THE COMPLEMENTARY ROLE OF SHEEP IN UPLAND AND HILL AREAS

THE FULL REPORT, WITH REFERENCES, TO SUPPORT THE SUMMARY DOCUMENT PUBLISHED BY NSA.
The National Sheep Association is an organisation that represents the views and interests of sheep producers throughout the UK. It is funded by its membership of sheep farmers and its activities involve it in every aspect of the sheep industry.

The purpose of this report is to update the NSA report on the Complementary role of sheep in Less Favoured Areas, which was produced in 2012. Like the first paper, this updated report looks at the wide range of public goods and services provided by sheep farming businesses in the hills and upland areas of the UK. NSA considers these to fall into three pillars of sustainability – economic outputs, environmental benefits and societal links. All the benefits within these pillars, be they food production, local economies, landscape management, cultural heritage or environmental stewardship, are enjoyed by everyone from rural communities through to international consumers and tourists. NSA believes there has been some increase in recognition of these benefits since the first report. However, there is still a long way to go and steps must be taken to ensure the irreplaceable activity of sheep farming in these areas is preserved and enhanced.

It is positive that interest in sheep farming from the general public has increased since the first report, linked in no small way to a number of high profile television programmes such as This Farming Life and bestselling books such as The Shepherd’s Life. There has been acknowledgment in some quarters that sheep are an important part of the jigsaw in upland areas, and that agri-environment and conservation schemes have sometimes forced stocking rates too low, unintentionally damaging biodiversity. There have also been some backwards steps in terms of the misinformed debate over rewilding and links between sheep and flooding.

The recent referendum decision to take us out of the European Union has dramatically changed the political landscape. Discussions over land classification and support payments for public goods in our four nations have not yet been resolved since the most recent reform of the EU’s Common Agricultural Policy (CAP), and we must learn from the past as we create a new UK agricultural policy. This policy must give special consideration to the hills and uplands and the unique combination of public goods faring these areas provide. There has never been a more important time to understand the tri-fold contribution of economic, environment and societal benefits. Within these pages, NSA considers these three pillars of sheep farming in upland and hill areas and lists a number of aspirations for the sector.
1.0 INTRODUCTION

The uplands and hills of Britain are an integral part of the sheep industry, producing breeding stock for lowland enterprises, store lambs, finished lambs and wool. Traditionally an integral part of the stratified sheep industry, and home to some of our hardest native breeds, farming in these areas is now recognised as a multifunctional activity, providing more than just agricultural outputs. These are important areas of biodiversity and ecological processes, as well as being vital in sustaining rural communities.

NSA is concerned that upland and hill farms continually come under threat due to ever changing market, social and policy pressures. These influence and risk fundamental change to the farming system itself, often ignoring the value that this most traditional and essential form of livestock farming provide. Over the years, upland and hill farmers have been at the mercy of policy makers, increasing livestock numbers when headage payments were introduced to incentivise productivity gains, and then reducing stocking rates when environmental impact concerns came to the fore, despite overly prescriptive requirements often being detrimental and leading to undesirable agronomic, environmental and societal impacts.

This report is split into three sections, economics, environment and society, which NSA considers to be the three pillars of sustainability in this sector. This is supported by the International Convention of Biological Diversity acknowledging that “substantial investments are required to conserve biodiversity and that there is the expectation of a broad range of environmental, economic and social benefits from these investments” (United Nations, 1992).

Although the report is aimed at the upland areas of the UK, the principles apply to other marginal areas and most of the permanent pasture. Disadvantaged types of agricultural land have been recognised by policy makers at the highest level for decades, with special attention paid to areas right across Europe that may not be as fertile as the lowlands but deliver important public goods and services over and above food production. At the time of writing this report, new EU regulations were resulting in a change in designation for this type of land, from Less Favoured Areas (LFA) to Areas of Natural Constraint (ANC). These changes may result in quite a difference for the individual farms, but the total designation of 9.12 million hectares of LFA in the UK (53% of the utilised agricultural area) looks likely to remain similar. The breakdown of LFA land is:

- 2.2 million hectares in England; 1.8 million hectares of which are in agricultural production; 17% of the utilised agricultural area.
- 1.53 million hectares in Wales; 80% of the utilised agricultural area.
- 5.38 million hectares in Scotland; 86% of the utilised agricultural area.
- 69,220 hectares in Northern Ireland; around 70% of the total agricultural area.

(Cumulus Consultants Ltd, 2012)

NSA fully supports land being designated in this way, regardless of the terminology used, and believes it is important to have a system that recognises disadvantaged/naturally constrained areas within the UK agricultural policy that is developed post-Brexit.

The latest available data (2014) states there are 33.7 million sheep and lambs in the UK, including 16 million breeding ewes (AHDB, 2015). In England 61% of the sheep flock utilises 595,614ha of the permanent grassland available and 35% of the rough grazing available (Marsh et al., 2012). In England 61% of breeding sheep are found on LFA farms (Harvey & Scott, 2015); 63% of cattle and sheep holdings are in LFAs in Wales (National Assembly for Wales, 2009); 80% of the sheep population in Northern Ireland are within LFAs (Farmers Weekly, 2010); and LFAs in Scotland are home to 91% of breeding ewes (Laurence Gould Partnership, 2004).

Given the land mass and number of sheep, NSA believes it is clear that the hills and uplands are a vital part of complex picture and require particular attention.

2.0 ECONOMIC OUTPUTS

There are a wide variety of products that can be sourced from sheep meat: prime lamb remains a firm favourite for Sunday roasts and special occasions in the UK and across Europe; mince, burgers, diced lamb and lamb steaks are starting to find favour with younger consumers; quality mutton is experiencing a resurgence of interest from gastronomes; a variety of lamb and mutton products are highly sought after by ethnic populations; offal and low value cuts are popular in non-EU export markets; wool is seeing increased interest as a sustainable fibre; and Ugg boots and other quality products rely on a supply of sheep skins.

The UK is home to 25% of the EU sheep flock and 3% of the global flock, producing one third of EU sheep meat. It is the sixth biggest producer worldwide (Colby, 2015) and exports from the UK have risen with 36% of current production now going overseas (NFU & NSA, 2014). The UK finds itself in a strong position in a growing world population, having market access to 100 countries (AHDB, 2016b). The hills and uplands are an essential part of this production model, not just supplying lamb and mutton where possible, but also providing breeding stock and genetics to other sheep farming businesses in less marginal areas.

Despite this extremely positive position, the UK sheep industry still struggles for financial viability, having to compete against other cheaper meats, such as poultry and pork, and competing against global competitors in most market outlets. In addition, many of the efficiency drivers of the modern farming economy and its market structure put pressure on the traditional upland system. This means productivity gains are either not appropriate, due to land type, or are openly discouraged and disadvantaged, due to land designation and planning controls.
THE ROLE OF RED MEAT IN HUMAN HEALTH

Richard Young, Sustainable Food Trust, says: “We humans have evolved over tens of thousands of years as red meat eaters. As such, natural selection has adapted us to eat and thrive on meat as well as plants. Our combination of incisors and molars is a clear indication of that. Red meat from animals predominantly raised on grass contains the perfect balance of essential amino acids and essential fatty acids we all need for health. It also contains a wide range of essential minerals and antioxidants, providing us with red meat, sheep exhalve methane, which is a potent greenhouse gas. However, campaigner distort the significance of this by citing the FAO’s claim that livestock are responsible for 14.5% of global warming. More than half that estimate relates to the greenhouse gas emissions associated with the destruction of virgin land and rain forest in South America more than a decade ago. For the UK the change in land use is entirely the reverse, as lowland grassland gets converted to arable land for farm declines. On average, each hectare of grassland permanently converted to cropping will release CO2 and N2O equivalent to 250 tonnes of CO2 into the atmosphere over the next century, with most of this lost in the first 25 years. This also kills off the soil methane sink, which is the bacteria that use methane as their energy source, which are found in high numbers in permanent pasture. Ruminants only recycle carbon, whether exhaled as CO2 or CH4, giving unique characteristics and flours (Fisher et al, 2000). Groups fed indigenous grass or natural flora were found to have high concentrations of 18:3 linoleic acid, another type of omega 3 fatty acid and long chain poly-unsaturated fatty acid (Fisher et al, 2000).

The average fat content of red meat has significantly reduced over the past 20 years (AHDB, 2011a) and finishing lambs on grass specifically produces a lean product (AHDB, 2010). The general public is widely unaware of this, despite ‘healthiness’ becoming a key quality issue for consumers (Fisher et al, 2000). Due to modern breeding programmes, feeding regimes and new butchery methods, high proportions of visible fat have been eliminated (AHDB, 2011a) and fully trimmed lean raw lamb contains only 8% fat (AHDB, 2011b). Grass fed red meat is the richest known source of cancer preventing conjugated linoleic acid (CLA), containing three to five times more of the trans fat than meat from other sources (Robinson, 2015). For example, heather and moorland-fed lamb has been shown to be higher in CLA (Lee et al, 2005) while the consumption of heather herbs and flowers provides a more interesting, fuller flavour (Lee et al, 2005). Flavonoids have also shown that vitamin E is four times higher in grass-fed animals, and twice as high even of concentrated feed animals supplemented with vitamin E (Robinson, 2015). Vitamin E contributes to a lower risk of cancer, as well as heart disease and anti-aging properties (Robinson, 2015).

Mutton is a traditional meat with a reliable taste, containing every essential amino acid and being on excellent source of CLA (Blighman, 2013). Kennard (2014a) says mutton is nutrient dense and, while its mineral content tends to depend on the local soils, it is always significantly high in vitamin B12. It has higher omega 3 fatty acids than lamb, which is the essential fatty acid for health. Mutton has been shown to be 40% higher in omega 3 than lamb and provides the closest-to-ideal ratio of omega 6 to omega 3 (3:1) of 2:1. In short, the older the animal, the better the muscle. Meat flavour develops with age (Fisher et al, 2000) and mutton is a great example of this.

2.2 GENETICS

NSA believes upland and hill areas would benefit from:-

- Recognition of the value of upland and marginal sheep genetics to the UK gene pool and its wider sheep systems.
- The development of practical health assurance schemes and increased sharing of information by sellers to give confidence to buyers of breeding stock and store lambs.

There are more than 60 recognised pure breeds of sheep in the UK and more than 80 recognised breed societies when you include crosses, halfbreds, Mulins and composites. Most countries only have a handful (Rhys Davies, 2010). NSA estimates almost two thirds of these relate to native hill and upland breeds. This high number of breeds provides a uniquely broad base of genetic diversity with some genes, particularly those of upland breeds, not found anywhere else in the world. In 1992, the United Nations held the Rio de Janeiro Earth Summit and, as a result of this, the Convention on Biological Diversity (CBD) was formed. The concept, and subsequent direction of the CBD for domesticated species has been ‘to conserve and sustainably use biological diversity for the benefit of present and future generations’ (United Nations, 1992).

The stratification of the sheep industry is unique to Britain and makes the most of the topography and local breed traits found in each area. It can be both...
2.2 GENETICS continued
economically and biologically efficient (NFU & NSA, 2014) and the movement of stock from one land type to the other depending on the time of year.

A study comparing upland grazing by various breeds found traditional upland breeds (represented by Scottish Blackface and Swaledale cross Blackface

by themselves. Although recording for maternal performance was a long term strategy, it has paid off with results quicker than I expected.

This helps to select breeding stock with genetic merit appropriate to the system it is reared in. NSA member Samuel Wharry

UK BREEDING EWE NUMBERS

Wool is an excellent natural carbon store; carbon constitutes around 50% of the organic matter of the fleece, sequestered from the current atmosphere

2.3 WOOL AND SKINS

On a single day during the warmer months, sheep are gathered off the hills for shearing, a process required for the benefit of their welfare (BWMB, not dated).

2.2 GENETICS continued

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The drop in national ewe numbers since 2003 is largely due to a reduction in ewes from the three main hill breeds – Scottish Blackface, Swaledale and Welsh Mountain. New technology, information and marketing pressures have driven a decreased reliance on the pedigree sector (Pollott, 2012) and the 86:14 ratio of stratified to non-stratified 
flocks in 1971 has dramatically altered to 55:45 in 2012 (Pollott, 2012).

The top 50 ewes with the highest estimated breeding values (EBVs) for maternal performance are chosen from each breed, with up to 10 of each being purchased annually. These are then mated to the best rams available to combine the genetic advantages of the selected sires and dams with the local hill breeds.

Foundation ewes have been bred by the Divine Sheep Archive and the Rare Breeds Survival Trust, but they require continual assessment and replenishment. Further to its statement on conservation for food and health of the growing world population, the CBD added that

the lowest social bonds. It was therefore concluded that Blackface and Swaledale crosses were the best suited to managing the upland environment,
to forage over larger areas of the hill than other breeds and were willing to move further away from the rest of the flock than other breeds, resulting in

UK BEARING EWES

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From Carnlough, County Antrim (pictured), has been performance recording his Scottish Blackface flock since 1997. His persistent effort over many years has been rewarded as the flock has increased from around 1,500 in 1982 to over 3,000 today. Sam says: “The first few years we were

2.2 GENETICS continued

national gene bank, and protocols to mitigate a disease related culled that would wipe out gene pools within certain breeds predominantly in only their native area of the country, such as Heidewick and Lonk. Genetic traits of hill ewes found in ewes producing British lambs have fallen to 3.7% as a result of being flown hill ewes and flown Mule/half breed types, but this is still the greatest percentage of dams of lambs (Pollott, 2012). A survey by the North York Moors National Park Authority found that flocks in the area have been decreasing by an average of 3.5

The loss of the hardy upland breeds would also signify the end of traditional practices such as hefting of large open tracts of land, such as commons,

once a year to two years earlier, unlike synthetic fibres which use carbon from fossil fuels, de-chemicalising what has been stored over millions of years (DWT, 2014). Wool as a hygroscopic fibre absorbs water vapour from the rising air humidity, generating and retaining heat in the process and

Once a year, during the warmer months, sheep are gathered off the hills for shearing, a process required for the benefit of their welfare (BWMB, not dated). The thick, grey fleeces designed to help them survive the harsh winter months can lead to health and welfare problems in summer. Flies lay their eggs in the wool and their larvae burrow into the skin of the sheep, causing the discomfort and infection referred to as blowfly strike. Depending on the breed of the sheep, a fleece can weigh anything between 1.5kg and 10kg (BWMB, not dated). The thick, greasy fleeces designed to help them survive the harsh winter months can lead to health and welfare problems in summer. Flies lay their eggs in the wool and their larvae burrow into the skin of the sheep, causing the discomfort and infection referred to as blowfly strike. Depending

the boundaries of the industry, as methods of improving pasture in the hills and uplands is extremely limited. It is imperative that the industry works together to give profitable, well managed production and sustainable management of disease control (Sargison, 2012). Health, parasite control and disease must be taken more seriously in order for the system to survive. The current sale of sheep from the uplands to lowlands means gains could be made from known health statuses, the passing of information between suppliers and receiving farmers, and proper quarantining (NAIDS, 2016).

2.3 WOOL AND SKINS

NSA believes upland and hill areas would benefit from encouragement of retailers and consumers to consider the unique benefits of British wool in an attempt to get better and fairer prices for sheep farmers.

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flocks in 1971 has dramatically altered to 55:45 in 2012 (Pollott, 2012). Although the traditional Mules and halfbreds still dominate the British sheep industry and are the main contributors to the UK lamb crop as it currently stands (Pollott, 2012), a continued move towards ‘more’ ‘archetypal’ crossbreds would result in the breakdown of the traditional stratified system. Mules and halfbreds in all their guises are prime examples of outbreeding enhancement (known as hybrid vigour or heterosis). They are the choice of many lowland farmers to cross with a terminal sire, as they combine the hardness and longevity of the hill ewe with the profanity of the Bluefaced Leicester or Swaledale/Leicester crosses, producing prolific, fast growing female replacements with good mothering ability (NEMSA, 2014). Around 41% of crosses are either sired by the Border Leicester (halfblood type) or Bluefaced Leicester (Mule), down from around 50% in 1971. While the balance has more recently swung in favour of the Mule type (Pollott, 2012). In fact, halfbreds have become less numerous than they traditionally were, now making up less than 0.1% of the national flock (Pollott, 2012).

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making it a natural insulator (Campaign for Wool, 2016a). When used in the home, wool reduces carbon emissions and energy costs by preventing a loss of energy to the external environment (Campaign for Wool, 2016a). Wool has the unique ability to absorb and retain harmful substances like formaldehyde, released from modern building materials such as pressed wood and medium-density fibreboard (Campaign for Wool, 2016a). Unlike porous materials that act as sinks to these harmful substances, the wool fibres bond with them permanently meaning they will not pass through the wool barrier or be emitted into the atmosphere for the lifetime of the wool insulation (Thermoflex, 2014). Wool also acts as a retardant due to its high water and nitrogen content, and has a far higher ignition threshold than synthetic fabrics (Campaign for Wool, 2016a).

Despite the quantity of wool produced in the UK and its incredible properties, income for the product is very low. At one time it was incredibly valuable and provided an important income stream, but the rise of synthetic fibres in the 19th and 20th centuries brought an end to this and for most farmers, apart from those running specific wool breeds, wool is a by-product that only contributes marginally to the bottom line. Farmers can expect to pay an average of £9.41 per sheep for shearing, with returns usually expected to be £1.43 per sheep per year (Hurter, 2015), although Glover & Cazet (2013) reported of a Herdwick farmer receiving 50p per fleece, and his total costs of shearing, bundling and transport amounting to £1.50 per fleece, three times what he was being paid. Despite the cost, professional shearing is essential for animal welfare and securing the best quality fleece, as cutting the fibre too short can create mixed fibre length, lowering the value of and damaging the fibre (Hurter, 2015). Wool is now by-product in the UK and across many northern European countries, as 90% of income comes from meat. There is therefore little genetic selection of sheep breeds to enhance wool traits, with genetic selection focusing being almost entirely on environmental adaptability and carcass conformation. As a result, wool fleeces from UK sheep are highly variable in length, diameter, crimp and colour, related to breed and environmental conditions (Hurter, 2015).

PROTOMATING THE VALUE OF BRITISH WOOL

NSA member David Griffiths and wife Karen, keep just over 50 sheep on the Derbyshire/Staffordshire border. In April 2009 they opened Griffiths’ Mill as a mini woolen mill processing fleeces from their own sheep and those of customers throughout the county. When attending numerous shows and events and selling woolen yarns and carded wool around the world, it became obvious to them that more education about Britain’s wool heritage was needed. Karen says: “The number of people we met at shows who did not know wool came from sheep, or that its removal was for the health of the sheep, was amazing.” After months of planning and gathering support, David and Karen launched ‘The Woody Roadshow’ in spring 2016, an educational promotion of British sheep breeds and their wool. It displays and sells a range of British yarn, carded and spun from native wool producers, and also includes hand spinning and felt making demonstrations. It provides information about the work of the NSA British Wool Marketing Board and Rare Breeds Survival Trust. Karen adds: “Years ago our farmers valued their wool and sheepskin as much as their meat, but we allowed people to tell us fleeces were of little value and then many people started to treat them as such. While every fleece is not suitable for every purpose, we do have a fleece in Britain for every purpose. We need to re-educate everyone about the true value of our fleeces.”

The value of wool has improved in recent years, in no small part due to the launch of the Campaign for Wool in 2010. Farmers have seen a threefold increase in the price, albeit from a low base. The campaign, initiated by patron HRH Prince of Wales and funded by a number of international partners included the British Wool Marketing Board (BWMB) in the UK, is a global, influential, collaborative wool growers, fashion designers, retailer, interior designers and manufacturers and re-educating customers on the myriad of wool uses. From fine knitswear, cloth, hard wearing scarves and flame retardant home insulation, the campaign is helping to create a new international demand for wool, raising awareness of its unique natural, fire retardable and renewable properties (Campaign for Wool, 2016b).

Wool is also largely considered to be a low value by-product of the sheep industry in the UK, but there is still demand for them, mostly from overseas where regulations are less strict and production costs are much lower (AHDB, 2014). In 2013 79% of UK sheep skins were exported to China, followed by 9% to Turkey and 9% to the UK. The EU export total for 2013 was 64,000 tonnes, which is roughly 14 million skins, or a total of 14.5 million sheep slaughtered (AHDB, 2014). Domestic demand is limited to only thin UK fashions. Although the possibility of fourth opening in Wales is on the near future in backing views of decline across many decades, U.K. wool and mohair are added to the picture to save as cheaply as possible, the synthetic materials were developed but the three surviving UK weavers all profit themselves on minimal environmental impact. Organic Sheepskin in Herefordshire uses only vegetable tannins and their wool is treated with their own home made, water and supports organic system (Organic Sheepskin, 2015). Organic Sheepskin concentrates on wool production while the Devonia tannery on the edge of Dartmoor has been operating for more than 20 years and sell locally sourced, high grade tanneries to produce a wide range of products, including rugs, floor coverings, furniture products, wall coverings and home textiles (Devonia, not dated). Skyknits on the Isle of Skye, Scotland is a weaving factory and the island’s only flax fibre visitor attraction. It produces its own range of rugs, as well as working with several British manufacturers of coats, skirts, handbags, scarves and blankets (Skyknits, 2016).

2.3 WOOL AND SKINS continued

2.4 Niche Markets

NSA believes uphold and hill areas would benefit from encouragement of retailers to embrace heritage breeds as new and diverse products, resulting in more mainstream interests in these niche markets.

It is possible for some farmers to increase their profits by creating a premium or niche market, directly selling lamb and mutton or working with other market players, such as butchers, regional foot hubs and retailers. This is an ideal opportunity for hill and upland farmers looking to finish at least a proportion of stock on their own farms for sale at farm shops, farmers’ markets, specialist outlets and online, or co-operating with existing regional food hubs and supplier networks. However, it must be remembered that the niche market sector accounts for just 1-4% of total UK sheep output (Reduction of Cumbria Communities, 2011b) and there is a limit to its growth potential outside of mainstream retailers. The large number of niche breeds in the UK, coupled with an array of iconic areas and landscapes, mean there are excellent opportunities to create a strong brand identity for products. These brands can appeal to consumers across many market segments, such as outdoors, food, health, and nature (Reduction of Cumbria Communities, 2011b) or powerful niche terms such as organic, pasture-fed and local (Rhys-Davies, 2010). Producing lamb that has a strong and distinctive taste, from a native breed farmed on a long-established holding, gives a positive feeling of food safety, and buying it directly from the farmer means less food miles, appealing to the consumer’s need to be ‘green’ in their daily activities (Reduction of Cumbria Communities, 2011b). By working with niche retailers, they are perfectly suited to optimising meat production in the particular geographical and climatic conditions of their natural habitat (CPRE, 2012). They also add to the cultural heritage of the area, with their distinctiveness and variation, and provide a ‘generic bank’ for breed diversity, which may help tackle disease and provide resilience in the future (CPRE, 2012). Consistency is of vital importance when marketing such products and, although this can often be hard to achieve, groups of farmers working together can move towards solving the issues of different soils and locations (Reduction of Cumbria Communities, 2011b). Farmers who show grazing on common land would also have an opportunity to cooperate in marketing their unique product (Reduction of Cumbria Communities, 2011b). Creation of niche products encourages entrepreneurship, an opportunity for young people and new entrants (Scottish Government, 2000).

RETAIL SUPPORT OF A HERITAGE BRAND

Marks and Spencer’s has gained a lot of momentum since entering the food retail sector, increasing revenue by another 3.4% (£3.2bn) in 2015 (Marks and Spencer, 2015). One success story within its ‘specialty’ range has been offering Swaledale lamb through the winter months for the last six years. The Swaledale is a maternal breed and a specific outlet for finished male lambs is of huge benefit to breeders. M&S works alongside the Swaledale Sheep Breeders Association to source lambs of a specific specification, which is 16-21 kg with correct conformation and fat levels. John Stephenson of the ‘Swaledale Sheep Breeders Association describes how the scheme has grown. He says: “The first season listed for 10 weeks, with 250 lambs from 13 farmers being sent to the Dawn Meats abattoir. The sixth season lasted for 21 weeks, from the end of December 2015 to the end of the first week in May 2016. This saw 40 members supplying a total of 15,500 lambs.”

HERDWICK SPECIAL STATUS

Around 99% of Herdwick sheep are commercially farmed in the central and western Lake District and 95% of them are within 14 miles of Coniston, Cumbria. The Lakeland Herdwick breed gained protected designation of origin (PDO) status in 2012 meaning Herdwick products and foods produced, processed and prepared in this area are protected from misuse and imitation. Amanda Carson of the Herdwick Sheep Breeders Association explains how this standard of protection and promotion ensures product quality, provenance and full traceability, protecting a traditional farming system and giving consumer confidence. A scientific study at Bristol University, found Lakeland Herdwick meat to have unique levels of omega 3 and a beneficial higher proportion of total fats and poly-unsaturated fatty acids. The meat is renowned for its distinctive flavour and quality as a result of the slow maturing breeding grazing on heather and indigenous grasses. Lakeland Herdwick meat is the best example of the full flavour as it has had the time to develop. Despite the success of PDO, and similar protected geographical indication (PGI) status, very few sheep meat breeds benefit from it – and none may be able to once the UK leaves the EU. The exceptions are West Country Lamb (PGI), Welsh Lamb (PGI), Scotch Lamb (PGI), Scottish Lamb (PGI), Oxford Lamb (PDO) and Isle of Man Mutton Legend Lam (PDO) (Wikipedia, 2016b).

Because niche sheep products can be based on either a breed or a geographical location, they can help raise the profile of lamb and red meat and bring the producer closer to their market. This is therefore arguably important for the industry to create more mainstream interests for currently niche products to sustain populations of rare and upland breeds. Farmers need a bank of market knowledge and a will to cooperate if they are to be encouraged into niche market entrepreneurship, allowing them to develop branding, marketing and sales potential, finding potential customers (Scottish Government, 2000) and, once established, staying connected with changing market trends. With the wealth of abilities that farmers need...
to run their sheep flock, it is not always practical or possible for them to develop a whole other skillset related to branding, marketing and sales. Retailers have this expertise but do not have a track record of interest in creating mainstream interests for niche products to sustain populations of rare and upland breeds. The exception was following foot and mouth in 2001 when some retailers introduced schemes generating demand for high quality, light lambs (16.2 kg deadweight), which was ideal for hill lambs (Federation of Cumbria Commoners, 2011a).

For farmers that are engaged in niche markets, it is important they stay connected with the consumer and recognise the constantly changing trends in order to meet market demand (Federation of Cumbria Commoners, 2011b). This may include targeting ethnic and minority markets, particularly for products like mutton (Federation of Cumbria Commoners, 2011a), or expanding their own business by lambing for longer periods, building additional housing or freezing carcases (Federation of Cumbria Commoners, 2011b). The ethnic market makes up more than 25% of the UK demand for sheep meat, much of this being mutton, and so markets can be planned to match peak demand periods over and above the traditional peak always seen at Easter. For the Islamic calendar these include Eid al-‘Adha (“the celebration of the end of Ramadan”) and Eid al- fitr (“the tradition of families sacrificing an animal, keeping one third for themselves and giving one third to relatives and one third to the poor and needy”) (Federation of Cumbria Commoners, Commoners, 2011a).

2.4 NICHE MARKETS

Among other factors, the impact of this decoupling and the devastation of the 2001 foot-and-mouth epidemic caused livestock numbers in the UK to drop dramatically, particularly in more marginal areas. Other factors were poor market prices, the hangover of the BSE crisis in the late 1990s, culminating linked to bovine TB, new requirements for slurry storage in nitrate vulnerable zones (NVZs), agri-environment scheme guidelines and an aging farming population (Currumulus Consultants Ltd, 2012). Breeding ewes declined by 12% in English UPAs and 20.2% in Welsh UPAs between 2000 and 2010. Worst affected were Northern Ireland and Scotland with reductions of 31.6% and 31.7% respectively. Overall, the impact of these changes varied across the UK, depending on the nature of the land and the farming system. In areas with a more intensive farming system, such as in southern England, the decline was less pronounced. In contrast, in areas with a more extensive farming system, such as in northern Scotland, the decline was more significant.

The European Common Agricultural Policy (CAP) was established in 1962 (Wikipedia, 2016a) and has a long history of financially incentivising farmers to provide public goods rather than simply responding to market indicators. Long after its establishment in the aftermath of the world wars, the CAP continued to encourage productivity to feed a growing population. Livestock headage payments under Pillar One of CAP were one tool to do this, but this blunt format encouraged the keeping of sheep for numbers alone, resulting in overproduction and the sector not being in line with market demands. The 2003 CAP reform “decoupled” the link with production and moved to area-based payments as a way to encourage livestock sectors to move towards a free market and allow farmers greater freedom to respond to market demands (European Commission, 2016). Both the Single Payment Scheme and its recent successor, the Basic Payment Scheme, have used an area payment to distribute of Pillar One funds.

EU FUNDING TO MAINTAIN SHEEP NUMBERS

The most recent CAP reform resulted in Scotland adopting an area-based scheme that massively weighted payments to productive, lowland areas. Concerns that a low area payment for poorer, rough grazing (so called “region 3”) would see sheep numbers drop even further in these areas, the Scottish Upland Sheep Support Scheme was designed to target active farmers. A budget of €1.5m was allocated for the distribution of the total number of ewe hoggs claimed on by farmers and crofters in region 3, with a limit of one ewe hogg per 4ha. NSA member Sybil Macpherson, who farms an extensive flock in Assynt, says: “It was hoped the scheme would bring support payments to active farmers in region 3 in line with land in region 2, which is better quality rough grazing and attracts a higher area payment. However, there were 14,000 more eligible hoggs claimed for than expected, meaning the anticipated rate of €100/hogg dropped considerably. There have been a number of issues which have emerged following the processing of claims and it now appears a review of the scheme will be possible. It is essential that steps are taken to improve this much-needed scheme.”

While agri-environment work has traditionally been part of Pillar Two of CAP, the newer Basic Payment Scheme has “greening” requirements that all farms must meet in order to qualify for direct funding (BPA, 2015). Across Europe, the greening rules aim to encourage rotational mixed farming including grassland, because of its biodiversity value. Farms with more than 75% permanent pasture are exempt from greening requirements, showing the value placed on this type of land. This means nearly 100% of farms in the upland and hill areas of the UK already provide the level of public goods required by greening, which is something that needs to be recognised when the UK is replacing the EU CAP.

Pillar Two of CAP is the EU Rural Development Policy, aiming for economic, environmental and social improvement of the countryside. Strategic priorities include: knowledge transfer and innovation; competitiveness and viability; food chain organisation; ecosystem management; low carbon and climate resilience; and social inclusion, poverty reduction and economic diversification (Dwyer et al, 2016). In the UK the majority of Pillar Two funding is dedicated to the environmental element of rural development – 87% on the most recent CAP and previously 83% (Defra, 2014a) allowing many businesses to supplement production with environmental practices. Agri-environment schemes vary between EU countries; but they all aim to protect biodiversity, restore landscapes, prevent rural depopulation, and reduce pesticide and nutrient emissions (Keij, 2003). The uptake of schemes has been highest in areas of extensive farming, where biodiversity remains fairly high, and lowest in areas of more intensive farming where biodiversity levels are low (Keij, 2003). At its peak, 76% of the farmed land in England was under an agri-environment scheme, covering 6.4m ha with 52,000 farmers participating (Orford, 2015). An updated scheme under the recently reformed CAP has more complex requirements and resulted in a reduction from this level, although it is not yet clear how many farmers will sign up to...
the new environmental land management schemes (NELMS). Scotland’s Rural Development Programme receives the lowest level per hectare of EU funding support, but at its peak in 2005 covered 1,324,000ha of farmed land (RSPB Scotland, 2007). The Glaisle scheme in Wales, which includes many specialised schemes, has the participation of 5,350 farm businesses, and 11,600 farmers in Northern Ireland participate in agri-environment schemes, covering 418,000ha (OFPRD, 2015).

BOOSTING WILDLIFE WITH ENVIRONMENTAL STEWARDSHIP

NSA member Maurice McHenry farms 120ha on the north coast of County Antrim, Northern Ireland. This includes 61ha heather moorland, 32ha rough moorland grazing, 18ha unimproved grassland, 16ha improved grassland and 2ha species-rich grassland. The sheep enterprise is farms to meet the requirements of an agri-environment scheme—so, for example, ewes have no access to the heather between November and February, fertiliser is spread on only 10ha of land, and no sprays or herbicides are used on the heather or rough moorland grazing. Maurice says: “In 2009 the farm was awarded Most Beautiful Farm in Northern Ireland and was a finalist in the UK Silver Lapwing awards for commitment to the environment. Since 2002 it has been an Agri Food and Biosciences Institute (AFBI) research farm and DAVIDI focus farm for promoting sheep in a hill farm situation. The Farming and Volunteer Alliance did a survey of the farm on a number of occasions and identified more than 33 species of birds and at least five sites for frogs. Sheep play a complementary role in ensuring a diverse flora and fauna. Without sheep the natural vegetation would be unbroken and smother the smaller plants. Sheep do not poach the wet areas on the moorland or species-rich grassland and so this land is protected. ‘Steps are taken to improve this much-needed scheme.”

Current agri-environment schemes are legally binding, yet there is still uncertainty around what will happen once the UK leaves the EU. The role of agri-environment schemes will be of many things to consider in the forthcoming discussion about where to prioritise future funding, but there are opportunities to think about where improvements can be made, specifically linked to ‘ecosystem services’. Recognition of ecosystem services places hill and upland sheep farming in a position that cements the importance of its multiple outcome and holistic approach, acknowledging that production from traditional livestock systems works in balance with ecosystems and rural communities. For instance in-bye hay meadows may be relatively intensively grazed and cut, compared to much lower levels of intensity on heather hills and wet pastland ground. Farming the land in this way maintains valuable environmental habitats and delivers ecosystem services that are highly beneficial to society as a whole, but can be a serious limitation on farm business productivity and profitability. Agri-environment schemes are currently the only attempt at paying for this, but calculated on an income foregone principle so compensate only for what income is lost by agreeing to manage land according to a particular scheme. NSA believes it would be beneficial to pay for ecosystem services instead. This is particularly true when agri-environment is placed in the context of ‘sustainable intensification’, which is a priority in an era of growing demand for food. Bangor University’s work on this concept in the uplands aims for the most productive land to be utilised effectively, and the least productive land managed to attract payment from agri-environment schemes for ecosystem services (Williams, 2016).

2.5 PUBLIC GOODS continued

This is particularly true when agri-environment is placed in the context of ‘sustainable intensification’, which is a priority in an era of growing demand for food. Bangor University’s work on this concept in the uplands aims for the most productive land to be utilised effectively, and the least productive land managed to attract payment from agri-environment schemes for ecosystem services (Williams, 2016). Looking beyond the system of EU payments linked to the public goods provided by agriculture, there is also a growing acknowledgment of the ‘natural capital’ held and generated by farming practices, such as soil, water and air, particularly in the hills and uplands of the UK. Natural capital and ecosystem services are concepts with an increasing relevance to farming, as putting a price on nature’s assets can enable a price to be paid to people who maintain and enhance it. In the 2011 UK National Ecosystem Assessment it was estimated that the value of UK ecosystem services and the habitats and organisms providing them was billions of pounds (British Ecological Society, 2015). Natural capital underpins all other capital in economy and society, and coven the actual stock and living and non-living aspects of nature producing direct and indirect value to people. Ecosystem services are about the flow of benefits that this stock provides and that are derived from these assets, in providing ecosystem, support and cultural services (British Ecological Society, 2015). The Natural Capital Committee (2015) describes English natural capital as being largely in decline, and that it must be safeguarded for sustained economic growth. Natural capital is a move towards making sure that nature is considered in economic decisions (British Ecological Society, 2015) and may be an opportunity for a commercial future for farmers. For example, commercial businesses with a large environmental impact, such as airlines or power companies, could off-set this by paying farmers for natural capital and/or ecosystem services. This could perhaps fund ‘lockers’ to encourage biodiversity, pay for pest management to capture carbon, or support community-based activities in rural areas to protect the societal infrastructure of hill and upland areas. There is significant potential for the improvement of natural capital in England, and the Natural Capital Committee (2015) propose several options within an investment programme, such as woodland planting, peatland restoration, wetland creation and the improvement or environmental performance of farming.

Pillar Two of the EU CAP is not just about agri-environment schemes. It also covers natural handicap (the new Areas of Natural Constraint) and Natural 2000 measures, as well as focusing on delivering public goods through rural vitality. This is delivered by maintaining and promoting natural heritage, farm diversification and tourism activities through modernisation and infrastructure development measures, and/or grants for funding activities in rural areas. Pillar Two funding can also improve human capital by providing advice, training and capacity building measures. The main focus of much of the funding is to improve the competitiveness of the agricultural and forestry sectors, but this can directly or indirectly provide public goods, for example reducing greenhouse gas emissions through the funding of new, efficient buildings and equipment (Hast et al., 2011).

These areas defined by the EU as integral to a successful agricultural sector are as appropriate for the UK as elsewhere in Europe and should be considered for the UK’s agricultural policy post-Brexit. NSA would also like to see its suggestion of an agri-health scheme be further discussed in the new political situation, as small scale trial work of this has been very promising. In 2013, NSA put forward a set of objectives towards the creation of an agri-health fund scheme funded from the Pillar Two budget, which would reward farmers for measures such as voluntary monitoring and health initiatives, while fitting within the Pillar Two aims of improving competitiveness, environment and quality of life. It argued an increasing population with its growing food demand was an ever increasing struggle as resources become limited and climate change poses an increasing challenge. The scheme proposed would deliver public goods by increasing food security and food production with a reduced carbon footprint, and therefore contributing towards the UK target of reducing carbon emissions by 11% in 2020 and by 50% by 2050. It would promote better use of resources, often limited in hill and upland areas, and help sustain livestock numbers for the benefit of landscapes and communities. These objectives were incorporated into a project run by Hybu Cig Cymru (Meat Promotion Wales), which worked with five vet practices and 11 beef and sheep farms in Wales between October 2014 and June 2015 (HCC, 2015). Each farm was allocated £3,000 for the potential costs of any tests and treatments, and initial veterinary consultations were followed by investigations, testing and eventually an updated health plan. The project was very successful in allowing more time for farmers and vets to discuss issues and resulted in improved performance for greater economic benefit to the farm (HCC, 2015). In one particular case study, the farmer spent more time in the field, looking at lamb losses between scanning and selling, and resulted in a more targeted approach to worm management, strict management of contagious diseases, and a review of the vaccination plan for the flock (HCC, not dated). Helping the farmer become for efficient also reduced the carbon footprint of the enterprise.
There is no doubt that farming and the environment are inextricably linked, with 75% of the UK landscape devoted to farming (RSPB, 2013). Our unique landscape formed through thousands of years of traditional farming methods and environmental management by farmers, including the grazing of sheep, has encouraged the adaptation of many animal and plant species. The late 1990s and early 2000s saw financial incentives push up stocking rates, but the end of headage payments and introduction of environmental stewardship schemes have been widely welcomed by farmers to reverse the negative effects on biodiversity and the environment. However, this has gone too far in some scenarios and reduced stocking rates of sheep in certain parts of the UK hills and uplands are leading to degradation and real changes in habitat structure. NSA believes it is vital to find the right balance and finds support for this in the Convention on Biological Diversity’s (CBD) stance that ‘states are responsible for conserving their biological diversity and using their biological resources in a sustainable manner’ (United Nations, 1992).

Since the 1980s, fertiliser use has been steadily decreasing and crop production increasing, meaning farmers are using fertilisers more effectively and harnessing technological developments. Some of the more environmentally damaging pesticides are no longer used due to voluntary best practice measures (FACE, not dated) and the creation of agri-environment schemes, provided through Pillar Two CAP funding, has aimed to encourage best practice farming for the benefit of the environment. However, it is important to remember that in order to be sustainable and not adversely affect the amount, cost and quality of our food, programmes to improve biodiversity must be carefully thought out and applied to individual situations and habitats, not just a case of ‘everything everywhere’ (FACE, not dated). Farmers must be able to tailor schemes to best fit their practices and the land on which they farm, to get the best value for money in both production and environmental benefits.

3.0 ENVIRONMENTAL LINKS AND OUTPUTS

3.1 WATER MANAGEMENT & FLOOD ALLEVIATION

NSA believes upland and hill areas would benefit from deeper understanding of the role shepherds and the uplands play in prevention and mitigation of flooding and the supply of vital clean water to many urban communities. The ever-growing world population means there is an increasing requirement for water, yet the effects of climate change mean there are simultaneously more droughts and water shortages. Parts of the world that suffer from the most extreme droughts may no longer be able to produce enough food and predictions suggest the UK may have an increasing future role in feeding the world. At the same time, around 70% of our drinking water is sourced from the uplands catchments, highlighting the importance and strong overlap between a healthy natural environment and the wider public benefits that can be brought from its successful management. The naturally low nutrient levels in upland soils makes for a higher quality of water, requiring less treatment and therefore a lower cost to the public (Natural England, 2013a).

At the other end of the scale, the devastating floods of winter 2015, which Cumbria bore the brunt of, saw 34mm of rain recorded at a Honister weather station in one day, more than a month’s rainfall and a UK record (Glover, 2015). Within the resulting flooding debate, sheep were held responsible by some conservationists and commentators, yet it cannot go unnoticed that an increase in severe flooding throughout the UK in recent years has happened despite a dramatic decrease in sheep numbers, especially in hill and upland areas, since the CAP reforms in 2005. It must be acknowledged that some types of soil, in particular clay and mineral soils, can be caused to cap by the hooves of sheep – but on peat land soils, hooves can aid the breakup of the soil cap and increase the absorption of water into the soil. Designations such as sites of special scientific interest (SSSIs) have been known to prevent farmers from maintaining the waterways in their land, often with detrimental results. Every site in the UK is different, and so the need for site-specific solutions is essential for the best management. This is arguably why Defra announced in April 2014 that farmers in England could clear debris and maintain ditches up to 1.5km long on their land, following a successful two-year pilot. Plans for internal drainage boards and other groups to have more power in the maintenance of their local watercourses were also revealed, and simpler applications for environmental permits (Gov.uk, 2016).

Most major EU countries are experiencing increased flood risk due to the increased winter rainfall and irregular, extreme weather events that are likely due to climate change (Forest Research, not dated). The uplands: generally experience greater levels of rainfall than their lowland counterparts and, coupled with their steep slopes and some habitats with low water storage capacity, they experience rapid run off impacting on floods downstream (Natural England, 2013a) – but many natural habitats found in the uplands, such as bogs, woodlands and moors, are natural flood defences, acting as ‘giant sponges’ to absorb and hold water and slow run off up to a point (The Wildlife Trusts, not dated). Many of the major rivers rise from areas populated by blanket bogs and, when in good condition, these release water slowly, reducing the height, effect and cost of flooding downstream (The Wildlife Trusts, not dated). Well maintained woodland, scrub, moorland and heather are the most beneficial sources of vegetation for intercepting and impeding water flow (Natural England, 2001). When badly damaged their ability to store water is reduced, which is where measures such as reducing grazing and blocking old drainage ditches encourages the regeneration of essential vegetation, sphagnum mosses and heather (The Wildlife Trusts, not dated). Established forests are also valuable for flood mitigation, using more water through interception than other vegetation types, although large scale mono-species commercial plantings can cause severe soil erosion and water pollution at times of planting and harvesting.

SHEEP AND MITIGATION OF FLOODING

Work in Belford, Northumberland, by researchers from Newcastle University has meant a community once devastated by regular flooding has not seen the like since measures were implemented in 2010. Other than the obvious intention of reducing flood risk, the Flow Partnership project also aimed to improve the productivity of farmland, increase biodiversity and reduce pollution. Farmers within the catchment area were approached by the group and offered a payment to have the experimental measures conducted on their land. All of the farmers accepted, and it was their in-depth knowledge of the landscape that helped make the project successful. Most of the 26 measures implemented were low cost and involved very little maintenance going forward, and the project remained well under its £2.5 million budget at around £200,000. The aim was to dissipate and hold back the water at the top of the catchment, where there is rough sheep grazing, to prevent flooding and damage at the bottom of the catchment, where there is housing and arable land. Bunds created ponds where water can be diverted, stored at high peak time and released back into the river when levels return to their natural states. Large wood structures slow the flow of water and divert it onto the floodplain. The local community are reported to be extremely pleased with the results of the trial, and the farmers rewarded with a ‘feel-good factor’. Peter Brewis is one of those farmers. He says: “I was approached by Mark Wilkinson from Newcastle University to get involved in the project, after several flash floods affected the area. It was important the work had very little impact on the output of the farm, and we managed to find a number of areas that suited both of us, successfully holding water without affecting the farming, whether livestock or fields in arable rotation. There are plenty of suitable sites on the farm, using permanent pasture which recovers quickly after flooding, field corners of fields in arable rotation, and also woodland. These have all worked well. Not long after the first work was completed, Belford suffered a considerable storm but did not flood.”
Woodland, forest and scrub all slow the passage of water with their deep network of roots and surface areas of leaves. Some rainfall evaporates back into the atmosphere before ever hitting the ground (Natural England, 2001). The great surface areas of roots and leaves mean they absorb more water underground than grass, and are less prone to run-off into the atmosphere through evaporation (Natural England, 2001). Their high water usage in the summer means they drive, enhancing their soil ability to store water (Forest Research, not dated). The fewer rapid fluctuations in water flow mean less soil erosion and therefore less sediment load in watercourses further down the catchment (Natural England, 2001). Upland forestry has been promoted by some as a panacea for flooding in lowland areas, but it is unlikely to significantly affect the flood risk downstream on its own, as the effects are uneven out at a larger catchment level (Forest Research, not dated). Flooding downstream can also be caused by inappropriate building development directly onto floodplains or on land that would normally aid the natural draining away of water. Poor maintenance or insufficient sewers and drainage will also cause localised flooding in downstream areas (UELA, 2014).

It must be remembered that all sites are different and so solutions in areas affected by flooding will be different. In areas where there is little chance to slow down the water, the priority must be ongoing stream and river maintenance to get water away quickly. The removal of rocks and sediment will aid this, and also maintain spawning beds for fish. Non-intervention policies, such as those for streams and rivers in sites of special scientific interest (SSSI), go against centuries of human maintenance and are unsatisfactory; the answer is site-specific, flexible and sensitive maintenance to protect farmland and aquatic habitats. In other situations, flood mitigation can also be achieved through the maintenance of field drains, and the use of aircraft equipment at appropriate times of the year, which aid grass growth and reflation, reducing run off. Another option in areas where water needs to be controlled is riparian zone management, where a tree shelter belt is created along the water course to trap sediment and nutrients from run off. Willow is an ideal species of tree to use for this, as it is fast growing and has a dense root structure and wildlife value, but it is important to use a variety of species in case of disease (The Woodland Trust, not dated). The riparian bank stabilisation and habitat improvement work at Pontbren changed an eroding bank that was supplying sediment into the stream to a narrower and more heterogeneous bed profile with natural vegetation recovery (Smith, 2016). Further research is needed to find out different ages and species of trees affects the water holding capacity and hydraulic properties of different soil types and conditions (Marshall, 2016). The work at Pontbren is an excellent example of the benefits of strategic planting of trees and hedges for the alleviation of flooding. One of the lead researchers from the Pontbren trial, Miles Marshall from the Centre for Ecology and Hydrology, stresses that planting trees is only one of many measures needed to mitigate flooding and ‘is not the panacea to all flooding’. Once soils are already saturated, the effect of trees in aiding water storage space is greatly diminished. Current research, such as the NRFA Project led by Bangor University, is going further into developing an evidence base for positive interactions between trees and soil, and livestock.

### 3.2 CARBON & PEAT

**NSA believes upland and hill areas would benefit from:**

- Recognition of the environmental and societal benefits of grazing and farming to reducing risks of wildfires.
- Recognition of the environmental and societal benefits of grazing and farming to reducing risks of wildfires.

To help combat climate change, there must be a balance between carbon stored and atmospheric carbon dioxide on a global level (Savoury Institute, 2013). Carbon sequestration is a process by which carbon is taken out of the atmosphere by plants through photosynthesis and permanently stored in the soil, through live or dead plant material (Fenton, 2014). Organic soil carbon makes up 60% of the organic matter of soil (Savoury Institute, 2013). Upland peatland and peat soils are the largest stores of carbon in England, storing 1.38 million tonnes (Natural England, 2010). In anoxic conditions, plant material is converted into soil carbon (Scottish Government, 2010), equivalent to 200 times the annual carbon footprint of the red meat industry (Jones et al, 2014). The environmental and soil conditions have a strong positive outcome for invertebrates, soil flora and fauna and higher life forms, such as fish, in streams and rivers (Selbie et al, 2015). The environmental and societal benefits of peatland are obvious and the role of the uplands is crucial in national carbon budgets, although its role is not always fully understood. Efforts by farmers and grouse moor managers to protect moorland habitats from over-grazing, erosion, bracken and wildfires help protect the carbon locked in the peat soils below (Countrywide Alliance, 2012). This might include gap blocking, a method promoted by some Higher Level Stewardship schemes where drains previously created in the draining of uplands are blocked, allowing the improvement of healthy peat bogs, holding back water in the uplands and reducing risk of flooding downstream (Defra, 2010/2011). However, there is a fine balance. It is important to not over wet the uplands, as ground that is too wet loses its capacity to hold water in times of heavy rainfall. Similarly, care must be taken when planting trees in peatland areas, as they can cause the peat to dry up and release the carbon back into the atmosphere (Fenton, 2014). A balance must be created between carbon capture and the drying of grassland for improvement, maintaining a moist optimum level, and the difference between peatland soil and peat bogs must be recognised, as despite the habitat advantages of peat bog, it is not suitable to sustain sheep grazing. It must also be noted that increased growth of 8kg ashplated in boggy areas means flocks having to be moved or taken down from the hill (Brigden, 2015), causing different land management challenges.

Grasslands also provide an effective, profitable and culturally relevant way of storing soil carbon when in optimal health (Savoury Institute, 2013). Grazing livestock greatly contribute to the improvement of soils, transforming bare patches into flourishing grassland biodiversity (Savoury Institute, 2013) when in balance with environmental conditions and season. Their hooves break up the soil cap of peat soils and trample the dead vegetation (which would otherwise interfere with new growth) into the soil, holding water there. Many agri-environment schemes require sheep to be removed from the peat soils of the hills at certain times of the year and anti-the day and mineral soils of the slopes and lowlands, which are easily compacted by hooves, increasing the likelihood of run-off in arguably the wettest season. Excrement and urine provide rich gut bacteria to fertilise the soil. The penetration of water, provision of nutrients and an equilibrium without considering the wider picture, that is the potential for positive interactions between trees and soil is taking place in some instances, demonstrated by some of the top performing hill farms in the Jones et al (2014) study. Scenario analyses in a report by Hyland et al (2016) showed that by replicating the efficiency levels of the least emitting producers, the carbon footprint of lamb producers could be reduced by up to 30.5%. Selective breeding methods for improving lamb output per ewe, ewe productivity and growth rates (Jones et al, 2014) can garner positive environmental and economic benefits, with reduced greenhouse gas emissions and increased efficiencies in production.

**3.2 CARBON & PEAT continued**

THE COMPLEMENTARY ROLE OF SHEEP IN UPLAND AND HILL AREAS

3.2 WATER MANAGEMENT & FLOOD ALLEVATION

### 3.1 WATER MANAGEMENT & FLOOD ALLEVATION

continued
NSA believes hill and areas would benefit from encouragement of farmers to control bracken responsibly.

Heather moorland is a globally threatened habitat, mainly due to over-grazing, afforestation and bracken encroachment, and is in fact rare than rainforests. Blanket bog and upland heath are similar habitats, both providing excellent conditions for similar flora, but offer a greater variety of peat. Dry heath contains little or no bog mosses at all (Durham Diversiy Partnership, 2016). It provides habitat for a rich variety of flora and fauna and is of international importance, gaining the highest possible designations as areas of conservation (SACs) for rare vegetation and special protection areas (SPAs) for rare birds. Of all the heather moorland left worldwide, 75% is found in Britain, largely due to its management by sheep for grazing (Wilson et al., 2014). Re-establishment of more species-rich grasslands can support twice as many summer grazing sheep and, if applied across 1.5 million acres of bracken in the UK, could provide summer stocking for an extra three million sheep (NSA, 2014).

3.3 HEATHER & BRACKEN

NSA member Hamish Waugh farms in the Westerlak area of Dumfrieshire, Scotland. He has provided this image showing a fence line and where the clear heather growth. The area to the right, where there is no fence, is grazed at one ewe per two acres and the heather here is knee-deep, whereas the area to the left, where the fence is still grazed at one ewe per two acres, the heather here is knee-deep. He believes this shows the effect of under-grazing from the partial or total removal of sheep is not always what is desired. Grazing sheep on the savanna at a suitable stocking rate for that unique area, to maintain and even flourish the heather and other vegetation, is the most beneficial option for all aspects of the biodiversity and environment.

UNINTENDED CONSEQUENCES OF UNDER-GRAZING

A good working relationship and balance among all stakeholders on heather moorland is essential. For example, grouse moorland managers creating laneways has allowed hill farmers easier access to areas that were previously hard to reach or even totally inaccessible (Mooralond Association, 2016). A loss of productivity of heather stands would cause a reduction in the number of sheep and an increased risk of natural fires (Weather, not dated). Managed heather provides a habitat for a unique assemblage of wildlife, with older heather offering a diversity of sites providing food. Unmanaged heather promotes the growth of woody species, a higher risk of bracken and with no economic or grazing value (Countrywide Alliance, 2012). Burning heather creates a mosaic of nutritional grasslands and shrubs, encouraging grazing sheep to spread out and reducing damage from trampling and localised over-grazing (Mooralond Association, 2016). The short term negative effects of burning on the ecosystem are outweighed by the long term beneficial effects on management of the sites. Many nature conservators would like to see longer burning rotations to help increase the biodiversity, but this would be detrimental to overall moorland management.

Bracken as a dominant monoculture negatively impacts a variety of sectors in the uplands through its loss of grazing or farming land, wildlife habitat, suppression of young tree growth and heather, and toxicity to animals (Wilson et al, 1998). It smothers more sensitive and ecologically valuable habitats (Heather Trust, 2013) such as heather moorland, by blocking out light and rainfall with its fronds, preventing other species from thriving or establishing (Bracken Control, not dated & Heath, Trust, 2013). An increase in tick numbers in some areas to the spread of bracken and the associated increase of tick-borne diseases in birds, wildlife, livestock, pets and people. Bracken also reduces the land available for grazing, making it difficult for farmers to gather stock (Bracken Control, not dated) and can render land ineligible for the Basic Payment Scheme (NSA, 2015). It causes health problems in sheep, such as, urination and ‘brittle blindness’, and is also carcinogenic, linked to increased lung and breast cancer (Cumulus Consultants Ltd, 2014). The main health risks to humans are associated with the ingestion and ingestion of bracken spores (Wilson et al., 1998). Some of the toxic compounds found in the spores are water soluble and so ticks leaching into water sources are a possible cause of harm to humans (Wilson et al., 1998). The millions of spores shed by the plant in summer, particularly in hot and dry conditions, can be transported long distances by wind, during this time it would not be unusual to find some concentration of spores in the air over most areas of Britain (Wilson et al., 1998).

Increased temperatures attributed to global warming have given rise to an increased encroachment of bracken at a rate of 2% per annum across the UK (Wilson et al., 1998). Traditionally a sheep would cut bracken alongside the sheep, so the control of bracken was greater when more people worked the land. Nowadays, grazing sheep are one of the most important sheep owners for controlling bracken, alongside mechanical and chemical routes. This end, talkie made area-environment schemes for different habitats to allow winter grazing would have great benefit over most areas of Britain (Wilson et al., 1998).

INTEGRATING SHEEP WITH BRACKEN

NSA member Geoff Eyre has observed some changes in the landscape of the Peak District since the reduction in sheep he keeps. He says: “Areas where sheep used to browse bracken in their search for grasses underneath, slowing the return growth of the bracken, are now becoming dense bracken beds, upsetting the movement of sheep and causing other areas to become over-grazed.” The image shows a grazed strip which prevented a weed from spreading any further through a bracken bed. With regards to effective control of bracken growth, and particularly grasses on bracken stands, Geoff geoff: “Reducing bracken on my farm has seen walkers enjoying the scenery rather than walking down once-green footpath corridors or sheep tracks. I can now summer-graze one sheep on the care on land that was impenetrable bracken – and the rest of the moorland habitat and its wildlife is benefitting.”

Incentivising bracken control could also take into consideration alternative uses for the plant. Bracken has never been part of the traditional Hank of England, as it is in some countries, but it was traditionally used for a variety of products, including winter animal bedding which was then spread back on to the land in the spring. Modern uses are currently very niche, such as bracken being utilised as a potash and trace element-rich fertiliser, combined with low grade sheep’s wool for improved water retention and slower release of nitrogen (Dale Footprints, 2016). There are also a small number of biofuels made, which are 100% dead and dried bracken for domestic burning, claimed to burn hotter than oak and be a sustainable alternative to cutting trees for fuel (Brackenburn, 2016).

3.4 BIODIVERSITY & OTHER SPECIES

NSA believes hill and areas would benefit from:

- Recognition of the value of sheep grazing to ecology and biodiversity.
- Site-specific grazing prescriptions and exploration of outcomes approaches, as there is no such thing as an optimal grazing level for all habitats and different seasons/weather require flexibility.

The uplands hold a complex mosaic of habitats, each requiring different grazing regimes in order to maintain optimum structure and composition. Much of this has been highly influenced, if not created, by livestock grazing (Cumulus Consultants Ltd) which can control the growth of more aggressive plant species (English Nature, 2005). Grazing allows for a more gradual removal of plant material than cutting or burning, and gives mobile wildlife species the chance to move through the habitat (English Nature, 2005). Trampling also creates gaps in the vegetation to allow new seedlings to grow (English Nature, 2005). In a study by Hill & Berchke (2000) sheep were highlighted as important within maintaining the structural diversity of the landscape. They would otherwise have led to a loss of some natural landscapes, due to a combination of intensification in some areas with the decline of traditional farming practices in others, meaning some local populations of taxa are becoming critically low. In summer, 13 species of grasshopper and four species of snail were recorded in the wool of one sheep, with the maximum distance recorded for a grasshopper being 700m, much further than its normal home range. There were also a total of 133 plant species found, either in the wool or claws of the same sheep, remaining on the sheep for up to four weeks, transplanting by up to 100km.

Many bird species benefit from sharing their habitat with grazing sheep, including using naturally-shed wool as sturdy nest material. Habitat diversity supports species that prefer long or short vegetation or rely on the interaction between the two. Songbirds (passerines) in particular prefer the heather mosaic that sheep create by their natural grazing behaviour, and are more commonly found in areas where there are more sheep (Irwin, 2011). The situation reverses when under-grazing results in the encroachment of tall, coarse grasses in many areas, changing the vegetation structure and adversely impacting on bird species such as golden plover and other waders (Cumulus Consultants Ltd, 2012).

Increased numbers of under-grazing gives predators better opportunity to eat the eggs of ground nesting birds and decreases the accessibility for young chicks. Off-wintering of sheep decreases the habitat diversity for birds as there are less safe places for nesting (Edwards, 2006). The regulation of sheep from the hill pastures, and intensified use of in-bye land as a result, has led to a loss of floral diversity and structure for nesting birds, such as lapping and Skylark (Cumulus Consultants Ltd). Reduced level of grazing or total exclusion of grazing sheep increases in more competitive species, like tall grasses and rushes, and a decrease in shorter grasses often as a result. This has been shown to reduce the beneficial effects of relaxed grazing pressure on some invertebrates and moorland birds, as dense swards compromise their mobility and access to prey.

Some species of moth of conservation interest thrive in heavily grazed situations and skylarks are also benefited from short vegetation. Many

CASE STUDY

THE COMPLEMENTARY ROLE OF SHEEP IN UPLAND AND HILL AREAS JULY 2016

JULY 2016
other species benefit from the tussocky and contrasting structure of vegetation associated with grazing. The removal of grazing and therefore the removal of dung inputs to the soil and altered character of plant litter, have also been shown to reduce microbial biomass and nutrient cycling (Martin et al., 2013).

Invertebrates, flourishing from the reproduction sites in sheep dung, unlike the plant diversity maintained from effective grazing regimes as an excellent food source (Irvine, 2011). Beetles and their grubs are in turn an excellent food source for birds and some mammals. Dung beetles eat droppings, potentially containing parasites harmful to livestock, and so help maintain a clean pasture. Their burrowing into the soil aerates it, allowing nutrients and rainwater in and promoting healthy grass growth. Scotland is a stronghold for three species of dung beetle, in particular the Coirgorms and Western Isles (McKenzie, 2015). The northern dung beetle (Agrilus rusticus) is abundant in the uplands of the UK, in particular Scotland, the Peak District and Snowdonia, strongly associated with sheep-grazing. The population of the northern dung beetle has dramatically declined since the 1990s (Menendez, not dated). One of the main reasons for this decline is the changes in farming practices, particularly less grazing livestock on historic pastures (McKenzie, 2015).

Over recent years, there has been a huge increase in cases of Lyme disease in humans, of which ticks are the main vector.

Experts blame the rise on a number of factors, including climate change (particularly warmer winters) and increased housing development in rural areas (Donnelly & Harley, 2015). Ticks thrive in vegetation where there is sufficient humidity to stop them drying out, in particular bracken found in upland and moorland rough pasture (Smallholder, 2015). There is a complex transmission system in the uplands for leaping tick, passing between sheep and group, exacerbated by mountain hares and deer (Irvine, 2011) and if sheep numbers were to further decline reduced competition would result in an increase in one, if not all, of these populations and therefore an increase in population of ticks. Sheep are an important tick host, and while having natural immunity to Lyme disease (Smallholder, 2015) they can transmit and suffer mortality from leaping tick virus (Irvine, 2011). By adding sheep that are regularly treated with chemical pour-ons and dips to the environment, the amount of ticks present can be reduced (Pokarman, 2011).

At the extreme end of the push for reduced stocking rates is land abandonment. The idea of land abandonment can be split into three definitions: actual abandonment, where farming ceases and vegetation takes a natural succession into tall grass and eventually forest ecosystems; semi-abandonment, or hidden abandonment, where land remains subject to the most basic form of management in order to qualify for the current Basic Payment Scheme; or transitional abandonment, as a result of restructuring, land reforms, compulsory set-aside until it was abolished in 2008, or land use change (Scottish Government, 2015). Destocking or reduced management in the UK has commonly led to semi-abandonment, where the land is still viable for future use but is in real danger of actual abandonment. Certain factors contributing to the abandonment of farmland, be it actual or semi, include the distance from roads, retirement and lack of succession, low support payments and climate (Scottish Government, 2015). Unlegislated ‘land sparing’ is occurring in parts of Eastern Europe due to intensified use of other land in receipt of CAP support payments (GB. Parliament, 2012). Without enough conclusive evidence it is hard to decide how best to conserve areas of the UK that have a long history of agriculture, high population density and little remaining semi-natural habitat (GB. Parliament, 2012). In order for some land to be ‘spared’, other land would have to become even more intensified, arguably defeating the object. In Scotland, there has been significant destocking since 1992, predominantly in the lowest funded LFA, with numbers of breeding ewes falling by up to 42% in some areas (Scottish Government, 2015). One of the main reasons for this is the move from a permanent, local agricultural workforce to a more casual trend of employment, often bringing in workers who do not live in the areas all year round (Scottish Government, 2015). The total agricultural workforce in Scotland is down by 3% compared to 1992 but the number of casual workers has more than doubled (Scottish Government, 2015). Overall, 73% of upland farms do not employ any non-family labour (Thompson, 2009).

It is also important to consider the role of the human in biodiversity, as the potential for rural depopulation increases with a decline in the sheep farming of the hills and uplands. As much as we do not want to see the extinction of ground nesting birds or fragile upland flora, we also do not want to see the extinction of the shepherd, surely one of the oldest occupations. With such a large sheep population in this country, and sheep farming being threatened throughout Europe, protecting the UK shepherd is an activity of international significance.
Planting trees also encourages water infiltration into the soil, therefore reducing the water areas favoured by the hosts of the fluke parasite. Poorly drained and severely poached areas of land give rise to the incidence of lameness in sheep, as the ideal breeding ground for bacteria. Cattle can also be affected as they wander through areas of over-sown land. The seven agricultural policies outlined by the EU, as well as a holistic system could be put in place so, where sites are identified for improvement through tree planting, barriers for farmers to enhance biodiversity and assist with water management are removed. McCracken (2015) explains that planting trees can only not provide environmental and livestock benefits, but also an additional income stream for farmers, expanding into the timber industry and aiding resilience against economic and environmental decline. For governmental bodies to consider, to forge ahead with strategies to maximise the contribution of forestry to the economy, it is important to address the lack of commitment to re-wilding that has caused feelings of being undervalued and unwanted amongst farmers (Thompson, 2009). This is supported by Fenton (2015), who describes the idea of re-wilding as a highly emotional concept, rather than being based on a scientific understanding of local ecology, and one that will change a complementary role of sheep in upland and hill areas

3.5 WOODLAND

When trees are already established, grazing behaviour of sheep is beneficial to the diverse habitats found in niche areas of ancient semi-natural woodland, and sites where trees have been removed have suffered from a reduction in species diversity (Mayle, 1999). Sheep help create and maintain habitats for the invertebrates and vertebrates alike, which depend on the ground flora and shrub layers of these areas. (Mayle, 1999). The traditional sheep move less than one kilometre, providing pathways for other mammals and birds, creating seedling establishment sites, and reducing the spread of bracken (Mayle, 1999). Finding the balance is critical, as using sheep to control invasive and competitive plant species, such as bracken, prevents the shading out of ancient tree species, while some bare patches of ground reduce the competition for new seedlings (Mayle, 1999). Burns of tree regeneration have been observed when grazing is released, thanks to the good natured grazing pressure (Fenton, 2013a). Maintaining moderate levels of grazing pressure can lead to recreational areas by preserving the accessible footpaths, ensuring a more holistic system could be put in place so, where sites are identified for improvement through tree planting, barriers for farmers to enhance biodiversity and assist with water management are removed. McCracken (2015) explains that planting trees can only provide environmental and livestock benefits, but also an additional income stream for farmers, expanding into the timber industry and aiding resilience against economic and environmental decline. For governmental bodies to consider, to forge ahead with strategies to maximise the contribution of forestry to the economy, it is important to address the lack of commitment to re-wilding that has caused feelings of being undervalued and unwanted amongst farmers (Thompson, 2009). This is supported by Fenton (2015), who describes the idea of re-wilding as a highly emotional concept, rather than being based on a scientific understanding of local ecology, and one that will change a complementary role of sheep in upland and hill areas

An assumed practical interpretation of rewilding may be more of a concept of minimum intervention, with the use of free-ranging large herbivores to help the ecological community recover. This may make it difficult for the UK to benefit from having to adapt its land use. The seven agricultural policy outcomes of the EU, as well as a holistic system could be put in place so, where sites are identified for improvement through tree planting, barriers for farmers to enhance biodiversity and assist with water management are removed. McCracken (2015) explains that planting trees can only provide environmental and livestock benefits, but also an additional income stream for farmers, expanding into the timber industry and aiding resilience against economic and environmental decline. For governmental bodies to consider, to forge ahead with strategies to maximise the contribution of forestry to the economy, it is important to address the lack of commitment to re-wilding that has caused feelings of being undervalued and unwanted amongst farmers (Thompson, 2009). This is supported by Fenton (2015), who describes the idea of re-wilding as a highly emotional concept, rather than being based on a scientific understanding of local ecology, and one that will change a complementary role of sheep in upland and hill areas

3.6 SEMI-NATURAL HABITATS

The rural landscape of Britain so well known and loved by residents, visitors and tourists, writers and poets, artists, photographers and even musicians, from all around the world, is mostly as a result of man-made intervention; communities eking out a living and pastoral-type farming. There is a misconception that areas designated as Sites of Special Scientific Interest (SSSIs) and other HNV areas were once rich, structurally diverse habitats (Mayle, 1999). Fenton (2013a) observed that the better soils here allow for the natural colonisation of prickly shrubs, brambles, herbaceous and sedge, letting the tree regeneration sites without being eaten. Also the wintergreen herbaceae found here is palatable to the sheep, taking the pressure off tree browsing (Fenton, 2013a).

NSA believes upland and hill areas would benefit from:

- Easing of licences for control of problematic protected species, such as badgers, ravens and sea eagles, to a level that keeps farming and wildlife in balance.
- Recognition that the UK has very little truly wild landscape, instead the landscape, wildlife and ecology seen today is a result of thousands of years of farming.

In a country as densely populated as the UK it is important for physical and mental wellbeing for urban dwellers to have access to the countryside. Public access is widespread throughout the country, complemented by the 10 National Parks in England, three in Wales and two in Scotland. The designation of National Parks aims to protect and conserve the area concerned and, while they often designate areas of special national beauty, they are not as restrictive in design as National Nature Reserves, referring to as National Parks they cannot be categorised as by International Union for Conservation of Nature standards, as they are places where people live and work. Instead, they are IUCN category V “protected landscapes” shaped by nature and people over thousands of years and protected as national and cultural heritage (National Parks, not dated). Areas of outstanding natural beauty (AONBs) promote places of landscape, heritage and biodiversity beauty, and encourage visitors to understand the value of living rural communities with fewer restrictive controls on farmers and land owners than National Parks.

Within the rewilding debate, special reference should be made to the current proposals to release the Eurasian lynx to the UK. NSA has completed a review of these proposals, which are to obtain a licence to release six adult lynx on one of three possible sites for a five-year trial period. NSA did not find evidence that there are lynx suitable to the UK nor did its scientific advisor conclude that the lynx should be introduced. The lynx is such a shy animal, and its related ecology would be highly detrimental if the proposed scheme went ahead, with sheep seeking shelter at woodland edges being exposed to predation from the lynx. The welfare of sheep would be hugely compromised due to fear and distress of predation, protecting their lambs and the obviously maiming and deaths that would ensue. This would undermine the UK’s ‘A’ rating worldwide for its farm animal welfare, something that farmers strive to maintain in their daily work (NSA, 2016). An additional important feature of UK farming is the strict legislation for the safe disposal of carcasses, to reduce the likelihood of disease. A large predator ripping apart carcasses and transporting body parts will jeopardise all efforts farmers make towards biosecurity measures (NSA, 2016). A further reduction in sheep numbers from predation by lynx would do nothing to help the biodiversity in upland areas provided by sheep. Additionally, the ability of population of Eurasian lynx to be genetically resistant and sustainable given the UK’s dense population and urban infrastructure is highly questionable. NSA is concerned the lynx would be introduced as a protected species, adding to problems sheep farmers are already have with the lack of licensing to control problematic populations of ravens and sea eagles.

Although not directly related to rewilding, the term High Nature Value (HNV) farming is another approach being promoted by conservation bodies. This concept appears more advanced in other parts of Europe, due to its potential to offer market opportunities for products produced in harmony with special semi-natural habitats. It could arguably do this in the UK, particularly to differentiate some of our rare and heritage breeds from global commodity products, but NSA feels many hill and upland farms are already functioning as high nature value farms and that any HNV scheme should be indicative and not just to cater for extreme conservation approaches. The Scottish Government recognises this and promotes a high nature value scheme. In Scotland, this scheme is applied as the “HNV2020”, with a mass of specific support available for the reluctance of farmers. This can potentially help in the prevention of this too. Farmers wishing to operate a closed flock can benefit from tree planting, increasing biosecurity and assisting farmers to enhance biodiversity and assist with water management are removed. McCracken (2015) explains that planting trees can only provide environmental and livestock benefits, but also an additional income stream for farmers, expanding into the timber industry and aiding resilience against economic and environmental decline. For governmental bodies to consider, to forge ahead with strategies to maximise the contribution of forestry to the economy, it is important to address the lack of commitment to re-wilding that has caused feelings of being undervalued and unwanted amongst farmers (Thompson, 2009). This is supported by Fenton (2015), who describes the idea of re-wilding as a highly emotional concept, rather than being based on a scientific understanding of local ecology, and one that will change a complementary role of sheep in upland and hill areas
Farming people are an important but decreasing part of rural communities, and their falling numbers mean changes for the character of rural life (FACE, not dated). Populations of rural communities are increasing with people moving out of urban areas, who have different ideas on how the countryside should be, affecting its shape and giving less influence to farmers. The farmers that remain are under increased pressure, experiencing lower returns and a poor public image, are less likely to participate in community life, further distancing themselves from the rest of the community (FACE, not dated). Despite a rising trend in farmers reporting feelings of isolation, upland farmers experience most frequent contact with other farmers (Thompson, 2009). Demand for rural housing from outside the area, particularly for affluent retirees and second/holiday homes, has increased house prices making it more difficult for young local people to find affordable places to live and making retirement for farmers and farm workers a challenging decision. This contributes to driving young local people out of local area to look for employment and affordable living, and reduces acceptable retirement options for older farmers.

If young people can be encouraged to stay in the area and involved in agriculture, through innovative and educational support schemes, the industry will continue to flourish and traditional methods and heritage can be preserved in the best way possible. Providing existing farmers with the business skills to improve their farming establishments and to diversify in different ways can also enhance their returns for now and the future generation. Tourism is a huge industry, particularly linked to the breath-taking landscapes of the hills and uplands, and there are great gains to be made from farmers diversifying into the tourism sector in their local area where appropriate.

4.1 TOURISM & RECREATION

NSA believes upland and hill areas would benefit from:

- Proportionate easing of planning regulations, particularly in National Parks, to encourage and allow investment and appropriate energy-generation projects.
- Improved broadband access and mobile phone coverage, to allow resource access and facilitate diversification.
- Recognition of the multiplier effect and how farm enterprises support many other local business and services.

Tourism and recreation is reliant on the countryside being a managed environment, as visitors come to see the landscape, views and clear vistas. Tourism would be negatively affected if the landscape was unmanaged and the landscape became blocked with trees and scrub, and recreation opportunities would be limited without easy access. At least 86% of the open access land in England is found in the uplands, attracting 40 million visitors and making £1.78 billion for the local economies every year (Natural England, 2013a). In 2016, rural Wales saw 19m day visits and 2.28m overnight stays (The GB Tourist, 2014), spending £674m and £367m respectively. The Scottish countryside saw 2.6m overnight stays and 26m day visitors (The GB Day Visitor, 2014). Often visiting from the lowland, be it in urban or rural areas (CPRE, 2012), visitors come to seek inspiration, recreation, exercise and well-being, enjoyment and spiritual solitude, through a variety of activities from walking, climbing, caving or horse riding, to hand gliding and four-wheel drive experiences (Natural England, 2001).

It is important for rural communities to establish an alliance between their own aims and the interests of their visitors, and the farming community is arguably the most significant stakeholder as it earns a living directly from the land, is resident year round, and supports local services and businesses on an ongoing basis. It is important to not put these areas of special interest at risk, and therefore education and a greater understanding of the local environment can be provided by visitor’s centres in key places, such as carparks, while still managing public access (Natural England, 2001).

There is a total of 235,000km of footpaths in England and Wales. In Scotland the 15,000km of pathways (Parkinson, 2015) have been superseded since 2005 by most land becoming open access to walkers abiding by the Open Access Code (Scottish Outdoor Access Code, 2005). In Northern Ireland there are very few rights of way and so most walkers rely on the kindness and trust of landowners in order to explore the countryside. WalkNI (2016) provides a list of “quality walks” totalling 1,566km of footpaths. The 15 National Parks in England, Wales and Northern Ireland amount to a total of 2,265,800ha. The importance of the health benefits from contact with green space and the natural environment, or ‘green exercise’, is highlighted in the report by Pretty et al. (2007). The trial found that no matter the intensity, duration or type of activity, green exercise led to significant improvements in self-esteem and total mood disturbance. One in four people each year are now affected by a mental health issue and the prescription of anti-depressant drugs increased by 165% between 1998 and 2012 (Bragg & Atkins, 2016). Obesity and related illnesses are a greater cost to public health than smoking (Pretty et al., 2007) and costs the taxpayer more than the fire service, police and prisons combined (NHS, 2014). Creating a fitter and more emotionally content population would reduce the individual human suffering and cost less to the economy (Pretty et al., 2007) and this can all be achieved to the benefit of the uplands and hills.

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4.1 TOURISM & RECREATION continued

The overall UK shooting industry is worth £2 billion to the economy, with shooters spending £2.5 billion a year on goods and services. They provide vital income to the rural food and accommodation sector during the autumn and winter months when tourism is substantially reduced, often meaning the difference between profit and loss for some businesses. Shooting supports the equivalent of 74,000 full-time jobs, 5,200 of which are in the food and accommodation industry, and the conservation provided by shooters equates to 16,000 full-time jobs, at a cost of £250m a year through work done by shoot providers (PACEC, 2014). Scotland’s game shooting industry provides 16,300 full-time equivalent positions and is thought to be worth an annual £240m to local economies (Hirven, 2011). Around 16% of the uplands are managed as grouse moors, most of the traditional northern uplands recreational activity of grouse shooting (House of Commons, 2011).

Red grouse and red grouse shooting are indigenous to Britain, meaning there is global competition to secure and manage the best grouse shooting (Natural England, 2013a). Red grouse and red grouse shooting are indigenous to Britain, meaning there is global competition to secure and manage the best grouse shooting (Natural England, 2013a). Red grouse and red grouse shooting are indigenous to Britain, meaning there is global competition to secure and manage the best grouse shooting (Natural England, 2013a). Red grouse and red grouse shooting are indigenous to Britain, meaning there is global competition to secure and manage the best grouse shooting (Natural England, 2013a). Red grouse and red grouse shooting are indigenous to Britain, meaning there is global competition to secure and manage the best grouse shooting (Natural England, 2013a). Red grouse and red grouse shooting are indigenous to Britain, meaning there is global competition to secure and manage the best grouse shooting (Natural England, 2013a). Red grouse and red grouse shooting are indigenous to Britain, meaning there is global competition to secure and manage the best grouse shooting (Natural England, 2013a).

DIVERSIFICATION TO BENEFIT THE COMMUNITY

The multiplier effect of farmers paying back into the local economy is of great importance. Farming supports other industries such as food, fertiliser and machinery merchants, vets, hauliers, abattoirs and auction marts. In a report by Marsh et al. (2012) it was found that 34,000 people were employed on English sheep farms, supporting a further 111,405 jobs in allied industries and contributing a value of £291.4m to the local economy. Farmers and farming families recycle money in the local community by using local shops and businesses, by using local amenities such as pubs, church halls and schools, and by being part of local councils and committees. Many upland sheep farms are reliant on direct funding from the EU Common Agricultural Policy, but this money is recirculated amongst rural businesses whose success relies on farming families. The money farmers receive through the existing CAP system goes a long way to provide public goods that are not supported through the market place, such as landscape, access, prevention of wildfires and wildlife habitat.

With some farmers turning to tourism, energy production and other diversification opportunities to stabilise incomes, it is important they gain the widest range of opportunities and support. This includes proportionate easing of planning controls, particularly in National Parks, as well as improved broadband and mobile phone coverage. Digital exclusion is highest in rural and hard to reach areas where geographical features limit internet access. This means 1.2m small businesses lack the tools required for survival, as a reliable internet connection is often crucial to the success of a business, aiding communication and expanding the target audience (Airband 2015).

4.2 CULTURE & HERITAGE

Culture and heritage can be typified by the physical features found in rural areas, and the traditional customs and practices that survive to this day. Both are equally important in understanding the unique source of identity and learning in an area (Natural England, 2013a). Stone walls and barns spring to mind when thinking of physical features, and these are maintained because they still have a role in containing stock, as we are being a link to past agricultural systems. They are important to local history and are of interest to the local community and tourists alike. Environmental stewardship encourage the preservation of cultural and heritage features too, such as protection of historical and archaeological features (including ridge and furrow and sheep washes) and the restoration of historic buildings (Natural England, 2013b). Farmers have a key responsibility as stewards and land managers. This is supported by the Convention on Biological Diversity, which states the importance of ‘recognising the close and traditional dependence of many indigenous and local communities embodying traditional lifestyles on biological, on natural resources and the desirability of sharing equitably benefits arising from the use of traditional knowledge, innovations and practices relevant to the conservation of biological diversity and the sustainable use of its components’ (United Nations, 1992).

Local and national policy focus is also on supporting the protection of physical features. The UK has an Agricultural Show and County Show Protection Scheme, which was introduced in 2009 to help farmers protect physical features of historical importance. Rural and local communities who are registered on the scheme are entitled to receive a grant to assist in the cost of protection and maintenance of the features. The scheme has been extended to cover new types of feature, including access features of cultural importance, such as those of traditional agricultural practices. This includes old-fashioned sheep ways and the remains of old field boundaries. The scheme is targeted at specific groups, including farmers with a high proportion of rural land and land that is highly accessible to the public. The scheme is designed to support farmers and landowners to protect and maintain their unique heritage, ensuring that their landscape remains a rich tapestry of agricultural and farming history.

The farming family is widely viewed as the social institution upholding the traditional upland farming way of life. Farmers with ancestral links to the local area have a strong sense of place and link production to their social status within the farming community, demonstrating their desire to make a living from productive farming (Thompson, 2009). There was a time when most of the village got involved in the rearing of sheep from the hill, with many villagers having their own sheepfold for this purpose. The traditional social fabric of activities such as this are all but lost. Local and agricultural shows allow for the display of traditional skills and practices, as well as the native breeds of livestock that add distinctiveness to cultural heritage (CPIE, 2012). Shows provide educational tools for the public and preservation of traditional methods to the local community, such as the 18th-century practice of showing pedigree animals (ASA, 2015). Many showsSurvived the 2007 foot and mouth outbreak and are continuing to grow in numbers (ASA, 2015). The Association of Show and Agricultural organisations lists 188 shows in its 2016 Members’ Handbook. Most of these give an average attendance figure, ranging from 800 to 237.6% (ASA, 2016) although the attendance figure for the 2015 Royal Welsh Show reached 242,726 people (Royal Welsh Agricultural Society, 2016). ASA (2015) says six million people, 10% of the population, are now visiting agricultural shows every year. ASA (2015) describes the important purpose of agricultural shows in the promotion of British farming and education to bridge the gap between the rural and urban divide. Agricultural shows are the perfect opportunity to showcase the inextricably linked rural environment and food production, and can change the public perception of farmers and farming. They allow the non-farming public to ‘get on the other side of the farmer’s hedge’ (ASA, 2015) through a lively and informative programme of workshops, demonstrations and hands-on activities. With the appropriate marketing, level of creativity and relevant educational themes, it is no wonder they are becoming increasingly popular with the wider public. For farmers, shows provide a business event and social occasion, allowing them to buy and sell, showcase their best work and compare notes with colleagues and trade stands. They can be a vital shop window (ASA, 2015) for farmers in the latest technologies, trends and machinery from industry leaders, and an opportunity to learn about recent legislation and advice on current topics (ASA, 2015).
and rescuing others from floods. Supporting local food supply chains, such as abattoirs, markets and farm shops, boosts the local economy and can increase the profits of farmers by adding value and potentially cutting the additional costs associated with transporting livestock to slaughter (CPFRE, 2012). The significant reduction in the transportation of animals also appeals to the consumer as it is perceived as better welfare (CPFRE, 2012). The National Federation of Young Farmers Clubs in England and Wales, and its equivalents in Scotland and Northern Ireland, play a huge part in rural society, providing members with social events, skills training and opportunities for travel, as well as raising huge amounts of money for charity. Charity fundraising is important throughout rural communities, including for farming charities such as the Royal Agricultural Benevolent Institution (England and Wales) (RABI), the Royal Agricultural Benevolent Institution (Scotland) (SABBI) and provides help in a variety of means, from regular or one-off grants, essential household items, disability equipment and relief staff (RABI, 2016a). RABI received 52 referrals between January and May 2016 and provided assistance to 34. Around 28 of these cases were in significant upland areas, 20 uplands and eight from Cumbria. In 2015 RABI gave out £1.9m in grants to 1,341 individuals and families, with £270,000 going directly to working farmers (RABI, 2016b).

### 4.3 COMMON LAND & CROFTING

 NSA believes upland and hill areas would benefit from support for traditional commons and crofting communities and the goods and services they provide, allowing them to continue as a viable farming practice.

Common land ranges from extensive pastoral grazing, woodland areas, coastal marshes and even land near towns (Federation for Common Land, 2015). It is mostly, but not exclusively, found in upland and hill areas. Beneficial for heritage, public access and environmental factors, commons are protected from development and agricultural intensification through grazing rights and statutory protection (Defra, 2010/2011). Jones (2011) describes Scottish common land as ‘socially significant in the most marginal communities, producing high levels of public goods’. An important part of the landscape, commons provide a range of public goods and services such as space for exercise, recreation and fresh air for the wider public, who often do not understand or appreciate the practice of commoning (Blackenbury & Jones, 2015). There are 1,166,780 ha of common land in the UK, 372,941 ha of which are in England, 173,366 ha in Wales, 591,901 ha in Scotland and 28,573 ha in Northern Ireland (Foundation for Common Land, 2015). Dartmoor Forest is the largest area of registered common land in England and is the source for 45.4% of all water for Devon and Cornwall. The Long Mynd in Shropshire receives approximately 300,000 visitors a year, including many who visit for its range of outdoor pursuits. West Arkengarthdale Common in the Yorkshire Dales National Park has a significant store of carbon in its peat soils (Aglinory & Morris, 2015).

As with other upland and hill areas, commons have been influenced by fluctuations in policy over a period of years, often made with a lack of understanding about the practice and how it works. Pillar One funded schemes have focused on high stocking and production, whereas Pillar Two funded schemes have focused on reductions on grazing pressure for the benefit of the environment (Blackenbury & Jones, 2015). Despite there being a reducing stocking rate, the income from grazing has not kept pace. As a result, the current common land income would be from having more sheep on the common, due to the low returns from sheep farming (Aglinory & Morris, 2015). Many Welsh Grazing Associations use agri-environment schemes within Glastir to manage the pattern and number of animals grazing and financially support the management of the common, but find these schemes to be inflexible to proven methods of grazing control and unable to deal with the range of grazing issues (Blackenbury & Jones, 2015). Farmers are generally in favour of involvement in agri-environment schemes, however they seek flexible schemes that can be site specific and adaptable depending on changing conditions. For commons, this means allowing farmers and graziers to design their own grazing prescriptions for the benefit of the common and to best mitigate any costs occurred, such as fencing, off-wintering and reduced labour (Aglinory & Morris, 2015). This must be taken into consideration as the UK looks towards its future outside the EU and develops its own schemes to support marginal areas. One concern that must be addressed is the protection of legal rights when agri-environment schemes or land designations are agreed.

Part One of the Commons Act 2006 requires electronic registers of all common land to be implemented by all grazing authorities. However, this is both difficult and expensive and, as a result, most local authorities have little or no information regarding the current situation of their local commons (Staley, 2016). NSA hosts the Welsh Commons Forum, a meeting of commons users and council to discuss interests and views around common land they share. The Welsh Commons Forum played an important role in influencing when the Commons Act 2006 was at the date of its introduction of up to five years from ‘day one’, for the purpose of creating a new right to management, without which the implementation of other parts of the act becomes difficult (Staley, 2016). It is often forgotten that common rights are attached to the land, not the current owner of the land, and as a result, land has been sold over the years with no obligation to inform the registration authorities of the transfer of rights, and has even been sold for housing developments (Staley, 2016). Some grazings have no committee to regulate them, and the Crofters Commission in Scotland estimates around 20% of crofters’ common grazings are completely unregulated, with another 34% technically unregulated (Jones, 2011).

The future of the commons is a concern for many. As with other sectors of upland farming, there is a reducing pool of knowledge and skills among farmers and young people move out of the industry in search of better wages. Successful farming of the commons requires knowledge of the specific environment and how it is best utilised by livestock. No two commons are the same, so the knowledge and particular farming practices of each common varies (Edwards, 2006). There is a long history and tradition of farmers on the commons working together and being mutually dependent on each other’s stock management practices (Thompson, 2009). There are barriers...
4.3 COMMON LAND & CROFTING continued

Crofting is a traditional practice found in the Scottish Highlands and Islands where a tenant crofter is responsible for ensuring his area of land remains productive. Crofts form around 25% of the land in the Highlands and Islands, and therefore about 15% of the land in the UK (Scottish Crofting Federation, not dated). Crofters generally live on the croft or within 32km as specified by the Crofters Commission, either as a tenant or an owner-occupier (Brackenbury & Jones, 2015). There are around 18,000 crofts in total, supporting 10,000-12,000 crofting households and around 33,000 individuals (Crofting Commission, not dated). In Scottish parishes dominated by crofting land use, up to 80% of the farmed land can be common land (Jones, 2011). The Soil Association has set up a scheme to encourage young people into crofting, in order to keep traditional skills and safe-guard their culture and history, while learning the importance of health and environment (Soil Association, 2015). It encompasses a database of 388 farms within the national park boundary and most courses are organised within Dartmoor to be convenient for its farmers. Helen and Roy Rodmorr have benefitted from the work of the project, as Helen explains. “It has helped the whole family attain new skills and get formal training,” she says. “It is wonderful. The entire organisation is done for you and usually fits in with the farming calendar. The project is valued by the family and stays relevant to the needs of upland farming and our community.”

Developing Skills on Dartmoor

The Dartmoor Hill Farm Project, set up in 2003, aims to ensure a viable future for Dartmoor farmers, supporting them to establish and run projects to add value to their businesses. The project is funded by the Dartmoor National Park Authority (DNPA), the Duchy of Cornwall and, more recently, the Prince’s Countryside Fund. It encompasses a database of 388 farms within the national park boundary and most courses are organised within Dartmoor to be convenient for its farmers. Helen and Roy Rodmorr have benefitted from the work of the project, as Helen explains. “It has helped the whole family attain new skills and get formal training,” she says. “It is wonderful. The entire organisation is done for you and usually fits in with the farming calendar. The project is valued by the family and stays relevant to the needs of upland farming and our community.”

4.4 SHEEP MANAGEMENT SKILLS

Developing Skills on Dartmoor

There are numerous existing knowledge exchange schemes, including those provided by UK levy bodies. Alongside work to promote red meat and create profitable demands for products, the livestock levy bodies use the statutory levy paid on all beef and sheep slaughtered to share information, support training and conduct research and development, all for the improvement of efficiency, sustainability and cost-effectiveness of the different sectors. In England, the Agriculture and Horticulture Development Board (AHDB) for Beef and Lamb received £15.773m in 2014/15 (AHDB, 2015b). This was supplemented by other fee, grant and commercial incomes and 20% of the total income to AHDB Beef & Lamb previously EBLEX was spent on research and development and knowledge transfer (AHDB, 2015b). For Hybu Cig Cymru (Meat Promotion Wales), the same organisation for Welsh levy payers, the sheep levy was the greatest contribution to the total in 2014/15, at 66.33%. The split in levy spend for 2014/15 saw 10.57% go towards industry development (HCC, not dated). The equivalent body in Scotland is Quality Meat Scotland (QMS), which also covers 90% of farmed livestock in its internationally recognised assurance schemes (QMS, 2016). Its 2014/15 income from the statutory red meat levy was £4,995,837, with 16.9% spent on industry development. The situation is slightly different in Northern Ireland, where most of the levy goes to the Livestock and Meat Commission (LMCNI) but Agrisearch, part of the Northern Ireland Agricultural Research and Development Council, uses some levy to fund many of the projects undertaken by the Agri Food and Biosciences Institute (AFBI). In 2015, the sheep total sheep levy key was £24,963, but there was additional sheep income comprised of £19,956 due to a one-off special project. The expenditure on direct programmes in 2015 including research and development, was £42,948, which was 95% of the total income from total levy payments alone (Agriresearch, 2015).

Other programmes are funded by the Government. For example, skills and training provided under the Rural Development Programme for England are 70% funded, Defra managed and include 32 training providers (Gov.uk, 2014). The available courses range from management, business skills and ICT to traditional rural skills (Gov.uk, 2014). Some of the main providers include URPS (UK Rural Skills), who aim to enrich rural communities by raising standards, increasing safety and boosting efficiency and productivity (URPS, 2016). Innovation for Agriculture is a consortium of 15 English agricultural societies delivering new science and innovation to farmers from its technical centres around the UK. Communicating through websites, publications, conferences, workshops and on-farm demonstrations, Innovation for Agriculture focuses on precision livestock and animal health and welfare, soil and water, renewable energy and the uplifts (Innovation for Agriculture, 2016). The
4.4 SHEEP MANAGEMENT SKILLS continued

Agri-Skills Fund (2016) was set up in 2008 to ensure that skills in the agricultural and horticultural industries were being sufficiently addressed. The forum works alongside industry stakeholders, (rural land-based and environmental skills) and Landex (land-based colleges aspiring to excellence) to aim to achieve a UK-wide profitable and sustainable industry that can meet the demands of 21st century land management and is a valued part of society. In the 2013 report, ‘A UK Strategy for Agricultural Technologies’ (HM Government, 2013), it was stated that the Government aimed to build on the work done by the Agri-Skills Fund, with a vision for the UK to become a world leader in agricultural technology, innovation and sustainability. It recognises that the UK agricultural sector already has a strong set of skilled workers, world-class retailers and is a traditional leader in agricultural sciences, but the current regulatory regime and skills gap is hindering the development and use of new technologies and innovation. The Government pledged to spend £90 million over the five years from 2013 to establish Centres for Agricultural Innovation, focused on helping businesses develop through technology and skills, and providing a platform for training, skills development and succession planning. By making the skills and training more demand-led, it would bring closer links and greater access to the many successful agricultural colleges, higher education and research institutes, updating the skills of those currently in the sector and attracting new entrants. While it can be assumed this funding is safe through to 2018, the longer-term future for this type of support is unclear with the UK potentially not having the same funding opportunities outside the EU. The Government has said developing a skilled workforce, alongside use of new technologies and regulation for risk and innovation, is the way for the UK agricultural sector to increase productivity and become a key contributor to food security and international development (HM Government, 2013), and this must not be forgotten in future discussions. Of equal importance is the research that must be conducted to ensure new technologies and skills are always being developed for the agricultural sector to take up, and in order to move forward. European funding has been an important catalyst for some of this research in the past and the UK must not be allowed to fall behind the rest of the world as it designs and determines its future outside of Europe.

A Government review concluded upland farmers need strong business skills and new and entrepreneurial outlooks in order to make the best of their businesses. It said they should seek greater efficiencies by cutting costs and maximising incomes, pooling resources with neighbours and using contractors to help reduce costs of staff and equipment. Greater efficiencies will also aid the reduction of the carbon footprint of their enterprise. Producing higher value products, such as special breeds, or finishing their own stock, can help gain greater profits, and the carbon footprint of their enterprise. Producing higher value products, such as special breeds, or finishing their own stock, can help gain greater profits, and the carbon footprint of their enterprise. Producing higher value products, such as special breeds, or finishing their own stock, can help gain greater profits, and the carbon footprint of their enterprise. Producing higher value products, such as special breeds, or finishing their own stock, can help gain greater profits, and the carbon footprint of their enterprise. Producing higher value products, such as special breeds, or finishing their own stock, can help gain greater profits, and the carbon footprint of their enterprise. Producing higher value products, such as special breeds, or finishing their own stock, can help gain greater profits, and the carbon footprint of their enterprise. Producing higher value products, such as special breeds, or finishing their own stock, can help gain greater profits, and the carbon footprint of their enterprise. Producing higher value products, such as special breeds, or finishing their own stock, can help gain greater profits, and the carbon footprint of their enterprise. Producing higher value products, such as special breeds, or finishing their own stock, can help gain greater profits, and the carbon footprint of their enterprise. Producing higher value products, such as special breeds, or finishing their own stock, can help gain greater profits, and the carbon footprint of their enterprise. Producing higher value products, such as special breeds, or finishing their own stock, can help gain greater profits, and the carbon footprint of their enterprise. Producing higher value products, such as special breeds, or finishing their own stock, can help gain greater profits, and the carbon footprint of their enterprise. Producing higher value products, such as special breeds, or finishing their own stock, can help gain greater profits.

Succession is an important, yet sensitive and concerning issue for many farmers, and organising a successor will be actively encouraged. The average age of farmers in the UK currently stands at 59, with a third of farmers aged over 65 (Defra et al, 2015). The idea of creating a ‘genetic link’ between farmers of the past, present and future is popular with farmers when thinking about their successor, with the transfer of knowledge and traditional skills to their children who see themselves as ‘preparing a farming temperament’ and having farming ‘bred into’ them (Thompson, 2009). This could be seen as discriminatory towards those who are passionate and could bring new ideas to the industry, but lack the ancestry link to farming, preventing the Government from realistically getting involved in promoting succession with the aim of creating a genetic link (Thompson, 2009). However there is evidence to suggest that some farmers encourage their children to stay in education and pursue other careers (Thompson, 2009), perhaps as they do not see farming as financially viable for the future.

4.5 OPPORTUNITIES FOR NEW ENTRANTS

It is estimated that for a sustainable future agriculture must attract 60,000 new entrants over the next decade (Glover & Cazalet-Smith, 2013). It is good news for the industry if this means the new blood coming through is knowledgeable and skilled, but these people must continue to be inspired and provided with the tools for best practice. This is where the biggest gains can be made, as young people tend to be more open to the use of new technologies and systems and can develop business skills that enable them to improve the industry and sustain it for the future. In order to compete in a volatile market, they must have an entrepreneurial outlook and seek to add value through greater efficiencies by cutting costs and increasing outputs (Defra, 2010/2011).

NSA believes upland and hill areas would benefit from:-

• Support and encouragement of future generations entering upland livestock farming with a holistic focus on productivity and provision of public goods.
• Support for existing and older farmers to step back with dignity.

ENCOURAGING THE NEXT GENERATION

NSA Next Generation is an initiative that supports the future of the sheep sector by encouraging participation by young people. The overall aim is to provide an informative service for young people looking to enter the industry or improve the family business, through training, competitions and events. Joanne Briggs, who coordinates the NSA Next Generation activity, explains that it includes a yearly intake of up to 12 NSA Next Generation Ambassadors. These individuals are selected for their passion for the future of the sheep industry and undertake several training sessions and seminars over the course of the scheme, to provide them with the ideas and tools for a prosperous business. The rigorous selection process ensures an even spread from across the UK, which also helps sustain the future of NSA’s vital work at a regional level, encouraging future office holders and volunteers. Themes of the training sessions range from performance recording and grassland management to financial management and media training.

There are various organisations that support young and new entrants to the industry through funding and schemes, including NSA through its Next Generation initiative and Ambassador programme. NSA provides a lambing list where farmers can advertise work experience placements at lambing time, providing valuable opportunities for agricultural and veterinary students. There is also the opportunity for NSA to match-make young people with longer work experience opportunities, university sandwich placements and paid employment. Keen young shepherds under the age of 27 are able to enter NSA Young Shepherd competitions, where they demonstrate their abilities in lamb classification, handling, shearing and ATY use, refining their practical skills and industry knowledge, and the Prince’s Countryside Fund (2013) provides funding for several different projects, including the Hill Farming Succession Scheme. This aims to train five farmers from target valleys of Cumbria to become mentors to young people and educate public and agency staff, and train eight young people over a period of two years in hill farming skills, gaining experience from the farmers and skills to maintain countryside infrastructure. The Farmer Network is a non-profit organisation operating in Cumbria and the Yorkshire Dales, to support, help and guide its members and improve the sustainability of their farms. It aims to encourage local farmers to work together, improve efficiency, increase knowledge and skills, increase revenue and educate the public (The Prince’s Countryside Fund, 2013). In 2014, the Farmer Network gave £20,000 worth of technical training grants to 104 of its members, and provided five young people with £6,000 in grants and £77,000 in low interest loans to help them develop their businesses. It also provides a labour directory for farmers looking for labour or contractors looking for work, with some even offering free help (The Farmer Network, 2015). Also funded by The Prince’s Countryside Fund are the academies run by the Fresh Start Land Enterprise Centre (FSLEC). These are open to anyone aged over 18, from a farming or non-farming background, looking to start a new business or diversify and existing one, and providing mentoring.
4.5 OPPORTUNITIES FOR NEW ENTRANTS

The industry requires new entrants at all these levels, not just sheep farming. Without an interest of new entrants into Allied activities to sheep farming also attract new entrants, such as veterinary, research, trade and supply companies, food science and industry and must not be neglected in future discussions for a UK support system outside of the EU.

The uptake of these four schemes has Entrants Start-Up Grant Scheme running alongside it has no upper age limit but still requires a minimum of 3ha and is aimed at farmers or agricultural business for the first time or taking over an existing business, be it a farm or a croft. The five-year plan is aimed at 16-40 year level two qualification in agriculture (CAFRE, 2016). In Scotland, there is the Young Farmers Start-Up Grant Scheme for those starting an agricultural business for the first time or taking over an existing business, be it a farm or a croft. The five-year plan is aimed at 16-40 year old who must have a minimum of 3ha, and can be the equivalent of £70,000 in two instalments (Scottish Government, 2016a). The New Entrants Start-Up Grant Scheme running alongside it has no upper age limit but still requires a minimum of 3ha and is aimed at farmers or crofters who started up within 12 months of application to the scheme (Scottish Government, 2016b). The uptake of these four schemes has been variable, depending on how prescriptive it is, but the concept of having this support is essential for the long-term sustainability of the industry and must not be neglected in future discussions for a UK support system outside of the EU.

The unique environment created by hundreds of years of upland farming provides a valuable source of quality water, carbon sequestration and biodiversity. The uplands provide an environment of minimal input use and pollution, giving clean, fresh water much further downstream and combating carbon dioxide emissions by transforming the gases into valuable stores of carbon. Rough vegetation and areas of woodland are excellent forms of flood mitigation and create habitats for the many species that share the environment with grazing livestock. Farmers are important managers of their environment and must be encouraged to maintain the mosaic habitats of heather and shrubs, by the removal of bracken through grazing and other forms of management. Appropriate stocking rates are essential to environmental outputs and schemes must be flexible and site-specific in order to avoid the detrimental effects of both over and under-grazing. It is important the traditional practices and environmental management undertaken by farmers are not undermined by a desire of other interest groups to rewild the landscape, reducing our farming capital and making the countryside inhabitable to more fragile plant and animal species, and less accessible to visitors.

Upland communities, of which farmers are a central part, provide a wealth of social and health benefits for residents and tourists alike. Many people working in urban areas look to the great outdoors for recreational activities and to boost their mental and physical health, with proven results. They also provide a wealth of history and culture, with many traditional practices, buildings and ways of life maintained by the local people. Farmers pride themselves on their work and achievements, which often span generations, and the strong sense of place which their ancestral heritage provides them. Attracting visitors to the area boosts the local economy and allows for farmers to diversify into travel and tourism, increasing their incomes from the otherwise poor returns from farming. The opportunity for succession and entrepreneurship encourages young people to stay or move into the industry, and this must be encouraged by providing both existing farmers and the next generation with skills and inspiration to drive the sector forward.

5 CONCLUSION

5.1 ECONOMIC OUTPUTS:

A stable, sustainable sheep industry is essential to supply domestic, export and developing markets with nutritious and enjoyable food for a growing world population that is expanding in ethnic diversity and wealth. Sheep meat will be the primary economic driver for the industry for the foreseeable future, with breeding stock and stone lamb production being a key part of this. Decision makers and the public should be better informed on the importance of red meat, in particular sheep meat products, as part of a balanced diet with responsible credentials. The support of large retailers to improve public awareness is of great importance, but also to promote products that support the traditional hill system. Adding value through wool and other sheep related products is crucial and retailers and textile manufacturers could develop the British wool industry to deliver better prices for fleeces. The traditional stratified sheep industry, unique to Britain, is an economic, practical and environmentally sensible way of sheep farming, making the most of the different characteristics of breeds and environments. However, the stratified sector must rise to the challenges presented, particularly in relation to disease control and information sharing. The loss of breed traits of hill pure breeds and upland Mules would change the entire face of the sheep industry and it is highly desirable to create and maintain a wide range bank of genetic material. It is vital the hill and upland sheep sector, producing sustainable meat and wool, is additionally supported and financially rewarded for the public goods and services it provides.

5.2 ENVIRONMENTAL LINKS AND OUTPUTS:

The unique environment created by hundreds of years of upland farming provides a valuable source of quality water, carbon sequestration and biodiversity. The uplands provide an environment of minimal input use and pollution, giving clean, fresh water much further downstream and combating carbon dioxide emissions by transforming the gases into valuable stores of carbon. Rough vegetation and areas of woodland are excellent forms of flood mitigation and create habitats for the many species that share the environment with grazing livestock. Farmers are important managers of their environment and must be encouraged to maintain the mosaic habitats of heather and shrubs, by the removal of bracken through grazing and other forms of management. Appropriate stocking rates are essential to environmental outputs and schemes must be flexible and site-specific in order to avoid the detrimental effects of both over and under-grazing. It is important the traditional practices and environmental management undertaken by farmers are not undermined by a desire of other interest groups to rewild the landscape, reducing our farming capital and making the countryside inhabitable to more fragile plant and animal species, and less accessible to visitors.

5.3 SOCIETAL LINKS AND OUTCOMES:

Upland communities, of which farmers are a central part, provide a wealth of social and health benefits for residents and tourists alike. Many people working in urban areas look to the great outdoors for recreational activities and to boost their mental and physical health, with proven results. They also provide a wealth of history and culture, with many traditional practices, buildings and ways of life maintained by the local people. Farmers pride themselves on their work and achievements, which often span generations, and the strong sense of place which their ancestral heritage provides them. Attracting visitors to the area boosts the local economy and allows for farmers to diversify into travel and tourism, increasing their incomes from the otherwise poor returns from farming. The opportunity for succession and entrepreneurship encourages young people to stay or move into the industry, and this must be encouraged by providing both existing farmers and the next generation with skills and inspiration to drive the sector forward.
5.4 SUMMARY OF ASPIRATIONS

NSA believes upland and hill areas would benefit from the following changes.

FOR ECONOMIC OUTPUT
• Improved resources for marketing of upland lamb and other sheep products.
• Mitigation against market volatility.
• Promotion of the health benefits of predominantly grass-fed red meat to a wider audience.
• Sustainable prices for producers and consumers.
• Recognition of the value of upland and marginal sheep genetics to the UK gene pool and its wider sheep systems.
• The development of practical health assurance schemes and increased sharing of information by sellers to give confidence to buyers of breeding stock and store lambs.
• Encouragement of retailers and consumers to consider the unique benefits of British wool in an attempt to get better and fairer prices for sheep farmers.
• Encouragement of retailers to embrace heritage breeds as new and diverse products, resulting in more mainstream interests in these niche markets.
• A farm support and reward system, developed post-Brexit, which caters for all agricultural sectors but specifically increases the financial recognition of provision of a broad range of public goods.
• Payment (via public and private means) for eco-system services based on reward and deliverables, and not income foregone.

FOR ENVIRONMENTAL LINKS AND OUTPUT
• Deeper understanding of the role sheep and the uplands play in prevention and mitigation of flooding and the supply of vital clean water to many urban communities.
• Recognition of the extreme importance of the uplands as carbon sinks, in particular peat soils, and the role that farmers play in protecting them.
• Recognition of the environmental and societal benefits of grazing and farming to reducing risks of wildfires.
• Encouragement of farmers to control bracken responsibly.
• Recognition of the value of sheep grazing to ecology and biodiversity.
• Site-specific grazing prescriptions and exploration of outcomes approaches, as there is no such thing as an optimal grazing level for all habitats and different seasons/weather require flexibility.
• Trees and valuable areas of scrub within grazing areas no longer being classed as permanent ineligible features (PIF) under the Basic Payment Scheme or its post-Brexit successor.
• Resolution of contradictions between the Basic Payment Scheme and agri-environment schemes, and steps taken to ensure no such contradictions exist in post-Brexit schemes.
• Easing of licences for control of problematic protected species, such as badgers, ravens and sea eagles, to a level that keeps farming and wildlife in balance.
• Recognition that the UK has very little truly wild landscape, instead the landscape, wildlife and ecology seen today is a result of thousands of years of farming.

FOR SOCIETAL LINKS AND OUTCOMES
• Proportionate easing of planning regulations, particularly in National Parks, to encourage and allow investment and appropriate energy-generation projects.
• Improved broadband access and mobile phone coverage, to allow resource access and facilitate diversification.
• Recognition of the multiplier effect and how farm enterprises support many other local business and services.

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