	£940	£0
Total support	£	£22,379	£44,585	£30,822	£19,577
SPS	£/ha	£205.74	£128.83	£79.91	£138.27
HFA	£/ha	£28.01	£15.01	£14.16	£9.94
AES	£/ha	£38.77	£43.50	£37.02	£17.89
Other	£/ha	£0.00	£0.92	£4.12	£0.00
Total support	£/ha	£272.52	£188.26	£135.23	£166.10
SPS	£/labour unit	£11,733	£16,229	£13,799	£6,876
HFA	£/labour unit	£1,597	£1,891	£2,445	£494
AES	£/labour unit	£2,211	£5,480	£6,393	£890
Other	£/labour unit	£0	£116	£712	£0
Total support	£/labour unit	£15,541	£23,715	£23,350	£8,260

The exclusively beef farms were the smallest farms, followed by dairy and with the mixed and sheep farms of a similar size and roughly twice the size of the dairy farms. Labour use was calculated based on full time equivalents (FTE) i.e. part-time were rated at 0.5 FTEs and casual at 0.25 FTEs for both family and hired labour. The amount of labour per farm follows a predictable pattern based on farm type with the dairy farms having the most labour and the sheep farms the least. Interestingly the labour intensity in hectares per labour unit is similar between the beef and the dairy farms despite the latter's much greater number of units and perceived intensity of production. This is

partly associated with size in that the beef farms were on average the smallest. The sheep farms are comfortably the least intensive based on the hectares per labour unit.

Support payments per hectare by farm type

The support payments per hectare show a much higher overall level of payments for beef farms at around £273/ha, similar for dairy and mixed at about £100/ha less and only £135/ha for sheep farms. This discrepancy is mostly due to the Single Payment which is much the highest for beef at £205/ha similar for mixed and dairy and only about £80/ha for the sheep farms. This is partly due to the lower amounts of historic entitlement associated with sheep farming but it is mainly due to the bias in terms of land type towards the moorland SDA with its much lower rate of SPS and with very little lowland SPS whereas the beef farms had the opposite bias a significant amount of lowland SPS (including the DA). The picture is, however, also distorted by the access to common land that has distorted the picture somewhat. Beef farms have the highest HFA payments at £28/ha compared with the sheep and mixed at £14 – £15/ha. This surprising finding is largely due to one farm that had access to a large area of common land on which HFA was claimed, if this farm were excluded, the average HFA payment for sheep farms in the sample would have increased to £19/ha. Income from agri-environment schemes (AES) was similar across the beef, sheep and mixed grazing farms but only half that level on dairy farms. This was not at all surprising.

Support payments per labour unit by farm type

The greater labour efficiency of sheep farms brings the amount of support per labour unit to a high level shared with mixed farms at around £23,500 per labour unit. Beef farms with their high payments but low labour efficiency received about £15,500 in support payments per labour unit and dairy only about £8,000/labour unit. In terms of supporting income per person the Single Payment is most effective on the mixed farms closely followed by the sheep farms. Dairy farms were the least dependant on the Single Payment to support employment at under £7,000/person compared with sheep farms at twice that level and mixed farms at over £16,000 per labour unit.

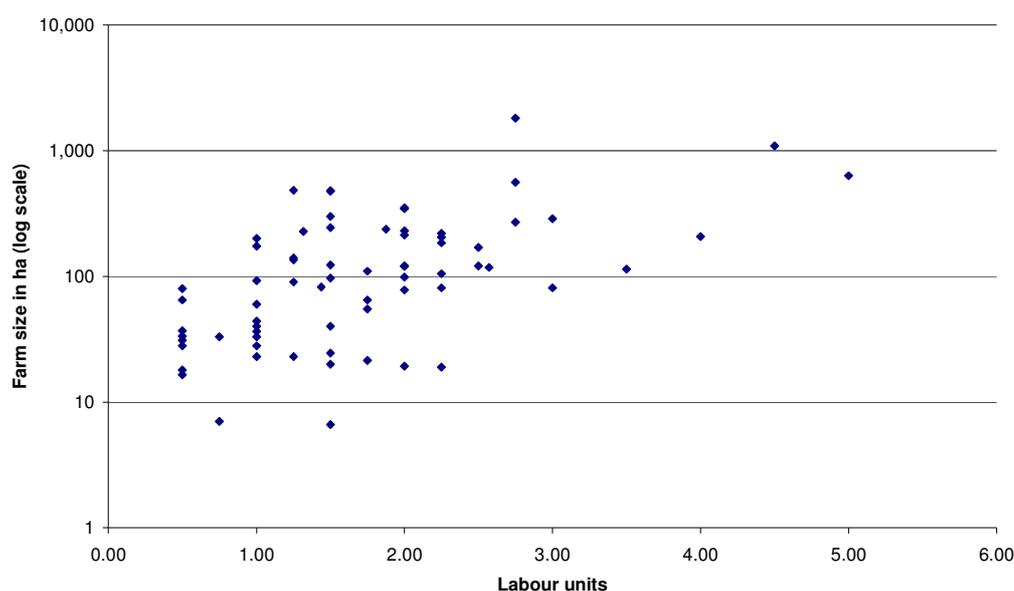
Scale economies and labour usage

Figure 5 shows labour usage set against farm size. Perhaps not surprisingly given the range in labour use by farm type it can be seen that it is not a close relationship. The graph is on a log scale to accommodate the great range in sizes and as a result it does not quite make clear how much the range in size expands as the number of labour units increases. What happens is that there are smaller sizes of farm being run by anything from one person part-time to two or more but the upper end of the range increases with an increase in the size of the labour force. Hence farms being run by only half a full-time person range from 17 to 80 hectares. At the full-time person scale of operation the range is from 23 to 200 ha. At 1.5 labour units the range expands to 7 ha right up to 481 ha with two it is 19 ha to 350 ha. Farms run by three full-time labour equivalents do tend to be over 100ha. The greatest range and diversity is really between one and two full-time labour units where the range in size of

farm that they run can vary across a full range from the very small to the very large. However, an important caveat is the extent of non-agricultural activities affecting the relationship between farm size and labour requirement. The farm of 7 hectares at the lower end of the size spectrum for the 1.5 labour unit size was heavily reliant on a non-agricultural activity (forestry contracting) which had little or no bearing on the area farmed.

Therefore it is clear that whilst there are economies of scale and an association between increasing labour usage and increase in area farmed it is far from a clear or a linear relationship.

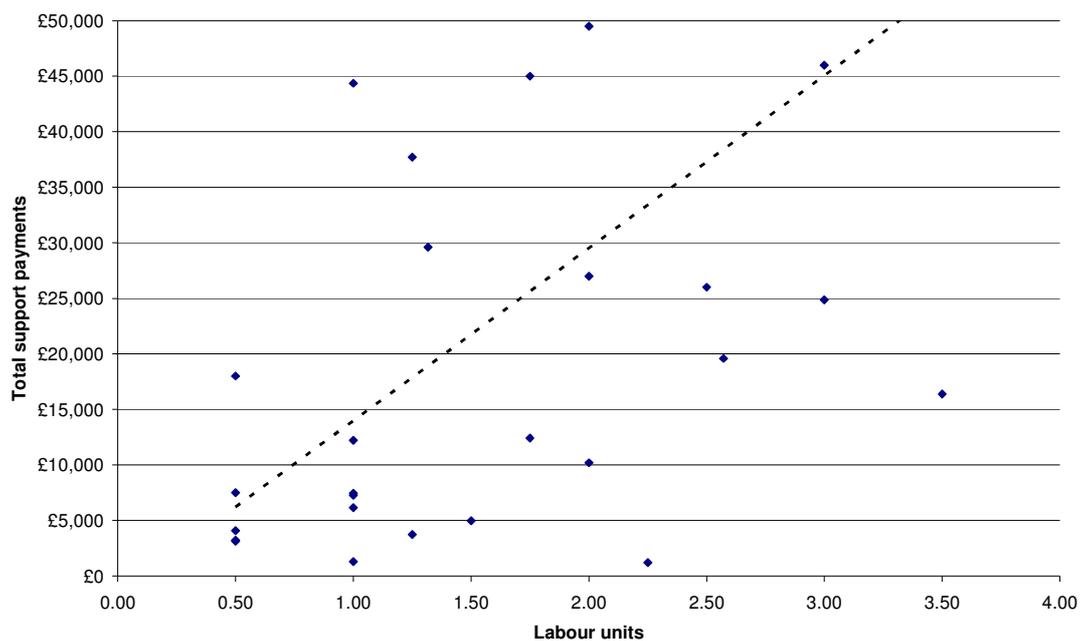
Figure 5: Labour usage and farm size



The relationship between labour usage and support payments

Given the lack of responsiveness to economies of scale on labour usage and the diversity based on farm type it would not be surprising if the level of support payments received per full-time labour equivalent was highly variable. This is shown to be the case in Figure 6. There is a positive relationship as shown by the linear regression line. But with a very wide scatter of results.

Figure 6 Relationship between labour employed and support payments



Note: the dotted line is an ordinary least squares linear regression curve derived from the two variables